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Digitalization in the medium and large companies of Ticino: opportunities and challenges for IBM

How and if companies in Ticino are integrating digital solutions into their Business Model

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Business Model

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“The author is solely responsible for the content of the work.”

A te, papà, che non puoi essere qui. “Quello che eravamo prima l’uno per l’altro lo siamo ancora” (Henry Scott)

A voi, la mia famiglia, che in questi anni mi avete supportata e sopportata con amore e pazienza.

E a te, che credi sempre in me.

Abstract

Digitalization is a subject largely covered in literature and developed in several academic theses. It is quite clear that it must be distinguished from mere digitization and it is proved that it has a profound impact on processes, Value Chain and Business Models. Nowadays, one refers to it as Digitalization Strategy and, in order to be efficient, it must start from Management and then go on to pervade the Companies at all levels. Since it is defined as a "Revolution" that began worldwide several years ago, today it is mandatory to deal with the digital maturity of the entrepreneurial sectors. Based first of all on a review of the literature and using an explorative survey and semi-structured interviews, this research aims to assess the level of digital maturity of medium-large companies in Ticino, which are strategically relevant for IBM, its promoter. In addition, another purpose is to study the challenges, opportunities and transformations following digitalization, relating them to the business context of Ticino. Findings – The findings of this study show that Ticino is in an embryonic stage of digitalization. Several companies are just approaching it now and plan to adopt a few digital technologies in the next 5 years. Many of them are currently evaluating the implications in their way of doing business.

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1. Introduction

In the last decade the entrepreneurial world has been overwhelmed by a technological revolution. It has gone through what has been defined as a "digital transformation", generally meant as the integration in the processes of new digital technologies (such as social media, robotics, analytics, machine learning), to arrive at a radical change in the customer experience or operations and the manifesting of the need to formulate new business models. (Fitzgerald, Kruschwitz, Bonnet, & Welch, 2013)

The most far-sighted companies immediately understood the potential of this change and took action to ensure competitive advantages. Integrating a digital strategy, however, brings many challenges. First of all, it is necessary to analyze in depth the initial situation and then anticipate the impact of the new strategy, which can be reflected in several results: "Internal efficiency; i.e., improved way of working via digital means and re-planning internal processes; External opportunities, i.e., new business opportunities in existing business domain (new services, new customers etc.); Disruptive change; digitalization causes changes business roles completely". (Parviainen, Tihinen, Kääriäinen, & Teppola, 2017, p. 64). The figure below summarizes this concept very effectively:

Figure 1: Digitalization impact

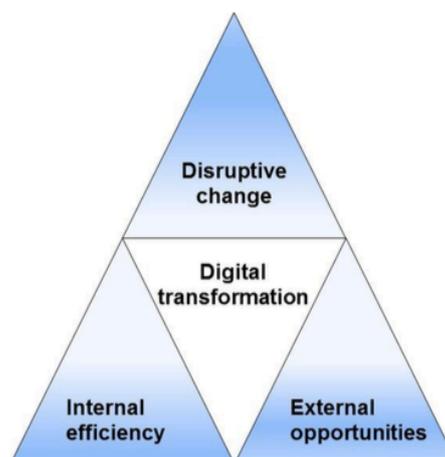


Fig. 1. Digitalization impact

Source : Parviainen, Tihinen, Kääriäinen, & Teppola, 2017, p. 66

One of the major challenges is to understand to what extent the company can rely only on its own internal resources in the analysis of the initial situation and in the subsequent steps of formalization, implementation and monitoring of the digital strategy. Staff must be informed and trained, and step by step a company culture must be "built-up"; in some cases, it will be necessary to use external specialized consultants.

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At a global level, many companies are now in a stage of "digital maturity", have made this philosophy of change their own for years and today simply monitor the results and follow the trends.

As the strategy of digitalization is a topic of study all over the world, it is possible to come across hundreds of scientific articles that analyze every aspect, evolution over time or opportunities. By looking through the results of a bibliographic research it is relatively easy to get an idea of how certain companies have integrated the new solutions into their business models. However, these results are related to economic contexts which are very different from Ticino.

Hence the need of IBM, the promoter of this study, to investigate more deeply the situation in Ticino, in particular that of medium-large companies located in the area, which, although representing a minority, are strategically important for the company. IBM has been able to radically change and reinvent itself by adapting its business model to the times, becoming a point of reference for companies that need focused consulting and tailor-made technological services. It has been able to anticipate the times and to make the mandatory need to change its own business model its wealth. "After a severe financial crisis in the early 1990s, IBM shifted its focus from being a supplier of hardware to becoming a service provider. Drawing on know-how built over decades, IBM launched a range of new activities in consulting, IT maintenance and other services. The transformation was substantial: By 2009, more than half of IBM's US\$96 billion in revenues came from these activities, which had barely existed 15 years earlier." (Zott & Amit, 2017)

This research comes from the desire of IBM to study the opportunities, changes and challenges arising from digitalization, faced by medium and large companies in Ticino. The purpose of the following pages will be to assess whether, how and at what level they have integrated or intend to integrate the new digital solutions, also commercialized by IBM, into their business model.

This target has been pursued starting from an in-depth analysis of the literature. It has helped to: contextualize and define what is meant by digitalization, differentiating it from the concept of digitization (a key point in the analysis of the situation in Ticino); explain the concept of Business model and its evolution in the last decade, caused by technological innovation; frame, without in-depth analysis, what is the relationship between Business model innovation and digital maturity.

Also due to the deep lack of studies on the subject with regard to medium and large companies in Ticino, it has been decided to prepare an exploratory questionnaire to investigate the current level of adoption of digital technologies, the present and future intentions of their introduction and collect general information data on companies in the area, necessary for further consideration. The survey has been addressed to those companies most representative in the sectors of greatest strategic interest for IBM in Ticino (fashion/luxury, finance, pharmaceuticals, health, precision mechanics) and it has been sent exclusively to managers who should be aware of the digital strategy of their company.

After analyzing the results of the questionnaire, it has been chosen to adopt an exploratory approach and to conduct two semi-structured face-to-face interviews. The first has been done with Sintetica SA, a company leader in the pharmaceutical sector, which is still at an embryonic stage of digitalization strategy. The second concerns a private clinic, the Hildebrand Clinic, which has been approaching digitalization, even if partially, for several years. The aim of the interviews has been to deepen certain concepts, identified as key thanks to the questionnaire. These are related to the skills needed for a successful digitalization strategy, to the use of external expertise during the process, and to clarify at what level the choices related to digitalization will impact on the way of doing business.

The main goal of this study is to identify with which challenges and opportunities IBM will need to deal in the immediate future in its strategic business environment in Ticino, underlining the peculiarities of a geographical market that differs substantially from that reported in most of the literature.

2. The literature review

2.1. Definition of Digitalization

There are many definitions of digitalization since it appears to be “one of the major trends changing society and business in the near- and long-term future”. (Parviainen, Tihinen, Kääriäinen, & Teppola, 2017, p. 64). Digital technologies are transforming the way we live and work. It has been described as the “Fourth industrial Revolution” by several authors. (Parviainen, Tihinen, Kääriäinen, & Teppola, 2017; Degryse, 2016/02) The first and second revolutions have become history, the third has been characterized by “the use of computer technology and automation to control industrial processes. In our age, digitalisation and robotisation constitute the next significant fault-line. These technologies bring about more fundamental changes than before, not only in the industry, but in all areas of the economy, as well, even in the society.” (Csath, 2018/1, p. 64)

Focusing on a less macro level, Digitalization is therefore a transformation that has a profound impact at all levels of the organization's environment. It comes hand in hand with product innovation and services innovation but causes a waterfall effect also at the level of processes, company organization, business models, company culture, strategy, etc. The old way of working simply no longer creates enough value. (Parviainen, Tihinen, Kääriäinen, & Teppola; Ibarra, Ganzarain, & Igartua, 2018) The strength of digital technologies – social, mobile, robotics, analytics, cloud, machine learning – is no longer simply whether they are used or not, but how companies integrate them and how those technologies transform the way of doing business. (Kane G. , Palmer, Phillips, Kiron, & Buckley, July 2015).

Several authors also point out the need to distinguish between digitization (i.e. the process of converting analogue data into digital data sets) and digitalization meant as described above. These two terms are sometimes used as synonyms but could not express more different concepts. (Rachinger, Rauter, Müller, Vorraber, & Schirgi, 2018)

Through the analysis of scientific journal articles, books and studies of all kinds, can be identified hundreds of new technologies. This complicates the possibility to discern those that really matter and can make a difference, either for the intent of this research or for the intent of business decisions. However, several studies have identified how elective technologies may have four common characteristics: “high rate of technology change, broad potential scope of impact, large economic value that could be affected, and substantial potential for disruptive economic impact.” (Manyika, et al., 2013 May, p. 2)

As also shown in the image on the next page, among those that are already or will become part of the daily lives of people and companies in the near future there are the following: mobile internet, automation of knowledge work, the internet of things, cloud technology, advanced robotics, autonomous and near-autonomous vehicles, next generation genomics, energy storage, 3d printing, advanced materials, advanced oil and gas exploration and recovery and

renewable energy. These can be categorized as the most economically disruptive technologies. (Manyika, et al., 2013 May)

Figure 2: Twelve potentially economically disruptive technologies

	Mobile Internet	Increasingly inexpensive and capable mobile computing devices and Internet connectivity
	Automation of knowledge work	Intelligent software systems that can perform knowledge work tasks involving unstructured commands and subtle judgments
	The Internet of Things	Networks of low-cost sensors and actuators for data collection, monitoring, decision making, and process optimization
	Cloud technology	Use of computer hardware and software resources delivered over a network or the Internet, often as a service
	Advanced robotics	Increasingly capable robots with enhanced senses, dexterity, and intelligence used to automate tasks or augment humans
	Autonomous and near-autonomous vehicles	Vehicles that can navigate and operate with reduced or no human intervention
	Next-generation genomics	Fast, low-cost gene sequencing, advanced big data analytics, and synthetic biology ("writing" DNA)
	Energy storage	Devices or systems that store energy for later use, including batteries
	3D printing	Additive manufacturing techniques to create objects by printing layers of material based on digital models
	Advanced materials	Materials designed to have superior characteristics (e.g., strength, weight, conductivity) or functionality
	Advanced oil and gas exploration and recovery	Exploration and recovery techniques that make extraction of unconventional oil and gas economical
	Renewable energy	Generation of electricity from renewable sources with reduced harmful climate impact

