



Università  
Ca' Foscari  
Venezia

Corso di Laurea Magistrale in  
Economia e Finanza – Economics and Finance

Economics and finance  
“Second Cycle D. M. 270/2004”

Final Thesis

**FinTech and digital transformation in Finance  
Opportunity, Innovation and Future**

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**Academic Year**

2019/2020

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## **Introduction**

The society has been evolving continually due to its ability to invent, adapt and improve. There were more significant technological development and in the last decades than in the past century. The growth driver of this inventions is not big corporations but early-stage companies.

Every such company initiate with an idea that may change the future of the world. However, in order to adopt it in mass production, it needs resources and capital. A crucial role in such a journey from the fundamental concept stage to its introduction to the market plays Technology as it acts as fuel to start-ups. During the last decade, FinTech industry have shown a strong upward trend in both value and number of deals.

In recent years, new technologies have transversely modified all sectors of the global economy, in the different segments of the industrial and services world. In fact, from telecommunications, to commerce and other activities, the digitalization has profoundly changed the way we do business. The same has happened and is happening in the financial world; just think of the new applications that allow you to meet the needs in terms of payment services, financing, asset management, insurance and consultancy.

The improvements resulting from artificial intelligence, the increased computing power of the computers and the encryption have made it possible to manage one much more data and the ability to store more and more information about individuals and companies. This new wave of technological innovations, called "FinTech", is accelerating changes in the financial industry and tends to improve the user experience.

The aim of the thesis is to analyse the FinTech phenomenon from different points of view given the various variables that distinguish it. The spread of FinTech start-ups was also favoured by the progressive deterioration of the relationship between bank and customer, by the loss of trust in the traditional financial system, especially after the recent economic crisis. This factor has created a fertile ground for the birth of these innovative start-ups that focus on the customer, build value for people and generate value.

Financial technology as an evolutionary phenomenon banking, financial and insurance industry, is of primary importance precisely for the potential consequences that derive from it and for this reason it was chosen as the topic for this thesis.

With this paper, in developing the transformation that digitalization is bringing to the banking sector, I will focus my attention on the potential of FinTech technologies in improving banks' relationship with small and medium-sized enterprises.

The first part of the paper will be an introductory one: starting with digitalization and its evolution from the time of the economic crisis to present, we will then arrive at the birth of FinTech through digitalization and its current diffusion in financial field. We will see how digitalization has developed worldwide and with what consequences. Furthermore, we will also see the impact of digitization at the national level.

In the second chapter we will deal with the theme of innovations and accelerators of digital transformation. We will investigate what are the new skills to better face digitalization and what are the impacts they entail. We will analyse the role of start-ups in the digital industry and how new technologies are addressed.

The third part will report the case study relating to MF CentraleRisk. It aims to better understand, through my direct experience, how the FinTech revolution is addressing to the business relations between companies and credit institutions. The issues between the banks, firms and digitalization and how it perceives start-ups and FinTech technology in general.

In chapter four we will discuss the future of digitalization and will try to provide the reader with a complete vision of the whole phenomenon. The intention is to identify and describe the possible scenarios that will occur in the future. Given the dynamics of the phenomenon, we underline the fact that accurate prediction is difficult, as current times lead to very rapid changes which makes the future predictions uncertain.

Finally, in the last part of the paper, on the basis of the considerations that emerged in the previous chapters, I will analyse how the digitization process will transform the way the companies and credit institutions conduct their business and, consequently, the bank-customer relationship in the next future.

To achieve the objective of my research, a review of journal articles, conference papers, books, and edited volumes and a direct interview of my supervisor was performed. The thesis was carried out in qualitative terms. The data taken into consideration were taken from reports and analyses carried out by consultancy companies. These have means and tools suitable for conducting studies and research on companies operating in the banking and financial sector, understanding their reactions and hypothesising their possible future reactions.

# Digital Transformation

## 1.1 Digitalization in Finance

In recent years there has been a lot of discussion regarding digital transformation and the so called Industry 4.0<sup>1</sup> one of the biggest challenges that is testing hard large and small companies. The idea of this concept is to initiate a transformation the manufacturing industry using the digitalization of operations and exploitation of new technologies.

As a natural evolution of technologies such as the Internet of Things (IoT), Artificial Intelligence (AI) and Big Data, everything is connected, it is online and can be automated and equipped with its own intelligence. As a result, everything that is not or cannot be digitized or automated (human creativity or intuition), acquires a high value.

The term itself "digital transformation" has a broad meanings depending on the context to which it applies and the rules to which it refers. One of the many definitions that have been attributed, associates it with the investment and use of the latest technologies able to increasing efficiency, competitiveness, contribute to the growth of business, and to connect the digital world with the real one, by sharing information and data in real time. By taking advantage of the wave of digitization, companies have the opportunity to create alternative businesses, previously difficult even to imagine. This process requires a substantial modification of the culture, the mind-set of the companies and their strategies. As sustained by L. Gerlitz "the business world's rapid digitalization is breaking down the traditional barriers of the industry, and many academics and practitioners are emphasizing the need to rethink the existing Business Models"<sup>2</sup>. As the article suggests "the recent researches are mainly focused on the technological development and less in the new business models that are emerging through the integration of those technological innovations"<sup>3</sup>. A new cultural approach is therefore indispensable, capable of changing, not only the vision, but also

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<sup>1</sup> Rojko.A, "Industry 4.0 Concept: Background and overview" Vol 11, No 5, 2017

<https://online-journals.org/index.php/i-jim/article/view/7072>

<sup>2</sup> Gerlitz. L, Design Management as a Domain of Smart and Sustainable Enterprise: Business Modelling for Innovation And Smart Growth in Industry 4.0. Entrepreneurship and Sustainability Issues. 3(3) (2016) 244-268.

<sup>3</sup> Ibara. D, Ganzarain. J, Ignacio. J "Business model innovation through Industry 4.0", Elsevier, 2018

<https://www.sciencedirect.com/science/article/pii/S2351978918302968>

develop new models of operating processes, new methods of interaction with customers and suppliers. As the literature suggest the business modelling is a crucial tool for the current process that allows to reduce the costs, increase the efficiency, satisfy profit expectation and pursue the progress of the core business. Another interesting analysis of the digitalization process is the contribution of David L. Rogers in the book “Digital Transformation Playbook”. The author sustains that "The key to digital transformation is actually changing the way you think as an organization"<sup>4</sup>. Moreover, he indicates the 5 domains for a successful digital transformation and focus on customers, competition, data, innovation and value. In this case the “customer” is seen as an “influencer” who can engage new customers. The “competition” is used to create new platforms not only final products. A crucial role is played by “data” that has to be converted into assets. Another important aspect is “innovation” which has to be a consequence of a rapid experimentation. And finally the “value” as a real value that the business delivers to its customers.

With a view to technological innovation, we are facing a defragmentation of the value chain thanks to new tools that are digital technologies and, at the same time, a change in the meaning of Value for companies. It is no longer a static concept, defined by its own industry, but becomes a dynamic concept that adapts to the needs of the market. The current economic conditions promote technological investments in each market and sector with the aim of cost reduction, efficiency, and to support growth or create new businesses.

## **1.2 Evolution of Digital Innovation**

Financial sector innovation has a long history spanning the development of the double-entry accounting, the establishment of modern central banks and payment systems, offering financial products to retail customers. The financial services industry has been a major buyer of products and IT services globally. Banks have been responsible for most innovations in the financial industry, just thinking at (Automated Teller Machines, ATM) during the 70s. In the seventies, driven by the growth in transactions, the need to process and authorize card payments no longer manually and by telephone but to develop

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<sup>4</sup> Rogers. D, “The digital Transformation Playbook” <http://www.argylejournal.com/chief-marketing-officer/the-digital-transformation-playbook-author-explores-rethinking-a-business-strategy-in-the-digital-age/>

electronic systems. Therefore, financial services traditional have been a driving force in the IT industry and this trend is not slowing down. Financial institutions, in fact, have started to implement internal technological solutions to support the provision of services to their customers and to guarantee compliance with regulatory obligations. In addition, banks have relied on outsourcing agreements with external service providers to provide technologically advanced solutions. On the other hand, only in recent years we have started hearing about FinTech, but the interaction between technology and financial services is not in itself new. FinTech's most recent phenomenon seems to accelerate the innovative research process to a new level, also due to the entry into the financial world of specialized start-ups and established technology companies. While successful start-ups are not new at all (to have an idea just think to Bloomberg in the 1980s or to PayPal in the late 1990s), their numbers and profiles are constantly increasing and are real examples of successful business. An interesting research paper by the authors Douglas W, J. Barberis and Ross P. Buckley “The Evolution of FinTech: A New Post-Crisis Paradigm”<sup>5</sup>. The authors discuss the evolution of the so called “new marriage of financial services and information technology”. However, the interlinkage between technology and finance has a long history and the authors divide it in three distinct eras.

The first era is denoted as FinTech 1.0 (1866 – 1967), with the introduction of the telegraph and the laying of the first transatlantic cable in 1866. These provided a fundamental infrastructure for development of the modern financial world and its global expansion in the late 19th century, enabling rapid transmission of financial information, transactions and payments worldwide. In addition, the telegraph in 1918 played a very important and indispensable role for the functioning of the Fedwire Funds Service<sup>6</sup> since it was used to make money transfers between the various American banking institutions. The financial sector therefore provided the necessary resources to develop these technologies which then supported industrial development.

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<sup>5</sup> Arner. D, Barberis. J.A., Buckley. R, “ The evolution of Fintech: A new post-crisis paradigm?”Research paper No. 2015/047

<sup>6</sup> The Fedwire Funds Service is the premier electronic funds-transfer service that banks, businesses and government agencies rely on for mission-critical, same-day transactions. Fedwire Funds Service participants benefit from the finality of payments credited to their Federal Reserve Bank master accounts. <https://www.frbservices.org/financial-services/wires/index.html>

The second era is denoted as FinTech 2.0 (1967 – 2008), as a natural step for development of existing digital financial services starting with the launch of calculator and ATM. In the 70s there were several technological innovations that changed the financial world. First, in 1972 Lloyds Bank in collaboration with IBM, created the first modern bank, completely self-service, with a user interface intuitive and login credentials for security. In the area of payments, Fedwire, originally established in 1918, became electronic in the early 1970s, replacing the use of the telegraph. While in 1973 the Society for Worldwide Interbank Financial Telecommunication<sup>7</sup> (SWIFT) was established to reduce the serious risks inherent in cross-border payments, creating a real cross-border payment system. Throughout this period, financial institutions have increased the use of information technology in their businesses, making the financial world in the late 1980s a digital-based industry. It was in those years that many financial infrastructures technology have been implemented and widely used in many areas of finance, from risk management to cash management and data analysis. The period 1997-1998 showed the limitations and risks associated with systems management complexes, with the collapse of Long-Term Capital Management<sup>8</sup> (LTCM) following the financial crises in Asian area. However, it was the emergence of the internet that brought about innovation on a higher level of development, starting from 1995 with Wells Fargo<sup>9</sup> that uses the world wide web to provide online account control, up to 2005 with the birth of the first banks without physical branches (such as ING Direct and HSBC Direct). In fact, internet banking was simply a digital version of the traditional banking model. By providing direct access e practically unlimited to its accounts, the technology has removed in this way the need for clients to be physically present to withdraw funds or perform other operations. On the other hand, this can lead to risks of a financial institution, especially with regard to liquidity problems. As noted by David Carse in his speech about regulatory framework of e-banking he is pointing out the following:

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<sup>7</sup> SWIFT is a messaging network that financial institutions use to securely transmit information and instructions through a standardized system of codes. <https://www.investopedia.com/articles/personal-finance/050515/how-swift-system-works.asp>

<sup>8</sup> Long-Term Capital Management was a massive hedge fund with \$126 billion in assets. It almost collapsed in late 1998. If it had, that would have set off a global financial crisis.

<https://www.thebalance.com/long-term-capital-crisis-3306240>

<sup>9</sup> In May 1995, Wells Fargo made history again by being the first bank to use its website as a platform for customers to access their accounts. <https://www.wellsfargohistory.com/first-in-online-banking/>

“E-banking does bring new challenges and perhaps additional risks for banks, consumers and regulators. But it also brings new opportunities to improve the efficiency of the payment system and the quality of banking service. There is no question of avoiding the changes. The question is how to manage them.”<sup>10</sup>

What the author is pointing out is the fact that numerous specific issues may arise in relation to the combination between the rise of internet and banking system. Moreover, the system need to guarantee that the virtual bank has a substantial value and should not be seen just simply as a concept that is tacking advantage on behalf of the popularity of the internet itself. This competitive pressure can be problematic from the point of view of financial stability. Also Steve Vamos<sup>11</sup> in a public speech during an intervention at TED x Melbourne (2016), he said that digital transformation does not concern IT, but consists in redefining the culture and strategy of a company, where technology becomes a strategic skill. It is therefore a question of creating new business models based on technologies, precisely because, according to Vamos, it is not technology that innovates, but people, whose potential is amplified by the technology itself. As can be seen, digitization in the era of FinTech

assumes that e-banking solution providers are controlled financial institutions. This aspect is crucial to figure out the transition from FinTech 2.0 to FinTech 3.0, in fact we move on from the provision of financial services operated only by regulated financial institutions to the onset in the financial world of various subjects outside the regulatory perimeter.

The incredible development of the internet has made possible the natural transition to the next step, FinTech 3.0 thanks to high degree of connection between economic operators and allowed it to be used in most countries of the world, becoming a reliable tool for development of financial system. It is very likely that the diffusion and use of connectivity allowed by the internet were the first elements that created the need to change the business models of financial institutions at every level. The financial crisis has

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<sup>10</sup> Carse. D, “Symposium on Applied R&D: Enhancing Global Competitiveness in the Next Millennium” on 8 October 1999. <https://www.bis.org/review/r991012c.pdf>

<sup>11</sup> VAMOS S., Public speech at TEDxMelbourne, 2016. <https://www.youtube.com/watch?v=lQUt-EKwa94>

somehow allowed new operators to enter the market by trying to respond to the new needs or functionalities requested by customers that traditional intermediaries had not adequately satisfied. In addition, the most recent phenomenon of FinTech seems to increase this process to a new level, following significant investments in new technologies and the entry of the same Fintechs into the market. Here there is a significant growth for all segments related to the most important digital enablers seen previously, which are driving the entire market, starting from that of services and software. This digitalization process was born from the need, for mature sectors, to reduce costs and to keep up with innovation, for emerging sectors, on the other hand, the growth objective has guided the technological investment. As highlighted in the report “Rapporto Anitec – Assinform 2019: mercato digitale strategico per l’economia italiana”<sup>12</sup> it is possible to identify the factors that have contributed significantly to reaching the current level of technological innovation in which we live today.

