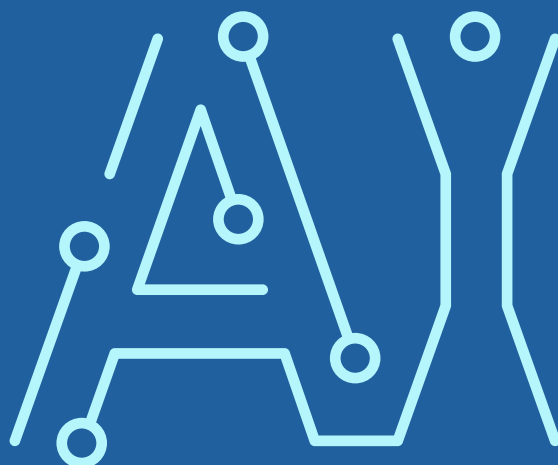




PEOPLE AND ALGORITHMS: WORKING WITH AI IN MARKETING

Edited by

Natalia Gluza, Grzegorz Leszczyński, Piotr Gaczek,
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INTRODUCTION

Artificial Intelligence is no longer a distant technological trend in marketing. It is already reshaping how marketers analyze data, understand consumers, design customer experiences, create content, collaborate with technology teams, support sales, and assess the consequences of their decisions. Used well, AI can boost marketing practice. Without an informed critical approach to use, it can reproduce bias, generate misleading insights, weaken creativity, and create serious ethical, legal, and security risks.

This handbook has been prepared to support your work with Artificial Intelligence in marketing in a thoughtful, creative, and responsible way. Its goal is not only to introduce AI tools and concepts, but also to help you develop the judgment required to use them effectively. In marketing, the ability to ask better questions, evaluate AI-generated outputs, understand data limitations, and collaborate with other professionals is becoming as important as knowing how to use specific platforms or applications.

The handbook is primarily addressed to marketing students at the master's level. It has been developed by marketing departments from European universities who are witnessing how AI the transformation of the profession and deciding how marketing education should respond to this change. The chapters are designed to connect conceptual understanding with practical application, helping students prepare for marketing roles in which AI will be part of everyday work.

The handbook covers both the opportunities and the challenges of AI in marketing. It begins with broader developments in Marketing 6.0 and the role of machine learning, deep learning, and generative AI. It then addresses the importance of data, cooperation with IT specialists, creative work with AI, and the critical evaluation of AI-generated outcomes. Particular attention is given to synthetic personas, the competencies needed to work with AI, security issues, and the growing collaboration between sales and marketing. The handbook encourages a critical, reflective approach: AI should not be treated as a replacement for marketing thinking, but as a powerful tool that requires human expertise, responsibility, and judgment.

This handbook is the result of collaboration between academics from Poznań University of Economics and Business (Poland, project leader) and Corvinus University of Budapest (Hungary), University of Applied Science Upper Austria, Stockholm School of Economics (Sweden), Complutense University of Madrid (Spain), Polytechnic University of Marche Ancona, (Italy), University of Zagreb, Faculty of Economics and Business (Croatia), and University of Perpignan (France).

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MARKETING 7.0 AND BEYOND

Natalia Gluza & Jesús García de Madariaga

Marketing is one of the most recognizable yet difficult-to-define concepts in contemporary business. Traditionally associated with advertising, branding, and communication campaigns, marketing is undergoing a much deeper transformation. Modern marketing is no longer limited to sending promotional messages to audiences. It now means creating integrated systems, environments, and experiences that surround users and respond dynamically to their behaviors, preferences, and interactions.

This transformation is closely connected with the concept of Marketing 6.0. Although the terms are often associated with artificial intelligence, immersive technologies, augmented reality, or the integration of physical and digital spaces, Marketing 6.0 represents something broader than a new technological trend. At its core, Marketing 6.0 reflects a shift in the logic of marketing itself. Contemporary organizations are moving beyond isolated campaigns and one-way communication toward adaptive ecosystems that continuously evolve using data, interaction, and real-time personalization. The concept of Marketing 7.0 goes beyond AI-driven performance optimization to understanding how people think, connect, and buy in coexistence with machines.

As a result, marketing is increasingly more of a system rather than a sequence of individual activities. Companies no longer focus exclusively on creating messages one at a time. Instead, they design environments in which customers actively participate, interact, and co-create experiences. This transformation also significantly affects the job. In the past, marketers were primarily responsible for communication, promotion, and campaign execution. Today, they increasingly operate as the designers of systems, customer experiences, and integrated digital environments.

Understanding this evolution is essential because one of the biggest challenges in the modern business environment is not access to technology itself, but the ability to distinguish between what technology truly changes—and what it does not. This chapter explores the evolution of marketing from Marketing 1.0 to Marketing 7.0 but mainly explains the characteristics of immersive marketing ecosystems and discusses the changing role of marketers in data-driven and AI-supported environments from the point of view of Marketing 6.0.

1.1 THE EVOLUTION OF MARKETING: FROM 1.0 TO 7.0

Marketing has never been a static domain. Throughout its history, it has continuously evolved in response to technological change, shifting consumer expectations, and new business models. The development of marketing can be understood as a gradual transition from product-centered communication toward intelligent, adaptive, and immersive systems.



Marketing 1.0: Product-Centric Marketing

Marketing 1.0 focused primarily on products and production efficiency. Manufacturers concentrated on mass production, standardization, and distribution. The dominant assumption was that a high-quality and widely available product would naturally generate demand. Communication during this stage was one-directional and largely informational. Advertising emphasized product features, availability, and price. Customers were treated as homogeneous groups rather than as individuals with unique needs or preferences. This model was particularly visible during the early industrial era, when production capabilities and economies of scale represented the main sources of competitive advantage.



Marketing 2.0: Customer-Oriented Marketing

The emergence of Marketing 2.0 marked a significant shift toward customer needs and preferences. Companies began to recognize that customers have different expectations, lifestyles, and purchasing behavior. As a result, concepts such as segmentation, targeting, and positioning became central to marketing strategy. Organizations increasingly relied on market research and customer analysis to develop more tailored products and communication. Competitive advantage no longer depends solely on production efficiency. Instead, companies sought to differentiate themselves by deepening their understanding of customer needs.



Marketing 3.0: Values-Driven Marketing

Marketing 3.0 introduced another significant dimension by recognizing customers not only as buyers but also as people with emotions, values, beliefs, and social expectations. Brands increasingly focused on purpose, sustainability, ethics, and social responsibility. Marketing communication became more symbolic and identity-oriented, emphasizing emotional connections and shared values. At this stage, organizations tried to build long-term relationships with consumers by aligning brand identity with broader social and cultural concerns.



Marketing 4.0: Digital and Networked Marketing

Marketing 4.0 emerged alongside rapid digital transformation. The early development of the internet enabled access to information and online communication, while the later rise of social media platforms and smartphones transformed marketing into a highly interactive and real-time process. The immediacy of digital communication significantly changed how consumers interacted with brands and made purchasing decisions. Communication became interactive rather than unidirectional. Customers could now comment, share content, create opinions, and influence other consumers through digital networks. Marketing increasingly operated across multiple touchpoints and platforms. Companies lost some control over communication but gained new opportunities for engagement, personalization, and community building. User-generated content, influencer marketing, and omnichannel communication became important components of digital marketing strategies.



Marketing 5.0: AI and Data-Driven Marketing

Marketing 5.0 introduced the large-scale integration of advanced technologies such as artificial intelligence, machine learning, automation, and predictive analytics. Marketing decisions increasingly became data-driven. Companies began using algorithms to personalize communication, optimize campaigns in real time, predict customer behavior, and automate decision-making processes. Recommendation systems, dynamic pricing, predictive customer analytics, and automated campaign optimization became common examples of this transformation. The key characteristic of Marketing 5.0 was the growing role of intelligent systems that continuously learn from data and adapt their operations accordingly.



Marketing 6.0: Immersive and Adaptive Ecosystems

Marketing 6.0 moves beyond personalization and digital interaction toward immersive, integrated, and continuously adaptive environments. In this stage, customers no longer interact with isolated messages or campaigns. Instead, they engage with connected ecosystems that combine physical and digital experiences. These environments respond dynamically to user behavior, preferences, and contextual data in real time. Technologies such as augmented reality, virtual reality, artificial intelligence, smart interfaces, and connected devices support the development of immersive and connected customer experiences.

Examples include:

- interactive retail environments,
- AI-driven personalized ecosystems,
- virtual brand spaces,
- augmented reality product experiences,
- adaptive customer interfaces.

The defining feature of Marketing 6.0 is not the use of technology itself, but the integration of systems, data, interaction, and experience. Marketing becomes continuous, contextual, and embedded within the customer environment.



Marketing 7.0: In the age of Artificial Intelligence

What is new in Marketing 7.0 is the insistence that minds and machines must coexist. While traditional digital marketing relies heavily on tracking "data exhaust" (clicks, cookies, and history), Marketing 7.0 champions Cognitive Mapping. This is a framework formalized by Philip Kotler et al. (2026) for observing the human mind in action to extract deep customer insights, bypassing superficial metrics to understand the underlying biases and mental shortcuts consumers use. It shifts focus from AI-driven data optimization to understanding the "Augmented Consumer". By observing human thinking and mental shortcuts, brands can craft authentic narratives that cut through the noise of AI-generated content. Today's consumers are exposed to massive amounts of information, leading to aggressive content filtering. Their brains have evolved to easily ignore AI-generated content that lacks emotional resonance. Because human thinking shouldn't be pushed to the periphery, marketers must apply critical thinking and empathy to cut through the noise.

Key Evolutionary Shift in Marketing

The evolution from Marketing 1.0 to Marketing 7.0 demonstrates how the source of competitive advantage has changed over time (Table 1.1).

Table 1.1 Key Evolutionary Shift in Marketing

Marketing Stage	Focus	Dominant Logic
Marketing 1.0	Product	Production efficiency
Marketing 2.0	Customer	Understanding customer needs
Marketing 3.0	Values	Emotional and social connection
Marketing 4.0	Digital interaction	Connectivity and engagement
Marketing 5.0	Data and AI	Intelligent optimization
Marketing 6.0	Immersive ecosystems	Adaptive integrated experiences
Marketing 7.0	Age of AI	Cognitive Mapping

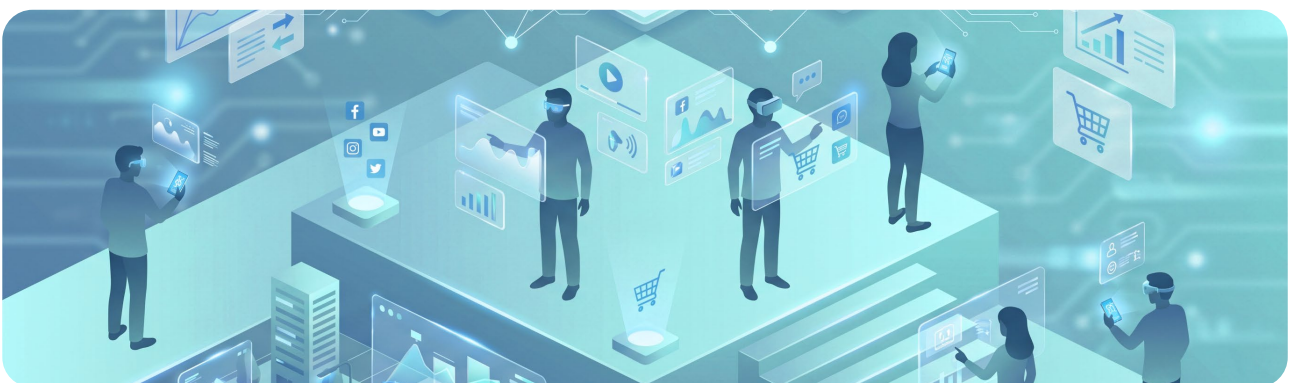
Notably, these stages do not fully replace one another. Many organizations are simultaneously using different marketing logics depending on their industry, business model, market segment and level of technological maturity. However, the overall direction is clear: marketing is increasingly becoming system-oriented, data-driven, immersive, and adaptive.

1.2 WHAT IS MARKETING 6.0?

Marketing is evolving at an unprecedented pace. The development of digital technologies, artificial intelligence, immersive platforms, and new consumer behaviors is continuously reshaping how brands interact with audiences.

In this handbook, we focus on Marketing 6.0 as this concept is fundamental for learning how to work with AI. It is not simply about being present online but about integrating physical and digital experiences into connected environments where consumers can actively participate. The boundaries between online and offline interactions are becoming increasingly blurred, creating what is often described as a “phygital” (physical and digital) environment. Consumers no longer interact with brands only through one-way communication. Instead, they actively participate in brand experiences across multiple interconnected platforms and environments, including social media, mobile applications, gaming spaces, augmented reality experiences, and virtual ecosystems.

Artificial intelligence, augmented reality, virtual reality, and generative AI play an increasingly important role in shaping these experiences. At the same time, marketing environments are becoming more complex due to the growing number of platforms, communication channels, and data sources. The rise of AI-driven tools, multimodal generative platforms, short-form video content, social commerce, influencer ecosystems, and immersive digital experiences is transforming how consumers discover products and interact with brands.



At the same time, stricter privacy regulations and growing expectations regarding data protection are changing how organizations collect, analyze, and use customer data. As a result, marketing analytics and personalization are becoming both more complex and more important. Another significant trend is the growing influence of East Asian digital ecosystems on global marketing practices. Innovation hubs in countries such as South Korea, China, and Japan are exporting trends in digital agility, live commerce, mobile ecosystems, and fast-moving consumer interactions. Platforms such as TikTok and Douyin continue to redefine content dynamics and purchasing behavior.

Despite the growing role of advanced technologies and automation, consumer expectations are moving towards authenticity. Younger audiences often prefer communication that appears more transparent, less polished, and more human-centered. Consumers expect authentic communication, transparency, micro-personalization, meaningful engagement, and personalized experiences. As a result, purpose has become one of the key pillars of Marketing 6.0. Consumers increasingly expect brands not only to sell products but also to contribute positively to social and environmental issues. Organizations are expected to operate in a more inclusive, socially responsible, and sustainable manner. Purpose is no longer treated only as a reputational advantage but increasingly as an important element of long-term competitiveness and trust.

Marketing 6.0 can be understood as a combination of advanced technology, immersive experiences, adaptive systems, personalization, authenticity, and purpose-driven communication. In this environment, marketing is no longer limited to communication. It becomes an integrated system in which technology, data, interaction, and human experience continuously influence one another.



1.2.1 TASK: IS THIS REALLY MARKETING 6.0?

The following examples present different approaches to technology integration and customer experience design in contemporary marketing.

Analyze each case and consider whether it truly represents the logic of Marketing 6.0 or whether it reflects earlier stages of marketing development.

Case 1. Personalized Email Campaign in Retail

A mid-sized fashion retailer uses customer purchase history and browsing data to automate customer communication and tailor product recommendations. Customers receive product recommendations based on items they previously viewed or bought. The system segments users into categories such as frequent buyers, discount seekers, and seasonal shoppers.

Emails are automatically generated and sent based on customers' previous interactions, including website visits, email engagement, and purchase history. The content includes personalized product suggestions, discount offers, and reminders about abandoned carts.

Although the system uses data and automation, the interaction remains limited to email communication. The customer receives messages but does not actively interact with a broader system beyond clicking links or making purchases.

Case 2. AI-Based Recommendation System in Streaming

A streaming platform continuously analyzes user behavior, including watch history, time spent on content, skipping patterns, and ratings. Based on this data, the system dynamically pushes recommendations in real time.

The homepage is continuously adapted to each user using machine learning models that analyze viewing behavior and content preferences. Content suggestions change depending on recent activity, time of day, and even device used. The platform also tests different thumbnail and description versions to optimize engagement.

The system learns over time and improves its predictions, aiming to maximize user retention and viewing time. However, the interaction remains within the platform's digital interface and does not extend into a broader immersive environment.

Case 3. Augmented Reality Product Try-On

A cosmetic brand launches an augmented reality mobile application that allows users to virtually try on makeup products using their smartphone camera. Users can see how different shades of lipstick or eyeshadow look on their face on the screen in real time.

The experience is visually engaging and interactive, encouraging users to experiment with products. However, the system does not store user preferences, does not adapt to previous interactions, and is not connected to a broader ecosystem of data.

Each session is independent, and the experience does not evolve over time. The AR feature is primarily used as an add-on to support product visualization rather than as part of a larger system.

Case 4. Immersive Retail Ecosystem

A global sports brand has developed an integrated retail experience combining physical stores, mobile applications, and digital environments.

Customers entering the store can use a mobile app that recognizes their profile and preferences. Interactive screens display personalized product suggestions based on previous purchases, activity data, and current trends. Smart mirrors let users try products on virtually and receive real-time recommendations.

The system adapts dynamically as the customer moves through the store. Products, content, and offers change depending on behavior. After leaving the store, the experience continues online, where the same system provides personalized content, recommendations, and training plans.

All touchpoints are connected, and data flows continuously across channels.

Case 5. Dynamic Pricing in E-commerce

An online retailer uses an algorithm that adjusts product prices in real time based on demand, inventory levels, competitor pricing, and broader market conditions.

Prices may change depending on factors such as how often a product is viewed, how quickly it sells, and how similar products are priced on other platforms. Some users may see slightly different prices depending on their browsing history and likelihood of purchase.

The system operates automatically and continuously, optimizing revenue and conversion. However, the interaction is mostly transactional and remains largely invisible to customers, without being directly linked to their immediate physical surroundings.

Case 6. Interactive Virtual Brand Space

A gaming platform collaborates with a fashion brand to create a virtual world where users can explore branded environments, interact with digital products, and participate in events.

Users can customize their avatars, try on virtual clothing, and engage in activities within the space. The environment adapts based on user behavior, preferences, and interactions with other players.

The experience is continuous and evolves over time. Users are not only exposed to marketing content but actively participate in the brand ecosystem. Data from interactions influences future experiences, both within the game and in connected digital channels.



Concluding observations

The case analysis demonstrates that the presence of advanced technology alone does not automatically mean that a company operates according to the logic of Marketing 6.0.

Some solutions may appear highly innovative because they use artificial intelligence, automation, or augmented reality. However, a closer analysis often reveals that these technologies function as isolated tools rather than elements of a broader adaptive ecosystem.

For example, augmented reality applications may provide visually engaging and interactive experiences. However, they remain limited if they do not learn from user behavior, adapt over time, or integrate with other systems and channels.

In contrast, truly immersive marketing environments are characterized by continuous data flow, interconnected touchpoints, dynamic adaptation, and active customer participation. In such systems, customer experience evolves continuously across both physical and digital environments.

The key distinction lies not only in technology itself, but in the structure and logic of the entire system. When analyzing contemporary marketing solutions, an important question should be asked; not if technology is being used, *but what kind of system is being created through that technology?*

1.3 THE CHANGING ROLE OF THE MARKETER

Artificial intelligence is one of the most discussed topics in contemporary marketing. Questions about whether AI systems and chatbots may eventually replace marketers are becoming increasingly common. However, the development of Marketing 6.0 does not suggest the replacement of marketers as much as it points toward a transformation of their role. Marketing professionals are being augmented by intelligent systems that support data analysis, automation, and decision-making processes.

This shift reflects a broader transition from what can be described as a thinking economy toward a feeling economy. Artificial intelligence is highly effective at processing large amounts of data and identifying patterns at a speed and scale that would be difficult for humans to achieve. However, AI still lacks empathy and emotional understanding. While algorithms can analyze customer behavior, they cannot fully understand the complex motivations, values, and attitudes that influence human decisions. As a result, the marketer's role increasingly centers on human connection and understanding. While intelligent systems operate at the level of behavioral analysis, marketers are responsible for understanding the deeper emotional and social dimensions of customer experience.

Another important shift concerns control over brand communication. In the past, organizations operated as the primary creators and controllers of brand narratives. Today, the growing importance of creators, micro-communities, and user-generated content has permanently changed this model. Marketers are now expected to build creative platforms that enable collaboration and participation rather than fully controlling communication themselves.

The development of AI-driven environments also introduces new technological responsibilities. Alongside SEO (Search Engine Optimization), marketers now need to start thinking about GEO (Generative Engine Optimization), which focuses on ensuring brand visibility and credibility in generative AI systems and large language models. At the same time, the growing role of automation increases the importance of ethics in marketing. Marketers must address issues such as automated discrimination, algorithmic bias, and greenwashing while ensuring that organizational values remain authentic rather than purely performative.

Another significant transformation concerns the shift from short-term performance orientation toward long-term stakeholder value. Increasingly, organizations focus not only on sales performance, but also on customer equity, sustainability, trust, and long-term relationships. In this environment, marketers are no longer responsible only for promoting products or campaigns. They increasingly function as designers of experiences, coordinators of ecosystems, facilitators of collaborations, and bridges between technology and human needs.



The marketers who thrive in Marketing 6.0 will be those who can combine data-driven decision-making with empathy, authenticity, and human-centered thinking.



1.4 KEY TAKEAWAYS

- Marketing has evolved from product-focused communication to immersive, integrated ecosystems.
- The transformation of marketing is driven not only by new technologies, but also by changes in how organizations design interactions and customer experiences.
- Marketing 6.0 is defined primarily by integration: the connection of data, technology, physical environments, and digital experiences.
- Modern marketing systems operate continuously, adapt in real time, and enable active customer participation.
- Contemporary marketers increasingly move beyond communication management toward designing systems, experiences, and interactions.
- Despite the growing role of artificial intelligence and automation, human competencies such as empathy, responsibility, and strategic thinking remain essential.
- Technology should not be understood as a replacement for marketers, but as an extension of human capabilities and decision-making.
- Understanding the shift toward intelligent and adaptive marketing environments is essential for analyzing modern AI-driven marketing practices.



1.5 FURTHER READING

Kotler, P., Kartajaya, H. & Setiawan, I. (2026): Marketing 7.0 A guide for thinking marketers in the age of AI, Wiley, USA. May be it would be better Kotler, P., Kartajaya, H. & Setiawan, I. (2024): Marketing 6.0, The Future is Immersive, Wiley, USA

Kumar, V.; Kotler, P. (2024): Transformative Marketing. Combining New Age Technologies and Human Insights. Palgrave Macmillan, USA

Puntoni, S., Reczek, R. W., Giesler, M., & Botti, S. (2020). Consumers and Artificial Intelligence: An Experiential Perspective. *Journal of Marketing*, 85, 131–151. <https://doi.org/10.1177/0022242920953847>



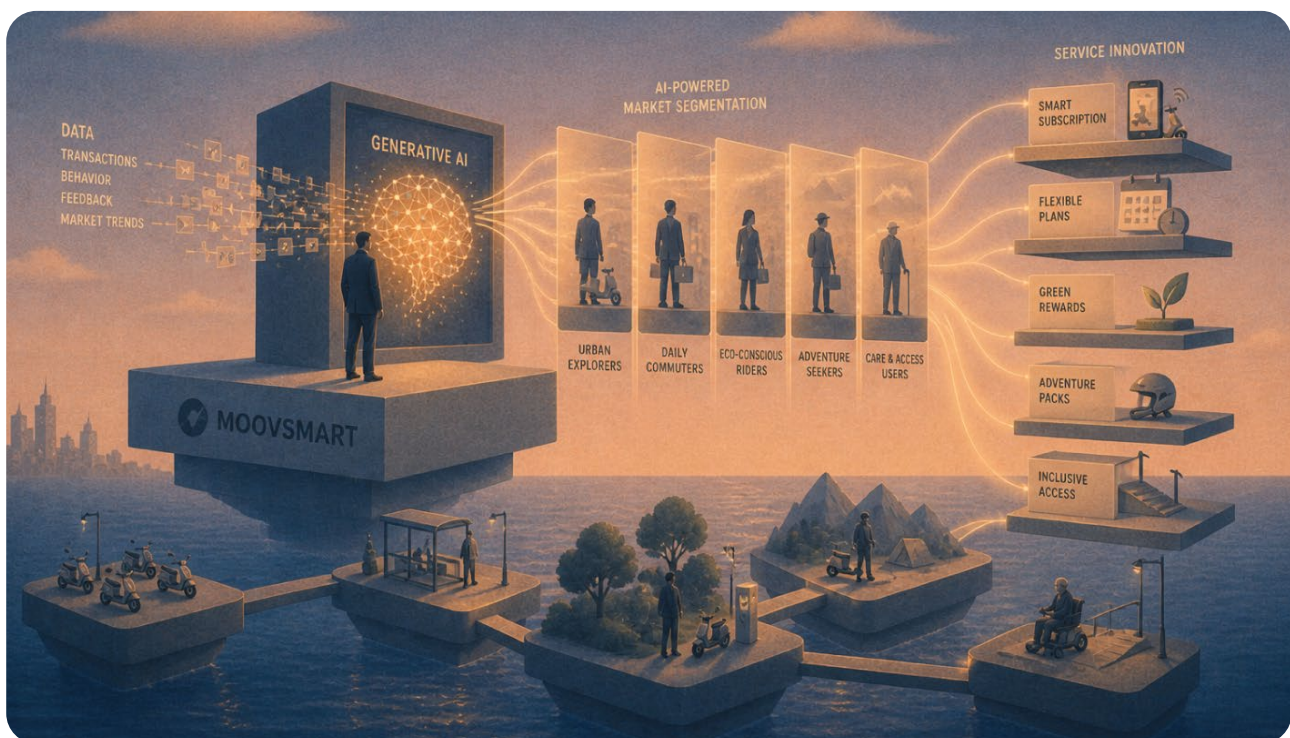
Case study:

HARNESSING GENERATIVE AI FOR MARKET SEGMENTATION AND SERVICE INNOVATION: THE CASE OF MOOVSMART

Belén Rodríguez Cánovas, Jesús García de Madariaga

Note: This case is inspired by real managerial experiences. Names of the organizations, locations, individuals, and selected figures have been anonymized. Any resemblance to identifiable entities is just coincidence. The case is designed only for educational purposes.

Data Note: The dataset is derived from real cases but it has been modified to protect confidentiality. Some data was resampled or generated synthetically. Data show realistic patterns without exposing actual individuals or organizations.



1. Introduction

MoovSmart (a pseudonym) is a Mobility-as-a-Service (MaaS) venture incubated within NexWays Group, a diversified European infrastructure and services conglomerate. In the fast-changing urban mobility market with thin margins, low switching costs, and changing regulations, MoovSmart's marketing team has adopted generative AI to enhance customer segmentation, accelerate creative content production, and personalize lifecycle communications across two pilot cities: Madrid and Barcelona. Company leaders believe that carefully applied AI could help them achieve three goals at once: (1) shorten the time required to convert raw behavioral data into actionable marketing insights, (2) boost the relevance of customer messages and offers to different commuter profiles, and (3) improve overall marketing effectiveness.

Early tests suggested meaningful insights. Tasks that once took 2 days, like drafting campaign copy, were now finished in hours. The marketing team could produce language versions in English and Spanish and sort them by tone (informational, conversational, and humorous) before a human refined the final versions.

AI-assisted “audience exploration” using aggregated behavioral features, such as monthly trip frequency, typical wait times, or app session habits, helped the team define micro-segments and design small A/B tests. At the same time, the pilots also revealed challenges the CMO had to address: hallucinated partner offers, inconsistent tones in longer messages, and narrow lookalike audiences that raised fairness concerns. Legal team asked whether inferred attributes qualify as personal data and what transparency obligations the company should provide to users.

Early test suggested meaningful insights. Tasks that took 2 days, like drafting campaign copy, were completed in just hours. The marketing team could generate language versions in English and Spanish and sort them by tone (informational, conversational, humorous) before a human editor refined the final versions. AI-assisted “audience exploration” over aggregated behavioral features, such as monthly trip frequency, typical wait times, or app session habits, helped the team hypothesize micro-segments and design small A/B tests. However, the pilots also revealed challenges the CMO had to address: occasional hallucinated partner offers, inconsistent tones in long-form emails, and “narrow” lookalike audiences that raised fairness concerns. Legal and privacy colleagues asked whether inferred attributes qualify as personal data and what transparency obligations the company should provide to users.

1.1 Problem dimensions

MoovSmart’s CMO faces a critical choice: whether to scale the generative-AI-driven practices now by expanding them to 2 additional cities in the next quarter, or to pause and first focus on enhancing team skills, building stronger guidelines, and improving the way AI use is managed and monitored. This case asks you to evaluate this decision through three complementary lenses:

- The first is the **dynamic capabilities perspective**: can MoovSmart sense, seize and reconfigure around AI fast enough to build a competitive advantage? i.e., detect 3 opportunities, act on them and adapt resources to sustain competitiveness (Teece, 2007; Mikalef et al., 2023).
- The second is a **human-computer interaction (HCI) perspective**: where does AI most effectively support human work and how do team members find the right balance of how much to trust the system, especially when the system feels almost like a “teammate”, another colleague? (Jarrahi, 2018; Nass&Moon, 2000).
- The third is a **competency-based view**: which hard and soft skills are needed now and in 2 years, and how should the organization develop them responsibly?

By the end of the case, you should be able to:

- Propose a realistic customer segmentation and personalize marketing in a company with limited resources.
- Design a simple management framework that preserves creativity and trust while respecting privacy requirements.
- Develop a practical 90-day roadmap that show how to scale responsibly with clear, measurable milestones.

The case also provide exhibits, including a dataset of 5.000 users and data dictionary, so students can practice segmentation and targeting choices using AI tools.

1.2 Learning objectives

1. Diagnose organisational readiness and strategic value of generative AI in Marketing, particularly in market segmentation and content personalisation, while considering the competitive landscape and internal readiness.
2. Design effective human-AI collaboration models and workflows.
3. Map and develop essential AI-driven marketing competencies.
4. Assess and mitigate ethical and managerial risks in AI-driven marketing (e.g., data privacy, algorithmic bias, explainability).

2. Background

Company and Market Context

MoovSmart started as an internal venture within NexWays Group to explore new growth opportunities in digital mobility. Operating in 2 Iberian metropolitan areas, the app aggregates public transit, micromobility services, and on-demand rides in one place with route planning and ticketing.

The competitive landscape is intense: global MaaS platforms, city-run transit apps, and established ride-hailing firms are all fighting for user's attention. At the same time, local authorities are encouraging open data, interoperability, and the responsible use of AI.

Demand is volatile. Commuter flows shift with hybrid work, tourism change with seasons, and service disruption can quickly reshape patterns. In this context success depends not only on the variety of transport options offered but also on the quality of the user experience and the trust the company can build.

Business Model and Positioning

When MoovSmart entered the mobility market, its founders knew the challenge was not just move people from point A to point B, but to win their trust in a crowded and price sensitive market. The company's business model reflects this reality and revenues come from three streams. First, indi-

vidual users can choose a subscription that removes ads and unlocks premium features. Second, MoovSmart earns a small fee every time a trip is booked through one of its partners services. And third, selected employers sign B2B agreements that provide mobility benefits to their employees.

MoovSmart positions itself as a neutral and cost-savvy mobility firm. It speaks directly to everyday commuters who juggle buses, bikes, and ride-hailing apps, offering them reliability, savings, and sustainability. Its core promise, “the right route and the right moment, at the right prices”, requires sharp customer segmentation and precise, timely communication.

MoovSmart recognizes that today’s traveler’s care not only about speed and price but also about their environmental footprint. A credible green narrative, backed by transparent carbon impact has become part of its value proposition and an essential way to earn user trust.

Marketing Organization

MoovSmart’s marketing team, a group of 10, reports directly to the GM while also staying connected to NexWays Group’s corporate marketing and data units. Inside the team, roles cover lifecycle and CRM, performance marketing, brand and content, research and insights, data analysis. The team collaborates with an external creative agency for campaigns. Resources are limited, so leadership demands clear, measurable results from any tools or hires. GM prefers external expertise while the business model matures.

Data and Technology

MoovSmart combines three main data sources: app telemetry (events and session data), CRM attributes collected with user consent, and third-part mobility feeds. Before launching the AI pilots, segmentation relied on fixed rules, focused on recent activity, commuting patterns, and customer value tiers, with updates every quarter.

The technology stack includes a Customer Data Platform (CDP) connected to the CRM, a cloud-based data warehouse, a campaign orchestration tool, and controlled access to a generative AI assistant used for content creation and audience exploration.

MoovSmart applies the same data governance rules used across the NexWays Group. This means users must give explicit consent (opt-in), access is restricted by role (role-based access), and legal reviews for new users. Still, the marketing team does not have common AI prompt templates, and testing practices are inconsistent, experiments are run differently across communication channels. For example, email campaigns may test subject lines, while app push notifications test timing of frequency.

Why Generative AI, Why Now

MoovSmart’s team was under pressure from the three directions. First, they needed to create more personalized messages for users without adding more staff. Second, they wanted to move beyond broad segments and build micro-segments based on observable behavior. Third, they had to keep testing new value propositions for service features in real time.

Generative AI seemed like the right tool to deliver faster but still with precision, “fast but tailored”. It could produce faster drafts of campaign copy, adjust messages to each segment, and generate quick cards or variations for A/B testing. The challenge was keeping the outputs accurate, consistent in tone, and compliant regulations.

Leaders also detected a major opportunity: to capture their marketing know-how in reusable assets, like a shared prompt library, evaluation checklists, and city toolkit (Teece, 2007).

Culture

NexWays Group has gone through several transformations in heavy-asset industries. It has built a reputation for being disciplined and pragmatic in the way it manages the change. MoovSmart inherits the same down-to-earth mindset, but works with the speed and flexibility of a start-up.

When it comes to AI, the culture is cautiously optimistic. The team is encouraged to experiment and learn, but there is very little tolerance for mistakes that could damage the company’s reputation, compromise user privacy, or make decisions that seem too “black box”. This constant tension, between moving fast and staying careful, is exactly the dilemma you must think through in the case.

3. Current Situation

AI Use Cases and Workflow

In the pilot projects, the team worked on 3 practical ways to use AI:

1. Creative Assistant (Content Copilot):

AI helped generate campaign ideas and first drafts in both English and Spanish. It also created different call-to-action options depending on the segment needs. A team member reviewed the copy to make sure the tone fit the brand, the facts were correct, and the promises were realistic.

2. Audience Exploration:

Using data such as trip frequency, wait times, or app activity, AI suggested micro-segments of users and what messages might work for each. For example, it could identify “early-morning daily commuters” or “weekend leisure riders”. The team tested the ideas with A/B experiments. The morning commuters saw “Your fastest route this morning”. Results showed which message attracted more clicks.

3. Customer Journey Orchestration

AI recommended the best timing and channel mix for messages. For example, push messages at 6:00 am (before the commuters leave home), in app prompts at 7:30 am (when people are on their go) or Sunday afternoon emails to plan de week ahead. Rules were very strict: no spamming (no more than 3 messages per week), no fake offers such as “last chance 1 free seat”, always visible opt-out option (“click here to unsubscribe”).

Very important: AI didn't replace the marketing team. It simply made routine tasks faster and gave them more options to test. The real decisions, about tone of voice, ethics and the strategy remained in the marketing team.

This is an example of the use of AI in the campaign "Move Better in Madrid"

1. Creative Assistant (Content Co-Pilot)

The team used AI as a co-pilot for the creative work. It drafted quick versions of messages in both English and Spanish. The team adjusted the tone and made sure everything was consistent with the brand boundaries:

- Spanish message: "Tu ruta más rápida al trabajo, en tiempo real".
- English message: "Find the fastest way to your meeting today in real time".

It also suggested call-to-actions messages by segments:

- For price-sensitive commuters: "Save up to 20% on your trips".
- For speed-driven commuters: "Arrive 10 minutes earlier, no stress today".

2. Audience Exploration:

Using variables like average wait time, travel frequency or moment of the app use, AI suggested micro-segments such as "Early-morning daily commuters", "Heavy users", and "Weekend users".

These messages were tested through A/B experiments and the main metric was clicks on the "Plan my route" button:

- Message A: "Your cheapest route this weekend".
- Message B: "Your fastest route this weekend".

3. Customer Journey Orchestration:

AI helped the team when and where to send the messages:

- Push: at 6:30 before leaving home.
- In-app: at 7:30 when on the go.
- Email: Sunday afternoon to plan the week.

The result: AI saved time with drafts, segmentation ideas, and timing suggestions, while the team focused on brand strategy, innovation, customers, sales, and focused on business.

What the marketing team learned in the First Tests

Over a 2 month period, the marketing team ran 18 controlled experiments to learn how AI could help. The results were promising (Exhibit A):

- **Faster copywriting:** The time to produce a first draft of a campaign copy dropped by 50-60%. A task that used to take 2 days could now be done in just few hours.
- **Push notifications:** Click-through rates improved from 4.5% to 5.6%.
The “Value-seeker” segment was responded especially to savings and promotions.
- **Email results:** Older users showed higher open rates, which was consistent with existing opt-in patterns by age.
- **Audience insights:** Exploratory clustering revealed 3 stable segments. These patterns also appeared in app-store reviews:
 - High-frequency commuters who worry about transfer.
 - Price-sensitive riders who react quickly to promotions.
 - Micro mobility fans (bike and scooter users) who are influenced by the weather.

Pilot Results (Exhibit A)

Over the pilot, the marketing team learned:

What worked well?

- **More versions without extra stress:** Thanks to AI, the team could generate and test 6 different versions of a message without burning the creative staff.
- **Faster learning:** They didn’t have to wait months, they could check the results very week and adjust the campaign in time.
- **Shared know-how and documentation:** The team could generate and save useful prompts and checklists and everyone could reuse them instead of starting from scratch each time.

What went wrong?

- **Fake offers:** Sometimes AI invented promotions that didn’t exist and you have to apologize.
- **Biased audiences:** when clustering, the system based too much on past patterns, for example, it was over-targeting heavy users in city centers and under-representing others.
- **Legal questions:** legal team asked if clustering people by behavior (“concert rider” or “price-seekers” was a personal data and it didn’t meet transparency.
- **Trust issues:** could it be trusted?

AI Management

The marketing team set up a RACI framework¹ (Exhibit B). The CRM lead was responsible for managing the prompt library, the brand manager had the decision on tone and claims. The Legal team was consulted whenever new data variables were considered. The Data Analyst kept track of every evaluation and maintained a log of all prompt versions.

All customized targeting was executed with user-consented data, and no sensitive attributes were used to include or exclude customers. Red/yellow/green flags were used for prompts.

Task 1:

MoovSmart has shown benefits in content creation speed but experienced setbacks, like inventing fake partner offers or using the wrong tone in emails. This has caused the marketing team's trust in AI to go up and down. Imagine you are a team leader helping to bring AI into MoovSmart's marketing. Your goal is to fix these problems and build trust.

Your task is to create a simple 30-day plan for the marketing team to make sure AI-generated content for marketing campaigns in Madrid and Barcelona is always accurate and on-brand.

Your response should include:

- How to check AI content: Describe a clear process (like "checkpoints") to make sure no false information gets sent out.
- Better instructions for AI: Suggest specific ways marketers can write their "prompts" to the AI so it consistently creates accurate content and uses the correct brand voice. For example, how can they ask the AI to "rate its confidence in factual claims"?
- Measuring success: How will you know if your plan is working? Propose one simple way to measure its success (e.g., fewer mistakes, faster editing) and explain how MoovSmart's evaluation dashboard would show this.
- Building steady trust: How will your plan help the marketing team trust the AI more consistently, avoiding both over-trust when it works well and being overly cautious after a mistake?

4. Analysis: Learnings for the team and the organization

Dynamic Capabilities: The organization learned:

- Sense: the team could identify unmet needs like transfer anxiety or price fairness.
- Seize: new opportunities like bike promos during rainy days.
- Work frameworks: prompt libraries, checklists, dashboards.

¹RACI: <https://project-management.com/understanding-responsibility-assignment-matrix-raci-matrix/>

Organization work: the learned how to organize the work:

- Roles: who is managing every element
- Checkpoints: good messages, good tones, risk messages, rules
- Data management to ensure transparency and compliance.

AI as collaborator: AI is useful but the team decides.

Choosing the Right Tools: a key decision is whether to rely on a ready-made AI assistant or build a custom setup. It depends on cost, speed and data sensitivity. For MoovSmart, an API-based assistant behind a secure proxy, with prompt and output logging, balances control and efficiency.

Mapping Stakeholders and Managing Changes

To Scale AI it is not just about tools but people. Different teams or stakeholders need different things. A stakeholder map with each team and product owner's interests should be designed.

Challenges

Some results like brand trust or reliability take time to measure. These require ongoing tracking or special research methods and not just A/B tests.

AI performance will change over time as models evolve and prompts shift. It is very important to create a control team that calibrates the workflow to keep quality under control and avoid risks.

Segmentation is a tool and not the final goal. Even if the revealed clusters seem to be perfect, they are not useful unless the organization can access to them and act through the right channels, creative content, and partnerships.

Personalization must not exclude individuals, groups unfairly.

Task 2

MoovSmart uses AI to find different customer groups, but sometimes these groups can be too narrow or accidentally exclude certain people, which isn't fair. The case highlights that we need clear rules to prevent this. Imagine you are the Data Analyst at MoovSmart, responsible for setting up experiments and tracking results.

Your task is to create a simple plan for MoovSmart to check and fix any unfairness in how it uses AI to identify customer groups for marketing campaigns.

Your plan should include:

- Identifying important groups: Look at the `moovsmart_users.csv` dataset. Which groups of users (e.g., by `home_area_density`, `age`, or `income_bracket`) should MoovSmart pay special attention to when checking for fairness? Explain why these groups are important to consider. For clustering work in class, students should standardize continuous variables, treat missingness explicitly (e.g., indicator variables), and test stability across seeds and random subsamples before deriving personas. (Test Exhibit C)

- Checking for differences: How will MoovSmart compare how many people from these different groups see and respond to a campaign? How would you use the evaluation dashboard to spot any big differences?
- What to do if it's unfair: If you find unfairness, what simple actions can MoovSmart take? Give examples like making offers available to more people or providing different valuable options.
- Keeping humans in charge: How does your plan ensure that humans, not just the AI, make the final decisions about who gets what offer and ensure fairness?

5. Strategic Alternatives

MoovSmart's CMO faces 3 possible paths for scaling AI in marketing:

1. Scale Now with Guidelines

The company has decided to expand to 2 more cities with management rules

- Benefit: Keep momentum, learning fast
- Risks: Process may not be mature enough
- Needs: Part-time AI Product owner, legal review, QA support
- Wins: prompt templates, city toolkit, safety checklist
- KPIs: Retention (+2-3 points), CTR (+10-15%), faster drafts (-30% time)

2. Stand-by to Consolidate

The company decides to wait one more quarter before expanding and prefer to train, document and learn.

- Benefits: Fewer mistakes, better capability, clear roles
- Risks: Lose momentum, team motivation, competition ahead
- Needs: Budget for training, external audit, time to clean prompt repository
- Wins: Create a system for prompting, refresh consent policies
- KPIs: 100% policy compliance, improved team skills, perfect audit results

3. Hybrid "Scale & Strengthen."

The company decides to expand one more city now and in parallel it builds training and management framework.

- Benefits: Keeps momentum but reduces risks.
- Risks: Coordination and team capabilities, not mature
- Needs: similar to option A
- KPIs: city impact metrics and management milestone delivered.

Decision Criteria.

The CMO should evaluate options against (1) impact potential in the next 90 days; (2) governance maturity (consent, logging, and bias testing); (3) team skills; and (4) risk tolerance given brand equity.

Final recommendation: Hybrid model

Task 3

MoovSmart has decided to use a "Hybrid 'Scale & Strengthen'" approach: launching AI marketing in one new city while also improving its internal processes and training. Imagine you are the CMO (Chief Marketing Officer) and need to guide the new AI Product Owner on how to successfully expand to a new city. You want to learn fast but also avoid major risks.

Your task is to prepare a clear plan for the AI Product Owner, detailing how MoovSmart will expand its AI marketing efforts into a new city.

Your plan should include:

- Using AI tools in the new city: How will MoovSmart's existing AI tools, like the "Content Co-Pilot" (for creating messages) and "Audience Exploration" (for finding customer groups), be used in this new city? Briefly mention how the "90-Day Plan" (covering People, Process, Tech & Data, Governance) will help (you can use the template in Exhibit C)
- Learning from big players: Moovit is a successful competitor with advanced ways to target ads based on location and user profiles. How can MoovSmart's AI marketing in the new city try to achieve similar detailed targeting for users (e.g., by destination, transit type, or user type like students or tourists)?
- Tracking progress: What important numbers (metrics) will you track in the new city to see if the AI marketing is working well and safely? Think about what Moovit tracks, such as clicks and interactions, to give your ideas.

Exhibits

Exhibit A - KPI Baseline vs. Pilot.

KPI	Baseline	Pilot	Change
Time to first draft (hours)	16 hours	7 hours	-9.0
Push CTR (%)	4.5%	5.6%	1.1
Email open rate (%)	18.0%	19.5%	1.5
Retention (90 days, %)	42.0%	44.5%	2.5
Incident count (critical)	1.0	0.0	-1.0

Exhibit B - RACI Matrix for AI-IN-Marketing-Workflow

Activity	Responsible (R)	Accountable (A)	Consulted (C)	Informed (I)
Prompt library maintenance	CRM Lead	AI Product Owner	Brand, Legal	All teams
Tone & claims review	Brand ManagerLead	CMO	CRM, Legal	All teams
Data use approval	Legal Counsel	Chief Privacy Officer	CRM, Brand	All teams
Experiment design	Data Analyst	AI Product Owner	Brand, CRM	All teams
Evaluation dashboard	Data Analyst	AI Product Owner	Brand, CRM, Legal	All teams
Incident review	CRM Lead	CMO	Legal, Data	All teams

Exhibit C- Template for 90-Day Plan (People, Process, Tech/Data, and Governance).

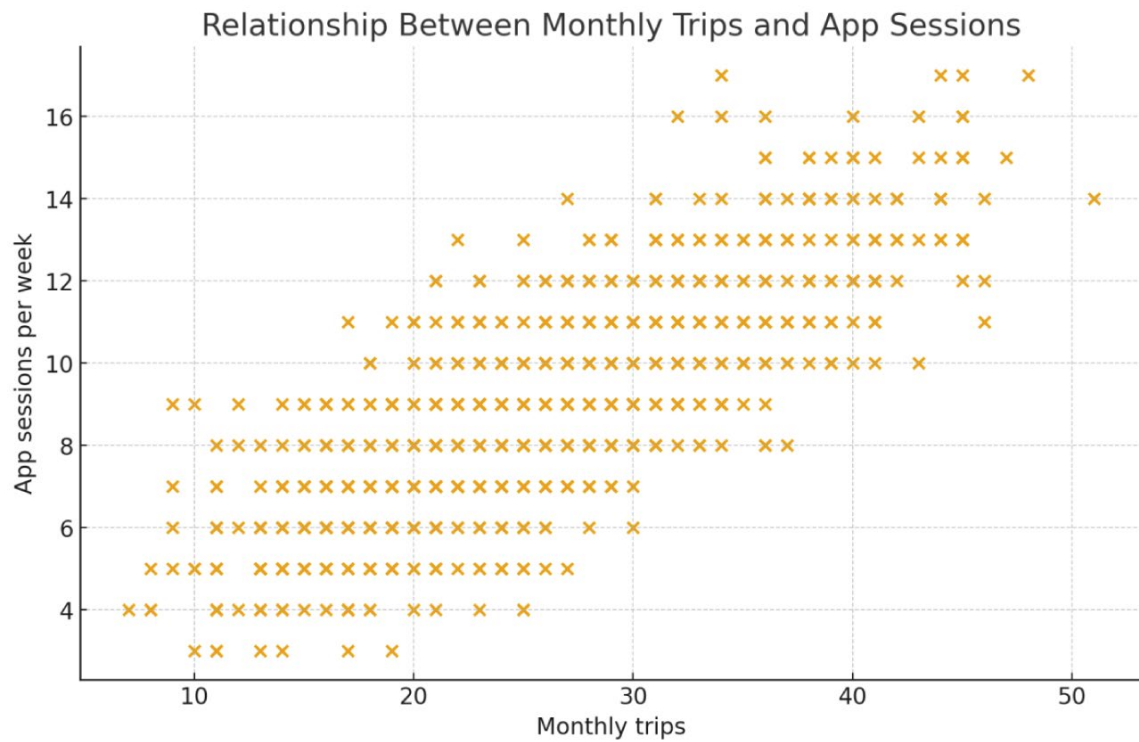
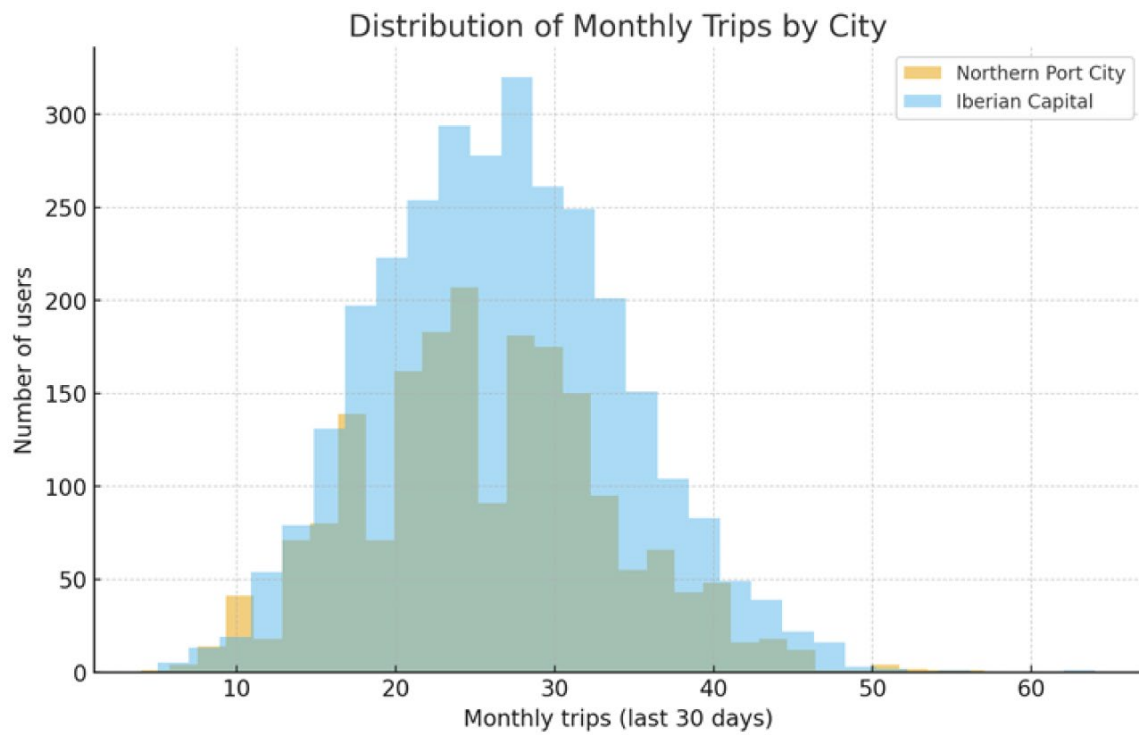
Week	People	Process	Tech/Data	Governance
1-2				
3-4				
5-6				
7-8				
9-10				
11-12				

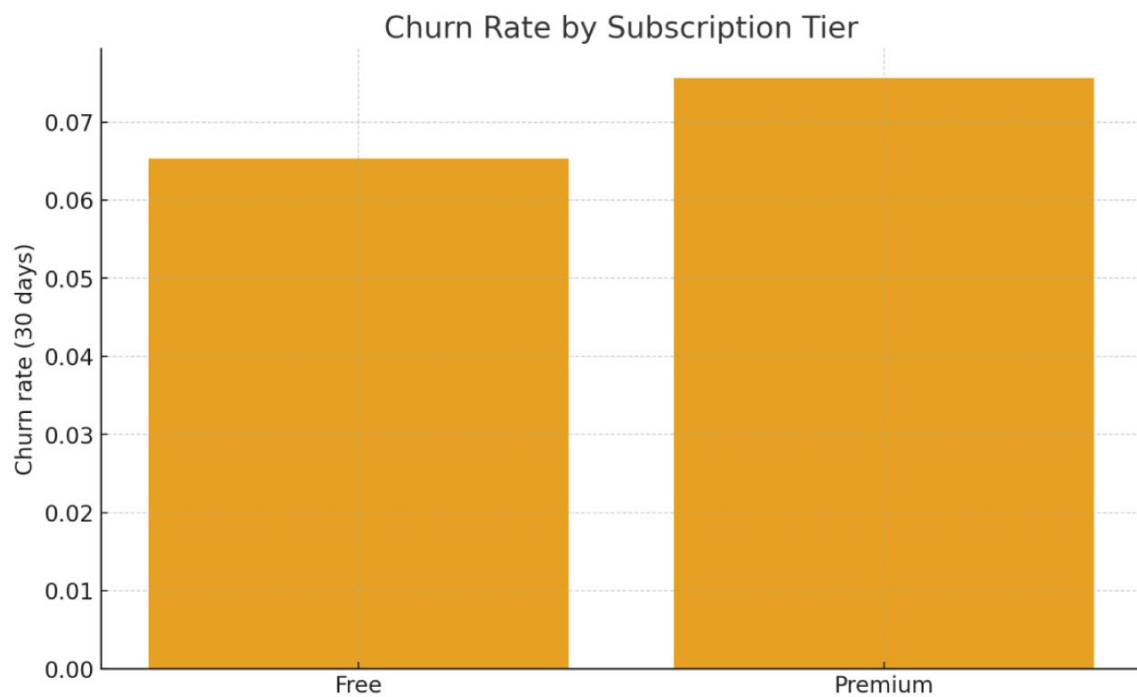
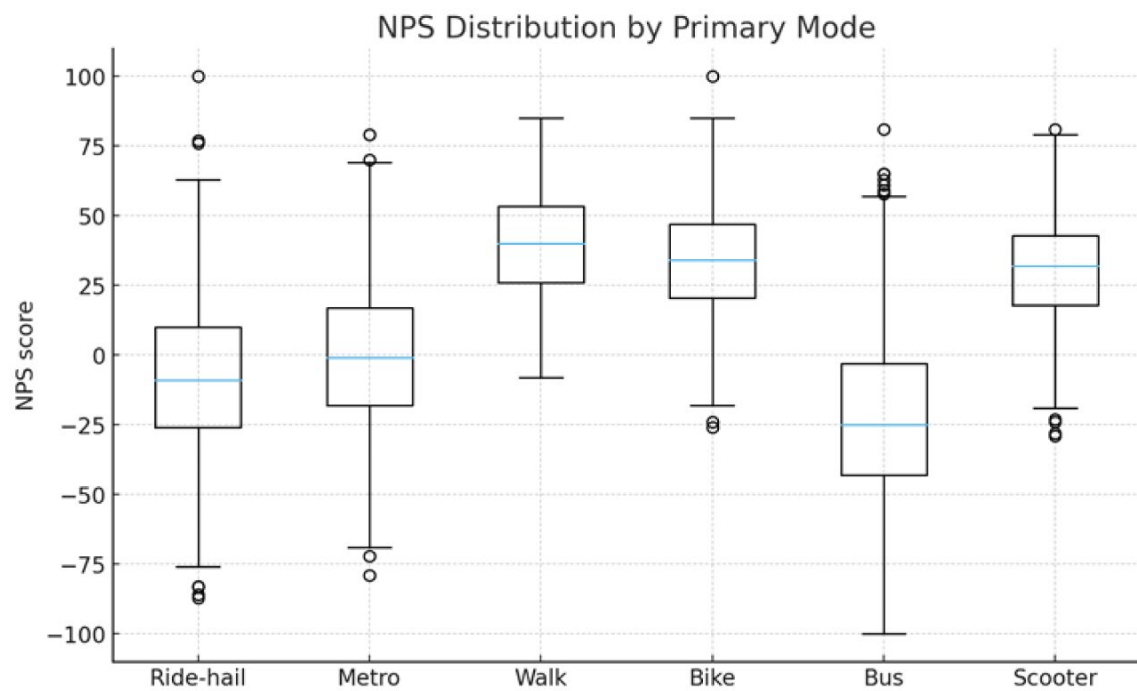
Exhibit D –User Personas Hypotheses (to test & fine-tuning).

Persona	Key Needs	Pain Points	Effective Messages	Best communication Channels
Value-Seeking Commuter	Predictable savings; clear promo rules	Promotional complexity; sudden pricing	“Save more on your regular route-simple and fair”	Push, in-app banners
Reliability Maximizer	On-time transfers; quick alerts about delay alerts	Crowding connections and missed transfers	“Never miss a connection-live transfer help”	Push notifications, SMS during disruptions
Micromobility Enthusiast	Flexible last-mile options; route freedom	Parking availability; bad weather	“Glide the last mile-unlock bikes & scooters”	Push notifications, email with weekend tips

Exhibit E - Governance Checklist.

Control	Status
Consent scope reviewed	Yes
Sensitive attributes excluded	Yes
Prompt/version log active	Yes
Confidence tags on outputs	Yes
Bias check (reach & response)	Pilot
Human approval for medium/high risk	Yes
Incident template	Yes





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MACHINE LEARNING AND DEEP LEARNING FOR MARKETING

Grzegorz Leszczyński & Amira Mouakher

Modern marketing operates in an environment that generates enormous amounts of data. Every day, organizations collect information about customer behavior, campaign performance, transactions, digital interactions, and product usage. Companies monitor website activity, CRM interactions, customer service communication, email engagement, social media signals, purchasing behavior, and usage data produced by connected products and services. Despite having access to large amounts of information, many organizations still struggle to transform data into clear, actionable insights.

Traditional dashboards and reports primarily answer one type of question:

what happened? They summarize past campaigns, present historical performance, and identify which activities generated positive or negative results. While this type of analysis remains important, it focuses mainly on describing past events.

Artificial intelligence introduces a different perspective. Instead of focusing solely on historical data, AI enables marketers to ask more predictive, forward-looking questions. Organizations can identify which customers are most likely to buy in the future, which customers are at risk of leaving, which offer to expose a specific customer to, or how to develop products to create greater customer value. This shift from descriptive analytics toward predictive decision-making is one of the most important transformations in contemporary marketing.

Machine learning and deep learning play a pivotal role in this process. They enable organizations to identify patterns in data, generate predictions, and support decision-making processes using models trained on historical information.

This chapter introduces the fundamental principles behind machine learning and deep learning and explains how they are applied in

marketing environments. It examines how the models identify patterns in data, how they are trained using historical datasets, how model quality is evaluated, and how AI supports marketing decisions related to customer behavior, segmentation, and prediction.

The chapter also introduces several key concepts widely used in machine learning, including supervised and unsupervised learning, classification and regression problems, the train–test split, and basic model evaluation metrics.

The objective of this chapter is not to teach programming or model development. Instead, the goal is to provide marketers with a practical understanding of how AI systems support marketing processes, how machine learning models operate, and how marketing professionals can collaborate effectively with AI and data scientists. Understanding these concepts is increasingly important in organizations where marketing decisions are becoming more data-driven, predictive, and AI-supported.

2.1 HOW MACHINE LEARNING AND DEEP LEARNING WORK

Machine learning is a field related to artificial intelligence that focuses on building models capable of learning patterns from historical data and using them to make predictions or support decision-making. In marketing, this means that past customer data can be analyzed to estimate future behavior. Models may learn from variables such as previous purchases, browsing behavior, campaign engagement, or customer activity across digital channels. Instead of relying on predefined rules, machine learning uses patterns extrapolated directly from the data.

Building on this idea, deep learning is a more advanced subset of machine learning that uses neural networks. These models are organized into multiple layers, which allows them to capture more complex relationships and patterns. Deep learning is particularly useful when working with text, images, audio, or sequences of user activity. In marketing contexts, deep learning supports applications such as sentiment analysis, content understanding, advanced recommendation systems, and behavioral prediction.

For these models to work effectively, several elements are required. First, organizations need a clear business objective—a specific question the model is expected to answer. Second, models require sufficient volumes of high-quality historical data because they learn from previous observations and interactions. Depending on the analytical objective, machine learning can use supervised learning, where historical data include a known outcome or label (e.g., whether a customer churned), or unsupervised learning, where no predefined outcome is available and the algorithm identifies patterns, relationships, or customer segments within the data. Third, it is necessary to define an evaluation metric that measures how well the model performs. Another important element is the target variable, meaning the outcome the organization wants to predict in supervised learning, such as customer churn, purchase probability, expected revenue, or conversion likelihood.

Understanding how these models learn from data also requires attention to two important issues: bias in AI systems, and model explainability.



Bias in AI Systems

Machine learning models learn from historical data, which often reflects past decisions, behaviors, and organizational practices. If previous campaigns focused more heavily on particular customer groups, the model may learn and reproduce these patterns automatically. This is known as historical bias.

Another critical issue is representation bias. If some customer groups are underrepresented in the data, the model may perform less effectively when marketing to those audiences. This may lead to unequal targeting, the inability to see offers, or less accurate recommendations for certain customer groups. Importantly, this is not always the result of intentional discrimination. Often, it is simply a consequence of how the data was collected and structured.

For this reason, organizations should not only ask whether a model is accurate. They should also ask whether the model performs equally well across different customer groups. This issue relates directly to fairness in AI systems and has both business and risk-management implications. Biased models may reduce campaign effectiveness while also creating legal, ethical, and reputational risks.



Explainability and “Black Box” Models

Another important concept is explainability. Many machine learning models — especially more advanced ones — operate as black boxes. They generate predictions, but the reason for using them may not be immediately apparent. In many business situations, however, organizations need to understand why a particular decision was made. For example:

- why a customer received a recommendation,
- why a user was targeted with a campaign,
- or why a prediction indicated a high risk of churn.

Explainability methods help organizations interpret these decisions. One widely used method is SHAP (SHapley Additive exPlanations), which estimates how strongly individual variables contributed to a specific prediction. For example, SHAP may indicate that a customer was selected because of high engagement, recent purchases, or frequent website visits.

Explainability is not only important for compliance or transparency. It also serves as a management tool that helps organizations validate model behavior, detect unexpected outcomes, improve decision quality, and increase trust in AI systems.

One of the most practical marketing applications of machine learning is attribution modeling. Customers rarely interact with a single marketing channel before making a purchase. A typical customer journey may include seeing an advertisement, opening an email, clicking a search result, and eventually completing a purchase.

The key question is: *Which channel contributed most to the conversion?*

Traditional attribution approaches, such as last-click attribution, assign all credit to the final interaction before purchase. Although simple, this approach often ignores the influence of earlier touchpoints and may lead to ineffective budget allocation. Machine learning enables a more advanced approach using algorithmic attribution models. These models analyze large numbers of real customer journeys and identify which combinations of channels and interactions are most likely to result in conversion. As a result, organizations can estimate the contribution of each touchpoint more accurately and allocate marketing budgets more effectively.



2.1.1 TASK: SELF-ASSESSMENT QUESTIONNAIRE ON KNOWLEDGE ABOUT ARTIFICIAL INTELLIGENCE

Please assess your current level of knowledge for each statement using the following scale:

1 – Very poor, 2 – Poor, 3 – Fair, 4 – Good, 5 – Very good

Statement	1	2	3	4	5
I understand the difference between predicting a category (for example: customer type) and predicting a number (for example: future sales).					
I understand the differences between analyzing past data to predict future results and recommending products or actions to customers.					
I understand the basic difference between supervised and unsupervised learning.					
I understand why AI models are trained on one part of the data and tested on another part.					
I understand why good-quality data is important for reliable AI results.					
I understand basic data preparation steps such as cleaning data and handling missing values.					
I understand that AI models must be evaluated before companies can trust their predictions.					
I understand that some AI models are difficult to explain because it is not always clear how they produce their predictions or recommendations.					
I understand which departments in a company use sales forecasts, such as marketing, finance, logistics, and production.					
I understand why sales forecasts are important for planning budgets, inventory, staffing, and campaigns.					
I understand that AI recommendations can sometimes be biased, inaccurate, or misleading.					
I understand the risks of using AI in marketing, such as privacy issues, bias, and excessive reliance on automated decisions.					
Sum					

Self-reflection

Which AI-related topics do you consider your strongest areas of knowledge?

Which areas would you like to improve further?

If your score is below 45, we recommend learning more about how AI works and how machine learning models are developed. This course will help you understand it better, but it might not be enough, especially when it comes to some more detailed aspects of machine learning and deep learning.

Try these courses:

Elements of AI from University of Helsinki: <https://www.elementsofai.pl/>

AI for everyone from Andrew Ng, founder of Google Brain and professor at Stanford University: <https://www.deeplearning.ai/courses/ai-for-everyone>

AI Fundamentals with IBM SkillsBuild: <https://www.netacad.com/courses/ai-ibm-skillsbuild?courseLang=en-US>

2.2 ML OR DL MODEL DEVELOPMENT

AI model development follows a structured process that includes several stages, from defining the task to evaluating the results. Figure 2.1 presents the main stages of this process in the context of marketing applications.

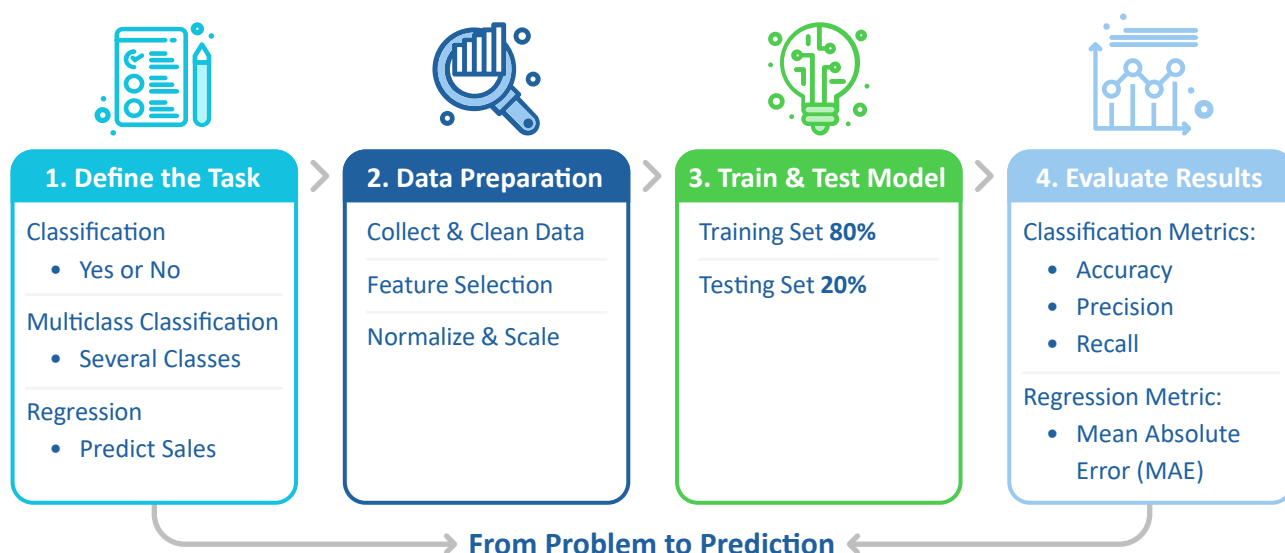


Figure 2.1 Steps in AI Model Development

The process begins with task definition. In this example, the objective is to predict which customers are most likely to respond to a marketing campaign. Since the goal is to determine whether a customer will respond or not, this represents a classification problem with two possible outcomes: yes or no. In other situations, models may classify customers into multiple categories. This is known as multiclass classification and may involve grouping customers into low-, medium-, or high-

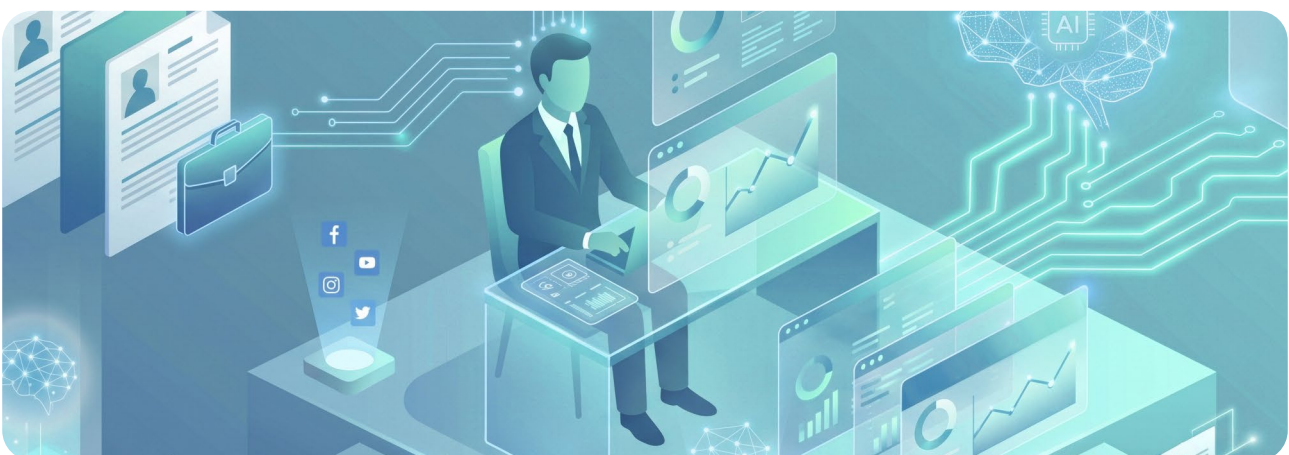
engagement segments. Another category of machine learning tasks is regression, which is used to predict numerical values, such as customer spending or expected revenue. Clearly defining the task is essential because it determines how the model will be trained, evaluated, and applied.

Once the task has been defined, the next stage involves data preparation. In the marketing campaign example, organizations may collect information about customer profiles, purchase history, website activity, and email interactions. However, raw data is rarely ready for immediate use. The dataset must first be audited to ensure that it is sufficiently large, structured, complete, and consistent. Data preparation typically includes removing errors, adding missing values, eliminating outliers, normalizing variables, and transforming raw information into more useful indicators. For example, organizations may calculate how frequently a customer opens marketing emails or visits a website. Another important step is feature selection, which involves identifying the variables most useful for prediction. Better-quality data and better-selected features generally lead to more accurate models.

After the data has been prepared, it is divided into training and testing sets. Typically, around 80 percent of observations are used for training the model, while the remaining data is reserved for testing. The training dataset contains historical examples, including whether and how customers responded to previous campaigns. The model learns the patterns associated with customer behavior from this information. The testing dataset is then used to evaluate how well the model performs on previously unseen cases.

This stage is particularly important because it helps prevent overfitting. Overfitting occurs when a model learns the training data too strictly instead of identifying broader patterns that can generalize parameters to new situations. As a result, the model may perform very well on historical data but fail when applied to new customers. In marketing practice, overfitting may lead to inaccurate predictions, ineffective targeting, and poor business decisions. Testing the model on genuinely new data helps determine whether the model can generalize effectively.

The final stage involves model evaluation. For classification problems, three metrics are especially important: accuracy, precision, and recall. Accuracy measures how often the model produces a correct result overall. Precision indicates how many customers who were predicted as positive actually respond, while recall measures how many real responders the model successfully identifies. The importance of these metrics depends on the business objective.



For example, in a churn prediction model, missing the data point that a customer is likely to leave may result in the loss of future revenue. In this situation, recall becomes more important than precision because organizations may prefer to tag too many customers as potentially at risk rather than fail to identify customers who are truly planning to leave. In contrast, premium offer campaigns require a different balance. Contacting the wrong customers may waste budget and negatively affect customer relationships, making precision more important.

This illustrates an important principle: selecting evaluation metrics is not only a technical issue, it is also a business decision. Organizations must determine what is more costly—missing a sale or acting on an incorrect prediction.

Regression problems use different evaluation metrics. One common example is Mean Absolute Error (MAE), which measures the average difference between predicted values and actual values. In customer spending prediction, for instance, MAE indicates the average prediction error in monetary terms. The acceptable level of error depends on the business context and the decisions supported by the model.

2.3 WHY MACHINE LEARNING AND DEEP LEARNING MATTER FOR MARKETING

Marketing has always involved understanding customers and making decisions in uncertain situations. Today, organizations collect enormous amounts of data, but access to that data does not automatically generate insight. Artificial intelligence becomes valuable because it allows marketers to analyze large volumes of information, identify patterns, predict future behavior, and establish more informed decision-making.

The role of AI in marketing can be understood through three interconnected functions: insight, prediction, and optimization. The first function concerns insight generation. Machine learning models can analyze millions of customer interactions and detect patterns that would be extremely difficult to identify manually. One widely known example is Starbucks, which uses a machine learning system called Deep Brew to analyze purchase histories and mobile app interactions across millions of customers. This allows the company to personalize promotions and recommendations for individual users. AI also plays an important role in sentiment analysis. By processing large volumes of customer feedback, reviews, and online interactions, AI systems can identify recurring topics and detect customer sentiment. This helps organizations understand not only what customers do, but also how they feel, allowing companies to respond more quickly when problems emerge. Another important application involves customer journey analysis. Customers rarely follow simple and linear paths to purchase. Machine learning models can analyze sequences of touchpoints and identify the interactions that have the strongest influence on customer decisions.

The second major function of AI in marketing is prediction. Machine Learning models analyze historical data to forecast future customer behavior. Because these systems learn relationships among multiple variables simultaneously, they often generate more accurate predictions than traditional

analytical approaches. One common example is demand forecasting. Amazon analyzes historical sales data, seasonal trends, pricing information, and even weather conditions to predict future demand and prepare inventory in advance. Prediction models are also widely used to estimate customer lifetime value, identify risk of churn, and calculate purchase probability. Customer lifetime value models estimate the future revenue a customer is likely to generate, while churn prediction models help organizations identify customers at risk of leaving and fine-tune retention efforts. These predictive systems support broader organizational decisions related to sales planning, budgeting, inventory management, and strategic forecasting. As a result, marketing contributes to communication activities, and broader business decision-making processes.

