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Digitalization process of complex B2B sales processes – Enablers and obstacles

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ABSTRACT

The purpose of this study is to shed light on the extent to which salespeople use technology throughout complex B2B sales processes. The research on technology in society considers specifically which enablers and obstacles are most prominent in driving the digitalization of complex B2B sales processes. This research applies a post-positivism approach based on a qualitative design, using insights from case studies. Data collection is based on an in-depth series of interviews with salespeople in several companies, in order to collect information about the digitalization of complex B2B sales processes. Findings indicate that a complex B2B sales process is not easily digitalized. On the contrary, there are a number of hurdles to overcome. General results reported contextualize the major specific one, while the specific ones focus on enablers and obstacles in complex B2B sales processes. The research aids our understanding of the process of obtaining valid information in this context. It also helps to classify and organize different kinds of analog and digital sources and channels of information. Provides suggestions for further research. This study proposes using a mixed structure in the sales department to obtain benefits of communication technologies and to use what advantages digitalization provides. This may start by dividing digitalization process into functions and after that, using the remaining possibilities, by territory, accounts or products, depending on the company. The study reveals dimensions (indicators and context) and sub-dimensions (organizational, technological, cultural and security issues) of relevance in the digitalization of complex B2B sales process.

1. Introduction

Most salespeople would probably agree that selling in many B2B-markets is becoming more and more demanding, making them less productive. This decrease in productivity has been explained by the selling organization's focus on offering more complex solutions, on differentiating them from their competitors in a demanding market [1]. This leads to increasing corporate sales force costs, due to combining the tangible (physical products) and intangible (services), increasing the efforts that salespeople required (to invest) in order to sell the solution offered [2]. Furthermore, complex B2B sales processes are characterized by multiple people involved (selling to buying centers) on both sides of a business agreement [3,4], often leading to protracted sales processes [5].

It is therefore not surprising that a top priority among sales directors in B2B-markets for complex sales solutions is to maximize revenue and increase the effectiveness of the sales force [6]. One way of reducing the cost of the salesforce, which has received attention from both practitioners and researchers, is to focus on digitalization and Sales Force Automation (SFA) in the sales process [7], so as to increase the effectiveness and thereby the revenue [8].

Digitalization, such as internet technology in society with its associated applications, has been argued as changing the way business is being done [9], and has increasingly been regarded as source of competitive advantage [10]. In professional selling, it has been argued that digitalization, such as social media, are driving a revolutionary change in the way selling is conducted [11]. Not surprisingly, several studies conclude that: "… *the Internet is the most widely used channel for communicating with customers* …"(p.676) [12].

Andzulis et al. [13] propose that social media have the potential to exert a major impact on every step of the B2B sales process, including collecting information, prospecting, discovering customer needs and closing the sale. Some commentators have gone as far as calling this the "fourth industrial revolution", which is driven by digitization, information and communications technology, machine learning, robotics and artificial intelligence [14].

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Although discussing it mainly from a B2C perspective, Ahearne and Rapp [15] argue that technology in society does have a role to play, but: "… *seldom replaces the human interaction necessary to further develop the relationship* …" (p. 111). Accordingly, looking at SMEs in international markets for complex sales solutions, Moen et al. [16] find that information and communication technologies are predominantly used for prospecting and market information, and not for closing sales. They conclude that face-to-face interaction is important in establishing trust with potential customers and therefore important in closing the sales [16]. Trust is an important factor in building strong relationships in B2B interactions, and Arli et al. [17] argue that digitalization often undermines the building of strong relationships based on trust.

This study aims to make a contribution on the role of technology in society in general, and specifically technology in B2B contexts, such as (i) knowledge about the digitalization process of direct sales; (ii) insights into the digitalization process of complex services in B2B contexts; (iii) shedding light on the need for maintaining face-to-face and personal contacts for closing deals in complex services sales in B2B contexts; (iv) an approach to inter-connecting marketing and direct sales functions.

This study focuses on automatization through the digitalization of communication modes. Although social networking technology inevitably influences societal communication [18], person-to-person communication in inter-organizational settings is the foundation of many B2B relationships. It is particularly true in sales processes of complex services in B2B contexts. The digitalization of sales process in such contexts has to be conducted with great care and balance.

The identification of enablers and obstacles, all of which are conditioners for closing deals in the current era of digitalization, has a high impact on the society and on the degree of digitalization. The circle closes when we realize that society not only addresses the flows redirected to technology, but also that technology has the capability to change flows of communication in society.

The pros and cons of the digitalization of the B2B sales process is the main focus of this study. We thus aim to provide a nuanced understanding of the use of technology in complex B2B sales processes. We contend that digitalization differs between simple B2B sales processes of standardized physical products, and complex B2B sales processes which include more solution-based sales offers (combining services and products). The research objective is therefore to shed light on the extent to which salespeople use technology throughout complex B2B sales processes. Thus, this study proposes boundary conditions for situations in which technology increases the productivity of salespeople in complex B2B sales processes. The research question is about what enablers and obstacles are most prominent in driving the digitalization of complex B2B sales processes.

2. Theoretical framework

Business-to-Business ecommerce is a reality [19]. Digitalization influences the tools used in SFA where traditional CRM systems has evolved into e-CRM, which can be defined as: "… *activities to manage customer relationships by using the internet, web browsers or other electronic touch points* …" [20]. It has made it possible for small and medium-sized enterprises (SMEs) to access more complex CRM functions, due to the reduction in cost for web-based CRM-systems, enhancing their ability to communicate and collect information about their customers [21]. Applications based on internet technology has also been shown to strengthen the communication between salespeople inside a company and its partners [9].

Furthermore, as discussed by Honeycutt Jr. [22], although organizations invest large amounts of money in digitalization, the link between this investment and increased performance is not clear. Successful Technology implementation depends on the inter-relation between many technological elements [23]. Many salespeople do not see the benefit of technology, and as one report shows, the failure rate of SFA-projects can be as high as 55–75% [22].

Two theoretical frameworks can be used to argue for the use of digitalization in complex B2B relationships. These are the commitment-trust theory and the model of information systems (IS) success.

2.1. Commitment–trust theory

In developing the construct of relationship marketing, Morgan and Hunt [24] argue that commitment and trust are the dominant mediating variables for building strong business relationships, and that trust constitutes the main effect. They define trust as: *"… confidence in an exchange partner's reliability and integrity …"* (p. 23). In support, Berry [25] argued that trust might be the single most important variable for building strong relationships, whereas Spekman [26] sees trust as the cornerstone for building long-term relationships.

Extending on this, Gounaris and Venetis [27] find that when focusing on trust-building in industrial service relationships, personal contact is important. However, the element of time is also significant. They find that personal contact is more important in dealing with new existing customers, in order to build a strong relationship.