Source: (Manyika, et al., 2013 May, p. 4)

2.2. Digitalization and Business Models

Definition of Business Model

As the title of a famous academic study states “Strategy, not Technology, drives digital transformation” (Kane G. , Palmer, Phillips, Kiron, & Buckley, July 2015). In exploring this statement, it is necessary to explain first the concept of Business Model. According to David J. Teece, Business Model has been part of economic behavior since pre-classical times. However, it is in the mid-1990s that this concept started to be the topic of a large number of studies and publications. (Zott, Amit, & Massa, 2011)

Osterwalder and Pigneur describe the Business model as “the rationale of how an organization creates and captures value” (Osterwalder & Pigneur, 2010, p. 5) but BM is more like a system of interconnected and interdependent activities that determine the way the company does business with its stakeholders. (Zott & Amit, 2017) “In other words, a business model is a bundle of specific activities — an activity system — conducted to satisfy the perceived needs of the market, along with the specification of which parties (a company or its partners) conduct which activities, and how these activities are linked to each other.” (Amit & Zott, 2012, p. 42)

Digitalization & Business Model: Business Model Innovation

The digitalization quickly made necessary to reformulate the concept of Business Model, through the integration of technological innovations. A reconfiguration of how a company does business is needed and the actions to be taken are a fundamental strategic choice. (Zott & Amit, 2017) However, the influence of digitalization on the business models is still a fuzzy challenge. Achieving the maximum benefit from technological opportunities and also looking at them from a strategic point of view seems to be a really difficult issue. (Mezger, 2014 ; Loebbecke & Picot , 2015 ; Bouwman, de Reuver, & Shahrokh, 2017 ;Rachinger, Rauter, Müller, Vorraber, & Schirgi, 2018) But digitalization drives also an increasing number of opportunities between changes at all levels of companies’ life, including the current ways of value creation. (Ibarra, Ganzarain, & Igartua, 2018)

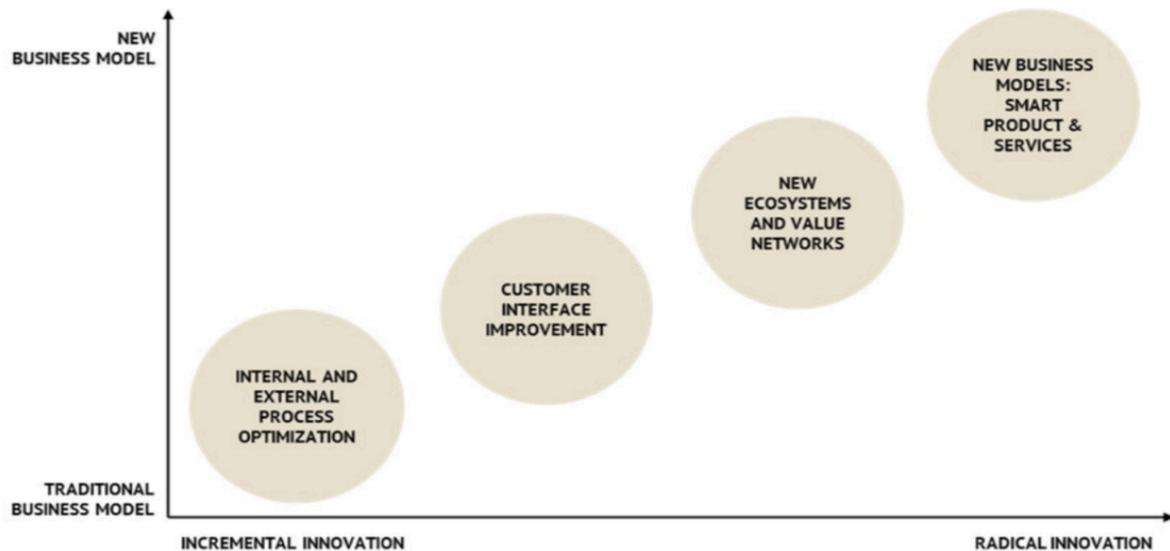
Companies are at a crossroads: they can choose to “significantly adapt one or more aspects of their business models” or to design a new one. (Wirtz, Schilke, & Ullrich, 2010, p. 273)

According to several authors there are four ways to implement a digital transformation in a company: (Ibarra, Ganzarain, & Igartua, 2018)

- Internal and external process optimization
- Customer interface improvement
- New ecosystems and value networks
- New business models: smart product and services

They are summarized in the chart below:

Figure 3: How to implement a digital transformation



Source: Ibarra, Ganzarain, & Igartua (2018), 8

Choosing one or the other route will involve very different challenges: it will mean to either optimize the current state, or embrace a disruptive innovation that completely overturns the old concept of BM owned by the company. (Ibarra, Ganzarain, & Igartua, 2018)

Otherwise “fast changing digital environment requires more exploration and experimentation that most companies are prepared to manage” mainly because digital disruption is really about many little breaks that occur over the time. The ability to respond to these needs is closely related to the digital maturity of the company. (Kane G. , Palmer, Phillips, Kiron, & Buckley, 2018, p. 10)

Definition and importance of digital maturity

Digital maturity “represents the degree to which organizations have adapted themselves to a digital business environment.” (Kane G. , Palmer, Phillips, Kiron, & Buckley, 2018, p. 3)

It is digitally mature “an organization where digital has transformed processes, talent engagement and business model” and with a clear and coherent digital strategy. In contrast, “less mature digital businesses are focused on solving discrete business problems with individual digital technologies”. (Kane G. , Palmer, Phillips, Kiron, & Buckley, July 2015, p. 3).

Establishing where in their own Business Model a digital technology has an impact, is a missing ability in less mature digital companies. This is really relevant because the strength of digital revolution is about how companies integrates the new technologies in their Business Models. In order to make these changes effective, it is important that companies hire competent people who are able to drive the transformation and build a new culture or to rely on third parties to

guide them in this direction. “Whether culture drives technology adoption or whether technology changes the culture is still an open question”. (Kane G. , Palmer, Phillips, Kiron, & Buckley, July 2015, p. 11).

Last but not least, a characteristic of digitally mature companies, which will be taken into account for the next considerations, is that who makes decisions about digital strategy is someone at the C-suite or vice president level. (Kane G. , Palmer, Phillips, Kiron, & Buckley, July 2015).

2.3. Ticino: its entrepreneurial fabric and digitalization

Ticino and its economy

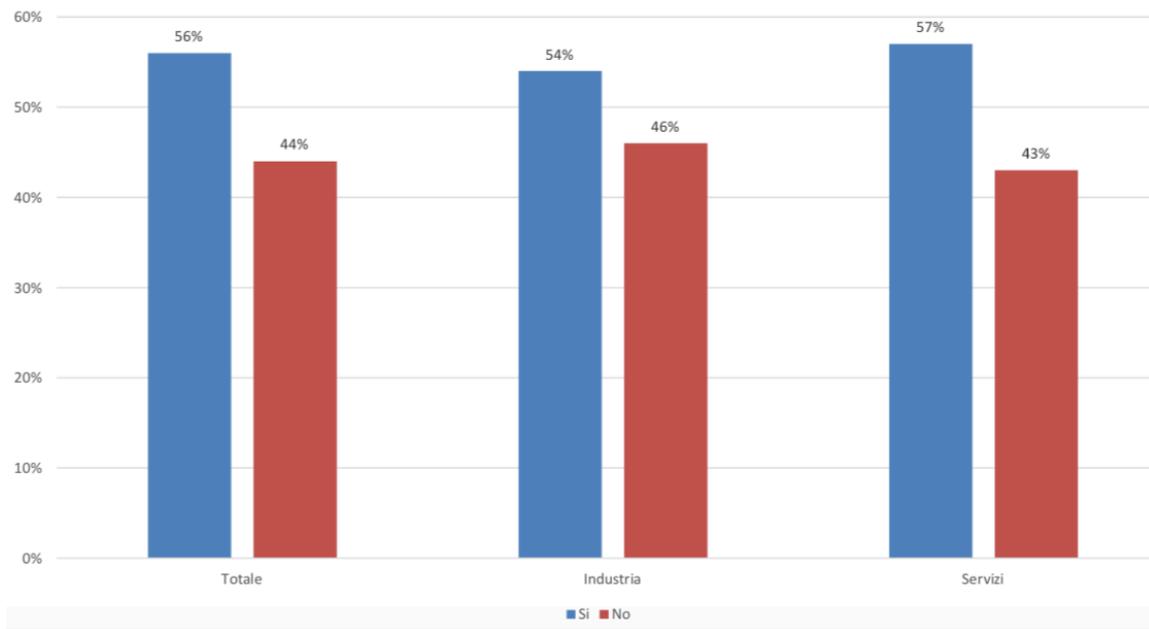
According to the estimates of the Federal Statistical Office, in 2015 the Canton Ticino generated a GDP in current prices of almost CHF 28.96 billion. The tertiary sector accounts for 73.8% (CHF 20.69 billion) of total gross value added, manufacturing and construction for 25.9% (CHF 7.25 billion), and the primary sector (Agriculture, forestry and fishing) for the remaining 0.3% (approximately CHF 73 million). The economy of Ticino is mainly oriented towards the activities of the tertiary sector, as is the Swiss economy. More than 90% of the companies in the Ticino business scenario are micro-companies (with less than 9 FTE employees, where FTE = Full time Equivalent). Two thirds of these companies are very small, with less than 2 FTE employees. Large companies (with more than 250 FTEs) represent only a very small fraction of all the organizations present in the territory (0.1%). However, the distribution of employment among the various categories of companies is more balanced. Even if the largest employers are micro-companies, which offer little more than a third of jobs, small and medium-sized companies offer a quarter of jobs, while large companies offer about 12%. On a national scale we could observe a very similar situation. The public sector offers 25,540 jobs (FTEs) in Ticino, or 13.7% of the total local economy. As a result, the private sector offers the majority of jobs (86.3%). (Gonzalez & Walker, 2018)

These are the sectors that mostly have grown between 2006 and 2017: pharmaceutical industry, chemicals, social work, information technology, research and development and health sector. The pharmaceutical industry recorded a growth rate, related to the creation of real value added, higher than all other sectors in the region, reaching +9.9% per year. However, the sectors in which Ticino is most specialized are not included in the previous list. They are textile & clothing industry, publishing & media and financial sector. (BAK Economics AG, 2019)