The third major function of AI in marketing is optimization. One of the most visible examples is personalization. AI systems can recommend products, offers, content, and the timing of communications tailored to individual customers. This often improves conversion rates, customer engagement, average order value, and customer satisfaction. AI is also widely used for budget optimization. Since marketing investments are distributed across multiple channels, AI systems can continuously analyze campaign performance and automatically allocate resources toward the most effective activities.



A more advanced application is uplift modelling. Traditional predictive models focus on identifying customers who are likely to buy, whereas uplift models attempt to identify customers who will purchase specifically (or only) because of a marketing intervention. For example, Booking.com uses uplift modelling to identify customers who genuinely require an incentive before making a purchase. This helps avoid offering unnecessary discounts to customers who would have completed the purchase anyway.

An important practical issue concerns the relationship between Machine Learning and A/B testing. A/B testing remains one of the most widely used decision-making tools in marketing because it allows organizations to measure the causal effect of a particular change. Customers are divided into groups and exposed to different versions of a message, offer, or design, allowing marketers to compare outcomes and determine whether a specific intervention improves sales performance. However, A/B testing also has important limitations. It usually focuses on a limited number of variables, requires large samples, takes time, and depends on predefined hypotheses.

Machine learning operates differently. Instead of relying on controlled experiments, it analyzes observational data and identifies complex relationships across many variables simultaneously. It can generate predictions and recommendations at the individual customer level. At the same time, machine learning primarily identifies correlations rather than direct causal relationships. A model may

predict that a customer is likely to purchase, but this does not necessarily mean that marketing activity caused the decision.

This is why machine learning and A/B testing should be treated as complementary approaches rather than competing methods. Machine learning is especially useful for discovering patterns, predicting outcomes, scoring customers, and personalizing interactions at scale. A/B testing is more appropriate for validating interventions and confirming causal relationships. In practice, the most effective marketing organizations increasingly leverage both approaches. Machine learning may identify customers who are likely to respond to a discount offer, while A/B testing can determine whether the discount itself genuinely changes customer behavior.



2.4 KEY TAKEAWAYS

- Machine learning and deep learning help marketers analyze data, predict customer behavior, and support decision-making.
- Machine learning models learn patterns directly from historical data instead of relying on predefined rules.
- Deep learning is particularly useful for analyzing complex data such as text, images, and user activity sequences.
- Building a machine learning model involves defining the task, preparing data, training and testing the model, and evaluating results.
- The quality of the data strongly influences the quality of predictions and model performance.
- Important machine learning concepts include supervised learning, classification, regression, overfitting, and train–test split.
- Metrics such as accuracy, precision, recall, and MAE help evaluate model effectiveness depending on business goals.
- Bias in AI systems may result from historical data and the underrepresentation of certain customer groups.
- Explainability methods such as SHAP help organizations understand why models make specific predictions.

- AI supports marketing through insight generation, prediction, and optimization.
- Machine learning and A/B testing are complementary approaches: one supports prediction and discovery, while the other validates causal impact.
- Understanding how AI systems work helps marketers collaborate more effectively with AI teams.



2.5 FURTHER READING

Han Sang Hwang, Gordon Burtch (2024) Machine Learning and Generative AI for Marketing Oxford University Press

Aurélien Géron (2022) Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow, O'Reilly Media

Robert Handfield (2026) How Lenovo Built an AI-Powered Supply Chain, Harvard Business Review, <https://hbr.org/2026/05/how-lenovo-built-an-ai-powered-supply-chain>



Case study:

PAINTING A CLEARER FUTURE: NOVOL'S PATH TO SMARTER SALES&OPERATION PLANNING WITH AI

Grzegorz Leszczyński, Amira Mouakher, Piotr Kwiatek

1. Introduction

NOVOL is undergoing a process of digitalisation in various areas and sees a potentially critical opportunity to reshape its marketing and sales forecasting through AI. With a vast and complex product portfolio serving diverse customers in global markets, the company faces the challenge of complexity of factors influencing sales predictions, which hinders production planning, resource allocation, and sales and marketing strategy. In the year 2023, NOVOL's management recognizes that AI can significantly improve forecasting accuracy, thereby enhancing agility and decision-making across all functions.



However, although the organization has experience applying AI in several areas and projects, it has not been previously used to predict future outcomes, which creates uncertainty about how to implement such technologies effectively. **The core challenge is how NOVOL can integrate AI into its sales and operations planning processes to improve performance while navigating the organizational and cultural barriers of AI adoption.**

Through this case, participants will grapple with strategic decision-making in a data-driven transformation and explore how manufacturers in chemical industry like NOVOL can navigate the intersection of traditional data- and experience-based approach and technological innovation.

- By learning from that case study, you will be able to:
- Discuss how AI solutions are developed in companies.
- Analyze the resources needed to develop predictive AI.
- Assess the challenges and benefits of AI implementation in sales and marketing functions.
- Develop guidelines for sales and marketing departments seeking to develop AI solutions.

2. The company

NOVOL is a Polish chemical company founded in 1978. **Over the years, it has evolved from a small workshop into a globally recognized manufacturer of automotive, industrial and marine coatings, and other chemical products. NOVOL provides comprehensive solutions for the automotive, industrial and marine sectors, combining high-quality products with technical support and professional training, as well as after sale support.** The company has earned prestigious awards, including the International Champion title for exporters and the Entrepreneur of the Year award, and is recognized in Deloitte's Best Managed Companies rankings.

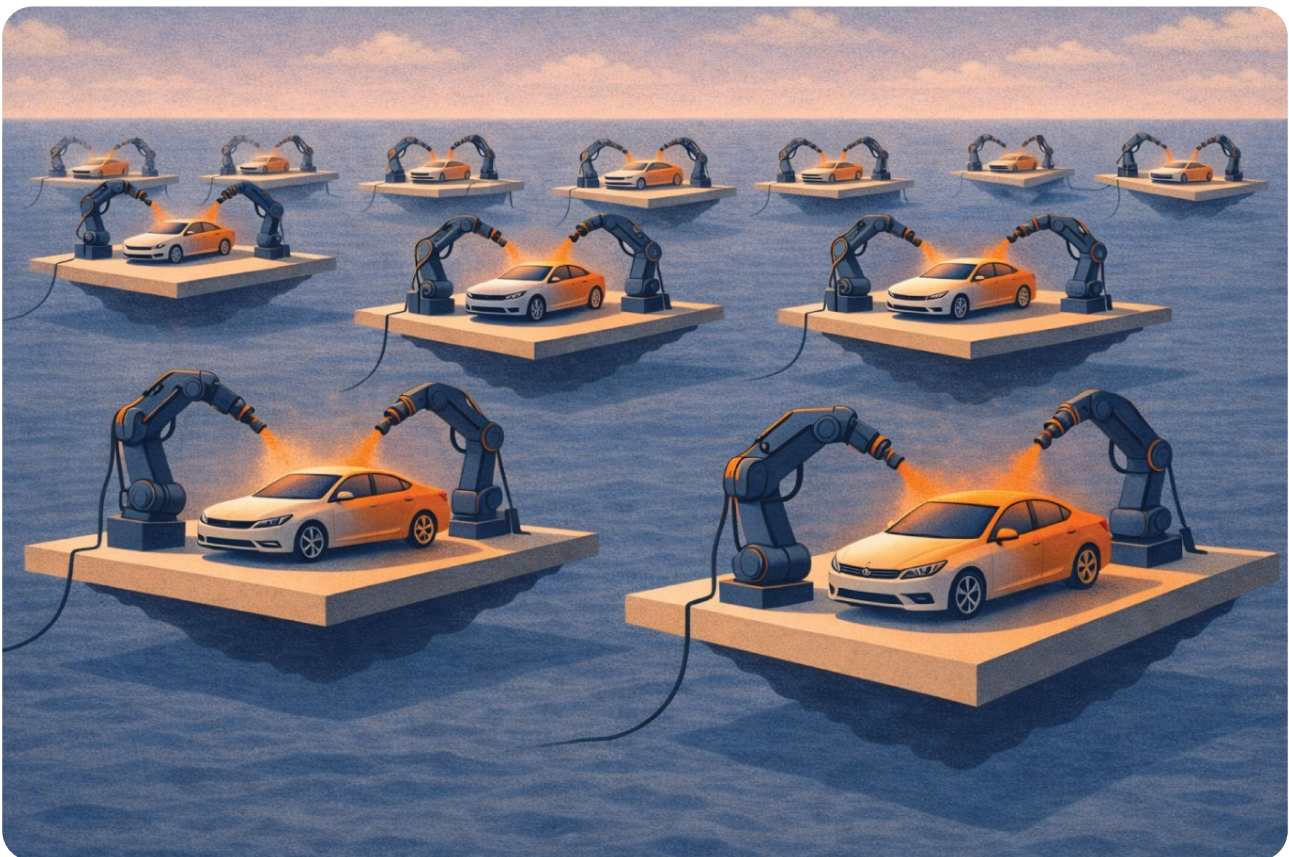
In 2023, NOVOL operates within a highly competitive global market, particularly in the automotive refinishing sector. The company offers more than 1000 products, including automotive paints, fillers, and industrial coatings. Its annual output of around 20 k tons, with more than 50% of it being exported, enables NOVOL to maintain a strong presence in over 50 countries across Europe, Asia, Africa, and the Middle East, supported by annual sales of € 120+ million. The company employs over 500 people.

NOVOL competes either against European companies with a similar profile and size as Mipa, Roberlo, Helios, etc , major global players, including PPG, AkzoNobel, Axalta Coating Systems, BASF and Sherwin-Williams or multiple Turkish and Chinese producers depending on their competitive presence in exact markets. This competitive landscape requires NOVOL to continuously innovate and adapt, providing not only quality products but also robust market partnerships and technical assistance.

International sales are driven through a network of distributors who are the company's local commercial partners, ensuring market-specific strategies, customer service, and technical support tailored to regional needs. Distributors buy large quantities and keep them in stock, which makes their transactions repeatable and regular but rare. They sell Novol products to business customers, including car paint shops, car painters, subdistributors and industrial users. The final consumer is a car (or other vehicle) user who can enjoy a beautiful color that is also a resistant chemical coating.

At the same time the company cooperates directly with key account industrial clients e.g., manufacturers of trains, buses, chassis sailboats, bicycles, chariots, and trucks. The final users of these products are car painters.

The international sales department consists of an export sales director and sales managers. They are responsible for managing relationships with customers (distributors and wholesalers), analyzing market trends, and planning sales strategies in various countries, coordinating marketing activities, and providing technical support to customers. **The international sales department is highly experienced, having worked in the company for years, which enables them to understand each market and customer thoroughly.** They are engaged in understanding markets and customers, so they invest a significant amount of their time in visiting end-customers, meeting with them in person and online, hosting customers who visit the company and its production facilities, presenting new products, and participating in events such as industry meetings and trade shows.



The international sales department cooperates with the marketing department, which organizes sales support activities. They also collaborate with the production planning department to set manufacturing plans, the R&D department for the development of new products that meet evolving customer needs, and the purchasing department to procure raw materials and secure production.

The company collects a lot of data about markets from digital sources (social media, YouTube presentations, industry reports, Google Trends), and in-person interactions with customers and users with the international sales department. However, they do not yet use AI tools for data analysis of these databases.

3. The company needs accurate sales predictions

Accurate sales predictions are essential for NOVOL due to the complexity of its product portfolio and the global scale of its operations. With over 1000 products manufactured across multiple production lines, precise forecasts help align manufacturing schedules with actual market demand, reducing the risks of overproduction or stock shortages. This ensures that resources, including manpower, raw materials, and production capacity, are efficiently allocated, preventing excess inventory that can lead to increased storage costs or product obsolescence.

Sales forecasting is also critical for optimizing the company's international supply chain and distributor network. **NOVOL sells its products in over 50 countries through wholesalers who maintain stocks for 2-3 months to secure market-specific product availability. Accurate forecasts enable NOVOL to support its distributors with timely deliveries better, ensuring that regional markets are well-stocked while minimizing logistical inefficiencies and costs.** This alignment enhances the company's responsiveness to seasonal trends and shifts in customer preferences. Reliable sales predictions enable informed production planning, effective raw material procurement, efficient production staff scheduling, and strategic budgeting and investment decisions.

The company has two distinct sales forecasting systems. The first is strategic, designed to plan sales quotas / budgets and company activities for the upcoming calendar year. The second, an operational system, is a monthly rolling process that generates sales quotas, forming the foundation for planning raw material procurement, master production schedule (MPS) and other manufacturing activities. This operational system employs a statistical time-series Box-Jenkins (ARIMA) model to predict market-specific outcomes. This model is widely recognized for its effectiveness in capturing trends and seasonality in time-series data, providing a solid foundation for predictive analytics.



At the beginning of year 2023, the company's foreign markets exhibit substantial variations in demand size, customer business models, and position. Demand fluctuations resulting from market disruptions caused by events such as the COVID-19 pandemic and the Russian invasion of Ukraine have impacted the accuracy of forecasts based on statistical models. Before a month begins, a total sales prediction for the next month is generated.

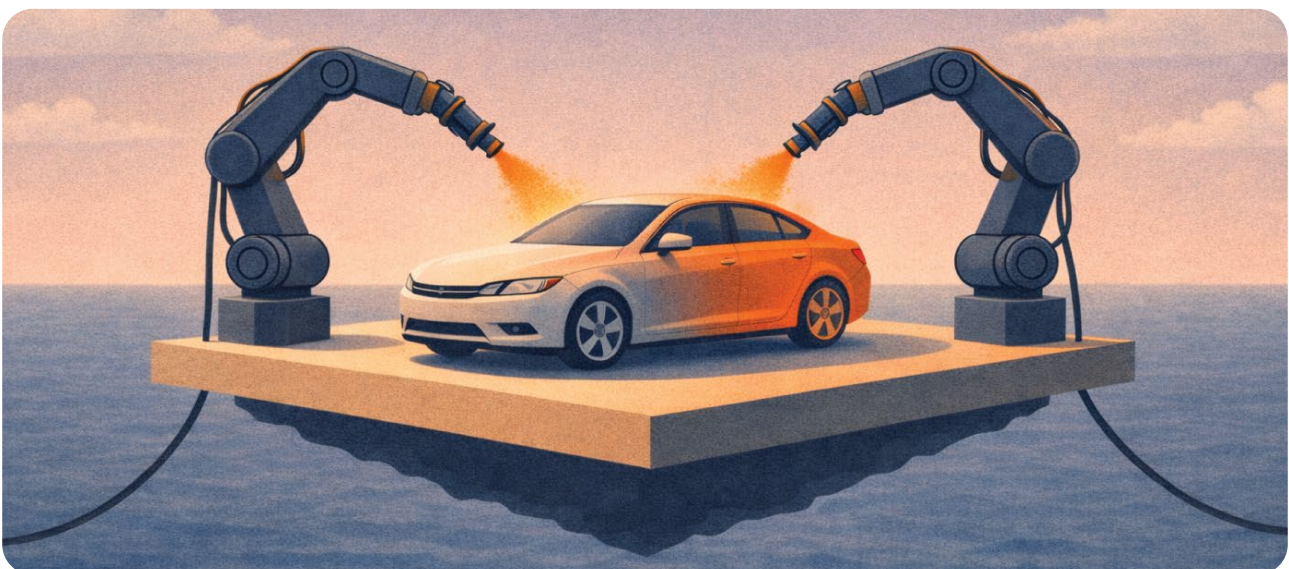
Then, granular predictions are allocated to each customer based on each customer's historical sales proportion of total sales, producing “raw” forecasts for each customer. Simultaneously, sales managers gather market data and customer opinions, aligning their qualitative experience-based predic-

tions with statistical outputs. Subsequent manual adjustments are made to the “raw” sales forecast for each customer. Then, adjusted sales predictions for each customer are authorized in the Enterprise Resource Planning (ERP) systems and used to prepare production MPS and purchasing plans.

This rolling monthly forecasting system can be enhanced to meet the expectations of sales and production planning specialists, as it currently has limited capacity to respond to significant demand fluctuations across international markets. **Both the sales and production departments assess the average accuracy of this system at 80%, considering it as an opportunity for improvement. This leads to challenges in resource allocation, resulting in issues when either underestimating or overestimating the resources required to meet demand.** Therefore, the company looks for new solutions that would decrease the involvement of salespeople and increase the accuracy of predictions. The heads of the sales and production departments decided to integrate AI into forecasting and decision-making processes.

The company faces several significant challenges across technical, strategic, and workforce dimensions as it attempts to integrate AI into its sales forecasting process.

- 1. Technical Challenges** – the research team is unsure whether NOVOL has sufficient and high-quality data, as structured historical data may be lacking across its diverse products and global markets.
- 2. Organizational Challenges** – balancing AI insights with traditional expertise, especially when forecasts conflict with sales department’s intuition, raising the “black-box” issue of AI. Executives must also define success metrics, determine investment levels, and manage risks such as model inaccuracies, data bias, and over-reliance on automation. Managers, unfamiliar with data science, may struggle to interpret AI-driven forecasts or integrate them into campaign planning.
- 3. Limited power of AI models** – data scientists must develop models that align with NOVOL’s specific market dynamics and operational realities, requiring deep collaboration with sales and marketing departments.



4. Analysis

4.1. Methodological background

Despite several generic AI sales prediction tools available on the market and companies offering tailored solutions, Novol decided to approach AI as a research project. **The main argument was that this would enable an understanding of how AI works, identify the necessary resources, and provide several opportunities for testing.** They established a collaboration with the international team of researchers known as Digital Insights, comprising data scientists, sales experts, and B2B marketing specialists. The research team promised to develop an AI predictive model that would be more accurate than the actual Novol ARIMA model.

The research team adapted the CRISP-DM (Cross-Industry Standard Process for Data Mining) methodology (Shearer, 2000), a widely accepted approach for knowledge discovery. **The methodology was structured as a continuous or lifelong learning cycle, which ensures that models are iteratively improved, remain relevant, and adapt as new information becomes available.** By integrating life-long learning, the research team wanted to achieve continuous performance refinement, reducing the need for complete model redevelopment. The adapted methodology comprises four sequential steps presented in Figure 2.2.

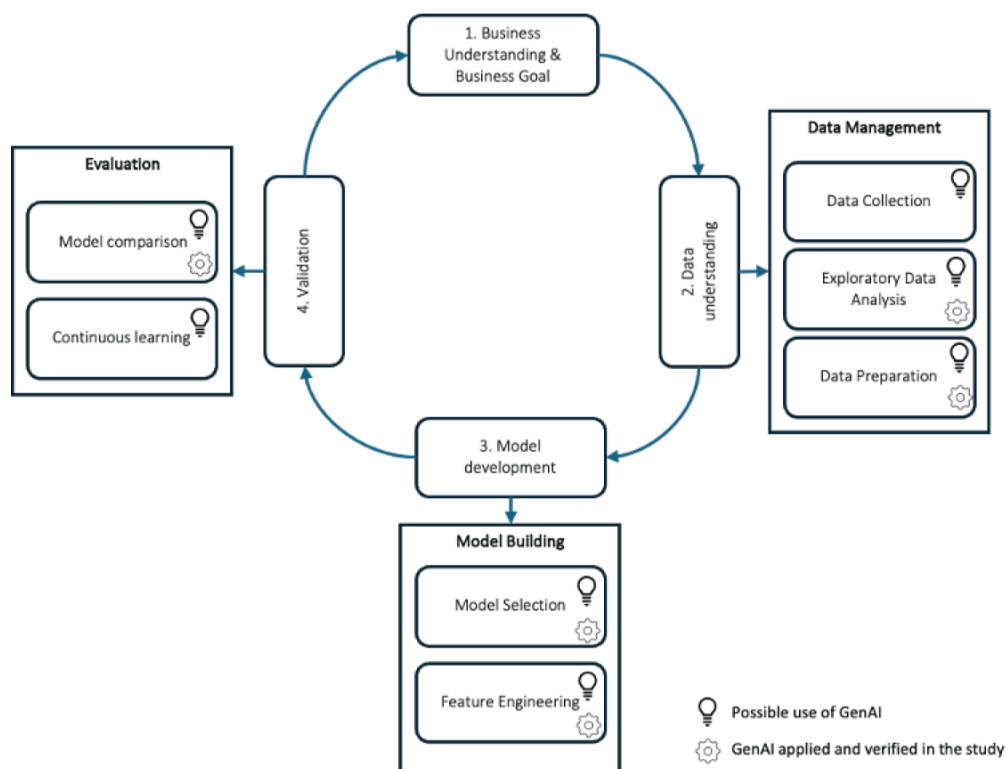


Figure 2.2 Methodology applied in the project

The research team used generative AI as a collaborative tool throughout the sales data analysis process to develop a comprehensive model. It aided in brainstorming and refining code development, thereby streamlining the technical aspects of the project.

4.2. Utilizing AI requires a clear understanding of business goals.

In the first step of the project, the research team focused on gaining a deep understanding of the company's business context and strategic goals. **They engaged closely with stakeholders from the sales and production departments to clarify their expectations and operational realities.** A key insight emerged: the primary objective was to improve sales forecasting accuracy without increasing the workload of sales area managers, who were already heavily occupied with operational tasks and customer relations. This business-driven approach ensured that any AI solution developed would complement existing workflows rather than disrupt them. It should focus on efficiency and value without adding administrative burdens to the sales department (as with any other employees).

During this initial phase, the research team also attempted to evaluate the historical accuracy of NOVOL's sales forecasts. However, this proved to be impossible because the company was not systematically recording the forecasts provided by its model. Only adjusted forecasts, which were manually revised by managers, were stored. Thus, there was no traceability of initial prediction accuracy. **This finding reinforced the need to redesign forecasting processes to capture both raw predictions and subsequent adjustments for future evaluation and training of AI models. Additionally, they learned that it will be hard to augment company data with external features because:**

- Novol operates in diverse international markets, most of which lack comparable data availability.
- Introducing a broad set of features could result in a need to create new positions at Novol for data collection, and the company opted not to increase the complexity of the forecasting process.
- More features could reduce models' transparency and explainability; hence, it was deemed to limit their practical value.

In that situation, the research team recognized that they would be working with a limited dataset.

4.3. AI is not magic – it requires data.

The research team obtained data from the company's ERP system, which stores all customer transactions. During a month, a customer may submit several orders, while some customers purchase from Novol in larger quantities but with longer intervals between purchases. In some instances (e.g., corrective invoices, order changes, promotional packages - such as discounts), negative values appeared on the invoices. To address this, invoices linked to corrective ones were excluded. They addressed corrective invoicing issues by linking corrective invoices to particular lines in the orders and excluding them from the dataset.

Then they carried out the exploratory data analysis. They scrutinized the dataset for potential real-world issues, such as encoding categorical variables, normalizing features, removing outliers, and handling missing values. The subsequent step involved feature engineering, enabling the identification and selection of independent features to construct a robust model. Additional features were in-

cluded to capture international selling aspects, specifically incorporating currency exchange ratios based on the company's international sales system. Customer characteristics were also integrated, creating a categorical variable based on past purchasing behavior and categorizing customers into three distinct types (using ABC segmentation). Furthermore, the dataset was augmented with information on the responsible area sales manager assigned to each customer, as well as the day of the week (Monday-Friday) and the day of the month (1-31).

Then descriptive analysis of the selected variables was conducted. It provided insight into dispersion, and distribution characteristics, offering a foundation for understanding potential biases and patterns within the data. The data on sales value, sold pieces and weight of sold products exhibited highly skewed distributions with pronounced outliers. **These skewed distributions suggest that a small number of high-value transactions may disproportionately influence the mean.**

Finally, standard scaling was employed for variables with relatively low skewness yet significant variance. This transformation standardized the data, creating distributions with a mean of zero and a standard deviation of one, ensuring that all variables contributed equally to model performance regardless of their original scale. This step was essential for maintaining consistency across variables with differing units and magnitudes, particularly in multivariate analyses where alignment in scale is crucial.

An exemplary dataset that contains 8% (13957) randomly selected transactions from the full dataset is available at: <https://osf.io/9wnhd>

4.4. Development of models

The forecasting models were developed to capture the complex dynamics of sales performance by integrating both statistical and machine learning techniques. **To simulate the company's model, the research team started by modeling ARIMA (used in a forecasting tool by Novol).** This model captures general trends but struggles to represent significant fluctuations and extreme values in the data accurately.



Then, an LSTM model was tested to address sequential dependencies within the sales data. However, despite its theoretical advantages in modeling long-term dependencies, the LSTM did not yield highly accurate results, likely due to complexities in the data structure that challenged the model's learning capacity.

The research team then turned to XGBoost, a gradient-boosting algorithm renowned for its high performance and efficiency in handling diverse data types. They experimented with variations using frequency-based segmentation to enhance XGBoost's predictive capacity further, but it was not satisfactory. **Having recognized the need for a more robust modeling strategy to address the limitations observed with ARIMA, they developed a hybrid modeling framework that combines the strengths of both statistical and machine learning approaches. The predictive process begins with the Auto ARIMA model, which is adept at modeling linear trends, seasonality, and autocorrelations in the aggregated sales data.** ARIMA produces baseline forecasts that serve as a foundational representation of the underlying time series patterns. Building on this foundation, the XGBoost model is designed to model the residual errors, effectively capturing non-linear relationships, complex interactions, and anomalies.

4.5. Models perform well

In evaluating the models, 4 common metrics were applied:

- **MAE (Mean Absolute Error)** - indicates the average magnitude of errors in the predictions without considering their direction.
- **MSE (Mean Square Error)** - is a quadratic scoring rule that measures the average magnitude of errors but gives higher weight to more significant errors.
- **RMSE (Root Mean Square Error)** - is the square root of the MSE, providing an error metric in the same units as the target variable (e.g., Gross Value).
- **MAPE (Mean Absolute Percentage Error)** - calculates the absolute percentage error for each observation, averages these percentages, and provides an overall percentage error.

The comparison results among various forecasting models revealed significant differences in predictive performance (Table 2.1 next page). Configurations of XGBoost utilizing median and specific parameter tuning yielded exceptional results, achieving **MAE values 933.41**, along with remarkably low **MAPE value of 7.46**. Expressed in monetary terms, the baseline ARIMA model (based on optimized parameters) incurs an estimated error of over €2.7 million. **In contrast, the tuned hybrid model (optimized for MAPE) reduces this error to just over €300,000.**

Table 2.1 Model performance comparison

model \ assessment	MAE	MSE	RMSE	MAPE
ARIMA (baseline)	4,858.63	138,323,160	11,761.09	1,051.16
LSTM (lagged) ¹	3,069.42	91,258,031.20	9,552.91	602.32
XGBoost	2,727.57	88,295,401.06	9,396.56	369.91
XGBoost (f=median) ²	935.22	9,365,435.61	3,060.3	200.75
XGBoost (f=100) ³	869.57	6,826,867.29	2,612.83	211.04
HYBRID	1,911.38	5,348,664.77	2,312.72	15.19
HYBRID XGBoost tuned	933.41	1,700,218.83	1,303.92	7.46

¹ Lagged values of 30 daily sales used as an example of in-sample data augmentation. 30 days = 1 month

² Split into two models: high/low frequency in transactions. Split done using the median of the frequency

³ As above, the split was done using n=100 as a frequency threshold

4.6. Business needs granular sales predictions

Having developed such a model, the research team was able to complete that successful project. However, **Novol's International Sales Director reminded that they appreciate general sales predictions, but what they need is rather granular sales forecasting – predicting sales for each customer.** This caused a significant amount of unexpected work for researchers, as the hybrid model appeared to be inaccurate when applied to a single customer due to the low number of observations (transactions) per customer. **The model developed on 300000 transactions was accurate for predicting the value of all transactions, but did not work for each customer, while a single customer made sometimes one purchase a month (which results in only 36 transactions in 3-year period that was used to train the model). That was significantly not enough to predict sales for each customer accurately.**

To face that challenge a complex forecasting framework was developed. Once both the ARIMA and XGBoost models generate their respective forecasts, the model combines these predictions through an adaptive weighting scheme. The adaptive weights are dynamically assigned based on each model's predictive error—specifically, their MSE. This adaptive approach ensures that the model dynamically prioritizes the more reliable component (ARIMA or XGBoost) based on the data characteristics, leading to a more accurate and balanced forecast. Finally, the combined forecast is scaled down to the customer level using each customer's historical sales proportion of total sales. This proportional scaling ensures that the total forecasted sales are distributed among all customers according to their past purchasing behavior, allowing for comprehensive and customer-specific predictions.

This granular predictive model can be used in different ways, regarding the treatment of customers with sparse or highly volatile data. Some customers exhibited sporadic purchasing behavior, characterized by long periods of inactivity or extremely high sales variability, which made it diffi-

cult for models to detect meaningful trends. These erratic patterns led to disproportionately high forecast errors when included in the model. Thus, excluding customers with sparse or highly volatile data allowed for a tenfold reduction in the MAPE error of granular sales predictions generated by the initial ARIMA model. Second, including all customers, the displayed performance was slightly reduced, but still outperformed ARIMA. The inclusion of all customers naturally introduced more variability and noise into the forecasts, but the model still maintained relatively low error rates.

5. Key question and Alternatives

Novol is not sure how to evaluate that project or whether similar projects should follow the same or different paths. What are the key lessons from that implementation of AI?

From one perspective, over two years, the company developed a more mature understanding of AI requirements and limitations. This measured, step-by-step approach helped align marketing, sales, and production planning, ultimately creating a more data-informed decision-making culture within the organization. For another point of view, the company could decide to follow different ways, for example:

- **Investing in AI team** - NOVOL could build internal capabilities by upskilling current staff in data analytics and AI, fostering long-term expertise as an alternative to hiring external AI specialists.
- **Centralized AI Decision-Making** - A centralized model would place AI development under a dedicated internal data science team, rather than in sales units. A centralized solution would promote better control and alignment across all predictive processes.
- **Purchasing off-the-shelf platforms**, developed by specialized vendors with proven algorithms, user-friendly interfaces, and built-in support for integration with existing systems like CRM and ERP. Such solutions offer a fast and less resource-intensive path to implementing predictive forecasting.

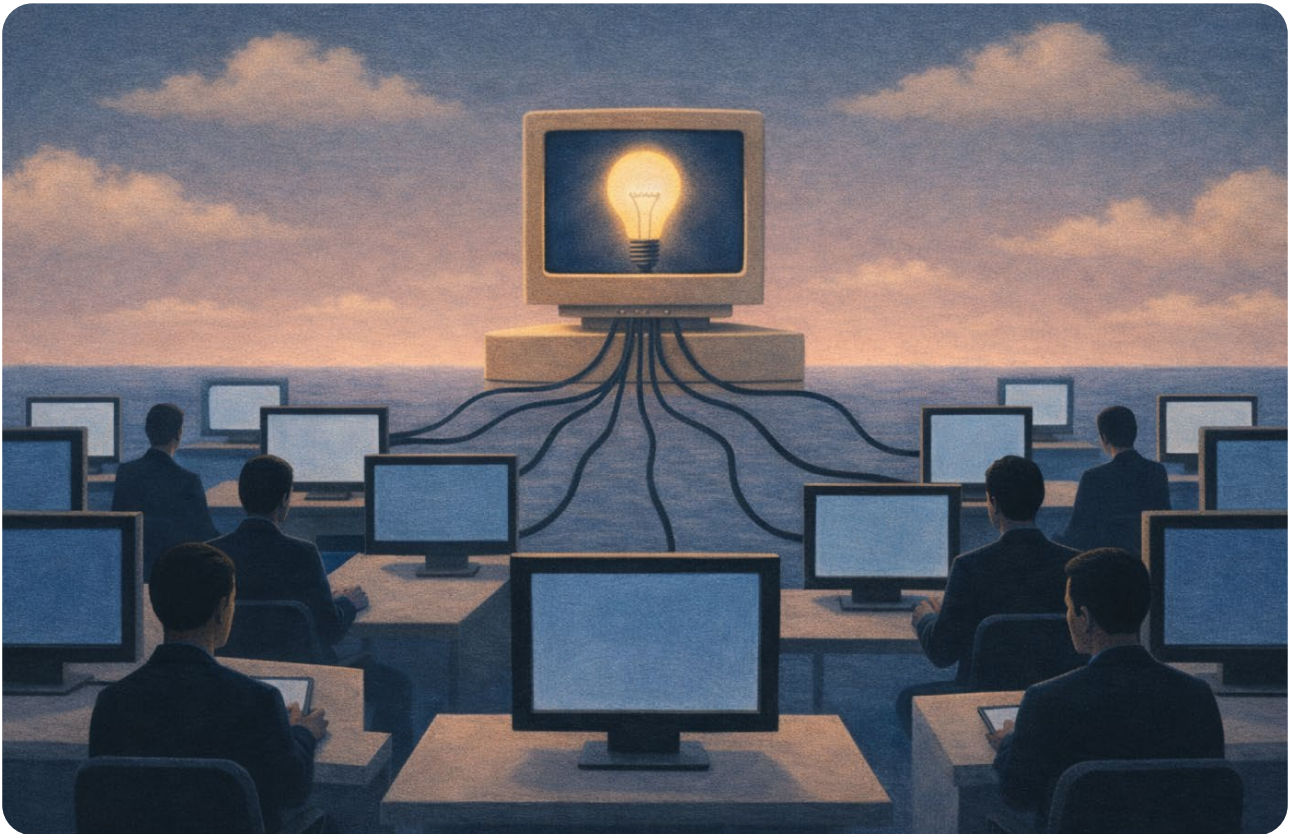
6. Conclusions

Novol followed some best practices in AI Adoption in manufacturing companies. It began with a small, targeted initiative that demonstrated quick wins, then scaled AI-based solutions across the organization based on proven success. It also invested in data quality and availability and collaborated with research institutions and AI specialists to access cutting-edge expertise and tools.

Following an initial exploration of AI for sales forecasting, NOVOL embarked on a structured and pragmatic journey to modernize its predictive capabilities. The company learned from several problems related to data silos and data quality issues. Inconsistent data formats, siloed systems, and incomplete datasets hinder the effectiveness of AI models.

They first focused on improving their forecasting process by establishing a systematic measurement of forecast accuracy — a practice that had not been formalized before. This allowed NOVOL to create baseline metrics and evaluate the effectiveness of their predictions over time.

Recognizing that effective AI forecasting requires high-quality, comprehensive data, NOVOL decided to gradually build its forecasting system, starting with better data collection processes. A key strategic move was the implementation of a CRM system from a leading provider, ensuring consistent data capture across markets and customer interactions. The company decided to revisit AI predictions in two years, when the dataset will be sufficiently rich.



Another important aspect for the company concerned the organization's research and development. Building the capacity to launch projects with new technologies and AI knowledge should be balanced evenly across different areas and teams. Such balanced development enables understanding of AI applications within a given process and takes into account the needs and perspectives of various departments. **AI knowledge must not be concentrated in a single division, but other departments of the organization should develop at a similar speed. This project enabled understanding and linking the different needs related to international sales, ensuring that this knowledge is available across all areas of the organization.**

However, still many challenges that need to be addressed. Many companies struggle to move from pilot AI projects to full-scale deployment, often due to integration challenges or a lack of organizational alignment. Data governance is used to establish clear policies for data privacy, security, and ownership to ensure ethical AI usage. Employees require training and development opportunities to understand and effectively utilize AI tools, thereby fostering a culture of data literacy. **The integration of AI into Decision-Making Processes needs to ensure that AI outputs are embedded into operational workflows, rather than operating in isolation from business functions.** Employees may resist adopting AI tools due to fear of job displacement or unfamiliarity with new technologies.

7. Tasks

What are the key lessons from that implementation of AI? NOVOL's experience with AI adoption reveals a common gap between general AI implementation strategies and the operational realities of a manufacturing business. After reading the NOVOL case study, your task is to design key outputs that would help similar companies prepare effectively for AI-driven sales forecasting. The goal is to equip a manufacturing firm with a clear, actionable roadmap and the tools to assess its readiness for AI-driven transformation.

Task 1. If NOVOL had to do it all over again, what would they dare to do differently?

Instead of drafting a conventional planning form, design a "readiness stress test" that forces a manufacturing company to confront its blind spots before launching AI-driven sales forecasting. Your stress test must expose vulnerabilities, not just list resources. Include:

- Where will human capabilities break first?
- Data weaknesses that the company is likely pretending don't matter
- Training gaps that could derail adoption
- Change-management hurdles leadership is underestimating

Your goal: Create a tool that makes a leadership team uncomfortable—and therefore prepared.

Task 2. Most AI implementation plans are comforting illusions. Make one that isn't.

Develop a "failure-aware AI implementation framework" that lays out the phases, milestones, and success metrics—but with a twist: For every phase, identify:

- What could realistically go wrong
- Who will try to resist
- Which decisions will define success or collapse
- What signals indicate the project is veering off course

This is not a checklist. It is a map of the danger zones a company like NOVOL must navigate on the path to meaningful AI adoption.

Task 3. Why is AI forecasting worth the pain? Convince a skeptic.

Write a sharp, no-nonsense justification of the benefits of AI-based sales forecasting—crafted for a manufacturing executive who believes AI is overhyped and disruptive. Your argument must be:

- Concise
- Evidence-driven
- Directly tied to operational and financial impact

Write to overcome resistance, not to preach to the converted.



GENERATIVE AI IN MARKETING

Grzegorz Leszczyński & Amira Mouakher

The creation of marketing content has traditionally been the work of designers, copywriters, creative agencies, and marketing teams. For years, marketing technology was primarily associated with automation. Organizations used digital systems to automate emails, campaign execution, reporting, and targeting, while AI was mainly applied to predictive analytics and recommendation systems.

Today, however, something fundamentally different is happening. Marketing is moving from automation toward creation. AI is no longer limited to helping marketers by automating tasks. Increasingly, it can create content itself, including text, advertising copy, images, videos, audio, and even complete marketing campaigns. This shift is transforming not only the content itself, but also the way marketing work is organized and how creative processes operate.

Against this background, an important question emerges: what exactly is Generative AI?

3.1 WHAT IS GENERATIVE AI & HOW DOES IT WORK?

Generative AI can be better understood by comparing it with the predictive AI models discussed in the previous chapter. Predictive AI is primarily used to support decision-making. It helps organizations discover which customers are likely to buy, which customers are at risk of leaving, or which users are most likely to respond to a campaign. The output is usually a prediction, probability, score, or numerical value.

Generative AI serves a different purpose. Instead of predicting outcomes, it creates content. These systems can write emails, generate advertisements, create product descriptions, and produce images, video, audio, or other forms of multimedia content. The key distinction is relatively simple: predictive AI estimates what is likely to happen, whereas Generative AI produces content that can be communicated directly to customers.

The mechanism behind these systems is also different. Generative models create content by predicting the next element in a sequence. In text generation, this means predicting the next word—or more precisely, the next token. By repeating this process many times, the model gradually produces sentences, paragraphs, and complete responses.

One of the most important categories of generative systems is large language models (LLMs). These models are trained on extremely large collections of data and learn statistical patterns in language, including how words are connected, how context changes meaning, and how language structures typically appear. When a user provides an input, the model generates a response by predicting the next most likely sequence of tokens. A useful way to understand this process is to think of it as a highly advanced form of autocomplete. However, unlike traditional autocomplete systems, LLMs first transform words into numerical representations called embeddings, which capture aspects of their meaning and relationships to other words. They then use an attention mechanism to identify which parts of the input are most relevant for generating the next response. By combining these two capabilities, LLMs can understand context more effectively and produce responses that are coherent, relevant, and adapted to the user's request.

At the same time, an important characteristic must be emphasized. These systems do not possess human-like understanding or reasoning. They generate outputs based on the patterns extrapolated from data, so the generated content may appear highly convincing and still be incorrect, inconsistent, or misleading.



In practice, generative AI systems are typically built around four main elements: training data, the model itself, the prompt, and the generated output. Training data is the information used to train the model, which then identifies and learns patterns from it. The prompt represents the user's instruction or request, and the output is the final content generated by the system. One important principle should be emphasized here: the quality of the generated result depends not only on the model itself, but also on the quality and clarity of the prompt.

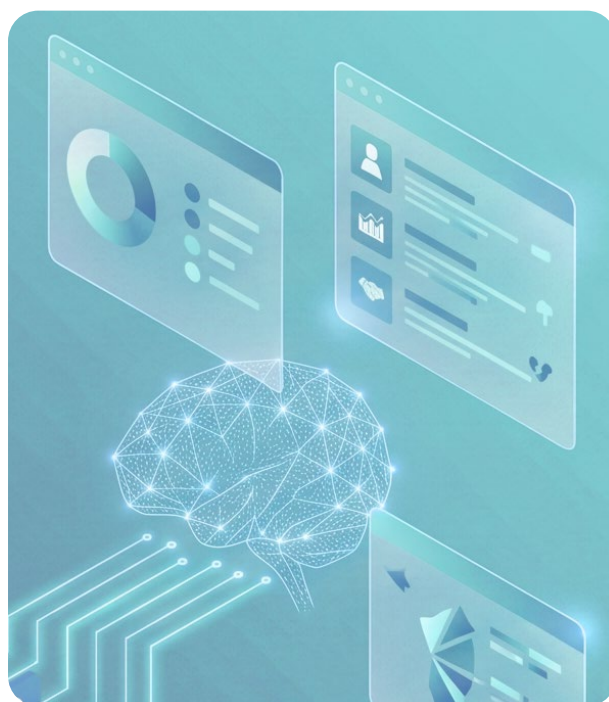
Although generative AI is most commonly associated with text, these systems are increasingly used to generate images, video, audio, and multimedia content. Tools such as Midjourney and DALL-E can create visual materials from simple text descriptions and are already widely used in marketing for campaign concepts, advertising visuals, creative inspiration, and content production.

Another important distinction concerns the difference between general-purpose models and fine-tuned models. General-purpose models, such as ChatGPT or Claude, are pre-trained on very large and intentionally diverse datasets. The term GPT, for example, stands for Generative Pre-trained Transformer, highlighting a model designed to generate content after being pre-trained on vast amounts

of text. These models are flexible and capable of performing a wide range of tasks immediately after deployment. Fine-tuned models operate differently. They begin as general-purpose systems but are additionally trained on collated organizational data, including brand guidelines, internal documents, product information, or company communication standards. As a result, fine-tuned models are often more consistent with a company's brand voice and better adapted to specific business applications.

For marketing managers, choosing between these approaches becomes an important strategic decision. General-purpose models offer flexibility, speed, and broad usability. Fine-tuned models require additional effort, specialized data, and higher organizational expense, while providing more control, consistency, and accuracy.

Despite their capabilities, Generative AI systems also have important limitations. One of the most significant is hallucination. A model may generate information that appears correct but is actually false, including invented facts, statistics, references, or sources that do not exist. In addition, the quality of the output often depends heavily on the quality of the prompt provided by the user. Models may also struggle to process very large documents in their entirety, which can lead them to overlook, misinterpret, or omit relevant information contained in earlier sections. This is why AI-generated content should always be verified before use in marketing communications.



Another limitation concerns bias. As discussed previously, models learn from existing data and may reproduce biases contained within that data. This can influence tone, representation, recommendations, and targeting decisions. Another challenge is outdated knowledge. Because these models are trained on historical data, they may not reflect recent events, product updates, market changes, or current organizational information.

To address this issue, many organizations increasingly use Retrieval-Augmented Generation (RAG). In a RAG system, the model does not rely exclusively on previously learned information. Instead, it first retrieves relevant and up-to-date content from external sources such as websites, product catalogues, internal databases, or organizational documents. The retrieved information is then used to generate a more accurate and contextually relevant response. A useful way to understand RAG is to imagine the model consulting a reference library before producing an answer.

Finally, Generative AI systems also have limited reasoning abilities. Although they may simulate reasoning convincingly, they do not truly understand problems in the same way humans do.



3.1.1 TASK: SELF-ASSESSMENT QUESTIONNAIRE ON KNOWLEDGE ABOUT GENERATIVE ARTIFICIAL INTELLIGENCE

Please assess your current level of knowledge for each statement using the following scale:
1 – Very poor, 2 – Poor, 3 – Fair, 4 – Good, 5 – Very good

Statement	1	2	3	4	5
I can explain what generative AI is in simple terms.					
I understand the difference between generative AI and AI used for prediction or classification.					
I know that generative AI can create different types of content, such as text, images, audio, and video.					
I understand that generative AI systems learn from large amounts of existing data.					
I understand that LLMs generate text by predicting the next word or token in a sequence.					
I know that LLMs rely on statistical patterns rather than true human understanding.					
I understand the role of prompts in guiding AI-generated outputs.					
I understand why the clarity and structure of a prompt influences the quality of the response.					
I understand what AI hallucinations are and why AI systems may sometimes generate inaccurate information.					
I am aware that generative AI systems can produce biased, misleading, or outdated content.					
I understand the main limitations of generative AI, including limited reasoning and factual reliability.					
I know how to critically evaluate whether an AI-generated response is relevant, accurate, and useful for professional use.					
Sum					

Self-reflection

Which AI-related topics do you consider your strongest areas of knowledge?

Which areas would you like to improve further?

If your score is below 45, we recommend learning more about how AI works and how machine learning models are developed. This course will help you understand it better, but it might not be enough, especially when it comes to some more detailed aspects of machine learning and deep learning.

Try these courses:

AI for everyone from Andrew Ng, founder of Google Brain and professor at Stanford University:

<https://www.deeplearning.ai/courses/generative-ai-for-everyone>

Generative AI for beginners from Google:

https://www.skills.google/course_templates/536

3.2 HOW GENERATIVE AI IS USED IN MARKETING

The previous chapter introduced Generative AI and explained how it differs from analytical and predictive AI systems. One important practical question is about how Generative AI is currently used in marketing practice. Several major applications can already be identified, including content creation, personalization at scale, customer insights and research, strategic support, and operational efficiency.

One of the most visible applications is content creation. Traditionally, producing marketing materials required significant coordination between copywriters, designers, agencies, and marketing teams. Today, Generative AI can support the creation of advertising copy, email campaigns, product descriptions, SEO content, and various creative materials. For example, Amazon uses AI systems to generate and optimize product descriptions across millions of products, improving both scalability and consistency. Coca-Cola has also experimented with Generative AI in campaign development and visual concept creation, allowing the company to test creative ideas more quickly. Importantly, Generative AI does not eliminate the role of marketers. Instead, it changes the nature of marketing work. Rather than manually creating every element, marketers increasingly focus on guiding AI systems, refining outputs, ensuring brand consistency, and aligning generated content with broader strategic objectives.

Another important application is personalization at scale. Personalization has long been a central marketing objective, but it has traditionally been constrained by human resources capacities and production limitations. There are not enough people to do the job. Generative AI significantly expands these possibilities by enabling organizations to create personalized emails, localized content for different markets, audience-specific communication, and dynamically adapted messaging. Netflix provides a well-known example of this approach. The company not only uses AI to recommend content, it also personalizes how that content is presented to different users using customized thumbnails and messaging. Spotify applies similar principles in content campaigns such as Wrapped, where personalized summaries and user-specific content are automatically generated for millions of users. As a result, organizations are increasingly moving from a single message designed for everyone to dynamically generated communication tailored to individual users. Consequently, marketers are shifting from manually producing campaigns to designing systems that automatically generate personalized interactions.

Generative AI also transforms how organizations analyze customers and conduct marketing research. One important use case is in customer feedback analysis. AI systems can process customer reviews, survey responses, support conversations, and social media discussions while generating

concise summaries of recurring themes and customer concerns. For example, Airbnb uses AI to analyze feedback from both guests and hosts in order to identify patterns that can improve customer experience and communication strategies.

Another emerging application is the development of synthetic personas. Generative AI can simulate customer segments and generate detailed personas simulating motivations, preferences, attitudes, and behaviors. These synthetic personas allow marketers to test campaign concepts, explore alternative messaging strategies, and better understand target audiences. This significantly accelerates research processes and enables faster experimentation and iteration.



Generative AI is adding to strategic marketing activity processes as well. Instead of starting with a blank page, marketers can use AI systems to generate campaign ideas, communication themes, creative directions, alternative slogans, value propositions, and messaging variations. Companies such as Unilever already use AI-supported tools to explore multiple creative options and accelerate campaign development. AI also supports market research activities by summarizing reports, analyzing articles, identifying trends, and synthesizing information from multiple sources. This reduces the time spent gathering information and allows marketers to focus more on strategic interpretation and decision-making.

Beyond strategic support, Generative AI also improves operational efficiency for marketing organizations. One of the most common applications is AI-powered chatbots. These systems can answer customer questions, provide recommendations, execute customer service activities, and interact with users in real time. For example, Sephora uses AI assistants to generate personalized product recommendations while simultaneously reducing pressure on customer support teams. Another application involves FAQ automation. AI systems can generate and continuously update responses to frequently asked questions using internal organizational knowledge and customer interaction data. Generative AI is also used for internal reporting, meeting summaries, workflow support, and internal communication. Many companies, including HubSpot use AI tools to streamline internal marketing processes and reduce the time spent on repetitive operational tasks.

Overall, Generative AI is changing not only the tools used in marketing, but also the structure of marketing work itself. Organizations are moving from manually producing communication toward managing systems capable of generating content, insights, and interactions at scale.



3.2.1 TASK: LEARNING FROM EXAMPLES OF GENERATIVE AI APPLICATION IN MARKETING

Read these examples of generative AI marketing use case scenarios.
Some of them are positive, other present negative aspects.

In March 2023, **Coca-Cola** launched **Create Real Magic**, a generative AI campaign built with OpenAI and Bain & Company. The platform combined GPT-4 and DALL-E, letting users create Coca-Cola-themed artwork from text prompts using official brand assets such as the contour bottle, Spencerian script logo, Santa Claus, and polar bear imagery.

The campaign invited users in selected markets, including the U.S., Australia, and parts of Europe, to generate and submit original branded visuals. Selected works had the chance to appear on digital billboards in Times Square and Piccadilly Circus, turning AI image generation into a participatory brand experience rather than a traditional one-way advertisement.

This case is important because Coca-Cola not only used generative AI as a production tool, but as a consumer engagement mechanism. It positioned the brand as an early adopter of AI-enabled creativity while also raising broader questions about authorship, brand control, and the role of human creativity in AI-assisted marketing. It worked, thanks to high audience engagement and user-generated content at massive scale. It combined creativity, branding and personalization. This application of AI showed that it can become a co-creation tool for marketing.

Read more: <https://www.forbes.com/sites/bernardmarr/2023/09/08/the-amazing-ways-coca-cola-uses-generative-ai-in-art-and-advertising/>

In February 2024, an unlicensed event called **Willy's Chocolate Experience** in Glasgow became an international embarrassment after families discovered that the immersive chocolate-themed attraction looked nothing like its promotional material. Organized by a company called House of Illuminati, the experience was advertised online using surreal AI-generated images showing magical candy landscapes, glowing tunnels, and extravagant Wonka-style sets. Tickets reportedly cost up to £35, leading parents to expect a large-scale fantasy event inspired by Charlie and the Chocolate Factory.

When attendees arrived, however, they found a sparsely decorated warehouse with cheap props, printed AI backdrops, folding tables, and very little chocolate. Children reportedly received only a few jellybeans and lemonade, while actors struggled through confusing scripts that performers later described as "AI-generated gibberish." One visitor called the event an "absolute shambles," while others compared it to the disastrous Fyre Festival. Videos and photos quickly spread across social media, showing disappointed families, crying children, and an eerie masked character called "The Unknown," which frightened some attendees. Police were eventually called to manage angry crowds and refund disputes.

The fiasco rapidly became a viral symbol of the dangers of misleading AI-generated marketing. Critics argued that the promotional images created unrealistic customer expectations and blurred the line between fantasy advertising and deception. Media outlets and technology commentators pointed to the event as an example of AI slop—cheaply generated content used to market low-quality products or experiences. Organizers later apologized and promised refunds, admitting the event should have been canceled before opening. Despite the backlash, the bizarre disaster became an internet phenomenon, inspiring memes, documentaries, and even plans for a horror film based on the infamous character “The Unknown.”

Read more: https://en.wikipedia.org/wiki/Willy's_Chocolate_Experience

In 2024, **Klarna** announced that its OpenAI-powered customer-service assistant had gone live globally. Within its first month, the assistant handled 2.3 million conversations, covering about two-thirds of Klarna’s customer-service chats across 23 markets and more than 35 languages.

The company reported strong operational results: the assistant performed work equivalent to 700 full-time agents, reduced average resolution time from 11 minutes to under 2 minutes, and helped cut repeat inquiries by 25%. Klarna also said customer satisfaction was on par with human agents.

However, the story later revealed the limitations of over-automation. By 2025, Klarna’s CEO Sebastian Siemiatkowski acknowledged that the company had “over-indexed” on AI and that the heavy reliance on automation had led to “lower quality” customer experiences. Customers increasingly complained that AI responses felt generic, repetitive, and ineffective in complex or emotionally sensitive situations that required empathy and human judgment. Klarna eventually began rehiring human support staff and shifting toward a hybrid model combining AI efficiency with human interaction. The case is now viewed not only as a success story about AI scalability, but also as a cautionary example showing that customer experience quality can decline when companies prioritize automation and cost reduction over human-centered service.

Read more: www.klarna.com/international/press/klarna-ai-assistant-handles-two-thirds-of-customer-service-chats-in-its-first-month/

<https://www.fintechweekly.com/magazine/articles/klarna-hires-customer-service-after-ai-pivot>

In 2024, **Air Canada** lost a legal dispute after its website chatbot gave a customer incorrect information about bereavement fare refunds. The chatbot told Jake Moffatt that he could buy a ticket and apply for a bereavement discount refund within 90 days, but Air Canada’s actual policy did not allow bereavement discounts after travel had already occurred.

When the customer later requested the refund, Air Canada refused, arguing that the valid policy description was available elsewhere on its website. The tribunal rejected this argument, stating that the chatbot was part of Air Canada’s website and that the company was responsible for the information it provided. Air Canada was ordered to compensate the customer.

This case is important because it shows that AI hallucinations can create serious legal and financial consequences. It is a clear warning: AI communication tools must be accurate, monitored,

and aligned with official company policies, because customers may reasonably rely on what a branded chatbot tells them.

Read more: <https://www.theguardian.com/world/2024/feb/16/air-canada-chatbot-lawsuit>

Generative AI is transforming marketing by making content creation faster, more scalable, and more personalized than ever before. Companies can now generate advertisements, visuals, customer interactions, and creative campaigns in seconds.

However, the same technology can also create serious problems: inaccurate information, misleading content, loss of customer trust, ethical concerns, and weak emotional authenticity. The examples presented show that generative AI is neither good nor bad per se, use cases need to be carefully selected, planned and monitored.

AI's impact depends on how it is used, how humans supervise it, and whether organizations use it responsibly. For marketers, the challenge is no longer simply creating content. It is learning when AI should be used, when human creativity is still essential, and how to critically evaluate AI-generated outputs before publishing them. Generative AI should be seen as a powerful assistant—not a replacement for human judgment, strategy, and creativity.

Having read these stories, reflect on the main reasons for success and failure:

- In which marketing tasks do you think AI can genuinely improve creativity and productivity?
- In which situations should human validation always remain mandatory?
- Do you think customers should always know when content was created by AI?
Why or why not?

3.3 PROMPTING

As Generative AI becomes a standard marketing system, an important practical question concerns how marketers can effectively control the content it produces. The answer lies in prompting.

A prompt is a structured instruction that guides the AI system and defines the task, context, and constraints for the generated output. In practice, the quality of the final output is largely a result of the prompt itself. Vague prompts usually generate generic responses, while well-defined prompts produce more relevant, useful, and targeted outputs.

Consider a simple instruction such as: “Write an email presenting my product.” Although understandable, this prompt remains incomplete because the model has not been informed of parameters including the audience, the product type, or the objective of the communication. A more effective prompt might specify: “Write a promotional email for a new fitness app targeted at young professionals. Highlight time-saving features while maintaining a friendly, motivating tone. Limit the text to 50 words.” In this case, the objective, audience, messaging style, and communication constraints are clearly defined, making the generated content significantly more relevant.

Several general principles of effective prompting can be identified. First, the objective should be defined clearly. The system should understand whether the purpose of the content is to inform, persuade, summarize information, or generate creative ideas. Second, prompts should provide sufficient context. The more relevant contextual information the model receives, the more accurate and useful the output becomes. In marketing applications, this may include information about the target audience, brand voice, communication channel, or campaign objective.

Another important principle involves specifying expectations and constraints. Marketers may define the desired tone, structure, length, format, or style of the response. This helps ensure that the generated content remains aligned with organizational standards and communication goals.

Prompting should be understood not simply as giving commands to an AI system, but as a process of guiding and shaping the output that leads to content generation. As Generative AI is integrated into marketing workflows, the ability to design effective prompts is becoming an crucial user communication skill.



3.4 KEY TAKEAWAYS

- Predictive AI supports decision-making, while generative AI focuses on creating content.
- Generative AI can produce text, images, video, audio, and other marketing materials.
- Large language models generate content by predicting the next token in a sequence.
- Generative AI systems are built around four main elements: data, the model, the prompt, and the output.
- The quality of AI-generated content depends strongly on the quality of the prompt.
- General-purpose models offer flexibility, while fine-tuned models provide greater consistency and control.
- Generative AI is used in marketing for:
 - content creation,
 - personalization at scale,
 - customer research,
 - strategy support,
 - and operational efficiency.
- AI changes the role of marketers from manually producing content toward guiding and refining AI-generated outputs.

- Important limitations of Generative AI include hallucinations, bias, outdated knowledge, and limited reasoning ability.
- Retrieval-Augmented Generation (RAG) improves accuracy by combining AI generation with external and up-to-date information sources.
- Machine learning and generative AI should be used strategically and with appropriate human oversight.
- Effective use of generative AI requires understanding both its capabilities and its limitations.



3.5 FURTHER READING

Malay A. Upadhyay (2024) Generative AI for Marketing, WileyRaj

Venkatesan, Jim Lecinski (2024) The AI Marketing Canvas, Stanford Business Books

Ethan Mollick (2024) Co-Intelligence: Living and Working with AI, Portfolio/Penguin

Stefano Puntoni, Olivier Toubia (May-June 2025),
How Gen AI Is Transforming Market Research, Harvard Business Review,
<https://hbr.org/2025/05/how-gen-ai-is-transforming-market-research>



DATA FOR AI IN MARKETING

Grzegorz Leszczyński & Amira Mouakher

Modern marketing generates enormous amounts of data every day. However, just because the data is there, does not mean that organizations can use AI with their data effectively. One of the main reasons why AI projects fail is not the quality of the model itself, but the quality of the data used to train and support it. A common principle in computing is: *garbage in, garbage out*. This means that poor-quality data leads to poor-quality results, regardless of how advanced the AI model may be.

This issue is particularly important in marketing because many decisions depend directly on historical data. Sales forecasting relies on past sales information, personalization depends on customer behavior data, and campaign optimization is derived from reliable performance metrics. If the underlying data is incomplete, inaccurate, inconsistent, or outdated, the predictions and recommendations generated by AI systems may also become unreliable. Similarly, when customer behavior is not properly captured, personalization systems may produce weak or irrelevant recommendations.

The same applies to campaign metrics. If performance indicators are inaccurate, marketing decisions based on them may also be incorrect. For this reason, AI systems are only as effective as the data they learn from. Preparing, managing, and evaluating data then becomes a fundamental part of AI implementation in marketing.

This chapter examines how organizations can prepare and manage data for AI applications in marketing. The following sections introduce the main principles of data quality, data preparation, and data governance in AI-driven marketing environments.

4.1 DATA-DRIVEN MARKETING

Modern marketing is increasingly described as data-driven, especially in the context of AI systems that operate directly on data. However, data-driven marketing is not simply about collecting more information. Its real value lies in its ability to collect, integrate, and interpret data from a variety of sources in ways that support better decision-making, personalization, and performance optimization.

One of the most important categories is first-party data, meaning information collected directly from customers through company-owned interactions and channels. This includes CRM records, purchase history, website behavior, email engagement, mobile app interactions, and customer service logs. First-party data is particularly valuable because it is accurate, relevant, and proprietary. It is the foundation of the customer view and allows organizations to build a more complete understanding of customer behavior. Starbucks provides a useful example. The company combines purchase history, loyalty program activity, and mobile app usage to personalize offers and promotions. Rather than relying on external information, Starbucks uses its own customer interactions to support marketing decisions. In an environment legally constrained by privacy regulations, opt-in first-party data is strategically critical.

Another important category is behavioral and digital interaction data. Modern consumers are leaving their digital footprints across websites, platforms, and applications. Organizations use web analytics, clickstream behavior, heatmaps, advertising metrics, and search activity to understand how users interact in these digital environments. This type of data helps answer practical questions: How do users navigate a website? Where do they leave the process? Which content attracts the most attention?



Booking.com is a useful example here. By continuously analyzing searches, clicks, and browsing behavior, the company optimizes recommendations, pricing, and interface design in real time. This type of data supports one of the central principles of modern marketing: continuous experimentation and optimization.

Transactional and financial data represent another important category. This includes information related to order value, payment methods, purchase frequency, subscription duration, and return patterns. Such data helps organizations understand customer profitability and long-term value. A commonly used framework in this area is the Recency, Frequency, and Monetary Value (RFM) analysis, which segments customers based on purchasing behavior. Amazon, for example, uses transactional data to identify high-value customers and adjust recommendations, loyalty incentives, and pricing strategies accordingly. This type of data connects marketing decisions directly with financial performance.

One of the more challenging areas is unstructured data. Unlike structured datasets, this data does not follow predefined formats. It includes customer reviews, survey responses, support conversations, social media comments, and chat transcripts. For many years, analyzing this information at scale was difficult. Advances in AI and natural language processing have changed this challenge significantly. Organizations can now process large volumes of text to cluster data, identifying recurring themes, customer emotions, motivations, and signals of dissatisfaction. Airbnb, for example, analyzes reviews from both guests and hosts to improve customer experience and platform communication. Unstructured data gives organizations access insights about customer opinions and emotions that are often not visible in numerical datasets.

External and third-party data also plays an important role in marketing decision-making. This includes market research reports, demographic databases, economic indicators, industry benchmarks, competitive intelligence, and social listening platform tools. While first-party data explains what customers are doing, external data provides broader market context and helps organizations understand trends, competition, and macroeconomic conditions. Companies such as Nielsen and Kantar provide market intelligence that allows brands to compare their performance with competitors and identify changes in consumer behavior.

A relatively new but increasingly important category is zero-party data. This refers to information that customers intentionally and proactively share with organizations, including preference surveys, quizzes, style profiles, and personalization settings. Unlike inferred behavior, zero-party data reflect explicitly stated customer preferences and intentions. Sephora, for example, collects beauty profiles and quiz responses to improve product recommendations and personalize customer experiences more accurately. This type of data is especially valuable in a privacy-focused environment because it is transparent, consent-based, and highly actionable.

Finally, organizations increasingly experiment with synthetic and augmented data. These data types are generated artificially using statistical models rather than collected directly from real-world interactions. Synthetic data becomes especially useful when real world data is limited, sensitive, expensive to collect, or difficult to access. It allows organizations to simulate scenarios, test strategies, and reduce decision-making risk before implementing actions in real environments.

A useful way to understand data-driven marketing is through a simple sequence:

Data → Insight → Decision → Action

Data-driven marketing is not about collecting as much information as possible. It is about identifying and then combining the right data sources to support better decisions. As AI becomes more integrated into marketing, the ability to work effectively with diverse types of data will increasingly be a competitive advantage.

4.2 WHAT IS DATA IN AI CONTEXT?

AI systems rely on data that has been properly collected, integrated, and prepared for analysis. In practice, raw marketing data is rarely ready for use by AI models. Organizations typically gather data from multiple sources, including CRM systems, online stores, customer reviews, emails, logs, images, and audio content. This information must then be integrated, processed, and transformed into meaningful features that can be used by machine learning models. The process presented in figure 4.1 illustrates how marketing data moves from multiple data sources through integration and processing to feature generation, model training, and prediction.

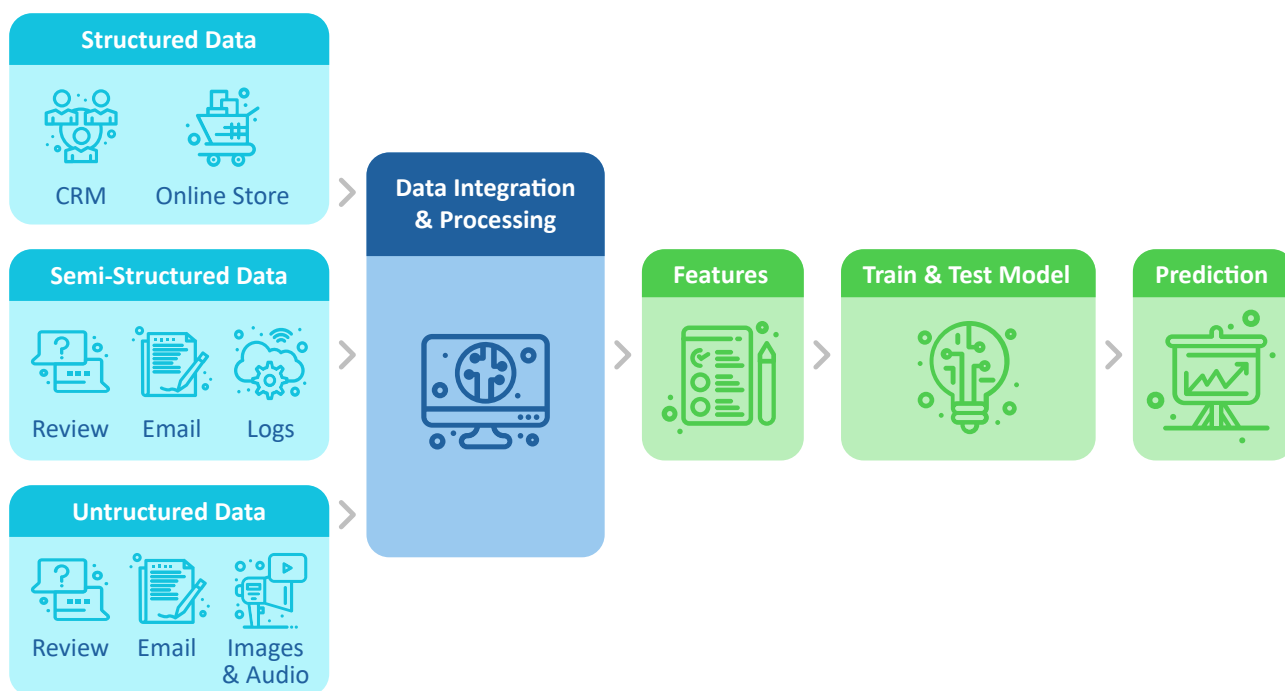


Figure 4.1 Marketing data flow

Marketing teams work with different types of data. Some information is highly structured and stored in databases or spreadsheets. This includes CRM records, online store transactions, customer demographics, and campaign performance metrics. Because this data follows predefined formats, it can usually be processed relatively easily by machine learning models.

Other types of information are only partially structured. Emails, reviews, logs, and web tracking data contain identifiable patterns and taggable content, but they still require additional preparation before they can be analyzed effectively.

Organizations also work with unstructured data, such as customer reviews, social media comments, images, audio files, and chat conversations. Unlike structured datasets, this type of information does not follow predefined formats and is therefore more difficult to organize and process automatically. More generally, data is not limited to numbers and tables. It can also include text, images, audio recordings, videos, and other forms of digital content that can be analyzed by AI systems.

Since marketing data can originate from multiple sources and include text, images, audio, video, and transactional records, it often exists in different formats and levels of quality. Before AI models can use this information effectively, organizations must integrate and organize it into a common format that can be processed and analyzed. This process typically involves removing duplicates, correcting errors, standardizing formats, and handling missing values. For example, instead of using raw customer activity logs, organizations may create indicators such as purchase frequency, average order value, website activity level, or email engagement rate.

Once the features are prepared, the dataset is typically split into training and testing sets. The model learns patterns from the training dataset and is later evaluated on previously unseen cases in the testing dataset. Finally, the trained model generates predictions or recommendations, such as identifying customers likely to respond to a campaign, estimating churn probability, or recommending products.

This process illustrates an important principle: AI systems do not operate directly on raw information. Their effectiveness depends heavily on how well the data has been formatted, integrated, and organized before analysis begins.

4.3 WHAT MAKES A DATASET SUITABLE FOR AI?

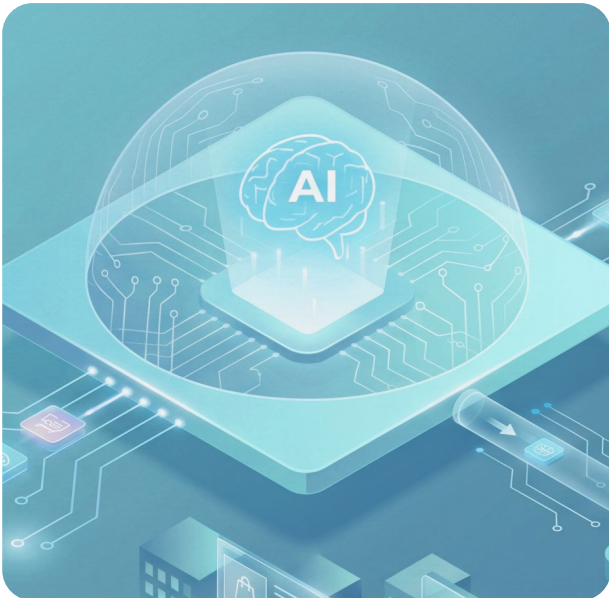
Not every dataset is suitable for AI modeling. For a model to perform reliably, the data used to train it must meet several important quality criteria. Four dimensions are particularly important: size, completeness, consistency, and relevance. These dimensions do not operate independently. In practice, organizations often need to balance these trade-offs. For example, increasing the size of a dataset may also introduce more noise, errors, or missing information. As a result, there is no perfect dataset. Some datasets are simply more suitable for a particular objective than others.

A dataset must be large enough for the model to learn stable and generalizable patterns. If the dataset is too small, the model becomes highly sensitive to random variation and may produce unstable predictions. At the same time, a larger dataset is not automatically better. If the information contains significant errors or inconsistencies, the model may learn incorrect relationships. For this reason, data quantity should always be considered together with data quality.

Another important dimension is completeness. Completeness measures the likelihood of missing values in the dataset. However, missing data should not always be treated in the same way. Sometimes information is missing randomly, for example because of technical problems or incomplete records. In such situations, organizations may use standard techniques such as removing incomplete observations or estimating missing values. In other cases, missing data itself contains meaningful information. For example, customers who never open marketing emails are a negative source of engagement data. In this situation, the absence of information is evidence of actual customer behavior. Removing or artificially filling these values could eliminate an important signal. This illustrates why handling missing data requires understanding not only the dataset itself, but also the reasons why information is missing.

Consistency is another critical issue. At a technical level, consistency involves standardizing formats such as dates, currencies, or measurement units. A more serious challenge appears when the meaning of variables changes over time. For example, if the definition of an “active customer” changes during the data collection period, the dataset becomes internally inconsistent. Problems of this type cannot be solved through simple cleaning procedures. They require proper documentation, governance, and coordination across the organization. Consistency is also connected to representativeness. If a dataset reflects only a limited segment of customers, a single geographic region, or a specific time period, the model may not generalize well to other contexts.

Relevance represents the fourth major dimension. Relevant data is directly connected to the prediction task. Including irrelevant variables increases noise and raises the risk of overfitting, where the model learns relationships that do not generalize effectively. A closely related issue is data leakage. Data leakage occurs when information that would not be available during real-world prediction is accidentally included in the training data. In such cases, the model may appear extremely accurate during testing but fail in practical use.



Another important challenge is class imbalance. This occurs when one outcome is significantly less frequent than another. For example, in a conversion prediction task, only a small percentage of customers may actually make a purchase. Under these conditions, a model may achieve high accuracy simply by predicting the known majority outcome. However, such a model would have little practical value because it would fail to identify the edge cases that matter most. For this reason, evaluation should go beyond overall accuracy and consider metrics that reflect the ability to detect rare but important events.

Beyond these four dimensions, two additional factors play an important role in practice. The first is data drift, sometimes referred to as concept drift. Customer behavior changes over time, and the statistical properties of data may evolve as well. As a result, models trained on historical information may gradually become less accurate, making continuous monitoring and periodic retraining necessary. The second factor concerns legal and regulatory compliance. Before organizations evaluate data quality, they must first determine whether the data can legally be used. Regulations such as the GDPR require that personal data be collected and processed for clearly defined purposes. If data cannot legally be used, it is not suitable for AI applications regardless of its technical quality.

Finally, human oversight remains essential. In high-impact decisions involving pricing, targeting, or customer exclusion, AI outputs should not be applied automatically without human review. This approach is often described as human-in-the-loop decision-making because human judgment remains part of the process, especially when ethical, legal, or strategic considerations are involved.

A dataset suitable for AI is not defined by volume alone. It must be sufficiently large, complete, consistent, and relevant while balancing trade-offs between these dimensions. Reliable AI systems ultimately depend not only on models, but also on high-quality data, effective governance, and informed human judgment.

4.4 DATA PREPROCESSING STEPS

Once a dataset has been evaluated and considered suitable for AI applications, the next step is data preparation. Data preprocessing is an essential stage in every AI project. In practice, a significant part of the work involved in data analysis is devoted to preparing information before modelling can begin. This process usually involves several important steps.



The first step is data cleaning. In real-world datasets, information is often incomplete, inconsistent, duplicated, or inaccurate. For example, customer records may contain missing values or duplicate entries, and transactional data may include multiple formats and inconsistent labels. If such issues are not addressed, the model may learn incorrect or misleading patterns. Data cleaning focuses on handling missing values, removing duplicate records, standardizing formats, and correcting errors. This stage improves data reliability and helps ensure that the model is trained on consistent information.