By contrast, later on in the relationship, the quality of delivery is more important. Both personal interaction and technology use are important in developing new customer relationships for B2B service organizations, with both variables having a strong impact on the development of new customer acquisitions. We therefore posit that: "… *managers should not expect IT to replace personal interaction to a great extent in B2B-service contexts …"*(p. 108) [28].

Building on the fact that trust differs relative to the specific context, Palmatier et al. [29] argue that when selling complex solutions, for which services are part of the delivery, there is a need for a stronger physical bond between the seller and the buyer, in order to build trust. Also, when it comes to more complex relationships, like selling to a buying center and not individual buyers, this demands a higher level of trust at different organizational levels, and therefore more personal interactions. Building strong physical relationships in complex B2B sales processes is essential to successfully adapting to new customers and keeping existing ones.

2.2. Model of information systems

Several theoretical models of technological acceptance have been widely used in the literature to explain successful information system integration. The Technology Acceptance Model (TAM) developed by Davis [30], and which builds on the Theory of Planned Behavior [31,32] and Theory of Reasoned Action (TRA) [33]. Venkatesh and Davis [34] extended the original TAM model to the TAM2 model. Venkatesh et al. [35] developed the Theory of Acceptance and Use of Technology (UTAUT) in order to integrate both models (TAM and TAM 2) of technology acceptance and Venkatesh and Bala [36] proposed a new model named TAM3 with more predictive factors on perceived ease of use. TAM1-3 models suggest that the perceived usefulness of the system and perceived ease of use are important drivers for understanding why people use information systems. The TAM1-3 models have been confirmed in several studies across different fields [37].

The DeLone and McLean Model of Information Systems Success [38] has also been widely used in the literature, supporting the framework structures [39]. Their model argues that the intention to use and user satisfaction are important mediators in the success of information systems. They define success as net benefits in the model, including both individual and organizational measures of success. The model has later been revised, and now presents important predictors, drivers of use, intention to use and user satisfaction [40].

As previous models have several common elements, there have been attempts to combine them. One relevant model for this study is that developed by Avlonitis and Panagopoulos [41] which focuses on professional salespeople and their acceptance of CRM systems.

Regarding the focus of this study, an important part of the models of

information system success are the predictors of perceived ease of use and perceived usefulness. We look at enablers and obstacles in complex B2B sales processes. We argue that enablers and obstacles can be found at different levels in an organization, at organizational, individual, and social level.

At the organizational level we find training, user participation, and accurate expectations to be relevant enablers or obstacles [41]. Training is important in getting people to accept the information system. Although the effect of different kinds of training is often debated, the link between an acceptance of information systems (such as SFA) has been shown to increase through the appropriate training [42].

Given that we look at the digitalization of the sales process, we also argue that training can be formal and initiated by the organization, or informal like personal experience, of using various online tools (e.g. LinkedIn). We therefore reason that a lack of training can be an obstacle to information system success, while extensive formal or informal training will be an enabler.

When users participate and are involved in training, it increases their understanding of the information system and makes them more positive towards the implemented information system [41]. It has been shown that the effect of training declines over time, but when users participate in the implementation of the information system, the decline is lower [43]. Thus, when deciding to use information systems in the sales process, salespeople involvement is an enabler, whereas a lack of involvement is an obstacle.

When salespeople know what to expect of an information system, it will be easier to understand how it could impact their performance, and therefore constitute an enabler [44]. At the individual level, we find computer experience, computer self-efficacy, and innovativeness to be relevant factors [41].

Computer self-efficacy and computer experience are related factors suggesting that if a person believes that they can use a computer, it will be easier to accept online systems [43]. This is also related to the informal training of online systems mentioned above.

Another factor is innovativeness, which is related to risk-friendlines. Using information systems is a risk when it comes to individual salesperson performance [45]. Using an information system demands time from the salesperson, time that could be used on other activities the salesperson believes are more relevant and important in generating sales (e.g. customer meetings). Individual computer experience and innovativeness can therefore be either enablers or obstacles to digitalization of the sales process.

The final factor is social, including supervisory influence, peer influence, and competition influence [41], which all builds on social norms, which can be defined as: "… *the specification of desirable behavior together with sanction rules in a community* …"(p. 63) [46]. This community in a sales setting is the direct supervisor and the salesperson's peers.

It has been found that when salespeople are encouraged to use an information system, this has a positive effect on the actual use [42]. If the salesperson's peers (other salespeople in the department) use the system, and there is a culture of use, this would encourage others to use the system [45]. Accordingly, a positive culture in the sales department works as an enabler to digitalize the sales process. Finally, we argue that perceived usefulness can be understood through the kind of information the salesperson collects and how much time the salesperson uses to collect specific information.

Nowadays, the importance of software systems is growing continuously [47]. It is clear is that technology and communication have evolved remarkably quickly. The traditional software model is turning toward Application Service Providers (ASPs) in order to reduce costs or limit the investment [48]. The internet has revolutionized the way in which individuals and companies communicate. In the research field of communication, Mettalo et al. [49], describe an extended concept, the Internet of Things (IoT), defined by Oriwoh et al. [50] (p. 122) as: "… *the interconnection of objects or 'things' for various purposes including identification, communication, sensing, and data collection* …". It is a reality that the inter-connection of things affects digitalization in general, and the digitalization of the sales process in particular. Depending on how the inter-connections are managed, and between those things that are inter-connected, they can become enablers or obstacles. Uckelmann et al. [51], describe the functions included in this new concept of infrastructure that enable the connection between entities. The IoT can be applied in different contexts [52,53]. In the last decade, social networking technology has been influencing human communication in society [18]. The digital channels of communication for the salesforce in companies has also focused on social media [54], defined by Scott [55] as a tool that: "… *provides a way people share ideas, content, thoughts, and relationships online* …" (p. 38). CRM strategy has evolved thanks to the use of social media applications such as LinkedIn or Twitter [54] which have changed the way a salesforce works.

Knowledge or information can be defined as having two dimensions, explicit and tacit [56]. Generally, explicit knowledge is information which is written down and can therefore easily be obtained through digital channels (i.e. objective and rational information). Tacit knowledge on the other hand is stored in the minds of people, and therefore much more difficult to share without direct contact with the individual [57]. Tacit knowledge (i.e. subjective and emotional) is much richer in content and is perceived as carrying more value than explicit knowledge [58].

Tacit knowledge can be understood as more nuanced and providing a deeper understanding than explicit knowledge. This deeper understanding is more important in later stages of the process, such as the interactions between sellers and buyers, as the salesperson needs an in-depth understanding when trying to close the deal with a potential customer. Due to this value, tacit knowledge has been proposed as a source of competitive advantage [56]. At the same time, collecting tacit knowledge is more time-consuming, because one has to be in direct contact in order to fully be able to extract tacit knowledge from another party, while explicit knowledge demands less time and could easily be collected through different IS systems.