Ticino and digitalization

There is an almost total lack of literature on the subject with the exception of an economic investigation conducted by The Ticino Chamber of Commerce between 2016 and 2017. The data is based on a representative sample of 281 companies reached (questionnaires sent to 944 companies). Of these: 96 belong to the industry sector, 185 to the service sector. With regard to the size: 176 are small companies, 66 medium-sized companies and 39 large companies. The results indicate that 60% of companies allocate more than 15% (with peaks of more than 70%) of their investments into innovation. 56% of them believe that digitalization will lead to an inevitable change in their activities. (Camera di Commercio Canton Ticino, 2017)

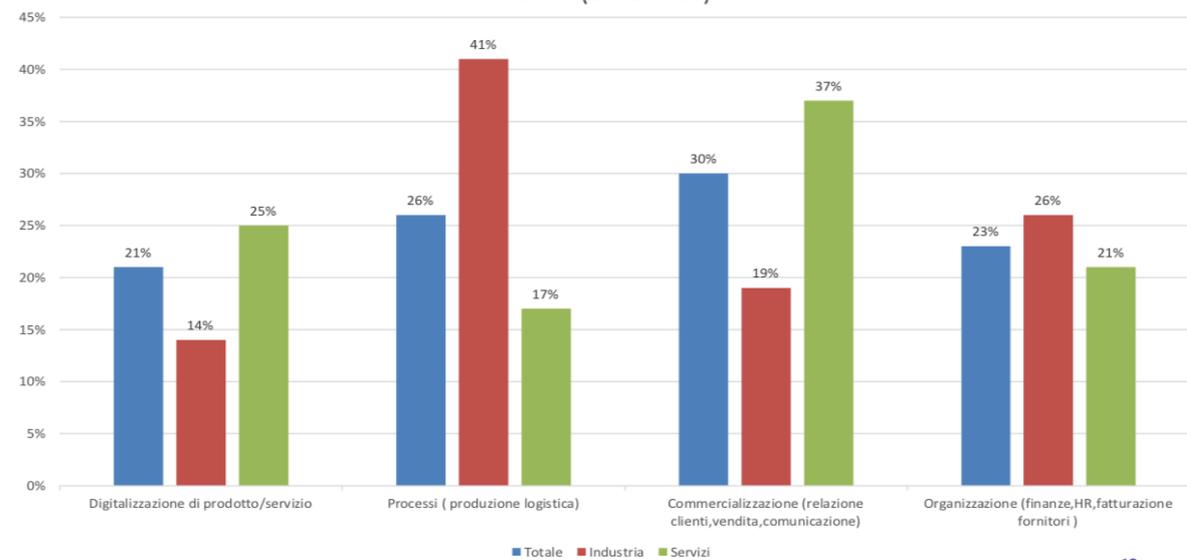
Figure 4: Will the digitalization change or modify your activity? Data in % of the number of companies surveyed



Source: (Camera di Commercio Canton Ticino, 2017, p. 19)

As shown in the image below, the planned investments in digitalization are composed as follows: products and services 21%; processes 26%; customer relations, sales and communication 30%; organization 23%. Last but not least 80% of companies estimate that digitization will not result in a reduction in the number of employees. (Camera di Commercio Canton Ticino, 2017)

Figure 5: Companies report that they will invest in the following sectors over the next five years (figures in %)



Source: (Camera di Commercio Canton Ticino, 2017, p. 19)

2.4. IBM

The Computing-Tabulating-Recording Company, the precursor to IBM, was founded on June 16, 1911.

IBM has proven to be a chameleonic company. Over the years it has been able to reinvent itself, continuously adapting its business model to the times. It is the world's largest technology company, present in 170 countries. Known in the past almost exclusively for its hardware, today provides its clients with tailor-made solutions, integrating products and services like cloud, cognitive systems and robotics, in order to ease the adaptation of companies to a market deeply influenced by change.

In 2017 IBM declared: "All companies need an enterprise-strength cloud platform. They need AI capable of understanding all their data. They need grounded in their professions and industries. And they need a technology infrastructure infused with intelligence, protected with advanced security and future-proofed against the flow of new breakthroughs and risks. That is, they need today's IBM." (IBM, 2018, p. 4)

Today, IBM is ready for "Chapter 2 of companies' digital reinventions" characterized by moving from experimentation to true business transformation at scale with AI and hybrid cloud. (IBM, 2019, p. 1)

IBM is also present in Ticino, where the needs and the level of digital maturity seem to be still far from the digital transformation to which it refers in its annual report.

Those below are some of the solutions and technologies that IBM offers:

- Cloud
- AI: Watson (natural language processing, speech processing, computer vision and machine learning)
- Blockchain
- Cybersecurity solutions
- Enterprise services

3. Questionnaire: Ticino and digitalization

3.1. Introduction

Given the difficulties in finding specific literature illustrating the level of penetration of the concept of the digitalization strategy in Ticino, it seemed appropriate to start the research and evaluation work through an explorative questionnaire. This approach has been taken with the awareness that there were no resources and contacts that would lead to a statistically relevant number of responses.

The questionnaire was conceptually divided into three parts:

- An introductory section for collecting general information about the company (sector, size, years of presence on the market, etc.).
- A second part built to learn about the current state of the company with regards to the digitalization strategy
- A last part that provides a picture of the company's vision, provided by the Management, with respect to the strategy of digitalization.

The questionnaire was created on-line through the use of a service called SurveyHero, and was sent to about 50 medium-large companies in Ticino, belonging to the sectors of greatest interest for the purposes of this research: chemical-pharmaceutical, precision mechanics, luxury and watchmaking, health, finance.

As no specific address books were available, penetration was low. There were 27 responses, one of which was incomplete.

3.2. Analysis of the results

General information about companies

According to the data of the “Ufficio di Statistica della Repubblica e Cantone Ticino” the number of medium-large companies in Ticino in 2017 (2016 latest statistical data, 2017 forecasts) was the following: (Ufficio di statistica, 2019)

Figure 6: Number of medium and large companies in Ticino in 2016

	Total	50<FTE employees<250	> 250 FTE
	Num. of Companies	Num. of Companies	Num. of Companies
Total	38'886	472	48
Primary Sector	1'200	0	0
A Agriculture, forestry and fishing	1'200	0	0
Secondary Sector	5'502	141	19
B Mining and quarrying activities	23	X	0
C Manufacturing activities	1'998	94	16
D Electricity, gas and air conditioning supply	60	6	X
E Water supply; sewerage, waste management and sanitation activities	105	X	0
F Constructions	3'316	39	X
Tertiary Sector	32'184	331	29
G Wholesale and retail trade; repair of motor vehicles and motorcycles	6'770	45	4
H Transport and storage	1'223	30	X
I Accommodation and food service activities	2'179	5	X
J Information and communication services	1'269	9	5
K Financial and insurance activities	1'427	34	X
L Real estate activities	1'125	X	0
M Professional, scientific and technical activities	6'793	15	0
N Administrative and support service activities	1'715	41	4
O Public administration and public defence; social security obligatoria	591	30	0
P Education	1'283	29	X
Q Health and social work	3'423	77	9
R Arts, entertainment and recreation activities	1'134	7	0
S Other service activities	3'252	7	0

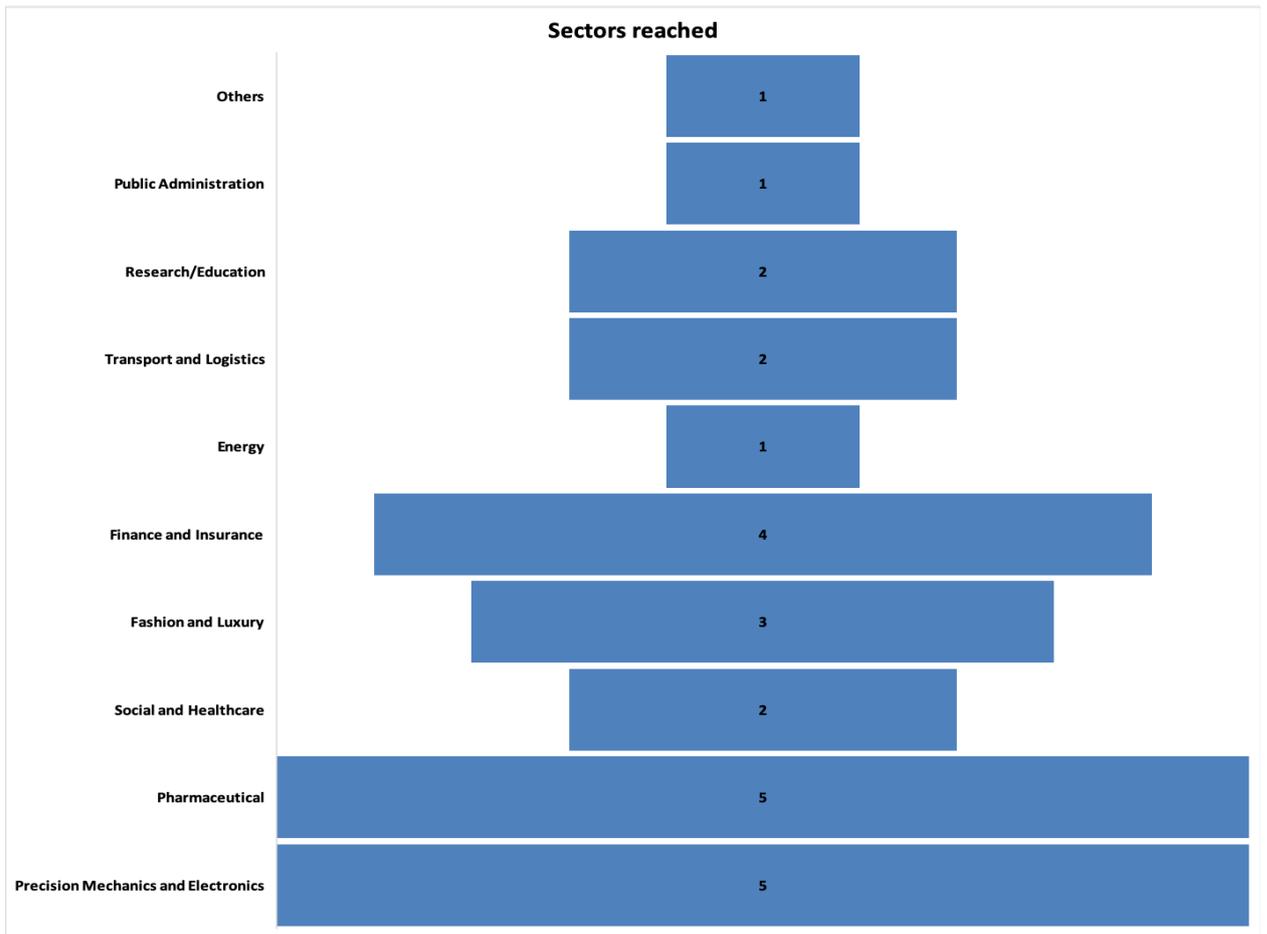
Source: (Ufficio di statistica, 2019)