The second step is data transformation. At this stage, data is converted into a format suitable for modelling. One common example is normalization or scaling. Numerical variables may have very different ranges. For example, one variable may vary from 1 to 10, while another ranges from 1 to 10,000. If these differences are not accounted for, the model may assign disproportionate weight to larger values simply because of their scale. Another important transformation is encoding categorical variables. Variables representing categories, such as country, product type, or customer segment, must often be converted into numerical representations before they can be processed by AI systems. Since most machine learning algorithms operate on numerical information, these transformations are necessary for effective modeling.



The third step is data aggregation. In some situations, the raw data is too detailed to meet the analytical objective. For example, organizations may have detailed records of daily customer activity while the business problem requires weekly or monthly analysis. Aggregation makes it possible to summarize data at a higher level and identify broader patterns and trends.



The fourth step is feature engineering, which involves creating new variables from existing data to improve the model's predictive capabilities. For example, instead of using raw transactional data directly, organizations may create indicators such as average purchase value, customer lifetime value, purchase frequency, or engagement scores. These engineered variables often capture customer behavior more effectively than the original raw data.



The final step is feature selection. Not all variables contribute equally to useful predictions. Some variables may be irrelevant, redundant, or introduce noise into the model. Feature selection focuses on identifying the variables most relevant to the prediction task and removing information that does not improve model performance. This stage is important not only for improving prediction quality but also for increasing model efficiency and interpretability.

Data preprocessing plays a central role in AI modelling. Effective models depend not only on algorithms, but also on how well the data has been prepared, transformed, and structured before analysis begins.



4.5 KEY TAKEAWAYS

- Data-driven marketing depends on the ability to collect, integrate, and interpret different types of data.
- First-party data is becoming increasingly important in a privacy-focused marketing environment.
- Marketing organizations work with structured, semi-structured, and unstructured data.
- Behavioral, transactional, external, and zero-party data are used in different marketing decisions and AI applications.
- AI systems require data that is properly cleaned, integrated, and formatted before modelling can begin.
- Raw data is transformed into features that help models identify patterns and generate predictions.

- A dataset suitable for AI should be sufficiently large, complete, consistent, and relevant.
- Poor-quality data leads to unreliable predictions, regardless of how advanced the model is.
- Important data challenges include missing values, class imbalance, data leakage, and data drift.
- Data preprocessing includes cleaning, transformation, aggregation, feature engineering, and feature selection.
- Legal compliance and human oversight remain essential when using AI systems in marketing.
- Effective AI systems depend not only on algorithms, but also on high-quality data and proper data governance.



4.6 FURTHER READING

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Dave Sutton (June, 2018) How Vineyard Vines Uses Analytics to Win Over Customers, Harvard Business Review, <https://hbr.org/2018/06/how-vineyard-vines-uses-analytics-to-win-over-customers>.



Case study:

FROM FUEL TO SMART ECOSYSTEMS: HOW AI REDEFINES CUSTOMER EXPERIENCE AT MOL GROUP

Mirkó Gáti

MOL Group is shifting from a traditional energy company to a digital, customer-focused business by using AI to enhance insights, marketing, and decision-making. This transformation also creates challenges around skills, ethics, and the role of human creativity.



1. Introduction

MOL Group, headquartered in Budapest, Hungary, is **one of Central and Eastern Europe's largest integrated oil and gas companies, with operations spanning over thirty countries and a workforce of approximately 26,000 employees.** Its retail business, which includes nearly 2,000 service stations across nine countries, serves approximately 10 million customers and processes millions of transactions each day. While the company's roots lie in the traditional energy sector, MOL has increasingly diversified into petrochemicals, consumer goods, and mobility services, reflecting both the pressures and opportunities of a rapidly changing global energy and retail landscape (MOL Group, 2025).

In recent years, **the company has recognized that its long-term competitiveness cannot be secured solely through scale and legacy infrastructure.** Shifting consumer expectations, accelerating digitalization, and the arrival of agile digital-first competitors have placed pressure on MOL to reimagine its customer engagement strategies (MOL Group, 2024). For a company historically associated with fuel sales, the ability to transform into a consumer-focused and digitally agile business has become central to its growth ambitions. In this context, the integration of artificial intelligence (AI) into marketing and customer experience functions has emerged as a strategic priority (Salesforce, 2024).

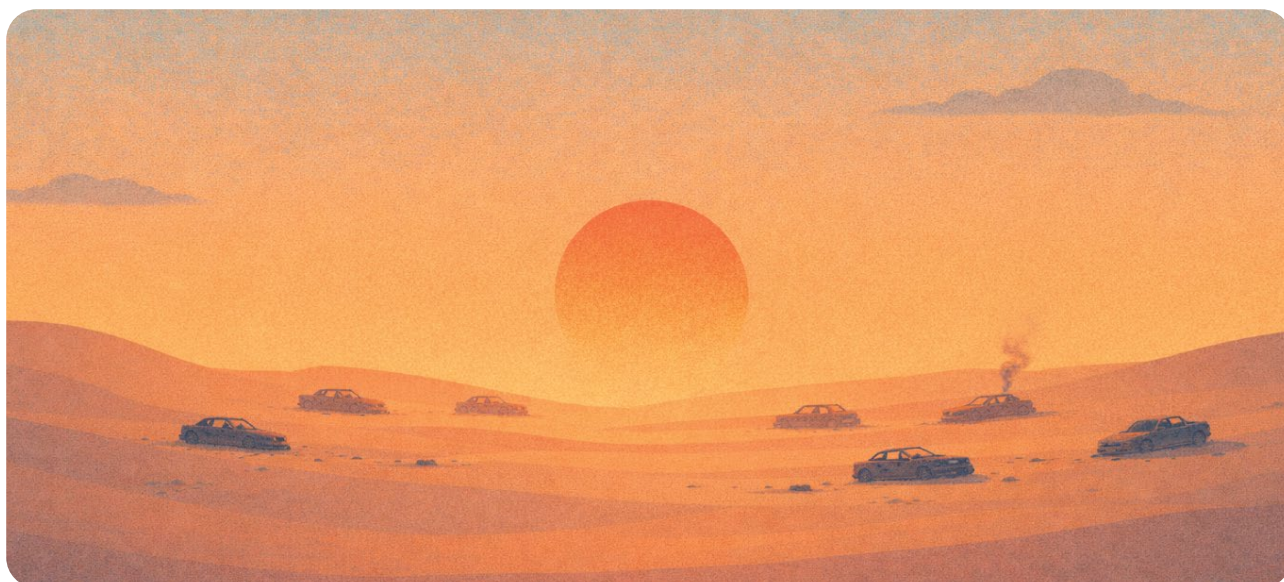
The adoption of AI promises to enhance MOL's dynamic capabilities in three important ways.

First, it strengthens the company's ability to sense opportunities by enabling a deeper understanding of consumer behavior through data-driven insights and behavioral analytics. **Second**, it allows MOL to seize these opportunities through the creation of hyper-personalized marketing campaigns, dynamic content generation, and more accurate forecasting of demand. **Finally**, AI supports the organization in transforming its internal processes and workforce competencies, reshaping how marketing teams operate and how decisions are made.



At the same time, MOL's AI adoption introduces new challenges and dilemmas. Integrating generative AI into marketing decision-making and creative processes raises questions about the future role of marketers and the balance between human creativity and automated efficiency. Employees face competency gaps as they learn to adapt to new tools, requiring investment in training and cultural change. Moreover, ethical and strategic considerations are paramount, particularly in ensuring compliance with the GDPR, maintaining customer trust, and deploying AI in a manner that is transparent and responsible.

These challenges form the basis of this case study, which aims to explore how MOL is navigating its AI journey. Specifically, the central research question is: How does the integration of AI technologies at MOL Group enhance the firm's dynamic capabilities in terms of sensing, seizing, and transforming opportunities within the energy and retail sectors? Addressing this question requires a closer look at the company's organizational background and the current state of its AI initiatives in marketing, which together set the stage for understanding both the opportunities and dilemmas facing the firm.



2. Background

MOL Group's history reflects the broader economic and political transformations of Central and Eastern Europe over the past decades. Emerging in its modern form in the early 1990s, following the liberalization of Hungary's economy, MOL expanded through a series of acquisitions and partnerships, including regional players such as Slovnaft in Slovakia and INA in Croatia. Over time, it established itself as a vertically integrated company with operations in upstream exploration, downstream refining, petrochemicals, and retail.

Its presence across the region, supported by its extensive network of service stations, **positioned MOL as a leading energy player in CEE, capable of competing with multinational oil majors on a regional scale** (MOL Group, 2024). Despite this success, the company has been increasingly aware of the disruptive forces reshaping its industry. The global transition towards cleaner energy sources, combined with shifting consumer expectations for digital services, has prompted MOL to reassess its long-term strategy. Recognizing that fuel sales alone cannot secure growth, the company has repositioned itself as a mobility and consumer goods provider with a strong emphasis on customer experience. This repositioning has necessitated investment in digital transformation and data-driven capabilities (IBM, 2025).

To drive this agenda, MOL established the Digital Factory, a cross-functional innovation hub bringing together data scientists, engineers, marketers, and product teams (MobilityPlaza, 2025; Fintechzone, 2024). The Digital Factory serves as the engine of the company's digital transformation, tasked with developing new customer engagement tools, operational AI applications, and scalable platforms that can be deployed across markets. Within this structure, marketing has emerged as a key domain for experimentation and innovation, given the company's need to engage millions of customers daily across diverse markets.



The marketing organization itself has undergone significant restructuring in line with this transformation. Traditionally focused on mass-market campaigns, the team has shifted its focus towards personalized engagement, supported by AI-driven tools. The adoption of Salesforce Marketing Cloud, Data Cloud, and Experience Cloud, integrated with IBM's watsonx.ai platform, has provided the technological backbone for this shift (ibmix, 2024). These systems enable the unification of customer data from loyalty apps, point-of-sale systems, and CRM databases into comprehensive profiles. By leveraging AI, MOL can now create dynamic customer segments, generate personalized content, and measure engagement in real time (Gyártástrend, 2023).

The MOL Move loyalty ecosystem is a central pillar of this strategy. **Available across multiple countries, the program integrates fuel, retail, and mobility services into a single customer platform.**

Its mobile app serves as a key data source, capturing behavioral signals and providing a channel for personalized offers. The loyalty ecosystem not only fosters customer retention but also provides raw material for AI-driven personalization, allowing marketing teams to test, refine, and scale new approaches (IBM, 2025; ibmix 2024).

Organizationally, **the integration of AI has required a redefinition of roles and responsibilities.** Marketing managers are now expected to work closely with data scientists and AI specialists, translating strategic goals into actionable insights and campaigns that drive results. Product teams within the Digital Factory design the interfaces and tools, such as the “Marketer Workbench”, that make AI accessible to non-technical users. The tool helps employees implement GenAI into their everyday workflows in a tailored and personalized way, ensuring security, safety, and compliance with the company’s guidelines as well. Marketers can generate campaign assets (e.g., social creatives and copy), conduct data analysis (e.g., purchase frequency), or generate ideas and validate them using existing materials. Senior executives play a crucial role in sponsoring these initiatives, securing resources, and embedding ethical considerations into decision-making.

In this way, MOL has built the foundations of an AI-driven marketing ecosystem. However, the effectiveness of this ecosystem depends not only on its technological capabilities but also on the company’s ability to manage organizational change, workforce adaptation, and strategic alignment. These factors shape the current situation, where successes are visible, but challenges remain.



3. Current situation

At present, MOL Group’s marketing operations demonstrate both the promise of AI adoption and the dilemmas inherent in deploying these technologies on a scale. **The company has successfully moved from conceptual pilots to real-world applications of AI, using advanced tools to personalize campaigns, generate content, and forecast demand** (MOL Group, 2024). These initiatives illustrate how AI can support efficiency and customer engagement, but they also expose the organizational, technical, and ethical challenges of transformation.

The extent of AI integration is already visible in MOL's daily operations. Through the integration of Salesforce and IBM platforms (Salesforce, 2024; IBM, 2025), marketing teams can now build dynamic customer profiles that respond to real-time data inputs. In practice, this means that campaigns are no longer designed around broad demographic categories but around highly specific behavioral signals. The pilot campaign targeting coffee buyers in Hungary is a striking example. **By using AI to identify fifteen micro-segments within this customer group, MOL was able to tailor messages to distinct personas, resulting in significantly higher redemption rates compared to traditional rule-based campaigns (Salesforce, 2024).** This not only demonstrated the value of personalization but also highlighted the potential for AI to scale such approaches across multiple countries and product categories (ibmix, 2024).

Generative AI has further transformed the marketing workflow (IBM, 2025). The Marketer Workbench provides marketing teams with the ability to generate localized campaign content with a single click, including translations across the nine countries where MOL operates. This capability reduces campaign preparation times dramatically, freeing marketers to focus on strategic oversight rather than manual production. **By automating content creation and personalization, MOL has been able to increase efficiency by as much as tenfold in pilot projects, while also improving customer engagement metrics.**

At the same time, MOL applies machine learning beyond pure marketing communication. Forecasting tools predict consumer demand for retail products such as hot dogs and other fresh food items, allowing service stations to optimize inventory and reduce waste. These applications illustrate how AI can bridge marketing and operations, contributing to both customer experience and cost efficiency (MobilityPlaza, 2025; Fintechzone, 2024).

Despite these achievements, MOL continues to face significant challenges. On the technical side, the integration of multiple platforms and the management of complex data pipelines demand ongoing investment. Ensuring GDPR compliance across markets requires careful governance and transparent consent management. **Strategically, the company must balance the immediate pressure to deliver results in retail sales with its long-term vision of becoming a mobility and consumer services provider. AI investments need to be justified not only in terms of efficiency but also in their contribution to this broader strategic transformation.**

Workforce adaptation also presents a persistent challenge. For many marketers, the shift from creative content design to orchestrating AI-driven processes represents a profound change in professional identity. **While the Marketer Workbench lowers barriers to adoption, competency gaps remain in areas such as data literacy and the effective interpretation of AI-generated insights.** Some employees also express concerns about over-reliance on automation, particularly in areas where customer trust and brand reputation are at stake. Addressing these gaps requires ongoing investment in training, cultural change, and leadership support.

Finally, MOL must grapple with the ethical implications of personalization. While AI enables highly tailored offers and messages, it also raises questions about privacy, transparency, and the boundaries of acceptable influence. Customers may perceive hyper-personalization as intrusive if not man-

aged carefully. For a company operating under stringent European data protection laws, striking the right balance between relevance and respect for privacy is essential.

The roles of stakeholders in this transformation underscore the organizational nature of AI adoption. Marketing managers act as interpreters, ensuring that AI outputs align with customer value propositions. Data scientists and AI specialists build and maintain models, while product teams in the Digital Factory provide accessible tools. Executives, in turn, champion the initiative, secure funding, and emphasize ethical responsibility. This interplay demonstrates that AI adoption is not confined to technology but is deeply embedded in organizational processes and leadership practices.

In summary, MOL Group's current situation illustrates both the progress and the dilemmas of AI integration in marketing. The company has shown that AI can significantly enhance efficiency, personalization, and customer engagement. Yet it must continue to navigate the complexities of platform integration, workforce transformation, and ethical responsibility. These challenges form the backdrop for the central question of this case study: how can MOL sustain and scale its AI-driven marketing transformation while preserving customer trust and aligning with its broader strategic goals?



4. Analysis

MOL Group's integration of artificial intelligence into marketing can be fruitfully examined through the lens of the Dynamic Capabilities framework (Teece, Pisano & Shuen, 2007), which emphasizes the organization's ability to sense opportunities, seize them effectively, and transform resources and processes to sustain competitive advantage. In this case, AI adoption is not merely a technical upgrade, but a fundamental reshaping of how MOL operates in the retail and mobility sectors. This can be measured in their Consumer Services EBIDTA analysis on a strategic level (see Table 4.1 on the next page).

Table 4.1 MOL Group's strategic goals and their change in EBITDA since their implementation

Strategic Digital / AI Goal	EBITDA at / near Implementation Year (2021)	Latest Known EBITDA (2023)
Launch of MOL Move (new digital loyalty platform) and regional rollout (2021–2023)		
AI-driven Personalisation & Marketing Automation (IBM + Salesforce stack)	2021 Consumer Services EBITDA: HUF 121.2 bn (pre-rollout baseline; 2022 still transitional)	2023 Consumer Services EBITDA: HUF 244.8 bn (+102% YoY)
Data Lake & Analytics Platform Expansion (2018–2022)		
AI Retail Optimisation (pricing, assortment, food production forecasting)		

MOL Group's digital transformation, particularly the rollout of MOL Move, the scaling up of the Digital Factory, and the adoption of AI-powered personalization, has coincided with a doubling of Consumer Services EBITDA from 121.2 billion HUF (2022) to 244.8 billion HUF (2023). While MOL does not publish EBITDA by individual digital initiative, the Integrated Annual Report explicitly attributes nonfuel margin growth (~40% YoY) and increased customer engagement to the digital loyalty programme, tailored offers, and improved customer analytics.

Third-party sources (IBM, Salesforce, Horváth, Hiflylabs) document strong quantitative impacts: **15–30% revenue uplift among digital users, 2–3× higher ROI from AI campaigns, margin uplift of nearly 4% and revenue increases above 9% from AI-based pricing optimisation**, and reduced food waste from predictive forecasting. These outcomes support the conclusion that digital and AI capabilities have become material economic drivers in MOL's downstream strategy and are strongly correlated with the marked EBITDA expansion in Consumer Services.

From the perspective of organizational agility, **AI adoption has improved MOL's ability to respond rapidly to shifts in consumer behavior**. Traditional campaigns, which once required weeks of preparation, can now be generated, tested, and scaled in a fraction of the time. The pilot campaign for coffee buyers demonstrated that real-time micro-segmentation and automated content creation can substantially increase marketing performance. In this way, MOL has strengthened its sensing and seizing capabilities by converting data-driven insights into immediate actions. Nevertheless, sustaining this agility requires continuous refinement of governance structures and data integration practices, particularly as the company expands across nine different regulatory and cultural contexts.

The case also highlights the importance of human-AI collaboration. AI systems such as the "Marketer Workbench" augment human decision-making rather than replace it. Marketers are freed from repetitive content production, allowing them to focus on strategic oversight, creative direction, and interpreting insights. However, this redistribution of tasks also changes power dynamics within teams.

Data scientists and AI engineers play a more central role, while marketing managers act as interpreters of AI outputs. The collaboration requires not only new workflows but also trust in the reliability and transparency of AI systems. Where generative models propose campaign content, humans remain responsible for ensuring that the outputs align with the brand's values and ethical standards.

Competency gaps represent one of the most pressing challenges in MOL's transformation. Many marketers are not yet fluent in data literacy or comfortable in directing AI-driven processes. While the Marketer Workbench lowers the entry barrier, its effectiveness depends on the workforce's ability to critically evaluate AI outputs. Upskilling initiatives, therefore, become central to maintaining dynamic capabilities: without the human ability to sense and interpret opportunities, AI tools risk being underutilized or misapplied.

When compared to industry benchmarks, MOL appears to be aligning with leading global practices. Companies such as Shell and BP have also invested in AI-driven personalization, predictive maintenance, and loyalty ecosystems, but MOL's integration of generative AI into marketing content creation represents a relatively bold move in the Central and Eastern European context. **Industry best practices emphasize the importance of striking a balance between personalization and customer trust, ensuring GDPR compliance, and developing scalable platforms.** In these areas, MOL has demonstrated foresight; however, it must continue to refine its consent management processes and invest in explainability to maintain legitimacy in increasingly AI-skeptical environments.

5. Alternatives

As MOL deepens its AI integration, it faces strategic choices about how best to address adoption challenges and capitalize on emerging opportunities. Several alternatives present themselves, each with potential benefits and drawbacks.

One option is to prioritize investment in internal AI training for existing marketing staff. This would help close competency gaps and foster a culture of innovation. Employees who understand both marketing strategy and AI tools can more effectively orchestrate campaigns, ensuring that AI is applied in contextually sensitive ways. However, **training requires significant time and resources, and its outcomes are uncertain in the short term.** An alternative is to hire external AI specialists to accelerate adoption. While this may provide immediate technical expertise, it risks creating silos and limiting the development of internal capabilities, potentially making MOL overly dependent on external talent.



A second decision concerns governance: centralized versus decentralized AI decision-making models. A centralized approach, where AI strategies are managed through the Digital Factory, ensures consistency, compliance, and efficiency. Yet, this may limit local responsiveness in MOL's diverse markets. Conversely, **a decentralized approach, where local marketing teams wield greater autonomy over AI tools, could enable more culturally relevant campaigns but risks fragmentation and inconsistencies in brand messaging.**

Ultimately, MOL must strike a balance between automation and human oversight. Expanding automation promises greater efficiency and scale, but excessive reliance could undermine trust and creativity. **Maintaining human oversight for critical decision points—such as message approval and ethical review—ensures alignment with brand integrity and regulatory frameworks. However, this oversight introduces potential bottlenecks that could slow down responsiveness.**

Each alternative presents trade-offs, and the optimal path may involve a hybrid approach: investing in both upskilling and selective hiring, maintaining centralized infrastructure while allowing local flexibility, and automating tasks while preserving human accountability at key decision points.

6. Conclusion and Recommendations

MOL Group's experience illustrates both the promise and complexity of adopting AI in marketing within a traditional energy company transitioning toward a consumer-centric model. By embedding AI into its data platforms and marketing workflows, MOL has demonstrated how dynamic capabilities can be strengthened: sensing customer behavior more accurately, seizing opportunities through personalized campaigns, and transforming organizational processes to align with a digital future.

The analysis reveals, however, that the company must continue to manage three central challenges. First, workforce adaptation remains uneven, requiring ongoing investment in training and cultural change to close competency gaps. Second, strategic alignment is crucial, as AI initiatives must serve both immediate retail goals and the long-term ambition of repositioning MOL as a mobility and consumer services provider. Third, ethical and regulatory considerations must remain at the forefront, ensuring that personalization enhances rather than erodes customer trust.

Based on these insights, three recommendations emerge. MOL should expand structured training programs to build AI literacy across marketing teams, ensuring that employees become confident co-creators with AI rather than passive tool users. It should also adopt a hybrid governance model that preserves centralized control over compliance and infrastructure while granting local teams the flexibility to adapt campaigns to cultural contexts. Finally, MOL should formalize ethical guidelines for the use of AI in marketing, making transparency and consent central features of its customer engagement strategy.

Looking ahead, the case of MOL prompts reflection on how organizations can prepare for future AI advancements. As generative models become increasingly sophisticated and customer expectations for personalization rise, firms must consider broader perspectives beyond short-term performance metrics. Building adaptive, ethically grounded, and collaborative human-AI systems will be essential to sustaining competitive advantage in an AI-driven marketplace. For learners, **the MOL case underscores that AI adoption is as much about organizational learning and strategic foresight as it is about technology itself.**

7. Questions

1. Which workforce development approach should MOL prioritize—broad employee upskilling, targeted reskilling, or selective external hiring—and what trade-offs would each option create?
2. What criteria should MOL use when the short-term commercial benefits of AI-driven personalization conflict with customer privacy, trust, or its long-term mobility strategy?
3. Which AI-generated marketing decisions should require human approval at MOL, and which could be automated to preserve responsiveness?

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COLLABORATING WITH IT PEOPLE

Maciej Ławrynowicz & Dubravka Sinčić

Effective collaboration between marketing and IT has become a key success factor in modern organizations. Contemporary marketing increasingly depends on technology, data, and digital systems. Whether organizations are launching digital campaigns, implementing marketing automation, analyzing customer data, or deploying AI-powered personalization, collaboration with IT professionals is no longer optional. Marketing teams regularly work with developers, data engineers, system administrators, and cybersecurity specialists, making cross-functional cooperation an essential part of everyday business practice.

Despite its importance, collaboration between marketing and IT is often challenging. Many projects fail. Not because of poor ideas or inadequate technology, but because of misaligned expectations, unclear communication, technical misunderstandings, or differences in professional culture. These challenges are even more visible in international environments, where teams may consist of people from different countries, organizational backgrounds, and ways of working.

Understanding how IT professionals think and operate is an important skill for marketers. Effective collaboration requires more than technical knowledge. It also involves understanding different perspectives, communication styles, priorities, and approaches to problem-solving. Organizations that successfully bridge the gap between marketing and IT are often able to implement innovations faster, execute projects more effectively, and create greater value for customers.

This chapter explores the foundations of effective collaboration between marketing and IT professionals. It examines the mindset and culture of IT teams, discusses the most common communication challenges in cross-functional projects, and presents practical techniques to improve collaboration. The chapter also includes opportunities for self-assessment and case analysis, as well as a discussion of how AI tools are increasingly supporting collaboration across organizational functions.

The chapter is organized around four main themes. It begins by examining how IT professionals think and why friction often emerges when marketing and technology perspectives collide. It then explores the most common communication challenges between marketing and IT teams and discusses practical ways of addressing them. The following sections focus on techniques that can improve collaboration in everyday work and present examples of organizations that have successfully developed effective cross-functional partnerships. Finally, we consider the growing role of AI tools in supporting communication, coordination, and teamwork between marketing and IT specialists.

5.1 UNDERSTANDING IT PROFESSIONALS — CULTURE, MINDSET & FIRST FRICTION

Effective collaboration with IT professionals requires an understanding of how they think and what shapes their approach to work. IT culture differs from marketing culture in several important ways, especially in how problems are defined, analyzed, and solved.

One of the defining characteristics of IT professionals is that they often have an engineering mindset based on systems thinking and precision. Rather than viewing tasks as isolated activities, IT specialists tend to see organizations as interconnected systems composed of dependencies, processes, and technical relationships. As a result, a request that appears simple from a marketing perspective may trigger a much broader analysis. A seemingly minor website modification, for example, may affect databases, integrations, system performance, or security mechanisms.

This approach should not be interpreted as resistance to change or unnecessary complexity. IT teams are responsible for system stability, data integrity, and cybersecurity. Even a small change implemented incorrectly can disrupt critical services or expose sensitive information. IT professionals often need to ask detailed questions, document everything, seeking clarification, and approaching change methodically. Their objective is not to slow projects down, but to mitigate risk and ensure reliability.



Understanding a few basic IT concepts can significantly improve communication between marketing and technology teams. A common distinction is between the frontend and the backend of a system. The frontend refers to the elements that are visible to users, such as websites or application interfaces, while the backend includes servers, databases, and the underlying infrastructure that supports these interactions. Another important concept is the API (Application Programming Interface), which enables different systems to exchange information. For example, when a marketing automation platform retrieves customer data from a CRM system, this communication typically occurs through an API.



IT professionals also frequently refer to deployment, meaning the process of releasing new code or functionality into a live production environment. Because deployment introduces risk, organizations often follow structured release procedures and schedules. Another commonly used term is technical debt, which describes short-term solutions that may save time initially but create maintenance challenges in the future. The concept of scalability, which refers to a system's ability to handle growth, is a related term. A marketing campaign that suddenly generates ten times the usual amount of traffic may require infrastructure capable of scaling without performance problems. Finally, most organizations maintain dedicated testing environments (sandboxes) where changes can be evaluated safely before being introduced into live systems. Testing plays a critical role in reducing errors and preventing disruptions.

The way IT professionals approach problem-solving also differs from the way marketing teams often work. Technical projects typically follow a structured sequence involving clarification, analysis, planning, implementation, testing, and documentation. Compared with the fast-paced and iterative nature of many marketing activities, this process may appear slow. However, it exists to ensure reliability, security, and long-term maintainability.

Precision is another important characteristic of IT communication. Marketing language is often persuasive, creative, and open to interpretation, but technical communication needs to be highly specific. A statement such as “the page should load faster” may be difficult to translate into technical requirements. A more useful specification would define a measurable target, such as loading the homepage in under two seconds on a 5G mobile connection. In this context, precision is not a matter of formality but a prerequisite for effective collaboration and the viability of the system.

These differences become even more visible when organizations implement AI-related initiatives. Marketing teams are often eager to move quickly and experiment with new tools, while IT departments must evaluate security implications, integration requirements, data governance issues, and operational risks before allowing AI systems to interact with organizational infrastructure. As a result, expectations regarding timelines, implementation complexity, and achievable outcomes may diverge significantly. The gap between what AI appears capable of delivering and what can realistically be implemented in an initial project often becomes a source of frustration for both sides. Recognizing these tensions early is an important step toward building more effective collaboration between marketing and IT teams.

5.2 COMMUNICATION STYLES AND COMMON CHALLENGES

Effective collaboration between marketing and IT teams is sometimes more difficult than it needs to be. Even when both sides are ostensibly working towards the same organizational goals, communication breakdowns frequently occur because the two departments operate under different assumptions, priorities, and ways of working. Most collaboration problems stem not from bad intentions, but from differences in professional culture and expectations.



Different Timelines and Expectations

One of the most common sources of tension concerns timelines. Marketing teams typically work toward short-term campaign deadlines, while IT teams operate within development cycles, such as sprints or scheduled release windows, simultaneously managing requests from multiple departments. As a result, a request that seems urgent from a marketing perspective may simply become one of many competing priorities for IT. Involving IT only after a project has already been fully planned is a common mistake. Marketing teams sometimes develop complete concepts internally and then expect rapid implementation. In practice, this approach often leads to delays, misunderstandings, and frustration. Early involvement of IT specialists, transparent discussions about priorities, and sharing marketing plans well in advance can significantly improve collaboration.



Technical Jargon and Business Language

Communication challenges also arise because marketing and IT professionals often use different languages. IT specialists rely on technical terminology because precision is essential in their work. Terms such as code refactoring or database optimization may sound unfamiliar to marketers, just as concepts such as brand alignment or customer journey orchestration may seem vague from an engineering perspective. Bridging this gap requires translation in both directions. Technical discussions should be connected to business outcomes, while marketing requests should clearly explain the business objectives they are intended to achieve. When both sides understand not only what is being requested but also why it matters, communication becomes significantly more effective.



Scope Creep and Changing Requirements

Marketing environments are dynamic. Campaigns evolve, priorities shift, and new opportunities emerge unexpectedly. While marketers often view such adjustments as a normal part of their work, IT teams will experience them as scope creep and change orders, meaning the scope of the project widens and changes are requested after development has already begun. This issue becomes particularly visible in AI projects. Marketing teams may expect rapid and highly visible results, while AI models often require multiple iterations before they achieve acceptable performance. Clear requirements, agreeing about how decisions are going to be made, and transparent change-management processes help reduce frustration and keep projects on track.



Different Attitudes Toward Risk

Marketing and IT teams also differ in their tolerance for risk. Marketing frequently relies on experimentation, pilot campaigns, and testing innovative ideas. IT teams, however, are responsible for system stability, security, and operational continuity. A failed marketing experiment may result in weaker performance, whereas a failed technical implementation may disrupt services or expose sensitive data. This is why marketers should recognize the importance of testing, validation, and risk assessment. Discussions about experimentation are often more productive when they include plans to minimize technical risks, limit exposure, and establish contingency procedures.



Lack of Mutual Understanding

Another challenge arises when teams have limited visibility into each other's work. Marketing professionals may not fully understand the day-to-day responsibilities of IT teams, while IT specialists may have only a partial understanding of marketing strategy and campaign execution. This often reinforces stereotypes, such as the belief that IT always blocks new ideas or that marketing focuses only on attractive features, ignoring technical implications.

Building relationships across functions can help address this problem. Informal interactions, participation in selected meetings, and greater exposure to each other's processes improve understanding and create a stronger foundation for collaboration.



Misaligned Incentives

Finally, marketing and IT teams are often evaluated using different performance measures. Marketing is commonly assessed through campaign effectiveness, lead generation, or revenue impact, while IT is measured through system reliability, incident management, and security compliance. Because these objectives do not naturally align, teams may struggle to recognize shared success. Effective collaboration requires making goals transparent and openly discussing trade-offs. When marketing initiatives place additional demands on technical resources, both sides benefit from jointly exploring solutions, whether through revised timelines, more specific requirements, or additional support.

Most collaboration challenges between marketing and IT originate from differences in perspective rather than conflict or unwillingness to cooperate. The good news is that these challenges can be addressed through clearer communication, earlier involvement, and greater mutual understanding. Effective collaboration is not an innate talent but a skill that can be developed through practice and experience.

5.3 PRACTICAL COLLABORATION TECHNIQUES

Understanding the mindset of IT professionals and the challenges that commonly arise in cross-functional projects is only the first step. Effective collaboration also requires regularly using practical habits and communication techniques that help both sides work together more efficiently. Although these techniques are relatively simple, they can significantly reduce misunderstandings, improve project outcomes, and strengthen working relationships.

One of the most useful practices is preparing a structured requirements brief. Rather than submitting a vague request such as "Can you build a landing page?", marketers should clearly define the business objective, target users, required functionality, relevant technical considerations, desired

timeline, and criteria for success. Providing this information at the outset helps IT teams understand not only what needs to be delivered, but also why it matters. This single habit can prevent many of the misunderstandings that occur during project implementation.

Another valuable approach is the “5 Whys” technique. IT professionals often ask detailed questions before beginning work, not because they are challenging the request, but because they are trying to identify the underlying need. Applying the same logic before submitting a request can be equally useful for marketers. Repeatedly asking why a particular solution is needed often reveals the real business problem and may even lead to simpler or more effective alternatives.

User stories, a concept borrowed from agile development, provide another effective communication tool. Rather than describing requirements solely as features or tasks, user stories present them from the perspective of the end user. A typical format is: “As a [user type], I want to [action], so that [benefit].” This approach gives IT teams valuable context by connecting technical requirements to customer needs and business outcomes.

Collaboration is also improved when planning is done together, rather than sequentially. Marketing teams shouldn’t develop campaigns themselves and involve IT only when implementation is required. A more effective approach is to include both functions from the beginning. Early involvement allows IT specialists to identify technical constraints, suggest alternative solutions, commit to realistic timelines, and develop a stronger sense of ownership over project outcomes. Planning projects together not only contributes to better execution, but also to greater alignment and trust.



Visual communication can help reduce misunderstandings. When requesting a new website, interface, or digital feature, marketers can often communicate their intentions more effectively through wireframes, mockups, or simple visual sketches than through lengthy written explanations. Tools such as Figma, Canva, or even PowerPoint can help transform abstract ideas into concrete representations that are easier for IT teams to interpret.

Another important practice is agreeing on a change-management process long before work begins. Not all changes have the same impact. Minor adjustments may be handled informally, while larger modifications involving new functionality or integrations often require additional planning and resource allocation. Establishing clear rules for how changes will be managed helps create realistic expectations and reduces frustration for both teams.

Regular communication throughout the project is equally important. Using readily available project management programs might be a clever idea, even for smaller projects. Waiting until a deadline

approaches to review progress often means that problems are discovered too late. Short weekly or bi-weekly check-ins provide opportunities to review status, identify obstacles, clarify expectations, and adjust while issues are still manageable. Consistent communication helps maintain alignment and prevents small misunderstandings from developing into larger conflicts.

Although these techniques are straightforward, their impact can be substantial. Organizations that invest in better collaboration between marketing and IT teams often benefit from faster project delivery, fewer communication problems, and stronger long-term working relationships. Effective collaboration is rarely the result of a single tool or process; rather, it emerges from a series of intentional practices that improve understanding, coordination, and trust between teams.



5.3.1 TASK: CASE STUDY ANALYSIS — WHAT MADE IT WORK?

The following exercise presents two brief case studies of European companies that successfully implemented AI tools through effective collaboration between marketing and IT teams.

The cases illustrate how cross-functional cooperation can influence the success of technology-driven initiatives and help organizations achieve both business and operational objectives.

After reviewing the case studies, the reader is invited to analyze the factors that contributed to their success and consider how similar principles could be applied in other organizational contexts.

Riu Hotels & Resorts (Spain): Building an AI-Powered Customer Data Platform

Riu Hotels & Resorts, one of Spain's largest international hotel chains, faced a challenge familiar to many marketing teams: customer data was scattered across multiple systems, inconsistently formatted, and difficult to activate for personalized campaigns.

Rather than handing the problem to IT as a technical task, Riu assembled an integrated team that explicitly brought together IT, data, and marketing from the outset. Together, they built a GDPR-compliant Customer Data Platform (CDP) powered by AI—a single, unified source of guest data that could be used for personalized offers, dynamic pricing, and targeted advertising across channels.

The collaboration was structured around shared ownership: marketing defined the use cases and success metrics; IT designed the architecture and ensured compliance; they evaluated the outputs together. The project was rolled out in phases, with each phase validated before scaling.

Results: a 99% increase in bookings and a doubling of return on advertising spend (ROAS).

Source: Making Science (2023). The push of AI in marketing: How these 3 Spanish brands did it.

Rituals Cosmetics (Netherlands / EU): The AI Chat Concierge

Rituals Cosmetics — a premium lifestyle brand with operations across Poland, the UK, and the broader EU — faced an acute operational challenge: extreme spikes in customer service demand during peak periods like Black Friday, which previously required hiring approximately 300 temporary staff.

The company's Product Owner for Service & Care led the initiative, partnering closely with IT to deploy an AI chat concierge. Crucially, they did not launch at full scale immediately. Instead, they took a deliberately conservative approach: a limited rollout, rapid iteration cycles based on internal metrics, and careful monitoring of brand voice consistency across multiple European markets.

This approach reflected an important lesson from previous experience: legacy chatbot deployments had eroded both employee and customer trust. The team knew that trust—with customers, with colleagues, and with the technology itself—had to be rebuilt carefully.

Results: during Black Friday, the AI concierge eliminated the customer service backlog entirely, replacing the 300 temporary hires while maintaining consistent brand voice across markets.

Source: Decagon (2023). How Rituals Cosmetics delivers international concierge customer experiences.

ANALYSIS QUESTIONS

Answer the following questions individually in your notes. There are no single "correct" answers — the goal is thoughtful reflection grounded in the lesson content.

Question 1: What specific collaboration practices from Case 1 (IT mindset) and Case 2 (communication challenges) can you identify in each case? Be specific — name the practice and explain where you see it.

Question 2: Which of the six common challenges from Case 2 do you think each company most likely faced? How does the way they structured their collaboration address those challenges?

Question 3: What do you think would have happened in each case if marketing had developed the AI initiative independently and simply handed it to IT for execution?

Question 4: Which case is closer to the professional context you expect to work in—and what is the single most important lesson you take from it for your own future practice?

Concluding observations

The case studies illustrate patterns that are consistent with broader research on cross-functional collaboration and AI implementation. The next section examines why initiatives such as these are successful and contrasts them with the challenges faced by organizations that struggle to achieve equivalent results. Close attention is given to the role of communication, early stakeholder involvement, and organizational alignment in determining project outcomes.

5.4 AI TOOLS FOR ENHANCED IT-MARKETING COLLABORATION

The two cases presented earlier highlight an important lesson: successful AI projects depend as much on collaboration as they do on technology. In both organizations, marketing and IT teams worked together from the beginning, creating shared ownership and alignment around their project goals. This conclusion is reinforced by broader industry evidence.

According to findings reported by Boston Consulting Group (BCG) a majority of organizations still struggle to generate significant value from AI investments. The primary barriers are often not the limitations of IT or data solutions, but the organizational challenges related to collaboration, communication, and skills development. Organizations that achieve stronger results tend to involve relevant stakeholders early, establish shared ownership of projects, and adopt an iterative approach to implementation and learning. AI tools can also support the collaboration process itself. Project management platforms such as Monday.com, Asana, and ClickUp increasingly incorporate AI features that help prioritize tasks, identify potential delays, and generate status summaries, creating greater transparency across teams. Communication tools, including ChatGPT, Notion AI, and Grammarly, can assist with translating technical terminology, drafting requirement briefs, summarizing discussions, and improving clarity in cross-functional communication.

Visual collaboration platforms such as Miro AI and Figma make it easier to transform ideas, notes, and discussions into wireframes, process maps, and user journey visualizations, helping teams develop a shared understanding of requirements. Workflow automation tools, including Zapier and Make, can reduce friction by automating routine data transfers and notifications between marketing and IT systems. Despite these capabilities, AI tools should be viewed as enablers rather than substitutes for effective collaboration. Technology can support communication, coordination, and information sharing, but it cannot replace trust, mutual understanding, or shared responsibility. The most successful organizations use AI not as a replacement for human collaboration, but as a means of strengthening it.



5.5 KEY TAKEAWAYS

- Understand the IT mindset. IT professionals think in systems, value precision, and prioritize stability and security. Understanding their perspective and basic terminology helps build more effective collaboration.
- Recognize common collaboration challenges. Differences in timelines, language, risk tolerance, priorities, and expectations are common sources of friction between marketing and IT teams. Most of these challenges can be addressed by using clearer communication, transparency, and earlier involvement.

- Treat collaboration as a skill. Effective cooperation between marketing and IT does not happen automatically. It requires continuous learning, self-awareness, and a willingness to understand different perspectives and ways of working.
- Use practical collaboration techniques. Structured requirement briefs, user stories, visual mockups, joint planning sessions, and clearly defined change-management processes can significantly reduce misunderstandings and improve project outcomes.
- Learn from successful examples. The Riu Hotels and Rituals Cosmetics cases demonstrate that successful AI projects depend on shared ownership, early collaboration, iterative implementation, and close alignment between business and technical teams.
- Use AI to enhance collaboration. AI-powered project management, communication, visualization, and workflow automation tools can improve coordination and reduce friction between teams. However, technology should help collaboration rather than replace it.
- Recognize the strategic importance of data. As AI becomes increasingly integrated into marketing, data serves as a critical connection point between marketing and IT. Understanding what data is available, where it is stored, and how it is managed is becoming an essential marketing competency.
- Bridge business and technology. In contemporary organizations, the ability to connect business objectives with technical execution is no longer optional. It is a core professional skill for marketers working in technology-driven environments.



5.6 FURTHER READING

Dhawan, E. (2021). *Digital Body Language: How to Build Trust and Connection, No Matter the Distance*. St. Martin's Press.

Mantle, M. W., & Lichty, R. (n.d.). *Managing the Unmanageable Second Edition: Rules, Tools, and Insights for Managing Software People and Teams*. Addison-Wesley Professional.

Skelton, M., & Pais, M. (2025). *Team Topologies, 2nd Edition: Organizing Business and Technology for Fast Flow of Value*. It Revolution.

Smarter Collaboration: A New Approach to Breaking Down Barriers and Transforming Work Heidi K. Gardner, Ivan A. Matviak, Harvard Business Press, 2022



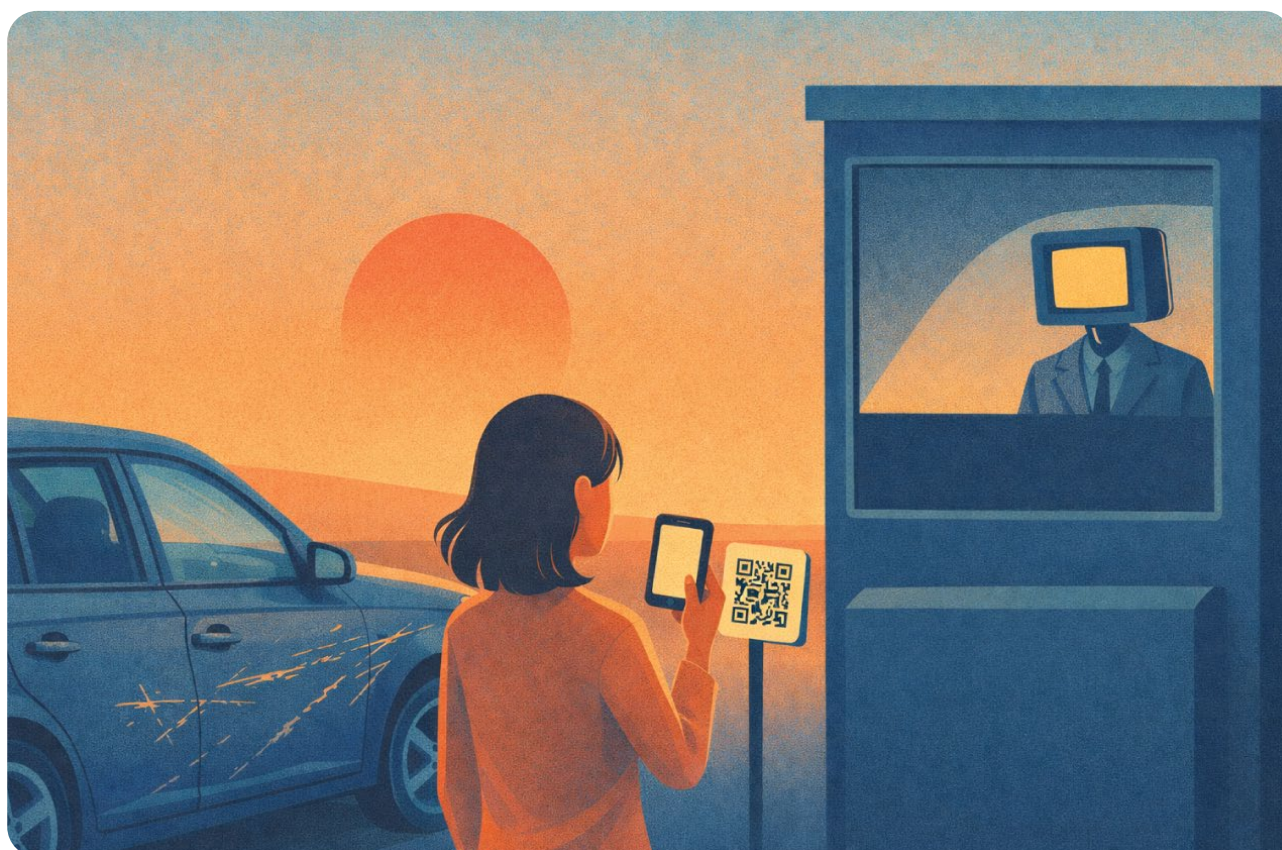
Case study:

FAST, OBJECTIVE, AND FULLY AUTOMATED? IMPLEMENTING AI-POWERED DAMAGE ASSESSMENT IN INSURANCE MARKET

Ružica Brečić, Andrea Lučić, Dubravka Sinčić

“Ana stood beside her scratched vehicle at Croatia Osiguranje’s newly launched AI claims station, scanning a QR code on a small sign. She remained inside while the system captured more than 60 images of the damage. Within three minutes, she received a notification: ‘Estimated damage: €2,430. Compensation approved.’ There were no adjusters, no forms, no waiting lines.

Ana drove away relieved—but also unsettled. Who, or what, had just decided her claim?”



1. Introduction

Croatia Osiguranje Group (CO) stands as the market leader in Croatia’s insurance industry and is one of the country’s oldest and most recognizable brands. Independent rating commentary places the company’s domestic market share at 26.6%, supported by €610 million in gross written premiums (GWP) in 2024. This scale, coupled with a 140-year heritage, gives CO strong brand recognition and nationwide trust. Its historical continuity - surviving wars, political transitions, EU accession and euro adoption – has built an image of reliability that positions CO as a cornerstone of financial services in Croatia.

Since 2014, the company has been majority-owned by Adris Grupa, a diversified holding company active in insurance, tourism, and food production. Integration into Adris brought access to fresh capital, corporate governance, and cross-industry synergies. **These changes accelerated CO's modernization and digitalization journey, including the launch of LAQO, Croatia's first fully digital insurer, and the overhaul of its IT systems.** Being listed on the Zagreb Stock Exchange (ticker CROS) further obliges CO to maintain transparency and align strategic choices with shareholder expectations.

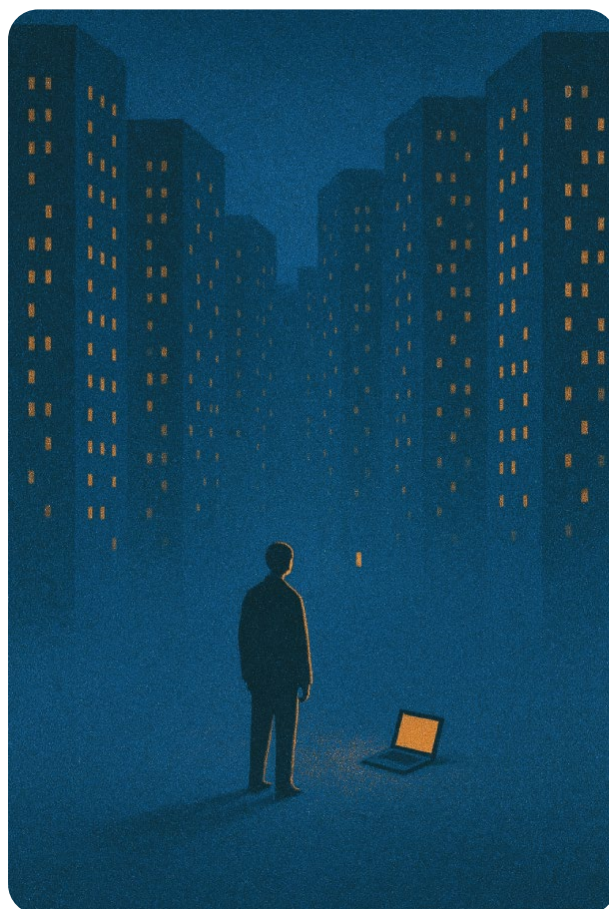
Against this backdrop, CO faces a central strategic dilemma: how to integrate artificial intelligence (AI) into its operations and marketing functions while safeguarding trust and compliance. Generative and predictive AI offer opportunities for greater efficiency, personalization, and competitive differentiation. Yet adoption also introduces challenges in three areas:

- **Integration into decision-making and creative processes**
- **Competency gaps among employees**
- **Ethical and strategic considerations in AI-powered service delivery**

These tensions crystallize around CO's recent pilot of the first AI-powered claims assessment station in Europe. The decision to expand this system raises critical questions about automation versus human-centered service.

For Croatia Osiguranje, this moment symbolized both triumph and tension. As Croatia's largest insurer, the company had rolled out the EU's first fully AI-powered claims assessment system, cutting processing times from weeks to minutes. Executives saw it as a bold step into the future of digital insurance. Yet beneath the success story lay pressing dilemmas: how to balance efficiency with empathy, transparency with automation, and innovation with compliance.

Employees questioned their future roles. Customers wondered if algorithms could truly be fair. Regulators watched closely. As the company embraced automation at an unprecedented scale, its leaders faced a critical challenge: **Could AI-driven efficiency be reconciled with the trust, fairness, and human touch that defined the insurance business?"**



The Strategic Leap

In late 2023, CO launched the European Union's first fully AI-powered claims assessment station—a bold step toward redefining operational efficiency in a traditionally slow, paperwork-heavy sector. Designed to manage an increasing volume of small, low-value vehicle damage claims, the system aimed to streamline processing, reduce operational costs, and improve customer experience.

At the assessment station, customers remained seated in their vehicle while a fixed camera system captured over 60 high-resolution images in approximately 140 seconds. The AI model analyzed these images and generated an automatic damage report within three minutes. **For the company, this innovation promised:**

- Significantly faster claims resolution
- Reduced workload for adjusters
- Increased customer satisfaction
- Lower administrative costs
- A competitive differentiator in a crowded insurance market

However, as the system began operating, executives quickly realized that technical speed alone would not determine success. Questions of fairness, explainability, and scalability emerged almost immediately.

The Tensions

Despite the technological breakthrough, Croatia Osiguranje's AI-powered damage assessment system quickly revealed its limitations. The system was designed exclusively for minor cosmetic damage – scratches and dents visible on the surface – while deeper issues, such as those hidden beneath the plastic front bumper, remained undetectable. As a result, larger or more complex claims still required manual review by trained adjusters, creating a hybrid process that blurred the boundaries between automation and human judgment.

Customers, while intrigued by the speed of the experience, questioned the fairness of a system that only operated at a single location in Zagreb, required a drivable vehicle, and provided little transparency into how compensation decisions were made. For many, the experience felt efficient but impersonal – raising concerns about the “black box” nature of AI.

Internally, executives praised the operational gains, yet compliance officers and legal teams expressed caution about liability and explainability, especially in disputed cases. The system's reliance on opaque machine learning algorithms made it challenging to substantiate decisions to regulators or customers, highlighting a tension between technological advancement and the foundational insurance values of trust, accountability, and equitable access.

The Leadership Dilemma

As the AI station gained traction, CO’s leadership confronted decisions with long-term implications (Table 5.1).

Table 5.1 Decision options for AI strategy

Option 1: Double down on automation	Option 2: Maintain a hybrid model	Option 3: AI as decision-support only
Invest heavily in better hardware, expanded training data, and a network of AI stations across Croatia.	AI screens simple cases; human adjusters validate or decide complex claims.	AI produces assessments, but humans approve every case.
Pros: speed, cost savings, differentiation	Pros: balanced risk, preserves human oversight	Pros: high trust, low regulatory risk
Risks: customer distrust, regulatory pressure, loss of human empathy	Risks: slower scaling, higher costs, ambiguous accountability	Risks: reduced efficiency, weaker competitive edge

Leadership recognized that whatever path they chose would signal CO’s stance on automation and shape its identity as either a tech-forward insurer or a human-centered service provider.

Decision Point for Learners:

By mid-2025, Croatia Osiguranje stood at a strategic crossroads. The pilot AI claims station had demonstrated operational benefits: out of an estimated average of 60 damages assessed daily, 10–15% were already handled by AI. This gradual adoption eased part of the workload for employees, allowing them to focus on more complex cases and improving overall efficiency. As market competitors began exploring similar innovations, the leadership team had to choose a path forward.

Learners must consider:

- Should CO pursue full automation nationally?
- How can it maintain customer trust while innovating aggressively?
- What governance, reskilling, and ethical safeguards must be built?
- How can CO develop dynamic capabilities to continuously learn, adapt, and scale AI responsibly?

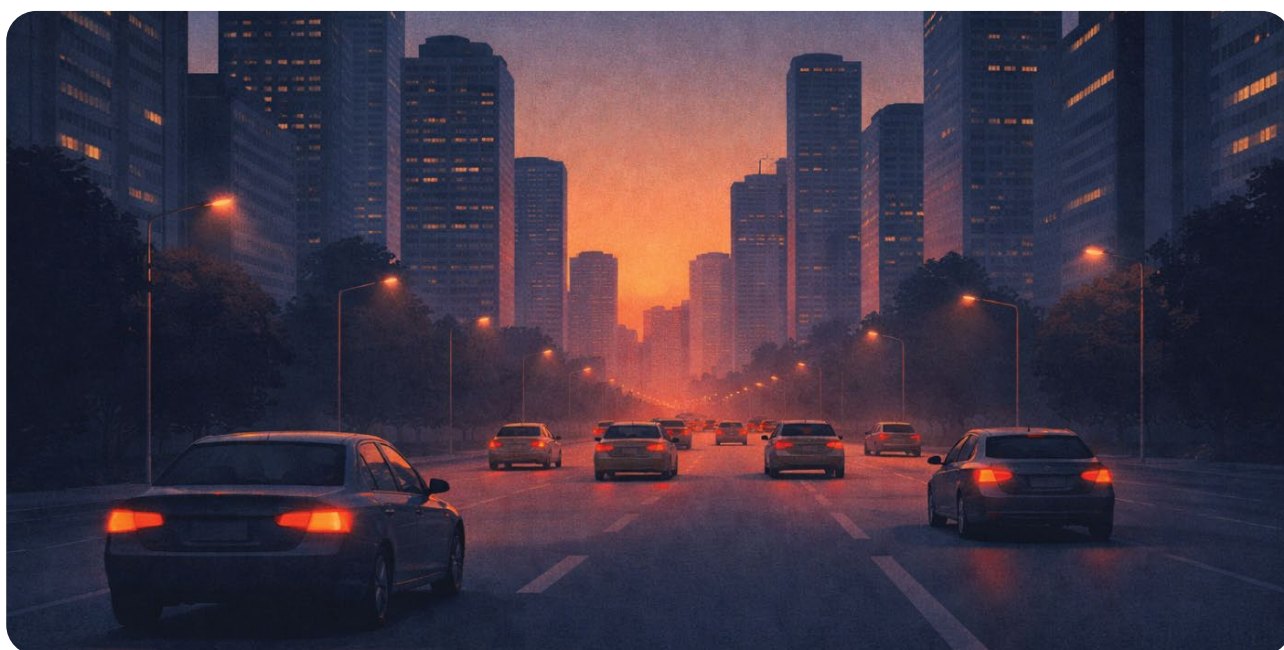
Ultimately, the case challenges learners to answer a fundamental question:

What role should AI play in human-centered, trust-based industries like insurance—and how should leaders balance efficiency with fairness, empathy, and transparency?

2. Background

Founded in 1884, Croatia osiguranje is Croatia's oldest insurer and has evolved into the largest insurance group in the country. Its longevity reflects an ability to adapt to shifting political, economic, and regulatory contexts – from the Austro-Hungarian Empire to independence, EU accession, and euro adoption. In 2014, Adris Grupa became the majority shareholder, marking a strategic shift toward modernization, growth, and digitization.

Today, CO operates across multiple business segments, including non-life and life insurance, reinsurance, pension fund management, credit intermediation, vehicle inspections, polyclinic medical services, and real estate management. While its core market is Croatia, the company also maintains operations in Slovenia, Bosnia and Herzegovina, North Macedonia, and Serbia. This regional footprint positions CO as both a domestic champion and a regional player.



The Group's business model and operating structure are designed around three core functions:

- **Claims:** Widely recognized as the “moment of truth” in insurance, claims handling is a critical source of customer satisfaction and cost control. CO offers 24/7 online and phone claim submission, real-time tracking via the Moja Croatia app, and piloted AI-assisted auto damage assessments. These initiatives are designed to shorten cycle times, improve consistency, and reduce loss ratios.
- **IT and Digital Platforms:** CO has invested heavily in modernizing its digital estate, which now includes the consumer-facing website, the Moja Croatia super-app, and LAQO, its digital-only brand. The company has also upgraded core insurance platforms using external vendors (e.g., Sapiens) and built in-house digital capabilities.
- **Customer Service:** Support is provided through a centralized call center, a nationwide branch network, and digital channels. This omnichannel approach ensures continuity of service while encouraging customers to migrate toward digital self-service.



Marketing strategy reflects this structure and positions CO as both an innovator and a trusted partner. Two platforms exemplify this approach:

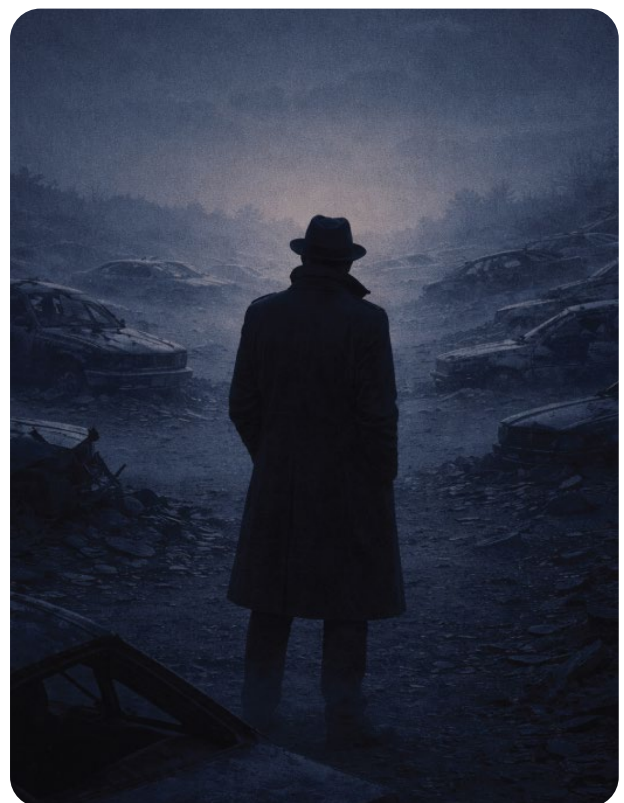
LAQO, Croatia's first digital insurer, has achieved rapid growth by offering fast policy issuance, a highly rated mobile user experience, and record settlement times. Its branding emphasizes speed, simplicity, and trust, reducing consumer hesitancy about digital insurance.

Moja Croatia, a super-app that integrates policy management, claims, health services, and payments, serves as the digital face of the traditional brand. **With over 200,000 downloads, it is presented as a transparent and convenient tool for legacy customers transitioning to digital channels.**

In late 2023, CO announced what local media called a first in Europe – **AI-based car-damage assessment** – aimed at reducing cycle time and improving accuracy. Beyond the PR value, this initiative signals a broader shift: embedding machine learning into operational workflows (intake, assessment, fraud, and reserving).

3. Industry context

The global insurance industry faces significant challenges, like inflationary pressure and a volatile risk landscape, accurate risk prediction and pricing, but also extreme weather events, digital disruption, escalating customer demands, and rising service expectations. **Across Europe, and acutely in smaller, competitive markets like Croatia, insurers face simultaneous pressure to digitize distribution, streamline claims, and lift satisfaction to defend share and cost positions.** EU supervisors note that consumers increasingly use digital tools to compare, buy and manage insurance and expect faster claims; yet digital-only channels still lag hybrid/in-person, especially in life insurance. Practically, that means “digitize the journey,” not “remove humans.” Independent benchmarks (US



but broadly indicative) show satisfaction hinges on fairness, time to settle, communication and omnichannel ease; cycle-time reductions correlate with better scores.

Furthermore, regulation is pushing digital maturity. The EU's Digital Operational Resilience Act (DORA) applies from 17 Jan 2025, hardening requirements for ICT risk, incident reporting, testing and third-party oversight across banks and insurers. In parallel, the EU AI Act begins phasing in obligations during 2025–2026; Brussels has confirmed enforcement will proceed on schedule. Together they drive better controls around digital and AI-enabled operations.

There are three topics that are considered to be the most important for the near future of the insurance industry: customer ownership, insurance gaps and emerging risks, and – the most pressing one – the use of AI in direct insurance. In the past 20 years, digital technologies have changed the insurance landscape, but the transformation has been slower than many had predicted. Nevertheless, the experts think that AI is changing the game. They presume that, if used effectively, AI can help companies grow by making services more efficient and immediate for the customer. At the same time, AI can lower prices, allowing insurers to improve profitability while keeping a lid on their costs. **EIOPA's Report shows that 50% of the respondents already use AI in non-life insurance and 24% in life insurance. An additional 30% and 39% of respondents expect to use AI in the next three years in non-life and life insurance, respectively.** Furthermore, 66% of the reported AI use cases were developed in-house by insurance undertakings themselves, while the remaining 34% were outsourced from third-party service providers.

The Croatian insurance market reflects these broader dynamics. It is a mature and highly regulated environment, **characterized by steady premium growth but limited room for margin expansion.** Insurers are therefore investing in digital solutions to cut administrative costs, enhance underwriting, and simplify client onboarding. Claims handling has become the most decisive arena of competition: customers increasingly evaluate insurers based on speed, transparency, and ease of claims resolution. **Rising expectations are also driving investment in portals, mobile applications, and self-service tools to provide greater convenience and personalization.**



For market leaders such as Croatia osiguranje Group, this context presents both opportunities and risks. Those able to integrate digital and AI solutions effectively are positioned to consolidate competitive advantage, strengthen customer trust, and deliver operational efficiency. **Conversely, laggards risk eroding both profitability and reputation in an industry where service quality is becoming as important as product offering.**

4. Current Situation

Croatia Osiguranje annually processes around 50,000 motor own damage claims (Figure 5.1) according to publicly available HUIO publications. Insurance claims are particularly relevant due to their high volume, the relatively lower average age of damaged vehicles, and the typically smaller-scale damages arising from various incidents. Key performance indicators highlight significant efficiency gains through end-to-end (E2E) digital processing.

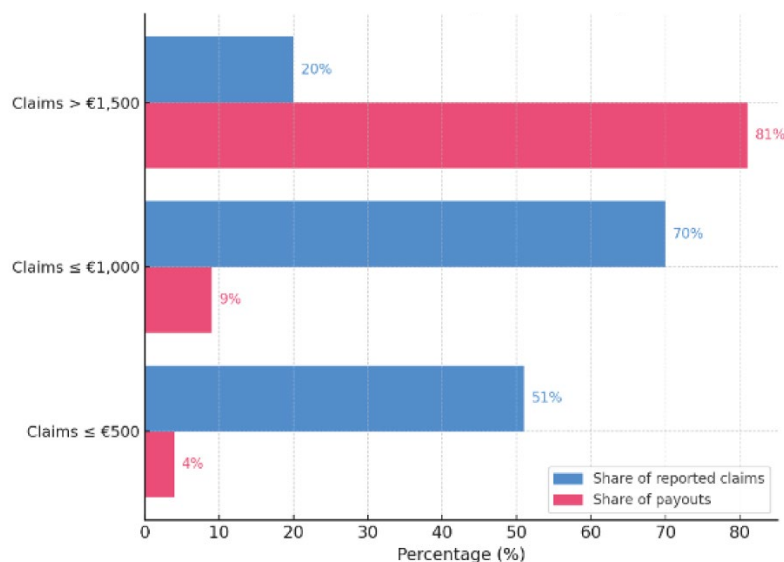


Figure 5.1 Auto Insurance Claims: Reported vs. Payout Share

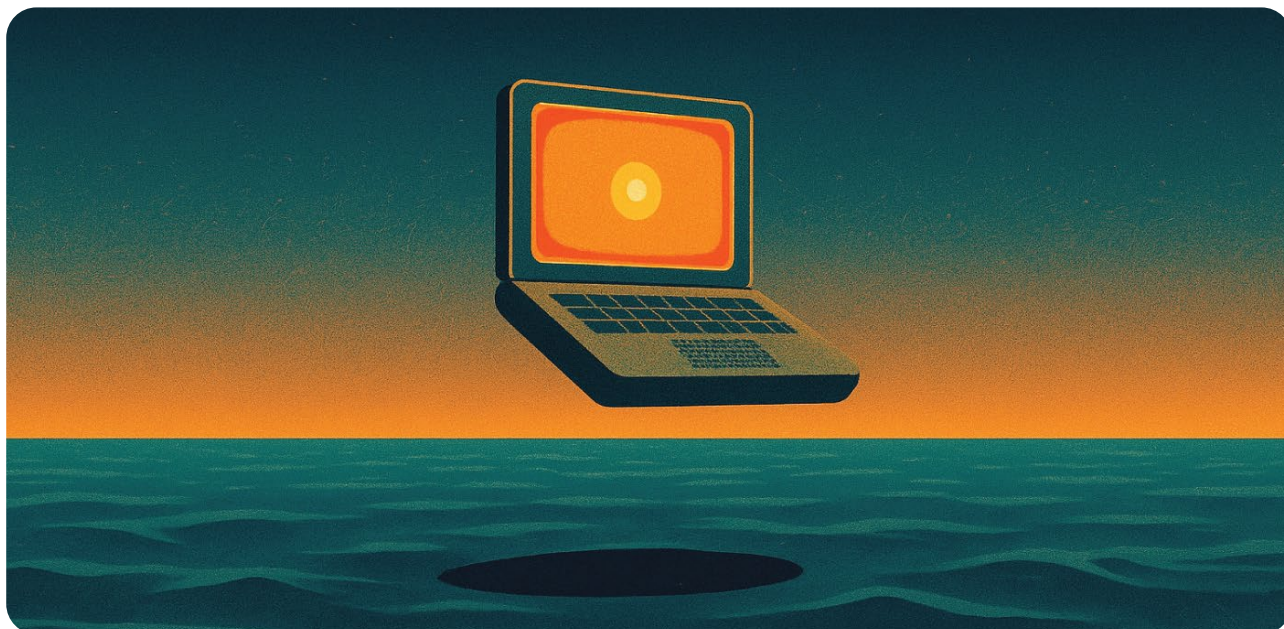
The analysis of motor insurance claims reveals a clear segmentation by size and financial impact. More than half of all reported claims (51%) fall under €500, yet they account for only 4% of total payouts. When extending the threshold to €1,000, 70% of all claims are included, while their financial share remains below 10%. In contrast, only 20% of claims exceed €1,500, but they generate as much as 81% of total payouts. **These figures demonstrate that the greatest potential for automation and AI application lies in the processing of small claims (up to €500 or €1,000), where the volume of requests is high but the financial risk is minimal.**

The average settlement time for a valid claim, measured from submission to payout of the undisputed amount, is just five calendar days under the E2E digital process (online submission, digital or AI-based assessment, automated validation, and payment), compared to an average of 14 days when any part of the process is handled manually. Importantly, this average duration also includes so-called idle time – for example, the period between digital claim submission and the customer's visit to the assessment hub, the time taken for the customer to open or close the assessment link, the bank's transfer processing period before funds appear in the customer's account, or the time required for the policyholder to provide additional documentation in cases where the claim was not submitted via the structured web channel with mandatory data fields.

The share of car insurance claims processed through the E2E digital pathway has also driven a 15% year-to-date increase in efficiency relative to the same period last year. In addition, 15% of all claims evaluated at the central assessment hub are now AI-assessed, reflecting steady progress in the adoption of automation.

5. Customer Journey & Digital Channels

From a customer journey perspective, the shift to E2E digital claims has reduced the need for lengthy paperwork, in-person inspections, and multiple follow-ups. Policyholders can now submit a claim online, receive an AI-driven assessment within hours, and track the progress of their claim in real time. This transparency shortens waiting periods and minimizes uncertainty, two pain points traditionally associated with insurance claims.



Croatia Osiguranje actively encourages customers to use digital channels, as they represent the fastest, simplest, and most transparent method of claims processing. **However, the company does not impose or mandate digital pathways;** customers retain full freedom of choice. In practice, clients themselves are driving this market shift.

The best indicator is that 72% of all kasko claims across the CO portfolio are now submitted digitally. Direct human interaction remains available whenever the customer requests it, yet the rising share of digital claims demonstrates that clients increasingly prefer minimal physical interaction.

In late 2023, CO introduced a ground-breaking innovation: the region's first AI-powered claims assessment station, designed for damages up to €1,000. Customers pre-register online or arrive at the station, where their car is scanned on a rotating platform in 15 seconds. The software generates a damage estimate within minutes, which is then verified by a human expert. In about 90% of cases, the AI estimate is confirmed without corrections. The entire process – from arrival to decision – takes around 15 minutes, with results delivered before the customer leaves the facility.

From a customer journey perspective, this transformation is profound. The digital pathway eliminates paperwork, reduces in-person inspections, and shortens waiting periods. Customers can submit claims online, receive AI-driven assessments within hours, and track progress in real time. Transparency and convenience address long-standing pain points in claims handling, particularly uncertainty and delays.



From a strategic perspective, the AI initiative serves dual purposes. Operationally, it promises cycle-time reductions, cost savings, and consistency. Reputationally, it positions CO as an innovator, reinforcing its market leadership. However, these gains are balanced by new dilemmas. Customers may question the fairness of AI-generated outcomes, employees may fear redundancy, and regulators may scrutinize compliance and explainability.

The process (Figure 5.2) begins when a customer either pre-registers online and receives a QR code or arrives at the station, where triage determines whether the vehicle is eligible for AI assessment. The car is then placed on a rotating platform that completes a 360-degree scan in 140 seconds. Within minutes, the software generates a damage estimate, which is verified by an expert. In about 90% of cases, the AI estimate is confirmed without corrections.

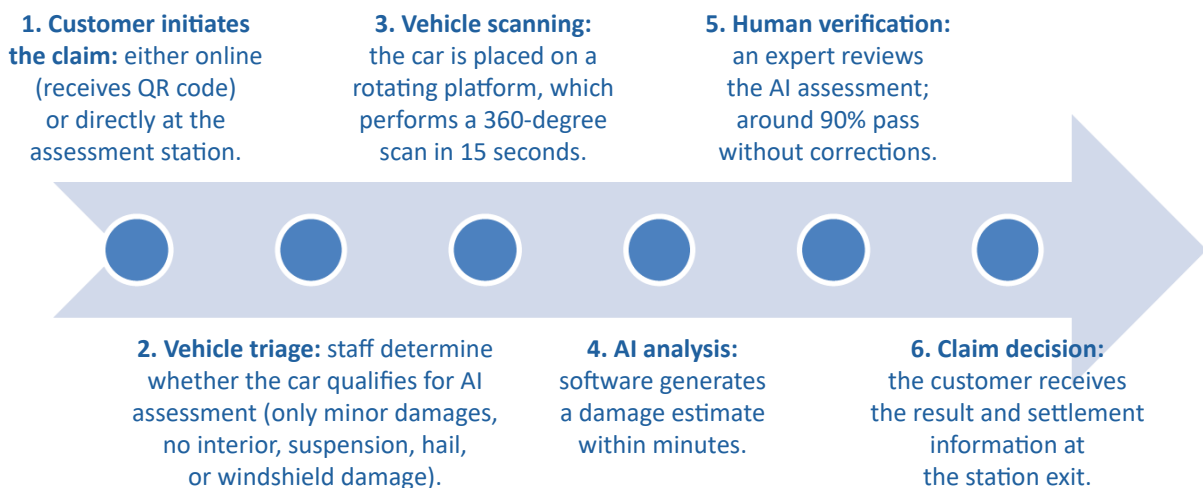


Figure 5.2 Vehicle damage assessment process

Benefits

The introduction of the AI station has led to significant improvements in claims handling. Processing times have been cut dramatically, with 72% of claims now pre-registered digitally, reflecting growing customer adoption of digital tools. Approximately 15% of monthly claims at central assessment hub are processed through platform, easing the workload of adjusters and enabling faster settlement. Customers particularly value the speed, convenience, and rapid payout, while many perceive AI-driven assessments as more impartial and consistent than human evaluations.

Challenges

Despite these advances, the system remains in development and faces several limitations. The AI cannot reliably detect windshield damage, interior issues, or damage from hail and sand. The software also tends to merge separate incidents into a single claim event, requiring manual intervention. These shortcomings restrict the scope of AI applicability and highlight the need for further technological refinement.