Based on the above presentation of theoretical frameworks we argue that enablers of and obstacles to using IS in the sales process can be found both at the organizational-, individual-, and social/cultural levels in an organization. Also, an important success factor when evaluating different approaches is the ability to build trust between the seller and the buyer, whether this is done through an IS or through face-to-face contact. Lastly, the job of a salesperson selling complex solutions is demanding, both regarding the number of activities [59], and the fact that the work is intrinsically cognitively demanding [60]. Therefore, the aspect of time used is important, and can be revealed through the type of information on which the salesperson focuses, and whether is it tacit or explicit.

2.3. Comparative view of direct sales in different markets

B2B (business-to-business) sales processes require stronger sales efforts by the seller in reaching out, closing deals and maintaining business relationship with customers [61,62]. B2B contains more detailed stages in the sales process. Commonly, more people are involved at the customer interface, compared to the final consumer. B2B relationships are often long-term, requiring value creation work from sales and extending to loyalty [63], leading to higher sales by retaining customers through follow-up orders and rebuys. Generally, the B2B sales process is less digitalized than B2C and C2C.

B2C (business-to-consumer) sales process requires more marketing effort, but less effort from the sales department to reach out and achieve sales with consumers [64]. B2C contains less detailed stages in the sales process than B2B. B2C relationships are often less long-term, and less work is needed from the sales department in terms of loyalty building [65], and achieving higher sales from new first-buy consumers. Nowadays, the B2C sales process can be more digitalized than that B2B of

[66].

C2C (consumer-to-consumer) sales processes nowadays often requires less efforts from consumers acting as sellers, compared to sellers in B2B and B2C sales processes [67]. Specific stages of the sales process are not commonly followed in this market, but it is often about transactional relationships (just one). It can often be a totally digitalized sales process conducted quickly through virtual platforms [68,69]).

Previous market combinations of businesses and consumers B2B, B2C and C2C) arise from being less digitalized and extend to totally digitalized. However, for all of them, all kind of business models can be built around it-based networking technologies moving from traditional commerce to e-commerce. Shi and Wu [70] (p. 498) assert that: "… e-commerce refers to business models built around networking technologies …".

There is also another business model that is growing in the market, called "online to offline" (O2O), which means that customers buy online in a digital store and pick up products in a physical store [71]. The O2O sales process starts with the initial stages of e-commerce market contexts, ending with the last stages of the traditional sales process.

2.4. Regulatory agencies

Technological advances and what they really mean for the market and society is relatively new compared with other areas. The use of technology requires innovative adaptations to unique obstacles [72]. This is the reason why many countries are using multisector regulatory agencies [73] such as the State Public Utility Commissions (PUCs) in the USA that embrace telecom, water, transportation and energy, and the System of Science, Technology and Innovation (SSTI -Sistema de Ciencia, Tecnología e Innovación) in Spain, to give another example.

Technology is currently involved in daily (societal) life, leading to the regulatory agencies imposing guidelines on technological regulation. Technological *advances* progress faster than technological *regulations* in many areas, which leads to legal gaps affecting various aspects, such as privacy and the treatment of data. Encryption protocols may therefore provide additional transactions safety [74].

The world has become globalized in many ways, but countries often have different legislation for technologies. Nevertheless, information runs through the World Wide Web and transactions between sellers and buyers take place within or between countries. There is therefore a compelling need to homogenize buyer protection standards in the international e-commerce market [75].

Digitalization of the sales process offers several improvements in efficiency, such as cost savings or a wider market. However, it is necessary to have clear and wider regulation, as well as a global regulatory agency to cover potential contingencies and to preserve security and privacy in digital markets [76].

3. Methodology

This research applied a post-positivism approach on that, according to Noor [77] is "… *about a reality which is socially constructed rather than objectively determined* …" (p. 1602). This study deals with understanding the subjectivity of B2B relationships, which requires a qualitative approach. In particular, this research uses a case study approach [77,78] to follow the changes from analog to digital in complex B2B sales processes in a services context.

3.1. Industry selection

The case study [79,80] is based on seven selling organizations complex software services sales in the context of business relationships with their customers in Spain. All the companies offer services and products but have a higher percentage of sales/incomes in services than in product-related, 5 of 7 companies work in multiple industries and the other two in the healthcare industry.

The reasons for the selection of companies which offer complex software solution are:

i) Software solutions not only cover all stages in complex service sales processes but are also a type of service solution that is critical to the buying organizations. In all cases, the software solution offered is an ERP that is a core requirement for the buying organization to connect departments with each other and with automatizing flows [81] inside the organization and with stakeholders in their supply chains.
ii) The software providers are technologically oriented, making use of digital channels and sources relevant to their sales processes.

All the software providers are small- and medium-sized, and the salespeople interviewed are all experienced professionals (between 9 and 20 years of experience).

3.2. Research design

We have selected a qualitative research paradigm to guide our exploratory study of the digitalization of complex B2B sales processes. The flexibility of this research design enables the findings to emerge and develop [82]. Following Glaser and Strauss [83] the methodology was oriented towards allowing the researcher to create complete descriptions of the context in which one specific digitalization of complex B2B sales processes is created, developed and maintained. The research design allows sufficient flexibility to guide the researcher in data collection and analysis.

The study applies a structure consisting of three stages, as shown in Fig. 1.

3.2.1. First phase

The research team created a list of interviewee criteria in order to accomplish the purpose of the study as follows: (i) profession to be B2B seller; and (ii) job experience to be at least five years in complex service B2B markets. The research team did two screening interviews with two sellers in a pre-study to verify the relevance and appropriateness of the interview guide to be used in the second phase of this study.

3.2.2. Second phase

The research team ran three series of in-depth interviews in the second phase of this study, with one salesperson in each company, in order to establish a fixed point for collecting information about the digitalization of complex B2B sales processes. The interviewees are assured that all data and information collected would remain anonymous and confidential. In each company, we select the salesperson with the most experience in complex service selling in his/her current industry.

In each interview, we ask each salesperson for personal data such as his/her age, number of years in his/her current industry and number of years in his/her actual company. We also ask for information about his/her company, such as: number of employees, number of salespeople or company incomes. A face-to-face survey is used to capture the most important aspect of the digitalization of the sales process in the industry studied. An important part of the in-depth interviews was to observe digital methods used by the B2B seller interviewees, and the digital tools mainly used on mobile phones or on a tablet. After this process, information collected was organized, structured and analyzed. The main sections were organized around characteristics of information and the investment of time, which are summarized in Table 1.