If only the sectors previously defined as strategic for IBM are considered, the limited number of companies immediately comes to the fore. They are included into the three lines in light blue. (FTE: full time equivalent)

Below it is possible to see which sectors were reached by the questionnaire and in which number:

- 5 Pharmaceutical Companies
- 5 Precision Mechanics and Electronics
- 4 Finance and Insurance
- 3 Fashion and Luxury
- 2 Social and Healthcare; 2 Transport and Logistic; 2 Research/Education
- 3 Other Sectors

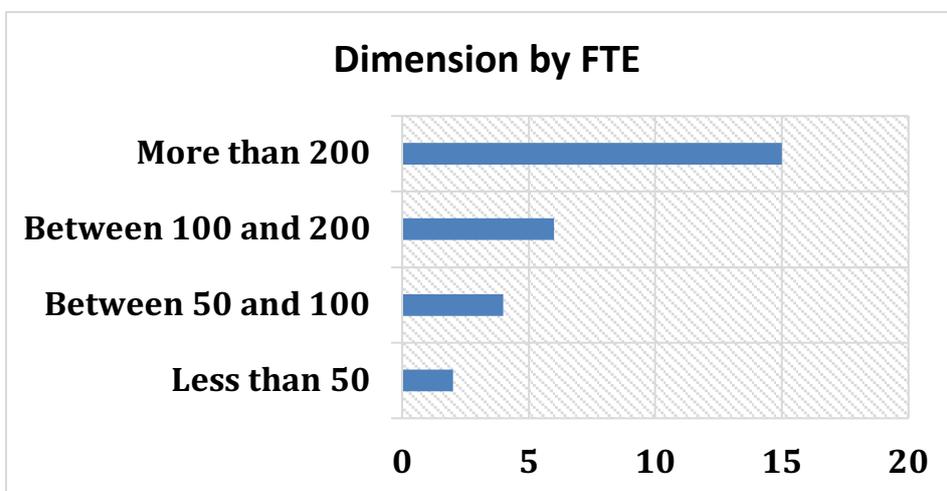
Figure 7: Sectors reached by the survey



Source: Questionnaire

55.5% of the companies that answered the questionnaire was big:

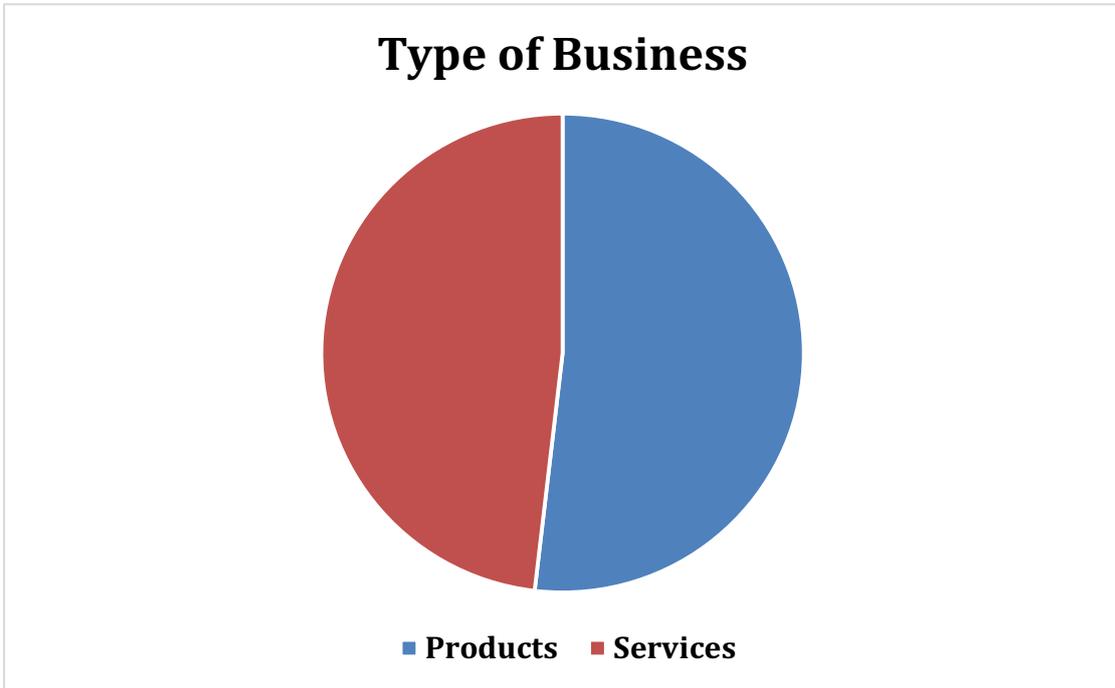
Figure 8: Dimension of Companies



Source: Questionnaire

There has been almost equal adherence among the services sector and the product sector:

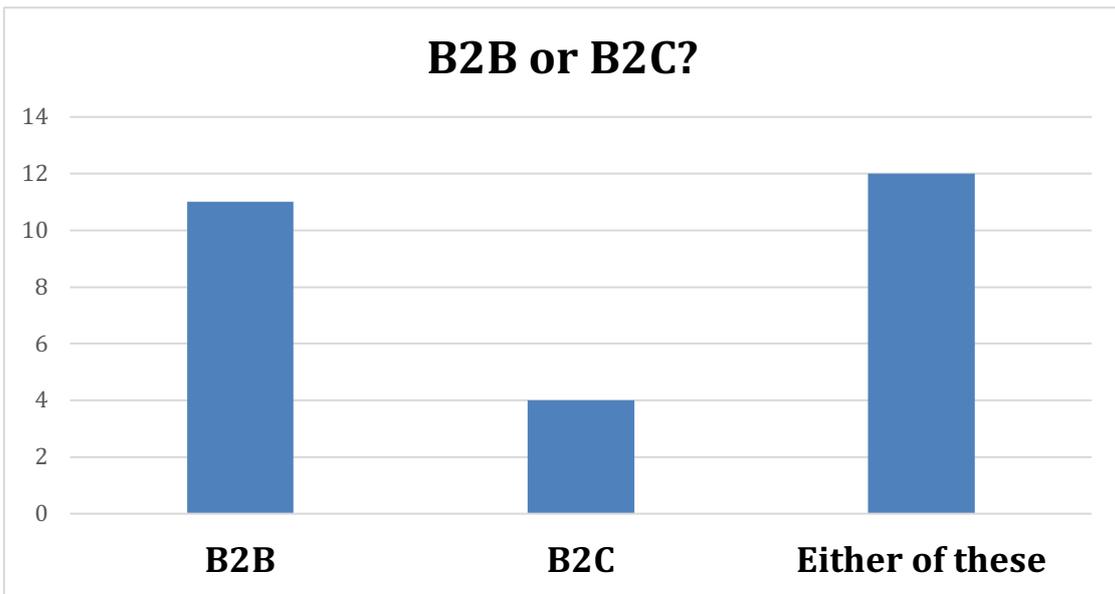
Figure 9: Type of Business



Source: Questionnaire

Only 15% of companies were B2C. The remaining 85% were B2B or B2B plus B2C:

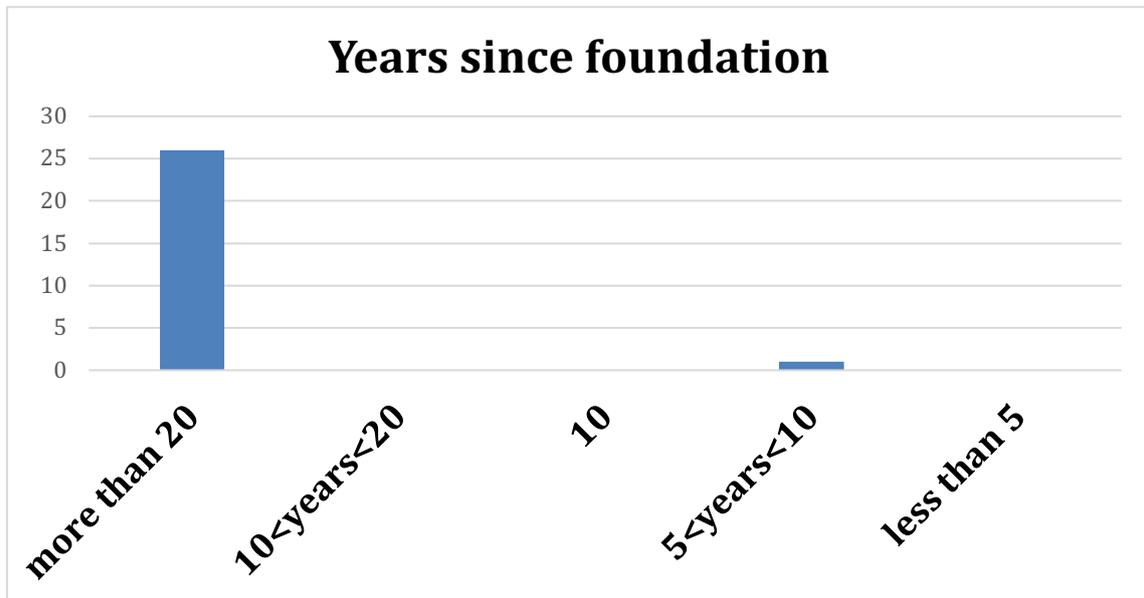
Figure 10: B2B, B2C, Either of these



Source: Questionnaire

Although once again underlining the statistical non-relevance, given the relatively small sample size, it is particularly interesting to note how long these companies have been present on the market:

Figure 11: Years since company's foundation



Source: Questionnaire

Most of the companies have been active in Ticino since more than 20 years. This is really significant because “established companies are increasingly stepping up to “come of age” in a digital world, they also have some distinct challenges compared with younger companies.” (Kane G. , Palmer, Phillips, Kiron, & Buckley, 2018, p. 17)

Older companies are generally less digitally mature, so they have much more to learn and change in order to improve their digital strategy. Sometimes for them it may be necessary to “unlearn” in order to reach their new targets (Bonchek, 2016) and “to break free from competency traps and old models that constrain thinking and new learning”. (Kane G. , Palmer, Phillips, Kiron, & Buckley, 2018, p. 18)

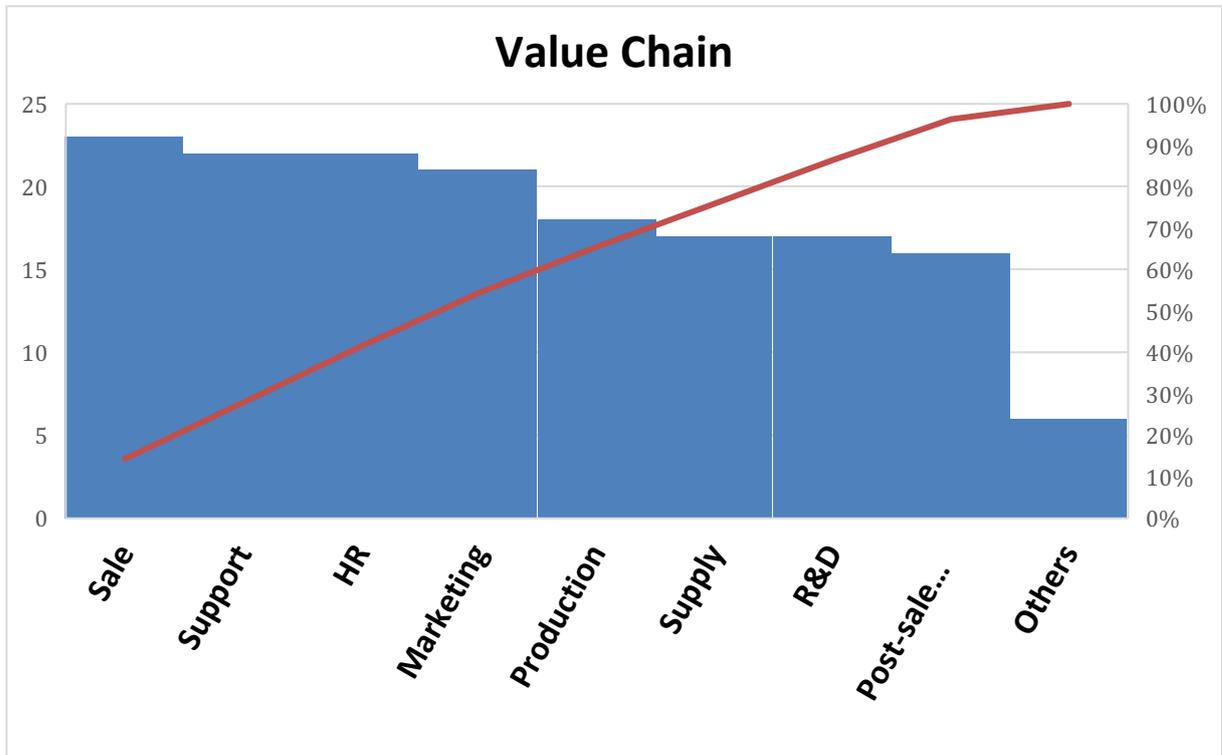
One of the targets of this survey was to succeed in collecting only the responses of employees with managerial functions, i.e. those who should be aware of the company's strategy. This goal has been achieved. All of the respondents hold management positions: most of them are directors (37%) or managers (18.5%), the others are Heads of business units, CEO, CFO and COO. This gives a different meaning and relevance to the answers obtained.

The last of the general questions was perhaps the most important. It was about which steps of the company's value chain are carried out in Ticino. The answers are crucial in defining the possible digital needs of Ticino companies.

Of the companies surveyed, 60% carry out all stages of the value chain in Switzerland. Between 80% and 90% of companies perform sales, support, HR and Marketing in Ticino.

This is a very important factor in determining the impact of new digitalization strategies on their Business Models:

Figure 12: Value Chain



Source: Questionnaire

Current state of the company's digitalization strategy

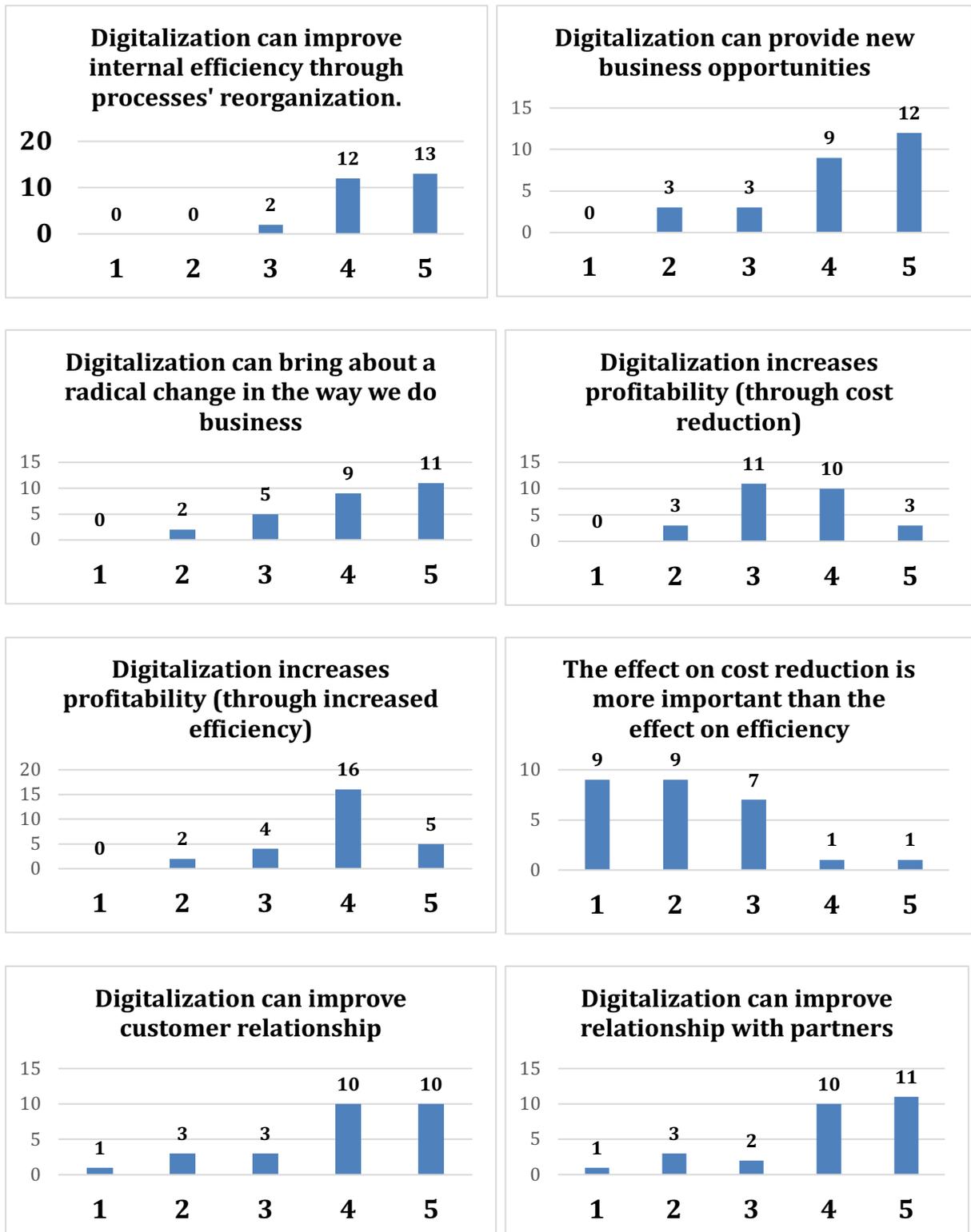
Even though the importance of digitalization is well known, companies are often struggling to understand its potential impacts and benefits. An example of this can be shown by considering the questionnaire, in which the first section was an open question: "What comes to your mind if I say digitalization?" The purpose of this question was to figure out the level of knowledge about the subject and also which one might be the company's vision about the digitalization strategy and its own importance. If the answer had been detailed and precise then it would have been evident that the company had clearly passed on its vision to its employees.

But, even companies that in the following questions place themselves in an advanced stage of knowledge and implementation of digitalization strategies, associate the latter with non-strategic activities such as paper reduction or a different approach to archiving.

It is remarkable that most of the responses focus on a key issue: processes and optimization. It is not by chance, therefore, that the improvement of internal efficiency, through the reorganization of processes, is considered by most of the participants as one of the major benefits brought by the digitalization strategy. Getting new business opportunities, improving relationships with stakeholders can therefore be seen as a consequence of a change in the way of doing business, as shown in the literature review.

The above affirmations are related to the following image. The survey participant had to answer the following statements by assessing their veracity on a scale from one to five (where 5 = very true)

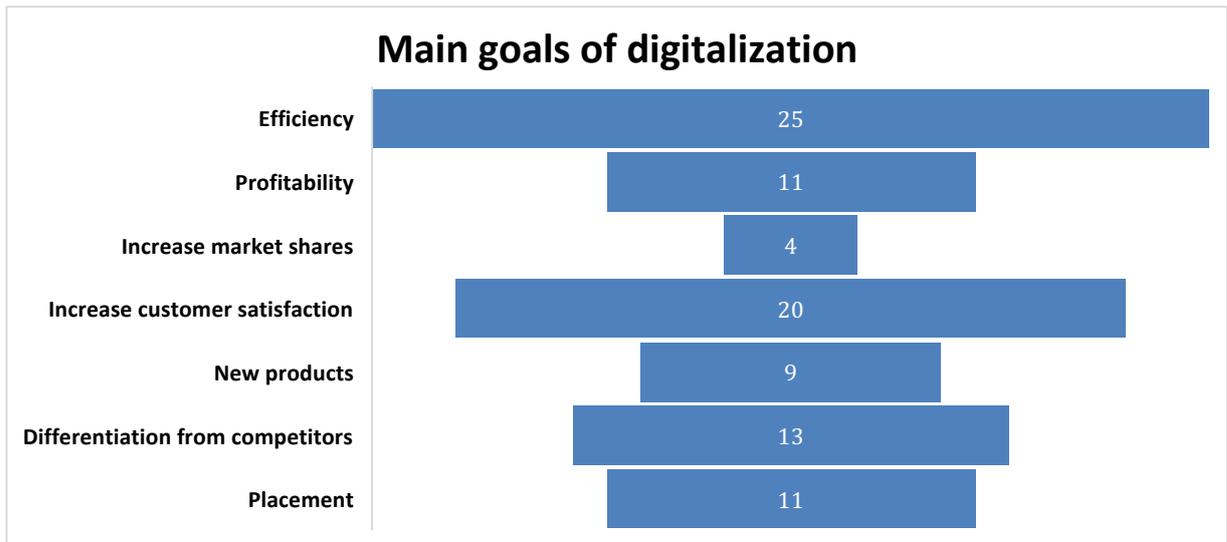
Figure 13: On a scale from one to five how true do you consider the following statements to be?