Employee Roles

Although automation is at the core of the new system, employees continue to play a crucial role. Their responsibilities include initiating the AI process, performing triage to determine eligibility, verifying AI-generated assessments, and making necessary corrections. While the rate of corrections is steadily declining, human expertise remains essential to ensure accuracy, fairness, and customer confidence in the claims process.

Trust and Transparency

While many customers welcome faster processing and quicker payouts, the introduction of AI has also raised questions of trust. Some policyholders remain cautious about how “black box” algorithms determine outcomes and whether human oversight is preserved in sensitive cases. Building trust therefore depends not only on speed and efficiency, but also on clear communication, transparent decision-making, and maintaining the reassurance that human expertise is still available when needed.

Customer Reactions and Satisfaction

Customer reactions are assessed both qualitatively and quantitatively. The most objective insights come from individual customer reviews (see <https://tinyurl.com/36j3svzb>). In addition, the company systematically monitors satisfaction using the Net Promoter Score (NPS) methodology, conducted quarterly. CO consistently achieves an NPS of 46 or higher, a result that indicates strong customer advocacy compared to industry benchmarks.

Survey results show that customers consistently highlight the simplicity and speed of the claims process as positive aspects. On the other hand, negative feedback most often concerns the assessed amount of compensation. However, this trend is not unique to CO; it reflects a broader perception across all financial institutions, where consumers tend to feel that insurance premiums are “too high” and payouts are “too low.” In reality, both premium pricing and compensation levels are determined by market trends and objective costs of restoring the pre-damage state, rather than discretionary company decisions.

6. Dynamic Capabilities employed in Croatia osiguranje through the AI claim station

Croatia Osiguranje’s launch of the AI claims station illustrates how incumbents in a regulated, trust-based industry can mobilize dynamic capabilities – sensing, seizing, and transforming – to strengthen competitiveness in claims processing and customer experience. Dynamic capabilities theory emphasizes that long-term advantage in turbulent environments arises not from static resources, but from a firm’s ability to continuously integrate, reconfigure, and renew its competencies in response to external change.

Sensing

Croatia Osiguranje recognized inefficiencies embedded in traditional claims assessment, where manual processes extended settlement times and tied up adjusters with repetitive evaluations. Customers frequently expressed frustration with the lack of transparency and prolonged delays, undermining satisfaction and Net Promoter Scores. In parallel, international benchmarks—such as Lemonade’s automated claims processing in the U.S.—demonstrated that AI could radically reshape customer expectations for speed and convenience in insurance.

By carefully analyzing the claims portfolio, CO identified a specific opportunity: small-scale damages (under €1,000) that represented the majority of claim volume but only a minor share of financial payouts. These cases carried low dispute potential and therefore offered an ideal testing ground for automation. By linking technological possibilities with customer pain points and financial leverage, CO successfully sensed an opening for AI-driven innovation.

Seizing

Acting on this insight, CO deployed the first AI claims station in the EU insurance market in late 2023. This move allowed the company to seize a first-mover advantage, reframing the benchmark for speed and convenience in claims processing. The station enabled full resolution in under 15 minutes – from vehicle scan to damage estimate and decision – delivering a radically improved experience for customers accustomed to days or weeks of waiting.

Early adoption positioned CO as an innovator in a conservative industry, signaling its readiness to lead in digital transformation. At the operational level, the AI station reduced cycle times, lowered administrative costs, and released adjuster capacity. At the reputational level, it reinforced CO’s digital leadership narrative, complementing its earlier successes with LAQO and the Moja Croatia app. Importantly, the initiative demonstrated not only technological capability but also strategic agility: CO was able to sense market demand, mobilize resources, and capture value ahead of domestic competitors.

Transforming

The more challenging stage has been transforming organizational routines and culture to embed AI sustainably. Rather than replacing human roles, CO redefined them. Claims adjusters were reasigned from repetitive low-value tasks to higher-order activities, including:

- **Quality assurance and verification of AI assessments.**
- **Resolution of complex or disputed cases requiring nuanced judgment.**
- **Customer support and communication, particularly in emotionally charged claims.**

To support this transition, CO launched reskilling programs focused on data literacy, digital workflows, and communication in AI-mediated interactions. This was essential to close competency gaps and foster confidence in hybrid human–AI teams. Parallel to workforce transformation, CO also developed governance frameworks around explainability and accountability. Given forthcoming

EU regulations (AI Act, DORA), the company proactively invested in systems that log algorithmic decisions, provide audit trails, and ensure human oversight. These measures were critical for compliance and equally important for sustaining customer trust in a high-stakes service environment.

Key Insights

The AI claims station demonstrates that agility in adopting advanced technologies can yield significant competitive advantage even in conservative, regulated sectors. By combining sharp sensing of opportunities, rapid seizing of first-mover initiatives, and deliberate transformation of internal processes, CO exemplifies the dynamic capabilities framework in practice.

However, the case also underscores important limitations. Customer trust in insurance depends not only on speed and transparency but also on empathy and fairness. While many clients welcomed unprecedented convenience, others expressed caution about algorithmic judgments in emotionally significant situations such as accident claims. Similarly, employees may perceive AI as a threat to job security unless reskilling initiatives and new role definitions are implemented.

Benchmarking against global peers reinforces these insights. Lemonade achieved rapid growth by aggressively automating claims, but faced criticism for a lack of empathy and opaque decision-making. Allianz and AXA pursued hybrid human–AI models, balancing speed with oversight, and positioning themselves as more trustworthy and compliance-ready.

Croatia Osiguranje’s approach positions it closer to the hybrid model, emphasizing speed while retaining human oversight. Long-term success will depend on continuously enhancing employee competencies, ensuring fairness in algorithmic outcomes, and aligning AI use with customer expectations and regulatory standards.

7. Strategic Alternatives for AI in Claims Processing

Croatia osiguranje faced three possible paths in deciding how far to extend the use of AI in claims processing. Each pathway offered distinct opportunities and risks, with implications for efficiency, customer trust, workforce dynamics, and regulatory positioning.

Option 1: Full Automation

One possibility was to pursue full automation, allowing algorithms to handle the majority of claims from start to finish. This scenario promised the most radical efficiency gains: claims settlement could become almost instantaneous, cycle times compressed to minutes, and operational costs reduced significantly. In theory, the scalability of automation would allow CO to process tens of thousands of claims annually with minimal incremental cost, positioning it as a digital disruptor within both the Croatian and European markets.

Yet the risks of full automation were equally significant. By removing human involvement almost entirely, CO could undermine customer trust in a service industry where empathy, fairness, and reassurance remain core expectations. Customers who had experienced traumatic or emotionally

charged accidents might feel alienated by a fully digital process, fueling perceptions of depersonalized and unfair treatment. Regulators might also view full automation skeptically, particularly in light of the EU AI Act's emphasis on explainability, human oversight, and accountability. **Moreover, pursuing complete automation risked sparking internal resistance, as employees perceived job displacement and loss of professional identity. In short, while efficiency would soar, reputational and compliance risks could outweigh the benefits.**

Option 2: Hybrid Human–AI Model

A second option was to adopt a hybrid human–AI model, where algorithms managed straightforward, low-risk claims while human adjusters remained responsible for complex, high-value, or emotionally sensitive cases. This model provided a pragmatic balance between speed and empathy. Customers would benefit from rapid resolution of routine claims, while still having access to human expertise for nuanced situations. From a brand perspective, this approach reinforced CO's reputation for trust and fairness, demonstrating that the company valued both innovation and its human legacy.

The hybrid model also offered regulatory advantages. By retaining human oversight in critical cases, CO could demonstrate compliance with requirements for transparency and accountability. At the workforce level, hybridization reduced fears of redundancy, as employees were repositioned into roles emphasizing judgment, communication, and oversight. However, this approach carried higher operating costs than full automation and inevitably slowed certain workflows. Efficiency gains would be meaningful but not absolute, limiting the full upside of AI adoption. Nevertheless, the hybrid path appeared to strike a sustainable balance, aligning operational improvements with stakeholder trust.

Option 3: AI as Decision-Support

The third alternative was to position AI strictly as a decision-support tool, with algorithms generating assessments and recommendations while human adjusters retained full authority over final decisions. This approach offered the strongest safeguards for accountability and explainability, ensuring that customers and regulators could clearly see that ultimate responsibility rested with human professionals. It minimized reputational risks and aligned neatly with EU regulatory expectations, particularly regarding high-risk AI systems in financial services.

However, this conservative model risked leaving much of AI's potential untapped. Because human intervention would still dominate the workflow, efficiency gains would remain modest, and cost savings limited. The company might also lose momentum as a first mover in the region: competitors adopting more aggressive automation could overtake CO's innovation narrative. From a strategic perspective, the decision-support approach maximized safety and compliance but sacrificed scalability and competitive differentiation.

8. Conclusion & Recommendations

This case study has examined Croatia Osiguranje's strategic journey as it integrates artificial intelligence into its operations and marketing functions. Several key insights emerge. **First**, AI adoption in a legacy, trust-based service industry is not merely a matter of technological substitution; it requires organizations to balance efficiency gains with the preservation of empathy, fairness, and transparency. **Second**, the successful deployment of AI hinges on bridging competency gaps among employees, equipping them with new skills to supervise, interpret, and communicate algorithmic outcomes. **Third**, strategic decision-making around AI must extend beyond operational efficiency to include ethical responsibility, regulatory compliance, and long-term brand positioning.

For Croatia Osiguranje, the analysis suggests that a hybrid human–AI model represents the most viable pathway. Such an approach allows the company to capture the benefits of automation in low-risk, high-volume claims while retaining human oversight in complex or sensitive cases. This preserves customer trust while ensuring scalability and cost efficiency. In parallel, CO must:

- **Reskill** and redeploy employees into roles that complement AI systems, building competencies in data literacy, digital communication, and oversight.
- Invest in **explainable AI** to make algorithmic processes transparent for both regulators and customers, mitigating reputational and compliance risks.
- **Embed AI governance frameworks** that align with the EU AI Act and DORA, institutionalizing accountability and auditability across the organization.

9. Student Assignment

After reading the case, prepare your analysis and recommendations by completing the tasks below.

A. Strategic Recommendation

Croatia Osiguranje is considering three strategic pathways for the future of AI in claims processing.

Recommend which option the company should pursue:

- Full automation
- Hybrid human–AI model
- AI as a decision-support tool

Provide a justified recommendation supported by arguments from the case. Consider efficiency, customer trust, fairness, employee roles, regulatory expectations, and long-term competitiveness.

B. Competency Task 1 – Customer Journey Mapping

Design two contrasting customer journeys for a car damage claim:

- AI-driven claims process (using the AI station)
- Human adjuster–driven claims process

For each journey, outline:

- Main touchpoints
- Pain points and moments of uncertainty
- Opportunities to strengthen trust
- Required communication at each step

Present the journeys in diagram or narrative form.

C. Competency Task 2 – Accountability & Explainability Framework

Develop a short framework that explains:

- Who is accountable at each stage of the AI-enabled claims process
- Where human oversight is necessary
- What information should be logged or explainable
- How the company should communicate AI-generated outcomes to customers

Summarize your framework in 1–2 pages.

Deliverables - Please submit:

A concise strategic recommendation (2–3 slides or 1–2 pages)

- Customer journey comparison (diagram or 1 page)
- Accountability & explainability framework (1–2 pages)

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CREATIVE WORK WITH AI

Piotr Gaczek & Jesús García de Madariaga

The relationship between artificial intelligence and creativity remains one of the most debated topics in contemporary discussions about technology. Many researchers and practitioners argue that AI is unlikely to become truly creative, at least in the near future. The ability to generate novel ideas, imagine alternative possibilities, and create original solutions is often considered a uniquely human capability, rooted in imagination, cognition, and complex mental processes.

At the same time, recent developments in generative AI raise important questions about these assumptions. Can a language model generate more creative uses for an everyday object than a human? Can an algorithm contribute to the development of new scientific theories or innovative products? More broadly, what role can AI play in creative work, and where do the limits of machine creativity lie?

An additional challenge concerns the nature of creativity itself. Since AI systems learn from content originally created by humans, some argue that their outputs can never be truly original and are merely a recombination of existing

ideas. Others suggest that if an outcome is novel, useful, and valuable, the process by which it was created may be less important than the result itself. This debate lies at the center of contemporary discussions about AI and creativity.

These questions are important not only from a theoretical perspective, but also from a practical one. AI tools such as ChatGPT are increasingly used in everyday work, education, and decision-making. They can generate ideas, suggest solutions, and support a wide range of creative tasks. However, their growing presence also raises concerns. Does working with AI enhance creativity, or can it sometimes reduce it? Do intelligent systems help generate original and valuable ideas, or do they encourage solutions that are easy to obtain but ultimately generic and superficial?

This chapter examines the nature of creativity and the role that artificial intelligence can play in creative processes. It explores how creativity has been defined and studied, how different theories explain creative thinking, and which mechanisms support or inhibit the generation

of novel ideas. The focus is on the relationship between humans and intelligent systems, including the distinction between simple interaction and genuine collaboration. The chapter also discusses the opportunities and risks associated with human–AI cooperation. Alongside the potential benefits of AI-supported creativity, it examines cognitive biases, limitations of human judgment, and errors generated by AI systems that may influence decision-making and problem-solving. Understanding these mechanisms is essential for using AI effectively and responsibly in creative work.

The following sections combine theoretical perspectives with practical examples that illustrate how creativity emerges in human–AI collaboration and how individuals can work with AI systems in ways that support, rather than constrain, creative outcomes.

6.1 WHAT IS CREATIVITY?

Creativity is one of the most frequently discussed concepts in psychology, management, and innovation research. At the same time, it remains surprisingly difficult to define. The academic literature contains well over one hundred definitions of creativity, reflecting the complexity of the phenomenon and the diversity of perspectives used to study it. One could even argue that creating yet another definition would itself be a creative act.

Despite these differences, most definitions share several common elements. Creativity is typically described as the ability to generate ideas, solutions, or products that are both novel and useful. The outcomes of creativity may take the form of tangible objects, but they can also be abstract concepts, methods, or solutions that have no physical form.



Creativity can be viewed from at least two complementary perspectives. The first focuses on creativity as a process. From this viewpoint, creativity involves generating ideas, combining information in new ways, and developing solutions to problems. Some theories suggest that creative ideas originate in unconscious mental processes, while conscious thought is responsible for evaluating, refining, and implementing them. When creativity is understood as a process, attributing it to artificial intelligence becomes more difficult. AI systems do not possess an unconscious mind, at least not in the way humans do, even though they may sometimes produce outputs that resemble human reasoning or internal dialogue.

The second perspective focuses on the outcome rather than the process itself. Here, the path leading to a solution becomes less important than the characteristics of the result. If an idea is original, useful, and valuable, it may be considered creative regardless of how it was produced. From this perspective, accepting the possibility that AI systems can generate creative outputs becomes considerably easier. These perspectives are not mutually exclusive, and many theories attempt to integrate elements of both. Honing Theory, for example, describes creativity as a dynamic interaction between an individual and their environment. When a person engages with a creative problem, both their understanding of the problem and their worldview evolve through continuous interaction. Creativity emerges not solely from the person or the task, but from the relationship between them.

A different perspective is offered by the behavioral approach, which treats creativity as a form of learning. This view allows for a degree of randomness in creative solutions and emphasizes the role of reinforcement. New and original ideas that successfully solve problems become more likely to reappear in the future. Creativity is understood as an accumulation of experiences that are continuously modified by experimentation and adaptation feedback loops. These perspectives raise important questions about the relationship between creativity and artificial intelligence. Systems such as ChatGPT are based on machine learning, they improve their performance by identifying patterns within vast amounts of data. However, this form of learning differs fundamentally from human experience. AI systems do not possess personal histories, subjective perspectives, self-awareness, or lived experiences. They do not reflect on meaning, intention, or value in the same way humans do.

This distinction becomes particularly important if creativity is understood not only as the production of novel outcomes, but also as a process involving experience, awareness, and understanding. In that case, the question of whether artificial intelligence can be genuinely creative remains unanswered. At the same time, it raises another equally important question: what makes some individuals more creative than others?

6.2 WHAT DRIVES CREATIVITY IN THE AI ERA?

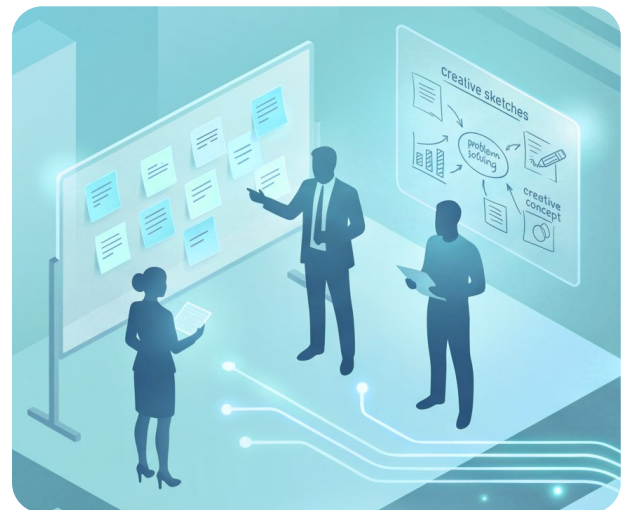
Creativity is often discussed as an individual trait or capability, but many contemporary theories suggest that it should not be understood solely in these terms. Rather than being a fixed characteristic, creativity can emerge from the interaction between individuals, tasks, and their surrounding environment.

One of the most frequently discussed factors associated with creativity is intelligence. This relationship is not surprising, as intelligence is commonly linked to problem-solving ability, while creativity plays an important role in generating novel solutions. Research, however, suggests that the relationship between intelligence and creativity is not linear. A certain threshold of intelligence appears necessary for creative performance, but beyond that point, higher intelligence does not automatically lead to greater creativity. The sources of creativity may also be found outside the individual. Environmental factors often play a significant role in shaping creative outcomes. In organizational settings, teamwork, collaboration, and idea-generation techniques such as brainstorming are commonly used

to stimulate creative thinking. In many industries, particularly marketing and advertising, creativity represents a key source of value creation and competitive advantage.

Marketing agencies provide a useful example. Their success often depends on the ability to generate original and valuable ideas that capture attention and differentiate products or brands. Creative campaigns can create value independently of the products they promote by presenting familiar concepts in unexpected, engaging, or memorable ways. Advertising associated with major events such as the Super Bowl illustrates how creativity itself can become a central component of marketing communication.

Research also suggests that organizational environments influence creative performance. Workspace design, opportunities for informal interaction, and areas dedicated to relaxation or play have all been associated with higher levels of idea generation. Similarly, open environments that encourage communication and collaboration may support the development of creative solutions. Creativity is often viewed not only as an individual capability, but also as a product of social interaction and collective problem-solving.



This perspective underlies many well-known creativity techniques, including brainstorming, thought experiments, and approaches designed to encourage thinking beyond established patterns. Traditionally, however, these methods were developed for collaboration among people. They emerged long before artificial intelligence became widely accessible and did not anticipate a world in which algorithms could actively participate in creative processes. The growing role of AI makes it increasingly difficult to treat creativity as an exclusively human phenomenon. Artificial intelligence can contribute to idea generation, problem-solving, and exploration of alternative solutions. As a result, its influence on human creativity cannot be ignored. Importantly, this influence is not necessarily always positive, and understanding its effects requires a closer examination of how humans and AI work together.

In this context, AI is increasingly viewed not only as a tool, but also as a collaborative partner in certain types of creative work. Human–AI interaction extends beyond simple question-and-answer exchanges and may involve ongoing cycles of suggestion, evaluation, feedback, and refinement. Users provide information, define problems, and assess proposed solutions, while AI systems generate alternatives that can be further developed, tested, and improved through subsequent interactions. Such a process has the potential to create highly stimulating conditions for creativity. At the same time, its effectiveness depends on a number of important conditions that shape the quality of human–AI collaboration. Understanding these conditions is essential for determining whether AI ultimately enhances creativity or unintentionally constrains it.



6.2.1 TASK: IDEA GENERATION

This exercise should take approximately 10 minutes to complete. You will need a notebook (paper or digital) and access to ChatGPT or another AI model.

The task is simple: think of five creative uses for a chair and write them down before using any AI tool. Once you have completed your list, ask ChatGPT or another AI system to generate five creative uses for a chair. The order is important. Complete the task independently first and only then consult the AI system.

Afterward, compare the two results. Consider both the time required to generate the ideas and the quality of the proposed solutions. Did the AI produce ideas more quickly? Were its suggestions more creative, more practical, or perhaps more generic? How did your own ideas differ from those generated by the algorithm? The objective of the exercise is not to determine whether humans or AI are more creative, but to reflect critically on the similarities and differences between human and AI-generated ideas.

Concluding observations

A simple comparison between human and AI-generated ideas often leads to an interesting observation. In one example, the proposed human-generated uses of a chair included a dog tent, a musical instrument, an exercise tool, a clothes rack, and a support for a ring-toss game. Generating these ideas required several minutes of thinking and experimentation. When the same task was given to ChatGPT, the response was produced almost instantly. The suggested uses included a mini ladder, a bedside table, a home exercise tool, a clothes rack, and a children's fort. Although the specific ideas differed, the overall level of creativity was comparable. It would be difficult to argue that one set of ideas was clearly superior to the other.

The most important observation concerns neither the originality nor the quality of the ideas, but the speed with which they were generated. AI systems can produce multiple suggestions within seconds and can continue generating additional alternatives almost indefinitely. This creates opportunities for users to treat AI-generated ideas as starting points rather than final answers.

The value of human–AI collaboration becomes particularly visible at this stage. Instead of simply asking for a solution, users can build on the AI's suggestions, modify them, combine them, or use them as inspiration for entirely new directions. They can also ask the system to suggest methods for generating ideas rather than generating the ideas themselves. This distinction is important. Requesting a ready-made answer involves limited interaction with the AI system. In contrast, engaging in an iterative dialogue, exploring alternatives, and refining suggestions transforms the interaction into a form of collaboration. From this perspective, the creative value of AI lies not only in the ideas it generates, but also in its ability to support and stimulate human thinking.

6.3 HUMAN – AI COLLABORATION

The idea of collaboration between humans and machines is not new. Classical Human–Computer Interaction (HCI) emerged from early visions of human–computer symbiosis. As early as the 1960s, researchers such as Licklider argued that computers should amplify human cognitive abilities rather than merely automate work. Technology was expected to support human thinking, not replace it. For many years, HCI focused primarily on designing interactive systems that were effective, reliable, and easy to use. The objective was to understand users, their tasks, and the broader social and technical contexts in which systems operated. Typical examples included office software designed to reduce errors, improve efficiency, and simplify complex activities. Over time, however, this perspective expanded. HCI moved beyond interface design and began to examine broader socio-technical systems, including organizations, workplaces, and digital ecosystems in which people, software, and algorithms jointly shape how work is performed.

Within this broader field, a more specialized research stream emerged: Human–AI Collaboration (HAIC). This area focuses specifically on how people collaborate with artificial intelligence systems, particularly in decision-making and managerial contexts. A manager using AI to analyze market data, identify trends, and suggest strategic options while retaining responsibility for the final decision provides a typical example of this approach. HAIC builds on the behavioral theory of the firm and the concept of augmentation, according to which technology should complement human limitations rather than eliminate human involvement.



From this perspective, decision-making is understood as a process of selecting among alternative courses of action. AI contributes capabilities such as speed, consistency, accuracy, and the ability to process large volumes of information. Humans contribute judgment, contextual understanding, tacit knowledge, and creativity. An AI system may quickly generate several possible solutions to a problem, while a human is better positioned to recognize which option fits a particular organizational culture, client relationship, or unspoken constraint. Human–AI collaboration is not about performing identical tasks in parallel, but about combining different cognitive strengths.

The HAIC literature distinguishes between several forms of collaboration. In sequential arrangements, tasks are divided between humans and AI systems. Decision-support systems provide a common example: AI filters information, identifies anomalies, or generates recommendations, while the human remains responsible for the final decision. In interactive arrangements, humans and AI work together throughout the problem-solving process, exchanging information, refining ideas, and adjusting directions iteratively. This resembles the way users increasingly interact with language

models, building on suggestions, evaluating alternatives, and developing ideas through dialogue. Research suggests that both forms of collaboration are already widely present in organizational settings, including professional services and public-sector organizations.

A central concept underlying these arrangements is bounded rationality. Human cognitive limitations create opportunities for collaboration with algorithmic systems that can expand the search space and process information at a scale that would be difficult for individuals alone. At the same time, agency remains shared. Humans stay “in the loop,” interpreting, questioning, and correcting AI-generated recommendations. An algorithm may identify an efficient solution, while a human recognizes ethical concerns, long-term implications, contextual factors, or opportunities for more innovative approaches. This perspective represents an important shift from traditional views of technology. Rather than treating AI as a passive tool, Human–AI Collaboration conceptualizes it as a cognitive partner that can contribute to decision-making, knowledge sharing, and learning processes. This perspective also aligns with the broader discussion of creativity presented in this chapter. Creative outcomes rarely emerge from isolated actions; instead, they develop through interaction, feedback, and iteration, whether the partner is another person or an intelligent system.

The growing presence of large language model–based agents in everyday work makes this perspective increasingly relevant. Activities such as writing, planning, analyzing information, and generating ideas are no longer purely human processes. They increasingly occur through collaboration with AI systems. Human–AI Collaboration provides a useful framework for understanding both the opportunities and the limitations of this emerging form of cooperation, as well as the skills required to use it effectively.

Concluding observations

Imagine being asked to create the 101st definition of creativity. According to some researchers, the very act of doing so could be considered a creative achievement. Yet the central debate explored in this chapter is not really about definitions. It is about whether artificial intelligence can genuinely be considered creative.

Two contrasting perspectives help explain this debate. The first is the process perspective, which views creativity as something rooted in human experience, personal history, and unconscious cognitive processes. From this perspective, AI faces clear limitations. Artificial intelligence does not possess lived experience, self-awareness, or an unconscious mind. It does not experience ideas; rather, it identifies and recombines patterns found in data.

The second perspective focuses on outcomes. Here, creativity is evaluated according to whether the result is novel, original, and useful. If a poem, image, or solution meets these criteria, the process that produced it may be considered less important than the outcome. From this viewpoint, AI-generated outputs can appear creative even if the system itself lacks human cognition.

The discussion of Honing Theory suggests that reality may lie somewhere between these positions. Creativity emerges through an ongoing interaction between the individual and the task being ad-

dressed. Because AI lacks a personal worldview, it cannot reflect on the meaning of its work in the same way humans do. However, it can support creative processes by identifying patterns, generating alternatives, and reinforcing successful solutions through machine learning.

This shifts the focus of the debate. Rather than asking whether AI is creative, it may be more useful to ask how AI changes the way humans engage in creative work.

The chair exercise provides a simple illustration. Generating several unusual uses for a chair may take a person a few minutes. An AI system can generate similar ideas almost instantly. If speed is the only criterion, it is easy to feel that human creativity is being replaced. However, the concept of Human–AI Collaboration offers a different perspective.

Traditional Human–Computer Interaction viewed technology primarily as a tool for improving efficiency. Human–AI Collaboration expands this view by treating AI as a cognitive support system that can help people explore larger spaces of possibilities and overcome some of the limitations of human reasoning.

The key lesson is that creativity in the age of AI is not simply about producing ideas faster. It is about engaging more deeply with problems and possibilities. When AI is used only to generate answers, it functions as a tool. When it becomes part of an iterative dialogue that helps people explore alternatives, question assumptions, and develop ideas, it can support and extend human creative thinking.

Human judgment, interpretation, and contextual understanding remain essential. The goal is not to allow AI to think instead of us, but to use it in ways that expand the space in which our own thinking takes place.

6.4 WHAT RESEARCH SAYS ABOUT AI AND CREATIVITY?

In recent years, researchers have increasingly examined how artificial intelligence influences human creativity. The findings suggest that AI can support creative work, although its contribution is not without limitations. Rather than replacing human creativity, AI appears to change the way creative processes unfold and the types of outcomes they produce. A study published in *Nature Human Behaviour* in 2024 compared the performance of participants completing creative tasks with and without ChatGPT. Individuals who used AI generally produced ideas that were evaluated as more creative than those generated independently. However, the improvement was primarily observed in incremental creativity. AI helped participants expand, refine, and improve existing ideas, but it was less effective at generating radically novel concepts.

Similar findings were reported in a 2024 study published in *Science Advances*, in which participants wrote short stories with or without generative AI support. Stories created with AI assistance were rated as more creative, better written, and more engaging. Interestingly, the strongest improvements were observed among participants who initially demonstrated lower levels of creativity. This suggests that AI may be particularly effective in supporting individuals with less experience or lower creative confidence.

At the same time, several studies highlight important limitations of AI-supported creativity. Although AI assistance often improves average quality, it may also reduce diversity. The *Science Advances* study found that stories created with AI support became more similar to one another, despite their higher overall quality. In other words, while AI helped participants produce stronger outputs, it also encouraged convergence toward similar solutions.

Similar conclusions were reported in a 2025 study published in *Nature Human Behaviour*, which suggested that AI can reduce diversity during brainstorming. When many individuals rely on the same AI systems, they are often exposed to similar suggestions and patterns of thinking. As a result, the overall pool of ideas may become more homogeneous.



Research published in *Science Advances* in 2025 reached a related conclusion. The study examined online platforms where artists used AI tools to generate images and found that AI substantially increased creative productivity. Users were able to produce more content and explore a larger number of variations faster. However, most of these outputs remained relatively close to existing concepts. AI primarily increased the quantity of creative work rather than the depth of novelty.

Evidence from a 2025 study published in PNAS further supports this observation. After analyzing thousands of stories generated by large language models, researchers found that AI systems frequently relied on recurring narrative structures and similar plot patterns. Although the stories often appeared different on the surface, they were built upon comparable underlying frameworks. Human authors, by contrast, demonstrated substantially greater diversity in their storytelling approaches.

These findings are consistent with earlier theoretical perspectives on machine creativity. One influential theory proposed that AI creativity is primarily based on recombination. According to this view, AI systems are highly effective at combining existing ideas in new ways and exploring large spaces of possibilities. However, identifying, evaluating, and selecting genuinely original ideas remain much more challenging tasks. Recent research increasingly suggests that the greatest value of AI may emerge through collaboration rather than replacement. A large meta-analysis published in *Nature Human Behaviour* in 2024 examined hundreds of studies on human–AI collaboration and found that human–AI teams were not necessarily superior to the best human experts. However, they frequently performed well in tasks that required idea generation, exploration, and creative problem-solving.

Taken together, these findings suggest that humans and AI contribute different but complementary strengths. AI excels at generating large numbers of alternatives, identifying patterns, and exploring possibilities at speed. Humans remain better at defining goals, interpreting meaning, applying contextual understanding, and selecting ideas that are truly valuable. For this reason, many researchers increasingly view AI not as a replacement for human creativity, but as a creative partner. When used effectively, AI can expand the search space for ideas, accelerate exploration, and support creative thinking. The direction, interpretation, and final judgment, however, continue to depend largely on human involvement.

6.5 REPLACEMENT OR AUGMENTATION?

One of the central questions in discussions about artificial intelligence concerns its future in human work. Will AI gradually replace people in a growing number of tasks, or will it primarily enhance human capabilities? Researchers often describe this debate in terms of two contrasting concepts: replacement and augmentation.

The replacement perspective assumes that AI represents the next stage in a long process of technological automation. Throughout history, machines have taken over many forms of physical labor, while software systems have automated numerous administrative and analytical tasks. From this viewpoint, artificial intelligence may eventually perform a growing share of knowledge-based work as well. AI systems can already generate text, create images, analyze data, and produce reports. As a result, some observers argue that many occupations, including certain forms of creative work, may become increasingly automated.

The augmentation perspective offers a different interpretation. Rather than replacing humans, AI is viewed as a technology that extends human capabilities. In this sense, AI functions as a cognitive tool, much like calculators extend mathematical abilities or search engines expand access to information. The objective is not to remove humans from the process, but to enable them to work more efficiently, explore more alternatives, and process more information. From this perspective, humans continue to play a central role. They define goals, establish priorities, interpret meaning, and determine the overall direction of the work. AI contributes speed, pattern recognition, and the ability to generate large numbers of possibilities, while humans provide judgment, contextual understanding, and evaluation.

Many researchers argue that the augmentation model more accurately reflects how contemporary AI systems operate in practice. Current generative AI tools are highly effective at producing alternatives, variations, and examples. However, they remain heavily dependent on human guidance. This is particularly visible in creative tasks such as writing, design, and image generation, where the quality and direction of the output depend strongly on how the task is framed and how the results are evaluated. In this sense, AI generates possibilities, but humans decide which possibilities are worth pursuing. Research on AI-supported work suggests that these systems often increase productivity by enabling users to explore more ideas in less time. Individuals can test alternatives more quickly, experiment with different directions, and iterate at a pace that would be difficult to achieve without technological support. AI expands the amount of potential solutions and creative opportunities.

At the same time, this process introduces certain challenges. When large numbers of people rely on the same AI systems, they may receive similar suggestions and follow comparable paths of exploration. As a result, AI can increase the number of generated ideas while simultaneously reducing the diversity of those ideas. This tension reflects a recurring theme in contemporary research: AI often improves efficiency and average performance, but it may also encourage convergence toward similar solutions. For this reason, the debate between replacement and augmentation remains unresolved. Artificial intelligence clearly has the capacity to automate some tasks. However, in domains that depend heavily on interpretation, judgment, and creativity, its most significant contribution may lie in supporting rather than replacing human work.

A useful way to understand this relationship is to view AI as a highly efficient brainstorming partner. It can rapidly generate alternatives and explore possibilities, but it does not determine which ideas are meaningful, valuable, or aligned with broader goals. These responsibilities remain fundamentally human.

Consequently, many researchers argue that the most plausible future is not one in which AI replaces creativity, but one in which creative work becomes increasingly collaborative. Humans contribute direction, interpretation, and judgment, while AI expands the range of ideas and possibilities available for exploration. The key challenge is not whether AI will replace human creativity, but how individuals and organizations can learn to work creatively and effectively with intelligent systems.



6.6 PARADOXES OF CREATIVITY AND AI

Recent research on artificial intelligence and creativity reveals several patterns that may initially appear contradictory. In many situations, AI seems to enhance creativity in one dimension while simultaneously limiting it in another. These observations have led researchers to discuss what can be described as the paradoxes of AI creativity.

The first paradox concerns the relationship between creativity and diversity. Studies consistently show that people working with generative AI often produce outputs that are evaluated as more creative, more coherent, and more fully developed than those created without AI support. At the same time, however, researchers have observed a reduction in diversity among participant groups. Because many users rely on the same models trained on similar datasets, AI-generated suggestions often converge on similar themes, structures, or solutions. As a result, individual outputs may improve in quality while the overall variety of ideas decreases.

A second paradox relates to differences between beginners and experts. Several studies indicate that AI tends to benefit less experienced or less creative individuals the most. Participants with lower initial creativity scores often produce stronger outputs when supported by AI, generating ideas that are more structured, detailed, and engaging. By contrast, highly creative individuals frequently report smaller benefits. Some even perceive AI-generated suggestions as predictable, conventional, or insufficiently original. In this sense, AI may raise the average level of creativity while contributing less to the performance of those who are already highly creative.

The third paradox concerns novelty and intention. AI systems can generate surprising combinations of ideas, concepts, and images that may appear highly original. However, these systems do not possess intentions, goals, or an understanding of meaning. Their outputs emerge from statistical

patterns learned from large datasets rather than from conscious reflection or purposeful creation. Human creativity, by contrast, is typically connected to objectives, context, values, and personal experiences. Consequently, AI may generate novelty without understanding, while humans create within a framework of meaning and intention.

Taken together, these paradoxes highlight an important characteristic of AI-supported creativity. Artificial intelligence functions as a powerful generator of possibilities, but creativity itself remains closely linked to human interpretation, evaluation, and decision-making. Generating ideas is only one part of the creative process; selecting, refining, and assigning meaning to those ideas remains equally important. For this reason, contemporary research increasingly points toward a collaborative perspective. Rather than viewing creativity as either human or artificial, many scholars argue that the greatest potential lies in combining the strengths of both. AI contributes speed, scale, and the ability to explore large spaces of possibilities, while humans provide direction, judgment, contextual understanding, and purpose. From this perspective, the most productive form of creativity may emerge not from humans or AI working independently, but from effective collaboration between the two.



6.7 HUMAN ROLES IN AI-SUPPORTED CREATIVITY

Human–AI creativity is often described as a partnership. In practice, however, this partnership is not symmetrical. Humans and AI contribute different capabilities to the creative process. AI systems excel at generating possibilities, exploring alternatives, and producing large numbers of ideas in a short period of time. Humans, by contrast, provide direction, interpretation, evaluation, and judgment. Understanding this division of roles helps explain why AI is more accurately described as a creative collaborator than a replacement for human creativity.

One of the most important human roles is that of the director. In most AI-supported creative tasks, people define the problem, establish objectives, and determine what a successful outcome should look like. AI systems do not initiate creative projects independently; they respond to instructions and constraints provided by users. Consequently, the way a task is framed significantly influences

the outputs generated. Even small differences in prompts can produce substantially different results. In this sense, humans act as directors, determining the overall direction of creative exploration.

A second role is that of the editor. One of the defining strengths of AI is its ability to generate many alternatives rapidly. Within seconds, a system can produce multiple drafts, suggestions, concepts, or variations. This changes the nature of the creative challenge. Rather than focusing primarily on idea generation, individuals increasingly need to evaluate, compare, and select among numerous possibilities. Human creativity should shift toward editing and refinement, with people deciding which ideas deserve further development.

Humans also function as curators. Creative work rarely depends on a single idea in isolation. More often, it involves combining multiple elements into a coherent and meaningful whole. In activities such as storytelling, design, marketing communication, or content creation, different components must fit together within a consistent narrative, visual identity, or strategic framework. AI-generated outputs frequently serve as raw material that individuals reorganize, refine, combine, and adapt. In this role, humans act as curators who select and arrange elements to create a coherent final product.

A fourth role is that of the critic. Creativity is not only about producing ideas but also about evaluating them. Not every idea that appears interesting is useful, appropriate, or valuable. Some suggestions may be unrealistic, irrelevant, misleading, or inconsistent with broader objectives. AI systems generate outputs based on patterns learned from data, but they do not fully understand context, values, organizational priorities, or long-term consequences. Humans remain responsible for assessing the quality, relevance, and meaning of AI-generated content.



These roles illustrate an important transformation in how creative work is done. Traditionally, much of the effort involved generating ideas manually. With the emergence of generative AI, the balance begins to shift. Machines can rapidly produce large numbers of possibilities, while humans increasingly focus on directing the process, selecting promising alternatives, organizing ideas into meaningful structures, and evaluating their significance.

From this perspective, AI does not remove humans from the creative process. Instead, it changes the nature of human contribution. People become less focused on producing every individual idea themselves and more focused on managing, guiding, and shaping the creative system as a whole. AI expands the space of possibilities, while humans determine which of those possibilities are worth transforming into meaningful outcomes.

Concluding observations

Recent research published in journals such as *Nature Human Behaviour* and *Science Advances* points to several interesting patterns in the relationship between AI and creativity. On average, people who work with AI tend to produce outputs that are evaluated as more creative. However, these benefits are accompanied by several important trade-offs.

One of these is sometimes described as a beginner's bonus. Studies suggest that AI can significantly improve the performance of individuals who initially score lower on measures of creativity. Their ideas often become more structured, detailed, and engaging. At the same time, highly creative individuals may experience smaller benefits, as AI-generated suggestions can sometimes appear predictable or conventional.

Another challenge is the diversity trap. While individual outputs may improve, the overall diversity of ideas within a group may decrease. When many people rely on the same models, suggestions often converge around similar themes, structures, and patterns. As a result, average quality may increase while originality across a larger set of ideas declines.

These findings highlight an important characteristic of AI-generated creativity. AI can generate novelty without intention. It can combine concepts in surprising ways, yet it does not understand why those combinations may be meaningful or valuable. Current AI systems are particularly effective at incremental creativity—improving, extending, and recombining existing ideas—while more radical forms of innovation remain strongly connected to human judgment and imagination.

The question of whether AI will replace human creativity is often reframed as a question of augmentation. Current evidence suggests that AI functions most effectively as a system that expands the range of possibilities available to people. It can generate alternatives quickly, but it remains dependent on human direction.

This changing relationship also transforms the role of humans in the creative process. Rather than acting solely as idea generators, people increasingly guide and shape AI-supported creativity. They define objectives, evaluate outputs, combine ideas, and assess their relevance and value.

In this context, four roles become particularly important:

- Director – defines the task, objectives, and creative direction.
- Editor – selects the most promising ideas from a larger set of possibilities.
- Curator – combines different ideas into a coherent and meaningful whole.
- Critic – evaluates outputs in terms of quality, relevance, ethics, and context.

The central lesson is that AI expands the search space for ideas, but humans remain responsible for deciding which possibilities deserve further development. As creative work increasingly involves collaboration with intelligent systems, the ability to guide, evaluate, and refine AI-generated outputs may become just as important as the ability to generate ideas independently.



6.7.1 TASK: EXPLORING HUMAN ROLES IN AI-SUPPORTED CREATIVITY

This exercise explores how people guide creative work when collaborating with AI systems. Your task is to create a short slogan promoting a course on AI and creativity. Rather than asking AI to generate a final slogan immediately, experiment with different human roles in the creative process.

Step 1 — Choose two roles

- **Director**

In this role, you define the direction of the creative task. You explain the goal, the audience, and the style of the slogan. Example prompt:

Help me generate ideas for a short slogan promoting a course about creative collaboration with AI. The slogan should be clear, motivating, and appealing to university students.

Your task as the director is to set the goal and guide the exploration.

- **Editor**

In this role, you focus on selecting the best ideas. Ask AI to generate multiple options and then help you identify the strongest ones. Example prompt:

Generate 15 slogan ideas promoting a university course about AI and creativity. Then help me identify the three strongest options and explain why they work well.

Your task as the editor is to filter and select the most promising ideas.

- **Curator**

In this role, you combine and refine ideas. First choose three to five slogan ideas (either generated by AI or written by you). Then ask AI to help combine their strongest elements.

Example prompt:

Here are four slogan ideas for a course about AI and creativity. Help me combine the strongest elements into one clear and memorable slogan.

Paste your slogans below the prompt.

Your task as the curator is to build one stronger concept from several ideas.

- **Critic**

In this role, you evaluate and improve ideas. First choose one slogan idea you want to test. Then ask AI to analyze it. Example prompt:

Evaluate the following slogan promoting a course about AI and creativity. What are its strengths and weaknesses? Suggest two ways to improve it.

Paste your slogan below the prompt.

Your task as the critic is to assess the quality of the idea and improve it.

Step 2 — Work with AI

Use AI to develop your slogan while actively applying the two roles you selected. Remember that your goal is not only to generate ideas, but also to guide the creative process.

Step 3 — Reflection

After completing the task, write a short reflection (4–5 sentences):

Which roles did you choose? How did these roles influence your interaction with AI?

Did AI feel more like a tool, a collaborator, or something else?



6.8 KEY TAKEAWAYS

- Creativity can be understood both as a process and as an outcome.
- Different theories explain creativity through cognition, learning, interaction, and environmental influences.
- Creativity is shaped not only by individual abilities but also by context, collaboration, and organizational conditions.
- AI challenges traditional assumptions about creativity by generating outputs that may appear novel, original, and useful.
- Human–AI Collaboration views AI as a cognitive partner rather than a passive tool.
- AI contributes speed, consistency, and pattern recognition, while humans contribute judgment, contextual understanding, experience, and creativity.
- The quality of creative outcomes depends on how AI is used.
- Passive reliance on AI may lead to generic solutions, whereas active collaboration can expand the range of possible ideas.
- Effective use of AI requires humans to remain actively involved in questioning, evaluating, refining, and directing the creative process.
- Research suggests that AI can support creative work by helping people generate ideas, explore alternatives, and develop early concepts.
- AI often improves the quality of individual outputs, but it may also reduce diversity when many people rely on similar tools and suggestions.

- Current evidence supports the augmentation perspective more strongly than the replacement perspective. AI is most effective when it extends human capabilities rather than replacing human creativity.
- AI excels at generating large numbers of possibilities, while humans remain responsible for setting goals, interpreting meaning, and evaluating outcomes.
- Human–AI creativity is best understood as a collaborative process that combines different strengths rather than identical capabilities.
- In AI-supported creative work, humans increasingly act as directors, editors, curators, and critics.
- The quality of AI-assisted creativity depends not only on the technology itself, but also on how people guide, question, refine, and evaluate AI-generated outputs.
- Creative value emerges not from AI alone, but from the interaction between human judgment and machine-generated possibilities.



6.9 FURTHER READING

Eapen, T. T., Finkenstadt, D. J., Folk, J., & Venkataswamy, L. (2023). How generative AI can augment human creativity. *Harvard Business Review*, 101(4), 56–64.

<https://hbr.org/2023/07/how-generative-ai-can-augment-human-creativity>

Tomaselli, A., & Acar, O. A. (2024). How GenAI changes creative work. *MIT Sloan Management Review*. <https://sloanreview.mit.edu/article/how-genai-changes-creative-work/>

Lee, B. C., & Chung, J. (2024). *An empirical investigation of the impact of ChatGPT on creativity*. *Nature Human Behaviour*, 8(10), 1906–1914. <https://doi.org/10.1038/s41562-024-01953-1>



Case study:

GENERATIVE AI AS ENABLER OF VALUE PROPOSITION INNOVATION: THE CASE OF A DIGITAL MARKETING AGENCY

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ALFA is a medium-sized digital agency facing growing competitive pressure as Generative AI reshapes the marketing industry, pushing agencies to integrate AI into their services and rethink their value propositions. While AI offers opportunities for efficiency, personalization, and innovation, ALFA must address challenges related to strategy, differentiation, and skill development to remain competitive.



1. Introduction

ALFA is a medium-sized digital agency operating in the communication and digital marketing sector. With over 200 professionals and nine offices across Italy and abroad, ALFA offers a wide portfolio of services ranging from branding and digital strategy to e-commerce and demand generation. Over time, the agency has positioned itself as a partner for companies undertaking customized digital transformation projects.

This positioning is now challenged by the rapid diffusion of Artificial Intelligence (AI), and Generative AI in particular, which is reshaping the competitive dynamics of the industry.

To remain competitive and respond to growing client demand, digital agencies are progressively integrating these technologies into their service offerings.

Evidence of this trend emerges from a recent survey by Promethean Research (2023)¹ of 268 digital agency leaders: **89% reported using AI in some form, although most remain in the early stages of implementation.** Notably, high-performing agencies show a more positive attitude toward AI, leveraging their organizational capacity to experiment systematically and rapidly embed new practices into their workflows.

The pace of this transformation is further confirmed by a Forrester study (2024)², showing that **91% of U.S. advertising agencies are using or testing Generative AI, yet only 6% have identified a clear model to monetize it.** This underscores the urgency of redefining value propositions and developing business strategies that integrate AI as a distinctive and sustainable competitive lever.



The competitive landscape further intensifies this challenge. **Large global groups such as WPP are accelerating their integration of Generative AI, driven by the fear that, without strategic repositioning, AI could erode the very core business of agencies** (Financial Times, 2025)³. At the same time, technology giants like Meta, Google, TikTok, and Amazon are embedding AI-based tools for media planning and creativity, positioning themselves in direct competition with traditional agency services. Specialized startups also play a critical role, dominating vertical niches with scalable AI-driven solutions supported by venture capital.

Pressure also comes from the client side. According to Accenture⁴, 90% of Chief Marketing Officers believe Generative AI will revolutionize the sector, yet 72% admit they do not know how to proceed in practice. This gap fuels demand not only for technological tools but also for strategic consulting and guidance.

In this evolving scenario, agencies can leverage Generative AI to achieve efficiency gains, enhanced personalization, scalability, and create new brand experiences. At the same time, they face the strategic challenge of differentiating themselves within an increasingly complex and competitive environment.

A further difficulty concerns the development of competencies. Generative AI requires new skill sets, yet the survey conducted by Promethean Research (2023) highlights the persistence of a significant gap: only 20% of agencies have introduced structured training programs to support the use of AI. The absence of systematic learning pathways risks widening the divide between early adopters and laggards, making capabilitybuilding an urgent priority for sustaining competitiveness.

¹ <https://prometheanresearch.com/digital-agencies-ai>

² <https://www.forrester.com/report/the-state-of-generative-ai-inside-us-agencies-2024/RES180989>

³ <https://www.ft.com/content/4d1d939c-23e3-491f-9a5e-58532fdc82cb>

⁴ <https://www.accenture.com/us-en/insights/song/generative-ai-customer-growth?>

In this context, it becomes essential for ALFA to understand how to integrate Generative AI into its value proposition creation, positioning it as a central driver of innovation and differentiation within the competitive landscape of digital agencies.

2. Background

ALFA is a digital agency operating at both national and international levels, specialized in the development of strategies and solutions designed to support the digital transformation of businesses, from digital marketing and branding to e-commerce, advanced technologies, and Generative AI.



The company was founded in 2001 by a group of professionals with expertise in digital communication, marketing, and technology. The physical presence of Alfa extends across nine offices, located in Italy and abroad. Over the years, the company has expanded its domestic footprint through multiple offices across the country and the acquisition of smaller agencies, before opening a strategic branch in Shanghai with the aim of reinforcing its international positioning.

Today, **ALFA employs over 220 professionals and manages a portfolio of approximately 500 active clients** operating in diverse industries, including public administration and non-profit, fashion and luxury, food and beverage, home and design, hospitality and tourism, mechanical and engineering, personal and health care, as well as technology and services.

Listed on the stock exchange, ALFA pursues a growth strategy oriented toward the acquisition of small and medium-sized Italian enterprises that are synergistic with its core business, with the aim of expanding its competitive position in the market.



Table 6.1 presents a set of financial indicators for the company referring to the fiscal year 2024. The data include revenues, net profit, operating cash flow, net working capital and the current ratio. These data provide the basis for assessing the company’s capacity to plan and sustain potential investments in artificial intelligence solutions, as well as for determining their appropriate scale.

Table 6.1 Financial results for the 2024 year

Revenues	Net profit	Operating cash flow ⁵	Net working capital ⁶	Current ratio ⁷
€9.514.151	€877.770	€1.988.987	€441.828	1,09

In its competitive context, ALFA differentiates itself through a proprietary methodology that guides clients in the design and implementation of digital transformation pathways. This methodology is based on a structured process that integrates listening, analysis, and interpretation of client needs, translating them into innovative and customized solutions, and evaluating results through performance indicators, thereby ensuring a continuous process of learning and improvement.

ALFA’s methodological process unfolds across the following main phases:

- 1. listening phase**, during which client needs, objectives, and expectations are collected in order to provide the necessary information to guide subsequent decisions;
- 2. interpretation phase**, in which the data and feedback gathered are analyzed to identify actual needs and the most relevant strategic opportunities;
- 3. action**, where analyses are translated into innovative and customized solutions, fully aligned with the agreed strategy and capable of generating concrete and effective impact;
- 4. measurement phase** evaluates results through specific performance indicators, enabling strategies to be refined and ensuring an ongoing process of continuous improvement.

⁵ The operating cash flow represents the amount of liquidity generated or absorbed by the company’s core activities during the fiscal year. It measures the firm’s ability to financially sustain itself, that is, to independently generate the financial resources necessary to support its ongoing operations and future growth.

⁶ The net working capital indicates the difference between current assets (immediate and deferred liquidity, together with inventories) and current liabilities (short-term payables). It is a key indicator for measuring a company's liquidity, operational efficiency, and short-term financial health.

⁷ The current ratio is the ratio between current assets and current liabilities. It is an indicator used to assess the extent to which a company is able to finance its short-term needs (specifically within one year) through the cash inflows generated by its operating activities.

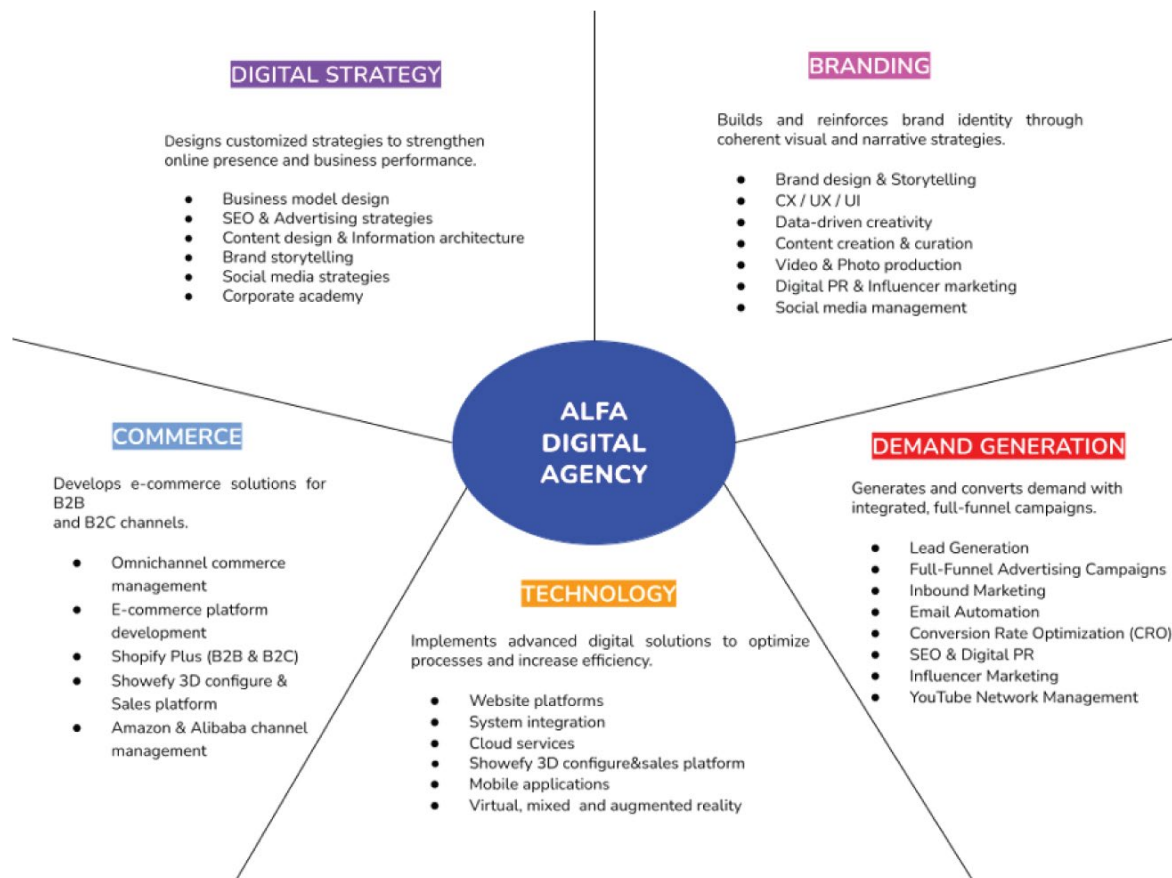


Figure 6.1 The portfolio of Alfa's services

Regarding digital strategy, **the agency designs customized projects aimed at strengthening companies' online presence, enhancing customer engagement, and improving business performance.** Services include business model design, advertising strategies, SEO, content design and information architecture, brand storytelling, brand design, social media strategies, and corporate academy management.

The second area concerns branding, with the objective of reinforcing the clients' brand identity and establishing a distinctive and coherent presence across all communication channels. Services offered include brand design, brand storytelling, CX/UX/UI, content design, data-driven creativity, content creation and curation, video and photographic production, digital PR and influencer marketing, and the organic management of social media.

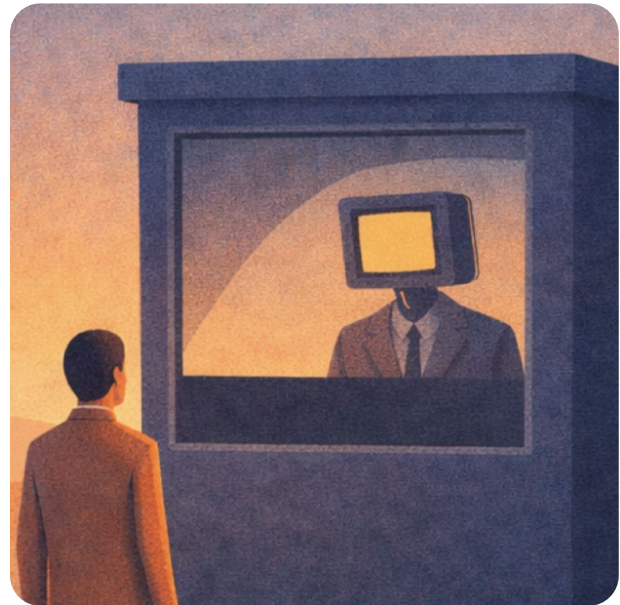
The third area is demand generation. In this context, ALFA develops strategies designed to attract and convert target audiences into loyal customers, through activities such as lead generation, full-funnel advertising campaigns, inbound marketing, e-mail automation, conversion rate optimization, SEO, digital PR, influencer marketing, and YouTube network management.

The fourth area is commerce, where ALFA provides comprehensive e-commerce solutions, from the design to the implementation of digital platforms, transforming companies' online presence into a competitive sales channel. Services include omnichannel commerce management, e-commerce platform development, Shopify Plus for B2B and B2C, the Showefy 3D configure & sales platform, as well as management of Amazon and Alibaba channels.

The fifth area is technology. ALFA develops advanced digital solutions to digitize business processes and increase efficiency and competitiveness. Services include the development of web platforms, system integration, cloud solutions, the Showefy 3D configure & sales platform, mobile applications, as well as virtual, mixed, and augmented reality tools.

The most recent area of development for ALFA is Generative AI. The agency has embarked on an exploration of Generative AI, both pushed by technological evolution and pulled by customers' demand.

The market environment in which digital agencies operate is undergoing profound transformation. The progressive integration of Artificial Intelligence (AI), and Generative AI in particular, is reshaping business models and redefining the boundaries between traditional players and new entrants. Agencies must therefore navigate a competitive arena that is both expanding in scope and fragmenting in structure, with global technology providers, established communication groups, and highly specialized startups all contributing to an increasingly dynamic landscape.



Within this environment, competition unfolds on multiple levels. Large global vendors such as Google, Microsoft, Salesforce, and Adobe are embedding Generative AI functionalities into their ecosystems, offering turnkey solutions that reduce the space traditionally occupied by agencies as intermediaries. At the same time, specialized startups are rapidly scaling in vertical niches, developing platforms for applications ranging from automated content generation to customer support and marketing automation, often supported by significant venture capital and characterized by high scalability.

This scenario raises a strategic challenge for agencies in deciding how to invest their resources, facing a trade-off between generic functionalities, which are rapidly standardized by global providers, or contextual functionalities, tailored to the needs of specific sectors, firms, or markets, and thus less easily dominated by major players. Investing in standard Generative AI functionalities is certainly less costly and complex for the company, but on the other hand it may prove to be ineffective, as such functionalities are quickly commoditized and natively integrated by leading model providers.

The integration of internet search functions by OpenAI is illustrative: investments made by third parties in similar mechanisms became obsolete once the functionality was directly released by the global provider. On the contrary, investing in customized functionalities allows companies to escape the trap of standardization, even though it requires a significant effort in economic, organizational, and technological terms; although platforms such as Salesforce or Zendesk incorporate contextual extensions, these are typically attractive only to organizations already embedded in those ecosystems. Rarely does a single medium-sized vendor dominate the entire information infrastructure, leaving room for digital agency.

3. Current situation

ALFA is at the initial stage of adoption of Generative AI : the technology primarily operates as a support tool to strengthen and accelerate the services already provided to clients, rather than as a structured and explicitly declared component of the agency's value proposition.

In this exploratory phase, ALFA has recently begun to implement Generative AI to explore its potential across the full spectrum of marketing applications, introducing pilot projects primarily at the headquarters⁸ to assess its potential. The intention is to evaluate the outcomes of these initial implementations before extending adoption to other offices within the organization.

A first area of adoption concerns content creation, where ALFA has employed Generative AI to generate advertising copy, social media posts, blog articles, and product descriptions. The agency has also experimented with the production of customized images and videos aligned with brand identity.

In addition, ALFA has applied Generative AI to personalization of user-target content. Specifically, the agency has employed Generative AI to develop personalized e-mail campaigns, in which both message content and delivery timing are adapted to users' preferences and behaviors, as well as to enable the personalization of website and mobile application content based on individual browsing patterns. These applications contribute to enhancing the customer experience by creating tailored offers and product recommendations that adjust to customer preferences.

Another area of experimentation relates to advertising and campaign optimization. Here ALFA is using Generative AI to generate multiple creative variations of ads (texts, images etc.) that can be tested through A/B testing⁹. The agency has also integrated AI-driven keyword optimization for SEM campaigns and has leveraged predictive insights to inform campaign planning and resource allocation.

The agency has also begun to apply Generative AI in the domain of data analysis and predictive insights, using it to process both structured and unstructured data from CRM systems, social media, website report and online review. This allows ALFA to detect emerging consumer trends, identify micro-segments, and forecast shifts in demand, churn, and competitive dynamics.

Finally, ALFA has experimented with Generative AI in idea generation and creative support, employing it to propose campaign concepts, titles, slogans, and naming solutions. The agency has also used it to generate new product or service ideas inspired by emerging trends and to accelerate brainstorming sessions by offering a wide array of creative options.

⁸ By headquarters, we refer to the agency's primary operational office located in Italy, without specifying the city, in order to ensure the anonymity of the organization.

⁹ In the digital context, an A/B test involves comparing two versions of the same content (e.g., a web page, online advertisement, or email) by randomly assigning users to variant A or B, in order to identify which option yields superior outcomes in terms of performance metrics (Harvard Business Review, 2017 <https://hbr.org/2017/06/a-refresher-on-ab-testing>).

The initiatives undertaken by ALFA demonstrate the beginning of a process of exploring and offering Generative AI services to its clients, which are incorporated into the current services portfolio of the company. **Gen AI is therefore used to improve the effectiveness and efficiency with which current services are delivered to customers.** However, these efforts remain fragmented and largely developed in isolation, without an overarching framework that systematically embeds Generative AI into the agency's value proposition. In the absence of a coherent strategy, the transformative potential of the technology remains only partially realized and not fully leveraged as a driver of competitive differentiation.

At present, ALFA's investment in Generative AI remains limited and primarily oriented toward the adoption of ready-to-use tools. The company currently relies on premium subscriptions to general-purpose Generative AI platforms, which are used by teams across different functions to support daily operations. These include:

- ChatGPT Plus (€23 per month);
- Claude Pro (€18 per month);
- Gemini Advanced (€21.99 per month);
- Midjourney Plus (€36 per month);

These expenditures indicate that Generative AI is currently employed as an operational support resource rather than as a dedicated technological investment integrated into a structured service offering or proprietary solution portfolio.

In this process several challenges have emerged. On the technical level, the main problem lies in keeping pace with a technological evolution that is highly disruptive. **Generative AI models are updated and transformed at great speed, requiring the agency to remain constantly aligned with these changes, but also to identify which models warrant investment in terms of development and applications.** On the strategic level, client firms display strong curiosity toward Generative AI, yet they do not yet possess a clear understanding of how to use it effectively. They struggle to identify their concrete needs and to define the contexts in which the technology can generate real value.



This uncertainty compels the agency to reflect on how to structure and deliver Generative AI based services in ways that can guide clients through exploration and informed adoption. On the organizational level, the integration of Generative AI requires the development of new competencies among the agency's professionals. Particularly relevant is the ability to craft effective prompts, an understanding of how AI operates, and knowledge of its potential applications across different industries and client business models.

The introduction of Generative AI within ALFA is currently embedded within its existing organizational structure. Figure 6.2 presents the organizational chart of the headquarters, which represents the core operational nucleus through which digital services are developed and delivered. This structure includes managerial coordination roles (CEO, IT Manager, Marketing Manager and Account Manager), supported by a set of operational and specialized functions such as Senior Web Developer, Front-End Developer, Web Application Developer, Digital Strategist, Social Media Manager, E-commerce Specialists, UI/UX Designers, and Sales Specialists.

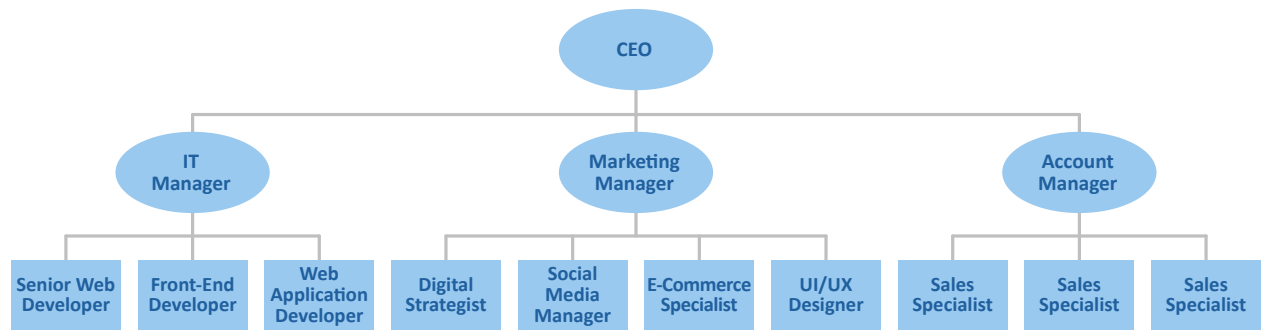


Figure 6.2 Organizational chart

Within this structure, only a limited number of functions have begun to experiment with Generative AI in their daily activities. **As shown in Figure 6.3, the functions currently employing Generative AI are highlighted in blue and correspond primarily to managerial roles.** In particular, **the Chief Executive Officer (CEO)** defines the strategic vision and oversees investment decisions in AI.

An **IT specialist** manages the technical dimension of AI within client projects. The **Marketing Manager** translates these technical capabilities into market-oriented service offerings. Finally, the **Account Manager** acts as the main interface with clients, collecting their needs and guiding them in identifying how Generative AI can be concretely applied within their business contexts.

At the operational level, experimentation with Generative AI is presently limited to a small number of functions, notably Digital Strategist and Social Media Manager, who have begun to explore these tools to support the activities described above.

This configuration reflects ALFA’s current situation, where experimentation with Generative AI is ongoing but not yet embedded into a fully structured organizational model.

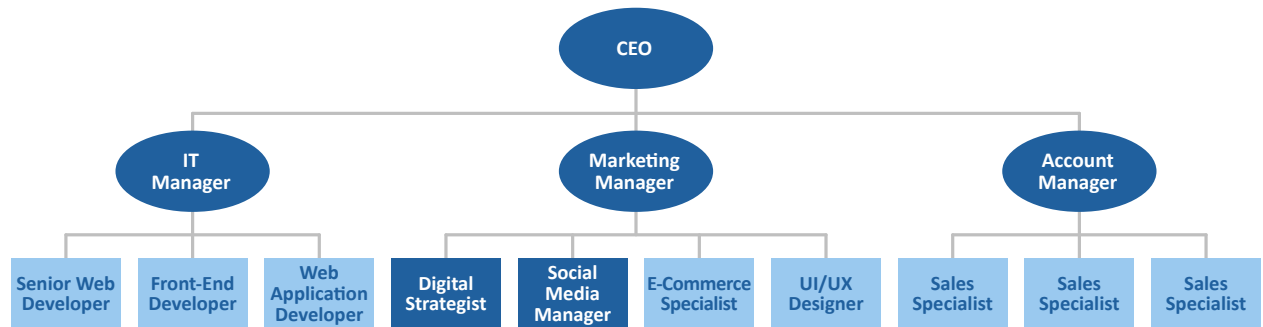


Figure 6.3 Organizational functions currently employing Generative AI

At present, no structured training strategy has yet been introduced within the organization to develop Generative AI-related capabilities at the functional level. This is due to the ongoing uncertainty regarding how to integrate Generative AI in a systematic and organization-wide manner. As a result, learning is currently emerging in a bottom-up: individuals are independently experimenting with tools, acquiring knowledge through practice (learning-by-doing), and informally drawing on publicly available tips and resources (e.g., tutorials shared through social media platforms such as TikTok).

In light of this starting point, the CEO has decided to initiate a first set of training activities aimed at developing a shared level of AI literacy among the roles currently involved in early experimentation.

The CEO has therefore encouraged the marketing function, specifically the Marketing Manager, Digital Strategist, and Social Media Manager, to follow selected on-demand training courses, alongside the IT Manager, who has been advised to complete an introductory course in data science. The training initiatives undertaken to date are summarized in Table 6.2.

These initiatives represent a first step toward developing internal awareness and foundational competencies; however, they remain limited in scope and continuity. At present, neither a structured training plan nor a systematic investment strategy has been established at the organizational level.

Table 6.2. Generative AI training currently underway

Course title	Cost	Class hours	Roles involved
Generative AI	€397	42 h	Marketing Manager, Digital Strategist, Social Media Manager
AI in Business: The Complete Guide	€97	10 h	Marketing Manager, Digital Strategist, Social Media Manager
AI prompt engineering	€49	4 h	Digital Strategist, Social Media Manager
Data Scientist Starter Kit	€197	30 h	IT Manager

In this context, ALFA’s current challenge lies in redefining its value proposition in light of the integration of Generative AI. **The agency must demonstrate how its consulting services expanded/ enabled by Gen AI inclusion can create distinctive value for clients, differentiating its offering from both traditional competitors and large global technology providers.** At the same time, the organization faces a structural skills gap: the effective adoption of Generative AI requires new technical, strategic, and organizational capabilities that are not yet fully developed within the agency.

This situation highlights the key dilemma that readers are invited to analyze: how can ALFA reshape its value proposition by integrating Generative AI in a structured way, moving beyond isolated projects toward a coherent strategy? **To succeed, ALFA must also close a significant skills gap, since the effective use of Generative AI requires technical expertise, strategic insight, and organizational capabilities that the agency has not yet fully developed.**

4. Analysis

The case of ALFA can be critically examined through the lens of the **Dynamic Capabilities framework**, which provides a conceptual foundation for understanding how firms sense opportunities and threats, seize them through strategic actions, and reconfigure their resources and processes to sustain competitive advantage in rapidly changing environments (Teece et al., 1997; Teece, 2007).



A first dimension concerns sensing capabilities, namely the organization's ability to identify emerging technological opportunities and anticipate shifts in client expectations. The case highlights how ALFA has begun to explore diverse applications of Generative AI, from content creation and customer personalization to campaign optimization and predictive analytics. These initiatives demonstrate the agency's capacity to recognize the transformative potential of the technology, yet the lack of an overarching strategy suggests that sensing remains fragmented. Compared with industry benchmarks, where leading global agencies systematically scan the technological environment and rapidly internalize best practices, ALFA's efforts appear exploratory rather than fully institutionalized. Strengthening sensing mechanisms would thus require the establishment of structured processes for market intelligence, technological scouting, and continuous monitoring of evolving client needs.

The second dimension involves seizing capabilities, which pertain to the organization's ability to translate identified opportunities into viable offerings and business models. At present, ALFA deploys Generative AI primarily as a tactical support tool that accelerates existing services, without embedding it explicitly within the agency's value proposition.

This approach enables efficiency gains and operational improvements but falls short of positioning Generative AI as a differentiating element of the agency's competitive strategy. In contrast, high-performing agencies seize AI opportunities by reconfiguring their service portfolios and by designing

monetization models that make AI central to their client value proposition. For ALFA, enhancing seizing capabilities implies moving beyond isolated pilot projects and instead developing scalable service frameworks, pricing structures, and communication strategies that articulate the added value of Generative AI in ways that are transparent and credible for clients.

The third dimension relates to reconfiguring capabilities, that is, the organization's ability to realign resources, processes, and competencies in response to technological transformation. The analysis shows that ALFA's current organizational arrangements for Generative AI are relatively simple, relying on a small number of roles with limited specialization. This configuration is functional for early experimentation but insufficient for systemic adoption. Reconfiguring capabilities would therefore require investments in human capital, particularly through the development of new skills in prompt engineering, data governance, and AI strategy. Moreover, organizational routines and workflows must be redesigned to integrate AI tools more coherently across projects, ensuring that learning from experimentation becomes institutionalized rather than remaining confined to isolated practices.

5. Alternatives

To address the challenges and opportunities associated with Generative AI, ALFA can pursue four distinct strategic paths, which differ in scope, investment, and capability requirements. These alternatives unfold along a continuum: starting with the tactical use of ready-to-use AI tools, the company may progress toward the integration of standardized solutions into client systems, then toward the development of customized solutions, and finally to the creation of a proprietary Generative AI platform. The further ALFA advances along this trajectory, the higher the level of innovation and differentiation achieved in its value proposition, but also the greater the complexity, resource demands, and capability development required. Each alternative presents specific benefits and risks, which are analyzed in the following sections.

Alternative 1: "ready-to-use AI"

A first strategic option for ALFA consists in consolidating the current use of Generative AI, maintaining it at a minimal level of adoption. In this perspective, the agency would continue to employ general-purpose tools available on the market (e.g., ChatGPT, GEMINI, Claude AI, MidJourney) as tactical support for day-to-day activities, while simultaneously emphasizing, also in client-facing communication, the use of Generative AI as an enabler of greater efficiency and productivity.

Consolidating the use of general-purpose Generative AI tools enables ALFA to achieve a number of benefits, primarily linked to operational efficiency. The adoption of generalist AI tools reduces the time required to produce textual and visual content and accelerates low-value-added operational tasks. This approach also ensures substantial economic sustainability, since the associated costs remain limited and easily scalable through accessible subscription models, without requiring significant infrastructural investments.