The interviews were all performed in the same way. During the meetings, the research team transcribed the information. The information gathered were thereafter structured, interpreted and summarized in the form of reports. The summary reports highlight the most important findings from each interview provided by the interviewees, and enabled comparing the content and coherency of the information obtained in previous and subsequent interviews.

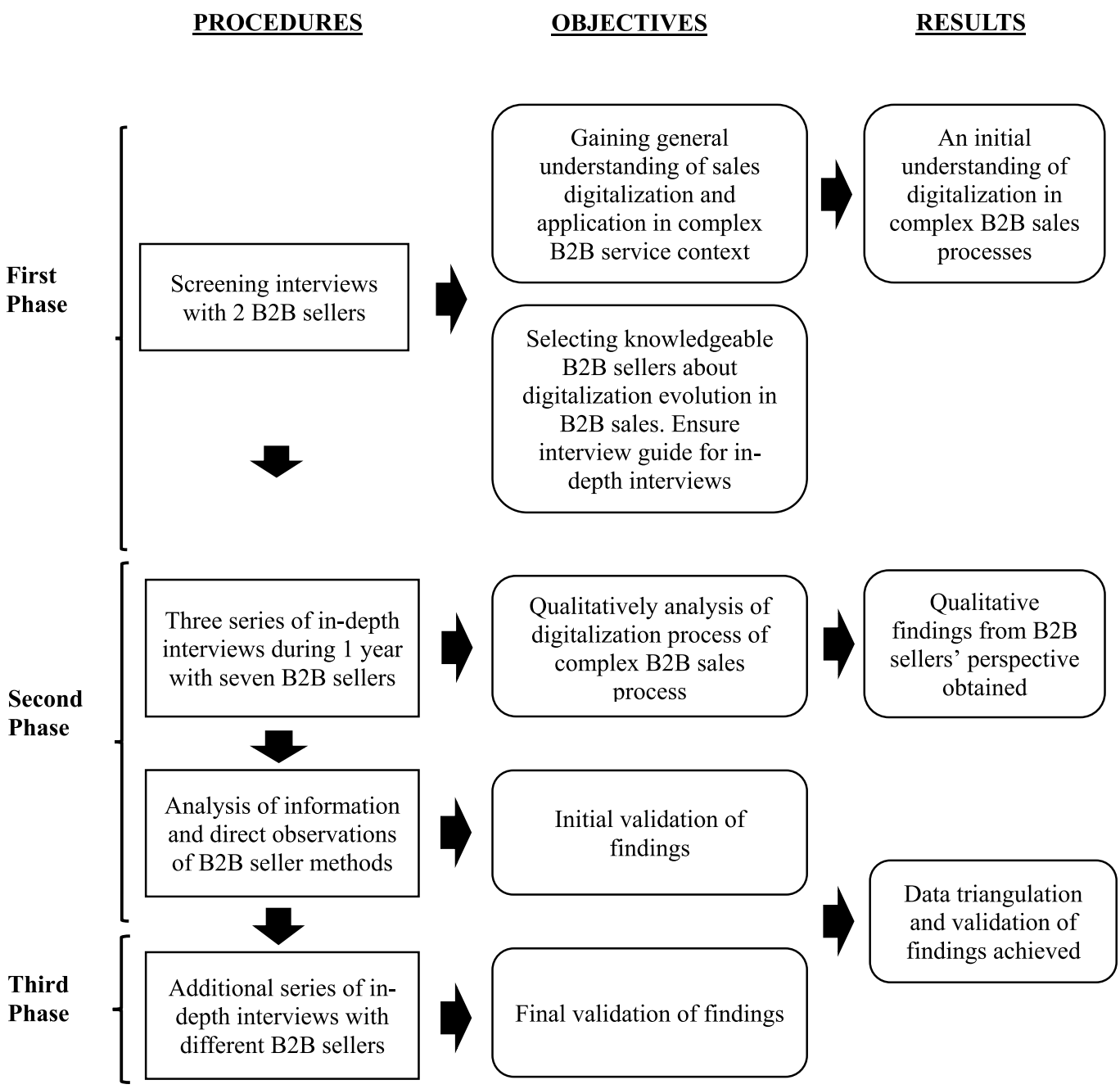

Fig. 1. Methodological procedures, objectives and results.

3.2.3. Third phase

This phase was conducted with the aim of conducting a final validation of findings. Different B2B sellers also meeting the interviewee criteria defined in the research design were interviewed in an additional series of in-depth interviews.

During the in-depth interviews, the research team took note of all the information that interviewees provided. Furthermore, the meetings were recorded, after which the interview responses were organized and coded.

3.3. Sample characteristics

Most of the sample comprised men (6 out of 7). Their age ranged between 40 and 56. All of them had solid experience in the information and communication industry (between 9 and 20 years). The characteristics of the sample are shown in Table 2.

4. Results

We report the results divided into general and specific. The general results contextualize the specific ones, while the specific ones focus on enablers and obstacles in complex B2B sales processes.

4.1. Contextualizing complex B2B sales processes and digitalization

The salespeople interviewed in the in-depth series perceive that their companies are selling complex solutions. Although a business deal between seller and buyer often entail something tangible to favor the interchange, most of the sales process derives from services associated with the business deal. Services are perceived by all of the interviewees

Table 1
Questionnaire sections.

Section	Content	Description
Information	Source	Analog (customers and competitors) Digital (social media, website and blogs)
	Type	Technology, customers, competitors, economic, social
	Objective/ Goal	Customers, competitors, own company
	Channel	Analog (customers and competitors) Digital (social media, website and blogs)
Time	% of Time	Total amount of time Amount of time per task Amount of time per target
	Stages	Identify customer. Create trustful relationship. Make sales proposal Close deal Follow-Up Support

as more complex than products, because of being to a greater of lesser extent intangible, heterogeneous, non-stock, perishable and inseparable from the salesperson who offers the service.

Importantly, the interviewed salespeople in this study perceive their sales processes as complex. The sales process in a B2B context that is required to make a deal is not only between two people, but also considers all the different hierarchy levels between organizations of the selling and buying companies. The salespeople interviewed also perceive that complex sales process consist of a few principal stages as follows: (i) identifying potential customers through an information search mainly about their organizations; (ii) creating a trustful relationship through skills of the salespeople and knowledge about the potential customers; (iii) making sales proposals (i.e. the service solution offered) to potential buyers; (iv) closing deals through convincing the potential customers of the sales solution benefits; and (v) follow-up support of the product and service within the deal with existing customers.

Collecting information about potential and existing customers is a regular activity, according to the interviewed salespeople. However, it does not have the same importance throughout the various stages of the complex sales process. Furthermore, existing and potential customers are generally at different stages of the sales process.