Source: Questionnaire

Looking at the results summarized in the table above, it is evident that most of the respondents are aware of how digitalization can radically change the way of doing business. 92.6% of the companies believe that Efficiency is the major goal of digitalization. The latter is following by the increase in customer satisfaction, the differentiation from competitors, profitability, placement in the market, the possibility to create new products and the last position is held by increasing market shares.

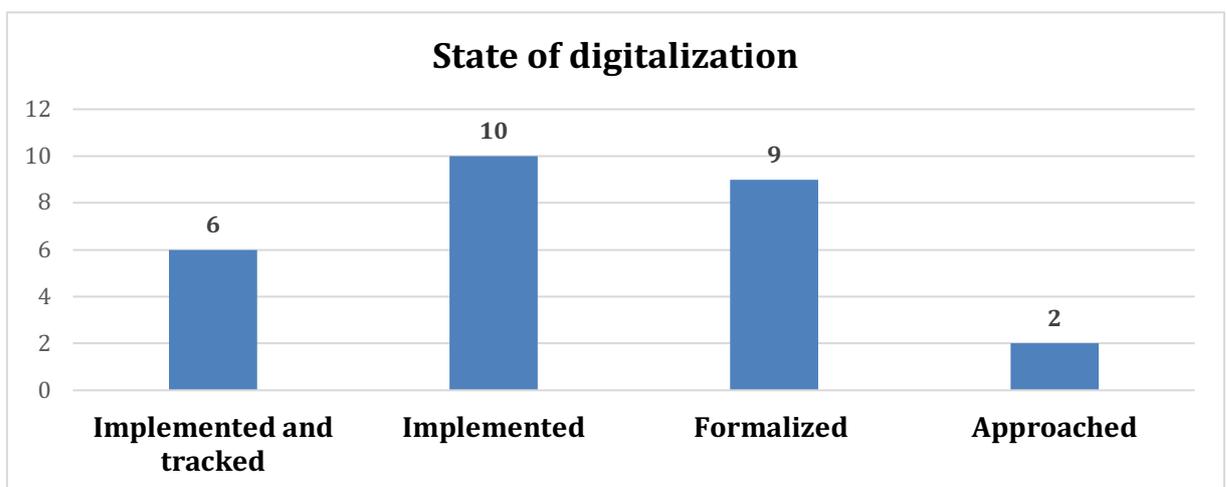
Figure 14: Main goals of digitalization



Source: Questionnaire

Out of 27 companies, 16 wrote that they have implemented a digitalization strategy; only 6 of them also claimed to track its trend. Of the remaining 11: 9 declared that they have formalized it but not yet implemented it and 2 have approached it without defining a plan for the near future.

Figure 15: State of digitalization

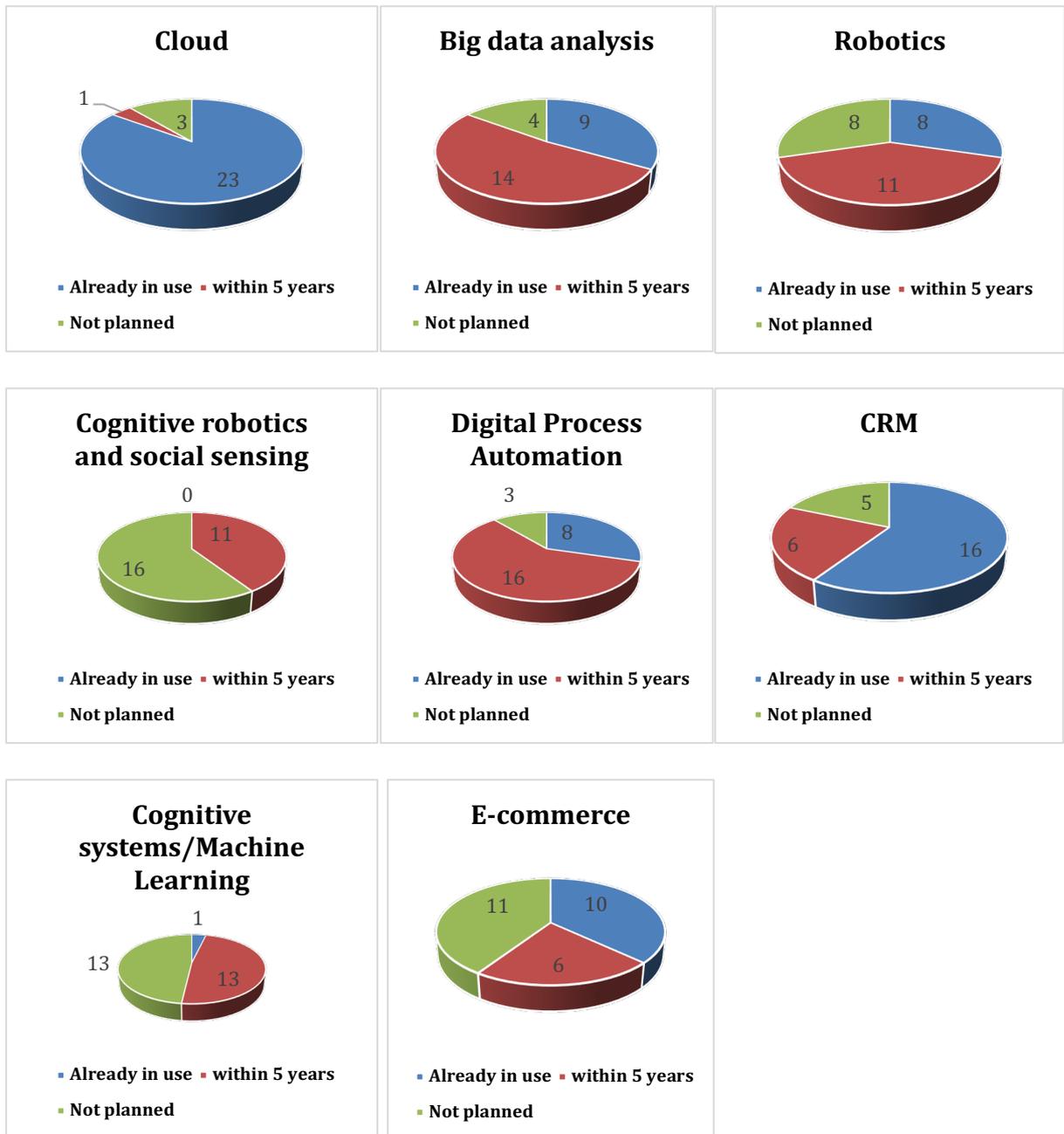


Source: Questionnaire

However, if we compare this data with that concerning technologies already in use, the initial reflection linked to the paradigm of digitalization = less paper comes to mind.

In other than cloud technology and CRM, few companies in Ticino have already introduced in their business models what in the world literature seem to be the drivers of this new industrial revolution: Big Data Analysis (only 9), Machine Learning (only 1), Robotics and Digital Process Automation (only 8). Most of them, however, expect to remedy this lack in the next 5 years.

Figure 16: State of the art



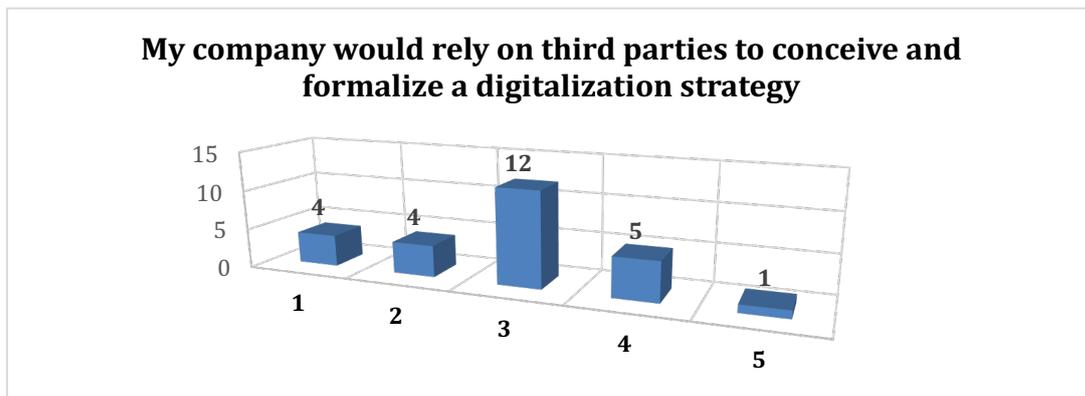
Source: Questionnaire

The Management of the participating companies seems, from the answers, to be interested in making them actively participate in this disruptive revolution but on average, they agree that the entrepreneurial fabric of Ticino is not yet fully prepared for it. Most of them are concerned about the costs necessary to face a process of change of this magnitude. It is also interesting to note that, in most of the interviewed companies, it has not been clearly formalized how and by what method and resources conceive, formalize and implement a digital strategy.

This can be noticed in the answers to the last 3 questions of the survey. The participants were supposed to evaluate on a scale from 1 to 5 (where 5=very true) some statements, explained below and in the following graphs: the result is a prevalence of mean values.