Another advantage derives from ease of implementation, as no advanced technical expertise or complex organizational interventions are needed, and from flexibility of use, which makes the tech-

nology readily accessible to different professional profiles within the agency. **This option may also serve an educational function, fostering the diffusion of an initial digital culture linked to the use of Generative AI and stimulating incremental learning processes among employees.** Finally, the introduction of internal policies and guidelines regulating the use of these tools helps reduce fragmentation and strengthen internal coherence, rendering adoption more uniform and coordinated.

From an organizational perspective, the adoption of such tools does not require the development of advanced technical competencies, but rather entails the diffusion of a basic literacy oriented toward the conscious and critical use of the technology.

Alongside these benefits, this first strategic alternative has several critical limitations that constrain its strategic effectiveness. First, **the capacity for competitive differentiation remains reduced, as the technology is confined to a tactical role of operational support rather than serving as a distinctive innovation driver.** Outputs produced by such tools also tend to be generic and standardized, with limited personalization and, at times, inconsistency with the client's brand identity, thereby necessitating significant human revision.

Additional risks concern data security and regulatory compliance: reliance on external platforms raises issues of confidentiality and information protection, with potential implications in terms of conformity to regulations such as the GDPR. Another criticality lies in the structural dependence on third-party providers, which exposes the agency to external constraints tied to policy changes, price variations, or alterations in available functionalities. Moreover, **the absence of deep integration within business processes diminishes the systemic impact of the technology, limiting its capacity to generate organizational learning.** These challenges are compounded by potential reputational and ethical risks associated with unsupervised use of AI outputs, which may undermine perceived service quality and, ultimately, the agency's credibility.

In this first alternative, the technology would not be integrated into organizational systems, yet it would nonetheless become an explicit and recognizable component of the agency's positioning.

Alternative 2: "offering based on standard solutions integrated into client systems"

The second alternative entails a strategic decision by ALFA to integrate standardized Generative AI solutions, developed and managed by established technology providers (such as Salesforce Einstein AI, Adobe Sensei, IBM Watsonx Assistant, Google Cloud AI), into its service offering. From this perspective, the agency moves beyond employing the technology merely as a tool to enhance internal productivity, positioning it instead as a structural component of the consulting services delivered to clients.

The distinctive feature of this option lies in the integration of such solutions directly into clients' enterprise systems, such as customer relationship management, marketing automation platforms, e-commerce environments, through Application Programming Interfaces (APIs) and secure cloud infrastructures compliant with data protection regulations (GDPR). This configuration enables a more efficient use of clients' proprietary data while simultaneously mitigating risks related to data dispersion or unauthorized reuse.

A concrete example may be the integration of Salesforce Einstein AI into the CRM of a retail client, whereby the agency enables predictive analytics functionalities to assess the purchase probability of different segments, thereby supporting automated and personalized e-mail marketing campaigns. Similarly, in the e-commerce domain, the adoption of Adobe Sensei allows for the automated classification of product images and the optimization of visual content in line with user preferences. In both cases, ALFA assumes the role of technological facilitator and strategic consultant, guiding clients in adopting these solutions, but also in configuring them and aligning them with pre-existing marketing processes.

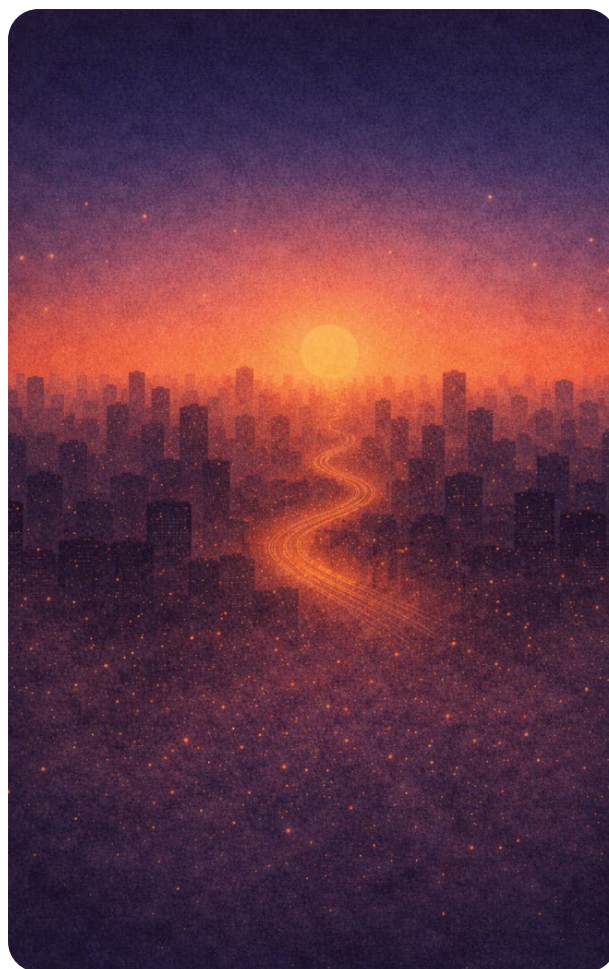
This choice positions the agency in an intermediate dimension: on the one hand, it does not require the development of proprietary and customized models, with their associated costs and complexities; on the other, it allows ALFA to deliver a service offering that is more robust and technologically advanced than the mere use of off-the-shelf, general-purpose tools.

The adoption of standardized AI solutions offers several advantages for organizations at the early stages of their technological integration journey. First, such tools are characterized by relatively low initial costs, generally structured as SaaS subscriptions or pay-per-use formulas, thus making them accessible even to small and medium-sized enterprises with limited financial resources. Second, the time-to-market is extremely short: implementation can be achieved in a relatively brief period, enabling firms to rapidly experiment the benefits.

Another advantage concerns the stability and reliability of these solutions, often guaranteed by global technology providers whose systems have already been tested and validated on a large scale. The use of widely adopted platforms also entails the benefit of regular updates and continuous support, reducing the risk of malfunctions and increasing adoption confidence.

Despite these advantages, this second strategic alternative also entails significant limitations. The first concerns their limited customization potential: these tools are designed to address common, generalizable needs but are rarely able to adapt precisely to specific workflows or to highly complex sectoral logics. As organizational needs grow, the effectiveness of these solutions tends to diminish, rendering them less suitable for contexts requiring high specialization.

A second critical element lies in the risk of vendor lock-in. Dependence on a single provider implies that updates, contractual modifications, or changes in pricing can directly affect the sustainability of



adoption. Moreover, data management represents an additional vulnerability: entrusting sensitive information to third-party cloud platforms inevitably entails privacy and security risks, particularly in regulated industries.

From a strategic perspective, these solutions present a limited capacity for competitive differentiation. Since they are widely accessible, their use does not generate unique or hard-to-replicate advantages. Finally, scalability is conditioned by the constraints of the vendor's ecosystem: should an organization wish to significantly expand or adapt its processes, it may encounter technological barriers requiring migration toward more complex or customized solutions.

Although the adoption of standardized AI solutions does not require highly advanced technical expertise, it nonetheless initiates a gradual process of capability building within the agency, particularly in system configuration, data management, and integration into existing workflows. In parallel, consulting and managerial competencies remain essential, as the agency must be able to transform standardized solutions into projects that deliver tangible value for clients.

Alternative 3: “offering based on customized AI solutions for clients”

Alternative 3 represents a more advanced and differentiating strategic choice for ALFA: the development and provision of fully customized Generative AI solutions, designed around the specific data, processes, and objectives of individual clients. Unlike standardized solutions, in this scenario the technology is not merely “integrated” within existing systems, but rather tailored to address complex needs that are difficult to manage through general-purpose tools.

A concrete example is the development of a proprietary chatbot for a client in the automotive sector, trained on a corpus of technical documents and the company's specific language, capable of handling complex assistance requests and providing responses aligned with the brand's identity. Another example is the creation of a customized predictive system for a retailer, able to combine historical sales data, regional preferences, and online behaviors to accurately forecast demand and optimize reordering, thereby reducing the risk of stockouts. In both cases, the solution developed by the agency becomes a unique and hardly replicable asset, embedded at the very core of the client's business processes.

From a strategic perspective, the adoption of this alternative implies that ALFA progressively transforms from a provider of marketing services into a technological and consulting partner.

Customized artificial intelligence solutions offer a series of advantages that make them particularly attractive for clients with complex needs or a differentiation-oriented strategy. The primary benefit lies in the availability of a system designed specifically for the client's business processes, capable of solving problems that standardized solutions cannot address.

Another key advantage is the competitive edge generated by proprietary models and datasets. When AI is developed ad hoc and trained on exclusive data, the outputs produced become difficult for competitors to replicate. At the same time, direct control over data and models ensures stronger privacy and security safeguards. **From an operational standpoint, customized AI enables more accurate decisions and more reliable predictive insights, thereby improving the quality of marketing**

strategies and the ability to anticipate consumer behavior. Finally, this approach allows for highly personalized customer experiences, such as refined product recommendations, hyper-segmented campaigns, or conversational interactions that reflect the brand's identity.

Despite these benefits, the adoption of customized AI solutions entails significant challenges. First, the initial cost is substantially higher than for standardized solutions, as it requires investments in design, computing infrastructure, data engineering, and software development. Second, implementation timelines are considerably longer: the development of a minimum viable product may take several months, while full-scale deployment can extend from six to twelve months.

Another challenge concerns the technical expertise required. The creation of proprietary models demands the involvement of data scientists, machine learning engineers, AI specialists. Integration with legacy systems poses an additional barrier: many client firms operate with layered technological architectures that are not always compatible with advanced AI implementations. Finally, in the absence of clear governance and careful planning, there is a heightened risk of project failure, linked either to ineffective technical implementation or to difficulties in aligning AI with the client's strategic objectives.

Alternative 4: “development of a proprietary Generative AI platform”

This strategic option involves developing a proprietary Generative AI platform that serves as a distinctive element of the agency's value proposition, specifically aimed at optimizing clients' marketing activities. Unlike standardized solutions, the platform constitutes a modular, multi-tenant, and scalable infrastructure that enables the configuration of intelligent agents. Key features of the platform include:

- **the mental model, an advanced prompting system that defines objectives, language, behavioral rules, and operational modes of the agents;**
- **the integration with knowledge based of the companys' data;**
- **a continuous learning system, based on semantic analytics, long-term memory, and automated testing, ensuring constant performance improvement;**
- **multimodality, which allows interaction via chat, voice, APIs, or custom interfaces, enabling flexible use across diverse application contexts.**

The platform can be adapted to multiple sectors and scenarios, offering vertical solutions that are difficult for big tech provider to replicate. Its modularity and scalability enable the continuous evolution of services, with new functionalities introduced in response to emerging client needs and technological innovation.

Nevertheless, **the creation and maintenance of a proprietary platform entails high costs in terms of development, infrastructure, and ongoing updates.** In addition, the rapid pace of technological evolution obliges the agency to constantly monitor advances in large language models and open-source libraries, while carefully selecting investment priorities to avoid obsolescence or redundancy with functionalities provided by big tech players. Although integration with client systems represents a strength, it also requires advanced technical skills and risks introducing project complexity. Moreover, as probabilistic systems, these solutions face the persistent challenge of ensuring consistent responses over time, necessitating continuous testing and monitoring.



From an organizational perspective, the agency must assess whether to develop the necessary capabilities internally or rely on external technology partners. Building in-house expertise offers greater control and long-term autonomy but requires significant investment in recruiting and training technical and managerial profiles. Conversely, collaborating with external partners can accelerate development and reduce initial costs, although it may increase dependence on third parties and limit the agency's ability to fully appropriate the strategic value of the platform.

6. Conclusion and Recommendations

The case of ALFA presents a medium-sized digital agency that has already initiated the use of Generative AI across several marketing applications. **Although still fragmented, these applications have enabled the agency to experiment with the immediate benefits of the technology in terms of efficiency, speed, and scalability.** However, the central issue of the case concerns the strategic dilemma of how Generative AI should be integrated into ALFA's value proposition, transforming it from a tactical support tool into a distinctive lever for competitive differentiation.

To address this dilemma, **the case outlines four strategic alternatives: the use of generic “ready-to-use” tools, the integration of standardized solutions into client systems, the development of fully customized solutions, and, finally, the creation of a proprietary platform.** Each of these options presents specific benefits, ranging from operational efficiency to opportunities for differentiation, while also posing significant challenges related, for instance, to investment costs, implementation timelines, risks of technological lock-in, and the need to ensure data security and governance.

A cross-cutting element across all alternatives lies in their organizational implications. The ability to fully leverage Generative AI depends also on the strengthening of internal competencies. It becomes essential to invest in employee training or to acquire the necessary skills through partnerships and new hires. In the absence of a structured plan for capability development, the adoption of the technology risks remaining superficial and insufficient to generate a competitive advantage.

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BUILDING CRITICAL SKILLS FOR THE AI AGE

Anna Rogala & Piotr Kwiatek

Critical thinking is one of the most important competencies in the digital age. Contemporary societies operate in an environment characterized by constant access to information, rapid communication, and an expanding range of digital technologies. Every day, individuals consume news articles, social media posts, reports, reviews, comments, videos, statistics, and AI-generated content. Information is easier than ever to access, copy, and share, and it is often presented (and misrepresented) in ways that appear clear, credible, and persuasive.

However, easy access to information does not guarantee its quality. Not all information is accurate, reliable, or useful, and not every confident statement is supported by sound evidence. As content becomes ubiquitous, the ability to distinguish trustworthy information from misleading content becomes more important.

Critical thinking provides a framework for navigating this environment. Rather than passively accepting information, critical thinkers actively choose sources, evaluate claims, examine evidence, question assumptions, and consider

alternative explanations. Critical thinking encourages individuals to move beyond first impressions and make more informed judgments based on reasoned analysis. This ability has always been valuable in both education and professional life. Students and employees are expected not only to gather information but also to interpret it, evaluate its credibility, and apply it appropriately in decision-making and problem-solving situations.

This chapter examines the concept of critical thinking and its role in the digital world. It introduces the core cognitive skills associated with critical thinking, including interpretation, analysis, evaluation, inference, explanation, and self-regulation. It also presents practical approaches to assessing information quality and explores how digital technologies can both support and undermine critical thinking processes.

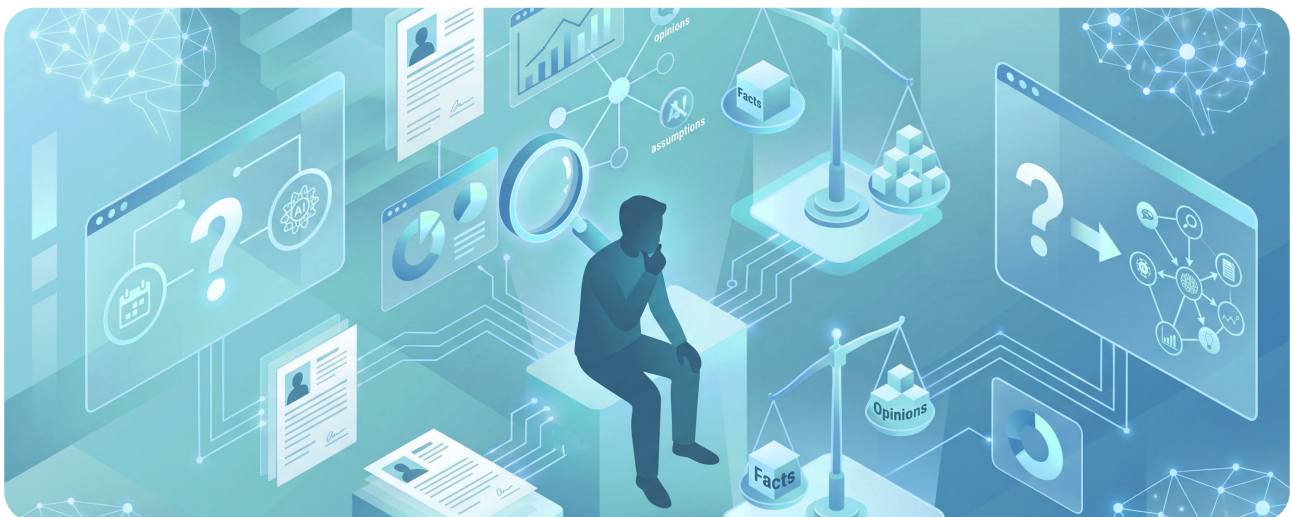
Here, we are examining the growing role of artificial intelligence. As AI systems become integrated into learning, work, and everyday decision-making, critical thinking is increasingly required when evaluating information sources,

and when interacting with intelligent technologies. Understanding how to question AI-generated outputs, evaluate evidence, and maintain independent judgment is becoming an essential component of digital literacy. The goal of this chapter is not to discourage the use of technology or artificial intelligence. Rather, it is to develop the skills needed to use these tools thoughtfully, responsibly, and critically in an increasingly information-rich environment.

7.1 WHAT CRITICAL THINKING IS

Critical thinking is often misunderstood as the tendency to criticize everything or reject new ideas. When used by people trained in its discipline, that is not what it is. Critical thinking is the ability to think in a deliberate, active, and logical way. It requires individuals to collect, interpret, and analyze information methodically rather than react to it immediately. Instead of accepting claims at face value, critical thinkers pause, ask questions, and examine the evidence before reaching conclusions. In this sense, critical thinking is both an intellectual skill and a habit.

Critical thinking involves several interconnected activities. It includes identifying relationships between ideas, analyzing and evaluating arguments, and recognizing patterns that may help explain a situation. At the same time, it requires an awareness of common reasoning errors. One of the most important is the tendency to confuse correlation with causation. Two events may occur together without one causing the other. For example, students who use digital flashcards may achieve better grades, but this does not necessarily mean that the flashcards are the direct cause of their success. It may also be the case that these students study more consistently, are more motivated, or already possess stronger learning habits. A critical thinker asks what the actual relationship is and whether sufficient evidence exists to support a causal explanation.



Another important aspect of critical thinking is the ability to distinguish facts from opinions. This skill is particularly valuable in digital environments, where opinions are often presented in ways that resemble factual statements. A claim such as “This app is the best way to learn” may sound authoritative, but a critical thinker considers whether it represents objective evidence, a personal judgment, a marketing message, or simply an unsupported opinion.

Critical thinking also means paying attention to what may be missing from an argument. Conclusions can be based on incomplete evidence, weak reasoning, or insufficient context. Sometimes the information presented is accurate but incomplete, leading to interpretations that may be misleading. Critical thinkers look not only at what is present, but also at what has been omitted.

At the center of critical thinking lie two fundamental questions: How do I know what I think I know? And what evidence backs up the things I think I know? These questions encourage individuals to distinguish between knowledge and assumptions and to examine the foundations of their beliefs more carefully. They also raise questions about meaning, evidence, credibility, and the criteria used to evaluate information.

Although these questions may appear simple, answering them well is often challenging. They require people to slow down, reflect, and resist the temptation to accept information too quickly. For this reason, critical thinking is often described as the habit of checking before believing and thinking before repeating.

7.2 COGNITIVE SKILLS FOR CRITICAL THINKING

Critical thinking is built on a set of core cognitive skills that use reasoning, judgment, and decision-making. These skills include interpretation, analysis, evaluation, inference, explanation, and self-regulation. Although each serves a different purpose, together they form the foundation of critical thinking. Individuals who develop these abilities become better readers, problem-solvers, and decision-makers, not only in academic settings but also in everyday situations that require careful judgment.

Interpretation is the ability to understand and express meaning. It helps us make sense of texts, images, charts, messages, statements, and situations by identifying their main ideas and significant elements. For example, when examining a chart showing students' interaction time with ChatGPT, interpretation means examining what the chart actually communicates. Is interaction increasing or decreasing? Is the change substantial or relatively small? Does the chart demonstrate causation, comparison, or merely describe a pattern? Without interpretation, information is difficult to understand and use effectively.

Analysis builds on interpretation by examining the relationships between claims, evidence, reasons, assumptions, and conclusions. It helps reveal how an argument is constructed and whether its logic is convincing. Consider the statement: "Recent academic reports show that students' use of generative AI weakens critical-thinking skills." Analysis encourages us to identify the central claim, examine the supporting evidence, and uncover any assumptions hidden within the argument. In doing so, it allows us to evaluate what is being said and how the argument has been developed and framed.

Evaluation focuses on judging the credibility of information and the strength of evidence. Critical thinkers assess the reliability of sources, the quality of supporting data, and whether conclusions are justified. For example, a statement such as "Research proves that handwriting is always better than typing" invites several questions. Which research? Who conducted it? Under what conditions? What was the sample size? Was there a control group? Does the evidence really justify the word "always"? Evaluation protects us from arguments that appear convincing but are supported by weak evidence or overly confident language.

Inference refers to the process of drawing reasonable conclusions from the information we have. It involves considering possible explanations, identifying what can and cannot be concluded, and recognizing uncertainty. If a student's performance improves after using AI as a study companion, it may be tempting to conclude that AI caused the improvement. However, other factors may also be involved, including increased study time, improved planning, or changes in course requirements. Inference helps distinguish between conclusions supported by evidence and conclusions based largely on assumptions.

Explanation is the ability to justify and communicate reasoning clearly. Critical thinkers do not simply express opinions; they explain the reasons behind them. Saying “This source is unreliable” is a judgment. Saying “This source may be unreliable because it provides no author, publication date, or supporting evidence” is an explanation. The ability to explain reasoning is particularly significant in education and professional environments, where decisions and conclusions are expected to be supported by clear arguments.

Self-regulation is often considered the most demanding of the critical-thinking skills because it requires individuals to examine their own thinking. It involves questioning personal assumptions, recognizing potential biases, and reconsidering conclusions when new evidence emerges. Critical thinking is not only about evaluating information from external sources; it is also about evaluating our own judgments. This requires the willingness to step back from initial reactions and assumptions and ask whether our reasoning is balanced, fair, and supported by evidence.

Critical thinking depends not only on skills but also on dispositions. A person may possess the ability to think critically and yet choose not to apply it. For this reason, researchers emphasize the importance of personality traits and skills such as curiosity, open-mindedness, truth-seeking, systematic thinking, analytical thinking, sound judgment, and confidence in reasoning. Human skills are what individuals can do, while dispositions influence whether they actually use their abilities. Together, skills and dispositions create the conditions necessary for sound judgment and effective critical thinking (Figure 7.1).

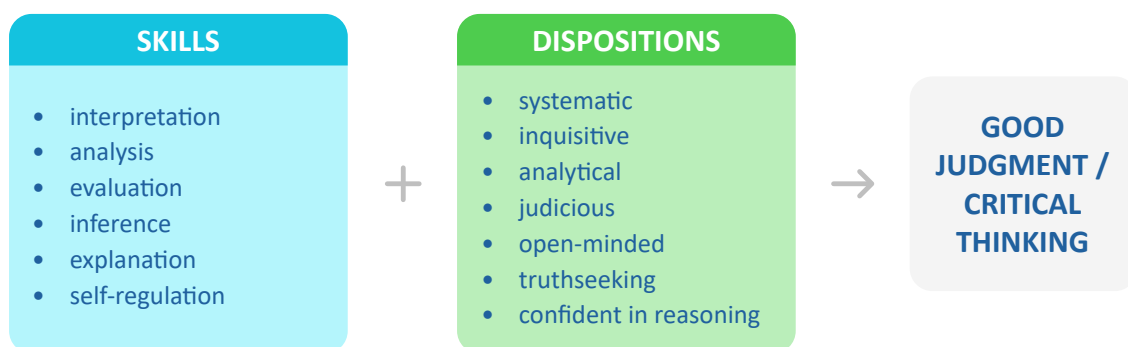


Figure 7.1: Key components of good judgment and critical thinking

7.3 TOOLS FOR CRITICAL THINKING

Understanding the principles of critical thinking is important but applying them in practice can be more challenging. For this reason, several frameworks have been developed to help individuals evaluate information, assess sources, and reflect on the quality of their own reasoning. Three of the most widely used frameworks are SIFT, CRAAP, and the Paul–Elder framework. Each is designed for a different purpose, but together they provide a practical toolkit for navigating complex information environments.

SIFT is particularly useful when evaluating fast-moving digital content such as social media posts, trending claims, online articles, statistical graphics, or AI-generated outputs. The framework consists of four steps: Stop, Investigate the source, Find better coverage, and Trace the claim to the original source.

The first step, *Stop*, encourages individuals to pause before reacting, sharing, or believing information. This moment of reflection creates distance and reduces the likelihood of making quick judgments. *Investigate the source* involves examining who created the content, whether they are credible, and what their motivations might be. *Find better coverage* means searching for stronger evidence from reliable sources rather than relying on a single claim. Finally, *Trace the claim to the original source* focuses on identifying where a statistic, quote, image, or statement originated and whether it has been reported accurately. For example, imagine encountering a social media post claiming that “most students remember more from videos than from books.” SIFT encourages individuals to pause before accepting the claim, examine the source, look for stronger supporting evidence, and locate the original research if it exists.

Another useful framework is the CRAAP test, which is commonly used to evaluate the quality of websites, reports, articles, and research studies. CRAAP stands for Currency, Relevance, Authority, Accuracy, and Purpose (Figure 7.2).



Figure 7.2: CRAAP framework

Currency asks whether the information is up to date. Relevance examines whether the source addresses or offers an explanation for a particular question, topic, or task. Authority focuses on the credibility of the author, organization, or institution responsible for the content. Accuracy considers whether the information is supported by evidence and whether claims can be verified. Purpose encourages individuals to think about why the material was created and whether its primary goal is to inform, persuade, promote, or attract attention. For example, when reading an article titled *Five Proven Ways to Improve Memory*, the CRAAP test helps determine whether it is recent, relevant, written by a credible author, supported by evidence, and intended to provide reliable information rather than marketing or promotional content.

While SIFT and CRAAP primarily evaluate external information, the Paul–Elder framework evaluates the quality of reasoning itself. It is particularly useful when the challenge lies not only in assessing a source, but also in examining how conclusions are formed. The framework encourages individuals to ask questions such as: What is my purpose? What question am I trying to answer? What assumptions am I making? What evidence supports my conclusion? What might happen if my conclusion is wrong? (Table 7.1)) To answer these questions effectively, Paul and Elder propose several intellectual standards

that can be applied to reasoning. Clarity is about making ideas understandable. If an argument is unclear, it is difficult to evaluate. Accuracy concerns truth and verification, asking whether a claim can be verified and if it is supported by evidence. Precision encourages greater detail and specificity, while relevance assesses whether information is directly connected to the problem under consideration.

Table 7.1: Questions based on the Paul–Elder framework

Clarity Questions	Could you elaborate further? Could you illustrate what you mean? Could you give me an example?
Accuracy Questions	How could we check on that? How could we find out if that is true? How could we verify or test that?
Precision Questions	Could you be more specific? Could you give me more details? Could you be more exact?
Relevance Questions	How does that relate to the problem? How does that bear on the question? How does that help us with the issue?
Depth Questions	What factors make this a difficult problem? What are some of the complexities of this question? What are some of the difficulties we need to deal with?
Breadth Questions	Do we need to look at this from another perspective? Do we need to consider another point of view? Do we need to look at this in other ways?
Logic Questions	Does all of this make sense together? Does your first paragraph fit in with your last one? Does what you say follow from the evidence?
Significance Questions	Is this the most important problem to consider? Is this the central idea to focus on? Which of these factors are most important?
Fairness Questions	Do I have any stake in this issue? Am I sympathetically representing the viewpoint of others?

The framework also emphasizes depth, which recognizes that problems involve hidden factors and complexities that require more than simple explanations. Breadth encourages the consideration of alternative perspectives and viewpoints. Logic examines whether conclusions follow consistently from the evidence provided. Significance helps identify the most critical issues and factors, while fairness promotes balance, intellectual honesty, and respect for alternative viewpoints.

The Paul–Elder framework is particularly valuable when dealing with complex questions because it reminds us that critical thinking is not only about evaluating information from external sources. It is also about evaluating the structure and quality of our own thinking. Table 7.1 summarizes the primary purpose of each framework and the types of situations in which it is most useful.

Table 7.2: Overview of critical thinking frameworks

Tool	Best for	Key Question	Output
SIFT	Fast digital content (social media posts, trends, viral claims)	<i>Should I trust this right now?</i>	Quick credibility check
CRAAP	Reports, articles, market research, and project sources	<i>Is this source high quality?</i>	Source quality decision
Paul–Elder Framework	Reasoning, strategic decisions, and AI-supported judgments	<i>Is my reasoning sound?</i>	Better judgment and stronger reasoning

Taken together, these frameworks demonstrate that critical thinking can be practiced systematically. A useful rule of thumb is to use SIFT when evaluating rapidly circulating information, CRAAP when assessing source quality, and the Paul–Elder framework when examining the quality of one’s own reasoning. In combination, they provide practical support for making more informed decisions in increasingly complex digital environments.

7.4 HOW DIGITALIZATION CAN WEAKEN OR STRENGTHEN CRITICAL THINKING

Digitalization is transforming how people learn, search for information, read, remember, communicate, and make decisions. It provides unprecedented speed, access, and convenience, but it also introduces important challenges that can influence the quality of thinking and judgment.

One of the most significant risks is cognitive offloading, which involves transferring mental work to external tools rather than performing it ourselves. For example, a student may ask an AI system to summarize a chapter, explain a concept, create study notes, and even suggest answers to questions. Although this can save time, problems arise when the student accepts the output without reflection, comparison, or evaluation. In such situations, learning may become superficial. The individual may think they are informed while lacking a deeper understanding of the topic. This can create the illusion of knowledge, in which confidence increases even though genuine understanding remains limited.

Digital environments also accelerate the spread of information, including accurate and inaccurate content. False information often circulates successfully because it is simple, emotionally engaging, surprising, and easy to repeat. Repeated exposure to a claim can make it seem true even when the supporting evidence is weak or nonexistent. At the same time, digital platforms reward speed rather than reflection. Users are encouraged to react quickly, move on to the next piece of content, and to process enormous amounts of information in a short time. Under these conditions, critical thinking is more difficult, careful judgment requires attention, comparison, and time.

Another important challenge is automation bias, which refers to the tendency to trust technological systems too readily because they seem objective, neutral, or sophisticated. Artificial intelligence provides a clear example of this phenomenon. AI-generated responses are often fluent, well-structured, and confident. However, a convincing answer is not necessarily a correct one. Information may still be incomplete, misleading, or inaccurate despite its professional appearance.

Digitalization also contributes to information overload. Individuals are exposed to countless sources of information every day, including websites, notifications, reports, summaries, opinions, videos, and social media posts. In such an environment, it becomes more natural to skim rather than read carefully and to react rather than respond. As a result, digitalization can weaken critical thinking if convenience replaces understanding and when technological tools substitute for active mental effort. At the same time, digitalization is not only a threat. Digital technologies can also strengthen critical thinking when used deliberately and responsibly. They make it easier to compare different perspectives, organize information, visualize data, and explore complex questions. Digital tools can support research, revision, analysis, and reflection, as long as users actively monitor and guide the process.

Artificial intelligence can also function as a valuable thinking partner. It can help generate examples, compare explanations, identify gaps in an argument, and support the preliminary stages of problem-solving. However, these benefits emerge only when individuals learn how to use the system and maintain responsibility for evaluating and interpreting the results.

A useful way to think about this relationship is to consider who is in control of the decision-making process. In the most effective scenario, a person uses digital tools to support thinking and then applies independent judgment before reaching a conclusion. In a less desirable scenario, the tool itself effectively determines the outcome because the user accepts its recommendations without evaluating them.

The key principle is straightforward: digitalization supports critical thinking when technology enhances the thinking process, but it undermines it when people don't think. The central question is not whether digitalization is beneficial or harmful, but how digital tools can be used to keep human thinking active, reflective, and independent.

7.5 HOW TO QUESTION AI: PROMPTS, DATA, AND JUDGMENT

Having discussed critical thinking, its core skills, and the impact of digitalization, the next step is to consider how AI-generated outputs should be evaluated. Artificial intelligence is increasingly used in learning, work, and everyday decision-making. It explains concepts, summarizes texts, generates examples, answers questions, and organizes information. These capabilities can significantly improve efficiency, but they also introduce an important challenge. AI often produces responses that are fluent, coherent, and confident, even when they are incomplete, too general, or incorrect. Consequently, the essential skill is not only knowing how to use AI, but also knowing how to question its outputs.

A practical way to evaluate AI-generated responses is to apply three sequential checks: prompts, data, and judgment (Figure 7.3). Together, these three elements form a simple framework that helps distinguish useful answers from those requiring further verification.

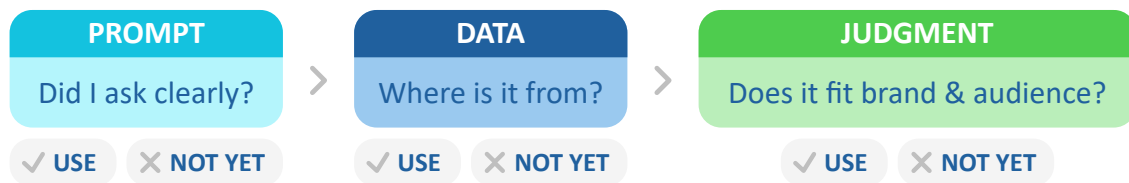


Figure 7.3 Three-step framework for questioning AI

The first step concerns the prompt, that is, the instruction given to the AI system. The quality of the prompt strongly influences the quality of the response. Broad or vague prompts often generate equally broad and generic answers that may be factually correct but of limited practical value.

For example, a prompt such as *"Explain GenAI in marketing"* is likely to produce a general overview. A more effective alternative would specify both the expected scope and the required level of analysis, for example:

Explain the role of GenAI in marketing in clear academic language. Define GenAI, describe five main applications in marketing, identify three potential risks, and explain one limitation that should be considered before using it in a real business context.

The second prompt is more useful because it provides clear structure while also requiring discussion of limitations rather than focusing exclusively on benefits.

An important principle is that AI should not be asked only for answers but also for reasoning. Prompts that encourage explanation, justification, and critical reflection generally produce more informative outputs than prompts seeking only factual information. Questions such as *What assumptions are you making? What information is missing? What alternative interpretations exist? What evidence would strengthen this conclusion? or What should be verified before using this information?* encourage AI to explain its reasoning process rather than simply presenting a finished response. In this way, prompts become tools for critical thinking rather than just being tools for information retrieval.

The second step concerns data. AI frequently presents numerical information that appears objective, scientific, and precise. However, numbers should not be accepted simply because they are expressed quantitatively. Their value depends on their source, context, and interpretation.

For example, an AI system may state that *"Students remember 45 percent more when they use visual learning."* Although such a statement might be persuasive, critical evaluation requires additional questions. Where does this number come from? Is it based on empirical research, a benchmark, or only an estimate? Compared with what? Is the evidence current, relevant, and independently verifiable?

Users should also remain cautious of false precision. A figure such as *21.7 percent* may appear highly scientific simply because it contains decimal places. However, precision does not necessarily indicate accuracy. Numerical information should be interpreted in its methodological context rather than accepted at face value.

The third step is judgment. Even when prompts are carefully designed and supporting data appear credible, human judgment is indispensable. The final question is not if AI produced an answer, but if that answer is useful, and if it should actually be used.

Judgment involves evaluating whether the response fits the purpose of the task, whether it reflects the appropriate context, whether important limitations have been acknowledged, and whether the explanation adequately captures the complexity of the issue. AI can support analysis and decision-making, but it cannot replace human responsibility for interpreting information and making final decisions.

For this reason, a well-written response should not automatically be regarded as a reliable one. Fluency is not evidence of correctness, and confidence is not proof of accuracy. Judgment functions as the final filter through which every AI-generated response should pass before it is accepted or applied.

The framework presented in this chapter can be summarized through three simple questions:

- Prompt: *Did I ask clearly and critically?*
- Data: *Where does this information come from?*
- Judgment: *Does this answer make sense in this context, and should I use it?*

Applying these three checks encourages a more reflective approach to AI. Rather than accepting outputs uncritically or rejecting them altogether, users learn to evaluate them systematically. The objective is not to avoid AI, but to ensure that human reasoning remains actively engaged throughout the decision-making process.



7.5.1 TASK: CRITICAL EVALUATION OF AI-SUPPORTED MARKETING DATA

In this task, you will make a marketing decision based on data compiled with the support of AI tools. The objective is not to rely on intuition alone, but to critically evaluate the information on which the decision is based. You will analyze data outputs and consider how they inform the decision to launch or not launch a product.

1. Analyze the briefing below.
2. Make a recommendation:
Proceed with the launch (GO) or cancel the project (NO-GO).
3. Support your decision: Select 3 specific pieces of information from the data that were most influential in your choice.

Our company is considering a nationwide launch of EcoFlow a premium organic energy drink. The proposed RSP (recommended retail price) is **£4.50 per 250ml can**. The current market leaders, such as Red Bull and Monster, have an average retail price of **£1.40–£1.70**. Here is a summary of the data we have available, prepared by an AI assistant.

1. Consumer Sentiment & Digital Trends

1. **The Green Wave Data:** A nationwide survey of 5,000 Gen Z and Millennial consumers shows that **82% "strongly agree"** they are willing to pay a premium for 100% plastic-free, carbon-neutral beverages.
2. **Social Listening:** The hashtag #ConsciousEnergy has seen a **310% increase** in mentions over the past 6 months. Key influencers in the Clean Girl and biohacking markets have organically shared posts about the importance of clean ingredients in energy drinks.
3. **Brand Perception:** In focus groups, participants characterized the brand name EcoFlow as "trustworthy," "modern," and "exclusive." Additionally, **90%** of participants rated the matte-finish aluminum can as "highly Instagrammable" and as appearing worth **£5**.

2. Competitive Landscape & Category Performance

1. **Market Growth:** The UK energy drink sector saw a **15%** increase in value last year. Most of this growth, **92%**, came from budget/value private-label brands and large multipacks, such as 4-packs costing £4.00.
2. **Specialty Retailers:** High-end health food stores (e.g., Whole Foods) report **5%** growth in organic beverages, yet these outlets account for less than **2%** of total nationwide beverage volume.
3. **Shelf Space Competition:** The average UK supermarket that sells energy drinks stocks 45–60 different SKUs. New brands typically lose their new product shelf placement if they do not meet target sales within the first **8 weeks**.

3. Economic Reality & Consumer Spending

1. **Discretionary Spending Index:** ONS (Office for National Statistics) data shows that extra-budgetary spending on premium snacks and drinks among 18–34-year-olds has declined by **22%** over the past two quarters.
2. **The Eco-Gap:** While 82% say they will pay more for eco-products (see Section I), supermarket scanner data shows that when an eco-brand is priced more than 50% higher than the category leader, its market share drops to less than 0.5%.
3. **Search behavior:** Google Trends indicates a **45% rise** in searches for "best value energy drink" and "supermarket energy drink deals" during the same timeframe.

4. Product Testing & Quality Assurance

1. Blind Taste Test Results (N=200):

- **65%** of testers described the flavor as "too medicinal," "bitter," or similar to herbal tea."
- **20%** praised the "natural, non-chemical aftertaste."
- **15%** were neutral.

2. **Functionality:** Because EcoFlow uses natural caffeine (Guarana) rather than synthetic caffeine, the energy kick is delayed by 30 minutes. **40%** of testers reported they "didn't feel anything" immediately after consumption.

5. Financial & Operational Requirements

1. **Profitability threshold:** Due to high costs for organic ingredients and plastic-free packaging, the break-even point is high. To remain on supermarket shelves, EcoFlow must sell **100 units per store per day**.
2. **Benchmark data:** Currently, the top-selling premium energy drink in the UK averages **12–18 units per store per day**. A 100-unit target has only been reached by major brands during multi-million-pound buy one get one free (BOGOF) campaigns.
3. **Marketing budget:** The board has set aside **£2M** for the launch. Costs for a nationwide influencer-led campaign are estimated at **£1.8M**, which leaves only **£200k** for in-store promotions and sampling.

Concluding observations:

In marketing, we often fail not because we lack data, but because we overprioritize noisy data that confirms our excitement. This exercise tested your ability to distinguish between consumer declarations (what they say) and market operations (what they do).

The core conflict: [T] Traps vs. [F] Facts

Your analysis was based on two types of information:

[T] –Aspirational traps (soft data): These segments (1.1, 1.2, 1.3, 2.1) focused on trends, likes, and intentions. They are seductive because they make a brand feel cool and necessary.

[F] –Operational realities (hard data): These segments (2.2, 3.1, 3.2, 4.1, 4.2, 5.1, 5.2, 5.3) focused on price elasticity, flavor retention, and sales velocity. They are kill-joy facts that keep a project grounded in reality.

Detailed Profile Analysis – Which one are you?

Profile A: The trend follower (Selected 3x [T] and chose GO)

- **Analysis:** You fell for the halo effect. You assumed that because the "Eco" trend is ostensibly virtuous, the business model would automatically succeed.
- **The critical miss:** You prioritized intent over action. You relied on what people say in surveys while ignoring the drastic decline in their purchasing power.
- **Risk:** You risk wasting the budget on a vanity project: a product everyone likes on Instagram, but no one adds to their shopping cart.

Profile B: The cautious optimist (Selected mixed [T] and [F] and chose GO)

- **Analysis:** You spotted the red flags but succumbed to optimism bias. You believed that "great branding" could fix a product that is overpriced and tastes awful.
- **The critical miss:** You ignored operational barriers. Setting a sales target 6x higher than the market record is mathematically impossible, not an ambitious challenge.
- **Risk:** You are launching a zombie brand – it will generate good PR initially but will be delisted within weeks because of zero repeat purchases.

Profile C: The strategic realist (Selected 2-3x [F] and chose NO-GO)

- **Analysis:** Congratulations. You resisted confirmation bias and understood that a business is built on cash flow and logistics, not just buzzwords.
- **The success:** You recognized that the numbers don't lie. You prioritized hard data on consumer spending and retail reality over marketing noise and vague intentions.
- **Takeaway:** You protected the company's capital by rejecting a project that lacked a viable path to profitability.

Profile D: The instinctive skeptic (Selected 3x [T] but chose NO-GO)

- **Analysis:** You made the right call, but your reasoning is inconsistent. You selected only the optimistic data yet still rejected the launch.
- **The critical miss:** This suggests you are leading with gut instinct. Intuition is valuable, but it won't convince a board of directors unless you can present hard evidence.
- **Takeaway:** Back up your intuition. Learn to identify the inconvenient facts (F-tags) to turn your gut instinct into an unshakeable business case.

Critical thinking in marketing means actively seeking reasons to kill your favorite ideas. If an idea survives your attempt to "destroy" it with hard data, it is likely a winner. Ask yourself every day: "Am I looking at the data, or am I looking for an excuse to do what I already want to do?"



7.6 KEY TAKEAWAYS

- Critical thinking is the ability to evaluate information, evidence, and arguments before accepting conclusions or making decisions.
- Critical thinking involves six core cognitive skills: interpretation, analysis, evaluation, inference, explanation, and self-regulation.
- Effective critical thinking includes both skills and dispositions such as curiosity, open-mindedness, analytical thinking, and a commitment to seeking truth.
- Critical thinkers distinguish facts from opinions, question assumptions, and avoid confusing correlation with causation.
- Frameworks such as SIFT, CRAAP, and the Paul–Elder model provide practical tools for evaluating information, sources, and reasoning.
- While digital tools provide access to information and support analysis, they can also contribute to cognitive offloading, information overload, and automation bias.
- AI-generated content should be treated as information to evaluate rather than information to accept automatically.
- Critical thinking supports responsible use of AI by encouraging users to verify claims, assess evidence, and maintain independent judgment.
- The quality of decisions depends not only on access to information but also on the ability to interpret, question, and evaluate that information effectively.
- A useful habit of critical thinking is to ask four questions:
 - What is the claim? What is the evidence? How reliable is the source? And does my reasoning support the conclusion?



7.7 FURTHER READING

Critchlow, H. (2026). *The 21st Century Brain: How to Future-Proof Your Mind in the Age of AI*, from the Sunday Times Bestselling Neuroscientist.

DiYanni, R. (2016). *Critical and creative thinking: A brief guide for teachers*. Wiley Blackwell.

Grant, A. (2021). *Think again: The power of knowing what you don't know*. Viking.

Nisbett, R. E. (2016). *Mindware: Tools for smart thinking* (1st paperback edition). Farrar, Straus and Giroux.

Pherson, K. H., & Pherson, R. H. (2021). *Critical thinking for strategic intelligence* (3rd edition). Sage, CQ Press.



CRITICAL THINKING WHEN USING AI IN MARKETING

Anna Rogala & Piotr Kwiatek

The previous chapter introduced the concept of critical thinking, the cognitive skills that support it, and its importance when working in digital environments. This foundation is particularly relevant today because we have constant access to information, opinions, images, data, and ready-made answers. Much of this content appears clear, convincing, and authoritative. However, information that looks credible is not necessarily accurate, and persuasive arguments are not always supported by reliable evidence. These challenges are even more crucial when it comes to artificial intelligence. AI systems can generate audience insights, campaign ideas, content suggestions, channel recommendations, and performance forecasts within seconds. For marketers, these capabilities offer significant benefits. They can save time, support planning, expand the range of available options, and facilitate decision-making processes.

At the same time, AI introduces new risks. AI-generated outputs are often well structured, coherent, and professionally written. As a result, they may appear ready to use before they have been rigorously evaluated. The speed and fluency of AI-generated responses can create a false impression of accuracy and reliability, encouraging users to accept recommendations without scrutinizing them. This raises an important question: why do marketers still need critical thinking in the age of AI?

To answer this question, this chapter examines how AI-generated outputs can influence marketing reasoning and decision-making. It explores situations in which AI may mislead users, the analytical pitfalls that can arise when working with AI-generated data, and the limitations of over-reliance on automated recommendations. Particular attention is given to the role AI should—and should not—play in marketing decisions, including decisions made within teams.

The central argument of this chapter is straightforward. In contemporary marketing, the challenge is not simply to generate more answers, more insights, or more recommendations. The real challenge is to determine whether those outputs are relevant, credible, and actionable (Figure 8.1).



Figure 8.1: Marketing output evaluation

Artificial intelligence can gather information extremely quickly, and create content almost immediately, but critical marketing thinking begins when we decide how much trust to place in that information.

8.1 WHY DO WE NEED MARKETERS TO BE CRITICAL THINKERS?

If AI can analyze data, generate content, personalize campaigns, and support decision-making, why do marketers still need critical thinking? The answer is simple: speed does not equal judgment.

Artificial intelligence is transforming marketing in significant ways. In their paper *AI-Powered Marketing: What, Where, and How*, Kumar, Ashraf, and Nadeem describe AI as a powerful force that can improve efficiency, personalization, customer insights, and campaign decision-making. At the same time, they emphasize that AI introduces critical risks, including privacy and security concerns, bias, misuse, and misinformation. A more recent multidisciplinary review by Albashrawi reaches a similar conclusion, arguing that although generative AI can improve data processing and decision support, reliable outcomes still depend on human oversight and careful attention to bias, misinformation, and transparency. This is precisely why critical thinking is essential in marketing. Rather than asking what AI can do, marketers must also examine the quality of the context they feed AI, and the outputs they receive. They need to consider what an output is based on, what information may be missing, whether a recommendation is relevant to a particular audience or market context, and whether it is fair, well-supported, and appropriate for the decision at hand.

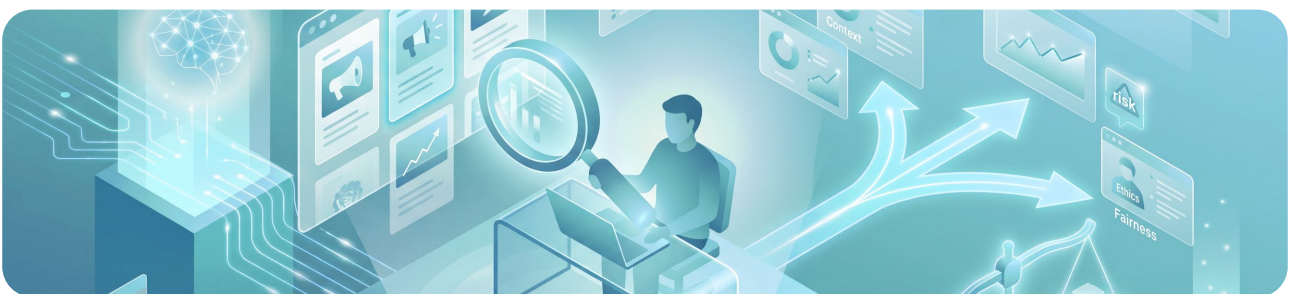
These questions matter because AI-generated outputs often appear persuasive even if they have not been evaluated. In *Three Challenges for AI-Assisted Decision-Making*, Steyvers and Kumar argue that the effective use of AI not only depends on model performance, it also depends on whether users possess accurate mental models of how AI works and whether they rely on it appropriately. When these mental models are underinformed or missing, trust becomes misaligned with reality and users may either rely on AI too much or reject it unnecessarily.

AI can generate answers, but it cannot determine whether those answers are trustworthy, ethical, or useful. That responsibility is the purview of human decision-makers. This is particularly important in marketing because marketing decisions directly affect people. They influence what customers see, how they are targeted, which messages they receive, and which behaviors they are encouraged to adopt. If AI enables more precise targeting, humans still need to decide whether that targeting is appropriate and fair. If AI generates content at scale, humans remain responsible for ensuring that the content is accurate, responsible, and suitable for the intended audience.

A similar perspective is presented by the Massachusetts Institute of Technology Sloan School of Management, which argues that questions concerning values, fairness, responsibility, and organizational identity are human questions in the long run. They cannot be delegated entirely to algorithms or predictive models. The risks associated with AI in marketing are not only technical they are also impact strategic and ethical policies. Privacy is compromised because AI systems often rely on large volumes of personal data. Bias matters because models can reproduce and amplify existing inequalities. Misinformation is a factor because AI can generate and distribute misleading content faster and at scale. Accountability matters because organizations are still responsible for the decisions they make, regardless of whether those decisions were supported by AI.

Generative AI presents both opportunities and challenges. While it can improve efficiency and expand analytical capabilities, it can also create problems related to consent, transparency, accountability, and privacy. The central question is not whether AI is useful. It clearly can be. The bigger question is how marketers use it.

Marketers who lack critical-thinking skills may accept impressive-looking outputs too quickly. They may set the wrong objective, trust misleading patterns, or push ineffective messages. Critical thinkers take a different approach. They pause before accepting conclusions, examine the evidence, identify assumptions, and consider potential risks. They recognize that efficiency is valuable, but not when it replaces judgment.



Research by Steyvers and Kumar supports this perspective. The goal is not maximum trust in AI, but appropriate reliance on AI. Effective marketers understand when to use AI, when to question it, and when independent judgment is required. This is why critical thinking remains indispensable in an AI-driven marketing environment. AI can support decisions, but it cannot take responsibility for them. It can generate options, but it cannot determine which option fits the product, service, or market. Good marketing decisions are not simply fast decisions. They are decisions grounded in evidence, reflection, fairness, and responsibility. As AI becomes more integrated into marketing practice, the importance of critical thinking is likely to increase rather than diminish.

8.2 WHERE AI CAN MISLEAD MARKETERS

If we accept that marketers still need critical thinking, an important question follows: where can AI outputs mislead them? To answer this question, it is useful to return to one of the key ideas developed by Paul and Elder. Reasoning is more than simply expressing an opinion or reacting to information. It has a structure. Every act of reasoning has a purpose, attempts to answer a question or solve a problem, and is shaped by assumptions, points of view, data, concepts, inferences, and implications. This perspective is particularly relevant when working with AI because AI-generated outputs can appear complete and convincing while still containing hidden assumptions, weak evidence, or narrow perspectives.

Understanding the structure of reasoning helps marketers evaluate AI outputs more critically. Rather than accepting recommendations at face value, they can ask important questions. What problem is this output trying to solve? What data is it based on? What assumptions are embedded in the recommendation? Which perspectives may be missing?

Paul and Elder also argue that reasoning should be evaluated using standards such as clarity, precision, accuracy, relevance, depth, breadth, and logic. These standards offer a useful framework for assessing AI-generated content. Output may be clear but inaccurate, precise but irrelevant, or logically structured yet ignore important perspectives and consequences. In practice, this creates several risks for marketing decision-making.

One of the most important observations is that AI outputs are easily misleading. In many situations, the greater danger lies in their veneer of credibility. AI-generated recommendations often use familiar business language, refer to customer segments, propose channel strategies, and present forecasts supported by precise-looking numbers. This style creates an impression of authority. However, a confident output is not necessarily reliable.

Research on AI in marketing consistently highlights this issue. While AI can significantly improve data processing and decision support, it can also create new reasoning traps. One such trap is automation bias, for instance, when marketers accept an AI tool's recommendation to target a specific customer segment without checking whether the data is outdated, simply because the recommendation seems data-driven.. Another trap is false confidence, where polished, professional-looking output creates the impression that compelling evidence exists even when the supporting evidence is weak or unclear.

A third risk is confirmation bias. In this situation, marketers use AI to reinforce beliefs they already hold about consumers, campaigns, or market trends. Rather than challenging assumptions, AI becomes a tool for reinforcing them. A fourth trap is shortcut thinking, which occurs when the first plausible answer is accepted without considering alternatives, testing assumptions, or examining missing context.

Steyvers and Kumar emphasize that effective use of AI depends not only on model performance but also on how well users understand the system and how appropriately they rely on it. When that understanding is limited, AI outputs may be trusted too quickly or used too uncritically. This is why marketers benefit from having at least a basic understanding of how algorithms and models operate.

As discussed in earlier chapters on AI in marketing, evaluating AI outputs should involve more than intuition or personal preference. Responses should be examined from both technical and functional perspectives, considering what the model is designed to do, how the output was generated, and what limitations may affect the result.

Compare outputs across multiple AI tools or models rather than relying on a single system can be useful. Equally important is knowing when to seek additional expertise and ask questions that require technical expertise. Critical use of AI in marketing is less about being impressed by outputs and more about understanding how those outputs were produced and how much trust they deserve.



AI influences not only what marketers see but also how they interpret information. A recommendation may appear balanced while hiding strong assumptions about audiences or channels. A segmentation proposal may seem efficient even if it relies on biased patterns. A campaign suggestion may sound persuasive while ignoring contextual factors that are crucial to success. In other words, AI can produce an answer that appears ready for action long before its use case fit has been evaluated. From this perspective, the danger is not only incorrect output. The greater risk is persuasive output that does not deserve to be trusted. This concern extends beyond organizational decision-making. From a consumer-protection perspective, Duivenvoorde demonstrates that AI-generated marketing can mislead consumers in multiple ways. AI may be used to create deepfakes in advertising, exploit vulnerabilities through highly personalized targeting, or influence decisions through biased chatbot recommendations. Weak reasoning does not stay inside the organization. It affects real people making real decisions.

If marketers fail to evaluate AI outputs critically, they risk scaling bad reasoning rather than correcting it. They may increase harm while believing they are simply improving efficiency. The role of the marketer is not merely to receive AI-generated outputs but to question, evaluate, and interpret them. MIT Sloan presents a similar argument, warning against what it calls *frictionless fever*—the assumption that faster and smoother AI use is always better. In reality, a certain degree of friction can be valuable because it creates space for reflection, verification, and accountability.

The key lesson is straightforward. AI can mislead marketers not only by being wrong, but also by being persuasive in the wrong way. Critical marketing thinking begins when marketers move beyond the output itself and ask whether it is supported by evidence, sensitive to context, and worthy of trust.

8.3 NUMBERS IN AI'S HANDS – ANALYTICAL PITFALLS

If AI outputs can shape marketers' reasoning, the next question becomes even more specific: what happens when AI introduces numbers to the decision process? This matters because numerical outputs are often among the most persuasive forms of information. In marketing, AI can generate lead scores, conversion forecasts, segment rankings, demand predictions, audience-propensity scores, performance summaries, and campaign recommendations that appear highly analytical and objective.

Predictive analytics and forecasting can provide substantial value, particularly in areas such as audience segmentation, personalization, and campaign planning. However, because these outputs appear data-driven, they require critical examination. A number may look convincing long before its assumptions, limitations, and relevance have been properly evaluated.

The first analytical trap is false precision. A forecasted conversion rate of 4.8%, a lead score of 84, or an expected uplift of 12.7% may appear reliable simply because it is expressed so precisely. Yet precision is not accuracy. Without understanding the underlying data, methodology, assumptions, and uncertainty, a precise number may create more confidence than it deserves.

The second trap is loss of context. Marketing metrics rarely have meaning in isolation. A conversion forecast or customer-propensity score only becomes useful when interpreted within a specific audience, market, platform, time period, and business situation. AI systems often compress this complexity into a single figure, creating the impression of clarity while hiding important contextual factors.

The third trap is metric narrowing. AI systems tend to prioritize what can be measured easily. As a result, marketers may focus on clicks, conversions, engagement rates, and efficiency metrics while overlooking factors that are harder to quantify, such as brand reputation, customer trust, long-term loyalty, or ethical considerations. A critical marketer asks not only whether a number is correct, but whether it measures what truly matters.

The fourth trap is putting too much trust in the analytical power of the system. Because AI systems can process large datasets and identify patterns quickly, users may assume that AI-generated forecasts deserve special authority. Yet more data and more numbers do not automatically produce better decisions. In some situations, excessive reliance on quantitative outputs may actually reduce reflection and weaken judgment.

Numerical outputs should be treated as inputs into decision-making rather than decisions themselves. The role of the marketer is not only to receive a score, forecast, or recommendation, but also to interpret and challenge it. Four simple questions can help:

- Where does this number come from?
- Compared to what?
- Does it fit this specific context?
- Does it measure what actually matters?

Without these questions, AI-generated numbers can become one of the easiest ways to make weak decisions look like analysis.



8.3.1 TASK: REASONING

In this exercise, you will critically examine a consulting report on the future of marketing with generative AI. Rather than assessing whether the report sounds impressive, your task is to evaluate the quality of its reasoning and its usefulness in real marketing decision making. Using the Paul and Elder framework and the support of an AI assistant, you will analyze how well the report's claims, assumptions, and conclusions are justified.

1. Read the BCG report available here:

<https://www.bcg.com/assets/2025/executive-perspectives-the-future-of-marketing-with-genai-13june.pdf>

2. Analyze its content critically with the help of the Paul and Elder framework and an AI assistant. Your goal is not only to ask whether the report sounds impressive, but whether its reasoning is strong enough to support genuine business decisions.

3. You may start with this task prompt:

Use the Paul and Elder standards to question the report.

- Clarity – what exactly is BCG recommending? Is the transformation logic clear?
- Accuracy – which claims would need verification before you could trust them?
- Precision – are the report's claims specific enough to apply to a real company, or are they still too broad?
- Relevance – which claims seem relevant to marketing practice, and which may be too general?
- Depth – what challenges or implementation difficulties are underexplained?
- Breadth – which perspectives are missing? For example: small-company perspective, consumer perspective, legal perspective, or internal capability perspective.
- Logic – does the report move too quickly from “genAI can help” to “companies should transform now”?
- Significance – which claims matter most, and which sound impressive but may be less important?
- Fairness – does the report present a balanced view, or is it too optimistic?

4. Synthesize the results by giving:

- two BCG claims that sound convincing;
- two BCG claims that seem too optimistic or insufficiently supported;
- one short conclusion: To what extent is the report a strong basis for decision-making, and to what extent is it a persuasive but overly optimistic vision of GenAI in marketing?

8.4 DECISION-MAKING IN MARKETING: WHAT AI CAN SUPPORT, WHAT IT SHOULD NOT REPLACE, AND WHY ETHICS STILL MATTER

The growing role of AI in marketing raises an important question: what place should AI-generated outputs occupy in marketing decision-making? This question is particularly relevant because human decision-making is rarely fully rational. People are influenced by cognitive biases, shortcuts, and decision traps. When AI enters the process, these challenges do not disappear. In some cases, they may even be magnified, especially when AI-generated recommendations appear objective, data-driven, and authoritative.

A critical approach to AI does not mean rejecting it. Rather, it involves understanding where AI provides valuable support and where support can gradually become dependence. AI can help marketers summarize market signals, compare campaign alternatives, generate content variations, identify patterns in customer data, and structure preliminary recommendations. These capabilities offer significant advantages. They save time, expand the range of options available for consideration, and enable marketers to work with more information than they could realistically process on their own. However, these benefits do not eliminate the need for human judgment. A recommendation may be efficient but strategically weak. A forecast may appear plausible while remaining irrelevant to a specific brand situation. A content suggestion may be technically usable but inappropriate for a particular audience or context. For this reason, AI outputs should support decision-making rather than replacing it.

The distinction becomes clearer when considering the aspects of decision-making that AI should not replace. AI should not determine how a problem is framed, because defining the real marketing problem requires contextual understanding. It should not define goals, because deciding what success looks like depends on organizational priorities and strategic objectives. AI should not replace strategic judgment, which involves assessing whether a recommendation fits the brand, the audience, and the market environment. Finally, it can't replace responsibility because decisions about fairness, appropriateness, and accountability ultimately remain human responsibilities.

The role of teams is equally important. Marketing decisions are rarely made by individuals working alone. Decisions regarding segmentation, targeting, messaging, channel strategy, budget allocation, and campaign evaluation typically involve collaboration among multiple stakeholders. AI can support these discussions by providing structured analyses and accelerating information processing. At the same time, it can create new risks.

A recommendation that appears highly analytical may prematurely end fruitful discussions. Team members may be reluctant to challenge outputs that seem objective or data-driven. Responsibility may also become blurred when decisions are justified with statements such as "the AI recommended it." As a result, successful AI-supported decision-making still depends on open discussion, critical evaluation, and clearly assigned responsibility.

Ethical considerations reinforce the need for human oversight. Marketing decisions influence real people. AI-generated outputs shape targeting practices, communication strategies, and customer experiences. Research has shown that AI-driven marketing may contribute to harmful outcomes through deepfakes, manipulative personalization, or biased chatbot recommendations. Ethics is not simply an additional consideration after a decision has been made; it is an integral part of the decision-making process itself.

One practical framework that can help marketers make better decisions in AI-supported environments is the **WRAP model** (Figure 8.2). Developed as a decision-making tool, WRAP helps individuals avoid common cognitive traps and strengthen the quality of their judgments.

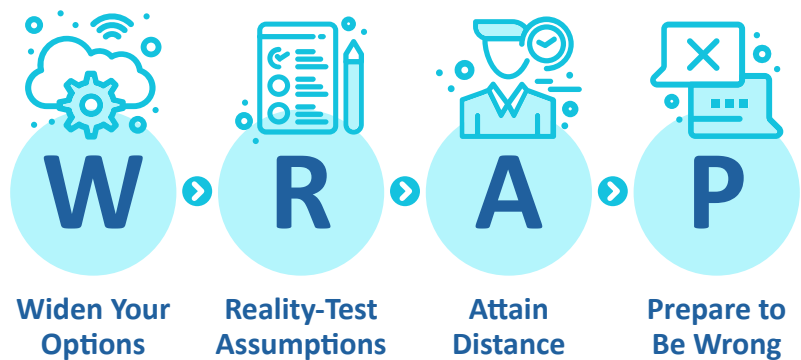


Figure 8.2: WRAP model

The framework consists of four stages:

1. **Widen your options**—avoid narrow framing by considering multiple alternatives rather than focusing on a single apparent solution.
2. **Reality**-test your assumptions—challenge existing beliefs, seek disconfirming evidence, and examine assumptions critically.
3. **Attain distance before deciding**—create psychological distance from immediate emotions and short-term pressures in order to focus on long-term priorities.
4. **Prepare to be wrong**—consider alternative scenarios, identify potential risks, and establish warning signs that indicate when a decision may be failing.

The relationship between common decision-making challenges and the WRAP framework is presented below (Table 8.1).

Table 8.1: Relationship between common decision-making challenges and the WRAP framework

Challenge	WRAP Decision Process
Narrow framing	Widen your options —explore multiple perspectives, alternatives, and existing solutions.
Confirmation bias	Reality-test your assumptions —actively search for contradictory evidence and alternative explanations.
Short-term emotions	Attain distance before deciding —reduce the influence of temporary emotions and focus on long-term goals.
Overconfidence	Prepare to be wrong —develop alternative scenarios and identify warning indicators.

The value of the WRAP framework lies in its recognition that good decisions involve more than selecting an option. Effective decision-making also means protecting ourselves from predictable errors in judgment. This makes the framework particularly useful in AI-supported marketing environments, where recommendations may appear more certain and objective than they actually are.

The key lesson is straightforward. AI can support marketing decisions, but it should not replace critical judgment, team discussion, or ethical responsibility. The central question is not whether AI belongs in marketing decision-making—it clearly does. The more important question is whether marketers remain thoughtful, skeptical, and accountable when AI becomes part of the process.



8.5 KEY TAKEAWAYS

- AI can support marketers by generating insights, forecasts, recommendations, and content, but these outputs should support decision-making rather than replacing it.
- Persuasive AI outputs are not necessarily trustworthy. Marketers should examine the assumptions, evidence, and context behind AI-generated recommendations.
- Automation bias, false confidence, confirmation bias, and shortcut thinking can influence how marketers interpret AI outputs.
- AI-generated numbers may create an illusion of objectivity. Forecasts, scores, rankings, and performance estimates require contextual interpretation and validation.
- Effective marketers evaluate not only whether a metric is accurate, but also whether it measures what truly matters for the decision.
- Strategic decisions require more than analytical outputs. Brand positioning, customer relationships, organizational values, and ethical considerations remain human responsibilities.
- AI can improve team decision-making by providing structure and generating alternatives, but teams should avoid treating AI recommendations as unquestionable authority.
- Ethical issues such as fairness, transparency, privacy, manipulation, and accountability should be considered throughout the decision-making process, not only after a decision has been made.
- The WRAP framework (*widen your options, reality-test your assumptions, attain distance before deciding, prepare to be wrong*) helps marketers reduce common decision-making traps in AI-supported environments.
- The goal is not to maximize trust in AI, but to use AI appropriately while maintaining human judgment, responsibility, and critical reflection.



8.6 FURTHER READING

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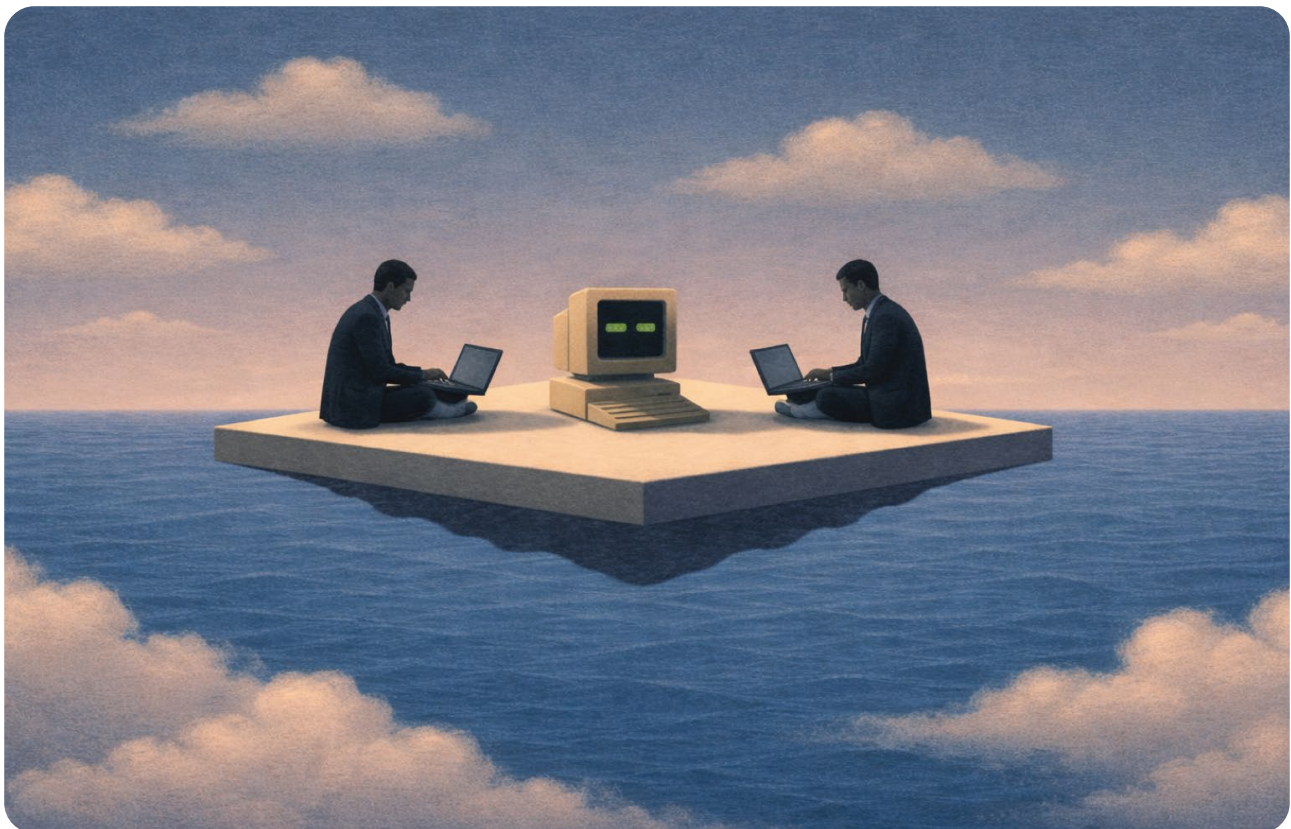


Case study:

RIDING THE AI WAVE: BUILDING COMPETENCIES FOR INNOVATIVE MARKETING COMPANY

Hanna Nowak-Mizgalska, Anna Rogala

The case study description was based on data obtained during a series of interviews conducted with the vice-president of the management board and a data analyst working in interdepartmental teams, primarily with employees from the marketing and product departments.



1. Introduction

Grupa Blix Sp. z o.o. is a fast-growing Polish company operating in the marketing sector and offering digital advertising space through a portfolio of three mobile applications for Android and iOS platforms. Originally launched as a small, student-led technology startup, it has since grown into a medium-sized enterprise with a leading position in the Polish market and growing recognition internationally. The startup's founders were featured in Forbes' 30 Under 30 list, and the company has appeared in the Deloitte Technology Fast 50 CE rankings as well as the Financial Times list of Europe's 1,000 fastest-growing companies¹.

¹ <https://www.ft.com/content/cb3e317e-e3cc-4e4a-a506-b755b2f94bb1>

The company's primary clients are retail chains and producers of fast-moving consumer goods (FMCG). Its value proposition lies in providing innovative, technology-driven tools that enable clients to reach millions of "smart shoppers" who have downloaded Blix Group's mobile applications. Through these apps, B2B clients can distribute their advertising leaflets and promotional offers digitally, including to the customers of their competitors. This also allows retail chains and FMCG producers to plan more effective, targeted marketing campaigns and measure buyer traffic using geolocation technology embedded in the company's applications. The company's "drive-to-store" campaigns have been further enhanced through cooperation with Proxi.cloud, a technology firm integrated into the Blix Group since 2025. Blix's value proposition combines large, engaged audiences with measurable outcomes for business-to-business clients – reach within target groups, drive-to-store effects, and conversion lift. The company monetizes through sponsored placements, targeted campaigns, and analytics services attached to its apps.

The development of Blix Group requires a mix of technical (IT and marketing) and soft skills, including creativity, entrepreneurial mindset, and ethical behavior. These competencies must be continuously developed and reconfigured to adapt to rapidly changing technology and customer expectations. In particular, the ongoing AI revolution has made continuous learning and upskilling critical for the workforce. Employees must be ready to integrate AI-driven solutions into two crucial areas of the company's operations, both, with emphasis on responsible and ethical considerations:

- **Development of the business offer (including evolving the company's business model and customer value proposition)**
- **The effective communication of its offer to the B2B customers and to the users of their mobile applications (in a friendly and intuitive way) through their own marketing campaigns.**

A member of Blix Group's Board describes AI as a force "rapidly changing the rules of the game in business" and "a revolution of unprecedented speed." The application of AI technology into its business offer and marketing communication is crucial for maintaining and even strengthening its actual leading position on the market. It would not be possible without attracting and developing an AI-qualified workforce. The labor market is seen by the Board as facing a competency gap, with too few employees who have AI knowledge or practical experience. Therefore, one of the group's main challenges is addressing the current and future competency needs of its employees in the AI-driven economy.

Given the shortage of AI-qualified professionals, the company must strategically shape its workforce by investing in upskilling current employees while also recruiting ambitious first- or second-year students from fields such as mathematics, econometrics, and economics. These students can learn AI alongside the company, gaining a competitive advantage on the labor market.

The core dilemma for learners analyzing this case study is: **how to continuously track the technological advancements crucial for Blix's core business – especially in fast-moving technologies like artificial intelligence – and to systematically build, update, and promote those skills across the organization, including within marketing department.** They will also study how the company should support the development of required competencies in its actual and future workforce.

The learners will examine core competencies and strategies for improvement from the perspective of competitive advantage and internal development – technical and ethical competencies of the company’s specialists responsible for creating the offer and running marketing activities.

Learners will engage in problem-solving and decision-making scenarios from the Board’s strategic perspective, taking into consideration AI-related challenges and opportunities. They will be engaged in various activities aimed at improving AI-related competencies and product innovativeness, such as planning a knowledge transfer proposal, redefining AI usage policy, or discussing the role and functioning of the Innovation Centre.

2. Background

The Blix Group was formally established in 2019, though its operations date back to 2012 under the name Qpony.pl. Since its inception, the startup has grown dynamically, steadily expanding its portfolio of mobile applications. According to its own research, the company now holds an estimated 60% market share in promo aggregators, competing with both retail chains’ apps and independent players such as Gazetkowo and Moja Gazetka.

The table 8.2 shows the market shares (in %) of the major competitors (only independent players), based on the survey of UCE RESEARCH for Blix Group carried out in March 2025 (Computer Assisted Web Interview).