Automation the use of equipment and integrated systems for carrying out any type of process. Computerization with the introduction of hardware and software has made it possible to manage business processes more quickly. Virtualization that allows to extract physical components and transform them into virtual components capable of being managed centrally and more efficiently. Cloud computing as the main trend concerning IT. It is a technology that allows to manage and use software and hardware information and resources on the network from a remote server. These are key aspects of FinTech 3.0, referring on the one hand to the change in mentality that has occurred on the part of the retail customer, on the other hand to the new business models within the financial landscape that push traditional intermediaries in the search for continuous structural innovation.

### **1.3 The value, opportunity and risk**

Nowadays we can observe many studies that demonstrate how digital technological innovation is profoundly changing the structural characteristics of modern economic systems, promoting integration between different industrial sectors, opening new

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<sup>12</sup> Fusari.G, “Rapporto Anitec – Assinform 2019: mercato digitale strategico per l’economia italiana” 2019 <https://www.zerounoweb.it/cio-innovation/rapporto-anitec-assinform-2019-mercato-digitale-strategico-per-leconomia-italiana/>

markets, extending existing ones and radically transforming business models and organization of corporate work. But it is also inducing changes in people's social behaviours and lifestyles<sup>13</sup>, not always based on conscious and reasoned choices in fact, the risk of passive adaptations and acting by imitation and conformation remains somehow at high level. The digitalization of economic and social relations in a certain sense enhance the development of favourable conditions so that technology can create, connect and coordinate services of different nature and level, previously unrelated, with information purposes and without limitations such as space and time, greatly expanding the possibilities for individuals and small businesses to access markets. Moreover, this conditions gave to possibility to enter into the market also to different subjects that were previously neglected or completely excluded.

The engine of this digital transformation of the economy is to be found in the spontaneous development of online service platforms. The combination of acquiring a huge mass of detailed information, generated and disseminated by a multiplicity of tools and sources<sup>14</sup>, and of their analysis capacity is aimed at generating knowledge on social preferences, individual consumption patterns, business activities and more, at the basis of the functioning of the digital economy. Through the use of tools such as AI<sup>15</sup>, in particular machine learning, it is possible to process the stock of information more efficiently, creating various opportunities for improvements, for example in the management of risks and information asymmetries, in the detection of fraud and in the general reduction of back-office costs. Artificial intelligence (AI), in this case, has the ability to reduce information asymmetries in the financial system and strengthening its information function for better decision making. Another segment where AI can be used is insurance markets. AI could reduce the degree of adverse selection and moral hazard, being able, for example, to offer customized insurance policies that reflect the characteristics detailed information of each customer or to monitor the ex-post behaviour of the insured.

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<sup>13</sup> OECD "*Key-issues for Digital Transformation in the G20*" 2017 <https://www.oecd.org/g20/key-issues-for-digital-transformation-in-the-g20.pdf>

<sup>14</sup> In reference to social networks such as (facebook, instagram, twitter, YouTube, TripAdvisor, blogs, vlogs, discussion forums). The topic raises numerous delicate issues of data protection, privacy and the correct use of information by managers of big data

<sup>15</sup> [Artificial intelligence](#) (AI) refers to the simulation of human intelligence in machines that are programmed to think like humans and mimic their actions. The term may also be applied to any machine that exhibits traits associated with a human mind such as learning and problem-solving.

Furthermore, artificial intelligence allows the reduction of costs, especially regarding the back-office of financial institutions, giving a positive boost to profitability.

The success of artificial intelligence clearly also brings with it some risks that should be taken into account. Risk of AI interpretation, complexity and incorrect learning of the technological tools. As mentioned in the report of IOSCO<sup>16</sup> “Research Report on Financial Technologies (Fintech)”<sup>17</sup> from 2017 applicable to the robot advisors the following risks may arise:

1. Risks of some errors in algorithms, it may occur errors in algorithm design or in programming language that may not be convenient or in the best interest of customer.
2. Risk of a very complex algorithm, that may give suggestion or advices with a hard and ambiguous interpretation.
3. Risk of a very simple algorithm, that may not capture sufficient data for a complete analysis and returns a generic advice.
4. Risk of static information, may occur when the information available changes dramatically and the algorithm fails to capture the new available information.

As a final consideration of risks, the use of data by consumers of financial services can lead to data confidentiality and information security problems. In fact, the use of AI applied to Big Data can from one hand allow improvements in the financial services offered by operators, but on the other hand, it raises many doubts about how consumers can be protected in terms of privacy and security of personal information.

#### **1.4 Digitalization at international level**

To have a general and at the same time more specific picture regarding the evolution of Fintech at international level, I have examined the reports of the companies competent in this specific sector. From an analysis conducted by PWC<sup>18</sup> in collaboration with CB

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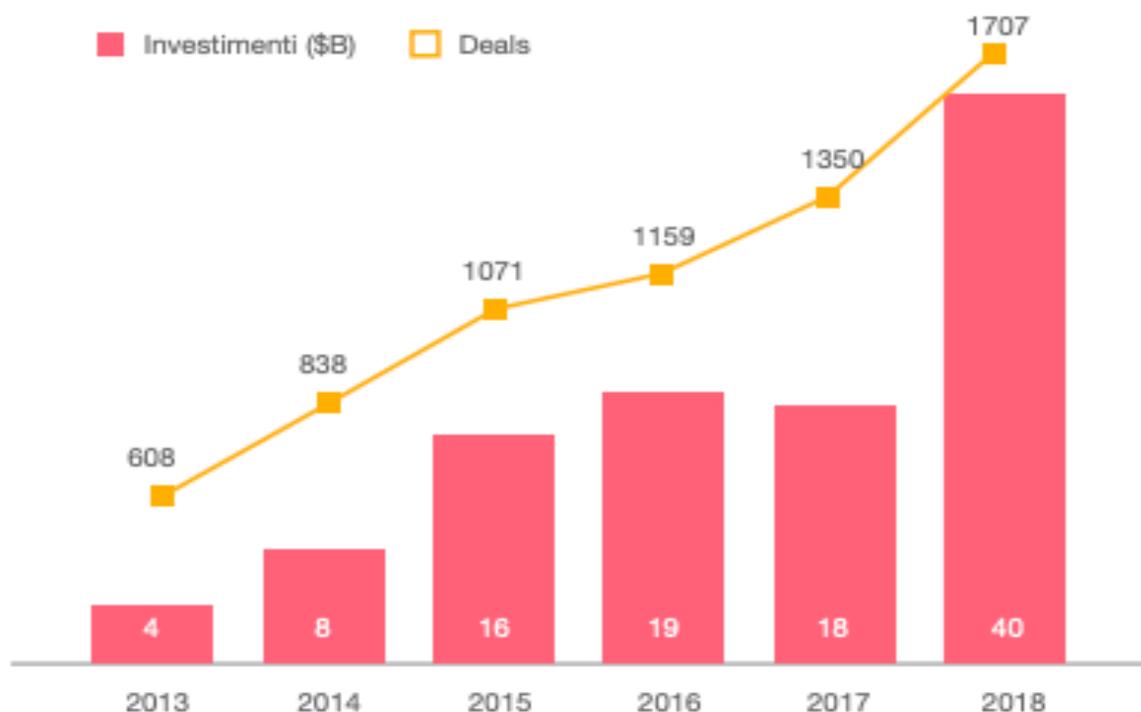
<sup>16</sup> The International Organization of Securities Commissions (IOSCO) is the international body that brings together the world's securities regulators and is recognized as the global standard setter for the securities sector. <https://www.iosco.org/>

<sup>17</sup> IOSCO Research Report on Financial Technologies (Fintech) 2017  
<https://www.iosco.org/library/pubdocs/pdf/IOSCOPD554.pdf>

<sup>18</sup> PWC, “Piccole FinTech crescono con “intelligenza””, Osservatorio FinTech Italia 2019 (seconda edizione)  
<https://www.pwc.com/it/it/publications/assets/docs/PwC-FinTech.pdf>

Insights<sup>19</sup>, it emerges that the companies that have faced the digital transformation by investing in digital and, adapting their business model and strategy, are those capable of occupying a dominant role on the market in the next future. According to CB Insight's report, 2018 saw a new absolute record in terms of volume and number of investments globally: approximately 40 billion dollars (+ 120% on the previous year), distributed over 1,707 "deals" and 1,463 startups globally. The continent that has recorded the most sustained growth from the point of view of the number of "deals" is Asia (+ 38%), but the United States still maintain the first position as regards the total volume of investments (around 12 billions of dollars). Figure 1 shows the investments in global Fintech.

**Figure 1 - Annual VC-backed global FinTech deals and financing 2013-2018 YTD (\$B)**



Source - CB INSIGHTS, 2019 Fintech Trends To Watch

Europe on the international scene, for its part is gaining positions while remaining at lower levels with respect to Asia and the American continent. In the European context of FinTech transactions, the United Kingdom, with over 216 Billion Dollars transacted,

<sup>19</sup> CBINSIGHTS "Fintech Trends to Watch" 2019 [https://www.cbinsights.com/reports/CB-Insights\\_Fintech-Trends-2019.pdf](https://www.cbinsights.com/reports/CB-Insights_Fintech-Trends-2019.pdf)

records the absolute highest value compared to other countries, followed by Germany (over 130 Billion Dollars) and France (about 92 Billion Dollars). Italy, with just over 38 billion dollars, is positioned on lower levels, and very close to those made in Spain. As the report drafted by PWC<sup>20</sup> highlights, the global FinTech market in 2018 is summarized in some significant trends which include:

- a new investment record
- a growing diversification of the market (geographical and type of investors)
- strong attention to the segment of the neo-challenger banks,
- increasingly positioning of the Internet on the financial market growth
- development of InsurTech which lays the foundation for the development of new business models
- a growing collaboration with banks

The number of FinTech companies at the international level is growing, introducing new technologies and new AI solutions with the aim of making organizations in the financial sector more efficient. The new players in this evolutionary context can be grouped into two brand areas:

- Financial Pure which includes all the companies that deal with Payment, Money Management, Lending, Asset Management, Capital Market and Crowdfunding.
- Other companies that operate outside the banking chain are entering the market with an innovative offer of great interest for the financial world such as InsurTech, RegTech, Tech Enabler and Cybersecurity.

According to KPMG<sup>21</sup> report from July 2019, in the last period, precisely from 2019, after the record of the previous year, we found a settlement with regard to the trend on investments in the Fintech sector. In fact, both the number of deals and the total value of investments decreased (37.9 billion dollars compared to 120 billion dollars in the first half of 2018). The sector has paid for the absence of mega deals, but the slowdown is not

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<sup>20</sup> PWC “Piccole FinTech crescono con intelligenza”, 2019 (seconda edizione)  
<https://www.pwc.com/it/it/publications/assets/docs/PwC-FinTech.pdf>

<sup>21</sup> KPMG, “The Pulse of Fintech” 2019 <https://assets.kpmg/content/dam/kpmg/it/pdf/2019/10/pulse-of-fintech-h1-2019.pdf>

worrying: for the second half of the year, several M&A operations are planned (including the already announced acquisitions of WorldPay by the American Fidelity for 43 billion Dollars and First Given by Fiserv for 22 billion, in addition to the next merger between Global Payments and Total System of 21.5 billion) which should increase the values. The main transactions concluded include investments in Dun & Bradstreet (\$ 6.9 billion), Concardis (\$ 6 billion) and NCF Wealth Holdings (\$ 2 billion). The factors that contributed to this rapid decline are primarily due to uncertainty at the international level. As Ian Pollari claims Global Co-Leader of Fintech KPMG International:

“It's going to take some time for open banking to gain customer traction in many markets as observed in the UK. However, we expect that in five years' time we will look back at open banking as a major driver of industry change.”

The main causes are identified in the change of regulations in China, the political tensions between the two world economic powers such as the United States and China. Another decisive factor at European level are the ongoing Brexit negotiations which have continuously fuelled the uncertainty that caused a brake on new investments. Other causes that contributed to the decline are to be found in investments in block chain that has reached maturity, investments in cybersecurity to prevent risks and new regulations. The existing investors and the new ones turn out to be much more selective by trying to invest in FinTech industry that have proven skills and prospects for rescheduling.

Looking at the fintech phenomenon globally, however, we discover that the interest in the Fintech sector is still quite solid.

According to the report released by KPMG and CB Insight<sup>22</sup>, despite the decline in the last period, the interest in investing in the Fintech industry has remained strong enough in the United States. The driving and most interesting sectors are the payment methods which continue to become increasingly electronic. In this regard, we can underline the acquisition of P2P by MasterCard. If on one hand we have seen less investments in the Insurtech sector on the other hand we have seen an increase in investments in the Wealthtech sector. Even Facebook's announcement of Libra<sup>23</sup> has again shifted the focus on investments in cryptocurrencies which have seen fewer investments in the last period.

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<sup>22</sup> CBINSIGHTS “Fintech Trends to Watch” 2019 [https://www.cbinsights.com/reports/CB-Insights\\_Fintech-Trends-2019.pdf](https://www.cbinsights.com/reports/CB-Insights_Fintech-Trends-2019.pdf)

<sup>23</sup> Casciabanca.F “ Facebook annuncia Libra e sale il valore di Bitcoin: cosa accadrà ora alle altre criptovalute? 2019 <https://www.ninjamarketing.it/2019/06/19/facebook-libra-bitcoin-altre-criptovalute/>

In Europe, investments in fintech have also decreased, but on the other hand, VC investments have remained strong. However, UK remains the leader in Europe with the highest volume of deals in the sector, followed by Germany and France. Despite Brexit-related problems, it has continued to attract large investments and remain the home of the 6 of top 10 Fintech companies. Germany in the last period has seen fewer investments but with a greater volume. This is a sign of maturity of the Fintech sector in the country. Even the Asia Pacific area after the investment record of the last period confirms the international trend with the reduction of investments. The distinctive factor that makes the Asian market so attractive for the success of fintech is the greater concentration of the population which corresponds to a significant backwardness in terms of services, including in the financial sphere. In fact, about 60% of the global population or more lives in Asia, considering that many births are not recorded. But regarding the slowdown in last period, China is seen as the main protagonist of this stagnation following foreign policy and difficult agreements with the United States.

However, as Tracey Zhang - Financial Service Tax Lead Partner in KPMG China, points out: “China's fintech market is unique. Baidu, Alibaba and Tencent (BAT companies) dominate and are making acquisitions to try to cover all the major sectors. We therefore expect the minority market to see more participation from small and medium-sized fintech players.” There are good prospects for the Asian market, more attention from investors in the blockchain sector is expected in the coming years. Other sectors that are sure to play an important role in attracting investors' attention are AI, big data and cloud services.