The first question concerned the possibility for the company to rely on third parties for the formalization of a digitization strategy. Most respondents to the survey did not clearly express either a positive or a negative opinion. (1 to 5, where 5 is very true)

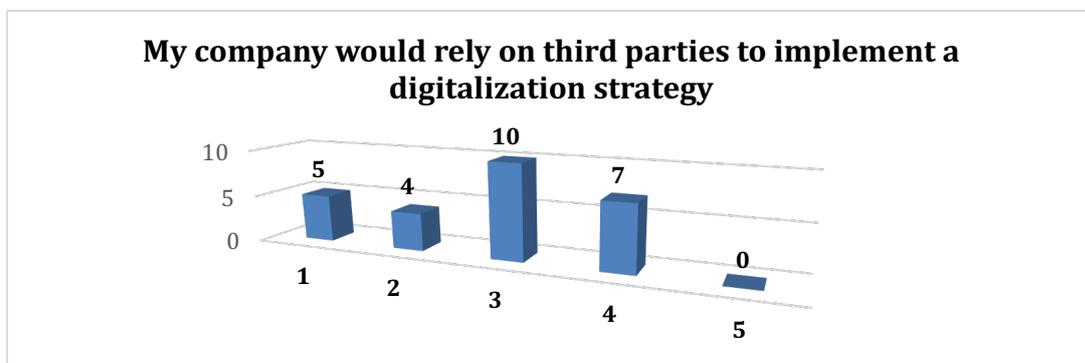
Figure 17:Conceiving and formalizing a digitalization strategy



Source: Questionnaire

The second question concerned the possibility of relying on third parties in the implementation of a digitalization strategy. The answers are very similar to those in the first question, with a slightly higher incidence of clearly positive responses. (1 to 5, where 5 is very true)

Figure 18:Implementation of a digitalization strategy

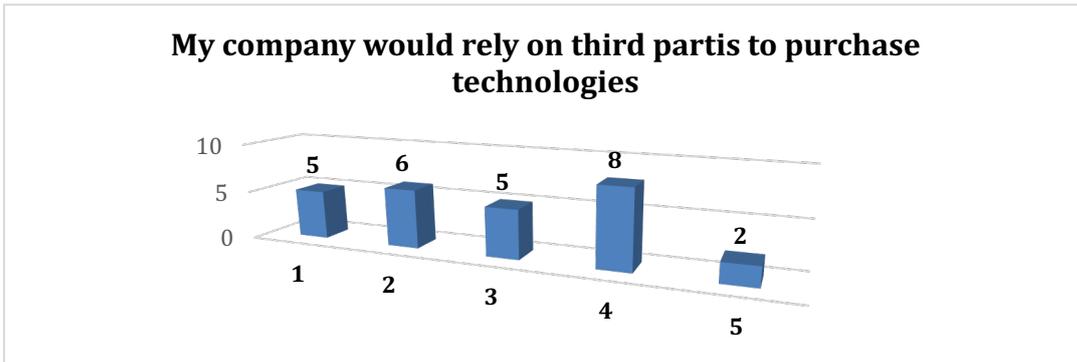


Source: Questionnaire

The third and final question stated: "In my opinion, my company would rely on third parties to purchase technologies, products/services from them, without involving them in the development and implementation of digital strategies". (1 to 5, where 5 is very true)

7,7% would definitely do that, 31% probably would do so, 19% basically doesn't have a strong opinion about.

Figure 19: Buy or not digital technologies



Source: Questionnaire

4. Interviews

Following the analysis of the findings of the explorative questionnaire, two interviews were conducted in order to examine in depth some aspects of the digitalization process and to deepen those key concepts for the aims of this investigation.

The key concepts are: the state of maturity of the digitalization strategy, understanding how deep the preliminary analyses are (with regard to the supposed impact at the level of processes and business models), finding out how the company has already or will implement the decisions and, last but not least, understanding whether it will rely on third parties or carry out all the steps internally.

The companies, Sintetica and Clinica Hildebrand, are in distinct states from the point of view of digital maturity and they have different digital transformation methods. The first one is approaching the initial process of analysis that will result in the formalization and implementation of the digital strategy, the second one decided to implement only a technology without a complete analysis.

The methodology of these two interviews is based on an open discussion, in order to follow the spontaneous flow of information, focusing on some fundamental aspects for this research. They are not reported literally: they are presented in the form of a study case.

4.1. Sintetica SA

Sintetica has been operating in Switzerland since 1921. It is a leader in the production of anesthetics and pain relievers, commercialized in hospitals worldwide. Innovation and excellence are its fundamental principles, as well as attention to its employees. Over the last few decades, it has grown to such an extent that a series of strategic choices are necessary in order to ensure continuity and growth. These include the decision to hire a highly experienced external consultant in order to be guided in the formulation and implementation of a digitalization strategy.

This person, which from now on will be referred to as D.F., has been responsible for several projects related to the digitalization strategy, specifically processes of "Transformation" i.e. with a generalized impact on all business levels. For about 15 years he has focused on the pharmaceutical world and he has worked for global corporations.

According to his experience, the motivation that drives companies to ask for his help is related to subjects such as competitiveness. The latter is a very comprehensive term, including topics such as growth management or the ability to differentiate, which does not necessarily mean to grow, or even the search for a different way to compete in order to maintain their market shares.

Sintetica bases its competitiveness on the human dimension. Everything in it is permeated by a "man-centric" culture in which man is at the base of the strategy. In cases like this, digitalization can make it easier for people to achieve their goals, while at the same time increasing their ability to contribute to the value of the company.

Sintetica is going through an important phase of growth. Therefore, the awareness emerged that its current support systems were not suitable to deal in an effective and efficient way with sales volumes and coverage of international markets. The development of a digitalization strategy to support the company's growth was therefore identified as fundamental. In addition, Sintetica did not have a sufficiently strong IT structure: acquiring a professional figure with experience in the field of digital strategy and, at the same time, reinforcing the existing IT structure were therefore inevitable choices.

From the experience of D.F. it emerges that this is a recurring theme in companies that are facing a change of this kind. For a company that has never had to deal with the digital world it is difficult to find the necessary skills internally, so it is necessary to surround itself with people who have direct experience of the added value of a digitalization strategy but, above all, have already experienced the deep process of change that leads to the achievement of its goal. The approach is therefore based on two different tracks: on one hand, existing employees are provided with new skills, and they in turn carry their own patrimony relating to their knowledge of the company; on the other, transversal skills are carried by external consultants. They are transversal with more than one meaning: in some cases, they are experts in a specific process, having already analyzed it in different business realities; in other cases, they are Subject Matter Experts in a technology that is fundamental for the company in question.

In the current phase, Sintetica has clear targets at a high level, as guiding principles; one of D.F.'s tasks will be to expand them and find the right resources and methodology to transform them into effective actions. The digitalization strategy will help the company to become the absolute leader for its products through the further refinement of its distinctive quality and also lead to new results in terms of innovation, a subject in respect of which Sintetica is particularly careful and active.

D.F. emphasized how digitalization permeates the entire company value chain. Each company has processes with greater relevance in terms of impact on its resources or business criticality. In a company like Sintetica, processes with a distinctive attribute are those that have to do with industrial issues, in other words, those related to the world of products and R&D, the foundation of every pharmaceutical company. Only innovation and new patents can ensure long-term continuity. All other processes, although of secondary importance, will still be affected by digitalization. In the long term, finance and controlling can also become important, as a growing society needs to present more data to the external environment. These data must therefore be made measurable and accessible.

D.F. in its speech distinguishes between "mere digitization", the one that is taking place in contexts where processes are very mature, and digitalization. The latter can become an enabling factor of new business models only if the company is able to make one more evolutive step, by means of re-engineering and digital transformation.

The ability to implement a digital transformation is linked to the identification of the right technologies at the level of macro-processes, but also at the level of individual sub-processes. It means therefore starting from the value chain (inbound logistics, outbound logistics, marketing, procurement...), to go further by identifying the most suitable elite technologies to support micro processes.

There are digital technologies that permeate the corporate environment in a total way, such as, for example, the world of analytics or automation used at several levels (production but also finance or marketing); or the blockchain, once of interest only in the financial field, now more and more strongly in sight also in the pharmaceutical field; or even the cold chain that is used to track the condition of products. An example of how these technologies are not independent but rather closely related is the interaction between cold-chain and big data analytics: the first one is used to track and record the state of conservation of those products that must meet certain requirements in order to maintain their quality intact; the second one has the role of analyzing the data collected to optimize their distribution processes, anticipating and discovering any leaks or margins for improvement.

Returning to the specific situation of Sintetica, a high-level assessment phase has been completed and it is now necessary to start with a detailed analysis that will lead, as a final result, to choices in terms of systems and technologies supporting the new business model to which the company will tend.

The preliminary analysis phase, for a company of the size of Sintetica, usually lasts from 3 to 6 months. The entire initiative of formalization and implementation will instead have a duration of 2 or 3 years. During this period, KPIs (n.d.r. key performance indicators) will also be selected and built and the company will acquire technologies capable of measuring them and monitoring their performance over time.

When asked if the information collected will be managed by an office that will deal specifically with digitalization in the long term, the answer of D.F. was that there will be obviously a team dedicated to support the digitalization strategy, but thinking that it will be a specific team to conduct it in the longer term at the whole company level is highly restricting. The aim of all the activities that will take place in the coming years will be to make the necessary know-how an intrinsic part of Sintetica at all levels and in all business areas.

The tools and technologies through which to apply this model of digital strategy transformation will not be a mere reproduction of other pre-existing ones used by competitors, in the case of a company like Sintetica that makes innovation its workhorse. Each technology must be tailored and developed, using internal skills and knowledge, but also the expertise of external advisors. This is a teamwork, synergic and fundamental to the success of the whole project.

4.2. Hildebrand Clinic Rehabilitation Centre Brissago

The Hildebrand Clinic Rehabilitation Centre Brissago is one of the most important Swiss centers of competence in the field of rehabilitation. Their services range from neurology to physiatrics, rheumatology and internal medicine.

The Hildebrand Clinic provides patients with interdisciplinary care to restore all functions and reintegrate them into social and professional life.

A premise has to be made: the digital strategy in the hospital-clinic field is very different from the other sectors. The first difference is that, even when dealing with private clinics, as explained by Giovanni Rabito, Assistant Director at Hildebrand Clinic in Brissago, the strategic role should be played first of all by the State, which has a global interest in public health. Only then the digital strategy should be developed by the Management of each clinic, ensuring that it will permeate every aspect of doing business.