The interviewees also perceive that the more complex the service solution offered, the higher their need for relevant and accurate information on the buyer. However, the complexity of the market or of product/service solution itself does not necessarily imply more time invested in searching for customer information.

In complex markets or those with complex product/service solutions, salespeople choose to spend more time taking care of existing customers, as they have already gathered information about them, rather than search information about new ones. The interviewed salespeople consider this investment of time more efficient in relation to their financial goals. A few reasons are that salespeople need more time for gathering information on other variables, such as competence, technology information and industry news.

On average, based on the interviewed salespeople, existing customers generate almost two-thirds of their sales income. Salesperson 5 states that: "… *I spend the most part of my time caring for my current customers … …they always need adaptations to the initial sales proposal and this is more effective than searching for new ones …"*. Collecting information about customers requires up to half of the salespeople's time. Evidently, to gain a new customer, salespeople need to spend more time collecting information than is necessary with existing ones. The sales proposal requires also substantial time from salespeople.

Although information is needed for the entire sales process, the type and amount are changing. There is consensus among the salespeople interviewed that the digitalization of the sales process works best in those stages in which the information is not crucial, and the seller can compare it easily in other ways (e.g. asking the customer), Consequently, digitalization is most relevant in the following stages: (i) identifying the customer; (iii) making a sales proposal; and (v) follow-up support. For example, Salesperson 7 states that: "… *when I locate a new customer, the information needed is not so crucial as later on, because I can usually search on the web and social networks about the potential customer …*".

A different kind of information is required depending on the profile of the customer company which affects the digitalization of the complex sales process. For example, Salesperson 6 asserts that: "… *although my selling catalogue is always the same, each customer company is different, so I have to offer a solution for the needs of each … …it requires different data in each case …*".

The digitalization of the complex sales process relies on the sources of information accessible to the seller. For example, Salesperson 3 states that: "… *I usually prefer to have a face-to-face meeting with a potential customer, but I do not always have the opportunity or the time, so I use social media to gather the information I need …*". Salesperson 4 comments that: "… *I could find useful customer databases, but my company does not invest in this, so I cannot access them …*".

The interviewed salespeople all agree that the search for appropriate information about potential customers to be offered a solution is an unavoidable action in complex B2B sales processes. However, the importance of information searching is not only outside the selling organization, but also inside one's own organization. The percentage of time spent searching for internal information is 5% in relation to the total time invested in searching for information. Salesperson2 asserts that: "… *each time I have to make a new proposal I need to be sure about the project calendar, technical resources available in my company or if there is a new version of the software …"*.

The availability of information about the complex sales process with a potential customer generally implies fewer face-to-face encounters and facilitating digitalization. For example, it could be a product/service solution and sales proposal similar to existing customers, or internet access to gather information about it.

The interviewed salespeople do not distinguish between analog and digital channels of information, both are used depending on the information required for the complex sales process. The interviewees distinguish between the source of information (i.e. analog or digital

Table 2
Characteristics of interviewees from service providers in phase 1.

	Personal characteristics				Organizational characteristics		
	Age	Gender	Years in current position	Years in industry	Nº employees	Annual Turnover (Million €)	Industry
Salesperson 1	45	Male	7	17	40 (7 sellers)	6	ICT multi-industry
Salesperson 2	40	Male	8	12	30 (4 sellers)	8	ICT multi-industry
Salesperson 3	47	Male	6	19	20 (2 sellers)	1	ICT multi-industry
Salesperson 4	56	Male	1	20	100 (12 sellers)	8	ICT multi-industry
Salesperson 5	45	Male	9	9	17 (3 sellers)	2	ICT systems
Salesperson 6	40	Female	12	16	70(3 sellers)	7	ICT health
Salesperson 7	51	Male	2	20	60 (5 sellers)	3.5	ICT health

ICT: Information and communication technology.

channel), but the processing of information between analog or digital is not evident, although we asked about this issue.

The analog information channel is nowadays mixed, as shown in Table 3 together with the digital one. For example, business cards handed over during visits become digitalized through the use of mobile phones, as well as the use of tablets and laptops to take notes in face-to-face meetings.

The interviewed salespeople perceive the potential to digitalize almost the whole sales process in the future. Nowadays, the stages in the complex sale process that do not require interaction between seller and buyer are digitalized to a larger extent than the others. The interviewees perceive that will be difficult to digitalize those parts of the sales process where face-to-face encounters become necessary in order to close deals.

Subsequently, digitalization appears to be implemented less in complex sales processes compared to simple sales processes, because complex sales needs more face-to-face interactions to close a deal.

The interviewed salespeople perceive the digital channel as faster than the analog one. More information can be gathered in less time through the digital channel than the analog one. However, the information collected through the analog channel is perceived to be more reliable and of higher quality than the information collected through digital channels.

The interviewed salespeople split their time approximately half and half between the digital and analog information channels. However, all the salespeople interviewed spent more time in face-to-face meetings than looking specifically for information. Again, they do not consciously keep in mind the information channel used, that is, whether it is analog or digital, but use the one that fulfils their needs with the tools currently at their fingertips. The salespeople interviewed perceive the quality of the information as more important than the quantity.

The analog source consists of two dimensions as shown in Table 3 for the interviewed salespeople, namely emotional (intuitive and subjective) and rational (objective), while the digital one has only the rationalist aspect, as there is no opportunity to use intuition.

A large share of the rational analog information is therefore digitalized along with some of the emotional analog information, but not all. Evidently, all the rational digital information is in effect digitalized in complex sales processes.

All the interviewees consider it indispensable that their companies provide them with technical resources to store information and to obtain reports. All interviewees perceive that their companies do not use digital information efficiently.

4.2. Specific results on digitalization in complex B2B sales processes

Table 4 structures the findings gathered in the interviews about digitalization in complex B2B sales processes. Two principal dimensions are revealed: (i) indicator, and (ii) context.

The first one is divided into enablers and obstacle indicators of digitalization, while the second is divided into internal and external contexts of the organization. Each combination of indicator and context generates four sub-dimensions, namely: (i) organizational; (ii) technological; (iii) cultural; and (iv) legal/security.

Table 4 structures and summarizes the specific results reported in this study, so as to provide an overview. This shows that the indicators of enablers and obstacles can either be internal or external across contexts in the digitalization in complex B2B sales processes.

The organizational sub-dimension in Table 4 refers to the internal structure of the companies which operate in business markets. This influences the speed and quality of digitalization, such as the standardization of processes and information, as well as communication flows or communication between the sales department and the other corporate departments.

The technological sub-dimension in Table 4 refers to technological resources to which companies have access and can use, such as optic fiber, devices, hardware, software and digital networks. The cultural one in Table 4 refers to the idiosyncrasy of companies, which influences the process of adaptation of digital tools, such as staff perceptions of technology or staff flexibility towards technological changes.