## 1.5 Digital at national level

In Italy, according to data from the Register of Companies in 2018, there are about 8,900<sup>24</sup> innovative start-ups. The Italian Fintech companies, in 2018 have attracted the interest of the investors: according to the data available on the net and reworked, a total of approximately € 198.65<sup>25</sup> million was collected, an amount 4 times higher than in 2017

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<sup>24</sup> Pacino.G “Startup, in Italia sfiorano quota 9 mila: sul podio le imprese di servizi” 2018  
<https://www.corrierecomunicazioni.it/digital-economy/startup-in-italia-sfiorano-quota-9-mila-sul-podio-le-imprese-di-servizi/>

<sup>25</sup> Ghigliani. M “Il Fintech è semplice e parla italiano” 2019  
<https://italiafintech.nova100.ilsole24ore.com/2019/01/15/fintech-semplice-italiano-2018/>

(in which the figure amounted to about € 47.84 million). The number of financing operations seems to remain almost unchanged, but the amounts collected are more substantial, this points out that also in Italy the Fintech companies are solid and mature. According to the ItaliaFintech report, businesses are also increasingly ready for Fintech: data from the Politecnico di Milano tell us that 55% of small and medium-sized businesses also carry out financial activities thanks to mobile phones and 92% via computers. Digital has therefore entered the financial life of Italian SMEs, which prefer digital services for advance payments on invoices (71%) and leasing solutions (66%). Despite this, there is still a lot to do, to bring a lot of information on new forms of innovative finance such as crowdfunding.

Italian FinTech becomes a market and opportunities for collaboration with the traditional financial sector open up to defend themselves from the growing competition of Big Tech. To give an idea of the sector's growth, it is useful to mention a short extract from the report of the FinTech Observatory Politecnico di Milano 2018, which stands: "11 millions of Italians (or 1 in 4) have used at least one FinTech service in 2018, and were satisfied with it: mobile payment services are particularly welcome, services to manage personal and family budget as well as services for instant money transfers between private, or insurance services such as digital claims management and micro-policies".

In evaluating the FinTech realities in Italian market, it is necessary to adopt specific criteria to be taken into consideration since there is no univocal definition of FinTech, and many realities are located between different sectors and many segments. Therefore, we distinguish two macro-areas of classification of the Italian FinTechs, depending on the specific activity it mainly carries out. We can distinguish between:

- Pure Financial Companies, all the "FinTech" in the strict sense, that operate in typical areas of the value of Financial companies (Payment, Money Management, Lending, Wealth & Asset Management, Capital Market)

- Other companies operating outside the chain, which are proposed on the market with an innovative and interesting offer for the financial world (InsurTech, RegTech, Cybersecurity).

According to the data provided by the Fintech Italia Observatory<sup>26</sup>, the first evidence shows how the population of the companies FinTech monitored at the end of 2018 reached 299 companies. However, the growth compared to the previous period is more than significant (+ 27%), a demonstration of how even in our country the FinTech is catching on, with companies offering increasingly "intelligent" and interactive services. In December 2018, there were 180 "Financial Pure" Start-ups up to more than 15% compared to the 2017 survey. Capital Market and Money Management were the areas that enjoyed the highest growth, reaching 13% and 11% respectively of the companies in the sector. It therefore emerges how the digital transformation process is able to create new business processes and functions to be added to those not yet digital. The Payment and Lending areas remain stable as is shown in the PWC report in proportion (20% and 15% of the Financial Pure), while contractions in the sectors are measured of Wealth & Asset Management (20%) and the Other Crowdfunding (21%). Therefore, the evolution of Financial Pure at the moment shows an increase in the Capital Marketing & Trading segment together with Money Management. As regards the Payment and Lending segment, the situation is stagnating, while the Crowdfunding and Wealth Asset Management segment decreases.

Based on an analysis conducted in 2018 by Abilab<sup>27</sup>, more than half of Italian banks is engaged in the development of innovative projects in the payments sector. Security issues follow (over 35% of banks) and investment and loan platforms (over 20%). In terms of tested technologies, more than a third are active on Big data analytics, blockchain, Distributed Ledger Technology (DLT) and artificial intelligence, a fourth favors cloud computing initiatives and the digitization of traditional services.

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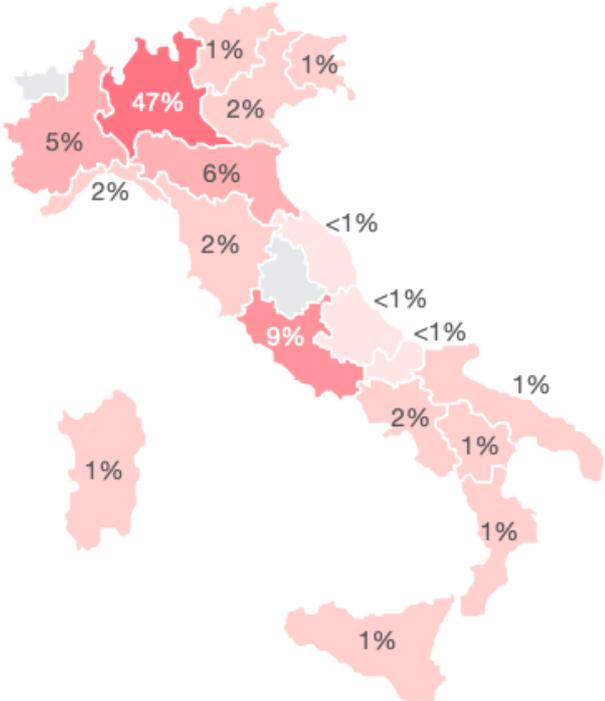
<sup>26</sup> PWC "Piccole FinTech crescono con intelligenza" 2019 (seconda edizione)  
<https://www.pwc.com/it/it/publications/assets/docs/PwC-FinTech.pdf>

<sup>27</sup> <https://www.abi.it/Pagine/news/BancheeFintech.aspx>

As Matteo Rizzi, founder of the Fintech Stage Festival, underlines in an interview given to Risk Compliance TV in June 2019<sup>28</sup>, Italy is slightly lagging behind both in terms of investments and in terms of innovation in financial services. But he claims that Italy is recovering quickly, if you look at what has happened in the last 24 months, with the arrival of new capital to invest, the sector has accelerated in this direction and these factors are fundamental ingredients for innovation.

As we can notice from Figure 2, the geographical distribution of Italian FinTechs shows an important concentration of FinTech in Lombardy (47% of the total), and in a particular way in Milan, which alone, with 120 activities, weighs about 40% of the sample. Outside of Lombardy the scenario shows a strong dispersion on the whole national territory, with the partial exception of Lazio, which has 9% of all national FinTechs, mainly in Rome. An approach of openness and drive towards technological innovation applied to processes and organizations, will allow companies to expand and continue to compete in the future.

**Figure 2 - The distribution of FinTech in Italy**



Source - PwC – NetConsulting cube: Osservatorio FinTech Italia 2019

From a recent study by Assintel Report 2020<sup>29</sup>, analysing the distribution of spending on the national territory in 2020, the projections indicate that 34.6% of the investments will be channelled into the macro-geographical area of the North West which will play the main role in terms of contribution. The Centre, with 8.6 billion euros, will generate 27.2%

<sup>28</sup> Rizzi. M “Lo stato attuale del Fintech in Italia” 2019 <https://www.youtube.com/watch?v=MMWFrWOZths>

<sup>29</sup> ASSINTEL, “Il mercato ICT e l’evoluzione digitale in Italia”, 2019 <https://d110erj175o600.cloudfront.net/wp-content/uploads/2019/10/assintel2020.pdf>

of the national ICT total, and centralized management of the expenditure of public institutions.

The North East will close 2020 with 21.6% of the total Italian ICT expenditure, with 6.8 billion euros. Investments in this geographical area will mainly be supported from Emilia Romagna and Veneto. The remaining 16.6% of national ICT expenditure will be generated by the Southern and Southern Regions Islands. Campania and Sicily are the subjects that will have the greatest impact on the result.

## **2. Accelerators and innovation systems**

### **2.1 Digital transformation and organizational dynamics**

The impacts of digitalization are transversal within companies and, in addition to system innovation, it improves relations with customers and the market. The creation and efficiency of internal processes are also helping to change organizational models and the demand for skills. Although, as emerges from the IDC survey, the corporate priorities relating to organizational changes still remain in the background compared to the others. Companies today are more aware of the fact that in order to drive a digital transformation that is truly pervasive, the organizational set-up must also evolve towards an agile model, based on innovation drivers and new skills. From what we read in Assintel Report<sup>30</sup> from 2019 based on the evidence of the survey conducted by IDC<sup>31</sup>, in 2018 one in four companies has already detected impacts on their organizational models: of these, most declare the establishment of new relationships between the IT area and business. International companies are preparing to invest significant resources in technologies and services to enable the digital transformation of their products and services and adapt to a new business model. "Worldwide digital transformation technology are expected to

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<sup>30</sup> ASSINTEL "Il mercato ICT e l'evoluzione digitale in Italia" 2019 <https://www.assintel.it/osservatori-2/assintel-report/assintel-report-2019/>

<sup>31</sup> Businesses Will Spend Nearly \$1.2 Trillion on Digital Transformation This Year as They Seek an Edge in the Digital Economy, <https://www.idc.com/getdoc.jsp?containerId=prUS45027419>

invest more than \$6 trillion<sup>32</sup> in the next four years," said Eileen Smith, vice president with IDC's Customer Insights & Analysis group. "Strong DX technology investment growth is forecast across all sectors, ranging between 15% and 20%, with the financial sector forecast to be the fastest with a compound annual growth rate (CAGR) of 20.4% between 2017 and 2022."<sup>33</sup>

Today, IT is increasingly playing a consultative role, able to understand the needs of the different business lines and to collaborate in translating them into technological solutions to meet different needs. A role, therefore, that of IT, increasingly of internal partner and enabler of innovation. The creation and introduction of new skills has a decisive impact on Digital Transformation projects and initiatives: the speed of technological changes is in fact placing a strong pressure on the demand for professional profiles and talents with adequate skills to support international and Italian companies in the digitization process. Companies are adapting and are aware of the need related to the recruitment, training and retention of profiles with skills in development, implementation, management and support for IT and digitalization strategies. In general, what emerges from the survey is that the impacts of Digital Transformation initiatives and projects on the internal organization are more evident in large companies than in smaller ones. In fact, more than half of the Large Enterprises have recorded impacts, both in terms of creation and / or introduction of new professional figures, both as regards the creation of new departments or corporate functions and for new relations between IT and other departments. As IDC Report point out "The fastest growing technology categories will be IaaS (35.9% CAGR), application development and deployment software (26.7% CAGR), and business services (26.5% CAGR)"<sup>34</sup>. The larger companies are starting a path towards greater organizational agility, with the aim of reducing both too hierarchical structures or too rigid processes, and to reduce response times to innovations and thus increase adaptive capacities.

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<sup>32</sup>Businesses Will Spend Nearly \$1.2 Trillion on Digital Transformation This Year as They Seek an Edge in the Digital Economy, According to a New IDC Spending Guide <https://finance.yahoo.com/news/businesses-spend-nearly-1-2-123000959.html>

<sup>33</sup> <https://www.idc.com/getdoc.jsp?containerId=prUS45027419>

<sup>34</sup> <https://www.idc.com/getdoc.jsp?containerId=prUS45027419>

These trends are also confirmed in the Assintel 2020<sup>35</sup> report, which analyses the Business Consulting and Business Process Outsourcing Market in Italy 2018-2020.

Taking into consideration what we read in the report the expenditure of Italian companies for Business Consulting Services (Strategy Consulting, Finance & Accounting Consulting, GRC (Governance, Risk, Compliance), Audit Consulting, Organizational Consulting) continues its positive moment in the 2018-2020 interval, with growth of over 6.2% which will bring the value is close to 2.3 billion euro at the end of the period.

The digital transformation of a company is certainly an expression of a social and cultural evolution that is pushing towards the affirmation of new forms of employees also within companies. Companies will focus on investing in the digital capabilities of their human capital as a prerequisite for the development of long-term competitiveness. In response to the transformation, the most critical challenges imposed by digital transformation can be the resistance to digital change by employees of companies. The lack of adequate professionalism within the company to face the digital transformation will increase the need for new professional skills and the development of new soft skills. Other aspects that companies will have to face are the need to develop a corporate culture in line with the work and competitive paradigms of the digital economy.

In this case, the planning and recovery of adequate resources to invest in digital technologies can be crucial in order to face the new challenges in the digital era.

## **2.2 What skills for digital innovation**

Going deeper into the issue relating to the request for new skills related to Digital Transformation, it is interesting to analyse the strategies that companies are implementing to deal with what is often perceived as a real lack of adequate professional profiles. From the research conducted on the Italian market, a clear focus of the companies emerges, above all towards the internal training of the resources already present in the company, through upskilling and reskilling processes. Based on the evidence of the IDC research for Assintel 2020<sup>36</sup>, 60% of the total in 2019 of the Italian

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<sup>35</sup>ASSINTEL, “Il mercato ICT e l’evoluzione digitale in Italia”, 2019  
<https://d110erj175o600.cloudfront.net/wp-content/uploads/2019/10/assintel2020.pdf>

<sup>36</sup> ASSINTEL, “Il mercato ICT e l’evoluzione digitale in Italia”, 2019  
<https://d110erj175o600.cloudfront.net/wp-content/uploads/2019/10/assintel2020.pdf>

companies interviewed declares that they are in a difficult situation due to a shortage of digital skills. The sector that is facing a shortage of digital skills is the Finance sector, as is highlighted in the IDC report, a very high percentage of companies who declare that they have difficulties related to skills shortages by employees and the difficulty of find qualified employees almost 70%. To better manage digital change within companies in all sectors, a mix of diversified skills ("hybrid skills"), from the softer ones, which include the ability to use IT tools in everyday work, to specialized ones, that is, advanced technological skills in the different areas of ICT. In addition to this, the Digital Transformation also requires a greater cross-functional attitude, to encourage collaboration between departments of different companies and even between different organizations.

According to research data, in 2019 the priority technological areas in which Italian companies experience a greater shortage of specialist skills are mainly those of Cyber Security, Cloud and Mobile, to which is also added the Big Data & Analytics area and, to a lesser extent, the Internet of Things for Large Enterprises. These areas are therefore the main ones in which it is necessary to hire or train resources. Cyber Security and the Cloud emerge as two areas criticism for all company sizes. The growth in the number of cyber-attacks at an international level and their greater sophistication are helping to push IT Security to the top of the list of strategic business and technological priorities and to direct investments on advanced and innovative solutions. The shortage of security talent is also contributing to a rapid increase in the average wages of these professionals. The most sought profiles in the Security area, they are those of Cyber Security Specialist, Cloud Security Architect, Cyber Risk Manager, Security Developer: that is, professionalism capable of identifying cyber risks and threats, assessing and protecting the vulnerabilities of corporate networks and systems.

The Public Administration sector (including Healthcare and Education) is predominantly oriented towards the use of external suppliers and outsourcers. From what emerges from the research of the Digital Agenda Observatory of the School of Management of the Polytechnic of Milan<sup>37</sup>, in 2019 the number of Italian public administrations that activated structured Smart Working initiatives doubled compared to 2018, from 8% to 16%. But

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<sup>37</sup> Osservatori.net "Italia digitale: la "macchina" è pronta a correre?" 2019  
[https://www.corriere.it/DATAROOM/AD\\_Report\\_2019.pdf](https://www.corriere.it/DATAROOM/AD_Report_2019.pdf)

only 23% of the projects in the public sector are fully operational, 32% are being extended and 45% are being tested. The Public Administration, however, is characterized by a high percentage of entities that focus on internal training programs.