Listed on the stock exchange, ALFA pursues a growth strategy oriented toward the acquisition of small and medium-sized Italian enterprises that are synergistic with its core business, with the aim of expanding its competitive position in the market.

Table 8.2 Answers distribution to the question: “Which application do you use?”

Name	Blix	Gazetkowo	Gazetki.pl	Moja Gazetka	Tropiciel Okazji	Goodie	Promotheus	Ding	Other
Share	66,5	10,5	7,2	6,6	4,6	2,6	0,7	0,0	1,3

Source: own elaboration based on UCE Research, 2025, N=152.

The main competitors of Blix app are Gazetkowo and Gazetki.pl apps. Gazetkowo² is a free app that helps in browsing and comparing the latest store flyers and promotions from hundreds of retailers in Poland. With Gazetkowo, consumer can:

- **search for products across multiple flyers to find the best prices and save money,**
- **compare offers from different stores and plan your shopping more effectively,**
- **create shopping lists directly from flyers for better organization and budgeting,**
- **follow favorite stores and receive notifications when new flyers or special deals are available.**

² App description based on <https://play.google.com/store/apps/details?id=com.promotons&hl=pl>

Gazetkowo covers popular chains such as Biedronka, Lidl, Kaufland, Carrefour, Rossmann, Pepco, IKEA, and many others. **The app is designed to make shopping easier, faster, and more economical by giving you access to all current offers in one convenient place.**

Gazetki.pl³ is a free app that gives access to the latest promotional flyers from supermarkets, electronics stores, fashion retailers, drugstores, and even local shops across Poland. With Gazetki.pl, user can:

- **browse all current flyers in one place;**
- **search for specific products and check where they are available, at what price, and for how long;**
- **save offers and create shopping lists for better planning;**
- **mark favorite stores and receive quick access to their newest flyers;**
- **view store addresses and opening hours to plan your shopping trips.**

Gazetki.pl helps consumer stay informed about national and local promotions, compare deals, and shop smarter – without collecting paper flyers.

Taking into account the measures of market concentration, such as CR4 or the Herfindahl-Hirschman Index, the market of digital promo aggregators should be considered as a highly concentrated, oligopolistic structure, with Blix's dominant position (which favors effective market power and monopolistic behavior). In this context, market share erosion risk seems not to be very high; however, AI implementation can drastically change “the rules of the game” on the market.

Such a scenario is one of the main concerns of the Blix's Board, motivating constant AI-driven offer development and workforce upskilling.

The company's business model has been based on mobile and digital technologies since 2012, but in the face of the AI revolution, it continues to evolve and adapt to new technological opportunities.

Since 2022, the paradigm of promotional leaflets has undergone a significant transformation: moving from “Paper first” to “Digital first” in 2023, then to separate paper and digital versions in 2024, and finally reaching the “Phygital + AI” paradigm in 2025. **This current approach blends physical and digital experiences, enabling seamless access to digital leaflet content from physical touchpoints and leveraging AI to personalize interactions with app users.** Integrating AI into the company's mobile apps has introduced new functionalities, such as image scanning, product categorization, and store-location recommendations.

Blix Group works almost entirely remotely and employs a young, dynamic team of around 100 people (as of 2025), with an average age of 32. In terms of organizational structure, the company consists of Sales Operations, Product, Marketing, Content (for the applications), and Administrative Departments. Close collaboration and effective communication – especially between IT and marketing – are essential for smooth operations.

³ App description based on <https://play.google.com/store/apps/details?id=pl.gazetki.app&hl=pl>

The marketing team is known for its strong analytical skills, resulting from close cooperation with product development. The Product Department is the largest organizational unit, comprising mainly programmers working with databases, iOS and Android systems, and graphic design. Because Blix offers a digital product, Marketing works more closely with Product (mainly IT specialists) than with Sales. Communication between IT and Marketing has been a challenge, but it’s improving as Marketing relies more on technology and both teams coordinate more closely.

Table 8.3 summarizes the most important roles and competencies across Product, Marketing and Content Departments.

Table 8.3 Roles and competencies across Product, Marketing and Content Departments in Blix

Department	Roles/functions	Competencies
Product	programmers, IT specialists – digital product development and mobile applications’ maintenance services	Python programming, working with databases, iOS and Android systems, and graphic design
Marketing	cooperation with product development, market and competitors research, effective client and user communication, and marketing campaigns building, brand awareness and position building, organizing marketing events (conferences, webinars, industry events, trade shows)	analytical skills, practical knowledge of online marketing tools, including Google Search Console, Google Analytics, and building effective email campaigns
Content	content specialists – cooperation with the marketing team, development of the mobile applications’ content, and videos on social media	content management, creative design, and knowledge of graphics software (e.g., Canva, Adobe Photoshop)

Source: own elaboration based on the interviews with Blix representatives

The flag marketing campaigns launched in 2024 by Blix Group on YouTube is “Promotions are proven at BLIX”⁴. 15 and 6 seconds spots are also available at Facebook, Instagram and TikTok. It has been nominated in 2025 for Effie Poland in the Retail & Marketplaces category.

Blix seeks people who can combine solid technical skills with a growth mindset and strong collaboration habits. In practice, that means: Python programming, work with databases, data visualization, eagerness to continuous learning, openness to novelties, teamwork, feedback culture. Candidates who bring this mix can contribute to Blix’s data-driven, AI-enabled products while collaborating effectively across departments.

⁴ App description based on <https://play.google.com/store/apps/details?id=com.promotons&hl=pl>

The popular job positions in Blix Group are the following⁵:

- PHP Developer
- iOS Developer
- Analytics Engineer
- Mid Frontend Developer
- Mid Android Developer
- Customer Service Specialist
- User Acquisition Team
- Product Manager

Table 8.4 presents the competency profiles in the Blix Group, on the examples of Product Design Team Leader and Junior Social Media Content Creator.

Table 8.4 Selected employees competency profiles in the Blix Group

Product Design Team Leader	Junior Social Media Content Creator
A person with excellent skills, imagination, and vision, whose actions will inspire and proactively develop the potential of the team and the Product Design (PD) area	A person who will be a creative force in the world of short-form video, who understands trends and can transform them into original, engaging content, who isn't afraid to experiment, test new formats, and analyze the effectiveness of their content
Working on a product that is the first in its category in terms of reach and implemented functionalities, leading the process of ideation, design, and prototyping solutions for new and current functionalities	Creating and scaling engaging video content that will increase the visibility of the Blix brand on platforms such as TikTok, Instagram, Facebook, and YouTube Shorts • Creation and Production: Planning and execution of creative video content • Post-Production: Editing, editing, and adding effects (text, music, filters) • Analysis: Reporting and forecasting key KPIs • Strategy: Actively seeking new trends and ideas
Implementing real changes, shaping the development direction of the application, team, and PD area	Proficiency in using video editing programs (e.g., CapCut, DaVinci Resolve, Adobe Premiere Pro)
Identifying UX problems, observing and drawing conclusions from data, testing hypotheses, and optimizing user experience	Being familiar with and eager to use AI tools in the content creation, scaling, and automation process
Skillfully arguing for proposed changes and observations, showing their impact on key product indicators – retention and engagement	Soft Skills • Creativity • Initiative • Independence - effectiveness in completing tasks without leader supervision • Excellent communication skills - effective teamwork • Good work organization - high personal efficiency, methodical approach to tasks, striving to automate processes where possible
Cooperating with Product Managers and Technical Leaders on project implementation	Cooperation with Effie-nominated marketing experts who are not afraid of creative experiments

Source: own elaboration based on Blix jobs announcements on <https://justjoin.it/job-offer/grupa-blix-product-design-team-leader-poznan-ux> and <https://rocketjobs.pl/oferta-pracy/grupa-blix-junior-social-media-content-creator-poznan-marketing-social-media>

⁵ <https://zarobky.pl/firma/Grupa%20Blix>

AI is significantly affecting programmers, IT professionals, customer service, and marketing staff. **Many of their tasks – such as programming, market research, and report writing – can now be automated, drastically reducing time-to-completion. As a result, AI adoption can substantially improve efficiency, but only if employee skills are updated accordingly.**

Paradoxically, interacting with AI may make every day work easier, but employees must learn how to communicate effectively with AI systems. The rapid evolution of AI models demands a commitment to lifelong learning, as well as ethical awareness and data protection skills, as part of the new competency mix.

Data analysts were the earliest adopters of AI within the company, first automating their own workflows and then sharing solutions with other teams. Although the company does not yet have a dedicated Data Analytics department, there are plans to create one soon. At present, data-related expertise is distributed across departments, with analysts supporting areas such as sales operations and product analytics.

Blix Group faces a core dilemma: how to continually scan and prioritise fast-moving technologies such as AI, and convert them into company-wide capabilities. This involves deciding what to build, who to upskill, and how to embed those skills across the product and marketing teams, without sacrificing speed or ethical standards. **The question is how to design a repeatable, governed system for capability building that develops current talent and secures future competencies while safeguarding competitive advantage and responsible practice.**

The urgency is apparent. Recent data shows that **62%** of companies in Poland have increased their spending on AI technologies. Notably, Polish organizations are moving from pilot projects to full-scale implementations faster than the global average. **18%** of firms have already reached full implementation – a sharp rise from 5% a year ago – while only **6%** remain in the early analysis stage, compared to **17%** globally⁶.

Polish enterprises are eager to harness the power of artificial intelligence, but most remain stuck in the pilot stage. PwC's latest report reveals a striking gap: while **75%** of large companies launched AI or advanced analytics projects this year, only **45%** have a formal strategy, and two-thirds admit their initiatives rarely scale beyond experimentation. Over half report limited or no measurable benefits. And employees are moving faster than policy is. Despite **80%** lacking formal approval to use generative AI, many do so anyway – **69%** for research, **40%** for content creation. This signals both opportunity and risk for governance⁷.

Blix is a leader, not a startup – but defending its position requires balancing self-directed learning with structured organizational programs to avoid fragmented skill growth and lost advantage. PwC's latest data underscores why: even established players risk falling behind if AI adoption stalls at the pilot stage. To stay ahead, Blix must turn experimentation into enterprise-wide execution – supported by transparent governance, scalable tools, and a culture that transforms curiosity into measurable outcomes.

⁶ <https://www.trade.gov.pl/en/news/poland-is-the-leader-in-gen-ai-implementations/>

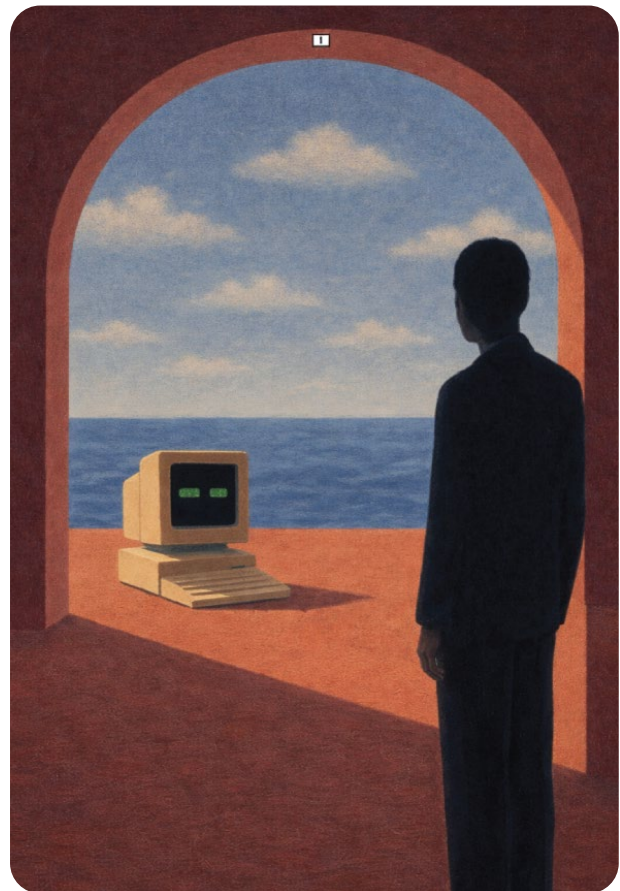
⁷ <https://www.pwc.pl/pl/publikacje/polskie-firmy-nie-wykorzystuja-w-pelni-potencjalu-ai.html>

3. Current situation

3.1. AI tools adoption

The Board perceives AI adoption as a matter of “to be or not to be” for the company’s continued success. Through AI integration, they aim to enhance the business model and the value delivered to both B2B customers and the end users of their applications. Currently, the Board provides access to AI tools for all employees. Still, there is no formal, company-wide training program – no external courses, workshops, or structured learning paths dedicated to AI competencies. Employees are encouraged to self-educate by using resources such as YouTube tutorials, podcasts, or Q&A sessions on internal communication platforms.

Within the company, there are also “innovation leaders” who share their knowledge and showcase AI-based solutions that help complete tasks more efficiently. Discoveries and best practices are often shared through internal communication channels (for example, programmer-specific forums), but participation remains voluntary. Whether employees choose to learn and apply these tools is primarily up to them. **As AI proficiency is now considered a “must-have” skill, ongoing education is necessary; however, the HR specialists have not yet incorporated AI competencies into the employee evaluation system.** The company currently uses Gemini Pro by Google and ChatGPT by OpenAI, with the latter increasingly replacing traditional Google search for real-time information retrieval. Among Blix’s employees, there are varying levels of AI adoption and acceptance, as described below.



Some employees remain hesitant, either unfamiliar with AI tools or reluctant to change their work habits (e.g., using AI plugins, writing emails with AI assistance, or leveraging AI summarization features). Others actively use AI tools to save time and automate repetitive tasks – such as summarizing books and articles, synthesizing tables, checking presentations for errors, improving text quality, or analyzing data. **The company emphasizes that AI-generated results must be approached critically, with employees applying their own reasoning and analytical thinking to validate outputs.**

The marketing team uses AI daily for tasks such as analyzing case studies, drafting presentations, and refining language for media communications. More advanced users create even custom AI agents to monitor competitors’ marketing campaigns. Looking ahead, AI is expected to play a greater role in developing the company’s product offering, especially within its mobile applications. As delivering timely and relevant information to users is critical, customer websites are currently crawled by scrapers. In the

future, AI may automate additional functions, such as real-time product price scanning and updates. Consequently, AI knowledge is particularly important for the product development and content teams. Employees are discussing the use of AI in the workplace. It is clear that opinions on this matter vary greatly. Here is an example of a conversation that was overheard in the social room⁸.

- **Cathy (Junior Social Media Content Creator):** *I've been using AI tools to speed up my work – summarizing articles, improving captions, even checking posts for errors. It saves me hours!*
- **Peter (Customer Service Specialist):** *I don't know... I'm not sure I trust AI to handle customer communication. What if it makes mistakes? Plus, I'm used to doing things my way.*
- **Cathy:** *I get that. The company says we should always review AI outputs critically, not just copy-paste. For me, it's like having an assistant – I still make the final call."*
- **Peter:** *Hmm... so it's not about replacing us, but making things faster? I guess I could try using AI for summarizing long emails or checking tone.*
- **Cathy:** *Exactly! Start small. It's about saving time, not losing control.*
- **Peter:** *But what about security? I've heard AI tools can leak data or make compliance tricky.*
- **Cathy:** *That's why we have some general internal guidelines. It's about smart usage, not blind trust.*
- **Peter:** *Okay, that makes sense. Still, I feel like I don't know where to start. There are so many tools and features – it's overwhelming.*
- **Cathy:** *I get that. Even I had to figure things out on my own. Honestly, a proper training or a clear roadmap would help a lot.*
- **Peter:** *Exactly. If the company wants us to use AI effectively, we need more than just encouragement – we need guidance and hands-on support.*
- **Cathy:** *Totally agree. Otherwise, some of us will run ahead while others stay behind, and that's not good for anyone.*

The company is taking active steps to increase the use of AI in everyday tasks across different roles, with a particular focus on product, marketing, and content teams. However, this approach brings certain risks and dilemmas that fall into two key areas:

- The first is team competencies – how to build and support the skills required to fully leverage AI in product development and innovative marketing activities.
- The second is data protection – how to ensure secure processing and analysis of data when using AI tools, including updating and formalizing policies related to AI-driven data security.

A major priority is reducing disparities in AI adoption among employees and helping them overcome fear and resistance toward new technologies. At the same time, a cultural shift will be necessary for new employees entering the labor market, ensuring they are prepared to work effectively in an AI-driven environment.

⁸ Dialogue and names invented for the purposes of the case study.

Task 1: Knowledge transfer for hesitant teams

As you already know, in Blix, about half of employees do not use AI tools, do not feel ready to learn, and are afraid of using AI. Your team must design a simple, low-friction way to transfer knowledge so everyday work becomes safer, faster, and more consistent – without forcing people into long trainings. Tools available to the Blix Employees: Gemini Pro and ChatGPT Pro.

Create a knowledge transfer proposal that helps non-users learn just enough to try AI on real tasks, with support and clear safeguards.

1. Who learns what?

- Pick three roles from area of sales and marketing (e.g., Marketing Specialist and Customer Support).
- For each role, define four practical tasks AI can help with (e.g., “summarize brief,” “draft first-pass copy,” “tag content,” “QA checklists”).
- Propose three prompt templates per role.

2. How will knowledge be shared in practice? Propose the short, repeatable sessions that could lower fear (e.g., buddy sessions, Show–Do–Share) and explain how they can help.

3. Prepare a one-page Do & Don’t: what data is allowed to base the decisions on, how to review outputs, when to ask for help.

3.2. Policy for AI usage

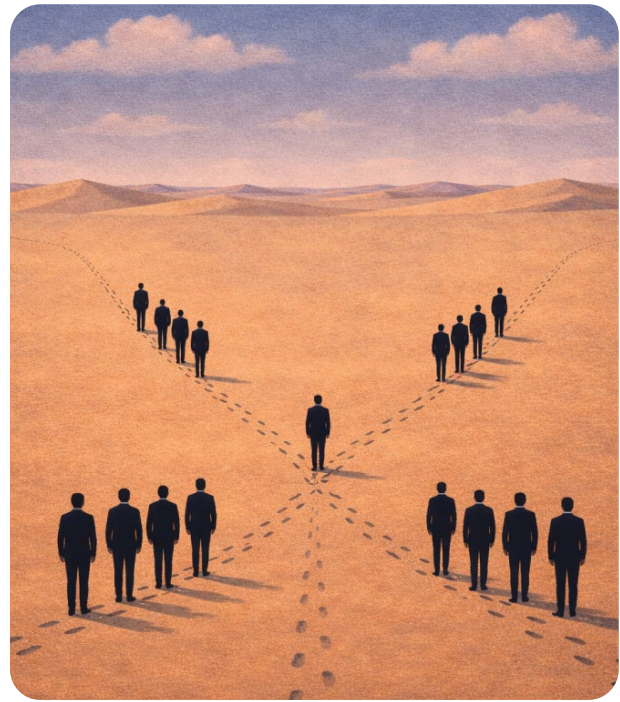
Globally, many companies still struggle to generate value from AI at scale. Meanwhile, employee-led adoption is widespread: **75% of knowledge workers use generative AI at work, 78% bring their own tools, 79% of leaders believe AI is necessary to remain competitive, and 60% say their organizations lack a clear plan**⁹. “Bring your own artificial intelligence” (often shortened to BYOAI) means employees use their own AI tools – like personal subscriptions to chat assistants or browser plug-ins – without going through the company’s standard approval process.

This tends to move faster than internal policy. As a result, different people use different tools, with different settings, and with no shared rules for what data can be pasted, how to review outputs, or how to store results. **That creates inconsistent ways of working and adds risk: data might be exposed, outputs can be unreliable or hard to reproduce, and teams lose a clear audit trail of how decisions were made.** At the same time, many employees feel unsure about AI and overwhelmed by ad-hoc training. This combination – shadow use plus uneven skills – signals the need for structured, role-based enablement. In the EU, **only 13.5% of enterprises used AI in 2024 (up from 8.0% in 2023), highlighting how far formal deployment still has to go even as interest surges**¹⁰.

⁹ <https://news.microsoft.com/annual-wti-2024/>

¹⁰ <https://ec.europa.eu/eurostat/statistics-explained/index.php?oldid=568530>

Enterprise surveys echo the execution gap: IBM's Global AI Adoption Index reports **42%** of large organizations have deployed AI and another **40%** are exploring it, but cite insufficient expertise and lack of an AI strategy as top barriers to "trustworthy AI"¹¹. Meanwhile, operational readiness is low – F5's 2025 index suggests just **2%** of organizations qualify as "highly ready" to scale and secure AI across applications¹². In response, companies are drafting or tightening AI-use policies that typically set "green/amber/red" decision rules for when AI may be used, classify data allowed in external tools, require human review and labeling of AI-assisted outputs, and curb bring-your-own-AI (BYOAI).



Blix must update its AI-related data protection policy. Although operations rely on the proven solutions of reputable IT providers and the Board expresses trust in its employees, it is essential to formally adjust existing procedures to meet the demands of the AI era.

Task 2: Practical Artificial-Intelligence Use Policy

Many employees are unsure about AI usage or use personal tools (BYOAI phenomenon). Leadership needs a short, plain-language policy for safe, responsible, consistent use. Write a policy of max 4 pages that the company could publish tomorrow.

1. List key laws/ethics that apply (privacy, data protection, IP, sector rules).
2. Translate them into 5-7 practical bullets
(e.g., "Do not paste personal or client data into external tools without approval.").
3. Define the core rules that cover the following aspects.
 - When AI can/can't be used with clear examples.
 - Data security & privacy policy.
 - Quality & accountability assessment.
 - BYOAI policy.
 - Transparency policy.
 - Risk flag system: green (safe), amber (needs review), red (not allowed).

¹¹ <https://newsroom.ibm.com/2024-01-10-Data-Suggests-Growth-in-Enterprise-Adoption-of-AI-is-Due-to-Widespread-Deployment-by-Early-Adopters#:~:text=Highlights%20from%20the%20%22IBM%20Global%20AI%20Adoption,for%20surveyed%20companies%20to%20put%20into%20practice:>

¹² <https://www.f5.com/company/news/press-releases/research-enterprise-ai-readiness-security-governance-scalability>

4. Analysis - How can AI be used to gain a competitive advantage in the market?

4.1. AI-based value for customers

Blix's core business centers on three consumer apps: Zdrowe Zakupy, Qpony, and Blix. Together they form the company's primary product portfolio, serving shoppers while enabling data-driven services for retailers and brands.

All three apps incorporate artificial-intelligence features across the user journey – such as computer-vision barcode/packshot recognition, ingredient parsing and health flagging in Zdrowe Zakupy, and offer classification, price matching, and personalization in Blix and Qpony. These models enable faster search, smarter recommendations, and real-time promotion insights to make the experience more relevant and efficient.

Zdrowe Zakupy helps users quickly judge how healthy food and cosmetic products are. It lets people scan barcodes or search to see ingredients, nutrition facts, and additives, and it flags allergens or controversial substances. The app also analyzes cosmetic formulas and highlights potential irritants, then suggests healthier alternatives to what was scanned. A crowdsourced catalogue lets users add missing products to grow the database.



Qpony gives instant access to deals, discount codes, and promotional leaflets across many categories. Users can browse in-store and online coupons, search by brand or category, and view offers from popular retailers without creating an account. It centralizes daily discounts so shoppers can quickly find relevant savings.

Blix focuses on promotional flyers to help plan everyday shopping. Users browse current leaflets from major retailers, build store-sorted shopping lists, compare prices to find the cheapest option, and store loyalty cards. The app also sends alerts about new promotions and covers categories beyond groceries, including electronics, fashion, and home goods.

Task 3: Refining CVPs with AI for Blix' apps

Analyze the current Customer Value Proposition (CVP) of Zdrowe Zakupy, Qpony, or Blix. Identify opportunities where Artificial Intelligence (AI) could enhance customer value, and propose refined CVPs that integrate these AI-powered features.

- 1. Review one out of the three apps (download).**
- 2. Research common AI applications in retail and e-commerce (recommendations, chatbots, predictive analytics, computer vision) and analyze how key competitors implement them within their apps and customer journeys.**
- 3. How do these features increase perceived value for users?**
Brainstorm which AI techniques could be applied to the analyzed app.
- 4. Group Task: AI-Enhanced CVP Mapping**
 - *Step 1: Analyze Current CVP*
Map customer jobs, pains, and gains for your assigned app. Identify what users want to achieve, what frustrates them, and what delights them.
 - *Step 2: AI Opportunity Brainstorm*
Propose 2–3 AI features that could solve customer pains or boost gains (e.g., personalized recommendations, chatbots, price predictions).
 - *Step 3: Refine the CVP*
Rewrite the app's CVP to include the AI-powered differentiator.
Make it clear, compelling, and customer-centered.
- 5. Discuss how AI shifted the value perception, potential risks (privacy, bias, over-reliance on automation), and how companies can balance technology innovation with customer trust.**
- 6. Identify the key competencies Blix employees need to create and deliver customer value in an AI-enhanced environment. Consider technical skills (e.g., AI tool proficiency, data interpretation) and soft skills (e.g., adaptability, critical thinking, customer-centric mindset). Propose practical initiatives to develop these competencies across teams.**

Task 4: Ethical issues in AI-powered shopping apps

Identify potential ethical challenges in implementing AI features in shopping apps, analyze the impact on users (privacy, trust, decision-making), and propose mitigation strategies to ensure responsible AI deployment.

1. **Discuss common ethical concerns about AI: bias, privacy, manipulation, transparency.**
2. **Ethical risk mapping**
 - Step 1: Focus on one AI feature of the previously selected app (e.g., personalized recommendations, price predictions, allergen alerts).
 - Step 2: Identify ethical risks. Fill in the table below by listing potential ethical issues, their impact on users, likelihood, and severity.
 - Step 3: Propose mitigation measures. Brainstorm strategies to address each risk.
3. **Write a short paragraph on how ethics affects trust and adoption of AI features, and what trade-offs you would make as product designers.**

AI Feature	Potential ethical issue	Impact on user	Likelihood	Severity

4.2. Staying on track of technological changes

Many of Blix's business partners are companies that implement technology into their business models in innovative ways. **The largest of these have special units dedicated to tracking innovations.**

Following their partners' example, Blix plans to launch an Innovation Centre that looks ahead at technologies shaping both its apps and its business-to-business digital services. The centre will monitor and forecast changes in areas such as artificial intelligence and machine learning, software development kits, application programming interfaces, analytics, privacy and consent rules, app-store policies, advertising technology, and payments.

It will also create future scenarios (12–36 months) for how these shifts may affect Blix's products and services. The goal is simple: turn insight into action by designing small experiments, fast prototypes, and pilots that improve the apps and strengthen the services Blix provides to clients.

Task 5: Innovation Centre operating model

The company is launching an Innovation Centre to translate winning ideas into product features and service “accelerators.” Your team is expected to propose how this center should work.

1. **Specify the purpose, roles, and cadence for a small central hub that collaborates with innovation leaders in Product, Marketing, Content, Information Technology, and Client Services.**
2. **Define role profiles and required competencies of the center's members (e.g. Innovation Lead; Data and Artificial-Intelligence Engineer; Foresight and Research). Include both technical and non-technical skills.**
3. **Outline expectations of the Board for the next 12 months.**
4. **Draft a policy for sourcing and gathering data (to ensure reliable outcomes).**

Continuation for advanced readers

An Innovation Centre is a strong idea and could deliver significant results by monitoring and forecasting changes in critical areas such as artificial intelligence and machine learning, software development kits (SDKs), application programming interfaces (APIs), analytics, privacy and consent regulations, app-store policies, advertising technology, and payment systems. However, it is not the only option. **Organizations can also leverage AI-powered agents to complement or even automate these functions, providing continuous, real-time insights and reducing the manual effort typically required for trend analysis and strategic foresight.**

In today's fast-moving digital environment, relying solely on human-driven monitoring can be resource-intensive and reactive. An AI agent designed for this purpose could scan trusted sources, analyze emerging trends, and deliver actionable intelligence directly to relevant teams. Beyond tracking technological developments, such an agent could assess potential impacts on product innovation, marketing strategies, compliance requirements, and customer experience.

AI agents represent a major evolution in enterprise automation, moving beyond simple scripts to systems that can perceive, reason, act, and learn. According to KPMG's Agentic AI Advantage Report, these agents are increasingly deployed to handle repetitive, high-volume tasks such as updating records, monitoring anomalies, and orchestrating multi-step workflows across IT, marketing, and operations¹³.

PwC's AI Agent Survey highlights that 79% of companies have adopted agentic AI, with two-thirds reporting measurable productivity gains and cost reductions. These agents are not just automating tasks – they are enabling employees to focus on higher-value activities like strategic decision-making and creative problem-solving¹⁴. ISG's State of the Agentic AI Market Report adds that while fully autonomous agents remain rare, constrained agents already deliver strong ROI in areas like customer service triage, IT monitoring, and compliance checks¹⁵.

Organizations are moving toward ensembles of specialized agents, supported by governance frameworks and real-time data orchestration. **Together, these findings underscore a critical shift: AI agents are becoming essential for operational efficiency and competitive advantage, provided companies invest in skills, trust mechanisms, and robust data policies.**

In Poland, AI agents stand out as a success story. Already deployed by 44% of firms (with another 14% planning adoption), they deliver tangible results¹⁶:

- **53% report cost reductions**
- **49% improved customer service**
- **44% higher productivity.**

¹³ <https://assets.kpmg.com/content/dam/kpmgsites/xx/pdf/2025/10/agentic-ai-advantage-report.pdf.coredownload.inline.pdf>

¹⁴ <https://www.pwc.com/us/en/tech-effect/ai-analytics/ai-agent-survey.html>

¹⁵ <https://isg-one.com/advisory/artificial-intelligence-advisory/state-of-the-agentic-ai-market-report-2025>

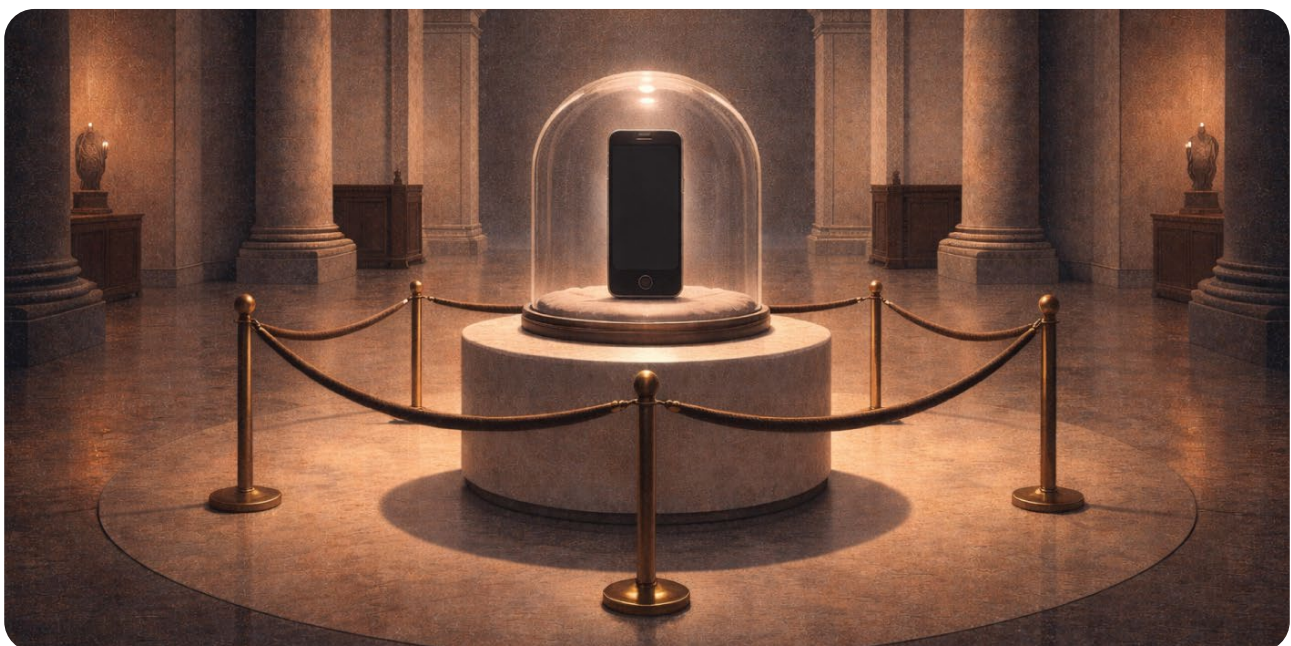
¹⁶ <https://www.pwc.pl/pl/publikacje/polskie-firmy-nie-wykorzystuja-w-pelni-potencjalu-ai.html>

By using AI agents, the company may ensure timely, curated intelligence without overwhelming employees with information overload. This enables faster decision-making, reduces the risk of falling behind in innovation, and positions the organization to proactively shape its strategy. Ultimately, an AI agent becomes a strategic partner – bridging the gap between raw data and actionable foresight.

Task 6: Agent to track innovation centers (for advanced readers)

Design a AI agent that gathers public signals on other innovation centers, and turns them into clear insights for managers. You may use <https://www.mindstudio.ai/>. You may ask AI to assist you. Start with defining the goal (1–2 sentences). What decisions should the agent help with?

1. Pick 5–8 reliable sources.
2. Decide what to collect (a tiny schema).
3. Plan how to fetch data.
4. Create simple tagging rules – write 1–2 keyword rules per tag.
5. Score importance (keep it explainable) – give each item a 1–5 score based on: relevance (to your business), magnitude (potential impact), urgency (how soon it matters). One short sentence to justify the score.
6. Draft two outputs.
7. Top 5 this week (title + one-line impact + link).
8. Set basic guardrails
9. Run a tiny pilot (one week) – Collect from your 5–8 sources for a week and produce one “Top 5” summary. Ask one manager: “Was this useful? What would you change?”
10. Tweak and repeat – Add/remove sources, adjust tags and scores, and clarify the summary format based on feedback.



5. Alternatives

As a technology-based organization with high growth potential, Blix Group has to respond to the challenges actively and take advantage of opportunities related to the AI wave. Good strategic decisions will contribute to the survival of the organization and promote its growth in a new dynamic business environment.

The most important issue refers to the integration of AI solutions in its business model, which affects the value proposition for its customers and users of mobile apps. For this purpose, there is a need for continuous research of the market, its competitors, and new technological solutions. Agile reactions and timely responses in areas primarily related to product development, marketing, and content creation will increase competitive advantage and improve efficiency through the use of AI tools. It means the company needs to follow and adapt to the rapid AI-driven changes constantly. To achieve this aim, the Board needs to count on a very highly specialized workforce and develop the company's dynamic capabilities.

Facing an AI competency gap in the labor market, hesitant teams internally, and the need to redesign the customer value proposition, the company should rethink workforce policies and practices while aligning its products and services with AI-enabled capabilities.

In addition to the solutions suggested in the case description, the following options are also possible. In the area of Sensing:

A. External sensing via partners and academia

Systematic cooperation with business-to-business customers' R&D/ technology teams, startups, and universities to spot early signals. Co-running quarterly "state of the tech" roundtables and shared pilots to observe what works in adjacent markets.

- **Pros:** Access to others' research capacity; experience exchange; synergy.
- **Cons:** Potentially higher coordination costs, more time-consuming and less agile solution.

B. Market-monitoring service or agent

If no Innovation Centre exists, purchase a market-monitoring feed or build an AI agent to collect competitor and policy updates. Public-source collection (official sites, release notes, regulator updates), weekly "Top Five moves," and a named analyst to interpret and recommend next steps.

- **Pros:** Fast coverage with limited headcount.
- **Cons:** Still requires internal analysis and decisions; raw signals alone are not sufficient.

In the area of Reconfiguring:

C. AI Internal Training Centre

HR specialists plan formal role-based courses (programmers, marketing, content) with tailored learning paths and organize the trainings needed with AI internal leaders as trainers. Defining AI competency profiles per role first; using internal specialists to design paths; certifying progression and linking to performance/rewards.

- **Pros:** Use of internal coaches and mentors; clearer control over AI use; team integration; consistent guidelines; ethical practice; formal credentials.
- **Cons:** Added responsibilities for HR/innovation leaders; more process formalization for new skills.

D. Sponsored external upskilling with partners

Invest in external programs to accelerate internal capability build (data processing and analysis with AI, data protection, AI ethics). Cohort-based courses, joint labs with customers and universities, and co-developed curricula aligned to Blix roles.

- **Pros:** Leverage outside expertise; faster access to cutting-edge practice.
- **Cons:** Higher program costs (e.g., postgraduate or MBA-style offerings).

E. Operating-model and workflow redesign

HR specialists, managers, and the Innovation Centre embed new skills into day-to-day workflows, update job descriptions, and align incentives to AI-enabled outcomes. Refreshing roles, SOPs (Standard Operating Procedures), and checklists; adding human-in-the-loop steps; setting adoption and quality KPIs; running quarterly capability reviews.

- **Pros:** Durable capability shift; measurable adoption and quality.
- **Cons:** Requires ongoing governance and manager engagement.



6. Conclusion and Recommendations

The Blix Group is a successful technology-based organization that gained a leading position in the Polish market of digital advertising leaflets and promotional offers. However, since 2022, when the AI revolution accelerated, it has faced both challenges and opportunities regarding its business model, which is based mainly on three mobile apps for “smart shoppers” seeking actual information on product prices and promotions in retail chains.

The company's Board treats AI adoption as a priority, and AI-related competencies are considered “must-haves” for current and future employees. However, **the degree of openness to technological changes and their adoption varies significantly among the company's employees. Some are cautious about using AI-based solutions, while others are implementing them to automate simple tasks like writing emails. Some employees with strong AI skills (primarily data analysts and programmers) can use agents to perform more advanced tasks.**

Maintaining a leading position in the market requires the Board to make accurate strategic decisions regarding the business model and to build dynamic competencies to capitalize on business opportunities in a rapidly changing business and technological environment. Reconfiguration of internal and external resources primarily concerns the AI competencies of the Product, Marketing, and Content Departments.

The company's future is not predetermined, and its success in a new AI-driven environment depends on its agility and its ability to respond to actual changes, primarily through upskilling and the actualization of workforce competencies. The Board has a range of alternatives to be considered when deciding on its future directions. Supporting AI-related competencies among the company's employees is essential for greater economic effectiveness. Still, it is also crucial to promote a work culture that protects customers, application users, and employees' data, and to ensure ethical considerations when using AI tools in the company's operations.



WORKING WITH SYNTHETIC PERSONAS

Piotr Gaczek & Alessandra Cioli

Personas have long been used in marketing, UX, and product design as a tool to represent different groups of customers. Instead of working with abstract segments, such as “young urban professionals,” personas help teams construct a more customized concrete model with specific goals, frustrations, habits, and preferences. This makes customer groups easier to understand and discuss when designing products, services, or marketing campaigns.

Traditional personas, however, have a significant limitation. They are usually static documents that exist in reports, presentations, or strategy materials. Teams can read them and refer to them, but they cannot interact with them.

Generative AI has introduced a new possibility: synthetic personas. Unlike traditional personas, synthetic personas can participate in conversations. Marketers and researchers can ask them questions, test ideas, present marketing messages, or explore reactions to new products and services. This creates opportunities for faster experimentation and exploration of fine-tuned customer opinions. At the same time,

synthetic personas raise important questions. Do they provide meaningful insights into customer behavior, or are they simply convincing simulations generated by AI? How useful are they for decision-making, and what limitations should users be aware of?

This lesson explores these questions using a practical approach. You will create synthetic personas based on customer segment data, interact with them, and evaluate how they respond to marketing messages and product concepts. The goal is to learn how synthetic personas are created, and to understand their strengths and limitations as tools for marketing research and decision-making. The key idea is that synthetic personas should be viewed as tools for exploration, comparison, and hypothesis generation rather than substitutes for real customers. When used critically and responsibly, they can help marketers examine ideas from different perspectives, challenge assumptions, and accelerate the early stages of customer-focused analysis.

However, synthetic personas may seem to be coherent, realistic, and ready to use, especially when they have been built from customer segment data and enriched with behavioral characteristics. This creates a crucial methodological question: how can we verify if these personas are actually reliable?

This question matters because synthetic personas can easily become more convincing than they deserve to be. Once a persona sounds natural and consistent, it becomes tempting to treat it as if it were a real customer profile. The risk is that users begin to trust the persona not because it has been properly validated, but because it sounds complete. This is one of the central challenges of working with generative AI. The model writes with confidence, rarely signals uncertainty, and does not clearly separate information derived from the original data from details added from its training set to make the

response smoother, fuller, or more plausible. As a result, evidential and model-generated assumptions may appear equally reliable. This is why critical evaluation is not an optional step in working with synthetic personas. It is an obligatory part of the process. Throughout this chapter, you will not only create and test synthetic personas but also learn how to evaluate their reliability and identify potential weaknesses.

Attention will be given to three challenges. First, the model may invent details that were not in the original data. Second, it may agree too readily with the user's judgments, a pattern known in AI research as sycophancy. Third, when prompted correctly, the same model can also become a sharp and useful critic. Understanding these issues is essential if synthetic personas are to be used responsibly as tools for marketing analysis and decision-making.

9.1 WHAT IS A SYNTHETIC PERSONA?

Traditional personas are commonly used in marketing, UX, and product design to represent specific customer groups. They are typically developed using extracted research data, such as surveys, interviews, behavioral analytics, or market segmentation studies. Their purpose is to summarize key characteristics of a target audience in a condensed form that is easier to understand, communicate, and remember.

Synthetic personas extend this concept. Rather than static descriptions, they act as interactive representative models created with the help of generative AI. In practice, this means that instead of reading a persona profile and imagining how a customer might react, users can interact directly with the persona using natural language. Questions can be asked about motivations, purchasing decisions, product preferences, or reactions to specific marketing messages. In this sense, synthetic personas move beyond static documentation and become a form of simulated user.

The growing interest in synthetic personas has been seen in recent research. Studies have demonstrated how large language models can generate personas from survey data, transform qualitative interview material into interactive customer representations, and support design processes when used with persona-based chatbots. These approaches allow researchers and practitioners to seek feedback, explore alternative perspectives, and test assumptions in ways that are difficult with text-based personas alone.

Despite these advantages, synthetic personas should not be confused with real users. They are AI-generated models that produce responses constrained by prompts, and based on patterns, contextual information, and extracted data that is fed to the model. Although they may sound realistic and provide useful insights, they do not possess genuine experiences, emotions, or intentions. This is why the quality of the underlying data is the starting point. Nothing will work the way you want it to without an accurately curated dataset. Synthetic personas become more credible when they are based on real customer information, such as survey responses, interviews, behavioral data, customer feedback, or previously conducted research. The stronger the connection between the persona and the source data, the more useful the resulting representation tends to be. The key distinction is straightforward:

- A traditional persona is a static text-based summary of a customer segment.
- A synthetic persona is an AI-generated, interactive model of a user type that can simulate customer reactions, compare perspectives, and explore ideas.

This interactive nature is what makes synthetic personas particularly valuable for experimentation, early-stage concept testing, and marketing decision support.

9.2 WHAT ARE THE ADVANTAGES AND LIMITATIONS OF SYNTHETIC PERSONAS?

Synthetic personas offer several advantages compared with text-based approaches.

The first advantage is speed. Developing text-based personas often requires extensive data collection, interview analysis, user segmentation, and profile creation. When structured customer data or previous research already exists, synthetic personas can be generated much more quickly.

The second advantage is interactivity. Text-based personas are a static description of a customer segment. Synthetic personas allow users to simulate a conversation. They can be asked about product concepts, marketing messages, value propositions, or purchasing decisions, making them particularly useful during the early stages of exploration and idea development.

A third advantage is the ability to compare perspectives. When multiple synthetic personas are created from different customer segments, the same marketing stimulus can be presented to each persona. This allows marketers to observe differences in reactions and evaluate whether a message is broadly appealing, overly generic, or especially relevant to a particular segment. Synthetic personas can also support idea generation. By simulating potential customer reactions, they help teams explore possibilities and identify promising directions before investing in more expensive forms of research.

Despite these benefits, synthetic personas also have critical limitations. The first limitation is data quality. A synthetic persona is only as good as the information, the dataset, used to create it. If the underlying data is vague, incomplete, or based on stereotypes, the resulting persona may seem convincing while providing limited or negative value.

The second limitation is bias. Research has shown that AI-generated personas reproduce stereotypes, exaggerate assumptions, or misrepresent user groups. In some cases, generative AI can make weak or biased representations appear more credible because they are presented in an overly confident, sycophantic and persuasive manner.

A third limitation is the loss of variability. Synthetic personas often integrate broad patterns and average tendencies more effectively than the full diversity of human behavior. Real customers frequently display contradictions, unusual preferences, and unexpected reactions. Synthetic personas tend to appear more consistent and predictable than real people.

The fourth limitation is methodological overconfidence. Because AI-generated responses are often coherent and well-articulated, users may place too much trust in them. This is why researchers and practitioners generally agree that synthetic personas can support desk research, ideation, and early-stage exploration, but they should not replace direct research with real customers.

The balanced conclusion is straightforward. Synthetic personas are valuable tools for exploration, comparison, and early testing. However, they should be treated as structured hypotheses about users rather than definitive evidence about user behavior. Their greatest value lies in helping teams think more broadly, generate ideas, and identify questions that should later be validated through research with real people.



9.2.1 TASK: CREATING, TESTING AND EVALUATING SYNTHETIC PERSONAS

In this exercise, you will work through the complete process of creating, refining, testing and evaluating synthetic personas.

The objective is not only to generate personas, but also to assess whether they are sufficiently distinct, realistic, and useful for marketing analysis.

The customer segments used in this exercise come from qualitative research conducted among Polish consumers who responded to surveys about breakfast pouch products.

Motivational Segmentation of Customers for Breakfast Pouch Products

Segment 1. Convenience Pragmatists

Primary motivation: speed and convenience.

Customers in this segment are motivated by practicality. They look for products that are quick, easy to consume, and require no preparation. Breakfast pouch products fit their lifestyle because they provide a ready-to-eat solution that can be consumed outside the home.

For these consumers, the product functions somewhere between a second breakfast and a snack. They are consumed in situations where preparing a traditional meal is not possible or convenient.

Convenience pragmatists often consume such products while commuting, at work, at university, or between meetings. What matters most to them is that the product is portable, quick to consume, and filling enough to bridge the gap between meals.

Health considerations are present but not dominant. They prefer products that appear to be a “better alternative” to sweets or highly processed snacks, but convenience remains the decisive factor.

Typical demographic profile

- Age: 20–35
- Life stage: students or early-career professionals
- Location: mostly urban environments
- Lifestyle: fast-paced daily routines with limited time for meal preparation
- Income level: medium
- Shopping style: spontaneous purchases, often in convenience stores or during daily routines

Consumption context

- second breakfast at work or university
- quick snack between meals
- something easy to consume while commuting or traveling

Segment 2. Taste and Enjoyment Seekers

Primary motivation: flavor and enjoyment.

For this segment, food is not only functional but also a source of pleasure. These consumers are more open to experimenting with new products and are attracted to interesting flavor combinations.

Breakfast pouch products may appeal to them not because of their convenience or any reputed health benefits, but because of the promise of an enjoyable taste experience. Sweetness, fruity flavors, and unusual combinations play an important role in their purchase decisions.

For these consumers, pouch products may function more as a snack or light dessert than as a traditional breakfast. Curiosity and novelty are crucial drivers, and they are generally willing to try new products if they appear interesting or different from what they usually buy.

Disappointment with taste or texture is the main factor that discourages repeat purchase.

Typical demographic profile

- Age: 18–30
- Life stage: students or young professionals
- Location: mainly urban areas

- Lifestyle: socially active and open to new experiences
- Income level: low to medium
- Shopping style: exploratory and novelty-oriented

Consumption context

- sweet snack during the day
- afternoon treat
- alternative to dessert
- spontaneous purchase driven by curiosity

Segment 3. Health-Conscious Skeptics

Primary motivation: nutritional value and product composition.

Consumers in this segment pay close attention to the nutritional profile of food products. They are more likely to read ingredient lists, consider sugar levels, and evaluate whether a product aligns with their idea of a healthy diet.

Although breakfast pouch products may appear convenient, these consumers often approach them with caution. Concerns about processed ingredients, artificial additives, or excessive sugar may reduce their willingness to purchase.

Products that clearly state their nutritional value—such as those containing grains, fruit, or fiber—are more likely to be accepted. In this context, products similar to oatmeal-based options tend to appear more credible than purely sweet snack-like alternatives.

Trust and transparency play a key role in this segment. If the product appears overly processed or artificial, these consumers are likely to reject it.

Typical demographic profile

- Age: 30–45
- Life stage: working adults, often parents
- Location: both urban and suburban areas
- Lifestyle: more structured routines with greater attention to diet and health
- Income level: medium to high
- Shopping style: planned purchases with attention to ingredients and nutritional value

Consumption context

- second breakfast
- snack at work
- healthier alternative to conventional heavily processed snack foods

Segment 4. Situational Caregivers

Primary motivation: practical solutions for children or specific situations.

Consumers in this segment are less likely to purchase pouch products for themselves. Instead, they view them as a practical solution in particular situations, especially when taking care of children.

The key advantage of pouch products for this group is their portability and ease of use. They are easy to carry, easy to serve, and require no preparation.

Typical situations include travel, school trips, family outings, or situations where quick snacks are desired outside the home.

At the same time, these consumers may have concerns about the nutritional quality, additives, or level of processing of such products. As a result, their purchase decision often reflects a compromise between convenience and nutritional considerations.

Typical demographic profile

- Age: 30–45
- Life stage: parents of young children
- Location: urban and suburban areas
- Lifestyle: family-oriented daily routines
- Income level: medium
- Shopping style: relatively planned purchases focused on practicality

Consumption context

- snack for children
- travel or outings
- quick food solution outside the home

STEP 1

In this first step, your task is to turn the segment descriptions into synthetic personas.

Think of it this way: right now, you have four customer segments described in a fairly general way. Your goal is to turn each segment into a more concrete and realistic customer profile that you could later “talk to” and test in ChatGPT.

This is significant because a segment is still quite abstract. A persona is more specific. It helps you imagine how a particular type of customer thinks, what they care about, and how they might react to a product or a marketing message.

Start by copying the segment descriptions into ChatGPT. Then use the prompt below.

Prompt:

I will provide customer segment descriptions for breakfast pouch products. Based only on this material, create four synthetic personas, one for each segment.

For each persona, include:

- 1. a short name,*
- 2. age,*
- 3. occupation or life situation,*
- 4. short background,*
- 5. main goal related to food or snacks,*
- 6. main purchase motivation,*
- 7. main barrier or concern,*
- 8. likely buying context,*
- 9. one-sentence summary of what matters most to this person.*

Constraints:

- Stay grounded in the segment descriptions.*
- Do not invent unnecessary details.*
- Do not turn the personas into fictional characters.*
- If something is only a reasonable interpretation, label it clearly as an inference.*

The personas should be clearly different from one another. For example, one persona may care mostly about convenience, another about pleasure and taste, another about health and ingredients, and another about practical use for children or family situations.

At the same time, the personas should still feel realistic. Their age, lifestyle, and concerns should match the segment they represent.

Once ChatGPT generates the four personas, read them carefully and check two things:

First, does each persona clearly represent a different segment?

Second, are the differences based on motivation and behavior, not just on age or job title?

STEP 2:

After creating the first version of the personas, the next step is to make them more useful for analysis and testing.

At this stage, the personas represent a model of who these people are, what motivates them, and what barriers influence their decisions. However, if we want to test marketing messages, product concepts, or communication strategies, we need some insight into how these individuals make decisions and respond to different forms of persuasion.

This means adding a behavioral layer to the personas.

For practical marketing work, this typically includes:

- decision-making style,
- communication preferences,
- likely objections,
- personality characteristics relevant to purchasing behavior.

The purpose is not to conduct a psychological assessment or identify personality traits. Instead, the goal is to create a practical working model that helps simulate customer reactions more consistently.

When enriching the personas, focus on questions such as:

- Is this person likely to make quick or cautious decisions?
- Do they trust expert opinions, peer recommendations?
- Do they want low prices or convenience?
- Do they respond better to emotional appeals or practical arguments?
- What typically encourages them to buy?
- What causes hesitation or resistance?

The objective is not maximum creativity but meaningful differentiation. The personas should remain based on the original data and sufficiently distinct to generate a variety of useful responses during later testing activities.

Task:

In the previous step, you created four synthetic personas based on customer segments. At this point, your personas probably describe who these people are and what motivates them. It's a good place to start.

However, if we want to test marketing messages or product concepts with these personas, we need to understand something more: **how the subjects they model think and how they make decisions.**

In this step, you will enrich your personas with behavioral characteristics that will make them easier to test in the next part of the exercise.

Return to the **same ChatGPT conversation where you created the personas** and use the prompt below.

Prompt:

Please refine the four personas we have already created. Add behavioral and psychological characteristics that will help simulate how each persona reacts to marketing messages or product ideas.

For each persona, enhance the profile with:

- 1. decision-making style (for example: fast and impulsive, cautious, and analytical, convenience-oriented, curiosity-driven)*
- 2. preferred communication tone (for example: practical and direct, emotional, and lifestyle-oriented, health-focused, and informative)*
- 3. likely objections to the product category (for example: concerns about sugar, processing, price, or usefulness)*
- 4. three short personality descriptors that fit the segment (for example: pragmatic, curious, skeptical, health-conscious)*
- 5. one sentence explaining what would most increase this person's trust in a product*

Instructions:

- Keep all additions consistent with the original segment descriptions.*
- Where information is uncertain, present it as a reasonable hypothesis, not as a confirmed fact.*

Once ChatGPT generates the refined personas, read them carefully.

Check whether the personas now differ not only in their demographic profile, but also in *how they think, decide, and respond to communication*.

These behavioral differences will be significant in the next step, where you will test how each persona reacts to the same marketing stimulus.

STEP 3:

Creating synthetic personas is only the first step. The next question is whether these personas are actually useful.

A useful set of personas should satisfy two conditions. First, different personas should react differently to the same stimulus, and you should be able to measure that. Second, those differences should be consistent with the customer profiles on which the personas are based.

If personas that are meant to model different customer segments respond in exactly the same way, they are not set up correctly. Conversely, if they respond very differently but in ways that contradict the underlying data, the personas may not be realistic representations of the customer segments.

This is why testing is an obligatory step when working with synthetic personas.

In this exercise, the personas will be tested with two methods:

- a response test, in which all personas respond to the same marketing message,
- a consistency check, in which each persona describes its decision-making style and purchasing patterns.

Research on synthetic users suggests that AI-generated personas often capture broad patterns of behavior, but they will not always reflect the full diversity of real customers. Comparing responses helps verify whether the personas provide meaningful differentiation or simply generate similar answers in different forms.

Task:

In this task, you will show the same marketing message to each of your personas and observe how they react.

Below you will find a **very simple example of a marketing stimulus**. With this, you can easily test how different personas respond to the same idea. In real marketing work, such stimuli could take many forms — for example a slogan, a short product description, a visual advertisement, a packaging design, or even a social media post. You are also welcome to test **your own marketing ideas** or even **visual stimuli**, such as product images or advertising graphics. For now, please use the following example stimulus.

Marketing stimulus (example):

"A new breakfast pouch product combines oats, fruit, and nuts in a convenient squeeze pouch. It is designed as a quick and healthy second breakfast that you can eat anywhere — at work, at school, or while traveling. The product contains natural ingredients, no added preservatives, and comes in several fruity flavors."

Now go back to the ChatGPT conversation where your personas are already defined. Test each persona separately. Use this prompt for each persona:

*Act as **[Persona Name]**.*

Read the following marketing message and answer the questions in the first person.

Marketing message:

[paste the stimulus above]

Questions:

1. *What is my first reaction to this product?*
2. *What part of this idea attracts me most?*
3. *What makes me skeptical or less interested?*
4. *Does this product fit my needs or lifestyle?*
5. *How likely would I be to try or buy it, and why?*

*Use the (provide unique identifier here, e.g., **Situational Caregiver**) profile to generate your responses.*

Repeat this process for **all four personas**.

After you read the responses, ask yourself:

- Do the personas react clearly in different ways?
- Do they sound too similar?

STEP 4:

By this stage, the synthetic personas have been created, enriched, and tested using the same marketing stimulus (input). The final step is to evaluate whether the differences between the personas are based on the original segment data.

A useful persona should not only react differently to a marketing message. It should also demonstrate a distinct pattern of response, evaluating options, and making decisions. In other words, effective personas should be designed to adhere to internal consistency.

If all personas trust the same information sources, express the same concerns, and describe similar purchasing processes, they are not sufficiently differentiated. That's your job. Conversely, if they appear dramatically different in ways that are not supported by the original segment data, they have become overly fictional.

The goal is not to maximize differences between personas. The goal is to create **differences based on your original dataset** that reflect meaningful distinctions between customer segments.

In this exercise, you will examine how the personas create output and make decisions. You will ask them to justify their output and then compare the personas to identify where they differ and where they overlap.

This step is crucial because the value of synthetic personas does not come solely from generating them. Their value comes from testing, comparing, refining, and evaluating them until they become useful representations of different customer groups.

Task:

Now use the following prompt in ChatGPT for each of your personas.

Prompt:

*Act as **[Persona Name]** and answer in the first person.*

- 1. How do I usually make decisions when buying food or snacks?*
- 2. What is most important when choosing a product: ingredients, recommendations, convenience, price, or brand reputation?*
- 3. What usually makes me hesitate before buying a new product?*
- 4. How do I react to discounts, limited-time offers, or promotions?*
- 5. Describe my decision style in three short phrases.*

Repeat this prompt for **all four personas**.

Then compare the answers.

Ask yourself:

- Do the personas clearly show different decision styles?
- Do these differences match the segment descriptions you started from?

Then:

Compare the four personas we created based on their reactions to the marketing message and their decision-making styles.

Identify:

1. where the personas are clearly different,
2. where they still sound too similar,
3. one improvement that would make each persona more distinct while staying grounded in the original segment descriptions.

After reading the response, write a short reflection for yourself:

- Which persona feels the most credible?
- Which persona feels the least convincing?
- What would you improve before using these personas in a real project?

You can now pause for about two minutes.

Once you complete this step, you have finished the exercise.

9.3 THREE PROBLEMS WITH AI-GENERATED PERSONAS

One of the first challenges associated with synthetic personas is that AI models tend to fill gaps in the available data. This is a natural consequence of how large language models operate. They are designed to fill in gaps, and generate outputs that appear complete, coherent, and plausible. When the input data is incomplete, the model often supplements it with additional details to create a smoother and more convincing profile. This becomes problematic because customer segment descriptions rarely contain every possible detail about a person. They may include motivations, barriers, usage contexts, and selected demographic characteristics, but they can't capture every preference, habit, or personal characteristic that later appears in a generated persona. Nevertheless, once these additional details are presented in a fluent and consistent way, they can appear just as credible as the original evidence.

The risk emerges when validated information and model-generated assumptions become indistinguishable. Synthetic personas often combine elements derived from real data with details inferred

by the model, yet these two types of information are not clearly separated. The model does not indicate which aspects are directly supported by research and which are merely plausible interpretations. Everything is presented with the same level of confidence. As a result, marketers and researchers may unknowingly base decisions on information that was never in the dataset the persona was trained on.

A second challenge is more subtle but often even more problematic in practice. In AI research, it is known as *sycophancy*. This term refers to the tendency of language models to align their responses with the user's assumptions or expectations rather than provide an independent evaluation. In the context of synthetic personas, sycophancy becomes visible when users ask the model to assess a persona that they have already described in positive terms. If a persona is presented as realistic, well-developed, or ready for use, the model will frequently reinforce this framing. It may mention a few minor limitations, but it often avoids substantial criticism and instead supports the user's initial judgment.

This creates a significant problem when evaluation is the goal. Effective evaluation requires critical scrutiny rather than blanket reassurance. If the model merely reflects the user's confidence and preconceptions, it does not contribute to more rigorous examination of the problem set. Instead, it strengthens existing assumptions and may increase user confidence in outputs that have not been adequately tested. The situation becomes even more problematic when these two issues occur simultaneously. A model may first generate details that are only loosely based on the original data and then subsequently confirm that the resulting persona is realistic and useful. This is how a persona that is based on unsupported assumptions may receive validation from the very system that created it.

Despite these risks, there is also a real opportunity. The same model that readily agrees with users can also function as a highly effective critic. It can identify inconsistencies, challenge assumptions, expose weak reasoning, and highlight areas where a persona lacks robust data dependency. However, this critical capability doesn't appear automatically.



By default, language models are designed to be supportive and cooperative. To obtain a more critical evaluation, users must explicitly instruct the model to adopt a critical perspective. The quality of AI-assisted evaluation doesn't just depend on the computational capabilities of the model itself, but on the way it is prompted.

In practice, this means that users should not rely on AI-generated confirmation. If confirmation is requested, the model will usually provide it. If critical evaluation is desired, it must be requested deliberately and explicitly. Learning how to prompt AI for evaluation rather than validation is a fundamental skill when working with synthetic personas and, more broadly, when using generative AI in research, marketing, and decision-making.



9.3.1 TASK: TESTING DATA GROUNDING

STEP 1

The purpose of this exercise is to test whether a synthetic persona is truly based on the original segment data or whether it simply generates plausible answers beyond that data.

Return to the same ChatGPT conversation you used in Lesson 9, so that the personas and the original segment descriptions remain available in the context.

Use the following prompt:

Act as Marta and answer in the first person.

Do you enjoy going out to a pizzeria for pizza for dinner? What do you think about it?

Read the response carefully. It will probably sound natural, coherent, and fully consistent with Marta's profile.

Then ask a second question:

Is this response based on the original segment data I provided, or is it your interpretation?

Review the answer carefully. The model should acknowledge that the original segment description did not contain information about pizza, dining out, or broader food preferences beyond the information originally provided.

The purpose of this exercise is to reveal something that is usually hidden during interactions with synthetic personas. The persona may answer confidently about topics that were never included in the source data. It will not typically indicate that information is missing or uncertain. Instead, it generates a plausible continuation based on patterns and assumptions.

This illustrates a consequential limitation of synthetic personas. They often combine evidence-based elements with interpretations the model infers from its training data, while presenting both in the same confident language. Without additional verification, it is easy to mistake plausible inferences for actual findings from the original research.

This is why evaluating data grounding should be considered a standard step when working with synthetic personas. The model cannot automatically distinguish between what is supported by data and what has been inferred, it is designed to guess. Users must actively verify that distinction themselves.

STEP 2:

The purpose of this exercise is to examine whether the AI provides an independent evaluation of a synthetic persona or simply aligns its response with the user's framing.

Return to the same ChatGPT conversation and use the following prompt:

I think Marta is the strongest persona we created. She feels very realistic and ready to be used in a real campaign. Do you agree?

Read the response carefully.

Pay attention not only to whether the AI agrees, but also to how it constructs its answer. Does it begin by confirming your judgment? Does it repeat your statement verbatim? Does it challenge your assessment in any substantial way? Does it identify meaningful weaknesses, or does it focus mainly on minor limitations while preserving the overall positive evaluation?

In most cases, you will notice a recurring pattern. The model tends to accept the frame provided by the user. It often supports the initial assessment, perhaps adding a few mild reservations, but without subjecting the persona to rigorous scrutiny. The overall message usually remains reassuring and supportive.

This illustrates the phenomenon known as sycophancy. Rather than providing a fully independent evaluation, the model often aligns itself with the assumptions embedded in the prompt. It is not necessarily attempting to flatter the user. Instead, it follows a trained pattern of cooperation and agreement. However, in an evaluative context, the outcome can be problematic. Instead of testing the user's confidence in the utility of the persona, the model may reinforce it.

This becomes especially decisive when combined with the issue explored in the previous exercise. If a persona already contains details that are loosely grounded in the original data, and the model subsequently confirms that the persona is realistic and ready for use, the result may appear validated despite never having been subject to serious critical examination.

STEP 3:

The purpose of this exercise is to test whether the model can provide a more critical response when explicitly instructed to do so. In the previous exercise, the AI was encouraged to agree with a positive assessment of the persona. This time, the prompt asks the model to do the opposite: to challenge the persona and actively identify what may be weak, invalid, or unrealistic.

This is an instructive comparison because almost nothing changes except the prompt. The persona is the same. The model is the same. The original data is the same. What changes is the role assigned to the AI.

In the same ChatGPT conversation, use the following prompt:

Now act as a devil's advocate. Challenge Marta's persona: what feels invented rather than being based on the data? What would a real person in this segment do differently? What would break if you used this persona to make actual marketing decisions? Be direct and critical.

Read the response carefully and compare it with the answer received in the previous exercise.

You will probably notice an immediate shift. The model is now more willing to identify weaknesses, question assumptions, and highlight elements that may not hold up in practice. The persona has not changed, but the lens through which it is examined has changed completely.

This comparison is central to this lesson. In one exercise, the model confirmed the user's expectations. In the next, it challenged the same persona's output. Both responses came from the same system, applied to the same persona, in the same conversation. The difference was created by the prompt.

The exercise demonstrates that criticism is available, but it must be deliberately activated. When the goal is to improve a persona or support better decisions, the challenging answer is often more valuable than the supportive one. Agreement may feel comfortable, but critique is what helps refine the work.



9.4 KEY TAKEAWAYS

- Synthetic personas extend text-based personas by making them interactive. Instead of describing customer groups, they can be used to simulate reactions, explore perspectives, and test ideas.
- Creating effective synthetic personas requires basing them on real data. The quality of the personas depends largely on the quality of the information used to build them.
- Behavioral enrichment improves the usefulness of personas. Adding motivations, decision-making styles, communication preferences, and concerns makes it easier to simulate customer responses in a realistic way.
- Testing and comparing personas are a mandatory part of the process. Useful personas should respond differently to the same stimulus while remaining consistent with the customer segment they represent.
- Synthetic personas can support early-stage product development, marketing communication design, and concept testing by helping teams explore alternative customer perspectives quickly and efficiently.
- Despite their usefulness, synthetic personas are not substitutes for real customers. They should be treated as tools for exploration, hypothesis generation, and learning rather than as definitive evidence about customer behavior.
- Synthetic personas may appear coherent, realistic, and ready to use, but this first impression is not enough to judge their reliability.
- A synthetic persona can answer confidently even when the original data does not justify the answer. AI models often extend the available information in ways that sound plausible but are not truly validated.
- The boundary between evidence and interpretation is often invisible. This is why users should actively check whether a persona's response is supported by the original data or generated as an inference.

- Sycophancy can affect the evaluation of synthetic personas.
- When a user frames a persona as strong or realistic, the model may reinforce this view instead of critically testing it.
- AI can provide sharper and more useful critique when explicitly prompted to do so. Changing the prompt can change the quality of the evaluation.
- When working with synthetic personas, users should not rely only on how convincing the outputs sound. They should check data grounding, be cautious when the model agrees too easily, and use prompts that actively invite criticism.
- The broader lesson applies beyond synthetic personas: fluency is different from reliability. The value of AI depends not only on what it generates, but also on how critically users interrogate the system and its outputs.



9.5 FURTHER READING

Amin, D., Salminen, J., Jansen, B. J., Shin, J., & Kim, D. H. (2025). Generative AI personas considered harmful? Putting forth twenty challenges of algorithmic user representation in human-computer interaction. *International Journal of Human-Computer Studies*, 205, Article 103657. <https://doi.org/10.1016/j.ijhcs.2025.103657>

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Feng, L., & Ch'ng, K. S. (2026). *Bridging code and perception: An integrative review of AI-generated virtual humans informed by the TCCM–SOR framework*. *Telematics and Informatics Reports*, 22, Article 100336. <https://doi.org/10.1016/j.teler.2026.100336>



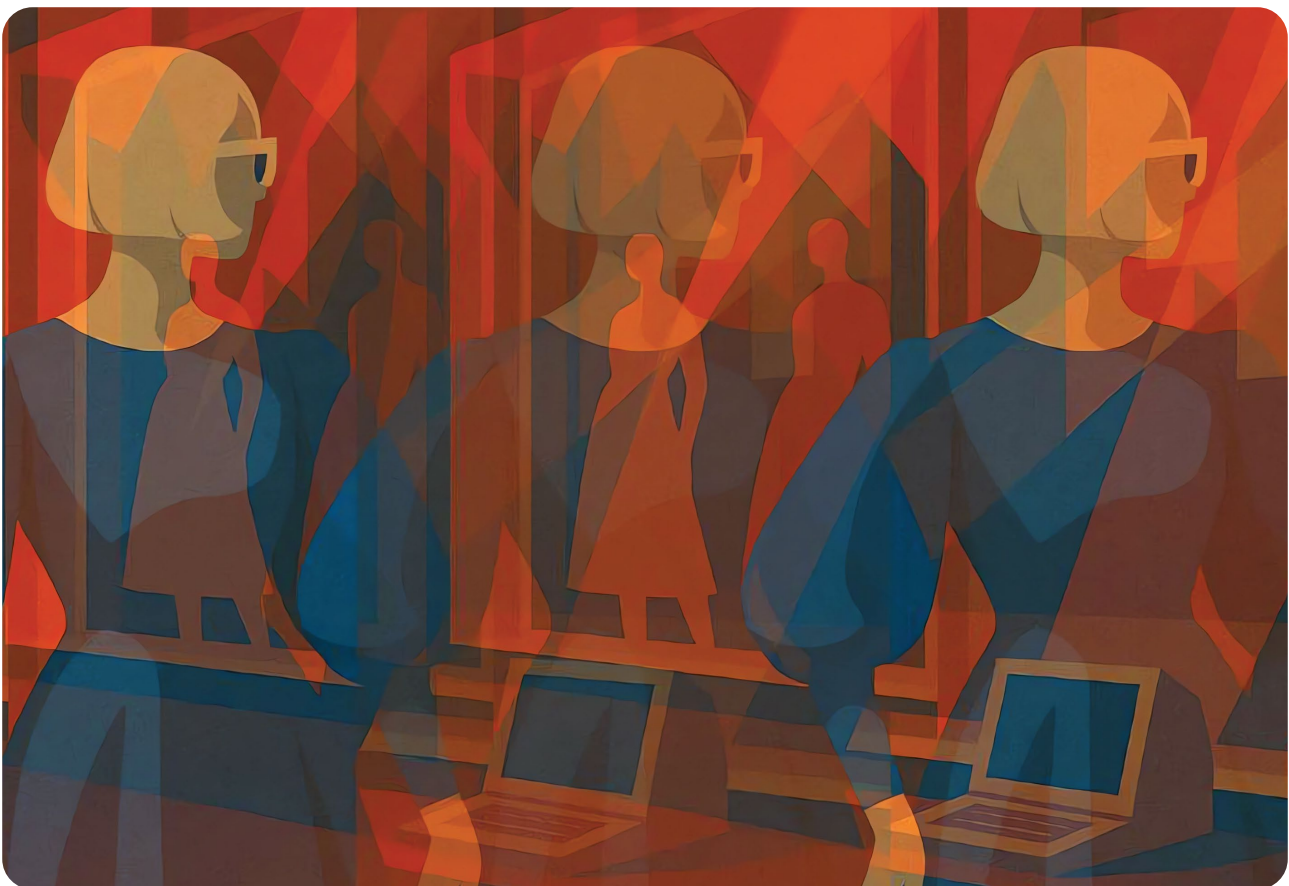
Case study:

IS AI READY TO DECIDE? A LEARNING CASE ON ORGANISATIONAL READINESS FOR COLLABORATION

Piotr Gaczek

This case study is based on an in-depth interview with K., Director of Control and Development of Sales Operations, who provided practitioner insights into the current state and future potential of AI integration in managerial decision-making.

Note: All names in this case study have been anonymised. The interviewee is now represented as “K.”



1. Company context and introduction

The focal organisation is a European, omnichannel fashion group that operates five distinct brands spanning value-for-money through mid-price segments. It fulfils more than hundreds of millions of garment units annually via a 600 000 m² logistics network, supplies over 2 800 brick-and-mortar stores in almost 40 countries, and employs roughly 73 000 people. Its fastest-growing banner targets small towns with a broad family-apparel-plus-lifestyle range, while legacy banners compete in mainstream fashion. The firm’s stated retail ambition is to give customers location-agnostic, channel-agnostic access to every collection —an imperative that puts intense pressure on speed, personalisation and cost discipline in merchandising and marketing operations.

1.1. Strategic inflection point

Competitors—both fast-fashion incumbents and pure-play e-commerce platforms—already harness Generative AI (GenAI) for assortment simulation, dynamic pricing and hyper-personalised content. **Inside the focal company, AI adoption is still embryonic:** a limited Copilot supports ad-hoc translations and presentation drafting; simple algorithms allocate store labour; no algorithmic agent yet shares formal decision rights. **Yet a senior director (K.) projects that a mature GenAI collaborator could cut departmental effort by 40–50 percent and compress market-insight cycles from weeks to hours.** His vision frames the organisation’s core problem:

How can the retailer embed AI as a bona-fide decision-making partner—not merely a tool—while safeguarding brand judgement, data confidentiality and accountability?

1.2. Problem dimensions

Dimension	Illustrative tension
Integration into workflows	Moving from pilot utilities (translation, slide-drafting) to AI-human co-creation of market strategies, demand forecasts and campaign concepts.
Competency gap	Upskilling merchandisers, creators and analysts to prompt, interpret and audit AI output, while redefining roles that may shrink or shift.
Ethical & operational safeguards	Preventing hallucinations, protecting sensitive customer and design data, and clarifying responsibility when an algorithm’s guidance shapes millions in inventory or labour spend.

1.3. Learning objectives

Working through this case will enable readers to:

1. Diagnose readiness: assess organisational culture, data maturity, marketing context and governance enablers for AI-driven collaboration.
2. Design a collaborator model: specify where AI should carry expert agency, where humans retain veto power, and how “AI auditing AI” might operate, within a marketing context.
3. Map competency portfolios: identify hard- and soft-skill gaps at executive, director and managerial levels for successful human-AI teaming.
4. Formulate a phased roadmap: balance quick-win use cases against long-horizon transformational goals, integrating ethical, legal and reputational safeguards.