The Hildebrand clinic approached digitalization around 2007, which in this specific case has resulted in the adoption of the "Electronic Health Record". The latter is the fundamental instrument for the analysis and collection of information concerning the patient. If used correctly, these can be predictive and can orient the treatment, as well as to result in a series of actions that will increase effectiveness and efficiency within the Clinic itself. For example, according to G.R., the development of qualitative analysis algorithms, i.e. the search for keywords within the information regarding the disease course, could help in finding potential risks, those that are called trigger tools (e.g.: differentiate between an infection resulting from a care problem or simply from the course of the disease). However, data warehouses or data mining systems are not currently used.

To date, the balance of this implementation is not entirely positive. From the point of view of processes, no studies have been carried out to assess their impact in advance. They have been, simply, inevitably changed after the introduction of the digital folder. The concept of re-engineering and preliminary investigation was therefore missed. The stimulus to adopt this technology came from IT and was embraced by Management as promoter of a concept of "modern hospital" and in line with the times. No appropriate KPIs have been identified and there is no method for collecting and consolidating data for statistical and predictive purposes. Until now, there is not any tracking system which can monitor and record changes. It is, for this reason, not possible to assess the impact of this technology on the internal environment and to eventually decide on the next steps to be taken. It appears therefore to be a case of digitization rather than digitalization. Changing this status quo would now involve high costs, often not affordable.

For the sector, says Giovanni Rabito, a stimulus to change came from the promulgation, in 2017, of a law that requires to maintain an electronic health record, available for consultation at the national level. All hospitals (by 2020) and old households (by 2022) will have to introduce patient data into a national digital system. If they do not do so in time, 50% of the rate will no longer be paid by the health insurance companies. This law will force the sector, even in Ticino, to adapt quickly to the changes but, as pointed out by G.R. will be a kind of bias of the system.

The introduction of digital will not occur naturally but will be imposed and pushed with logic that differs from the logic of a concept of use. It will not bring a deep cultural change, according to him.

In this interview, as in the previous one, it emerged that it is almost impossible not to rely also on third parties in the implementation of the digital strategy. The Hildebrand Clinic has trained and informed its employees and hired IT staff over the years, but it has in fact relied on external suppliers to purchase the software necessary to create and use the digital folder. G.R. believes that it is difficult to avoid external consulting and sales for the implementation and monitoring of digitalization. He furthermore points out that, outsourcing to small and medium-sized companies, can bring an advantage in the short term but not in the long term, because they may not be able to sustain investments in innovation. However, G.R. believes it is almost unfeasible to recourse to external parties for the formulation of a digital strategy in the hospital-clinic sector.

5. Conclusion

5.1. Review of questionnaire results

Introduction and explanation of the limits of the methodology

At the beginning of this path, designing brick by brick this thesis, it was decided to create an explorative questionnaire in order to clarify some issues necessary to address the following observations. The existence of literature on the subject and statistics relating specifically to the digitalization strategies of Ticino's companies, would have significantly facilitated the task and would have made the study and subsequent assumptions more accurate.

Obtaining precise demographic information, for example on the number of medium-large companies present in a given sector, has proved to be a difficult exercise. In fact, their number is so small that the precise data is not published in the official statistics, in order to protect their privacy. An attempt was therefore made to overcome this limit through the preparation of some general questions that would allow to classify the company and place it in a precise strategic context.

The next challenge, and with an even greater impact on the quality of this research, was to obtain an address book to cover as many market players as possible. Various interlocutors were contacted, such as sector associations or the DFE (Department of Finance and Economics), but unfortunately with poor results. The penetration was therefore very low, about 50 companies were reached, of which only 54% replied.

The questionnaire was also addressed to employees with precise characteristics, i.e. with managerial roles and knowledge of the digitalization strategy. This need has probably further reduced the ability to achieve more outcomes, while at the same time was necessary to increase their significance.

The answers obtained cannot have any statistical validity, since they are not representative of the population and it was not possible to select the sample according to predefined and effective criteria. At the same time, however, they are very useful in carrying out some remarks and in directing any further studies to this research.

Comments on the findings

The answers have been provided an excellent starting point for further reflections.

The picture that emerges from the analysis of the results is a representation of an industrial structure made up of medium-large companies, that have been on the market for more than 20 years. They therefore belong to that category, which, according to the literature, with greater difficulties suits the changes necessary to embrace a digital transformation. In many cases these companies have, at present, decided to adopt a single technology, without evaluating an intervention on several levels, that also requires a change in their business model.

The companies that replied to the survey carry out most of the phases of the value chain in Ticino, especially those related to sales and support. This data is of fundamental importance for IBM because it is indicative of the products/services that could be offered to them, especially if crossed with the next results related to the technologies that companies intend to adopt in the coming 5 years.

70% of the companies where it is not yet in use, expect to acquire Big data analysis software in the next 5 years, 58% plan to adopt systems of Robotics, 84% to embrace a Digital Process Automation. Since the prospective for the development of big data analysis is so high, the figure concerning social sensing is interesting. Nobody already has it in use and only 41% plan to adopt it in the future. Further insights and an informative campaign could provide an opportunity for IBM.

Almost all respondents said that they already use CRM programs and have adopted cloud solutions, but apart from these 2, the rest of the technologies are not an integrated part of their processes, at the moment.

If the data was statistically relevant, it could have given precise indication of the stage of digital maturity reached by medium and large companies in Ticino. In fact, according to several authors, mature organizations develop more digital technologies in near-equal measure. (Kane G. , Palmer, Phillips, Kiron, & Buckley, July 2015).

It is fundamental to understand how mature the digital strategy of a company already is in order to understand the next choices to be made and always keep up with the times but if the strategy is not monitored, this process cannot be carried out correctly. Of 60% of companies that have already implemented a digital strategy, only 37% say they are monitoring the results.

Probably in the context of Ticino is not yet applied what literature states, that is: "Digital experimentation should not be "once and done" effort. Rather, it is about developing a culture of experimentation in which new business ideas are continually tried and tested." (Kane G. , Palmer, Phillips, Kiron, & Buckley, 2018, p. 18)

What follows are some of the most interesting answers to the only open question of the survey "what comes to your mind if I say digitalization?":

- Efficient business processes thanks to new technologies
- Home Office, professional displacement, less office presence but greater focus on objectives. "Lead people with trust and by results".
- Process improvement, focusing on business, giving innovative answers to customers
- Automation - Service - Speed - Efficiency - Minimum size - First follower not first mover
- Process improvements, new Business Models, disruption, new working environment, digital factory
- Innovation, training, opening up to new markets
- A radical change in business operating procedures at all levels, from production to interdepartmental relations
- Flexibility, sharing and exchange of information in different languages and on different platforms
- High costs linked not only to technical solutions but also to the adaptation of skills. Planned obsolescence. Increase in the information to be managed, rapidity of information/communication. Increased storage capacity of information and therefore usability.

From these answers it is possible to understand that the management of Ticinese companies is nevertheless informed and aware of the high potential of digitalization. Moreover, it believes that it brings efficiency and increases customer satisfaction. This suggests that probably, even if with a delay, Ticino is moving towards the first phase that, according to the studies, seems to be completed in other regional areas. This last aspect can prove to be good for companies, which can easily become aware of any bias, but at the same time it will take away from them the competitive advantage of being forerunners, described extensively by several authors.

IBM plays a fundamental role here, as it can try to reach with targeted proposals, taking into account the peculiarities of the Ticino market, all the companies that are approaching the issue.

It is evident from the questionnaire that there is not yet a clear vision at company level of the possibility/need or not to use external consultants to acquire digital technologies or to obtain help in the implementation and formalization of the digital strategy. There seems to be no precise, formalized and communicated vision on how to deal with this issue. Almost none of the interviewees answered yes or no with decision, preferring medium values that leave open to IBM a large spectrum of possibilities of intervention.

5.2. Review of case studies

If more time had been available, it would have been interesting to interview, as had been established at the preliminary level, a greater number of companies, covering all sectors of strategic interest for IBM. Unfortunately, it was not possible to do so, and it was decided to focus on 2 companies with a different approach and a different stage of digital maturity.

What emerged was that, in the case of Sintetica SA, the company is approaching a process of integration of a “textbook” digitalization, which will include a series of preliminary analyses and will lead to a real digital transformation, with relative adaptation of the business model. The case of the Hildebrand Clinic, on the other hand, shows an embryonic approach to digitization, which has led to the adoption of a single technology.

Both case studies show, however, that IBM has different possibilities of action in the Ticino market. The need to rely on external consultants, in the various phases, has been clearly stated several times. In fact, it seems impossible to ignore third parties, both in terms of formalization, implementation and purchase, followed by customization, of technologies, both for monitoring. A number of instances have been referred to the need to choose KPIs so that it is possible to assess the success or failure of a strategy. Therefore, systems for the collection, safe storage and processing of information are necessary. Moreover, if production and storage systems are present, as in the case of Sintetica SA, other systems such as Robotics or Machine learning will also be required, permeating the entire company value chain.

The case of the Hildebrand Clinic, on the other hand, indicates that something is happening at a national level. The Confederation is perhaps trying, through the promulgation of sector-specific regulations, to speed up and make necessary that process, that has not yet taken off in a natural way in Ticino. It is therefore recommended to keep the market under observation, in search of those signals that indicate that the time is finally ripe.

5.3. Recommendations for IBM

Given the limited time at disposal and, in some cases, the lack of resources needed to carry out the analyses in the most efficient way, the field of study had to be considerably restricted. It is recommended to extend the research to other sectors considered strategic by IBM.

It would also have been interesting to evaluate whether the strategic choice, of addressing medium-large companies with greater interest, is the most appropriate one, having time and expertise at disposal. Given the high predominance in Ticino of micro and small enterprises, it would be recommendable to conduct studies to assess in general their inclination to adopt digital strategies and technologies, focusing then on the specific case of this area and on their stage of digital maturity. In this way, it will be possible to approach them with focused and specific solutions, opening up to a market that is much larger than the one described in this thesis.

In this case, IBM would be faced with the need to formulate a specific Business Model that adapts to this geographical region.

Moreover, interviews and surveys have shown that the Ticino market has peculiarities that differentiate it from the examples described in the literature. Companies are in an embryonic digital phase, but they want to rectify the situation. IBM therefore has to face the challenge to give answers to problems, mainly related to the need for the companies in Ticino to maintain / obtain competitiveness through the digitalization process, even if they cannot be more precursors of a certain technology, already in use for a while in other markets.

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