The areas of Big Data & Analytics and the Internet of Things are indicated almost exclusively by large companies, which more than others have already started projects in these areas, to innovate processes and products and to enhance the huge amount of data available. Projects in the Big Data area aim to make business activities more effective by exploiting data of different nature both within the company systems and from external sources. The most critical professional profiles are those of Data Scientist and Data Engineer. Data Engineer play a strategic role as it possesses the skills and capable of making the data usable and available, guaranteeing its quality and usability. Data Scientists, on the other hand, are those who extract information and value from data analysis, translating them into knowledge for business.

Mobile skills play a role of primary importance especially for the finance sector, which in fact today bases a large part of its business on the offer of services and products through mobile applications. The continuous development and updating of applications, therefore, is a fundamental business priority. Mobile skills it is vital for banks to offer high-performance products that are always accessible, developed and managed by expert and specialized resources.

According to IDC research data the main strategy adopted by Italian companies to manage and overcome the difficulties linked to the lack of digital skills is to undertake internal training, reskilling and upskilling programs for employees. This strategy is indicated by 44% of companies experiencing difficulties related to skills shortages. Often, training programs promoted by companies they concern volunteers, who within the company themselves feel the need to update their knowledge, or who have the aim of achieving certifications that can help improve their skills. In this scenario, the Human Resources function within companies is playing a role of primary importance, especially for the management and development of staff, with the aim of ensuring better productivity and efficiency. Companies where skills shortages digital is very marked, but they can run the risk of a growing and high dependence on external suppliers. Being dependent on external factors may in some cases lead to possession a very high bargaining power and to possess strong "know how" on some critical processes of the companies. The search for and recruitment of new staff ranks third among the activities undertaken by companies to

respond to the "skill gap", indicated by 21% of companies. In this case, the decision to introduce the missing skills directly from the labour market is much more difficult, since it is a question of incurring fixed costs which affect the profitability of companies.

### **2.3 Start-up open innovation**

The topic of innovation management presents itself with a wide range of possible alternatives. From formal research and development activities to more contingent processes of reengineering and adoption of solutions from outside. There are multiple choices and different from each other from formal acquisition through patents and licensing tools, to joint with companies specialized in technological innovation to collaboration with innovative startups. As indicated in the Assintel 2019<sup>38</sup> report, only 23% of Italian companies say they manage innovation through a formal and structured research and development process within the company. About 13% of companies rely on sector operators and companies with a specific mission on innovation. The practice of collaborating through ecosystems and online platforms (crowdsourcing, co-innovation platforms) is also very promising, involving about 10% of companies.

An interesting emerging phenomenon, although still marginal as a whole, is the collaboration with start-ups to accelerate innovation in the company. The perception of Italian companies with respect to start-ups, there is considerable interest on the part of large companies, especially with regard to the issue of potential acquisitions. Very often it represents the best strategy to reduce time-to-market compared to the internal development of new technologies. Start-ups appear more interested into process innovation rather than innovation of a product or service.

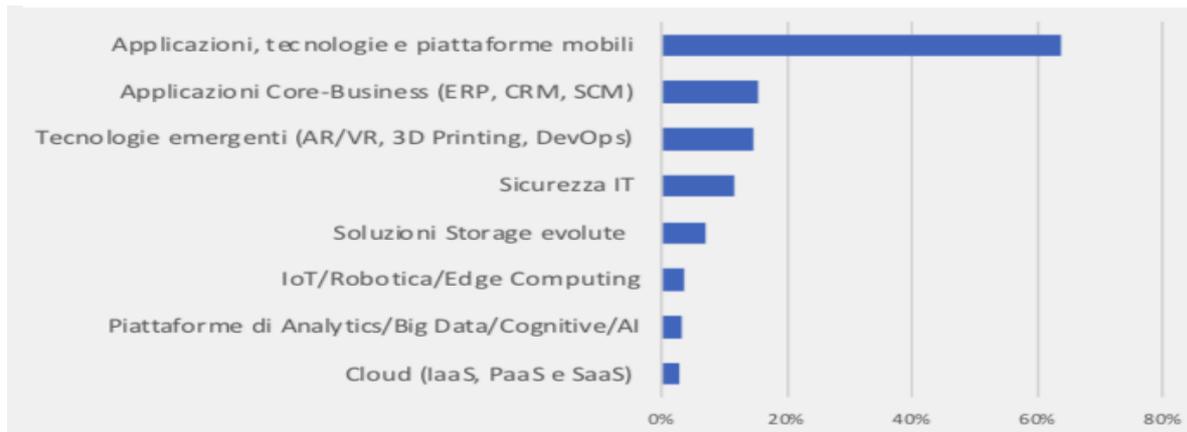
The report highlights that the world of finance shows the greatest dynamism in the scouting of innovative start-ups (almost 50% of companies), while manufacturing is among the most distant sectors around 7%. Most Italian companies (over 60%) rely on start-ups especially when it comes to tackling innovation projects on the topic of mobile technologies (platforms and applications) or on the renewal of core business applications

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<sup>38</sup> ASSINTEL "Il mercato ICT e l'evoluzione digitale in Italia" 2019 <https://www.assintel.it/osservatori-2/assintel-report/assintel-report-2019/>

(ERP, CRM, Supply Chain Management) about 15%. Over nine out of ten companies in the financial sector are essentially interested in projects related to mobile platforms and technologies and infrastructure technologies that guarantee better data access performance (in particular, advanced technologies). The Figure 3 highlights the main area of collaborations.

**Figure 3 – Collaboration with start-ups for digital transformation projects by business class**



Source – Survey IDC per Assintel Report 2019

When it comes to establishing a stable collaboration on complex topics related to innovation and digital transformation, Italian companies encounter very common obstacles in dealing with start-ups: in over 35% of cases, companies express a specific difficulty in finding start-ups with technologies that respond concretely to business needs, especially among the realities of Services and Commerce.

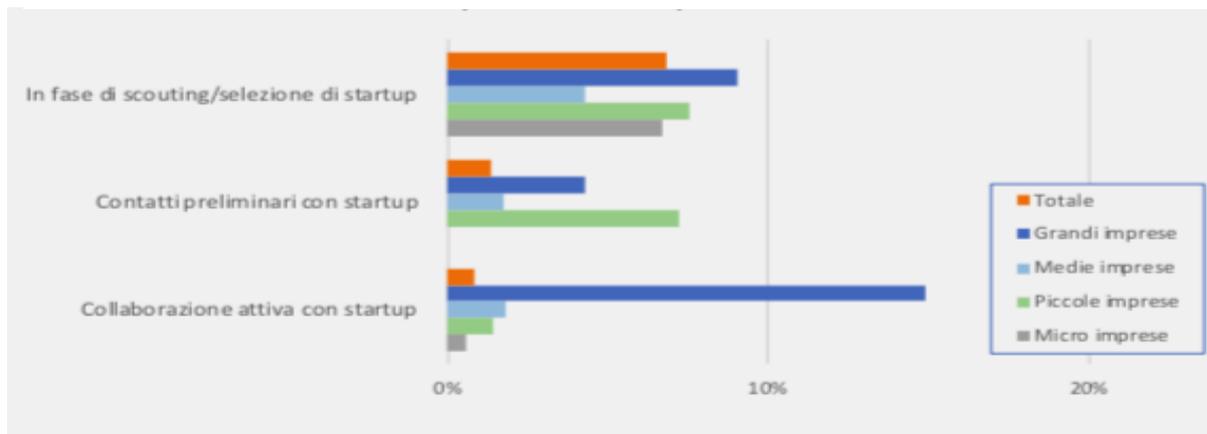
Start-ups remain among the main innovation partners. The interaction between businesses and the national innovation ecosystem, which includes both traditional Information and Communication Technology players and innovative start-ups, is of fundamental importance for successfully undertaking transformation and digitization strategies.

According to the data from the Osservatori<sup>39</sup>, Digital Transformation Academy highlights a phenomenon that is already a reality among large companies: 73% have started Open Innovation initiatives and about two thirds have started collaborations with start-ups (35%) or are planning to do it (27%). While SMEs are still lagging behind, among which

<sup>39</sup> [https://www.osservatori.net/it\\_it/osservatori/comunicati-stampa/impres-investimenti-digitali-open-innovation-collaborazioni-con-startup-comunicato](https://www.osservatori.net/it_it/osservatori/comunicati-stampa/impres-investimenti-digitali-open-innovation-collaborazioni-con-startup-comunicato)

only 28% adopt open innovation practices and just 4% work together with new innovative companies. Companies act on their organization to improve their ability to innovate. To do this in the best way, organizations are introducing dedicated roles, the Innovation Managers, who today are primarily required to intercept new opportunities, develop hidden talents and push for radical cultural and mental change, spreading a model in which everyone is an entrepreneur and contributes to the innovation. In Figure 4 is highlighted the main technological areas of collaboration with start-ups.

Figure 4 – The Technological areas of collaboration with start-ups



Source – Survey IDC per Assintel Report 2019

According to study conducted by Osservatori, over six out of ten large companies see start-ups as an interlocutor for the development of digital innovation. In particular, 35% already collaborate with new innovative companies, 27% intend to do so in the future. In most cases, large companies use start-ups as spot suppliers (51%), but a large part use them as research and development units (37%) and as long-term suppliers (30%). The start-up can also be a commercial partner, part of an incubation program, partner for the co-creation of business models. The main benefits are the possibility of accessing new frontier technologies and knowledge, the possibility of testing innovation with an initial pilot project, with defined times and budgets and therefore reduced risks and the opportunity to enrich its offer system and open up to new markets.

### 3. Case study – MF CentraleRisk

#### 3.1 Study Method

After a detailed study of the growing development of FinTech technology both at Italian and International level, as a natural consequence I thought appropriate to integrate the thesis with the direct testimony of an Italian startup in FinTech industry, specifically MF Centralerisk a FinTech of the Group Classeditori.

The main purpose is to understand how the firm is addressing the issue of digitalization and which technologies it invests to improve its customer experience and the services it delivers. Secondly, this study aims to understand how the SME itself perceives the services and FinTech technology in general: a threat to its business or an opportunity to create profitable partnerships?

The methodology chosen to answer these questions is the case study which represents an effective tool for analysing a specific reality. In general terms, the case study is a qualitative methodology, based on the in-depth examination of a single example in details of an entire class of phenomena. In this case study the focus is not oriented so much to the definition of the example and its general characteristics, but rather to the analysis of every single detail of a phenomenon. The approach that it was used is summarized in the following Table 1.

**Table 1 - The phases of the case study**

<b>PHASE</b>	<b>APPROACH</b>	<b>SPECIFICATION</b>	<b>CONTRIBUTION</b>
<b>I</b>	Public available documents and articles.	Collection of public available documents. Collection of internal documents.	Exploring and analyse how the business model components of FinTech are designed. Reflecting on theoretical background. Identify focus area for the interviews.
<b>II</b>	Conduct semi structured interviews, direct observation, collect customer feedback.	Meetings and interview with Marketing manager, Technical assistant, feedback from customers, additional information gathered from Demo.	Conduct in-depth exploration of the available documents based on findings and conclusions. Identification and exploration of the business model innovation strategies which contributes for the basis of the business model components.

In this specific case study, the data may come from different sources: documents, archival reports, interviews, direct observation, participant observation, object analysis.

The main source for the development of this case study was the semi-structured interview with Mrs. Deiana Federica, Marketing Manager of MF Centralerisk as well as a member of the digital innovation team of the MF NOCrisi. The interview is dated 30/12/2019 and lasted for about one hour during which many questions were asked regarding the main activities of the firm and other specific questions were asked to Mr. Lorenzo Ferrari Senior Assistant and Development Manager.

The first three questions were introductory and aimed at getting to know better the firm and its core business. The first question was addressed to know the composition of the customer portfolio. The scope of the second question was to understand the use of service by the same customers (operations, utility, development trend). The third question was aimed at understanding which technologies the company was currently investing in. The fourth concerned the introduction of the Directive or Legislative Decree n. 14 of 2019, containing the "Code of business crisis and insolvency". Finally, the fifth and sixth were related to the perception of the FinTech start-ups and the big players in the IT sector who are starting to operate in the financial sector. Given the growth of IT services in the financial sector, an on-cloud platform has been developed that allows companies, professionals and individuals to be able to analyse their riskiness towards the national credit system in a few seconds.

In addition to the material collected during the meeting, I was able to take advantage of data provided by the same bank as well as articles present on online newspapers.

### **3.2 The object of study**

The "MF Centralerisk", a subsidiary of the Class Editori group started its activity in 2016 precisely on May 16<sup>th</sup>. Since then through the software made available by the company on the web site [www.mfcentralerisk.it](http://www.mfcentralerisk.it), it is possible to require the analysis of the own risk with respect to national banking system.

#### **What it is used for:**

- To compare the "Group" data shown in "centralerisk" with the data of the consolidated financial statements.

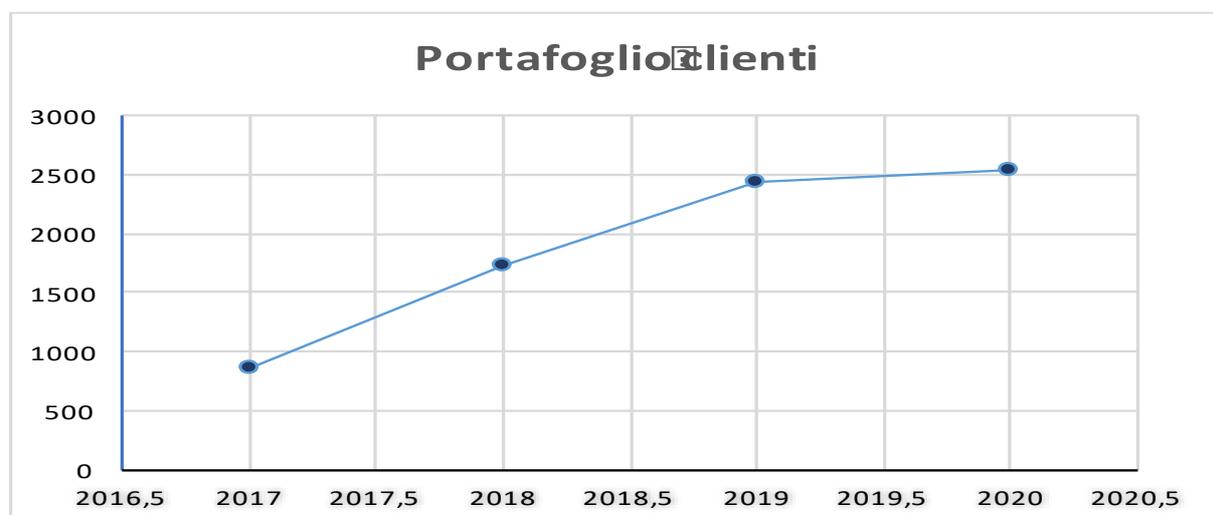
- To draw up credit lines by type of guarantees issued to the institution, grouped by company or by bank.
- To highlight: the overall guarantees given to the Banks, the Intra-group guarantees
- To highlight the guarantees given or received, Extra Group.
- To obtain a C.R. analysis of the entire "Group"
- To obtain overall Scoring of the company

### Who is it for?

- To companies with associates or subsidiaries
- At the holding companies
- To CFOs at the head of company groups
- To the Administrative Managers
- To Consultants

The company has two branches, the headquarters are in Milan and the operating branch in Treviso. The two branches have 2 directors, 9 employees and 6 commercial agents. Its client portfolio is made up of 3% of individuals and the remaining 97% of companies. Currently our client portfolio is 2,500 clients divided between private individuals, small and medium-sized enterprises and corporate groups.