Finally, the legal/security sub-dimension in Table 4 refers to laws and regulations for managing data to be used in digitalization, without causing damage with this use, such as data protection law and technical security measures (e.g. private channels through VPN (Virtual Private Network) and secured storage locations based on FTPS (File Transfer Protocol Security).

The following paragraphs further present the results of the digitalization of complex B2B sales processes, based on the in-depth interview series with salespeople. We report the enablers and obstacles raised by all, or almost all of the interviewees.

4.3. Internal enablers

One internal organizational enabler in complex B2B sales processes is the existence of standardized processes and information flows, all of which make it easier to digitalize them. Salesperson 1 asserts that: " …. *at least when implemented with the salesforce too, I had to report the same information, but in this software, instead in Excel or Word or by email …"*. Another internal organizational enabler is to provide motives and rational reasons for digitalizing processes and flows and integrating other departments of the company with sales. Salesperson 3 comments that: *"… it was hard to share my customer information with other colleagues, but at least my company helps me to understand this will be a step ahead in improving our competitive position …"*.

One internal technological enabler in complex B2B sales processes is the provision of technological staff training, focusing on knowledge about the information needed, the relevance of using technological devices and applications, and the integration of technological devices in staff work settings. Salesperson 6 states that: *"… I needed much* support *to integrate all the devices, but today I do not have to introduce the same data twice …"*. Salesperson 4 *"… ten years ago I used a Blackberry and I had to do all the office work at the beginning or end of the day; today I can run orders in a coffee shop or while I waiting for the next customer …"*. Another technological enabler is to create an adapted and limited access to hardware, software and devices, so as to avoid technological overload among staff. Salesperson 6 comments that: *"… I am happy with the digitalization … …my company gives me a new Iphone and Macbook, and I have to maintain the information in just one application, because, they are synchonized …"*.

A possible internal cultural enabler is the geographical distribution of the workplace, such as company offices located in different places, rather than one headquarter, in order to stimulate the development of digital communication rather than maintaining the analog one. Salesperson 6 asserts that: *"… meetings by videoconference are more effective …. …there are more meetings, but they are shorter …"*

Table 3
Correspondence of information characteristics.

Source of information	Personal sense	Information	Automatization
Digital	Rational	Objective	Totally digitalized
Analog	Rational	Objective	Partially digitalized
	Emotional	Subjective	Not digitalized

Table 4
Digitalization in complex B2B sales processes.

Digitalization in Complex B2B Sales Processes		Context	
		Internal	External
Indicator	*Enabler*	Organizational	
	Obstacle	Technological	
		Cultural	
		Legal/Security	

Another internal legal/security enabler is to request signed confidentiality agreements (NDA – Non-Disclosure Agreement). They can be applied to staff and other collaborators such as suppliers and customers. This kind of agreement offers security to the parties involved. Requests to access data with Electronic Certificates secures this function as well. Salesperson 7 comments that: "… *the electronic signature is the best invention ever as I do not need any paper and I do not have to waste time sending contracts or expenses sheets to the headquarters by postal mail …*".

4.4. External enablers

Yet another external organizational enabler is the entry of a third organization in the communication between buyer and seller organizations. The third organization may provide, from the call center to the technical platform, information integration for the digitalization of agreements (e.g. telecom companies provide the technical infrastructure for improving communication between companies). Salesperson 4 states that: *"… the chatbot installed in our company website has collected many leads …"*. Another external organizational enabler is cooperation with technological consultant organizations that can assist in digitalizing complex B2B sales processes. Salesperson 7 comments that: *"… I am sure all the digital changes would have been impossible without the recommendations of our technological partner …"*.

Another external technological enabler includes new software and devices available in the market with more functionalities, as well as new versions of the current ones. Salesforce 1 comments that: *"… it is wonderful not needing a computer to update salesforce data … …I can do it from my mobile …"*.

Another external cultural enabler entails events and conferences on recent technological advancements that are relevant to the company, and all the events and publicity that local and central government offer to support the digitalization benefits for companies. Salesperson 4 comments: *"… in our case, to dig into digitalization process was not only because of efficiency … …it was to maintain the image in the market …"*.

Finally, legal/security enabler refers to the laws and regulations supporting public finance of corporate digitalization. Salesperson 1 states that: *"… I work for a SME firm which installed the CRM, thanks to* financial support *from the local government to develop innovation …"*.

4.5. Internal obstacles

One internal organizational obstacle is a low budget for digitalizing corporate processes and information flows. Salesperson 2 asserts that: *"… there is not enough investment yet … …I do some tasks on the computer and others still on paper …"*. Another is an inadequate internal organization of salespeople as well as poor integration of sales department with other departments, such that technical support department do not offer insights into how to become more effective with digitalization. Low technological awareness of the CEO and the Sales Manager is another obstacle to digitalizing complex B2B sales processes. A lack of rotation among salespeople is an internal obstacle to digitalization. Rotation brings knowledge into the sales department, so that salespeople may try to adapt to the new digital solutions with partners. Another is that digitalization should be used for relevant tasks for staff, thus enhancing work effectiveness and efficiency. Rivalry within a sales department between salespeople is also an obstacle, such that younger members of the sales team do not share the benefits of technology with older ones. Salesperson 1 states that: *"… I do not like to introduce my information into the system, others could ruin my strategy, so I just put in the minimum …"*. Salespeople role overload is also an obstacle; if they do not know how to use the technology, it may be perceived as a waste of time.

Yet another internal technological obstacle is the lack of relevant and technical equipment, as digitalization requires appropriate devices, hardware and software. Salesperson 7 asserts that: *"… my company had to change my mobile, because it did not have enough memory to* support *the CRM mobile application …"*.

An internal cultural obstacle is the lack of staff's technological skills in general (including managers) and salespeople in particular. Staff needs to apply digital skills related to information management, communication, network or distributed work, continuous learning, strategic vision, network leadership, and customer orientation. Another obstacle is an underestimation of the technological potential of digitalization, so that it is not prioritized in the use of sales processes. Salesperson 7 comments that: *"… it is hard to use all of this technology … … when I started my career, the mobile did not exist …"*.

One internal legal/security obstacle is that staff may distrust technological tools, thus fearing a security failure and information leakage. Another obstacle entails gaps in the technological tools (hardware or software), which means that new versions do not always work better. Salesperson 4 states that: *"… last week we had a ransomware alert … …we had to be disconnected form headquarter for two days and a lot of information was lost …"*.