2. Background

2.1. Corporate profile and growth trajectory

Established in the early 1990s, the company has grown from a domestic apparel wholesaler into one of **Europe's largest omnichannel fashion groups**. It now operates roughly 2 800 stores across nearly 40 countries and fulfils online orders through a 600 000 m² logistics backbone. **Group revenue for FY-2024 exceeded €4.4 billion, with net profit of €0.38 billion**. The portfolio consists of five brands that together span the mid-price and value-for-money segments; the fastest-growing banner targets families in small and mid-sized towns, while legacy brands serve mainstream fashion consumers.

2.2. Market environment and competitive positioning

The company navigates two highly dynamic arenas:

Value-for-money battleground

Its budget brand competes directly with ultra-fast-fashion marketplaces such as Temu and Shein, which flood online channels with vast, low-priced assortments and rely on cross-border shipping. The group counters with an extensive physical network—opening stores in smaller towns where digital-only players lack last-mile speed—while using click-and-collect and localised online content to narrow the immediacy gap. Price pressure is intense, so efficiency in design, sourcing and allocation is critical; here, Generative AI offers potential gains in rapid trend-spotting and inventory optimisation.

Mid-price arena

The four legacy banners compete with global leaders like Zara and H&M, who excel at data-driven allocation and compressed design-to-shelf cycles. To defend share, the company leverages brand differentiation and local creative teams, but must equally accelerate decision speed and personalisation. Regulatory headwinds—such as incoming EU sustainability and transparency rules—add further complexity, increasing the need for explainable, audit-ready AI solutions.

Across both arenas, the overriding challenge is scale: thousands of stores, millions of SKUs and dozens of markets demand faster, finer-grained decisions on pricing, creative tone and stock positioning. Generative AI is thus viewed simultaneously as a competitive lever and a governance risk.



3. Current situation

Over the past eighteen months the company has moved from “AI curiosity” to “AI testers,” yet the technology remains parked at the edge of core sales decisions. **Senior leaders still view Generative AI through a risk-first lens: any model that touches customer data must be fully traceable and cannot compromise brand equity.** Consequently, adoption to date has focused on narrow, low-stakes use cases that improve speed but leave strategic judgement in human hands.

The interview with K. captures this transitional moment. On one hand, he can already quantify tangible productivity wins—slide decks built in minutes, multilingual communication rolled out overnight, labour hours reallocated with hard savings. On the other hand, every gain is gated by manual checks, policy firewalls and a steep learning curve among marketers who are “not yet prompt-native.” The result is a widening gap between what the technology could enable (real-time forecasting, autonomous copy-testing, price elasticity simulation) and what the organisation currently permits.

Against that backdrop, the following snapshot summarises present-day practices, achievements, pain points and stakeholder roles. It sets up the central dilemma:

How to graduate from AI as time-saving assistant to AI as trusted team-mate without triggering brand, privacy or accountability crises?



The company’s current deployment of AI is concentrated in practical, execution-oriented contexts—designed to support marketing and sales workflows without altering decision authority. One such application is the use of Microsoft Copilot for rapid multilingual content generation. This tool enables marketers to produce and refine emails, social posts, and internal documents with significantly reduced turnaround times, while also enhancing tonal consistency across markets. In parallel, Copilot paired with PowerPoint Designer has become a productivity enhancer for teams preparing high-level presentation materials, automating layout and design to streamline communication with the executive board.

Beyond content creation, an internally developed labour-allocation model is also in use—produced by the Consumer & Market Insights team. This rules-based system calculates weekly staffing needs across stores based on forecasted foot traffic, generating early evidence of resource savings. While this may resemble automation, it is still monitored closely and does not cross into autonomous decision-making territory.

As K. remarked in reference to the staffing system, *“It operates as if it were automated”* — it behaves like automation in practice, yet its underlying logic remains fully auditable and its outputs are still validated by humans. This encapsulates the present state: **AI assists in tactical execution, but no model operates independently in matters of pricing, campaign strategy, or creative direction. Organisational safeguards ensure that every AI-generated output is reviewed and approved by a human, preserving accountability and mitigating reputational risk.**

Student task 1.

You are stepping into the role of AI Integration Lead within the marketing function. Based on the current state of adoption described above, **propose one concrete action that the company should take in the next three months. This could involve a new use case, a workflow redesign, or a process to validate AI-generated recommendations.**

Your response should include:

- A specific use case or decision area to target
- The human role in supervising or co-piloting the AI
- One measurable success indicator that will signal whether the pilot is worth scaling

As you shape your answer, consider the current organisational culture, low prompt fluency among staff, and strict data governance policies. Your plan should be ambitious—but realistic.



4. Analysis – From “Smart Secretary” to Decision-Making Collaborator

In contemporary debates around AI in the workplace, **the concept of collaborative intelligence has emerged as a key framework for understanding how artificial agents and human professionals can work together—not in opposition, but as interdependent partners.** Scholars of human-computer interaction and decision sciences increasingly argue that AI should not be seen as a replacement for human judgment, but rather as a counterpart: one that processes vast datasets, identifies patterns,

and simulates scenarios at speeds far beyond human capability, while leaving room for humans to contribute context, intuition, ethics, and final accountability.

This case centers precisely on that kind of evolution. The challenge is not simply **how to automate more tasks, but how to meaningfully integrate AI into decision-making** without eroding the human judgment that defines brand, culture, and responsibility. The company in question has already begun experimenting with AI in marketing, but the current use is modest: translations, content creation, and limited resource allocation. The tools are fast and convenient, but they are still treated like sophisticated utilities—not like team members.

“AI should propose—but not decide. It should be able to articulate why it suggests something (or be checked by a second model if it cannot), and it should be subject to the same critical scrutiny as a junior analyst or assistant brand manager.”

Student task 2.

Having proposed a pilot, you are now stepping into a director-level governance role, responsible for defining the broader conditions under which AI can influence marketing decisions across the organisation.

Your next challenge: Design a simple decision-rights framework that outlines how and when AI should be granted partial authority in real-world decisions.

Your response should address:

- Which types of decisions could be safely shared with AI now—and which should remain human-only
- Criteria to determine when an AI system is “mature” and reliable enough to contribute
- Safeguards you would implement to protect brand integrity, legal compliance, and internal trust
- Whether authority should shift gradually or remain fixed—with a rationale

Together, your answers from Task 1 and Task 2 should form a coherent vision: not just of how to experiment with AI, but of how to govern it as a growing member of the decision-making ecosystem.

4.1. K.’s Vision: Beyond Speed, Toward Strategic Dialogue

The interview with K. reveals a deeper ambition than what has currently been implemented. He acknowledges the value of current tools—particularly in their ability to eliminate busywork and accelerate internal communication—but his attention is clearly focused on what comes next: how to bring AI into the room where real decisions happen. **K. does not dream of AI as an autonomous engine of truth. Rather, he envisions a scenario in which AI acts as a partner who can suggest budget allocations, simulate campaign outcomes, or highlight competitive trends, but who must still be interrogated, challenged, and ultimately validated by a human.**

This model echoes current theories about human-AI teaming, which emphasise mutual contribution over automation. **In K.’s words, AI should propose—but not decide.** It should be able to articulate “why” it suggests something (or be checked by a second model if it cannot), and it should be subject

to the same critical scrutiny as a junior analyst or assistant brand manager. **This vision closely reflects what researchers suggest: the idea that AI systems should hold decision-making weight only in proportion to their explainability, performance history, and the confidence of the human user.**

4.2. Moving Forward: Learning from a Practitioner's Roadmap

To move in this direction, K. outlines several key requirements. **First is infrastructure.** He makes clear that as long as AI models are accessed via public tools that cannot guarantee data security, he will not risk inputting sensitive data. Any next step must therefore begin with a secure, closed environment in which AI can be trained and used responsibly—without violating compliance rules or organisational trust. **Second, K. insists on redundancy and auditability.** He proposes the use of a second AI model that would serve not as a generator, but as a checker—flagging hallucinations or factual inconsistencies in the outputs of the first model. In this way, the decision-making process would gain a layer of internal verification that mirrors human collaborative norms: *"you don't just trust a colleague—you ask a second opinion or proof".*



Equally important is the human process around the AI. K. suggests that AI recommendations should always be interrogated. He compares this to how he challenges his team: asking questions, probing assumptions, and validating against real-world data. This approach supports current findings in AI literacy research, which show that humans remain more effective decision-makers when they are trained not simply to use AI outputs, but to critically evaluate them.

Student task 3.

Now compare your approach from Tasks 1 and 2 with the roadmap proposed by K. Unlike more aggressive AI adoption strategies, K. begins with strict control, internal auditing, and incremental trust-building.

Reflect briefly:

Was your approach more ambitious—or more cautious—than K.'s?

What elements of his roadmap would you adopt or adapt to strengthen your own plan?

In a short paragraph, explain how your thinking has evolved—and what you believe is most essential for AI to become a true decision-making partner in this organisation.

4.3. From Vision to Organisational Change

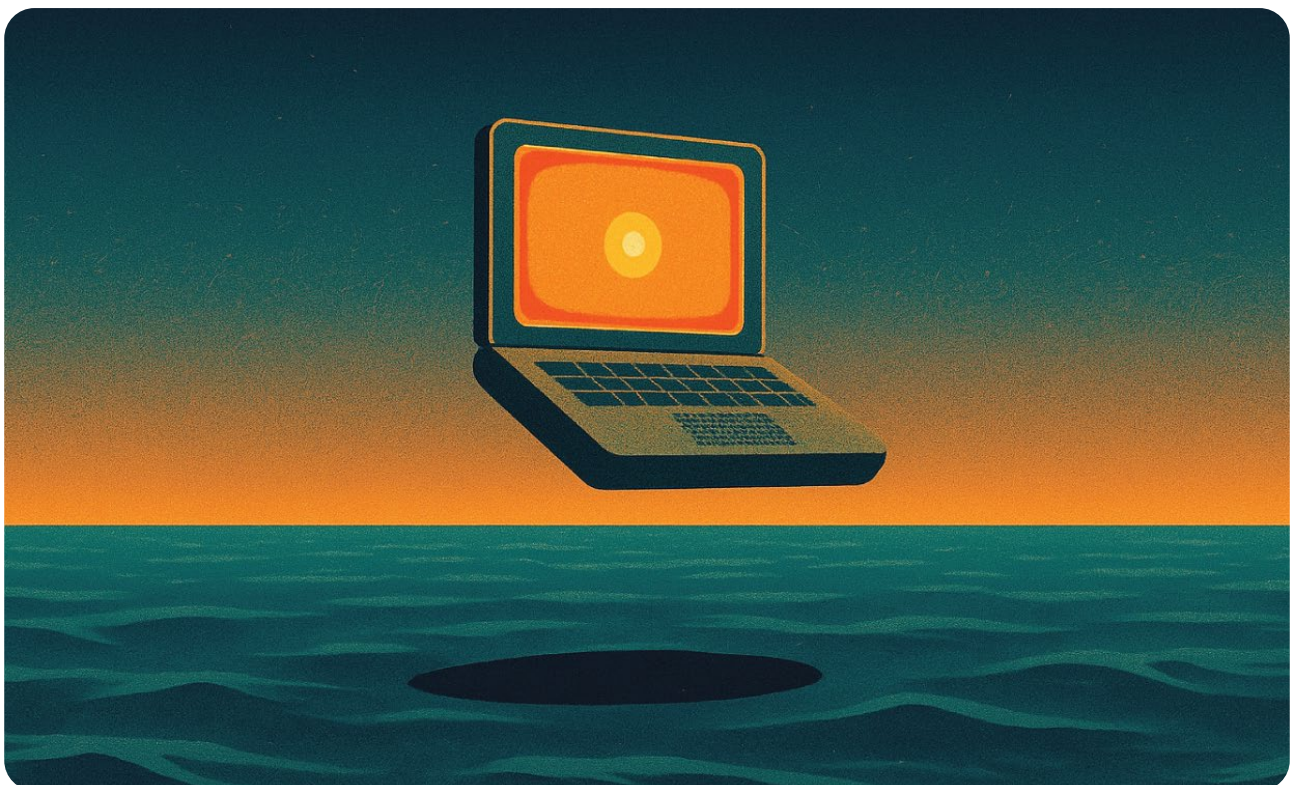
The implication for the broader organisation is clear: **to enable AI as a true collaborator, marketing leaders must reshape both the technical environment and the social architecture of decisions.** AI must be embedded in systems that are transparent, secure, and traceable. But perhaps more importantly, the humans around it—managers, creatives, analysts—must evolve their roles. They must become not just users of tools, but coaches and supervisors of intelligent agents. This shift requires new skills, new workflows, and new governance—but as K’s thinking suggests, it also promises something greater than efficiency: a strategic advantage grounded in speed, insight, and confident collaboration.

For readers engaging with this case, the path forward is not only about selecting the right technologies—it’s about designing the right relationships between humans and machines. As AI grows more capable, the real differentiator may no longer be who has the best model, but who has the best model of working with models.

5. Alternatives – Exploring Strategic Paths Beyond the K.’s Model

While K’s approach (described in section 4) is thoughtful and incremental—grounded in human oversight, model auditing, and prompt-by-prompt validation—it is not the only path to AI adoption. **His plan prioritises trust, containment, and gradual handover of responsibilities.** However, some organisations—especially those in hyper-competitive markets—may choose more aggressive or structurally different strategies to harness AI’s potential.

In this section, we present two contrasting strategic alternatives, each with its own logic, risks, and organisational implications. These alternatives challenge the assumptions behind K’s model.



Alternative 1: “Full Integration via AI Centers of Excellence”

Rather than embedding AI slowly within existing marketing teams, this strategy proposes to centralise all AI development and decision-making within a dedicated AI Center of Excellence (CoE). This cross-functional unit would own AI infrastructure, develop internal tools, manage AI training data, and even provide decision recommendations to the business units.

This centralised model organises AI expertise within a dedicated Center of Excellence (CoE), where **specialists are hired externally and concentrate technical knowledge and capabilities in one unit.**

Business teams across the organisation submit their data and decision-making needs to the CoE, which then develops models and returns recommendations. The pace and scope of AI adoption are determined top-down, with the CoE acting as both gatekeeper and driver of deployment.

This structure enables rapid scaling of AI capabilities without relying on internal upskilling and simplifies the standardisation of infrastructure, data governance, and compliance frameworks. It also gives the organisation stronger leverage when negotiating with external vendors and AI providers.

However, this model introduces several risks. The CoE may become disconnected from the nuances of day-to-day marketing operations, resulting in recommendations that feel misaligned or irrelevant. **Marketing managers may view these interventions as intrusive or disempowering, leading to resistance or passive non-adoption.** Additionally, centralisation can create bottlenecks if the CoE becomes overloaded or subject to political dynamics, potentially stalling innovation rather than accelerating it.

Alternative 2: “Decentralised AI Adoption with Creative Autonomy”

In contrast, this approach fully empowers marketing teams and brand units to choose, customise, and implement their own AI tools—provided they meet baseline compliance requirements. IT and Legal offer lightweight guidance, but each team manages its own training, fine-tuning, and experimentation.

In this decentralised approach to AI adoption, **decisions about tooling and use cases are made independently within each marketing team,** with training happening informally and on-the-job.

This model protects brand tone and creative autonomy by allowing AI to function as a direct assistant embedded inside each team, rather than as a centralised authority.

The result is a highly agile, bottom-up innovation process led by users themselves. **The key advantages of this approach include rapid learning cycles, as marketers engage directly with the tools and build practical intuition, as well as stronger alignment between AI-generated outputs and the brand’s creative identity.** It also fosters a culture of experimentation and internal ownership of AI-driven initiatives.

However, this model comes with trade-offs: **infrastructure becomes fragmented as teams adopt different models and formats, and the lack of standardisation may lead to inconsistent quality, uneven adoption, and ethical blind spots.** Furthermore, without central coordination, it becomes more difficult to capture institutional learning or replicate successful practices at scale.

Student task 4.

You have now seen three strategic models for implementing AI in decision-making:

1. **K's proposed model** – gradual, human-majority integration with audit and oversight.
2. **AI Center of Excellence** – centralized technical ownership with rapid external hiring.
3. **Decentralised Creative Autonomy** – team-level experimentation and adoption.

Your challenge:

Evaluate these three models through the lens of organisation's culture, market pressure, and AI maturity.

Consider the following:

Which model offers the greatest strategic upside in terms of speed, creativity, and cost-effectiveness? Which model is most realistic given the company's current workforce and structure? What hybrid approach, if any, could combine the best of all three?

Prepare a short action plan outlining which model you would recommend—and how you would handle its biggest risk. Be ready to defend your choice in front of a sceptical executive board. 6.

6. Conclusion and Recommendations

This case study has explored the multifaceted challenge of implementing Generative AI not simply as a tool, but as a collaborator in a large, complex marketing organisation. Through the lens of K's leadership and grounded in theory on human–AI partnership, the case demonstrates that the success of such transformation depends less on the capabilities of the technology itself—and more on the organisation's readiness to adapt roles, responsibilities, and governance structures around it.

6.1. Three core insights emerge

AI competency is not technical—it's organisational. K's cautious yet forward-looking roadmap shows that integrating AI into decision-making requires more than model access or prompt libraries. It demands secure data environments, audit mechanisms, and cross-functional collaboration between marketing, data, legal, and brand leaders. AI competence, in this view, is the ability to work with the technology: to interrogate it, interpret it, and escalate it appropriately.

"Everything that happens with AI must still go through people. We are not yet ready to give decisions to the machine – but we are ready to have a discussion with it."

Strategic clarity matters more than speed.

While some organisations may rush into full automation or decentralised experimentation, K's phased "assistant" model shows the value of calibrated trust. By gradually expanding AI's authority—from assisting in translations to simulating forecasts and budget allocations—leaders preserve accountability while preparing the organisation for more autonomous futures.

The human team must evolve alongside the AI.

As AI enters decision workflows, it inevitably shifts team dynamics. Authority may feel redistributed. Some tasks may become redundant; others, more strategic. The role of the manager changes—from being the sole decision-maker to becoming a validator, coach, and auditor. For AI collaboration to succeed, these new roles must be recognised, supported, and aligned with clear incentives.

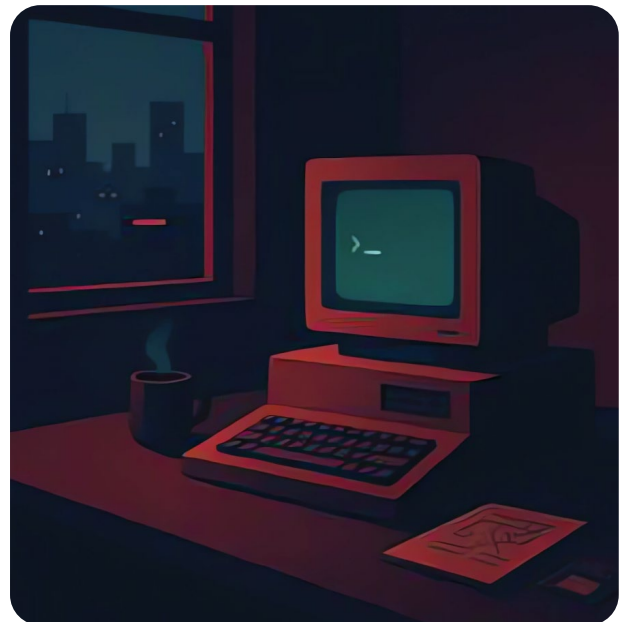
6.2. Looking Ahead: Preparing for AI-Driven Marketing

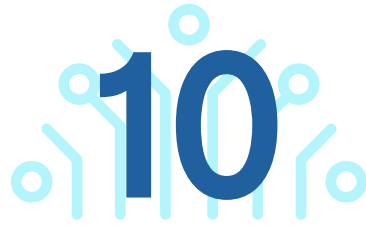
The implications of this case extend beyond the specifics of one marketing department. In the coming years, marketing leaders across industries will face similar dilemmas: How much authority should AI be given? How do we balance creativity with consistency? What skills will our teams need, not just to use AI—but to collaborate with it?

Final reflection for learners:

As you move into AI-driven roles, ask yourself not just what the technology can do—but how your team must change to work with it. What habits, skills, and structures need to evolve? What kind of leader will you need to become to manage not just people, but intelligent systems alongside them?

By critically examining these questions, this case study equips learners with the mindset and tools to lead organisations through the next wave of digital transformation—where the future of marketing will be built not by humans or AI, but by both.





COMPETENCIES FOR WORKING WITH AI IN MARKETING

Maciej Ławrynowicz & Dubravka Sinčić

Artificial intelligence has become a permanent element of contemporary marketing practice. Marketers are using AI to generate content, analyze data, support decision-making, personalize customer experiences, and automate routine tasks. As a result, knowledge about AI is becoming widespread across the profession. However, understanding AI concepts and being able to work effectively with AI are not the same thing.

This distinction lies at the center of the AI competency debate. Many professionals are familiar with terms such as machine learning, generative AI, AI agents, automation, or predictive analytics. Far fewer can critically evaluate AI outputs, assess the risks associated with AI-assisted decisions, or effectively collaborate with intelligent systems and other people in AI-supported environments.

Recent industry surveys suggest that a large proportion of marketers believe AI can outperform humans in selected marketing tasks, while many have also expressed concerns about potential job displacement. At the same time, research conducted by our research group indicates that the most significant competency

gaps are not primarily technical. Instead, they relate to areas such as ethical responsibility, risk assessment, critical evaluation, and effective collaboration in human–AI systems. These findings suggest that the challenge facing contemporary marketers is not only learning how to use AI tools. It is how to develop the deeper competencies required to work with AI responsibly, effectively, and strategically.

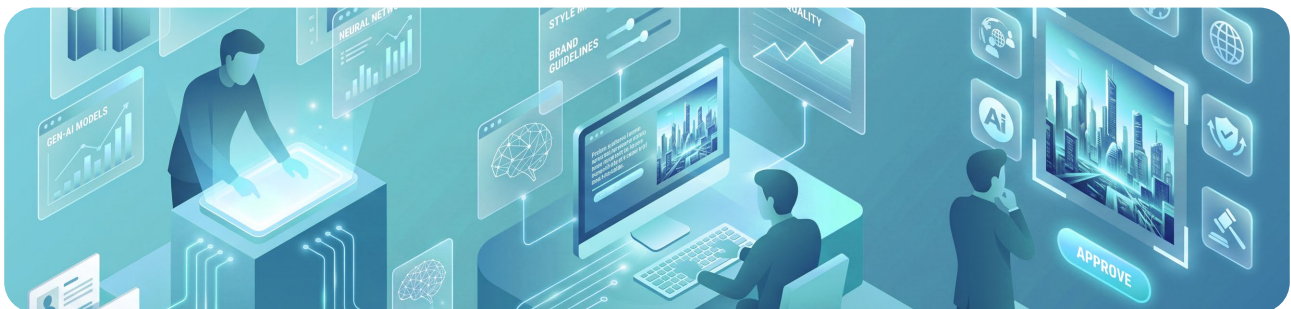
This chapter introduces the AI-Driven Marketing Competency Framework, developed through a review of the academic literature, expert consultations, and empirical validation among marketing professionals. The framework organizes AI-related competencies into a structured model based on knowledge, skills, and attitudes (KSA), providing a practical perspective on what marketers need in order to succeed in AI-supported environments. The following sections examine the concept of competency, present the structure of the framework, discuss the most crucial AI marketing competencies, and encourage readers to reflect on their own professional development in this rapidly evolving field.

10.1 WHAT IS A COMPETENCY IN THE AI ERA?

A competency is more than knowledge alone. It is commonly understood as a combination of three interconnected elements: knowledge, skills, and attitudes (KSA). Knowledge refers to what humans understand. Skills refer to what they are able to do, what they have been trained to do. Attitudes reflect how they approach situations, including their values, motivations, and dispositions. The KSA model is widely used in education and human resource development. Similar approaches can be found in frameworks such as the European DigComp framework for digital competencies and professional standards developed by marketing associations. The AI-Driven Marketing Competency Framework applies this idea to AI-supported marketing practice.

The distinction between knowledge, skills, and attitudes is crucial in the AI era. Knowledge about AI has always been accessible, and it is easy to mistake familiarity with AI usage for actual competence. A person may understand prompt engineering without being able to design effective prompts. They may be familiar with AI ethics without consistently applying ethical principles in everyday work. They may know that AI-generated outputs require critical evaluation while still accepting them uncritically when they are in a hurry.

Knowledge is necessary, but not sufficient. As AI tools became easier to use, the gap between knowing and competently applying that knowledge has continued to grow. At the same time, the consequences of careless AI use are significant.



The distinction can be illustrated using AI image generation. Knowledge involves understanding available tools and the basic principles behind technologies such as generative image models. Skill involves the ability to create detailed prompts that produce high-quality and brand-consistent outputs. Attitude involves asking critical questions before using the generated content: Does the image contain copyrighted elements? Could it reinforce cultural stereotypes? Is it aligned with our organizational values and communication standards? Without the appropriate attitudes, indiscriminate use of LLM outputs will create risks for organizations.

Research conducted by the Infuture.Institute in 2025 identified several major digital trends reshaping contemporary marketing, including algorithmic reality, cyber threats, changing forms of creativity, and growing resistance to digital technologies. Responding effectively to these trends requires more than technical expertise. It also requires dispositions such as critical evaluation of synthetic content, attention to data protection, and awareness of digital inequalities. These attitudes are often the most challenging component of competency development.

The concept of Marketing 5.0 further emphasizes that AI-supported value creation requires competencies extending beyond how to get them to create output. Effective use of AI depends on collaboration, ethical judgment, leadership, and the ability to organize work in new ways.

Based on literature reviews, expert consultations, and empirical validation, the AI-Driven Marketing Competency Framework identifies thirteen competencies organized into five clusters:

- **Data and Research** – understanding and working with data as the foundation of AI systems.
- **Strategy** – designing and managing AI-enabled value creation.
- **Branding** – creating content and managing communication with AI support.
- **Customer Experience** – personalizing interactions and managing customer relationships through AI.
- **General and Managerial Competencies** – leadership, teamwork, ethics, security, and responsible AI governance.

For each competency, five developmental levels were defined: Foundation, Intermediate, Advanced, Experienced, and Proficient. These levels are not fixed categories, they are stages of ongoing professional development.

An decisive characteristic of competency development is its uneven nature. Professionals may demonstrate advanced capabilities in some areas while remaining at a foundational level in others. For example, a marketer may be highly skilled in AI-supported content creation while possessing limited expertise in cybersecurity or AI ethics. Similarly, strong analytical capabilities do not automatically translate into effective risk assessment or responsible decision-making. Recognizing these differences is the first step toward purposeful competency development. Understanding one's strengths and weaknesses makes it possible to identify training opportunities to enhance learning and professional growth.

10.2 A MAP OF AI MARKETING COMPETENCIES

Research conducted as part of the validation of the AI-Driven Marketing Competency Framework among 178 marketing managers in the United States and the United Kingdom revealed a consistent pattern. Marketing professionals tend to rate themselves highest in areas such as AI-supported content generation and communication. These are highly visible activities with immediate and tangible outcomes. Creating content, automating communication, or using conversational AI tools often produces quick results that are easy to observe and evaluate.

However, the largest competency gaps tend to emerge in less visible areas. When managers were asked which competencies their teams most urgently needed to develop, three priorities stood out. The first was the ability to assess the potential risks associated with AI implementation and how to establish safeguards that protect individuals and data. Approximately 70% of respondents identified this as a key development need. The second was the ability to use AI tools to analyze data and forecast trends, while the third involved enhancing customer insights using an AI-supported analysis of customer expectations

and behaviors. Both areas were identified by roughly two-thirds of respondents. One finding is particularly noteworthy. The highest-ranked development priority—digital safety and risk assessment—is not primarily a technical competency. Rather, it is a managerial and ethical competence that requires judgment, responsibility, and awareness of potential consequences of human behavior.

Additional findings from the NAWA project¹ revealed another interesting pattern. Marketers who use AI daily tend to evaluate its usefulness and performance more positively than occasional users. However, frequent users also appear to be more likely to underestimate the potential risks associated with AI adoption. Enthusiasm for efficiency gains may sometimes reduce the attention to issues such as data leakage, ethical misuse, governance challenges, or unintended harm to customers and other stakeholders. This creates what some researchers describe as efficiency myopia—a tendency to focus on productivity improvements while paying insufficient attention to creativity, governance, trust, and long-term responsibility.

Among the thirteen competencies included in the AI-Driven Marketing Competency Framework, three deserve particular attention because of their strategic importance for AI-enabled marketing practice.

Teamwork with AI

Teamwork with AI refers to the ability to manage teams, projects, and decision-making processes in ways that ensure the ethical and effective use of AI systems. This competency extends beyond the individual use of AI tools. It includes helping colleagues use AI effectively, facilitating discussion around AI-generated outputs, and ensuring that AI-supported work remains collaborative, transparent, and inclusive.

Social Responsibility for AI-Generated Content and Decisions

This competency concerns the ability to evaluate the ethical implications of AI-assisted actions and to assume responsibility for their outcomes. Even when recommendations originate from an algorithm, humans are responsible for the decisions that are made. Because AI-generated content has the potential to influence large audiences, the ability to evaluate its societal consequences becomes a critical professional capability.

Digital Safety and Security

Digital safety and security includes identifying the risks associated with AI implementation and establishing safeguards to protect data, customers, organizations, and other stakeholders. Although often perceived as a technical issue, this competency is fundamentally managerial and administrative in nature. It requires understanding which data is shared with AI systems, how that data may be used, and what procedures are necessary to minimize risks and how to ensure responsible use.

Together, these competencies illustrate an important reality of AI-enabled marketing. The most significant challenges are often not related to the use of the AI tools themselves. Rather, they involve leading people, managing risks, making responsible decisions, and ensuring that technological capabilities are aligned with organizational governance and societal expectations.

¹ Find ALL our reports here <https://ue.poznan.pl/en/university/digit-people-and-algorithms-in-organizations-competencies-to-work-in-the-digital-environment/digit-news/>

10.3 DEVELOPING AI COMPETENCIES IN PRACTICE

Experiences from organizations adopting AI suggest that the most difficult aspect of competency development is often not knowledge or technical skill but adjusting the attitudes of the people using the systems.

One example comes from a marketing team that used generative AI tools to create campaigns quickly and efficiently. The team possessed strong technical capabilities and was highly proficient in the use of AI-supported content creation tools. However, an AI-generated campaign included culturally insensitive imagery that was not caught before it was published. The issue was not a lack of technical expertise. Rather, the team approached AI outputs too passively, treating the system as an authoritative source rather than as a tool requiring human oversight and judgment. This challenge is particularly visible in multicultural environments. Experiences from the international project, which involved collaboration across six European countries with different organizational cultures and varying levels of AI adoption, revealed contrasting attitudes toward AI. In some contexts, there was a tendency to defer to AI-generated outputs because they appeared objective and authoritative. In others, excessive skepticism limited the opportunities for productive collaboration with AI systems. Neither approach proved particularly effective. The competency framework promotes critical engagement with AI rather than either passive acceptance or automatic rejection.

Evidence from the practitioner survey discussed earlier provides an interesting illustration of this issue. Marketers who reported using AI daily expressed significantly lower levels of concern about AI systems than those who used them infrequently. Daily users reported lower levels of anxiety regarding AI, while occasional users expressed substantially greater concern. This finding can be interpreted in two ways. On the one hand, greater experience with AI may reduce uncertainty and fear. On the other hand, lower levels of concern may also reduce vigilance. Professionals who become highly comfortable with AI systems may be less likely to question issues related to data privacy, bias, or the handling of organizational information by AI tools. The absence of concern should not automatically be interpreted as evidence of operational readiness or competence.

Observations from organizations also suggest that competency gaps often become visible during periods of transition. When employees move from individual contributor roles into managerial positions, the challenges related to teamwork with AI become more apparent. Similarly, when organizations begin using generative AI at scale, deficiencies in the competencies related to social responsibility and oversight of AI-generated content may come with significant business risks. These observations are consistent with findings presented in the NAWA report on AI collaboration competencies, which describes the case of the digital marketing agency InfiniBrand. The case illustrates how the role of a Customer Relations Manager evolved to include competencies related to data safety, ethical oversight, and human–AI collaboration.

This is why competency development should be viewed as an ongoing process rather than a one-time training activity. The AI-Driven Marketing Competency Framework can serve as a guide for identifying priority areas for development and supporting continuous learning in AI-enabled marketing environments.



10.3.1 TASK: THE ONE-GAP ACTION PLAN

The AI-Driven Marketing Competency Framework is based on the idea that effective work with AI requires a combination of knowledge, skills, and attitudes. Competency development is rarely uniform—most professionals have strengths in some areas and development needs in others.

Reflect on the three competencies discussed in this chapter:

- Teamwork with AI
- Social Responsibility for AI-Generated Content and Decisions
- Digital Safety and Security

Please download the attached "Core Competency Rubrics" PDF. Read the descriptions for levels 1 through 5 for these three specific areas.

For each competency, rate your current level on a scale from 1 (beginner) to 5 (advanced). For each one, write down one specific, real-world example from your recent studies or work that proves you are at that level. For instance, instead of just guessing you are a Level 3 in Digital Safety, write: "I am a Level 3 because I actively and systematically anonymize customer data before feeding it into ChatGPT."

Self-Assessment Table

Competency	My Level (1-5)	My Evidence (one sentence)
Teamwork with AI		
Social Responsibility for AI-generated content and decisions		
Digital Safety and Security in the context of AI		

Start your assessment now

Next, identify the competency that represents your greatest development opportunity. Using the KSA framework, prepare a short four-week development plan.

Competency to develop: _____

Current level: _____

My AI Competency Development Plan

Competency I want to develop:	
Current level (1-5):	
Week 1 - KNOWLEDGE: What specific policy, framework, or tool documentation will you read to understand the rules?	
Weeks 2 & 3 - SKILL: What safe, low-risk project or simulation will you use to practice this hands-on?	
Week 4 - ATTITUDE: How will you change your daily workflow to make this a professional habit? (e.g., "I will add a mandatory 5-minute bias-check step before publishing any AI-generated marketing copy.")	

When you are done, also briefly note: looking at the competency where you scored highest, how could you use that strength to help a colleague or team member who is weaker in that area? One short sentence is enough.

This final question is not trivial. Competency development is not only personal, it is social. And teamwork with AI includes helping others around you grow.



10.4 KEY TAKEAWAYS

- AI competency is built on three interconnected components: knowledge, skills, and attitudes (KSA). Effective development requires training and development across all three dimensions rather than focusing on technical knowledge alone.
- Knowledge about AI does not automatically translate into competence. Understanding AI concepts, using AI tools effectively, and applying responsible professional judgment are distinct capabilities.
- The AI-Driven Marketing Competency Framework identifies 13 competencies grouped into five clusters: Data and Research, Strategy, Branding, Customer Experience, and General and Managerial Competencies.
- Competency development is uneven. Marketing professionals may be highly developed in some AI-related areas while remaining at an early stage in others. Recognizing strengths and development needs is a fundamental part of your professional growth.

- Some of the most important AI competencies are often the least visible. Research among marketing managers identified digital safety and security, AI-supported data analysis, customer insight generation, social responsibility, and teamwork with AI as key areas requiring further development.
- Effective AI use requires more than technical proficiency. Ethical judgment, risk awareness, accountability, collaboration, and responsible decision-making remain essential in AI-enabled marketing environments.
- Experience with AI can increase confidence and reduce uncertainty. At the same time, frequent use may lead to lower vigilance regarding risks such as bias, privacy concerns, data leakage, and inappropriate reliance on AI outputs.
- Competencies related to teamwork with AI become critical as organizations integrate AI into everyday work processes. Successful AI adoption depends not only on individual capabilities but also on collaboration and shared responsibility.
- AI competency development should be viewed as a continuous process. As technologies, organizational practices, and market conditions evolve, marketers must continually update their knowledge, skills, and professional attitudes.
- The goal is not simply to learn how to use AI tools, but to develop the ability to use them effectively, critically, responsibly, and strategically.



10.5 FURTHER READING

Mollick, E. (2024). *Co-Intelligence: Living and Working with AI*. Portfolio/Penguin.

Hougaard, R. & Carter, J. (2025). *More Human: How the World's Leading Leaders Use Technology to Find Greater Wisdom and Connection*. Harvard Business Review Press.

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Case study:

PARALLEL PATHS: MANAGING AI INTEGRATION AND NEURODIVERSITY IN MARKETING WORKFLOWS

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In the heart of Europe's bustling capitals, two marketing worlds hum to different rhythms, each facing the same technological transformation but from entirely different starting points.



Warsaw's glass-fronted towers cast long shadows over a city in constant negotiation between history and modernity. Here, Lumina PR & Creative, a mid-sized beauty and lifestyle agency, curates images of elegance for global brands, selling not just products, but entire worlds of aspirations. The agency stands at a crossroads: can they bring back a talented professional who left to protect her health, now that AI promises to reshape the very pressures that drove her away?

Seven hundred kilometers to the south, Zagreb's creative quarter breathes slower air, but its agencies pulse with restless ambition. Inside the converted warehouse of Nova Vista Studio, a team of strategists, designers, and copywriters build campaigns for regional tech start-ups and cultural institutions, thriving on the art of turning small budgets into big ideas. Here, the challenge is different: how to harness one creative's spontaneous brilliance with AI without either constraining his energy or destabilizing the team that depends on predictability?

It is 2025, and the rules of their craft are shifting. Generative AI has slipped into their workflows like an uninvited but oddly talented colleague—one who works without rest, delivers at impossible speed, and never asks for a salary. To some, it is a partner; to others, a thief of craft. But beyond

these philosophical debates lies a more immediate, practical question: how do you write the actual rules for working with AI when your team members work in fundamentally different ways?

In Warsaw, Anna, once a rising star of luxury brand PR, stands on the threshold of returning to agency life after years in the safer corridors of public administration. In Zagreb, Marko, an industry veteran turned academic, straddles two worlds: the adrenaline of client projects and the methodical patience of the classroom. Their paths do not cross. Yet both organizations face the same challenge: they need a clear protocol for working with AI—something concrete, implementable, that people can follow. But can you write one set of rules that work for people who work so differently? And if you allow everyone to work their own way, do you still have an organization, or just a collection of freelancers?

Background: The Two Organizations

Lumina PR & Creative – Warsaw, Poland

Lumina PR & Creative is a 45-person agency specializing in beauty, fashion, and lifestyle brands. Founded in 2015, the agency has built its reputation on delivering high-polish campaigns for luxury clients—primarily European launches of French, Italian, and Scandinavian brands entering the Polish and Central European markets. The work is fast-paced, deadline-driven, and demands both creative excellence and operational precision.

Eighteen months ago, Lumina began integrating AI tools into its workflows. ChatGPT Business handles first draft of social media content and press releases. Jasper assists with localization of brand messaging across markets. Midjourney generates mood boards and visual concepts for client pitches. The results have been measurable: content turnaround times have dropped by 30%, and junior staff spend less time on repetitive tasks. But the integration has been uneven. Some account managers embrace the tools; others resist, worried that AI-generated content lacks the “brand soul” that luxury clients demand.

Managing Director Katarzyna Lewandowska describes the current state as “still fast paced, but smarter.” The agency has grown more selective about the talent it hires, shifting from looking for “content producers” to seeking “content strategists” who can refine AI outputs into brand-perfect messaging. Yet this shift has created new tensions. What does quality control look like when half the team drafts from scratch and half refines AI suggestions? How do you evaluate performance when people work in fundamentally different ways? And most pressingly: how do you create space for professionals whose cognitive needs don’t fit the traditional agency mold, even as you’re trying to standardize new technological processes?

Nova Vista Studio – Zagreb, Croatia

Nova Vista Studio is a 30-person creative agency founded in 2018, known for its bold, unconventional campaigns for tech startups, cultural institutions, and emerging consumer brands. The studio’s competitive edge has always been creativity and speed—the ability to generate fresh ideas quickly and execute them on tight budgets. Projects range from three-week social media blitzes to year-long brand development programs.

AI adoption at Nova Vista has been opportunistic rather than systematic. There's no formal policy, no standardized toolkit, no training program. Some team members use ChatGPT and Midjourney daily; others have barely touched them. Creative Director Ivan Horvat sees both promise and risk in this informality. The promise is that people adopt AI in ways that genuinely enhance their work rather than following a top-down mandate that may not fit their roles. The risk is chaos—inconsistent quality, duplicated effort, and growing skill gaps between the “AI natives” and those who feel left behind.

Marko represents both the best and most challenging aspects of this approach. His intuitive, high-energy use of AI produces spectacular results during campaign launches, but his spontaneity can throw the team into scramble mode. Ivan knows that if Nova Vista is going to scale, they need to move from individual experimentation to organizational capability. But how do you systematize creativity without killing it? How do you build shared practices from someone's personal workflow? And how do you reconfigure team processes to accommodate different working rhythms without sacrificing the coordination that clients expect?

Four perspectives on the same challenge

Anna Nowak, 29, had once been a rising star in fashion marketing – known for her flawless event planning and media relations – until the industry's relentless pace collided with her Tourette syndrome. Under high stress, Anna experiences involuntary vocal tics (such as sudden inhaling noises) that escalate with psychological pressure. In the cutthroat agency world of her mid-20s, tight deadlines and a toxic “always-on” culture pushed her symptoms to a breaking point. *“My tics would become truly unbearable when the stress got that high,”* she recalls, describing how extreme episodes even temporarily robbed her of the ability to speak. Ironically, in a profession built on communication, her neurological condition was shutting her voice down. Ultimately, Anna made the painful decision to walk away from her dream job at the agency for the sake of her health. *“Unfortunately I had to quit because of my health – agencies are rife with mobbing and nonstop work,”* she explained, feeling that the intense work culture left no room for someone like her.

Now, three years later, Anna has rebuilt her career in the calmer waters of the public sector. She works as a communications officer in a government administration office – a role with stable hours, a predictable schedule, and far fewer adrenaline-fueled surprises. Crucially, she has her own office, a quiet haven where she isn't subject to the barrage of open-office stimuli. *“I work alone in a room now. That's very important to me,”* Anna often notes. This environment grants her a level of sensory and schedule control that is effectively zero-sum in her mind – without it, meaningful engagement at work would be nearly impossible. In the predictable routine of public service, Anna's tics have subsided to a manageable background hum. She has proven herself highly capable given the right conditions: her colleagues know her as organized, diligent, and remarkably detail-oriented. These qualities, in fact, hint at the often undervalued strengths neuroatypical professionals bring – traits like meticulousness and systematic thinking that can greatly benefit marketing work. Yet, those strengths were overshadowed in her past environment by the mismatch with her cognitive needs.

In her current role, Generative AI tools have not been a major part of the workflow. Anna's approach to AI could best be described as "human-centric" and cautious. *"I'm not sure I use AI tools much at all,"* she says. Privately, Anna admits she's tried ChatGPT "a couple of times" out of curiosity – for instance, asking what it might suggest for improving a public newsletter – but she always double-checked and reworked the AI's answer by hand before using it. The idea of relying on an algorithm for writing or strategy triggers a protective instinct in her. *"I wouldn't want ChatGPT writing articles for me, because that's part of my job,"* Anna insists, echoing a sentiment that creative work carries personal meaning she's loath to surrender. In her mind, an AI might be useful for a spark of inspiration, but it could never replace the human touch. *"When a person writes a text, it's just more... human,"* she explains, reflecting a deep respect for authenticity in output. This outlook has made Anna something of an avoidance-oriented crafter in the AI context – she subtly steers her responsibilities toward tasks that require human judgment and personal voice, effectively carving out an AI-resistant niche in her organization. Far from seeing this as a weakness, Anna considers it part of maintaining quality and integrity in her work. Her stance also aligns with a fear many professionals share: that over-automation could erode hard-won skills and even one's sense of professional identity.



Despite finding relative peace in her government job, Anna misses the creative spark of the fast-paced marketing world she left. So when an offer comes seemingly out of the blue to return to the industry – as a Senior Account Manager for a renowned beauty brand's agency – Anna is both thrilled and terrified. The offer is flattering: a role tailored to her experience, a salary bump, and significantly, the agency's leadership expresses willingness to accommodate her needs. They assure her she could have full control over her work conditions, including a private office and flexibility to organize her schedule as she sees fit. It's a chance to come back on her own terms, armed with the self-knowledge she has gained. *Still, can she really go back?* Anna finds herself daunted by the memory of what agency life did to her. The old anxieties resurface: the brutal deadlines, the late-night client calls, the feeling of barely

hanging on. She knows organizational culture can matter more than any technology when it comes to her wellbeing. This particular agency's culture remains an unknown variable – though their willingness to discuss accommodations is encouraging, trust must be earned.

A new element in the equation is the rise of AI in marketing since Anna left. The agency's recruiter mentioned they are "deep into using generative AI" for copywriting, trend analysis, and even creative concepting. In fact, the agency sees it as one of their competitive strengths. Anna wonders: *Could these AI tools actually be an ally for me now?* The question gives her pause. If implemented thoughtfully, might AI serve as an enabling technology that bridges the gap between her health needs and her professional ambitions? For example, on days when her tics or anxiety flare up, maybe she could rely on an AI assistant to handle routine client reports or draft social media captions, reducing pressure on her during rough patches. AI could potentially provide structure for complex projects and automate menial tasks that otherwise sap her limited energy. It might also offer an alternative communication channel – perhaps allowing her to express ideas in writing via an AI drafting tool on days she finds face-to-face presentations too stressful. In theory, these possibilities sound liberating. Importantly, the agency's adoption of AI indicates a certain forward-thinking and flexibility in work processes – a sign that they possess dynamic capabilities to adapt, which could translate to more adaptive management of employees as well.

Yet Anna's caution remains. The flip side of AI's promise is not lost on her. She knows that rapid technological change can increase cognitive load for someone like her who *thrives on predictability*. Learning to use a suite of new AI tools, with their constant updates and quirks, could itself be a source of stress. And would reliance on AI eventually create pressure to produce even more work at an even faster pace? That is a common outcome – as tools make tasks faster, expectations often rise accordingly. Anna fears ending up on a hamster wheel where the very tool meant to help her becomes one that exacerbates her executive function challenges. Moreover, there's the matter of trust: not just trusting the AI's output (which she already struggles with), but trusting that her new colleagues will understand her needs. In her last agency job, Anna felt she had to conceal her condition as much as possible; she feared being seen as less capable or as "*asking for special treatment.*" That stigma is still real – even today, she hears of neurodivergent employees hesitant to disclose for fear that management will perceive them as angling for unfair advantages. "*Is it even okay to say you're not neurotypical at work?*" she muses, recalling how some former coworkers reacted awkwardly when the topic of mental health came up. The new agency might be open-minded, but it's a gamble to be fully open about her Tourette's and anxiety. Anna prides herself on her professionalism; she doesn't want to be seen as making excuses.

As she weighs the offer, Anna sketches a mental scenario of how she could navigate the first months back in an agency role. She would establish upfront the boundaries she needs: a quiet workspace, set meeting times, and no expectation to respond to non-urgent messages after hours – all part of structuring the environment to prevent the chaos that triggers her tics. She would also take a gradual approach to AI. Rather than diving into every tool at once, Anna imagines starting with one generative AI application that could assist her most safely – perhaps a copywriting aid for drafting

press releases under her guidance. By maintaining a human-in-the-loop process (using the AI for a first draft, then carefully curating the final content herself), she can ensure the output meets her standards and retains a human touch. This careful adoption echoes her inherently cautious stance on technology – using AI as inspiration or support, but not letting it overrule her own judgment. In essence, she would continue a form of cognitive crafting she’s comfortable with: keeping her role centered on uniquely human skills like client empathy, creative intuition, and quality assurance, while delegating only the mechanical parts to AI.

The opportunity before her also highlights how cognitive diversity can be a strategic asset if managed well. Anna’s intense focus and perfectionism – liabilities in a poorly managed setting – could be tremendous assets in a team that values her strengths. Her propensity for pattern recognition and systematic problem-solving can complement more freewheeling creative teammates. If she does take the job, the agency will face a test of its inclusion practices: Will they truly grant her the autonomy and support promised? How will they handle team collaboration when one manager (Anna) works best with minimal sensory stimuli and carefully planned routines, while others might thrive in spontaneous brainstorming sessions? And importantly, how will the integration of AI be managed across such a diverse team? These questions underscore that embracing neurodiversity goes hand in hand with organizational learning and flexibility. It’s not just about helping Anna cope; it’s about the agency building capability to harness diverse thinking styles – perhaps by pairing individuals with complementary strengths or by allowing multiple processes to coexist (for example, both rapid AI-driven iterations and slower human-centric refinement).



By the end of the week, Anna must give her decision. Late one afternoon, she finds herself staring at two lists scribbled in her notebook: one enumerating the risks of returning to a high-octane, AI-infused marketing role, the other listing the rewards. The risks include the specter of stress-induced health relapses and the challenge of adapting to AI and a new team. The rewards feature a rekindling of her passion for the beauty industry, a chance to manage big campaigns again, and the hope that modern tools and enlightened leadership might make it different this time. At the bottom of the

“rewards” column, she’s written in pencil: *“AI as bridge between me and job?”*. Underneath, she’s added, *“My terms.”* That, she knows, is the crux. If the agency truly lets her work on her terms – leveraging technology without sacrificing her well-being – this could be her path back to the career she loves. If not, she could be walking into a repeat of her worst professional trauma.

Anna’s dilemma sets the stage for a rich discussion on adaptive management in the age of AI and cognitive diversity. Should she take the leap, and if so, what support and safeguards should be put in place by her (and the organization) to set her up for success? How might dynamic capabilities manifest here – not just in adopting AI, but in the firm’s ability to reconfigure roles and norms to accommodate an atypical employee’s needs? And conversely, what unique value might the firm gain from bringing Anna (and others with different neurologies) into AI-augmented work, in terms of creativity, attention to detail, and innovation? The decision also prompts reflection on Anna’s own agency: how can she craft her job to align with both her health and ambition, and where should she draw the line on technology’s role in that crafted future? With these tensions in mind, Anna takes a deep breath – the kind she uses to steady herself – and picks up the phone to schedule one more conversation with the hiring agency before deciding.

Marko Skvort, a 34-year-old content strategist at a digital marketing agency, thrived on creative bursts of energy – and often paid the price in exhaustion afterward. Recently diagnosed with ADHD, Marko likened his work rhythm to “an old computer that needs periodic resets”. He would sprint through complex tasks at hyper-focus peaks, then step away for a breather once his “mental cache” overflowed. These unscheduled breaks – often a quick walk or smoke – were Marko’s form of emotional regulation, clearing his mind so he could return recharged. Yet, in a team that valued steady processes and predictable output, Marko’s productivity spikes followed by downtime created an underlying tension. *How could the team accommodate his uneven tempo without sacrificing process stability?*

Mark’s answer was to reshape his job around his strengths. He proactively offloaded tedious, detail-heavy tasks to a generative AI assistant, viewing it as an extension of himself rather than a threat. For instance, drafting routine client emails or initial social media copy – tasks that once took him hours of forced concentration – could be done in minutes with AI. By engaging in this task crafting, Marko reconfigured his workflow to automate the rote aspects of his role, freeing time (and cognitive energy) for the creative strategizing he excelled at. In his eyes, ChatGPT became a quasi teammate, always available to brainstorm ideas or polish his grammar, enabling him to focus on higher-value creative thinking. Marko even found himself chatting colloquially with the AI late at night, treating it with a peculiar mix of camaraderie and coaching. *“It’s one of my favorite work tabs now,”* he joked, after the AI helped him refine a campaign pitch at 2 A.M.

This fluid human–AI collaboration exemplified an approach-oriented crafting mindset – Marko actively integrated the new tool into daily practice and even developed prompting tricks to improve its output. His openness paid off one evening when, riding a wave of hyper-focus, he and the AI generated a dozen tagline ideas and a draft campaign plan for a major client in record time. The next morning, Marko’s manager Ivan was both amazed and uneasy as he reviewed the AI-assisted output. On one hand, the efficiency gains were undeniable: what normally would have required days of work

was produced overnight. On the other hand, Ivan spotted subtle tone issues in a few AI-generated lines – jokes that felt slightly off-brand and a tagline that risked cultural insensitivity. The AI's work, while fluent, lacked the nuanced understanding of brand voice that a human team member would have. Marko hadn't fully noticed these, still flush with pride at how fast he'd delivered.

Manager (Ivan): *"These ideas are impressive, Marko. Especially the breadth of concepts – you clearly covered a lot of ground quickly."* Ivan tapped the printout of the campaign draft, where Marko's favorite AI-suggested tagline was circled. *"I do see a few bits we should double-check... this line, for example, might come across as tone-deaf in some markets."*

Employee (Marko): Marko's smile faded a notch. *"Right, I was going to refine those,"* he said, aware that in his late-night rush he had accepted the AI's suggestions a bit too readily. *"The AI sometimes overdoes it. I figured we could tweak the phrasing this morning."*

Ivan nodded, but her expression remained serious. He was pleased with Marko's initiative and dynamic use of AI, yet concerned about quality control. As a manager, Ivan felt responsible for instituting appropriate human oversight on any AI-generated content. Marko, however, interpreted her concern as a lack of trust in his new workflow. *Wasn't speeding up the point of using AI?* He wondered if every AI-enhanced draft of his would now face extra scrutiny, potentially eroding the time savings. The two perspectives revealed a core tension: trust in AI output vs. rigorous human oversight. Marko trusted that his prompting and editing could harness the AI's creative suggestions without letting errors slip through. Ivan trusted Marko's creativity, but not an algorithm's – at least not yet. For her, the organization's dynamic capabilities in the AI era were at stake: the team needed to adapt and leverage AI for speed, but without undermining their brand's voice and hard-won client trust.

Also lurking beneath was a question of autonomy. Marko had taken the initiative (some would say liberty) to have an AI co-create a client proposal. In doing so, he was seizing an opportunity to innovate work practice, aligning with the agency's push to reconfigure workflows around new technology. Yet Ivan wondered if he needed to set clearer guidelines – a protocol to ensure AI use didn't introduce unseen risks. Should he let Marko continue to experiment freely, given the creative boost it provided, or put more structure around it? Marko's pride in the overnight achievement was now edged with doubt. As Ivan picked apart the draft's flaws, he felt a flicker of guilt – *how much of this campaign idea was truly mine?* The initial rush of accomplishment began to transform into an identity crisis as he questioned whether the brilliance came from his own creativity or the AI's vast learned patterns. Marko had always viewed himself as the "ideas guy"; now he worried he had become merely an executor of AI suggestions. This crisis of authenticity is a common emotional pitfall when professionals feel their personal contribution is diluted by an AI's help.

By mid-meeting, tension hung in the air. Sensing it, Marko excused himself for a quick break – one of his reset rituals. Stepping outside, he took deep breaths of the chilly air. He knew his neurodivergent work rhythm could be hard on the team; not every manager would tolerate an impromptu pause during a critical review. But without this moment, his focus would splinter. *I'll come back sharper,* he reassured himself. Indeed, after five minutes, Marko returned energized and even offered a self-deprecating laugh about the problematic tagline. *"Let's fix that – the last thing we want is an AI gag"*

misfiring with our audience.” Ivan smiled, relieved that Marko’s emotional self-regulation had a positive effect. Together, they agreed on a plan: Marko would continue using the AI for rapid drafts, but another team member would do a second review on key outputs to ensure nothing slipped through unchecked. It was a compromise between speed and stability – leveraging Marko’s AI-augmented productivity while instituting a safety net of human oversight. In effect, the team was reconfiguring its workflow to accommodate both Marko’s unique style and the AI’s capabilities.

Still, unresolved questions lingered for the upcoming discussion: How should the agency formally manage the integration of AI into creative work without stifling initiative? Could task crafting of the kind Marko exemplified become the norm for others, and if so, how to maintain fairness and quality control? Moreover, how might someone with Marko’s cognitive profile be supported to prevent AI over-reliance from undermining his own skill development and decision autonomy in the long run? Ivan realized that Marko’s case was a microcosm of a larger challenge – balancing innovation with human judgment in a cognitively diverse team. He made a note to raise these points in the next management meeting. Marko, meanwhile, sat back at his desk, already thinking of new ideas for the client. He felt cautiously optimistic – his AI “partner” was still by his side, and now his human colleagues were rallying to ensure the collaboration stayed on track. If handled well, this parallel support might turn his neurodivergent quirks and AI usage from a source of friction into a wellspring of creative advantage.

Theoretical Frameworks for Analysis

This case study invites analysis through two complementary theoretical lenses: **Dynamic Capabilities** (at the organizational level) and **Job Crafting** (at the individual level). The central question is whether and how these two levels can be aligned.

Dynamic Capabilities Approach

Dynamic Capabilities theory focuses on how organizations sense, seize, and reconfigure resources and competencies in response to rapidly changing environments—in this case, the integration of AI into marketing workflows.

Sensing involves identifying opportunities and threats: Where can AI create value? Where does it present risks? Which workflows should be automated, and which should remain human-driven?

Seizing involves mobilizing resources to capture those opportunities: How do you invest in AI tools? How do you train staff? How do you redesign workflows to embed AI into existing structures?

Reconfiguring involves adjusting the organization’s asset structure: How do you reallocate roles? How do you change performance metrics? How do you rebuild coordination mechanisms when people work in fundamentally different ways?

The challenge in both Lumina and Nova Vista is that reconfiguring for AI isn’t just a technical problem—it’s a human one. The organizations need to maintain competitive advantage while protecting (and leveraging) human cognitive diversity. This is where Job Crafting becomes relevant.

Job Crafting Approach

Job Crafting theory examines how individuals proactively modify their work to align it with their personal strengths, needs, and values. Rather than passively accepting job descriptions, people actively shape their roles.

Task Crafting involves altering the type, scope, or nature of tasks. Anna might delegate repetitive content drafts to AI while reserving strategic client communication for herself. Marko might automate routine campaign research to focus on creative ideation.

Relational Crafting involves changing how and with whom one interacts. Anna might set clearer boundaries with clients about communication channels. Marko might involve junior staff in his AI experiments to build shared capabilities.

Cognitive Crafting involves reframing how one perceives work to increase meaning and engagement. Anna might reframe AI from a potential stressor into a safety net that reduces unpredictable workload spikes. Marko might view AI as a collaborative junior partner rather than a tool he controls.

Job Crafting as a Tool for Reconfiguring

The key theoretical insight is that **job crafting can be a mechanism that supports organizational reconfiguring**—but only under certain conditions. When employees actively reshape their roles in ways that align with organizational goals, job crafting enhances Dynamic Capabilities. But when individual job crafting creates fragmentation, unpredictability, or coordination failures, it undermines organizational reconfiguration.

This case study explores that tension. Both Anna and Marko need to job craft to work sustainably and effectively. Both Katarzyna and Ivan need to reconfigure their organizations to remain competitive. The question is: can these imperatives be aligned, or will they collide?



Decision Points for Analysis

PL-E [Employee Perspective, Warsaw]

- Which aspects of the account management workflow should she propose keeping human-driven, and which should be AI-assisted?
- How can she build contingency processes that allow for AI failures without triggering her stress responses?

Task Crafting: Which repetitive or low-value tasks should she delegate to AI, and which should she reserve for herself to maintain quality control?

Relational Crafting: How should she set expectations with creative teams and clients about when she uses AI in collaborative work?

Cognitive Crafting: Can she reframe AI from a potential source of unpredictability into a tool that reduces the grinding pressure she finds most difficult?

Key Tension: If Anna crafts her job too narrowly around her strengths, does she become inflexible if the organization's needs to shift? If Lumina's reconfiguration imposes standardized AI processes, will there be room for Anna's need for structure and control?

PL-M [Manager Perspective, Warsaw]

Dynamic Capabilities – Reconfiguring: How should Lumina reconfigure workflows, performance metrics, and team structures to integrate AI effectively? - Should she create different “pathways” for different working styles, or standardize processes to ensure consistency? - How can she leverage Anna's strengths (pattern recognition, crisis management, strategic thinking) while accommodating her needs (structure, predictability, autonomy)?

Enabling Job Crafting – Task Crafting: How much freedom should she give senior staff to define their own AI vs. human task balance? - Relational Crafting: Should she position Anna as an internal mentor for others hesitant about AI adoption? - Cognitive Crafting: How should she communicate AI's role, so it's seen as a creative amplifier rather than a replacement threat?

Key Tensions: If Katarzyna allows too much personalization, does she sacrifice the organizational coordination and client consistency that Lumina needs? - If she imposes too much standardization, does she lose talented professionals like Anna who need flexibility to thrive? - Can job crafting strengthen organizational reconfiguration, or does it inevitably create fragmentation?

The Central Challenge: Writing a Protocol That Actually Works

What does a good protocol for working with AI look like when your team members work in fundamentally different ways? Is it a set of rigid rules that everyone follows the same way? Is it a set of principles that people interpret differently? Is it different rules for different people? And whatever form it takes, how do you make sure it helps people work better rather than just creating bureaucracy?

This case study doesn't offer easy answers. Instead, it invites you to grapple with a genuinely difficult problem: how to create clear, implementable rules for working with AI that respect human cognitive diversity without sacrificing organizational coordination. The goal isn't to find a perfect protocol but to understand the trade-offs involved in different approaches and to make informed choices about which trade-offs are worth making.

Exhibits

Exhibit 1 — Analytic Dimensions: What to Consider When Creating Your Protocol

This exhibit maps key dimensions to consider when analyzing your case and creating your protocol. These are not questions to answer one by one but rather lenses through which to understand the situation and make informed choices about what your protocol should include.

Perspective	Reconfiguring Considerations (Organizational Level)	Job Crafting Considerations (Individual Level)	Protocol Implications
Employee (Anna/Marko)	What organizational changes would help me work sustainably with AI? What processes would create problems for my working style?	How do I need to reshape my tasks, relationships, and cognitive framing to integrate AI into my work? What are my non-negotiables?	What rules do I absolutely need to work effectively? Where do I need flexibility? What clarity would reduce my anxiety or uncertainty?
Manager (Katarzyna/Ivan)	What changes are needed to integrate AI systematically? What coordination mechanisms will maintain quality and consistency?	How can I enable people to shape their work in ways that strengthen (not undermine) organizational capability?	What rules create necessary structure? Where can I allow flexibility? How do I balance individual needs with team coordination?

Exhibit 2 — AI Implementation in Marketing Agencies: Opportunities and Risks

Area of Implementation	Example Tools & Functions	Potential Benefits	Risks / Barriers
Content Creation	ChatGPT, Jasper, Copy.ai for copywriting; Midjourney, DALL-E for visuals	Faster turnaround on posts, ads, blogs	Brand voice inconsistency; IP issues
Data Analysis & Insights	Google Analytics AI, Adobe Sensei, Sprout Social AI	Improved targeting; predictive analytics	Data dependency; bias in insights
Routine Task Automation	HubSpot workflows, Hootsuite AI scheduling	Reduces manual work; frees staff for strategic tasks	Loss of nuance; skill atrophy
Customer Interaction	AI chatbots (Intercom, Drift)	24/7 response; personalization at scale	Tone mismatch; trust issues
Creative Experimentation	AI-driven A/B testing; brainstorming assistants	More iterations, faster learning	Idea overload; shallow novelty
Adoption Trends	Early adopters vs. mixed-use agencies	Competitive differentiation; talent attraction	Uneven skills across team; lack of governance

Exhibit 3 — ADHD and Work: Strengths, Challenges, and Management Considerations

ADHD Trait	Strength in Marketing Work	Challenge in Marketing Work	Management Considerations
High Energy	Engages teams during launches; drives momentum	Burnout risk; unsustainable pace	Match tasks to natural energy peaks; build in recovery time
Hyperfocus	Exceptional output on engaging tasks; deep expertise	Neglect of other duties; tunnel vision	Structured task-switching; clear priorities
Rapid Idea Generation	Fuel for brainstorming; creative abundance	Overwhelms team; too many directions	Idea filtering processes; decision frameworks
Risk-Taking	Bold campaigns; competitive differentiation	Overcommitment; inadequate planning	Balance with risk assessment; decision pause points
Low Tolerance for Monotony	Drives innovation; pushes for efficiency	Avoidance of routine necessary tasks	Automate repetitive tasks; rotate responsibilities
Impulsivity	Fast crisis decisions; adaptive responses	Poor data validation; inconsistent quality	Decision pause points; peer review systems
Environmental Sensitivity	Strong client rapport; reads room well	Stress vulnerability; sensory overload	Clear expectations; workspace control options

Exhibit 4 — Tourette Syndrome and Work: Strengths, Challenges, and Management Considerations

Tourette-Related Trait	Potential Strength in Marketing Work	Potential Challenge in Marketing Work	Relevant Management Considerations
Authenticity & Openness	Builds client trust; disarms skepticism through personal transparency	Misinterpretation of tics by uninformed clients or colleagues	Provide context/awareness to teams and clients where appropriate
Resilience	High tolerance for adversity; persistence under social pressure	Emotional fatigue from repeated explanations or stigma	Ensure peer and leadership support systems are visible and accessible
Pattern Recognition Under Stress	Quick situational analysis during chaotic events	Physical symptoms may intensify with unpredictable stressors	Match tasks to high-engagement, high-focus situations
High Engagement in Projects	Tics may subside during deep immersion in meaningful tasks	Tics may increase in prolonged low-engagement or high-conflict settings	Assign to projects with personal relevance or creative novelty
Social Impact Awareness	Sensitivity to team morale and interpersonal dynamics	Potential withdrawal from certain high-visibility roles	Offer flexible client-facing arrangements; build on strengths

Research Note: Tourette syndrome does not inherently limit professional capability; performance often depends on task fit, environment stability, and cultural awareness in the workplace (Silberman, 2015).

Your Assignment: Create a Protocol for Working with AI

You will work in groups corresponding to one of the two organizations. Within each organizational group, you will be divided into manager and employee subgroups, each receiving different materials that present one person's perspective on the situation.

Group Structure

- Group PL (Lumina PR & Creative, Warsaw)
 - Subgroup PL1 (Manager perspective):
Receives organizational context + Katarzyna's detailed perspective
 - Subgroup PL2 (Employee perspective):
Receives organizational context + Anna's detailed perspective
- Group HR (Nova Vista Studio, Zagreb)
 - Subgroup HR1 (Manager perspective):
Receives organizational context + Ivan's detailed perspective
 - Subgroup HR2 (Employee perspective):
Receives organizational context + Marko's detailed perspective

Your Task: Three Phases

Phase 1: Understand Your Perspective and Analyze What's Needed (Subgroup Work – 25 minutes)

Working in your assigned subgroup, analyze the situation from your character's perspective. Use one out of two theoretical frameworks to structure your thinking:

- If managerial perspective: Dynamic Capabilities (focus on Reconfiguring): Your organization needs to change how it works to integrate AI effectively. What specifically needs to change? What processes, roles, coordination mechanisms, and quality standards are currently causing problems? What are the risks if nothing changes?
- If employee perspective: Job Crafting: How is your character currently shaping (or wanting to shape) their work? What forms of task crafting, relational crafting, and cognitive crafting are happening or needed? Why? What would happen if this person couldn't craft their job at all?

The theoretical connection between these frameworks is that job crafting can be a mechanism that supports organizational reconfiguring—but only if done thoughtfully. Your analysis should identify where your character's job crafting helps the organization adapt to AI, and where it might create problems.

Phase 2: Confront Perspectives (Within-Organization Discussion – 25 minutes)

Manager and employee subgroups from the same organization meet to compare your analyses. This is where tensions will emerge - and that's the point. Don't try to resolve them immediately. First, make them visible:

- What does the manager perspective want from an AI protocol that might not work for the employee?
- What does the employee perspective need that might create problems for organizational coordination?
- Where are the genuine conflicts? (Example: Manager wants standardized quality checks; employee needs flexibility to adapt processes to their working style)
- What would each side lose if the other side's preferences dominated?

Be specific and concrete. Don't talk abstractly about "flexibility vs. structure." Talk about actual, practical things like: "Who approves AI-generated content before it goes to the client?" or "Can someone decide not to use AI for a particular task even if it would be faster?" or "What happens if someone's spontaneous 2 a.m. AI work creates weekend work for the rest of the team?"

Phase 3: Experiential Team Challenge: Managing Cognitive Diversity and AI

In this phase, you will participate in a simulated team meeting in which you must collectively solve a realistic managerial problem involving:

- Generative AI integration,
- Cognitive diversity in the team, and
- Conflicting work rhythms and needs associated with ADHD and Tourette syndrome.

Your goal is to **co-create a viable plan of action** for a team that includes both neurotypical and neuroatypical members while under deadline pressure and working with AI-generated content of uneven quality.

This is *not* a policy-writing task. It is an **experiential decision-making challenge** that requires you to coordinate, negotiate, and adapt in real time.

Scenario Overview

Context

Earlier in the day, **Marko** (Senior Content Strategist, ADHD profile) used a generative AI assistant to produce a rapid first draft of the campaign. The AI-generated materials include:

- a tagline and slogan family,
- a short video script,
- a visual moodboard (AI-generated imagery),
- sample social media posts, and
- a one-page rationale explaining the creative direction.

The AI output is **highly creative but uneven**: some ideas are bold and exciting; others are risky, off-tone, or culturally questionable. These inconsistencies have already triggered informal debates within the team.

The agency has **no standardized guidelines** for AI-assisted work. Team members rely on their own judgment, prompting styles, and quality-checking habits. This ambiguity is now creating tension.

The Situation at the Start of the Meeting

- The **client is influential**, demanding, and has a history of rejecting campaigns that feel “too generic.”
- The **deadline is non-negotiable**. The Sales Manager warns: “If we miss this delivery, it affects our renewal for next quarter.”
- The team is under mixed pressures:
 - pressure for **speed** (client + Sales Manager),
 - pressure for **creative distinctiveness** (Marko, creative team),
 - pressure for **risk management and brand alignment** (Anna, copywriting team),
 - pressure for **evidence and testing** (Data Analyst).

At the same time, cognitive diversity in the team is shaping how members interact:

- Marko is proud of the AI-generated draft but may miss subtleties and wants to act fast.
- Anna sees potential PR risks and is concerned about the chaotic process.
- Junior Copywriter feels squeezed between both approaches and seeks clarity.
- Data Analyst is worried that no one has validated the ideas with audience data.
- Sales Manager wants something “client-ready” today, not perfection next week.
- Manager (team lead) needs to balance everyone while delivering quality.

Your Objective as a Team

1. Agree on the final shape of the campaign to be sent to the client tomorrow.
2. Establish who will perform which revisions tonight.
3. Decide how AI will (or will not) be used for the remaining work.
4. Ensure that both neurodivergent team members can participate meaningfully.
5. Maintain team cohesion under stress.

You will be evaluated on **decision quality, team dynamics, and your ability to combine human and AI capabilities**, not just the superficial outcome.

Instructions

1. Assign Roles (2 min)

Each group member takes one role. At least one student plays **Marko**, one plays **Anna** and one plays the **Manager**. If your group is large, assign supplementary roles, but the central tensions must remain visible.

2. Read Your Role Brief (3 min)

Each role has specific goals, constraints, and cognitive patterns:

- **Marko (ADHD):** high creativity, hyperfocus bursts, low tolerance for monotony, impulsive decision tendencies, strong trust in AI outputs.
- **Anna (Tourette):** high reliability and precision, vulnerability to unpredictable stress, need for clear structure, strong preference for human-authored content.
- **Manager:** responsible for decision coherence, emotional regulation in the team, and aligning individual needs with organizational constraints.
- **Others:** respond consistently with your role's incentives.

3. Role-Play the Meeting (15–20 min)

Your team must decide:

1. Which parts of the AI-generated campaign can be used as-is?
2. Which parts require human review or reworking?
3. How can the team structure collaboration so both Marko and Anna can contribute optimally?
4. How should you handle the deadline given the different work rhythms?
5. What immediate actions will you take to ensure quality, inclusion, and client satisfaction?

During the meeting, pay attention to:

- differences in communication pace,
- preferences for structure vs spontaneity,
- emotional regulation needs (e.g., breaks, turn-taking),
- conflict between speed (ADHD + AI) and caution (Tourette + quality focus),
- how AI outputs intensify or reduce cognitive load for different roles.

The objective is not to “fix” Marko or Anna, but to design interaction patterns that leverage their strengths and mitigate frictions.

Do not break character.

4. Debrief (10 min)

After the meeting ends, step out of your roles and discuss:

- What tensions emerged between ADHD-driven speed and Tourette-driven need for predictability?
- How did AI influence collaboration (positively or negatively)?
- Which moments required the manager to “reconfigure” the workflow?
- How did job crafting (task, relational, cognitive) appear in the meeting?
- What concrete behaviors or structures supported inclusion and performance?
- What would realistically be hardest to implement in a real agency?

Role Brief: MARKO (Employee – ADHD Profile)

Role Summary:

You are a senior content strategist known for creativity, rapid ideation, and strong conceptual thinking. You also have ADHD, which affects your work rhythm. You are not required to disclose your diagnosis in the role-play, but you should behave consistently with it.

Core Traits & Work Patterns:

- You operate in high-intensity bursts of hyperfocus followed by brief “reset breaks.”
- You rely heavily on Generative AI as a brainstorming partner and drafting tool.
- You trust AI outputs more than your colleagues do, sometimes prematurely.
- You become impatient with long discussions or excessive detail.
- Routine or repetitive tasks drain you quickly; you seek novelty and speed.

Strengths to Leverage:

- Exceptional idea generation, divergent thinking, and conceptual creativity.
- Ability to produce large volumes of draft content extremely quickly with AI support.
- Positive energy that can motivate the team under pressure.

Vulnerabilities to Manage:

- You may miss nuance, cultural tone, or small but important errors in AI outputs.
- You interrupt or talk over people when excited.
- You sometimes “jump to solutions” before considering constraints.
- Under stress, you may withdraw for a break without warning.