**Figure 4 – Customer portfolio**



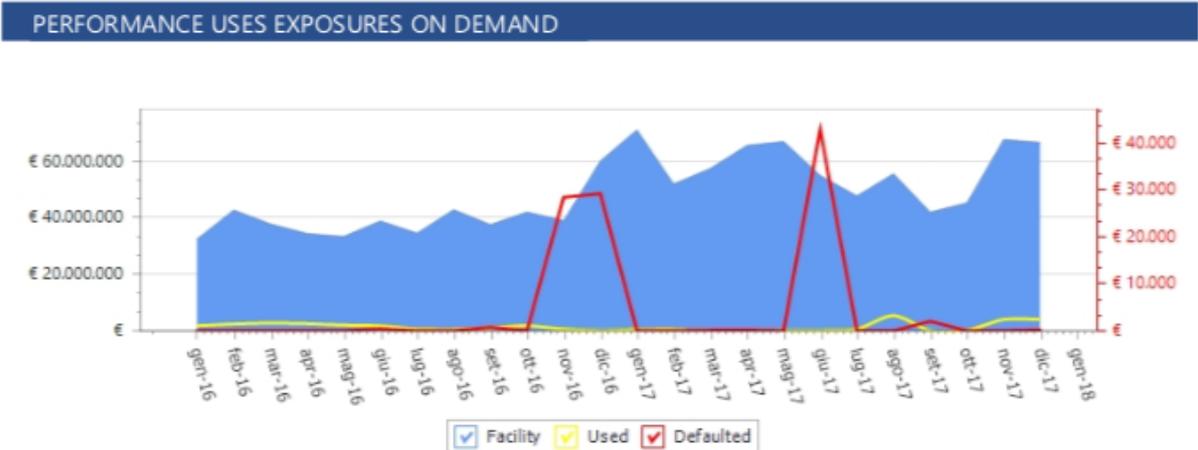
Source – [www.mfcentralerisk.it](http://www.mfcentralerisk.it)

Of these, 72% is represented by SMEs while the remaining 26% by large companies and 3% by private individuals. Despite its size and presence on the national territory, it has always been very attentive and ready to catch all the innovations deriving from digital innovation. We are the first company in Italy to have created an on cloud monitoring system active 24/24 hours a day and 7 days a week. MF Centralerisk customers have a complete service at their disposal, which they can access both from a PC and through the appropriate App for smartphones and tablets at any time of the day. Currently the

percentage of customers who are monitoring the service from PC is 93%, about half have activated the service also on their smartphone and tablet by downloading the MF Centralerisk notify app to receive notifications in real time. These percentages are continuously growing, registering new activations every week.

As pointed out by Mrs. Deiana, “banks are by far the main source of credit supply for Italian companies, with percentages between 85-90%. It is for this reason that the ultimate goal of our company is to facilitate the financial system by supporting the customer to keep his credit lines in order and making life easier for credit institutions to grant new credit lines”. See the Figure 6.

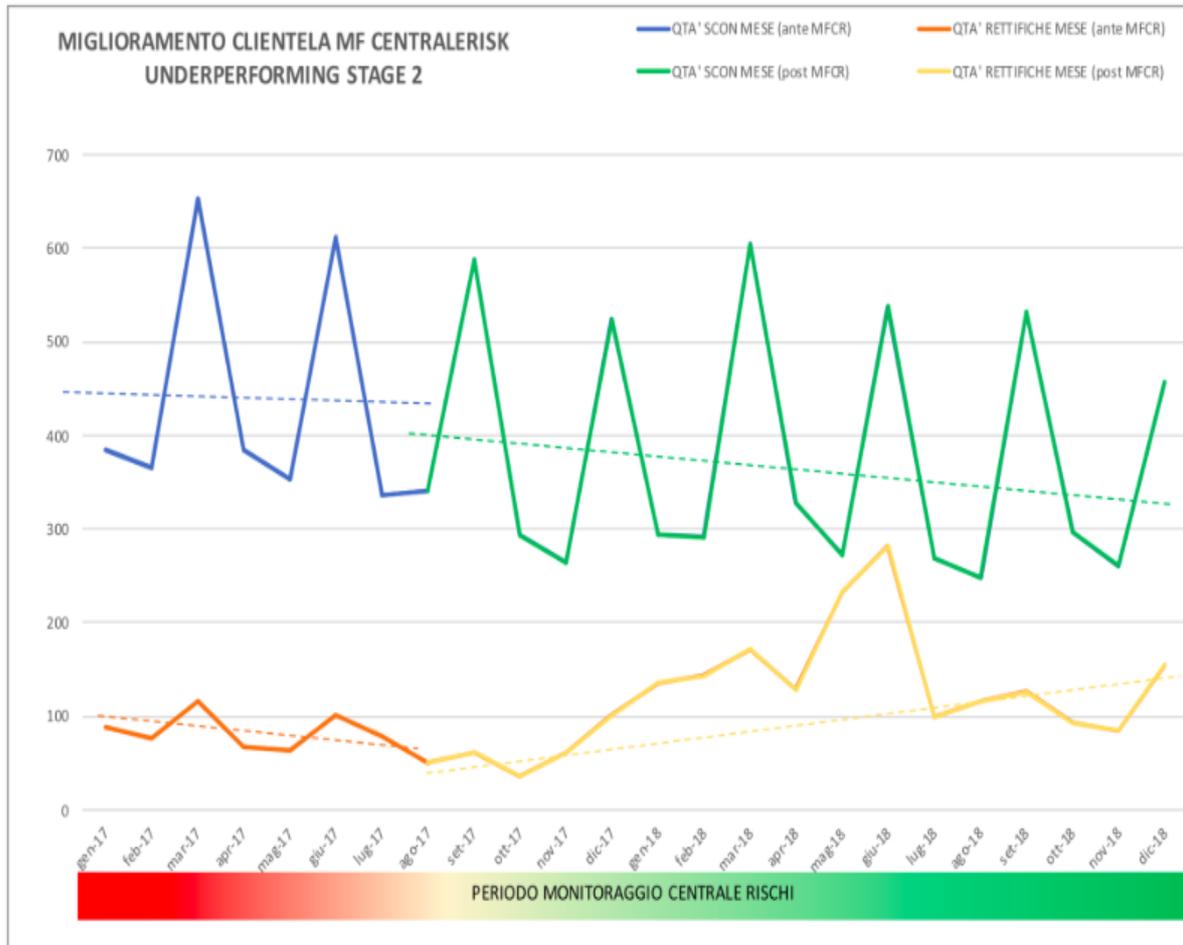
**Figure 5 – Performance uses exposures on demand**



Source – [www.mfcentralerisk.it](http://www.mfcentralerisk.it)

Moreover, from an internally conducted study on aggregated data, it was found that constant use of MF Centralerisk services can reduce the trespassing reported by over 35%, see Figure 7.

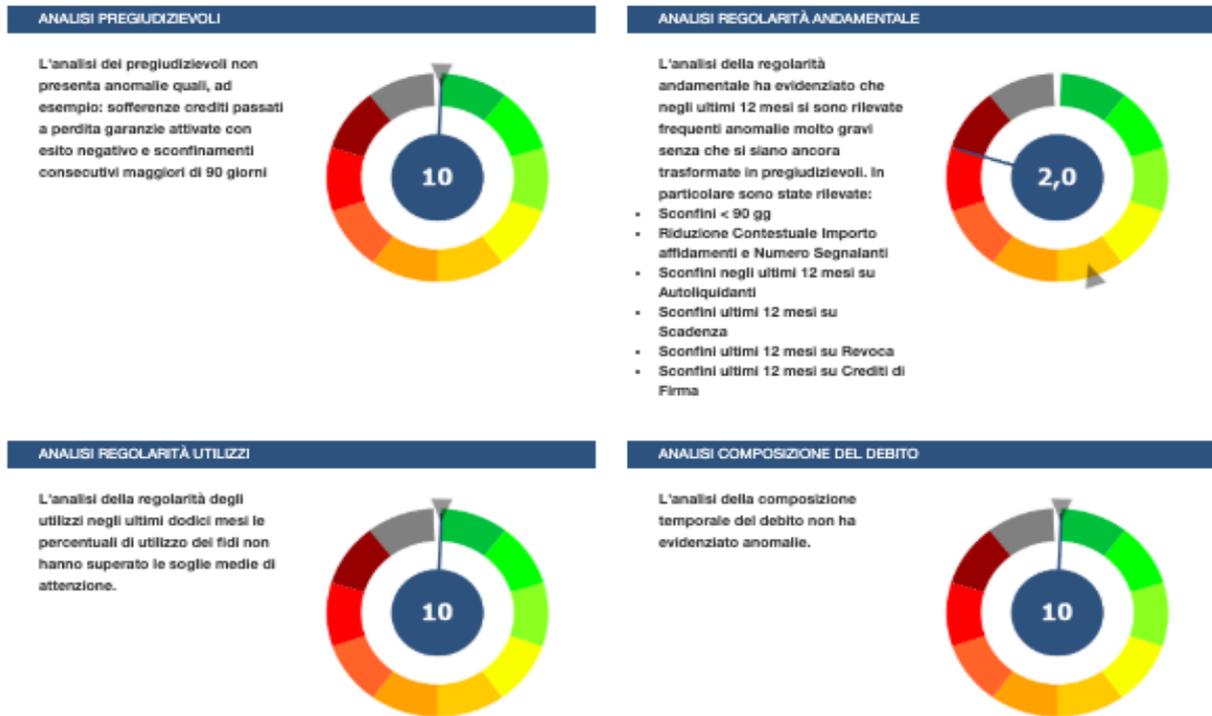
**Figure 6 – Aggregated trespassing signals**



Source – [www.mfcentralerisk.it](http://www.mfcentralerisk.it)

All these benefits bring an objective improvement both on the corporate rating of customers and on the ratios of the lending banks. Figure 8 shows the parameters used to determine the final Score of a company.

**Figure 7 – Parameters used to determine the final Scoring**



Source – [www.mfcentralerisk.it](http://www.mfcentralerisk.it)

In addition to its innovative character, the MF Centralerisk is a significant example in the analysis of the phenomenon of digital innovation also for its constant contact with the various banking institutions to offer its customers the best possible services.

In fact, the company has been collaborating for 3 years with “Credito Valtelinese”, credit institution, and recently also with “BPER” to develop ad hoc tools for its customers to meet their business needs. Also in this case, the common goal of both companies and banks is to create a credit control system in order to monitor credit risk.

### 3.3 The new digital solution

Before going into the details of the next project proposed by the company, it is necessary to premise that the solutions adopted and the services proposed by MF Centralerisk, as part of the Class Editori Group, always refer to a group strategy. Having said that, MF Centralerisk has always been characterized by a strong orientation towards digital

innovation and this has allowed it to be the first FinTech in Italy to provide avant-garde tools for financial analysis.

The idea of the new MF NoCrisi service was born following the legislative decree (Legislative Decree 14/2019) which introduced the duty from March 2019 for national companies to adopt an alert system and follow purposeful procedures aimed at anticipating the identification of a possible crisis. As stated in the official journal, the entrepreneur and the supervisory bodies are required to constantly monitor the financial situation, in search of warning signals based on a series of indicators identified by article 13 and by the National Order of Accountants. The control body must carry out a review of the indices at least once every three years: a delicate task, given that too sensitive a mechanism risks generating a very high number of false positives and routing companies that are actually healthy towards the composition. In the hierarchy provided for in the article, a presumption of the state of crisis occurs if a negative equity situation is found. Secondly, when the DSR (Debt service cover ratio) at six months is less than 1, that is, when the company does not produce sufficient income to cover the debts that presumably will have to be faced in the same period.

Thirdly, the control body has defined five indices with different thresholds according to the sectors of activity: in this case, the state of crisis is presumed when they are all overcome.

If the values are out of the norm, the entrepreneur or one of the control bodies must trigger the so-called internal alert: first by calling into question the corporate administrative body to take the appropriate measures and notify the situation to OCRI (Composition Body business crises) in case the problem persists. Intercepting the signs of crisis in time, especially when there is no obvious symptom and even the turnover does not seem to be shaken, it is possible to constantly keep under control the key indicators. Intercepting the signs of crisis in time, especially when there is no obvious symptom and even the turnover does not seem to be shaken, it is possible to constantly keep under control the key indicators.

The commitment for companies to adopt an adequate organizational, administrative and accounting structure aimed also at monitoring the health of the company and recovering economic and financial balances. Thus was born the idea of developing a useful tool for all companies to fulfil the legal obligation and safeguard their financial situation.



*Source – [www.mfcentralerisk.it](http://www.mfcentralerisk.it)*

MF NOCRISI is an on-cloud monitoring platform, able to Intercept the indicators of a possible corporate crisis and reporting to supervisory bodies through an alert.

The MF NOCRISI alert system provides monthly check for signs of crisis, updating the base data without the aid of manual activities. Plot of expected flows and alert system projects the data collected, updating the verifications of the future sustainability of the commitments.

The alert system allows its clients to process constantly and automatically the possible crisis indicators covered by the legislation: anomalies on the financial statements filed, anomalies in relations with banks and other financial entities, anomalies in payments to commercial counterparties, presence of personalized prejudices and a general view of the company trend.

Moreover, the alert system automatically processes future projections on the monthly data entered, allowing the administrative body to be able to endorse or modify a forecast already present for the certification of balance and business continuity. The advantages are obvious, first of all it provides the administrative body and the entrepreneur with a valid instrument for protecting and fulfilling an obligation. It gives way to the control body or auditor, to verify the adoption of tools and to automatically monitor crisis indicators and indications. It integrates the MF Centralerisk platform for monitoring data in the Central Credit Register and improving its bank scoring.



Source – [www.mfcentralerisk.it](http://www.mfcentralerisk.it)

The main advantages, as Mrs. Deiana points out, are “the fact that it allows the administrative body and the entrepreneur to protect himself by complying with his own obligation.

In addition to this it gives way to the control body or auditor, to verify the adoption of tools and automatically monitor the signs of crisis. It integrates the MF Centralerisk platform for monitoring data in the Central Credit Risk analysis and helps to improve the banking standing score”.