4.6. External obstacles

One external organizational obstacle in complex B2B sales processes is that the markets are relatively small, not necessarily monetarily, but the number of customers is limited, with high levels of personalization and thus expensive product and service solutions. Salesperson 7 comments that: *"… what is the sense of digitalizing, if, in the end, I have to offer a personalized solution … …it would be better if I could present a standard solution for all my customers, but this is not the case for me …"*.

An external technological obstacle is that of poor connections in some locations (e.g. absence of WIFI, 3G or 4G). This negatively influences sellers which need to consult some data sources or send a contract to the customer. Another is the absence of appropriate access to data bases of customers. Salesperson 3 explains: *"… I stopped in a gas station between two cities in a remote area … …it was funny to see how lost I felt without wifi or 4G … …what will happen with the spread of wifi-innibitors?..that day I did not report anything …"*.

One external cultural obstacle is the belief in some companies that digitalization can lead to more wasted time or data insecurity than traditional communications (e.g. data disappears, or hackers gain access) and negative perceptions of technology do not help. A lack of trust in new technological advancements may be caused by the initial version, or an update of new devices, or hardware and software may fail. Salesperson 2 comments that: *"… the previous application for sales department had to be changed, because some customer data had disappeared …"*.

One external legal/security obstacle is insufficient clarity of laws and regulation mainly about sharing information; a company may not know if it can share information, whether it is legal or not. Another problem is perceptions of poor security caused by the risk of external intrusion (e.g. hacker attacks). The studied ERP software industry contains sensitive data for which sharing information may involve in data protection risk. Salesperson 4 asserts that: *"… because of the digitalization process, my company had to hire a permanent legal service due to the high level of data-protection requirements and high penalties …"*.

5. Discussion of findings

The digitalization process is about converting analog information (such as artefacts, printed texts, drawings and photo images and sounds) into a digital format that computers can understand.

5.1. Digital equipment

However, not all kinds of information can be digitalized successfully. The digitalization process does not depend on the complexity of the process where the information come from, but on: (i) objectivity, simplicity and clarity of the analog information to be translated into binary code (i.e. information is divided into pieces so that it can be

translated into digital format); (ii) access to a software that has the capability to inter-relate basic pieces of information, making sense out of them. The process of digitalizing transactions does not depend on the complexity of the *transaction* process. The B2B process can be digitalized as B2C or C2C. Success depends on the strategy of the *digitalization* process.

The results indicate that the digitalization effectiveness of sales processes is not necessarily exclusive to simpler or basic sales processes (e.g. B2C in retail context), but also for complex B2B contexts.

As previously described, this study identifies five main stages based on complex B2B sales processes. Furthermore, the complexity of the service solution does not introduce further complexity to the sales process in terms of additional stages. However, the complexity of the sales solution introduces a need for more relevance and accuracy in the treatment of information within each stage.

Stages (i) i.e. locate customer; (iii) i.e. make sales proposal; and (v) i.e. follow-up support all require information which is mostly easier to digitalize. This is the reason why the interviewed salespeople perceive these stages as three of the most digitalized. These stages do not necessarily need face-to-face interactions.

There is a heterogeneity of digitalization between complex sales process. The differences between salespeople involved, related to the total number of staffs, in the same kind of complex service software providers, varies between 4% and 17%. Consequently, it implies a different degree of digitalization in the sales process. A lower percentage of staff in the same industry considered as salesforce, implies that sales functions are assigned to other departments. Thus, sharing information becomes crucial between departments, and the most effective way to share information is when this is digitalized.

The digitalization of complex B2B sales process depends not only on the selling organization, sales team or salespeople, but also on the profile of the buying organization. The buying organization may need more face-to-face encounters to close the deal, which per se implies less digitalization in complexB2B sales process.

Digitalization also relies on the information relevance and accuracy required for closing a deal. There are two points of view (i.e. selling and buying organizations) that depend on the source of information, whether it is analog and/or digital. It is also important who and when selling and buying organizations can gain access to what information.

Digitalization helps the selling organization to divide up the complex B2B sales process, firstly based on organizational functions (e.g. identify customers, create new relationships, make proposals, close deals, attention to existing customers, follow-up support) after which the organization can mix other issues with, such as products, geographic location of customers and category of customers. A practical example of division by functions is to pursue or renegotiate payments of invoices, which could be a new task for an administrative department. This means that the sales team could be organized by functions more effectively than before.

Digitalization also refers to the quantity and quality of information needed in the seller-buyer relationship. the involvement required by the customer is important, as more involvement in the purchase requires more information from the selling organization. This implies more face-to-face encounters and subsequently relying on the experience of salespeople. However, more experienced salespeople treating customer requirements often implies fewer face-to-face encounters.

The quantity of information for the seller, needed for simple sales processes, is less than for complex ones. The customer implications of searching for information is less for simple purchase processes than for complex ones, as the amount of information required is less.

The entire digitalization of the complex sales processes, if possible, should be slower, because of the need for trust, and the information accuracy required is higher than in simple sales processes.

The quality of information varies between complex B2B and simpler B2C sales processes. It is not so important to have a large amount of information about customers in B2C; it can be less information that is adapted to what is required, and from reliable sources. Digital sources and people (analog) are not equally reliable, so that judgment is needed to determine the relevance and accuracy of information obtained.

In traditional face-to-face encounters between selling and buying organizations, the information shared is not only objective information or binary data but is variable. For example, body language provides information about intentions, feelings and personality. Non-verbal communication conveys information about the degree of understanding or agreement.

Consequently, communication goes beyond sending or receiving packages of data in complex B2B sales processes. Communication is about sharing rational and emotional information. It is about finding common ground, thus giving the information a value and meaning to both parties.

There are stages in the complex sales process that need less confidence and can therefore be digitalized before other ones.

It is common to perceive the sales process as sequential and stepwise, following pre-defined stages. It is not uncommon that sales companies try to operate in this manner. However, feedback is needed between objective and subjective information in the complex B2B sales process. Actions and interactions between buying and selling organizations create barriers to completing the digitalization in each stage. Although the earlier stages, and the last one of the complex B2B sales process, generally requires more objective information, while the rest are more subjective, it is not linear and does not follow a strict timeline. The digitalization process is gradual, and there is no self-evident division between stages.

The profile of the selling and buying organizations also influence the digitalization of the complex B2B sales process. There is a hierarchical influence on the complex B2B sales process. It is not only the organization itself, but also the department and people which exert an influence. The salespeople and the purchase people as individuals and the department in which one works, influence the digitalization process. Demographic variables such as age and education, as well as experience, influence the degree of digitalization of the complex B2B sales process. A younger salesperson may have more technological skills, but with less experience, and they follow a more digitalized B2B sales process than an older one with fewer technological skills although with more experience.