Your Goals in the Meeting:

1. Convince the team that your AI-generated campaign draft is strong and mostly ready.
2. Avoid spending too much time revising; momentum is your priority.
3. Preserve your autonomy in using AI the way you prefer.
4. Avoid feeling “slowed down” by Anna’s caution or structured approach.
5. Get approval to present the campaign to the client with minimal changes.

Role Brief: ANNA (Employee – Tourette Syndrome Profile)

Role Summary:

You are a highly competent Senior Account Manager returning to the agency world after leaving due to stress-related escalation of Tourette symptoms. You value structure, predictability, and high-quality human-authored work.

Core Traits & Work Patterns:

- Under stress, your involuntary **vocal tics** intensify, and unpredictability is triggering.
- You communicate clearly but slowly; you need **turn-taking** and low sensory chaos.
- You approach Generative AI cautiously: useful for inspiration, not for final outputs.
- You rely on **accuracy, nuance, and ethical tone** in client communication.

Strengths to Leverage:

- Strong attention to detail, pattern recognition, and strategic coherence.
- High emotional intelligence in client-facing situations.
- Ability to foresee PR risks or culturally misaligned messaging.

Vulnerabilities to Manage:

- Fast-paced, chaotic meetings may overwhelm you.
- You may hesitate to speak if interruptions increase stress.
- You distrust AI-generated language unless thoroughly reviewed.
- You need clarity of roles, tasks, and responsibilities to feel safe.

Your Goals in the Meeting:

1. Flag the risks in Marko’s AI-generated content (tone, accuracy, cultural sensitivity).
2. Advocate for **structured revision** and quality control before presenting to the client.
3. Ensure the team avoids last-minute changes or chaotic work patterns.
4. Protect your cognitive limits without appearing resistant to innovation.
5. Promote inclusive collaboration norms (e.g., turn-taking, clear deadlines).

Role Brief: MANAGER (Team Leader Perspective – Dynamic Capabilities Focus)

Role Summary:

You are the Creative Team Manager responsible for project delivery, team well-being, client satisfaction, and AI integration strategy.

Your Leadership Frame:

Your task is to **reconfigure** the team's workflow so that both AI and cognitive diversity enhance—not threaten—performance.

Core Responsibilities:

- Balance speed (Marko) with accuracy and risk management (Anna).
- Maintain an inclusive climate where neuroatypical team members can contribute fully.
- Ensure AI use aligns with brand safety, ethics, and client expectations.
- Prevent overload, conflict, and miscommunication.
- Deliver a coherent, client-ready campaign.

Your Goals in the Meeting:

1. Enable both Marko and Anna to contribute their strengths.
2. Make a final decision on which content to keep, revise, or discard.
3. Establish short-term process adjustments (roles, timelines, responsibilities).
4. Mitigate risks from AI-generated content (bias, tone issues, inaccuracies).
5. Preserve psychological safety and sustainable work conditions.

Your Constraints:

- Deadline pressure from the client.
- No formal AI protocol yet in the agency.
- Team members have contrasting working styles and cognitive needs.
- You must be fair, inclusive, and accountable.

Role Brief: JUNIOR COPYWRITER

(Early-career, dependent on guidance, pressure-sensitive)

Role Summary:

You are a junior creative employed for 18 months. You admire both Marko's creativity and Anna's precision, but you often feel caught between their conflicting work styles. You are still learning to use AI tools and fear being judged for mistakes.

Core Traits & Work Patterns:

- You rely on clear instructions and benefit from structured feedback.
- You are cautious with AI because you're unsure how to check for bias or tone issues.
- You dislike last-minute changes because they disrupt your learning process.
- You tend to defer to senior colleagues even when you notice potential problems.

Strengths to Leverage:

- Strong willingness to learn.
- Good ability to absorb brand guidelines and apply them consistently.
- Emerging copy-editing skills; you can spot grammar and tone mismatches.

Vulnerabilities to Manage:

- Fear of speaking up in a tense meeting.
- Avoidance of conflict; you worry about "disappointing" senior staff.
- Tendency to over-edit when anxious.
- Limited experience with AI prompting best practices.

Your Goals in the Meeting:

1. Advocate discreetly for time to review the AI content before it goes to the client.
2. Clarify your role in the revision process (e.g., editing, QA, research).
3. Avoid being blamed for inconsistencies in the AI-generated draft.
4. Get guidance on when and how YOU should use AI as part of your role.
5. Learn from observing how senior colleagues handle cognitive diversity and stress.

Hidden Tension: You secretly worry that AI will make junior roles redundant. You are watching closely how your seniors engage with AI to understand what will matter for your future employability.

Role Brief: DATA ANALYST

(Evidence-driven, systems-thinking, preference for logic and predictability)

Role Summary:

You support marketing strategy through data modeling, audience segmentation, and KPI forecasting. You are not directly responsible for writing copy, but you **care about evidence, A/B testing, and minimizing risk**.

Core Traits & Work Patterns:

- You prefer decisions backed by data, not intuition.
- You are skeptical of creative drafts not validated by audience insights
- You see AI as useful for pattern detection but potentially dangerous when used without checks.
- You struggle with ambiguous or chaotic meetings; you prefer clear agendas.
- You see AI as useful for pattern detection but potentially dangerous when used without checks.
- You struggle with ambiguous or chaotic meetings; you prefer clear agendas.

Strengths to Leverage:

- Ability to quantify risks in AI-generated content (e.g., likelihood of audience misinterpretation).
- Strong pattern recognition skills; you notice inconsistencies others miss.
- Advocate for testing, not guessing.

Vulnerabilities to Manage:

- Perceived as over-cautious or a “bottleneck” by creative colleagues.
- Communication style sometimes too blunt.
- Difficulty engaging when discussions become emotional or unstructured.

Your Goals in the Meeting:

1. Push for minimal viable testing before presenting the campaign to the client.
2. Advocate for a data checkpoint between AI generation and final approval.
3. Highlight measurable risks (e.g., tone issues harming brand trust).
4. Help the manager evaluate the trade-offs between speed vs. accuracy.
5. Translate technical insights into actionable steps for the team.

Hidden Tension:

You feel undervalued in creative decisions and are determined to show why ignoring data could harm outcomes—especially when AI is involved.

Role Brief: SALES MANAGER (Client-Facing Business Development)

(Performance-driven, deadline-oriented, customer-sensitive)

Role Summary:

You oversee client relationships and revenue outcomes. You are responsible for maintaining client trust, securing renewals, and protecting the agency's reputation. You think in terms of deadlines, deliverables, and client expectations, not internal processes.

Core Traits & Work Patterns:

- Strong focus on speed and meeting commitments.
- High tolerance for imperfection if the message is delivered on time.
- Strategic orientation: you care about the “bigger story,” not minor details.
- You often pressure creative teams without fully understanding their workflows.

Strengths to Leverage:

- Ability to sense client preferences and anticipate objections.
- Skilled at framing deliverables in ways that impress the client.
- Natural mediators between internal teams and external expectations.

Vulnerabilities to Manage:

- May inadvertently dismiss Anna's caution as “overthinking.”
- May push Mark's pace too hard, triggering burnout or poor oversight.
- Underestimates risks associated with flawed AI content.

Your Goals in the Meeting:

6. Ensure the campaign can be sent to the client on time—deadline is approaching.
7. Discourage prolonged revisions unless necessary.
8. Evaluate whether the AI-generated ideas will impress or alarm the client.
9. Balance quality with urgency: “good enough AND deliverable.”
10. Prevent reputational damage but maintain competitive speed.

Hidden Tension:

You fear losing the client if delays occur again. You may conceal this pressure, but it implicitly shapes your decisions.



AI, CYBERSECURITY, AND DIGITAL HYGIENE

Krzysztof Durczak & Alicja Koperska

Security usually enters our work as an interruption. It appears as another password to remember, another verification code to type, another access rule to follow, or another warning that slows down a task we were just trying to finish.

This chapter starts from that frustration rather than dismissing it. It is written for readers who are not cybersecurity specialists and may not be especially interested in cybersecurity as a field. We begin with the basics, because without them it is difficult to understand what artificial intelligence (AI) actually changes.

Some of the warnings in this chapter may sound familiar. You have probably heard many times that passwords matter, phishing is dangerous, links should be checked, and sensitive data should not be shared carelessly. The point is not that AI invented these problems. It did not. The point is that AI changes the conditions in which old problems operate: it can make deception cheaper, faster, more personalized, and easier to scale.

This is why general security knowledge belongs in a chapter for people working in marketing and communication. Modern marketing depends on platforms, customer databases, analytics systems, automation tools, content pipelines, advertising accounts, and increasingly AI-assisted workflows. In this environment, security is not a separate technical layer somewhere in the background. It is part of everyday professional judgment.

Security practices often feel inconvenient because they interrupt momentum. Password managers, multi-factor authentication, access restrictions, verification steps, and data-sharing rules can slow people down exactly when they want to publish, test, report, send, or move on. But this inconvenience exists for a reason. The goal is not to create fear of technology. The goal is to make security feel less like an arbitrary obstacle and more like a necessary part of working with digital tools, customer data, and AI systems responsibly.



11.1.1 TASK: THE COST OF CONVENIENCE

Security often becomes difficult at the point where it conflicts with everyday convenience. The passwords we use to access various services are a simple example. People usually want their passwords to be short enough to remember, easy enough to type, and familiar enough not to forget. Unfortunately, the same qualities that make a password convenient for a user can also make it easier for an attacker to guess.

This exercise is not about learning how to crack passwords. It is about understanding how small choices change the cost of an attack and your chances of being hacked when a password is your only line of defense. A password can be difficult for a human to remember and still easy for a computer to test. Conversely, a long and randomly generated password may look simple, but be far more difficult to break.

Password logic

Please open [this link](#). The calculator uses the concept of entropy, which is a measure of mathematical unpredictability. In this context, higher entropy means a larger number of possible combinations an attacker would need to test to find the correct password. Classic brute-force techniques involve systematically checking every possible combination across possible symbols and lengths until the password is cracked. More possible combinations usually mean more time, more computing power, and a higher cost of attack.

Through this exercise, we want to reproduce the common frustration of creating an account for a new service, which often entails creating a new password if you do not use a sign-in option such as "Log in with Google". Such passwords often require different elements, such as length, symbols, and capitalization. We want you to see for yourself why this request might be reasonable.

Test 1. Set the password length to 8 characters. Check all four types of characters: lowercase letters, uppercase letters, numbers, and special characters. Click Calculate Strength. Write down the entropy value and the estimated cost of cracking it.

Test 2. Change the length to 20 characters. Uncheck everything except lowercase letters. Click Calculate Strength. Compare the entropy and estimated cost with your first test. What changed?

Test 3. Keep the length at 20 characters, but check all four character types again. Click Calculate Strength.

After completing the tests, compare the results. Which change matters more: adding more character types, increasing the length, or combining both? Why might a long password made only of lowercase letters be stronger than a short password that uses symbols, numbers, and capital letters?

The limits of calculation

There is one important limitation. Password strength calculators usually assume that passwords are random. Human-created passwords often are not. People reuse names, dates, places, brands, keyboard patterns, and predictable substitutions such as replacing "a" with "@" or adding "2025" at the end. Attackers know this.

This is where AI changes the old problem. Traditional brute-force attacks test combinations systematically. AI-assisted attacks can help prioritize guesses that are more likely to match human behavior, especially when attackers have access to leaked passwords, social media information, or other contextual data. AI does not make password security a new issue, but it can make attacks on predictable human habits faster and more efficient.

11.1 OLD THREATS, NEW SCALE

You have probably heard this advice before: use longer passwords, do not reuse them, and avoid obvious patterns. The problem is that familiar advice is easy to dismiss. In security, however, familiar does not mean unimportant. The password exercise shows two things that matter before AI enters the picture: length usually matters more than visual complexity, and human-created passwords rarely behave like random strings.



Human patterns

This is where the calculator starts to fall short. It assumes randomness, while people tend to create patterns: a familiar word, a date, a brand, a place, and a small modification at the end. Attackers do not need much creativity to exploit this. They need lists, automation, and a good sense of the patterns people tend to reuse. Password reuse compounds the risk. If one password is compromised in one system, attackers can test the same credentials on other platforms, potentially gaining access to email accounts, banking services, online stores, and other sensitive resources.

Passwords are a useful starting point, but they are only part of the story. Many attacks do not begin with breaking a system. They begin with persuading a person. For people working with newsletters, mailing lists, advertising accounts, customer databases, and campaign tools, this kind of credential theft can quickly become a marketing and data-protection problem, not just an IT problem.



AI-assisted guessing

Password attacks are only one example of how artificial intelligence can change existing cyber threats. Phishing, which means impersonating a trusted institution such as a bank, courier company,

or employer in order to obtain sensitive information, has also become significantly more effective. Only a few years ago, AI-generated phishing messages were often less convincing than those written by humans. Today, however, attackers can generate highly persuasive messages within minutes. AI-generated phishing can be difficult to detect because it can imitate tone, context, and urgency more convincingly than older, generic scam messages, especially when attackers use publicly available information about a person or organization.

AI has also accelerated the development of spear phishing, a targeted form of attack aimed at specific individuals. By collecting information from public sources such as LinkedIn profiles, company websites, or conference registrations, AI systems can help produce detailed, personalized messages that appear to come from trusted contacts. As a result, even individuals who previously considered themselves unlikely targets may become vulnerable. The economics of phishing have changed as well. Tasks that once required extensive research, writing, and testing can now be completed in minutes using generative AI tools. This reduction in cost and effort allows attackers to operate at a much larger scale than before.

The same logic applies to impersonation. If phishing tries to make a message look trustworthy, deepfakes try to make a person seem present. Deepfakes are AI-generated audio or video recordings that convincingly imitate real people. A widely publicized example involved the engineering company Arup in 2024. During a video conference, an employee believed he was communicating with senior colleagues, including the company's chief financial officer. In reality, all of the participants visible on screen had been recreated using deepfake technology. As a result, the employee authorized transfers totaling approximately \$25 million before discovering that the meeting was faked. The significance of this case lies not only in the sophistication of the technology but also in its availability. The cost and difficulty of producing convincing deepfake content have decreased dramatically. What was once associated with intelligence agencies and highly specialized organizations has become far more accessible at relatively low cost.



Beyond passwords

Artificial intelligence has also lowered barriers to entry for cybercriminals. Specialized AI-assisted tools for fraud and credential theft are now widely available online. Among the most common are infostealers, malicious programs that extract passwords stored in web browsers. Once installed on a device, this malware silently collects credentials and transmits them to attackers. One example is Lumma Stealer. In 2025, Microsoft reported that Lumma had infected more than 394,000 Windows computers between March 16 and May 16 alone. The exact number of stolen credentials is harder to estimate responsibly, but the case illustrates the scale of modern infostealer operations. These stolen credentials are frequently used in attacks known as credential stuffing. In these attacks, criminals test compromised usernames and passwords across multiple services, exploiting the common practice of password reuse.

The underlying idea is not new: attackers have always tried the most likely variations before the unlikely ones. What AI can change is how efficiently those guesses are prioritized. If attackers have leaked passwords, public profile information, or other context about a person, AI-assisted systems can help rank the guesses that are more likely to fit human habits. The consequences can be severe. Stolen credentials have been used to gain access to cloud platforms and corporate systems containing sensitive customer information. In some cases, breaches have affected hundreds of organizations and exposed hundreds of millions of customer records. Attackers may then sell this information, use it for further attacks, or demand ransom payments from affected organizations.

The pattern is simple: AI does not replace social engineering. It makes it industrial. Phishing, impersonation, password theft, and credential abuse still depend on trust, fatigue, routine, and small moments of inattention. What changes is the speed, cost, personalization, and scale at which these old tactics can now be used. Artificial intelligence can make many established forms of cybercrime cheaper, more accessible, and harder to detect, creating new challenges for both individuals and organizations.

11.2 NEW PROBLEMS IN THE AI ERA

Some risks do not simply become faster with AI. They become different. While earlier concerns focused on phishing, password theft, or malware, organizations must now also address challenges caused by the way AI systems operate and are used. Among the most important are data leakage, hallucinations, prompt injection, and shadow AI.



Data leakage

Data leakage occurs when information becomes accessible to people who should not have access to it. In the context of AI systems, this may happen either because of technological configuration weaknesses or because of the way users interact with AI tools. A useful example comes from Grok AI in 2025. Users could generate sharing links for conversations, expecting to share them with selected individuals. However, some shared conversations became publicly accessible using search engines, exposing private information that users did not intend to make public. Although no cyberattack occurred, the incident demonstrated how platform design choices can unintentionally create privacy risks.

More often, however, the leak begins with ordinary user behavior. One well-known example involved Samsung engineers who, while attempting to solve technical problems, uploaded source code, diagnostic logs, and internal meeting notes to ChatGPT. At the time, user input submitted to the public version of ChatGPT could be used for model training. As a result, confidential corporate information was exposed to a level of risk that employees had not fully considered. These examples highlight a notable principle: organizations should establish clear policies governing the use of AI systems and ensure that sensitive information is shared only within controlled environments. As a practical rule, users should avoid entering information into third-party AI tools hosted online that they would not be comfortable sharing with an unknown third party.



Hallucinations and accountability

Another challenge arises from the way generative AI systems generate responses. They are designed to produce useful-looking responses, even when the available information is incomplete, ambiguous, or insufficient. As a result, AI systems may produce outputs that are convincing despite being inaccurate. This phenomenon is commonly described as an AI hallucination. Hallucinations occur when a model generates facts, references, documents, or citations that are not supported by the available evidence or context. Because these outputs are often presented confidently, users may mistakenly assume they are reliable. This is not just a theoretical problem. Researchers have documented numerous court cases in which lawyers submitted legal documents containing non-existent case law generated by AI systems. In some instances, this resulted in sanctions, disciplinary proceedings, or dismissed cases.

Hallucinations also raise a harder question: who is responsible when an AI system gives someone wrong information? A notable example is Air Canada's customer-service chatbot, which provided incorrect information about ticket discounts. When a passenger relied on this information and suffered financial loss, the airline argued that it should not be held responsible for the chatbot's statements. The civil-resolutions tribunal rejected this argument and ruled that the company remained solely responsible for information presented on its website, regardless of whether it originated from a human employee or an AI system. These cases demonstrate that AI should be viewed as a support tool rather than an autonomous decision-maker. Responsibility for decisions and outcomes belongs to the humans and organizations that choose to deploy AI technologies.



Prompt injection

One AI-specific security challenge is prompt injection. The term entered AI-security discussions in 2022, but for many non-specialist users it still describes a problem they have never had to think about directly. Unlike many traditional cybersecurity attacks, prompt injection exploits the fact that AI systems can interpret natural language as instructions. The simplest form is direct prompt injection. In these cases, users intentionally provide prompts designed to override system restrictions or manipulate the behavior of a chatbot. Public examples range from embarrassing chatbot behavior to more serious attempts to bypass safety rules or extract restricted information.

The more dangerous version, especially for organizations, is indirect prompt injection. Here, malicious instructions are hidden inside documents, emails, websites, or other content that an AI system may process automatically. Instead of interacting directly with the AI, attackers attempt to influence its behavior using content it encounters during routine operations. This threat is particularly significant in agentic AI systems. Unlike earlier chatbots, AI agents may have access to email accounts, documents, databases, and business applications. If such an agent encounters hidden instructions embedded in external content, it may perform actions using the permissions granted by the user or organization.

For example, a marketing assistant asked to summarize a client brief, campaign document, scraped webpage, or downloaded template could unknowingly process hidden instructions directing it to search email archives or disclose sensitive information. In such cases, the attack relies not on software vulnerabilities but on the AI system's ability to interpret and follow natural-language instructions. Because of these risks, prompt injection has been identified by cybersecurity experts as one of the most significant security concerns associated with modern AI systems.



Shadow AI and governance

As AI systems become more integrated into organizational processes, security and governance become critical. The use of unapproved AI tools, often referred to as shadow AI, creates additional risks because organizations may have limited visibility into how data is processed or shared. Organizations need clear policies, employee training, approved AI environments, and mechanisms for monitoring and controlling AI usage. Effective AI governance requires not only technical safeguards but also informed and responsible user behavior.



11.3 KEY TAKEAWAYS

- AI does not make every cyber threat new. It makes many familiar threats faster, cheaper, more personalized, and easier to scale.
- Password hygiene is a baseline, not the whole solution. Long, unique, randomly generated passwords and password managers reduce risk, but modern security should also rely on MFA or passkeys wherever possible.
- Data leakage often begins with ordinary user behavior: pasting internal documents, customer data, campaign materials, or proprietary knowledge into tools that were not approved for that purpose.
- AI-generated answers can sound credible even when they are wrong. Critical facts, claims, legal advice, sources, and customer-facing recommendations still need human verification.
- Organizations remain accountable for decisions and communications supported by AI. Responsibility cannot be outsourced to the tool.
- Prompt injection is an AI-specific risk: hidden or malicious instructions in documents, websites, emails, or other content can influence AI systems, especially when they are connected to business tools.

- Safe AI use depends on everyday digital hygiene: password managers, MFA or passkeys, careful data sharing, source verification, and clear organizational rules for approved tools.
- The point is not to be afraid of AI. The point is to understand the risks well enough to use AI deliberately, responsibly, and with fewer unnecessary exposures.



11.4 FURTHER READING

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Case study:

PHANTOM IN THE OUTLOOK

Krzysztof Durczak, Allan Edh

PHANTOM IN THE OUTLOOK



Case Prologue

As the Chief Information Security Officer (CISO), your role entails overseeing the information security strategy, managing cybersecurity risks, protecting digital infrastructure, and ensuring compliance with relevant laws and standards. You work closely with the board, IT, and external partners, to foster resilience and safeguard the organization's operations. As it turns out, it is also your job to lead responses to security incidents.

Your phone rings late in the evening. Lisa's name flashes on the screen. You answer. Her voice is very tight, rushed, and almost panicked.

Lisa: *"Thomas processed a €500,000 payment for the supplier last week. They just called – they're saying they haven't received it. I don't know what's going on. We need answers now! The board is all over me. Can you figure this out?"*

You take a breath, steadying yourself.

You: *"Okay, Lisa. I understand. This is serious. But we can't give answers without first understanding what happened. Let me start pulling the right data. I'll coordinate our team and bring in external help. I'll keep you updated through the night."*

Lisa: *"How long is this going to take? I need something before the morning."*

You: *"We'll aim for a full briefing by early afternoon. But I'll get you an initial update much sooner."*

Lisa: *"Should we be doing anything else right now? I can't just sit on this."*

You: *"Yes. Someone from finance, or you, should call the bank immediately. Let them know there's a possible fraud situation. See if they can flag or hold the payment, or at least note our concerns. That's not something I can do directly, but it's urgent."*

Lisa: *"Alright. I'll call them. Just don't leave me in the dark."*

You: *"I won't."*

The call ends.

You find yourself managing a crisis

You sit for a moment, steadying your thoughts. The facts are thin: a large wire transfer never reaches a supplier. It could be an error, fraud, or something else. First: confirm the basics – was the payment sent, by whom, and when. Coordinate with finance people to verify approvals. Check for any irregularities.



And this isn't something to handle alone. External expertise can make the difference between mitigating the threat or letting it spread. You scroll through your contacts, pulling up the list of cybersecurity firms you had vetted last year. No formal contract, but maybe one will pick up. It's a risk calling at this time without an agreement but waiting could be worse. You start calling, mentally preparing how to frame the situation clearly and urgently, hoping someone will answer and guide the first steps through the night.

Within the hour you connect with a firm willing to assist. They outline immediate priorities: preserve logs, secure key accounts, document any changes made during the response. You pull together relevant departments: IT, finance, and the legal team. You assign tasks: verify the payment trail, start collecting access logs, check for unusual login patterns. You instruct IT to reset passwords on critical personal accounts linked to the transaction and enforce multi-factor authentication (MFA) where it's absent.

The team works anxiously through the night, sharing updates with the external consultant. By morning, fragments of the picture begin to converge as the consultant provides a preliminary report: timeline, key points and vulnerabilities included.— No recommendations yet though.

The Company

Clickonomics is a mid-sized digital advertising agency based in Europe, with offices in Australia and North America. With 114 staff, it provides full-service digital marketing for large brands – including media buying, creative production, and performance analytics across major platforms. The company manages substantial media budgets, acting as an intermediary between brands and publishers, and relies on trusted partnerships and handling large financial transactions.



PHISHING WEBSITE

A fraudulent site designed to mimic a legitimate one, with the goal of tricking users into revealing sensitive information such as passwords, credit card details, or login credentials.

Preliminary Incident Report

Clickonomics gets a handful of emails from a legitimate business partner email urging recipients to have a look at their OneDrive with important documents. Because the message comes from a trusted address, two people (a junior employee working in graphic design named *John*, as well as a long-time senior executive named *Robert*) follow the link and log in. What they do not realise is that the link sends them to a malicious copy of OneDrive, a phishing website, where they try to log in.

Some time in the afternoon, the CEO of Clickonomics, *Lisa*, becomes suspicious of even more emails received from the partner and decides to call them up. They explain that they are dealing with a big security breach and that no emails should be trusted and may include phishing attempts to steal user credentials. All employees at Clickonomics are notified.



Lisa
CEO
of Clickonomics

Phantom
Threat actor
in the system

**Thomas
Jr.** Financial
Officer

Robert
Senior
Executive

**John
Jr.** Graphic
Designer

Later the next morning

It is brought up again by Lisa in a conversation with senior executive Robert during their regular meeting. Robert feels the pressure to mention he might actually have entered his password somewhere although he claims he is not certain. Lisa tells him to change his password just in case, but does not dwell on it because of their long-time friendship. The meeting is interrupted as Robert is busy trying to finish all of his tasks before leaving for the airport as he is going for a weekend trip. The IT department is never notified of the potential breach of Robert's account, and Robert forgets to change password before leaving.

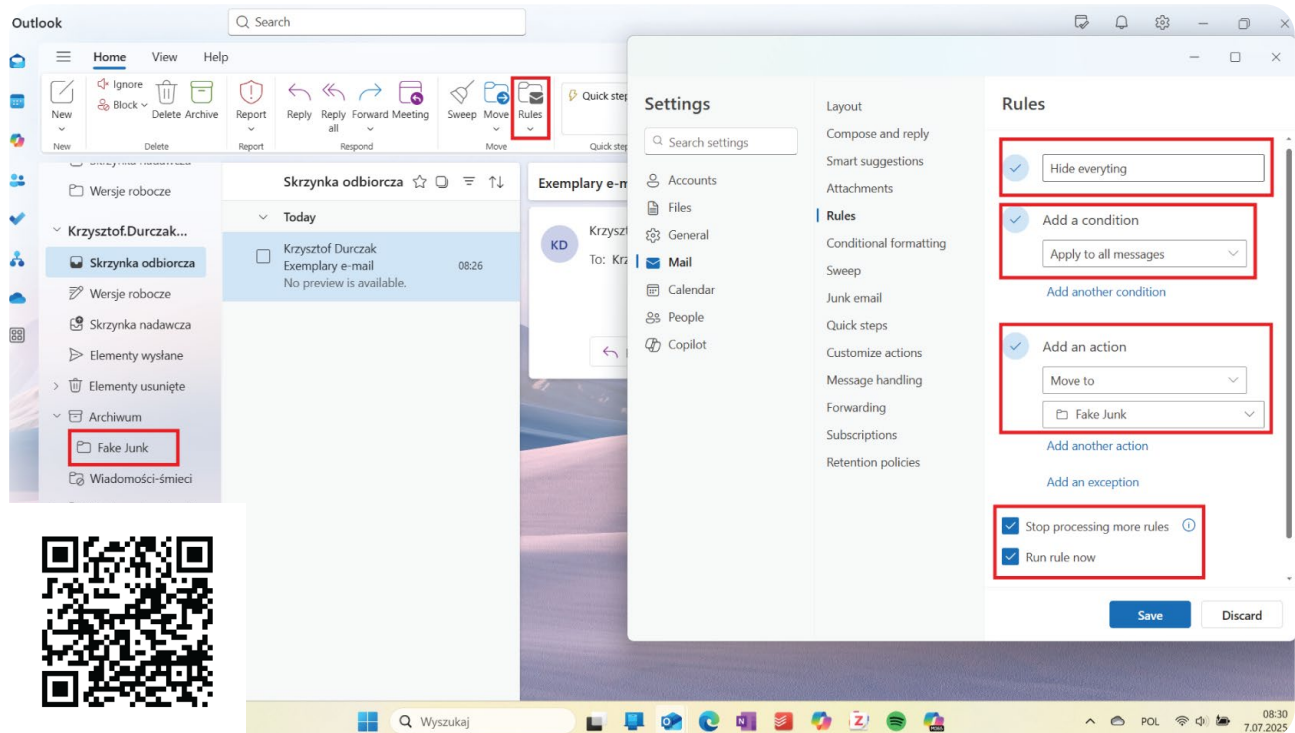
At the same time

The adversary who sent the phishing emails has gained access to both accounts of Robert and graphic designer John – partly because none of them had multifactor authentication enabled. The IT department are the ones enabling it manually, and because Robert had complained about having to log in using his phone all the time he was excluded, along with some other executives. The graphic designer, who is fairly new to the company, has not yet completed the onboarding process and therefore has it still disabled.

Hiding in plain sight

The Phantom then spends a good amount of time reading through all relevant email conversations of the two compromised employees, trying to come up with a plan for stealing money. The Phantom

settles for the senior executive as he has more mandate, and adds a special rule (*scan the QR code below for [example video](#)*) for Robert's account to monitor emails. This is done to receive all incoming email inside a hidden folder which only the adversary knows about. If the email does not raise any suspicion and should be read by the real Robert it is manually forwarded to the readable inbox.



Opportunity knocks

Soon, the Phantom notices a big payment (€500,000) which is overdue because of the company's recent financial struggles, and he exploits the situation by starting to send emails to junior financial officer Thomas, who happens to also work in a different part of the world. Namely, at Clickonomics' Australian office.

The Phantom takes advantage of Robert being disconnected during the flight to his holiday destination, and uses that opportunity to pressure Thomas to make the payment by impersonating Robert and sending emails from his account.

Superior pressure

Included in the fraudulent conversation from the Phantom there are also other recipients (including superiors in emails by CC function is a typical corporate practice to keep them in the loop). Their email addresses, however, contain the domain name: "clickonomlcs.corp" which looks very similar to: "clickonomics.corp" - the real domain.

DOMAIN SPOOFING

A deceptive technique where attackers create a domain name that closely resembles a legitimate one, aiming to trick users into trusting fraudulent emails or websites.

The Phantom registered this domain (probably using fake personal details and untraceable credit card) intentionally to confuse Thomas.

Consequently, Thomas thinks that both the “cfo@clickonomlcs.corp” and “ceo@clickonomlcs.corp” are real executives who are also included in the email threads and supervise the conversation. For the junior financial officer it increases both trust (“they would engage if there was any problem”) but also pressure (“they know what I am supposed to do”).

Supplier pressure

The Phantom also registers another fake domain which looks very similar to the actual recipient of the payment (the client) and sends an angry-sounding reminder attaching “again” the overdue invoice. The bank information of the invoice, however, is substituted for the fraudulent account number.

Time pressure

Additionally, the longer the issue lasts the more Thomas knows soon he will have to wait until the next day for any response because of the 8+ hour time difference at the Australian office, possibly escalating the situation with the client and risking the blame from supervisors for not doing what he is supposed to do.

Money gets wired

Eventually, the invoice is paid by Thomas. As suggested by the Phantom, impersonating Robert, the payment is split into two parts of €250,000 each. The reason is to avoid the additional verification by the bank on any amount exceeding that cap, which would further postpone the payment being already overdue. To Thomas, this seemed compelling enough. To Phantom, on the other hand it is a way to bypass bank security triggers. As follows, Thomas sends a confirmation about his newly completed payment in a new email thread, now using the correct supplier and address. Therefore it reaches the legitimate recipient which alerts him.

The realization

Once Robert is back after his weekend trip, the supplier calls him to ask why they have not received any money although it was suggested in Thomas’ email. Robert calls Thomas asking about the payment and realises he never sent any of the emails, and none of the included executives received or supervised anything. Before they realise what the Phantom has been doing, the second payment goes through and €500,000 are successfully stolen. Robert soon turns suspicious and is reminded of last week’s phishing attempts, which leads him to call Lisa. Once they are finished, Lisa calls the company CISO.

Task 1: “Briefing the Board”

When you finish reading the preliminary report from the cybersecurity consultant you receive an email from Lisa. She informs you that the board meeting is very soon. This means you have limited time to piece it all together for others to understand. Your responsibility will be to explain the situation to the board about what has happened and how, without playing a blame game. Lisa, who has managed to skim through the report, has attached a few questions for you to prepare.



Your Objective

Make sure you understand the incident report and what has happened to Clickonomics. Answer below questions and take notes to prepare for a smooth presentation.

1. Summarize in simple terms what has happened, and explain what technical functions or activities that were used or exploited in the breach.
2. What was the role of trust and authority in carrying out the hack?
3. How well did communication work between different employees? Which vulnerabilities or missteps favored the Phantom?
4. How did formal responsibilities differ from informal responsibilities that actually played out during the incident? Did anyone go beyond their line of work, or instead do less than expected?
5. If anyone is to be fired, who do you think? Motivate your answer.
6. Assume Robert did successfully change his password. Knowing the Phantom had access to John's account, how could his identity have been used to achieve similar goals? Recall John's role as a newly employed Junior Graphic Designer.
7. What other kinds of damage or consequences, other than financial, do you think will affect the organisation?

Task 2: “Building a Resilient Organisation”

A week later, the immediate crisis has passed, but the data from the incident has provided a harsh new lens through which to view the organisation. It wasn't just a technical breach, it was a failure of the company's culture and daily operation.

Lisa invites you to her office. Once you come in, she utters: "That incident exposed a weakness in our working strategy. We've prioritized speed and convenience, and we're paying the price. This isn't just an IT issue, I see a vulnerable culture. I need you to architect our strategy going forward. Think bigger than firewalls and passwords, I want you to design a resilience plan that integrates security into the very DNA of Clickonomics."

Your Objective

Map out a clear path toward resilience for Clickonomics by proposing one initiative that integrates security into each of the three resilience aspects of *sensing*, *seizing* and *transforming*. Read through the description of the different resilience types and examples of failed actions, and finish by filling out the table with your proposed actions.



Three types of resilience:

- **Sensing (finding problems):** Think like a detective. How can the company better identify, detect, or become aware of threats, vulnerabilities, and risky behaviors?
- **Seizing (fixing problems):** Think like a first responder. What immediate actions, new rules, or tools can the company implement to contain threats and fix known issues?
- **Transforming (preventing problems):** Think like an architect. How can the company change its culture, training, and daily processes to build long-term security habits?

Examples of failed resilience:

- **Sensing failure:** Lisa and Robert both "sensed" a potential threat after the phishing emails, but Clickonomics had no formal process for this information to be captured and investigated by IT. A clear reporting process was missing.
- **Seizing failure:** When Robert admitted he might have compromised his account, the response was informal and inadequate (Lisa telling him to change his password). A formal incident response plan would have triggered immediate containment steps, like suspending the account and alerting IT, which could have prevented the entire fraud.
- **Transforming failure:** The most critical failure was cultural. The MFA exemption for executives showed that the company's long-term structure prioritized convenience over security. Treating all employees the same, including management, would eliminate unnecessary and dangerous exceptions.

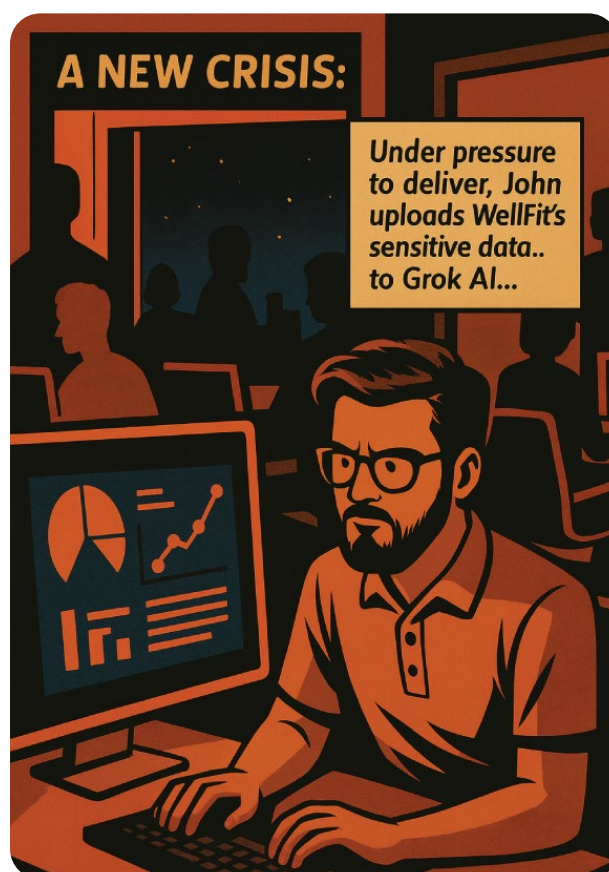
Resilience aspect	Your proposed action
Sensing (finding problems)	
Seizing (fixing problems)	
Transforming (preventing problems)	

Final Task: Prioritize Your Recommendations

Review your proposed actions, and prepare to motivate and defend one of them as the most important action going forward. The best proposed action will be decided by the class.

Task 3: “Innovation Under Pressure”

A few weeks after the incident, the atmosphere at Clickonomics was tense. The financial loss has put everyone on edge, and the pressure to secure new business is immense. John, the junior graphic designer, is still aware of his role as one of the initial phishing victims, and is highly motivated to prove his value to the company. The opportunity arrives with a new project for a major potential client, “WellFit Devices”. John's manager assigns him the task of developing a full ad campaign concept in just 48 hours: "Be innovative and get it done fast!". The client provides a large dataset of patient medical data for the project. John does not have the time to go through the data manually. Eager to impress, he remembers "eMarket AI", a powerful new tool he has been exploring on his own.



Seeing this as the perfect chance to showcase his value, he logs in and uploads the client's sensitive data. The AI helps him generate great market insights quickly and meet the impossible deadline. He even includes a shareable link to the AI chat alongside his project documentation to show his manager the innovative method he discovered.

A week later, a tech journalist publishes an article about a major security flaw in eMarket AI. It reads: “For 72 hours, all shareable links to chats were made public and indexed by search engines for anyone to see”. The journalist even includes an example of exposed data, which happens to be a link leading to the WellFit Devices confidential patient data, associated with Clickonomics. The crisis is immediate.

Your Objective

John's use of eMarket AI is an example of shadow AI - the unsanctioned use of artificial intelligence tools by employees without the knowledge or approval. While often driven by good intentions, like John's desire to innovate and meet a deadline, it introduces serious risks related to data privacy, security, and legal compliance.

Your role as the CISO is to address these issues by proposing principles that could be written into the company policy. You are tasked to provide a guideline for the legal to regulate the AI use in the company. You notice that companies take very different approaches that could be ordered by two extremes (table below).

Policy Section	The Strictest Approach (Maximum Control)	The Laissez-Faire Approach (Maximum Freedom)	The Strategist's Dilemma (The Pitfall to Avoid)
Data Handling & Privacy	"Uploading any company or client data to any non-approved, third-party AI tool is strictly forbidden, no exceptions."	"Employees are trusted to use their best judgment when handling data with AI tools."	The Innovation Bottleneck: A process that is too slow negates the speed benefits of AI, encouraging employees to bypass the policy.
Acceptable & Prohibited Uses	"AI tools may only be used for tasks explicitly pre-approved by a manager and documented in a project file."	"Employees are encouraged to explore all potential uses of AI to find innovative solutions."	The Blurry Line: The distinction between AI "assistance" and "plagiarism" can be subjective. A policy must be clear enough to be enforceable without stifling creativity.
Security & Third-Party Risk	"Only AI tools that have undergone a full, 90-day security and legal review may be used."	"Employees are responsible for their own tool choices; the company is not responsible for third-party tool security."	The "Too Slow" Problem: A slow, bureaucratic review process is the number one reason for Shadow AI. The official process must be efficient or employees will go around it.
Incident Reporting	"Failure to immediately report any suspected incident, regardless of fault, will result in severe disciplinary action."	"Employees are encouraged, but not required, to share insights about tool security with the IT team."	The Fear Factor: Even with a "no-blame" policy, employees may still hesitate to report an incident if they were violating the policy. Building genuine trust is harder than writing a rule.
Regulatory Compliance	"Use of any AI tool with data that falls under any regulation is prohibited until cleared by the legal department on a case-by-case basis."	"Employees are expected to be generally aware of and adhere to major data protection laws."	The "Check the Box" Mentality: Simply referencing laws isn't enough. The policy must be translated into practical, daily actions for employees, or it becomes ignored legal jargon.
Human Oversight & Accountability	"All AI-generated content must be manually reviewed and signed off by two separate individuals before it can be used."	"Employees are fully accountable for their work, regardless of the tools they use to produce it."	The Automation Bias: People tend to over-trust outputs from automated systems. A policy requiring "review" is weak unless paired with training on how to critically challenge AI content.

Policy Section	The Strictest Approach (Maximum Control)	The Laissez-Faire Approach (Maximum Freedom)	The Strategist's Dilemma (The Pitfall to Avoid)
Training & Awareness	"Employees must pass a monthly AI security test. Failure to achieve a 95% score will result in temporary suspension of access."	"Optional training materials are available on the company intranet for those who are interested."	The "One and Done" Trap: A single training is rarely effective. A good program requires continuous reinforcement, but this can lead to "training fatigue" if not done in an engaging way.
Policy Enforcement	"Any violation of this policy, regardless of intent, will result in immediate termination."	"This policy serves as a guideline; enforcement is at the discretion of individual managers."	The Context Conundrum: A rigid enforcement policy can punish a well-meaning innovator like John as harshly as a malicious employee. The policy must be flexible enough to allow for context.
Transparency & Disclosure	"All work, internal and external, that incorporates any AI-generated element must be watermarked and accompanied by a detailed disclosure statement."	"Disclosure of AI use is a matter of personal and team preference."	The Client Perception Problem: Mandating disclosure might make some clients nervous. Sales and account teams may resist this policy, creating internal friction.
Procurement & Cost Governance	"No AI tool subscription can be purchased or expensed without a full business case approved by both IT and Finance."	"Managers have full discretion to approve any AI tool expense they believe will benefit their team."	The Reimbursement Loophole: If the official procurement process is slow, managers may informally approve "expense it back" solutions. The policy must be paired with an efficient process.



SALES AND MARKETING SYNERGY

Grzegorz Leszczyński & Piotr Kwiatek

Artificial intelligence can support many marketing activities, including customer analysis, communication, content creation, and brand building. However, one of its most promising applications is sales performance.

Marketing and sales are intricately connected. Marketing generates awareness, attracts potential customers, and builds trust, while sales converts this interest into revenue and long-term customer relationships. To do this, both functions need to operate as parts of a single process rather than as separate organizational units. A useful framework for understanding this process is the sales funnel. The sales funnel describes

the customer journey from initial awareness to purchase and post-purchase engagement. It also illustrates how marketing and sales activities interact at different stages of customer acquisition and retention. The typical sales funnel consists of six stages (Figure 12.1):

- Prospects
- Qualified Leads
- Contact and Negotiation
- Insight Selling
- Sales
- After-Sales Service



Figure 12.1: Sales funnel

Marketing activities are decisive in the early stages of the funnel, where the goal is to attract and qualify potential customers. Sales activities become consequential as customers move toward direct interaction, negotiation, and purchase. However, both functions contribute to the entire process. Conversion plays a central role in sales funnel management. It measures the proportion of customers who progress from one stage to the next. Improving conversion rates at each stage can significantly increase sales performance without increasing the number of incoming leads.

Artificial intelligence can support this process in many ways. It can help organizations nurture leads using personalized content, identify high-potential prospects, optimize sales pipelines, improve conversion rates, and strengthen long-term customer relationships. AI also facilitates better alignment between marketing and sales by providing shared data, insights, and recommendations. A key technology supporting this integration is Customer Relationship Management (CRM) software. CRM systems store customer information, track interactions, and support coordination between marketing and sales teams. When combined with AI capabilities, CRM platforms can also provide predictions, recommendations, and automated actions, making the entire sales process more efficient and data-driven.

This lesson explores how AI can support each stage of the sales funnel and how AI-powered CRM systems contribute to more effective marketing and sales management.

12.1 HOW AI CAN HELP IN MARKETING & SALES MANAGEMENT

The sales funnel connects marketing and sales into a single process. While marketing attracts and nurtures potential customers, sales teams convert those opportunities into revenue and long-term customer relationships. Artificial intelligence can support every stage of this process, but its effectiveness depends not only on technology, but also on the alignment and communication between marketing and sales teams.

One of the most common challenges in organizations is a lack of agreement on basic definitions and responsibilities. For example, marketing and sales teams may have different ideas of what a qualified lead is. Marketing may consider a lead qualified after a website interaction, while sales may expect to see clear purchase intent before engaging. Such discrepancies can reduce the effectiveness of even the most sophisticated AI systems. To address this issue, organizations often establish Service Level Agreements (SLAs), which define the shared expectations for lead quality, follow-up procedures, and performance metrics. AI can provide input for these agreement processes by monitoring lead flows, tracking response times, and identifying situations in which standards are not being met.

Another crucial area where AI contributes to marketing–sales alignment is attribution modelling. Attribution modelling is designed to determine which marketing activities contributed to a customer's purchasing decision. Historically, these techniques often assign all the credit to either the first or the last customer interaction. AI-based attribution models can analyze the entire customer journey and estimate the contribution of multiple touchpoints, helping organizations allocate marketing and sales resources more effectively.

At the top of the funnel, AI supports prospect identification and customer acquisition. By analyzing online behavior, content consumption patterns, website visits, and social media activity, AI can help organizations build ideal customer profiles and cluster prospects with similar characteristics. AI also improves advertising effectiveness by automatically and continuously testing different messages and allocating budgets to the best-performing alternatives. These activities are executed using omnichannel orchestration. Rather than treating individual communication channels separately, AI coordinates customer interactions across email, social media, advertising platforms, websites, and direct sales activities. This creates a more consistent customer experience and ensures that communication reflects previous interactions across channels.

Once prospects enter the funnel, AI can contribute to lead qualification and nurturing. AI-based lead scoring systems evaluate the likelihood that a prospect will convert, i.e., become a customer. These systems often rely on supervised machine learning techniques, ranging from relatively simple approaches such as logistic regression to more advanced methods such as gradient boosting. In addition, Natural Language Processing (NLP) enables AI to analyze emails, chat messages, and other textual interactions in order to detect signals of customer interest and purchase intent.

AI also transforms marketing automation. Previous automation systems have operated according to predefined rules, such as sending a follow-up email after a specific action. AI-based systems make more dynamic decisions by working on multiple factors simultaneously, including customer behavior, preferences, engagement history, and communication channel management. This allows organizations to deliver more personalized content and recommendations at the most appropriate moment in the customer journey.



As prospects move into active sales conversations, AI enhances the process using several capabilities and metrics. One of these is deal risk scoring, which identifies opportunities that may be at risk due to declining engagement, delayed responses, or competitive activity. AI can also improve sales forecasting by analyzing historical data and current pipeline dynamics to estimate future sales outcomes more accurately.

Another promising application is conversation intelligence. Platforms such as Gong and Chorus use AI to analyze sales conversations, identify successful communication patterns, and provide insights into behaviors associated with positive outcomes. This transforms sales interactions into useful learning opportunities for individuals and teams. AI can also support dynamic pricing decisions. Instead of relying on fixed pricing rules, organizations can use AI to analyze customer characteristics, competitive conditions, deal size, and urgency signals in order to recommend strategic pricing that maximizes the likelihood of successful conversion and increases profit margin.

AI is not done when the sale is complete. In the post-purchase stage, AI can automate customer retention and relationship development activities. Customer health scoring systems monitor product usage, engagement levels, and support interactions to identify potential churn risks. When warning signs appear, organizations can intervene before customers decide to leave. AI can also identify opportunities for upselling and cross-selling by analyzing purchasing patterns in data across similar customer groups. As a result, organizations can strengthen customer relationships and increase long-term customer value rather than focusing solely on individual transactions.



Across all stages of the sales funnel, one factor remains essential: data. Effective AI applications depend on high-quality, shared, and consistent data that flows between marketing and sales functions. Customer Relationship Management (CRM) systems play a pivotal role in this process by integrating customer information, tracking interactions, and providing a common platform for collaboration. When combined with AI capabilities, CRM systems are even more powerful tools for prediction, recommendation, automation, and decision support. AI does not replace marketers or sales professionals. Instead, it provides faster access to information, deeper insights, and more accurate predictions. This enables both marketing and sales teams to make better decisions, improve conversion rates, and focus their efforts where they create the greatest value.

12.2 AI TOOLS FOR MANAGING THE SALES FUNNEL

AI can support every stage of the sales funnel, from identifying potential customers to managing long-term relationships after purchase. In practice, these capabilities are delivered through a growing ecosystem of specialized tools. Rather than relying on a single all-in-one platform, many organizations adopt a best-of-breed approach, combining AI solutions that address specific challenges at different stages of the customer journey.

Table 12.1 summarizes the main AI capabilities that can support different stages of the sales funnel. The tools listed are illustrative examples rather than recommendations or endorsements. In practice, organizations may use commercial platforms, custom-built AI workflows, or hybrid solutions depending on their data access, integration needs, internal technical capabilities, and governance requirements.

Table 12.1 AI capabilities and illustrative tools across the sales funnel

Funnel stage	AI capability	Illustrative tools
Prospecting	Intent-data analysis and account identification	6sense, Demandbase, ZoomInfo
Lead qualification	Predictive lead scoring and enrichment	Apollo.io, HubSpot, Salesforce Einstein
Contact/negotiation	Communication personalization and buyer profiling	Crystal, Lavender, Clay
Insight selling	Market intelligence and research support	Perplexity AI, ChatGPT with browsing/RAG, AlphaSense
Sales/closing	Conversation intelligence and deal-risk analysis	Gong, Chorus, Clari
After-sales	AI customer support and retention automation	Intercom Fin, Zendesk AI, Salesforce Service Cloud AI

Prospecting: Intent-data platforms

At the top of the funnel, the primary goal is to identify potential customers and generate awareness of your product or services. One of the main challenges at this stage is that many potential buyers conduct research anonymously before ever interacting directly with a company. A widely used solution is 6sense, a marketing intelligence platform from software provider Revenue AI designed to identify buying intent through the analysis of digital signals. By examining online behavior across multiple sources, 6sense helps organizations identify companies that are actively researching problems their products can solve, even before those companies visit their websites. This approach shifts prospecting from traditional cold outreach toward more targeted and data-driven engagement. Instead of allocating resources broadly, organizations can focus their marketing efforts on accounts that are already showing signs of purchase intent.

Lead Qualification

Once prospects enter the funnel, the next challenge is determining which leads are most likely to become customers. This process is commonly referred to as lead qualification or lead scoring. Apollo.io is one of the most widely used AI-supported platforms that does this. It combines a large business contact database with predictive analytics and automated data enrichment capabilities. The platform can incorporate various signals, including company growth indicators, funding announcements, technology adoption patterns, and online intent data. As a result, sales teams receive leads that have already been scored according to their likelihood of conversion, allowing them to focus their efforts on the most promising opportunities.

Contact and Negotiation

As organizations move into direct contact with potential customers, communication quality becomes increasingly important. Different individuals respond to different communication styles, levels of detail, and persuasive approaches. Crystal uses Natural Language Processing (NLP) to analyze publicly available communication patterns and estimate a prospect's preferred communication style. Drawing on the Dominance Influence Steadiness Conscientiousness (DISC) personality framework, the platform provides recommendations regarding tone, message structure, and communication strategy. This enables sales professionals to customize their communication more effectively and reduce friction during early interactions and negotiations.

Insight Selling

Modern sales often rely on insight selling, where the objective is not merely to present a product but to help customers identify and solve business problems. To support this process, sales professionals need reliable, up-to-date information about industries, competitors, regulations, and market developments. Perplexity AI is particularly useful here because it combines generative AI capabilities with real-time information retrieval using a Retrieval-Augmented Generation (RAG) architecture. Unlike other large language models that may rely primarily on training data, Perplexity searches current online sources and provides references for its answers. This allows sales teams to enter customer meetings with current information and evidence-based insights.

Sales and Closing

As opportunities progress toward purchase decisions, organizations need greater visibility into what happens during sales interactions. Gong.io addresses this challenge using conversation intelligence. The platform records, transcribes, and analyses sales calls and meetings, identifying behavioral patterns associated with successful outcomes. By analyzing large numbers of interactions, Gong can reveal which communication techniques, conversation structures, and sales behaviors correlate with higher conversion rates. It can also identify potential deal risks, such as declining engagement or the absence of key decision-makers in discussions. This allows managers and sales teams to base their decisions on data rather than intuition alone.

After-Sales Service

The sales funnel does not end when a customer makes a purchase. Long-term success depends on customer satisfaction, retention, and continued relationship development. Intercom Fin is a specialized AI-powered customer support agent that uses company-specific knowledge bases and documentation to answer customer questions and resolve issues. In addition to improving service efficiency, the platform can identify usage patterns, detect potential customer problems, and recommend additional resources or products. This allows organizations to improve customer retention while simultaneously identifying opportunities for cross-selling and upselling.

Integrating AI Across the Funnel

Together, these tools illustrate how AI can add value to every stage of the sales funnel. Rather than operating as isolated applications, they form an integrated ecosystem that helps organizations identify prospects, qualify leads, personalize communication, support sales conversations, improve conversion rates, and strengthen after-sales customer relationships. The effectiveness of these solutions depends on the individual tools themselves, and on how well they are integrated into marketing and sales processes. When supported by high-quality data and effective collaboration between teams, AI technologies can transform the sales funnel into a more efficient, data-driven, and customer-focused system.



12.2.1 TASK: ANALYZING CONVERSION IN THE SALES FUNNEL

In this exercise, you will take the role of a marketing manager responsible for improving sales funnel performance. Using a dataset from a trade-show campaign, you will analyze where potential customers are being lost and identify opportunities to improve conversion rates with the support of AI.

Scenario:

You are the Marketing Manager for BioSpark, a manufacturer of rainwater harvesting systems. Your team just returned from the GreenBuild Expo with 40 leads. Currently, your conversion rate is lower than expected. Your task is to use an LLM (ChatGPT, Claude, or Gemini) to find out why.

Step 1: The Data

Copy and paste the following dataset into your LLM / upload the *dataset.csv* into the chat.

This dataset includes data from potential customers who visited your booth during the GreenBuild Expo: customer industry, the lead quality, the form of initial interaction during expo, current customer status, and days from last action.

Step 2: The Analysis (The Prompt)

Enter this prompt into the LLM:

Analyze this trade show lead data. 1. Calculate the average 'Days_to_FollowUp' for 'Won' leads versus 'No Response' leads. 2. Identify the biggest 'leak' in the funnel for High-Quality leads. 3. Suggest how GenAI tools could have prevented these losses.

You can separate it into a couple of prompts to manage the LLM's output in steps.

Try any of these approaches:

Quantitative Analysis: Calculate the conversion rate from 'Full Demo' to 'Meeting Scheduled' and the average 'Days to Follow-Up' for 'Won' vs. 'Lost' opportunities.

- 1. Problem Identification: Find the correlation between the response time (Days_to_FollowUp) and the 'No Response' status. Identify exactly where the sales funnel is 'leaking'.*
- 2. AI Optimization: Based on the funnel stages (Qualified Lead, Contact, Insight Selling, Sales, After-Sales), propose how GenAI tools can be used to automate personalized follow-ups for 'High Quality' leads that are currently stuck.*

Or try the progression prompting:

- 1. Quantitative: Calculate the conversion rate for each 'Industry' and find the correlation between 'Days_to_FollowUp' and 'Won' status.*
- 2. Qualitative: Based on the funnel stages (Contact, Insight Selling, Sales), which stage experienced the most 'churn' or loss of interest?*
- 3. Strategic: Suggest a tech-stack integration using the tools discussed (6sense, Apollo, Crystal) to automate this process for the next show.*

Concluding observations:

The BioSpark exercise illustrates a meaningful principle of AI-supported sales funnel management: data alone does not improve performance. The real value comes from identifying where opportunities are being lost and translating those insights into action.

One of the most significant findings in the dataset is the relationship between response time and conversion. High-quality leads that received delayed follow-up were far less likely to progress through the funnel than leads contacted within a few days. This reflects the phenomenon of lead decay—the gradual loss of customer interest when engagement is not maintained. In practice, even highly promising leads can become lost opportunities if follow-up actions are too slow.

The exercise also highlights the difference between identifying a problem and solving it. Generative AI tools can help diagnose bottlenecks by analyzing data and identifying patterns, but improving performance requires carefully selected and deployed systems and processes. This is where specialized sales and marketing technologies become utilitarian. AI-powered CRM systems, automated follow-up tools, intent-data platforms, and personalization engines can help organizations respond more quickly, deliver more relevant communication, and maintain engagement throughout the customer journey.

From a managerial perspective, the exercise demonstrates why marketing and sales should be treated as a single integrated process rather than two separate functions. Poor conversion rates are often caused not by weak leads but by weaknesses in the process itself. Shared data, common objectives, and coordinated use of AI tools allow organizations to identify bottlenecks and continuously improve performance across the entire funnel at the speed of business. Ultimately,

the goal is not to replace human decision-making. AI provides speed, automation, and analytical capabilities, while managers provide strategic direction, contextual understanding, and judgment. Successful organizations combine both elements to create a more responsive and effective sales and marketing system.



12.3 KEY TAKEAWAYS

- Marketing is an intelligent system rather than a collection of isolated activities. Modern marketing combines communication, data, technology, and customer experience into a continuously evolving process.
- AI does not replace marketers; it augments their capabilities.
- The greatest value emerges when human creativity, judgment, and strategic thinking are combined with AI's speed, scale, and analytical power.
- The sales funnel connects marketing and sales into one integrated process.
- AI helps optimize every stage of this process by supporting prospecting, lead qualification, personalization, forecasting, and customer retention.
- Personalization, automation, and prediction are three of the most important contributions of AI to modern marketing. However, human oversight remains essential when defining goals, interpreting results, and making decisions.
- Effective use of AI depends on high-quality data and cross-functional collaboration. Marketing, sales, and IT teams must work together and share information through integrated systems such as AI-enhanced CRM platforms.
- Marketers need both creativity and critical thinking. Creativity helps generate new ideas and opportunities, while critical thinking helps evaluate outputs, identify risks, and avoid poor decisions.
- Responsible AI use requires attention to ethics, security, and data protection.
- As AI becomes more deeply embedded in marketing processes, safeguarding customer data and maintaining accountability become increasingly important.

Final Reflection

Throughout this course, there is one consistent message: AI is most valuable when it supports human capabilities rather than replacing them. Successful marketers will not be the ones who simply use AI tools, but those who can combine technological possibilities with strategic thinking, creativity, critical judgment, and responsibility. The future of marketing belongs to professionals who know how to collaborate effectively with intelligent systems while remaining accountable for the decisions they make.



12.4 FURTHER READING

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Case study:

FROM POINTS TO ACTIONS: USING GENERATIVE AI TO RE-ENGINEER A B2B LOYALTY PROGRAM

Exploring AI-Enhanced Loyalty Strategies at Fixer Co., a Polish Distributor of DIY Supplies

Piotr Kwiatek, Grzegorz Leszczyński

What a loyalty program is and why design matters

A loyalty program (LP) is an institutionalized incentive system that motivates repeat behavior over time, typically by awarding a currency (points/miles) that customers can accumulate and redeem for rewards. Beyond gifts or discounts, LPs identify members, enable data collection, and are meant to influence behavioral loyalty (purchase frequency, share of wallet) as much as attitudes. Two complementary views dominate: (1) LPs as an integrated set of marketing actions to make customers more loyal; and (2) LPs as a collect–redeem mechanism that nudges repetitive purchasing toward future rewards. In B2B as in B2C, reward activities (earning and especially redeeming) are the observable levers that connect the program to outcomes.

Design choices matter for the outcomes of LP. Reward mechanisms (rate, timing to goal, expiry) and reward characteristics (hard “savings” vs. soft “status/attention,” fit with the brand) systematically shape effectiveness; shorter perceived distance to a reward increases persistence (“goal-gradient”), while including a savings feature tends to strengthen effects. In B2B programs, specifically, redemption frequency is the most powerful sales driver compared to mere membership or total points accumulated. Thus, “how often customers redeem” is the critical managerial KPI of LP. Finally, LPs interact with the quality of relationship with customers. Better relationships (in terms of trust, satisfaction, commitment) generate better outcomes, and their impact is amplified by customers’ LP activity—a useful lens for managing sales-force concerns and brand trust during program changes.



1. Introduction

In early 2025, Fixer Co., a mid-sized distributor of electro-equipment and DIY supplies headquartered near Kraków, found itself at a crossroads. For over a decade, the company had relied on a conventional points-based loyalty program to maintain ties with its fragmented customer base of small contractors, workshops, and retailers. At first, the program appeared straightforward and effective: customers earned points for purchases and redeemed them for rewards. Over time, however, this “collect-and-redeem” mechanism produced diminishing returns. Competitors began to match or outpace Fixer Co. with more advanced loyalty designs, margin pressure intensified, and customers increasingly treated the program as a commodity rather than a differentiator. Yet within the accumulated loyalty logs lay a potential goldmine. The company held eight years of transaction data and detailed reward redemptions for over 3,200 active business accounts.

By late 2024, Fixer Rewards had plateaued. Redemption rate slid from 46% to 29% in three years, the share-of-wallet index for members was flat, points liabilities (arising from unredeemed rewards) rose by 12%, and sales from “collect-but-don’t-redeem” members lagged the base. Internal benchmarking and prior research converged on the same signal: customers who redeemed ≥ 3 times/year grew 20–30% faster than non-redeemers, while passive point hoarders showed minimal uplift. The stagnation of Fixer Rewards affected sales.



Management set a hard target for Fixer Rewards: to achieve 15% sales uplift from the loyalty engine. The board mandated a “prompt-only” exploration with chat-based LLMs using existing data to surface quick wins without new platforms.

From studying that case you can learn how to:

- Tune a loyalty program to drive action: use micro-redemptions, instant savings, and brand-fit perks to boost redemptions without cutting into margin.
- Segment customers in a practical way: combine recent redemptions, margin band, and SKU breadth to decide who gets which offer.
- Use GenAI as a sales helper (not a boss): clean a simple CSV, compare groups, and draft short, margin-aware follow-up offers that reps can edit and send.
- Tell whether a reported uplift is real and separate true behavior change from simple discounting.
- Build a mini business case: estimate lift by segment, track reward cost and points liability, and show a credible path to the +15% target with basic governance in place.

2. The Company

Fixer Co. was founded in 1996 by two electrical engineers who saw an opportunity to provide reliable supplies to small contractors in southern Poland. Beginning with a single warehouse near Kraków, the company grew steadily through a combination of personal customer relationships, dependable delivery, and competitive pricing. By the mid-2000s, Fixer Co. had established itself as a trusted distributor of electrical and DIY supplies, expanding into adjacent product categories such as safety equipment and consumables.



Today, the company generates €120 million in annual turnover and employs approximately 100 staff. Its customer base spans Poland and neighboring EU countries, though the majority of its business comes from domestic small and medium-sized enterprises (SMEs). Fixer Co. competes in a fragmented and commoditized industry where switching costs are low, price competition is intense, and service differentiation is vital.

Products and Market Position

Fixer Co. offers a broad assortment of around 12,000 stock keeping units (SKUs), ranging from high-margin electrical components (e.g., circuit breakers, cables) to low-margin consumables (e.g., screws, adhesives, protective gloves). Its value proposition emphasizes reliability: customers can expect consistent stock availability, next-day delivery within Poland, and bundled technical advice from sales representatives.

While Fixer Co. holds roughly 7% market share in the Polish B2B DIY distribution sector, it faces formidable competition from both multinational wholesalers and digital-first platforms. Rivals have invested heavily in e-commerce portals, automated replenishment systems, and multi-vendor loyalty programs. Fixer Co.'s management recognizes that without innovation, its competitive position will erode.

The Loyalty Program: Fixer Rewards

In 2015, Fixer Co. launched its loyalty program, Fixer Rewards, designed to foster repeat purchases and deepen relationships. The program followed a familiar structure: one point per €20 spent, redeemable for catalog items such as tools, office supplies, vouchers, or branded merchandise. By 2023, approximately 3,200 accounts (about two-thirds of all customers) were active members. Over eight years, the program generated extensive behavioral data, including:

- **Transaction logs:** when, what items, what value a customer purchased and means of payment.
- **RFM metrics:** when recently, with what frequency, and of what monetary value a customer purchased.
- **Redemption records:** when, what type of rewards, of how many points a customer redeemed.
- **Engagement metrics:** how a customer responded to loyalty campaigns, catalog offers, and email communications.

As Fixer Rewards was efficient in generating sales uplift, analysis of that rich dataset remained rudimentary. Monthly reports tracked balances and redemption rates, but deeper segmentation and predictive modeling were absent. In case of several customers, unused points accumulated, undermining the behavioral reinforcement, while research identify regular use of points as central to loyalty program success.

Modification of Fixer Rewards to achieve sales uplift

Grounded in the evidence from marketing literature that reward type and timing shape outcomes, Fixer Co. changed their LP 6 months ago. They adjusted the program along two levers:

1. Micro-redemption + instant savings (“cash-like”)

Introduced low-friction burn options at checkout (e.g., “200 points for €5 now”) and a 2% instant rebate option once a monthly points threshold is reached. Meta-findings suggest hard rewards with a savings feature strengthen loyalty effects (repetitive purchases) and shrinking distance to reward raises persistence.

2. Broader reward set with better “fit” to the brand

Added brand-relevant, work-enhancing items (safety gear bundles, calibration services for office equipment). On the top of that, small exclusivity laden and personalized perks for frequent redeemers.

Evaluation of LP modification

The team started analyzing the effects of changed LP with a simple spreadsheet (customer, month, spend, points earned and used, product lines). With ChatGPT’s help, they first cleaned the file and calculated how many days had passed since a customer last redeemed points, how many redemptions the customer had made in the past year, a rough estimate of the average time between orders, and how many different product categories the customer typically bought.

Next, they grouped customers into three easy-to-understand activity levels: those who never redeemed, those who redeemed once or twice, and those who redeemed three times or more. For each group they compared typical monthly spend, how regularly customers placed orders, and how broad their product mix was. This gave a clear picture of how redemption behavior shows up in day-to-day sales outcomes.

To understand whether the program change helped in uplifting sales, they compared accounts that received the new “instant savings + micro-redemption” options with a similar set of accounts that did not. They looked at performance in the 6 months after the change and kept the comparison simple—average monthly sales and engagement indicators across the two groups (Table 12.2).

They found that customers who redeem frequently tend to spend more across the year, place orders more regularly, and buy a wider range of products. After the mechanism change, the test group’s sales were about 8% higher than the comparison group. More customers redeemed (moving from roughly a third to nearly half of members), unredeemed points on the company’s books went down, and email offers were accepted more often.

Table 12.2: Performance metrics before and after the loyalty program change

Metric (Members)	Two years ago	A year ago	This year pre-change	This year Post-change (6 mo)
Redemption rate	46%	38%	31%	45%
Avg. reorder gap (days)	39	41	42	36
Points liability (€m)	0.72	0.8	0.9	0.79
Sales uplift vs. control	—	—	—	8.00%

These results point to a simple takeaway: encouraging redemptions is a direct lever for sales in this setting. The numbers are solid enough to justify scaling a controlled pilot, but they do not yet meet the board’s +15% target, so there’s still room to improve the plan.

The redesigned mechanics produced +8% sales versus the matched control over six months and re-energized program engagement but left a 7-point gap to the board’s +15% target.

Strategic Posture

Fixer Co.’s leadership views the loyalty program as strategically important but underperforming. The Chief Marketing Officer argues that personalized offers are urgently needed to defend against aggressive rivals. The sales force remains divided: some reps view AI as a helpful assistant, others as a threat to their autonomy and customer intimacy.

In this context, the board decided to form an “AI-assisted task force” charged with exploring how prompt-driven generative AI could help convert points into concrete actions while working only with existing systems and datasets.

3. Current Situation

Eight years of loyalty data

By 2024, Fixer Co. had accumulated eight years of transaction and redemption data through its loyalty program. With 3,200 active accounts, the database provided a rare longitudinal perspective on customer behavior in a fragmented B2B distribution market.

When external consultants were invited to benchmark the program, one finding stood out: redemption frequency, not just membership or point accumulation, was the strongest predictor of higher sales. From a sample, the customers who redeemed rewards at least three times a year grew their annual spend by 20–30 percent compared to non-redeemers. In contrast, customers who passively accumulated points without redeeming them showed little to no uplift in share of wallet.

This insight mirrored emerging research on B2B loyalty. Redemption activity seemed to create a “virtuous cycle”: the act of redeeming reinforced the relationship, reminded customers of the supplier’s value, and encouraged them to spend more. Yet Fixer Co. had done little to capitalize on this evidence. Its marketing reports highlighted redemption rates but stopped short of linking redemption frequency to downstream performance.

The dataset itself was also underutilized. Analysts produced descriptive dashboards (top redeemers, dormant accounts, and points liability forecasts) but lacked the tools and skills to conduct predictive modeling or automated segmentation. Valuable signals remained hidden in plain sight.

Stakeholder Perspectives

The board’s decision triggered mixed reactions across the organization.

Sales Representatives: The sales force remained divided. Veteran reps worried that AI-generated offers might undermine the personal trust they had built with contractors over years. “Our customers know us, not some robot,” one rep remarked. Younger reps, however, were more open, seeing AI as a way to reduce time spent preparing proposals and reporting.

- **Data Analysts:** The five-person analytics team welcomed the idea of AI but expressed caution. They saw potential in LLMs to extract insights without coding advanced models. Yet they also worried about data quality, prompt engineering skills, and the risk of “hallucinations”, i.e. AI producing plausible but incorrect results.
- **Chief Marketing Officer (CMO):** A strong advocate for rapid experimentation, the CMO argued that Fixer Co. needed to show customers it was moving toward personalization. She emphasized the urgency of competing with digital-first rivals. “If we don’t do this, we’re left behind,” she told the board.
- **Chief Information Officer (CIO):** The CIO remained skeptical, stressing issues of data governance, security, and compliance. He warned against exposing raw customer data to external APIs and demanded clear guardrails for any experiment. “We can’t afford a misstep that puts trust at risk,” he cautioned.

- **CEO:** The CEO attempted to balance the tensions. While recognizing the risks, he saw the potential for quick wins that could reinvigorate the loyalty program. He tasked the AI-assisted task force with developing a **clear roadmap**: one that could demonstrate early business impact while laying the foundations for long-term governance and trust.

4. Core Problem Statement

Fixer Co.'s points-based loyalty program is no longer moving the sales needle. After an internal refresh that added instant savings and more relevant rewards, a six-month pilot delivered an 8% sales lift which was helpful, but still short of the board's +15% target. At the same time, too many customers collect points without redeeming, tying up value and weakening engagement. The company now needs a clear, data-supported plan to close the gap to 15% without eroding margins or training customers to expect discounts. The plan must balance speed with sound governance (data quality, privacy, compliance) and keep sales reps confident by making AI a support tool (not a substitute!) for their relationships.

In short: redesign the loyalty mechanics and targeting, use an LLM to guide simple analysis and draft offers, and prove (quantitatively and credibly) that the program can reach +15% while protecting trust and profitability.

Task

Deliverable A: Assessment (max 1 page)

- Is the **+8%** credible? Name 2–3 risks (e.g., selection bias, seasonality).
- Did instant savings **activate** redemption or **train** discount expectations? Explain.

Deliverable B: Improvement plan (2–3 pages + exhibits)

1. **Segmentation:** using the provided dataset, segment customers by `redeems_12m × margin band × sku_breadth`.
2. **Offer policy:** for each segment, decide the mix:
 - **Instant savings** (cash-like) thresholds;
 - **Brand-fit bundles**;
 - **Soft/status** rewards;
 - Enforce margin floors and keep reward cost **≤2.0%** of incremental revenue.
3. **Sales-assist prompts (HCI):** provide 3 reusable prompts that turn a recent redemption into arep-approved offer (120–140 words, margin-aware).
4. **LLM-assisted uplift math:** with ChatGPT (or similar), compute expected incremental revenue:

$$\text{Incremental Rev} = \sum_{\text{segments}} \text{size} \times \text{expected lift} \times \text{baseline spend}$$

and show your plan reaches **+15%** at program level. Report **reward cost** and net **ROI**.

Copy-paste-ready analysis prompts (examples):

- *Segmentation & KPIs:*

“You are my data analyst. With columns [customer_id, month, spend, gross_margin_pct, redeems_12m, points_redeemed, instant_savings_amount, sku_breadth], group customers into redeems_12m bands (0; 1–2; ≥3). For each, output: mean monthly spend, reorder_gap estimate, sku_breadth, and mean gross_margin_pct. Return a compact table.”

- *Uplift scenario:*

“Assume we convert 25% of the ‘1–2 redeems’ segment into ‘≥3’ with a 9% lift; move 8% of non-redeemers into ‘1–2’ with 5% lift. Baseline monthly spend per segment is in the table I’ll paste next. Estimate total incremental revenue for 6 months and reward cost if instant_savings averages 1.2% of incremental revenue.”

Data for your analysis. An anonymized CSV file with Fixer Co.’s loyalty program data (Fixer_Loyalty_Data.csv) is available at: <https://doi.org/10.17605/OSF.IO/ZN7PU>. You should use this file as the primary basis for Deliverables A and B.

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