The MF NOCRISI alert system, through automatic import of the balance sheet and the results from Central Risk analysis, automatically calculates the Crisis Indices covered by the legislation pointing out:

- Net assets
- Financial Charges Sustainability Index
- Capital Adequacy Index
- Liquid Return Index of the Assets
- Liquidity index
- Social Security and Tax Debt Index

The MF NoCrisi service as Mr. Ferrari points out “has already been offered to our first customers to approximately 10% of our existing clients portfolio in the experimental

phase. In the next 6 months, we plan to expand it to our entire customer portfolio by August 2020”.

APR 2019	MAG 2019	GIU 2019	LUG 2019	AGO 2019
✓	✓	✓	✓	✓
⚠	⚠	⚠	⚠	✓
✓	✓	✓	✓	✓
✓	✓	⚠	✓	✓
⚠	✓	✓	✓	✓

Source – [www.mfcentralerisk.it](http://www.mfcentralerisk.it)

As specified in Article. 389, paragraph 1, of Legislative Decree January 12, 2019, n. 14 provides that the Code of Business Crisis and Insolvency will enter into force overall after 18 months from its publication in the Official Journal.

If, therefore, the deadlines are respected, the reform will enter into force on 14 August 2020 and the supplementary and corrective legislative decrees must therefore be issued by 14 August 2022. The basic concept is precisely this: constantly monitoring the situation is the safest strategy for intercepting the signs of crisis.

**3.4 Customer experience**

MF Centralerisk is a B2B FinTech company that provides its customers with cutting-edge financial and monitoring services. The model of the business is designed as customer centric. Dealing with customers in a B2B environment is not an easy task. Many components which are normally used to raise up the real value for the customers may not be used, therefore it may not be perceived as a suitable tool for their business.

The automatic monitoring service sends monthly alerts to the user whenever an event worthy of the attention of the financial director occurs. In the event that there are no abnormal events, the system does not send any alerts. In this case the user may not perceive the real value of the analysis.

MF Centraleisk has a very specific objective, that is to simplify the task of the financial director and put at his disposal only a few but very effective analytical tools. Given that sometimes there might be no reports during a period of time, it can lead to think that the customer has no longer need to monitor his own activity. The company focuses all its attention on those elements able of making a positive impact on the business activities of its customers. The value of the service is summarized in Table 2.

**Table 2 – Value of service**

<b>TANGIBLE VALUE</b>	<b>INTAGIBLE VALUE</b>
Investment cost	Online service and assistance 24/7
Documentation and Authorization	Digital signature for Authorization
Savings	Time to dedicate to core business
Up to date reports and original files from last 36 months	Generation and customize reports

Moreover, it underlines the fact that the technological contribution of our service has the objective of supporting and supervising the activity throughout its evolution. MF Centrale Risk has repeatedly demonstrated how its service has fully satisfied its customers in many sectors, especially in terms of efficiency, time, money and innovation.

**3.5 Key resources and activities**

To respond to a specific need in a particular segment, of course, a specific activity must be carried out. The main activity is based on data analysis; therefore, it is a data driven vocation. To operate it needs data, with the unique supplier, in this case is Bank of Italy. Customers cannot provide data by themselves, but they can ask their own data directly from their lending banks or Bank of Italy. So a close collaboration with customers is essential to better respond to its need and speed up the process. The focus area is getting quickly and automatically up to data, perform data analysis, and provide charts, tables,

reports and a final scoring to the customers. In order to achieve reliable results analytical techniques are used to provide a final scoring and therefore an important part of the companies rating. Based on the overall scoring and rating, financial officer has a real picture and perception of how the credit institution and banks evaluate the reliability of the company. Generally, banks and credit institutions consider the company's scoring to be fundamental before being able to grant new credit lines or renew existing credit lines. In this perspective MF Centralerisk allocates efficient resources based on customers oriented projects on a very flexible basis. Once a project is completed, the remaining resources are used to R&D activities and other customer projects.

### **3.6 Revenues and Cost structure**

The structure of cost and revenues are financial aspects of overall activities in the business model adopted by the company. In terms of revenues and costs it follows a very lean and accurate approach. The main office is located in Milano close to the group it belongs to. The operative office is located in city centre of Treviso. The office is rented and composed of 4 rooms. One large meeting room where the services are presented to customers and for internal teamwork and conferences. The other 3 rooms are occupied by the personnel in charge for the preparation of documents, testing of algorithms, management of relations with Bank of Italy and other institutions. The main server is located in Milano and is outsourced. To assure continuity of service provided, the back-up server is located in Treviso. All the computers are running on Mac and tests of new implementations are done on Microsoft Windows. The revenues are given by the sale of the service, assistance fees and annual or monthly subscriptions. As the main partner in software solutions it relies on Eulogika, a software house from Padua specialized in providing customized software solutions created for every type of customer.

### **3.7 Business benefits from MF CR platform**

Both the companies and banking system will benefit from a larger pool of customers, enabling them to grow their productivity and service through partnerships. Also, by working through a platform rather than independently, the system offers quality and guarantees high level analysis of data provided directly by banks. This enable an

innovative way to combine data from multiple sources (credit institutions, banks) to achieve higher levels of personalization. Not surprisingly, because Bank of Italy allows Banks and credit institutions to share information about their customers more easily and faster, Italy is ahead to monitor their companies and prevent risks.

As Massimiliano Bosaro, the CFO on MF Centralerisk, points out:

*“We have a credit monitoring system managed by the Bank of Italy which is among the best in Europe. Let’s use it and give importance to our Cr data, the ones that the financial system exchanges every month. We monitor this information monthly with automatic systems, and we give prestige to Italian excellence by bringing a healthy rigor in compliance with the punctuality of deadlines”.*<sup>40</sup>

When we are asked about the benefits our companies expect from using the MF CR service in their business almost all of them have the same rewards:

- Better customer service
- Increase in customer retention
- Expand the number of business partners (banks and credit institutions)
- Lower technology costs
- Lower labour costs
- More time for financial director to concentrate on other issues

Reinforce customer-banks relationships is the best ways to increase loyalty and revenue and decrease risk. MF CR recognize that this relationship is important and become increasingly digital. To keep our clients engaged, MF CR provide efficient digital touch points, that feel just on time and as personal as possible. This drives to create a highly digital experience for costumers.

### **3.8 Conclusion and discussion**

Through the proposed case study, an attempt was made to analyse an Italian company operating in the Fintech sector. The conclusions relating to this case study cannot be generalized to the entire Italian Fintech industry, but they are certainly very significant in

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<sup>40</sup> <https://www.mfcentralerisk.it/analisi/il-vino-buono/>

understanding the trend and business models that are developed. As we have seen, the digital revolution is fully underway and is creating new business models and transforming or replacing the current ones. The company is trying to gather the opportunities that emerge from new technologies to offer the customer an online service capable of satisfying all needs from the point of view of monitoring the financial activity. At the infrastructural level, the branches will continue to be present in the territory at least in the medium term even if they will certainly change their structure and the services offered, transforming themselves into advice centres on financial products and services. In the future they could in fact act as aggregation centres for several innovative start-ups by integrating their operations with a portfolio of different FinTech services. As we have seen, the proposal for new services is already underway and many others are looking forward to the near future. We can therefore conclude that the integration of these two worlds so different but at the same time so similar is not only possible but is already underway and will bring significant benefits for customers. Win-win solutions can therefore be created: large companies in the sector need cutting-edge financial services for a whole series of banking regulations that they cannot bypass. The same banks on the other hand can take advantage of their platforms and their ability to collect and process customer data in order to grasp their needs and then build customized offers. The proposed case study wants to better highlight this aspect and point out how the union between technology and finance constitutes an incentive for the financial sector. Certainly facing changes of this magnitude has not been and will not be easy, especially for those who do not have sufficient resources to adapt to an ever-increasing level of competition. However, digital innovation belongs to any economic cycle, as well as being an essential tool and a pillar for economic evolution, growth and development.

## 4 What Future of Fintech

### 4.1 Financial inclusion

The Italian banking association (ABI)<sup>41</sup> defines financial inclusion as the complex of activities developed to encourage access to banking services for individuals and organizations not yet fully integrated into the ordinary financial system. To give a more detailed definition of financial inclusion is meant access to banking services for subjects who do not have the necessary requirements to access it, for example allowing access to credit even to those who are unable to provide guarantees. At the basis of financial inclusion there is in fact the microcredit that provides loans with reference to the single person and his project based on a relationship of trust between the lending institution and the beneficiary. The term "financial inclusion" means offering to billions of so-called "non-bankable" individuals the opportunity to get out of poverty and become part of the formal financial system, thus participating in global economic life. Greater financial openness in this case is the precondition for a more cohesive society and more balanced growth and development.

According to the Global Findex Database 2017<sup>42</sup>, approximately 31% of the world's population does not have access to financial services, therefore to a bank or other type of institution. It is a form of exclusion that has a great impact on development, because it precludes the individual from accessing the transfer of money, the safe running of a business, credit and many services that are the basis of human development and the ability of the single to get the resources to express their potential.

Financial inclusion worldwide is however continuously growing thanks also to electronic devices and internet connection. According to the latest data provided by the World Bank, males are much more likely to use financial services and open an account than females. Worldwide, about 69%<sup>43</sup> of the adult population have a bank account, this is an important

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<sup>41</sup> <https://www.abi.it/Pagine/Societa/Inclusione-finanziaria/Inclusione-finanziaria.aspx>

<sup>42</sup> <http://documents.worldbank.org/curated/en/332881525873182837/pdf/126033-PUB-PUBLIC-pubdate-4-19-2018.pdf>

<sup>43</sup> <https://www.worldbank.org/en/news/press-release/2018/04/19/financial-inclusion-on-the-rise-but-gaps-remain-global-findex-database-shows>

step to get out of poverty. From 2014 to 2017, in just 3 years about 515 million people opened a bank account according to the report Global Findex.

World Bank Group President Jim Yong Kim said. “Financial inclusion allows people to save for family needs, borrow to support a business, or build a cushion against an emergency. Having access to financial services is a critical step towards reducing both poverty and inequality, and new data on mobile phone ownership and internet access show unprecedented opportunities to use technology to achieve universal financial inclusion.” So being more inclusive and progressive benefits the financial systems themselves. In fact, new consumers who access the formal financial system are going to strengthen national economies and enrich the global economy. In fact, with developing countries heading towards an average income level, financial inclusion is an important factor in the continuity of progress. Financial inclusion therefore also becomes a mission linked to the training of citizens who, despite having an account and having access to the banking system, do not have the tools to evaluate and use daily services. A simple control of expenses through an app, or the management of an online payment, are examples of relatively simple actions that should enter in the common use of the majority of the population. In the future, thanks to Open Banking, consumers will be able to have a much more complete visibility of the services of the banks and have access to an increasing number of information, by embarking on a saving path and having full control of their financial situation. NTT Data<sup>44</sup> has published a report on this trend and found that customers are looking for an increasingly direct relationship with their bank: the trend is that the consumer wants his bank to know his needs and offer him personalized solutions. With technology, this evolution is possible in a market context that sees Open Banking establishing itself as a new paradigm of relationship between Financial companies and customers.

Trying to imagine the evolution of the banking system in the coming years, a leading role could be assumed by the digital personal assistant, a sort of adviser and who could revolutionize the relationship between the Bank and the customer. Guided by the evolution of artificial intelligence, the digital assistant will revolutionize the way of living the bank, helping to improve the customer experience of the banking customer for

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<sup>44</sup> <https://www.nttdata.com/global/en/media/press-release/2019/july/ntt-data-global-study-finds>

efficiency and ease of use. The virtual assistant will, in fact, always be available and can be customized according to customer needs and preferences.

## **4.2 Prospective scenarios on the evolution**

The "digital revolution"<sup>45</sup>, as seen so far, is a phenomenon that challenges any business model and is forcing companies to change faster and more effectively. The start-ups and initiatives described in the previous paragraph should be proof that the wave of FinTech has already arrived and is changing organizational structures, business models and the mentality of consumers. New start-ups and big players are also changing the competitive landscape and redesigning the boundaries of the financial services industry. The markets in which banks and institutions operate are increasingly insecure, as digital transformation has reinterpreted reality in every business sector. The banking and financial sector, however, are the ones that are undergoing the greatest transformations. The innovations that have taken place thanks to FinTech, as many times underlined, have generated numerous advantages and possibilities for consumers: greater access to services, increasingly customized products, lower costs, efficient processes and financial stability. Hand in hand with these opportunities, there have also been significant disadvantages which we will try to highlight below, as inevitable consequences by banks and institutions to the wave of technological and digital innovation that has challenged the previous business models. What we will try to do in this chapter is to identify the possible future scenarios that banks and financial institutions will adopt or will have to face, between revolution, transformation and innovation. However, it is assumed that specific and professional tools are not available as the phenomenon is recent, therefore the reactions and consequences, in some cases, have not yet fully manifested or at least only in part. The information used and the considerations reported derive from the reading and conclusions drawn jointly from reports, papers, reading interviews and articles published by various control bodies (Bank of Italy in our case), personal

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<sup>45</sup> MARAGLINO M., "Le banche non sono scomparse, si sono alleate con le startup Fintech" 2018  
[www.econopoly.ilsole24ore.com/2018/04/17/alleanza-banche-startup-fintech/](http://www.econopoly.ilsole24ore.com/2018/04/17/alleanza-banche-startup-fintech/)

experience in a start-up and try to understand a possible future evolution of the phenomenon.

Financial Technology as we have seen is understood, first of all, as a revolution. We are witnessing the emergence of absolutely innovative phenomena, products and services that have radically changed the structure of the market, value chain, consumer habits and needs, the distribution of goods and the provision of services, as well as the characteristics of the products and financial services themselves.

The basic intention is to revolutionize the role of banks and financial institutions. The progressive intermediation between banks and consumers redefines the relationship and gives new companies more and more functions as financial intermediaries in the new digital ecosystem. Digital transformation marked the beginning of a new era based on real time, everywhere and anywhere. The technology, products and services available and accessible at any time and place have totally eradicated traditional logic. They have introduced rapid processes, innovative services and, among the many new features, they have changed the methods of payment, investment and loan requests.

The innovation scenario, on the other hand, encompasses the new paradigms of the financial transactions implemented. The financial system<sup>46</sup> in the last century has seen several innovations emerge, all based on the product and almost never on the customer at all. With the new technology it has been able to introduce completely innovative types of products and services as they are based on the user experience, and, until a few years ago, unimaginable. Everything accompanied not only by faster processes, but even more efficient and at lower costs than in the past. All this has led to a change for customers which has resulted in an important cultural change. Technology applied to finance is seen as a source of innovation as it has made it possible to make a system of completely innovative changes that have revolutionized the sector. The same revolutionary trends, however, such as the case of cryptocurrencies, after a first phase of enormous success, have generated distortions such as to cause a real collapse of their value leading the users themselves to suffer heavy consequences. Innovation seen as the digital transformation marks a point of no return: digital tools will change the future and, FinTech start-ups that

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<sup>46</sup> FERRARI R., *L'era del FinTech: la rivoluzione digitale nei servizi finanziari*, p.141.

will be able to interpret the increasingly evolving demands of the market, will prevail over other competitors and increase the own turnover.