The digitalization of a complex B2B sales process relies on the information needed, such as quantity and quality. It also relies on the confidence of people in technology. Consequently, it is not only the quantity and quality of information that is important in the digitalization of the complex B2B sales processes, but also the confidence of selling and buying organizations in technology. Enhanced confidence in technological tools implies more digitalization in the process.

6. Research implications

One of the characteristics of technological changes, which often makes salespeople suffer, is that there are many channels and sources of information and much time is taken up and at worst wasted in finding the appropriate data. It is widely reported [84] that there are human behavioral factors, such as adaptation [85] and resistance [86], which affect the adoption of technology. In particular, e-commerce adoption and its use has been studied extensively [87,88]. The extension of human behavioral factors are therefore a foundation for the digitalization of sales process, but this is beyond the scope of the present study. The success of digitalization in complex B2B sales processes is based on the efficient use of time by salespeople, and having the right information at the right time.

This study helps us to understand the value of technology in society and the process of obtaining valid information. It also helps classify and organize different kinds of analog and digital sources, and channels of information at a stage of technological change in which one company and its managers believe that more information is always better.

However, the most important thing is not to have more information, but to have classified and organized the information point in time so as to recover what is needed at each.

Consequently, an awareness of common enablers and obstacles to digitalizing complex B2B sales processes can help to improve action plans of digitalization, avoiding pitfalls and making it successful. The results reported indicate that a complex B2B sales process is not easily digitalized. On the contrary, there are a number of hurdles to overcome.

There appear to be a few trends among the companies of the interviewed salespeople. From the past to present, the studied companies increasingly substitute face-to-face encounters with remote calls at stages less critical and with less value to the complex B2B sales process. These companies maintain face-to-face encounters with important customers, and in particular when it is near to closing the deal. From the present to the future, the studied companies are likely to further substitute face-to-face encounters with remote ones in all stages of the complex B2B sales process with all customers, except when obtaining new customers. Furthermore, the complex B2B sales process are partially divided into stages, and customers categorized in groups.

The question is whether a complex B2B sales process can be totally digitalized. In other words, can face-to-face encounters become obsolete, where the analog information channel is fully replaced by a digital one? This is a topic for future work on complex B2B sales processes.

7. Managerial implications

We recommend using a mixed structure in the sales department, so as to exploit the benefits of communication technologies and to use what advantages digitalization provides. It may be advisable to start by dividing digitalization process by functions, and after that using the remaining possibilities, by territory, accounts or products, depending on the company.

Three internals sales elements should at least be created or maintained and there should be a total integration between them and the salesforce which works outside the office:

i) identification – to open doors using communication technologies. Functions must be able to identify potential customers through social media, webpages and events. After finding them, it is necessary to arrange a first meeting with the seller in the field.
ii) Template proposal – the administrative background of the sale. Making Power Point for presentations and drawing up contracts.
iii) post-sale – re solving incidents and the most important part, identifying new sales potential in the current customer. In post-sale, the need for information is not so high as in the other two. However, it is part of the sales process to digitalize and save costs for the company. Furthermore, this can provide new or additional sales opportunities.

Another proposal is an integration between sales and marketing departments. The objectives of the marketing department must be aligned with the sales department. This is due to the technology advancements which enable information to arrive at the customer in different ways, such as ads, social media, websites or face-to-face with the seller. The information and the message must be synchronized. It is also important to renew the image of the traditional face-to-face salesperson, offering them technological courses and adequate equipment.

We recommend staff training about what constitutes correct information and the appropriate amount, as well as how organize, analyze and exploit data. Companies not only need to have an ERP to store organized information or to make a dashboard but need to learn how the information can be integrated and shared with other systems and the security issues that this involves. It is important that a consultant company propose a roadmap for the digitalization process, including the digitalization of the sales process and the treatment of sales data.

The company needs to create a new position inside its technical support department. This position should have as its main function to promote digitalization between the employees of the company and to resolve any doubts about digitalization (e.g. how to use LinkedIn).

We recommend converting obstacles to enablers in the digitalization of complex B2B sales process as follows:

- Make the cultural sub-dimension work in the company through values and goals – align people's values with your organization's long-term goals to unleash all hidden talent among the staff;
- Make the organizational sub-dimension work in the company through
- skills and expectations – develop staff's professional digital skills to make it possible for them to perform the work that is expected of them; and
- within and beyond organization and productivity – work on the internal and external processes of digitalization of the organization to promote productivity in the complex B2B sales process.
- Make the technological sub-dimension work in the company through adapting the tools to employees and organizational processes
- Make the legal sub-dimension work through knowledge of specific laws and knowledge of legal technological limits

8. Conclusions, limitations and suggestions

We conclude that the digitalization of complex B2B sales processes is progressing in the studied companies. However, face-to-face encounters are still needed to close deals. This implies that later stages in the complex B2B sales process are more difficult to replace with digital interfaces. The analog ones still serve the purpose of safeguarding the outcome of complex B2B sales processes. We also conclude that objective information is related to the process of digitalization, while the subjective one is related to the analog one.

This study reveals two dimensions of relevance in the digitalization of complex B2B sales process, namely indicator and context. Indicators are both enablers and obstacles to digitalizing complex B2B sales process, while the other focus is on the internal and external contexts. This study also contributes to revealing sub-dimensions in the digitalization of the complex B2B sales process, such as organizational, technological, cultural and legal, as well as security issues.

This study makes several contributions to the field of technology in society, positioned in B2B contexts. It contributes to our knowledge about the digitalization process of direct sales, and specifically to insights into the digitalization process of complex services in B2B contexts.

The study also sheds light on the need to maintain face-to-face and personal contacts, so as to close deals in complex services sales in B2B contexts. Today, it is still not entirely possible the achieve total digitalization, because of the importance of the human factor in the sales process of complex services in B2B contexts.

In addition, this study also contributes to an approach to interconnect marketing and direct sales functions, which impacts on companies' internal organization, and its external communication with customers and other stakeholders.

This study is limited to complex service solutions in the software industry. Future research may focus on: (i) the extent to which other industries (i.e. product- or service-oriented ones) with complex B2B sales processes are digitalized, and the principal steps of the sales process; and (ii) digitalization of the purchase process in the buying organizations for complex services in the software industry and the principal steps of the purchase process. Consequently, future research, complemented with the perspective of the buying organization, will provide a usefull complementary contribution. The digitalization of complex B2B sales process involves the buying organization, but to what extent are there similarities and differences in B2B between sales and purchase processes of complex service or product solutions?

CRediT authorship contribution statement

Rocio Rodríguez: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Visualization, Writing - original draft, Writing - review & editing. **Göran Svensson:** Conceptualization, Data curation, Formal analysis, Funding acquisition, Methodology, Project administration, Visualization, Writing - original draft. **Erik Jens Mehl:** Writing - original draft.

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