Future scenarios remain somehow uncertain. However, by virtue of this evolutionary process, an attempt is made to outline the possible trends and possible reactions that will be witnessed in the short term and which, in some cases, have already started.

Financial institutions, as well as banks and credit institutions will inevitably face a transformation path. However, institutions that will not be able to adapt to the new changes required by the market, will be destined to disappear or to be acquired and incorporated by other larger banks and financial institutions, instead, to cope with changes and requests in progress. An example of an acquisition in this sense is represented by Visa, which recently acquired the Plaid company for 5.3 billion dollars<sup>47</sup>. Plaid's products allow consumers to conveniently share their financial information with thousands of apps and services. Visa's objectives are very clear, to offer advanced payment features and to work more closely with Fintechs.

Other operations of this type are the three mega operations of 87<sup>48</sup> billion dollars recorded in the first half of 2019. In this case we have the acquisition of WorldPay by Fidelity National Information Services Inc (FIS) for 43.6 billion, of the agreement between First Data and Fiserv for 22 billion and the transaction between Global Payments and Total System Services for 21.2 billion. The total value of these operations has exceeded half of the \$ 120 billion globally, setting a new record.

As pointed out by Jonathan Simnett, manager and fintech specialist of Hampton Partners:

“The heat is being applied to fundraising, auguring well for future large-scale fintech exits. 2Q2019 proved to be the largest quarter ever for fintech fundraising, with Europe already exceeding its 2018 annual record. As Europe and North America power ahead of the currently moribund Asian fintech fundraising market, we expect this to yield several large-scale fintech M&A transactions in the future.”<sup>49</sup>

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<sup>47</sup> <https://www.economyup.it/fintech/visa-compra-la-startup-fintech-plaid-per-53-miliardi-di-dollari-ecco-perche/>

<sup>48</sup> <https://www.fintastico.com/blog/pagamenti-fintech-guidano-le-fusioni-e-le-acquisizioni/>

<sup>49</sup> <https://www.iteuropa.com/news/fintech-ma-deal-volume-reach-three-year-high>

A key role will be played by Amazon, Apple, Google, Alibaba and Facebook for changing the banking sector<sup>50</sup>. These giants have the opportunity to exploit data coming from social media and to profile customers by offering them personalized products and services, at more competitive prices and predicting their needs in a more efficient way.

In 2017, Andreessen Horowitz general partner Alex Rampell said that of all the tech giants that could make a major move in financial services:

“Amazon is the most formidable. If Amazon can get you lower-debt payments or give you a bank account, you’ll buy more stuff on Amazon.”<sup>51</sup>

The strategy is clear, the company wants to focus on building its financial services and products in order to support its core goal and increase participation into the system.

The prospective scenarios on the evolution of the financial system have been analysed by the Basel Committee (BIS-BCBS, 2018)<sup>52</sup> regarding the scenarios that can be envisaged in consideration of the impact of the development of financial digitalization. In particular, the Committee formulates five possible scenarios for future evolution of the market context, which are distinguished on the basis of the different degree of disintermediation of the traditional financial system, which could be determined by the development of FinTech. A first scenario envisages a reaffirmation of the dominant position of the banks. In the hypothesis that these are able to leverage a renewed business model, capable of meeting the challenges of technological innovation and improving the customer relationship, returning to being primary suppliers of financial products and services. At the other extreme, a scenario of complete disintermediation of the banks by FinTech and Bigtech is expected, which will become the exclusive suppliers of financial services, playing the role of pure marketplace. Three "intermediate" scenarios are then highlighted (New bank, Distributed Bank, Relegated Bank), with a different graduation of the role of the incumbents and new entrants, as well as a different range of offerings and final interfaces towards the customer. The different formulations therefore reflect the question of whether there is still room for an intermediary function based on a fiduciary

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<sup>50</sup> <https://www.startmag.it/fintech/fintech-apple-google-amazon-alibaba/>

<sup>51</sup> Everything You Need To Know About What Amazon Is Doing In Financial Services, <https://www.cbinsights.com/research/report/amazon-across-financial-services-fintech/>

<sup>52</sup> BIS, “Implications of fintech developments for banks and bank supervisors” 2018 <https://www.bis.org/bcbs/publ/d431.pdf> -

relationship, for the purpose of carrying out financial transactions. Or if marketplaces and technologies are sufficient to allow direct matching between customers to meet their financial needs. As highlighted by the Basel Committee, the hypothesis of complete displacement of the incumbents may seem implausible, but it should not be underestimated on the basis of the elements already visible on the most competitive operational fronts proposed by FinTech. On the other hand, it is likely to imagine that combinations of the different intermediate scenarios can occur in reality.

This analysis highlights even more the need for a not merely technological renewal of the incumbents and, at the same time, a careful reflection on the effects that can be produced. In the absence of financial intermediaries in charge of centralized management of resources and risks, in terms of repercussions on the correct allocation of financial resources and economic growth.

Therefore, will be an increasing trend of integration between banks, financial institutions and FinTech companies to create new alliances, technological collaborations. The bank-FinTech combination highlights how the application of technology to the banking industry is of fundamental importance, while paying particular attention to calibrating the possible risks and disadvantages that may derive from it. This technology allows in fact to support the digitization processes to enable financial services to use Internet-based technologies.

### **4.3 From Industry 4.0 to 5G**

We have entered a further phase of the digital transformation. In this scenario, it is essential that innovation is oriented towards the human dimension, which concerns communication, collaboration, and process optimization. With the support of technologies, Artificial Intelligence for instance, it is already fundamental for every aspect of the workplace and the way people live and work. It is almost certain that over the next few years, automation technologies and economic pressure will have a great impact on creating new jobs. In the economic cycle, people's consumption patterns will shift from the purchase of goods to the purchase of a wider range of services, with evident consequences on the labour market. As emerges from the recent research conducted by IDC<sup>53</sup>, Italian companies are focused on tools for working remotely and on hourly

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<sup>53</sup>ASSINTEL, "Il mercato ICT e l'evoluzione digitale in Italia", 2019  
<https://d110erj175o600.cloudfront.net/wp-content/uploads/2019/10/assintel2020.pdf>

flexibility. It is also foreseeable that in the future Micro and Small Businesses will increasingly look at the introduction of technological platforms capable of redesigning the so-called "workplace" with the aim of creating and spreading knowledge, through efficient collaboration tools and flexible, quite similar to those used for personal communications.

According to Alessandro Zucchetti, president of Zucchetti, dialogue and vision of the future must go hand in hand. "At Zucchetti - we have always been used to listening to customers and planning future developments with them, in the sense that even new technologies must not be an end in themselves but bring real competitive advantages to the activity of businesses and professionals. For this reason, we have created a real innovation laboratory inside where we study the possible fields of application of new paradigms such as IoT and artificial intelligence."<sup>54</sup>

IoT solutions are designed to absorb, redesign and extend the range of ICT systems and services known so far, including new devices, increasingly advanced software and more flexible innovative services. Based on the results of the research conducted for the Assintel Report 2020, it is mainly large companies that have undertaken Internet of Things projects: around 41% of the total. The most dynamic sectors on the IoT are those of Finance, especially the Insurance segment, the Public Administration sector, especially for projects in the Smart City, Smart Building and Smart Utilities areas. The increasing mobility of people and connected objects, the progressive capillarity of 5G networks and the availability of Cloud services will above all push large companies to extend their IoT projects. In these areas, the implementation of IoT projects will be related to a greater competence on data analysis. The relevance of the analytical component in IoT solutions is continuously increasing to transform raw data into valuable information. The goal is to obtain competitive advantages, timely and more informed decisions. Overcome traditional competitive barriers, acquire new customers in new markets and maintain competitive leadership in new and mature markets.

The most significant factors in shaping the demand for IoT solutions of Italian companies in the medium term will be related to:

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<sup>54</sup> <http://www.datamanager.it/2019/12/scenari-it-2020-il-futuro-si-costruisce-insieme/>

- The propagation of interconnected devices. The new mechanism (e.g. Smartphone, Wearable, sensors and building automation systems, smart meters, connected cars, industrial controllers) it will offer organizations the opportunity to collect more and more data and useful information both for the operational aspects and for the design of new strategies. In order to obtain these advantages, new approaches and architectures will be needed to make sense, store and analyse the flow of connected data.
- Complexity of the IoT and search for technology suppliers: the new ecosystem is made up of a large variety of hardware, software, services and connectivity suppliers. On the other hand, many IoT devices can communicate with different operating systems and with a wide range of protocols, while IoT architectures often present problems that are not just techniques to be truly able to generate value. Faced with the shortage of staff specialized in the IoT and the request to innovate, Italian companies will increasingly express the need to work with suppliers capable of acting as project partners oriented to support them at all stages.
- Security, privacy and regulatory concerns: new types of cyber-attacks targeting connected devices and machine-generated data are constantly emerging. In this case, security, privacy and regulatory compliance will remain among the most important obstacles to the launch of IoT projects. As long as large amounts of data are collected from interconnected devices, businesses and consumers will increasingly be interested in regulatory, governance and privacy issues. Not only device security, but also connectivity and application management platforms will become fundamental and increasingly sophisticated. To ensure data protection, it will be important to identify and react quickly to threats and attacks to offer a quality experience to users and consumers.

Why 5G is so important for Italian companies? 5G networks are 10 times faster than 4G networks, moreover are able to provide mobile connectivity services with a large number of objects connected to the network to maximize the economic potential of the digital revolution in different production sectors. 5G is capable of boosting technological innovations related to the extension of human-machine dialogue and connected objects, enabling an increasingly pervasive use of Artificial Intelligence. With higher speed and

data carrying capacity, and more connection density than previous network technologies, 5G will not only allow mobile networks to operate more efficiently and provide higher performance, but above all it will be able to support many new applications and services intended to revolutionize the way we communicate and work. 5G networks will be the backbone of the new economic cycle where real-time interaction and exchange of information will generate new flows, where the difference in global competition will be the ability to use information to create value, open new markets, to make human and machines dialogue, rationalize costs and reduce waste.

Even if the moment of full implementation of the 5G network has not yet arrived, the experiments in progress allow us to anticipate the evolutions. Following the offerings of mobile services characterized by higher speed, smoother streaming of content, video calls and better quality Internet calls aimed at the mass market, the 5G network will reveal its economic potential in the medium term. Within 2 or 3 years, the progressive extension of the 5G network will begin to make its effects felt in various areas, reducing the limits that have hindered companies so far in the implementation of Internet of Things solutions. 5G will provide companies with ultra-fast and widespread mobile connectivity services, becoming the stimulation for innovation processes based on the ability to process data from multiple sources distributed throughout the territory, which are crucial to maximizing the economic potential of the digital revolution in different sectors.

#### **4.4 Opportunities and risk derived from FinTech**

After analysing the evolution of the phenomenon, we must focus our attention on the risks it can entail. As is known, financial activities are intrinsically connected with risks and the application of technological innovation in this area can bring with it new, more intense risks, especially of an operational and strategic type. The benefits brought by technological innovation and impact on consumer habits and on the competitiveness of the banking system should obviously be weighed against the risks that new technologies entail.

Before going into details analysing the risks, we focus our attention on the opportunities that derive from them based on existing publications. We need to divide the opportunities

into two macro areas. The resulting opportunities for consumers and opportunities for banks and the financial system.

Opportunities for consumers:

- *Higher level of financial inclusion:* Customer play a central role in this occasion. Only six out of 10 adults have a bank account, but there are more mobile devices than people in the world<sup>55</sup>. The main objective of digital finance is to reach scale, reduce costs and implement appropriate financial capability. Financial inclusion has to reach more people with efficiency and greater speed.
- *Better customer service and customized products:* banking system is regulated and knows how to operate in the market. The banking system with the help of fintechs can further improve the services and products offered to its customers. It could improve the customer experience with the help of a robot's advice and make incumbents more efficient.
- *Lower transaction costs of services and faster and safer banking system:* reduce fees and faster banking operations.

Opportunities for banks and financial system:

- *Enhance the efficiency of the banking system:* safer environment thanks to use of biometric and cryptographic technology.
- *Efficient use of data to manage risk and better marketing offer*
- *It may have positive impact on financial stability thanks to an increase of competition<sup>56</sup>*

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<sup>55</sup> World Bank, "Global financial development report", 2014  
<http://documents.worldbank.org/curated/en/225251468330270218/pdf/Global-financial-development-report-2014-financial-inclusion.pdf>

<sup>56</sup> Philippon. T, "The fintech opportunity", working paper, Stern School of Business, July 2016  
<https://www.nber.org/papers/w22476.pdf>

Once the opportunities have been identified, we can continue with the identification of the risks and the subjects on which they fall. The activities carried out by the different types of financial operators, allows to highlight not only the problems deriving from them, but also the impacts that are determined on the other subjects involved in financial intermediation activities, first of all to customers. Once again we need to divide the risks into two macro areas. The resulting risks for consumers and risks for banks and the financial system. As highlighted in the report proposed by CONSOB<sup>57</sup> the risks of FinTech activities:

Risks for customers:

- *Credit risk*: if FinTech operates as a marketplace
- *Market risk*: if Fintech operates as a marketplace
- *Liquidity risk* (absence of secondary market)
- *Operational risk*: legal risk, fraud or misconduct of FinTechs (platforms), data protection and privacy risks.
- *Risk of loss or improper use of customer data by the platform*: unauthorized access by third parties to personal data provided by the customer to the platform
- *Overconfidence and behavioural bias risk*
- *Risk of poor diversification of the client's portfolio*

Risks for banks, financial system and Fintech:

- *Credit risk*: if FinTech does not operate only as a marketplace, but it finances all or part of it

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<sup>57</sup> Schena, C, A. Tanda, C. Arlotta, G. Potenza, "Lo Sviluppo Del FinTech – Opportunità e rischi per l'industria finanziaria nell'era digitale", Marzo 2018, pag 46  
[http://www.consob.it/documents/46180/46181/FinTech\\_1.pdf/35712ee6-1ae5-4fbc-b4ca-e45b7bf80963](http://www.consob.it/documents/46180/46181/FinTech_1.pdf/35712ee6-1ae5-4fbc-b4ca-e45b7bf80963)

- *Market risk*: if FinTech does not operate only as a marketplace, but it finances all or part of it
- *Operational risk*: legal risk (including cross-border), conflict of interest, fraud by users (customers or third parties), ICT risk of which: cyber risk, errors or inadequacy of the algorithms operational risks related to third parties providing services (including cloud computing)
- *Compliance risk*: transparency and fairness (operations not carried out in the full interest of the customer), risk of conducting unauthorized activities, money laundering or terrorist use
- *Strategic risk*: governance skills, macroeconomic situation, technological environment (adoption of new systems, scalability, interoperability), competitive environment
- Reputational risk

The Fintech platforms deserve special consideration, as is highlighted in the report in most cases, the platforms do not operate on their own account (indirect intermediation circuit), but provide a virtual place where demand and supply of funds meet (marketplace, or circuits direct brokerage). Consequently, the risks associated with the activities carried out through the marketplace fall fully on the customers.

An interesting article about trends that increase risks is provided by "Agenda Digitale"<sup>58</sup> that identify the main trends that contribute to increasing the risks inherent in fintech solutions.

- Significant increase in the attack surface as a result of the tendency to bring an increasing number of processes online. The effect of this trend is the increase in entry points for attackers who can exploit system vulnerabilities. This aspect becomes particularly important for some processes such as customer identification and authentication which require the use of techniques aimed at minimizing fraud that exploits digital identity.

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<sup>58</sup> Ranise. S "Fintech, i principali rischi cyber e tre rimedi tecnologici" 2019  
<https://www.agendadigitale.eu/sicurezza/fintech-i-principali-rischi-cyber-e-tre-rimedi-tecnologici/>

- Failure to exploit cyber intelligence information by actors in the fintech sector. While there is a certain level of cooperation from hackers to carry out increasingly targeted and large-scale attacks, financial institutions have not yet managed to come up with an effective strategy for sharing information on ongoing attacks so that they can prepare the necessary containment measures and minimize the impact. The main problem is not of a technological nature but connected to the human factor and in particular to the lack of trust that the shared information is not then exploited for other purposes.
- Significant increase in the degree of interconnection between financial services to a level that creates dependencies between markets. This implies a greater danger of attack vectors that can be propagated through the dense network of interconnections, infecting different markets and potentially triggering a domino effect. To minimize the probability of triggering a domino effect, the infrastructures used to provide fintech services such as those for managing digital identity (for example those of individual European states or the transnational one based on eIDAS) must be secured. payments (e.g. SWIFT) and financial transactions (e.g. blockchain-based ones).

#### **4.5 Regulatory responses to risks**

The Fintech world is moving rapidly and with it is attracting many opportunities and many risks as we have seen. Of course, this fact brings with it the need to write the rules of the game without damaging the main actors but at the same time promoting development. The proposed rules and supervisors continue to add to the long list of new rules to be implemented. This new trend will continue also in the coming years thanks to the adoption of the new proposed solutions associated with the risk they entail.

The rules in response continue to arrive, some of which were discussed during the Basel Committee on Banking Supervision in February 2018<sup>59</sup>. In the report are presented 5 implications and considerations for regulation framework.

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<sup>59</sup> BIS, "Implications of fintech developments for banks and bank supervisors" 2018  
<https://www.bis.org/bchs/publ/d431.pdf>

- *Increased need for cooperation:* The development of Fintech is continuously growing, consequently there is the need of a prudent supervision. In this context, data privacy, enhance consumer protection, particular attention at cybersecurity, promote competition and compliance with anti-money laundry (AML) must be taken into consideration.
- *Bank supervisor's internal organization:* the fact that Fintech is changing traditional banking business models, as well as structures and operations, including the delivery of financial services is an important aspect to consider. This aspect requires to reassess their supervisory models and resources to enhance the effective oversight of the financial system. This can be done by assessing existing staffing and promote training programmes to ensure that, new skills and better tools become relevant and more effective in supervising the risks of new technologies and business models.
- *Suptech opportunities:* in this segment are taken into account the same technologies that offer efficiencies and opportunities such as AI / advanced data analytics, cloud computing, have the potential to enhance supervisory efficiency. Safety and financial stability is the scope of supervisors that are investigating and exploring the technologies. In order to improve their process, they share with each other their methods and recent experiences.
- *Relevance of regulatory frameworks:* the existing bank regulations together with supervisory and current standards precede the emergence of technology innovation. A review by bank supervisors of their supervisory frameworks based on evolving fintech risks. Uncover, once identified the ways frameworks could evolve to ensure suitable oversight of banking activities for a beneficial innovation.
- *Facilitation of innovation:* Supervisors in many jurisdictions promote initiatives to enhance interaction with the new financial players. For example, innovation hubs for innovative technologies, new business models and regulatory sandboxes. Supervisors in this occasion have the opportunity to learn from each other's, put in practice, and decide based on results what is appropriate to implement and what to expect.

A recent report published by KPMG<sup>60</sup> in March 2019 also takes into account the need for regulation. Specific regulations are identified in response to the resulting risks. Regulators answers take different forms based on actors and risks: risks for consumers, risks to firms.

Regulatory response to risks to consumer:

- *Regulatory perimeter*: An increased focus on service providers. Some firms are currently outside the perimeter and in the future may find themselves subject to new regulation.
- *Consumer protection*: using higher level of transparency and disclosure of products and services for consumer awareness of risks, introduces a limit to customers for specific products and services based on their risk.
- *Data protection and privacy*: with the existing General Data Protection Regulation (GDPR), already covers in part issues arising from fintech.

Regulatory response to risks to firms:

- *Regulatory perimeter*: Some firms are currently outside the perimeter and in the future may find themselves subject to new regulation.
- *Governance and risk management*: regulators and new rules to ensure that board and management understand the fintech applications. Some regulators are suggesting firms to identify a responsible for managing fintech-related risks.
- *Operational resilience*: the ability of a system to adapt to change, facing and overcoming difficult times given the issues that may arise.

It should be added that the uniformity of the legislation is not intended as an excess of legislation. Therefore, the definition of a renewed legislative framework will prove effective when it is able to grasp the innovations introduced by FinTech in the financial

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<sup>60</sup> KPMG, "Regulation and Supervision of fintech" 2019  
<https://assets.kpmg/content/dam/kpmg/it/pdf/2019/04/regulation-and-supervision-of-fintech.pdf>

system. Homogeneously regulate the plurality of financial operators and provide appropriate applications based on the degree of exposure to risks.

## **Conclusion**

In the last decades, thanks to the continuous digitalization and exploitation of FinTech technologies, it has been possible to witness a transformation in the financial sector that has generated a progressive deregulation and the replacement of intermediaries with cutting-edge automatic systems. The goal of this thesis is to understand how this evolution and transformation of finance is reshape the sector and what to expect in the future. The previous revolutions and transformations of the financial sector occurred from an internal context and were developed and then made available to all interested parties. The so-called financial revolutions began in large banking institutions and large corporations. With the crisis in the financial system and the tragic consequences on the world market, a new reformulation of the financial system has become necessary. All this has forced banks, financial institutions and companies to support important and necessary structural changes and changes in terms of business redefinition. Relations with customers have become obsolete, a change of vision and mind-set was needed in order to redefine a heterogeneous and highly competitive market compared to the past. Nowadays corporations and credit institutions live in a global financial environment that is characterized by new restricting Regulation as a consequence of Financial Crisis that imposed banks to reduce and revise their activities. Given the actual situation, institutions as well as banks and consumers started to perceive the financial services in a different way. Digitalization brought on the market new platforms and an innovative way to interpret and satisfy own financial needs. A very important role in this matter is attributed to start-ups, who are offering innovative services and products at affordable prices meeting the new needs of consumers. In the last period they have managed to gain important market shares. The most relevant FinTech trends have been introduced in the banking sector which concern payment, investment and lending. Customer needs are in a continuous evolution, the expectation of an immediate access to credit anywhere and everywhere, to overcome the distances issues, the credit risk and bureaucracy. Digital Customer exponentially relies on new digital services and expects a new faster, safer and more convenient experience. In this scenario, most companies and credit institutions are too tied to traditional models and are not completely prepared to face these expectations of customers. Supervisory bodies, both nationally and internationally, must therefore act by implementing a series of interventions aimed at regulating the new and different

profiles that come into play. These new factors and increasingly stringent regulation continues to bring pressure to banks in order to develop plentiful protection to prevent credit risk and a new financial crisis. For its part, the Fintech manage to provide alternative finance solutions, including everything else that credit institutions are not ready to offer, in this situation the aim is to become more efficient in response to customer expectations. As a result it was created a new way of doing business based on integrated digitalization that allows bank and other non-conventional players to overcome the physical infrastructures and bureaucracy and give the possibility to customers access to financial transactions 24/7 in a safety environment. Moreover, the new technology on which the FinTech is based rely on advanced and reliable data-driven approach. This approach permits to collect an increasing amount of data, such as interests and preferences, level of education, level of living, previous jobs, and many other different data used to better assess the quality of clients. Start-ups, companies, financial institutions and banks have the task of choosing the right approach to this phenomenon, they are to two ways in this sense to compete or to collaborate.

From this case study, I come up with the idea that an increasing number of companies, credit institutions as well as financial institutions are approaching in a positive way alternative digital finance solutions. The collaborations are increasing and the number of strategic partnerships between start-ups, incumbents and challengers have decided to follow only one path, the win-to-win direction. Start-ups figured out that it is important to offer technological advanced solutions to companies and banks, and at the same time they can be ideal partners and an important vehicle to accelerate and enhance the level of digitalization of financial sector. Partnering and collaboration means competitive advantages to create and strengths a better financial ecosystem, where financial institutions have the opportunity to adjust their gaps and manage the risk of being overcome within the sector. Being innovative allow business players to improve technical and digital innovations, faster and reliable solutions to customer needs, increase credit lines, lower operating fees and bureaucracy and, of course, increase the range of creativity and ability to offer to all clients the experience that better fit with their expectations. Furthermore, providing customized and better experiences to clients will increase not only the revenue but will enhance the loyalty among customer and their trust bringing new business opportunities. Developing and integrating partnerships and collaborations give Fintech start-ups the opportunity to get appearance they need. In this particular case,

what start-ups need is capital resources, a given amount of liquidity, license needed for operations and build as soon as possible a good reputation to reach and engage a broad domain of customers. Based on the findings and evidences, many questions about the future of start-ups and digitalization are coming up. Given all the information we have it is still very difficult to state or predict for sure what will happen in the next future because this new phenomena of digitalization of FinTech and advanced alternative Finance is in a continuous unpredictable movement and still many companies worldwide are starting to experience them at the present. Some hypothesis from this research we still can do. From start-ups perspective, the analysis of the existing regulation in force at the moment present some weaknesses in the system. Based on a non-homogeneous framework regarding the regulations among European countries. Another significant obstruction that appeared from this paper is the level of awareness among financial players about the existence of alternative financial instruments. Although, we assist at a significant increase in the global investments, where we can find potential customers or investors that are not conscious about the involvement of financial companies. From start-ups perspective, the fundamental actions rely on innovation. Those financial players that wish to survive and succeed in the future, will have to rely on innovation and continuous digitalization programs, through this mechanism it will be easier to reach and retain the new customers.

## **Bibliography**

Gerlitz. L, Design Management as a Domain of Smart and Sustainable Enterprise: Business Modelling for Innovation And Smart Growth in Industry 4.0. Entrepreneurship and Sustainability Issues. 3(3) (2016) 244-268.

FERRARI R., L'era del FinTech: la rivoluzione digitale nei servizi finanziari, p.141.

Schena. C, A. Tanda, C. Arlotta, G. Potenza, "Lo Sviluppo Del FinTech: Opportunità e rischi per l'industria finanziaria nell'era digitale", Marzo 2018, pag 46

## **Reports**

ASSINTEL, "Il mercato ICT e l'evoluzione digitale in Italia" 2019

CBINSIGHTS "Fintech Trends to Watch" 2019

IOSCO, "Research Report on Financial Technologies (Fintech)" 2017

KPMG, "*The Pulse of Fintech*" 2019

OECD "Key-issues for Digital Transformation in the G20" 2017

Osservatori.net "Italia digitale: la "macchina" è pronta a correre?" 2019

PWC, "*Piccole FinTech crescono con intelligenza*", Osservatorio FinTech Italia 2019 (seconda edizione)

World Bank, "*Global financial development report*" 2014

## Research papers

Arner. D, Barberis. J.A., Buckley. R, “*The evolution of Fintech: A new post-crisis paradigm?*” Research paper No. 2015/047

BIS, “Implications of fintech developments for banks and bank supervisors”  
2018

Ibara. D, Ganzarain. J, Ignacio. J “*Business model innovation through Industry 4.0*”, Elsevier, 2018

Philippon. T, “*The fintech opportunity*”, working paper, Stern School of Business, July 2016

Rojko. A, “*Industry 4.0 Concept: Background and overview*” Vol 11, No 5, 2017

## Sitography

<https://www.abi.it/Pagine/news/BancheeFintech.aspx>

<https://www.abi.it/Pagine/Societa/Inclusione-finanziaria/Inclusione-finanziaria.aspx>

<http://www.argylejournal.com/chief-marketing-officer/the-digital-transformation-playbook-author-explores-rethinking-a-business-strategy-in-the-digital-age/>

<https://www.bis.org/review/r991012c.pdf>

<https://www.cbinsights.com/research/report/amazon-across-financial-services-fintech/>

<https://www.corrierecomunicazioni.it/digital-economy/startup-in-italia-sfiorano-quota-9-mila-sul-podio-le-imprese-di-servizi/>  
<http://www.datamanager.it/2019/12/scenari-it-2020-il-futuro-si-costruisce-insieme/>

<http://documents.worldbank.org/curated/en/332881525873182837/pdf/126033-PUB-PUBLIC-pubdate-4-19-2018.pdf>

<https://www.economyup.it/fintech/visa-compra-la-startup-fintech-plaid-per-53-miliardi-di-dollari-ecco-perche/>

<https://finance.yahoo.com/news/businesses-spend-nearly-1-2-123000959.html>

<https://www.fintastico.com/blog/pagamenti-fintech-guidano-le-fusioni-e-le-acquisizioni/>

<https://www.frbservices.org/financial-services/wires/index.html>

<https://www.idc.com/getdoc.jsp?containerId=prUS45027419>

<https://www.investopedia.com/articles/personal-finance/050515/how-swift-system-works.asp>

<https://www.iosco.org/>

<https://italiafintech.nova100.ilsole24ore.com/2019/01/15/fintech-semplICE-italiano-2018/>

<https://www.iteuropa.com/news/fintech-ma-deal-volume-reach-three-year-high>

<https://www.mfcentralerisk.it/analisi/il-vino-buono/>

<https://www.ninjamarketing.it/2019/06/19/facebook-libra-bitcoin-altre-criptovalute/>

<https://www.nttdata.com/global/en/media/press-release/2019/july/ntt-data-global-study-finds>

[https://www.osservatori.net/it\\_it/osservatori/comunicati-stampa/imprese-investimenti-digitali-open-innovation-collaborazioni-con-startup-comunicato](https://www.osservatori.net/it_it/osservatori/comunicati-stampa/imprese-investimenti-digitali-open-innovation-collaborazioni-con-startup-comunicato)

<https://www.startmag.it/fintech/fintech-apple-google-amazon-alibaba/>

<https://www.thebalance.com/long-term-capital-crisis-3306240>

<https://www.wellsfargohistory.com/first-in-online-banking/>

<https://www.worldbank.org/en/news/press-release/2018/04/19/financial-inclusion-on-the-rise-but-gaps-remain-global-findex-database-shows>

<https://www.youtube.com/watch?v=lQUt-EKwa94>

<https://www.youtube.com/watch?v=MMWFrWOZths>