

## MANAGING DIGITALIZATION IN BANKING: CHALLENGES AND IMPLICATIONS

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### ABSTRACT

*The article presents the changing context of the banking sector, concerning the technological evolution and digitalization processes that occur in the financial market and society. The first three parts of the paper analyze developments for banking business within the digitalization process, reflect important aspects from other related studies and identify 10 relevant challenges when managing this strategic transformation. Our analysis includes the following topics: the digital era, technological development, new mobility banking services, AI, block chain, big data and new business banking models (from human to machine interaction, to machine to machine interactions). The fourth part includes relevant findings and other discussions regarding the management of digitalization and potential implications on banking business. The last part of the paper represents our concluding remarks.*

**KEYWORDS:** banks, regulations, digitalization, Fintech, management, policy.

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### 1. INTRODUCTION

Our paper examines a strategic concern for banking business – “how to manage digitalization?” and offers an integrated view, analyzing relevant aspects both at the macro and micro/bank-based level. We approach mainly the European banking sector, Europe remaining dependent on bank finance. The new way of doing business for banks involves also the digital transformation. Every bank should mix a strategic vision on the future operating model with a strong commitment to fix legacies from the past.

Banking organizations are diverse: small, medium or large sized, active only in local markets or cross-border, running different business models to support diverse segments of customers: retail customers, SMEs and large companies, public authorities and governments.

Within the post crisis environment, digitalization is one of the key topics in boardrooms everywhere, for banking organizations, regulators, authorities and also for the society as a whole.

The new European ecosystem built after the 2008 financial crisis includes a strong regulatory response, reflected in a better capitalized banking sector, with higher levels of liquidity, and a strong support offered to the public oversight via the creation of different structures and mechanisms, such as: European Single Resolution Board, European Supervisory Authorities, the Single Supervisory Mechanism and the Single Resolution Mechanism, European Stability Mechanism, Single Resolution Fund. ( Various regulations and directives to increase resilience, such as: EMIR, AIFMD, BRRD, Solvency II, MiFID II)

New regulations and standards, new governance actors for the financial sector, new reporting requirements, technological developments affect banking industry and banking business models.

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The first part of the paper provides insight on the relevant trends, at the European level, related to digitalization developments. Studies emphasize that the decade of regulation (10 years after the 2008 financial crisis) will be followed by a decade of digital transformation of the financial industry.

Within the related literature part of the paper, we explore relevant research and studies reflecting the digitalization impact on financial and banking industry.

The third part of the paper present our analysis for a selection of challenges, identified at the banks level, within the digitalization process. Technology and digitalization present both opportunities and vulnerabilities, for banks and their customers. Present applications propose improvement for the existing processes, banking products and services. Digitalization and FinTech's support also the introduction of new business models, new competitors, new markets(Computer programs and other technology used to support or enable banking and financial services).

The fourth part reflects the most relevant implications for banking organizations in order to manage the adoption of digitalization.

At the European level, relevant trends include the need to accommodate and balance: financial stability objectives, promotion of financial innovation, the need to insure customer protection, cooperation between innovators and authorities, more financial integration using digitalization as a catalyzer, a different approach to financial supervision for tech companies (FinTech, Big Tech) entering the financial industry and competing with banks.

## **2. RELATED LITERATURE**

Banking business models are constantly changing today, from the commercial and financial policies that have direct impact on financial markets to a new digital landscape that reshapes the traditional banking "eco-system", in line with the technology developments.

The digitalization trend is gaining momentum to the change totally the banking system, via leading innovations such as: informational and operational computing algorithms, quantum computing, Artificial Intelligence (AI), block chain technology, process automatization, biometrical technologies (both fingerprint and facial recognition), big data, mobile banking, branch digitalization (digital bank; a digital ledger in which transactions made in bitcoin or another cryptocurrency are recorded chronologically and publicly).

The relationships between banks, companies, between banks and different segments of customers, will be considerably different, in terms of interaction, satisfaction, feedback, decision making process, services provided. The transformation implies a new set of interactions, from human to human, towards human and machine, reaching machine to machine. In this respect, back-office operations, payment services, individual/retail lending services will be entirely different, cutting out the "middle man" where the concept of branch networks will be deleveraging. On the other hand, these rules may not entirely apply for the corporate business sector, where human interaction is still very important (a human interaction in the form of personal counseling) but new technologies will change indefinably the traditional structure of the banking system into a more open, fast and digitalized one.

The banking areas that have been touched in an early stage and continues to develop in this digital progress are: the deposits, the lending (more for retail banking), payments, asset management portfolios (in regard to the investment banking sector), equity and capital, reshaping the internal architecture of the banks from traditional way of doing "banking" to a more digital one, where Fintech starts to get along and coexist (in some cases harmonize) with the core activity of banks (Kobler, et. al., 2016).

In accordance with the prior changes mentioned, the "digital era" of the banking system has also started to redefine the behavior of the clients concerning their needs and expectations. The online

payment solutions have gained popularity in the past years, facilitating faster speed in interaction with the common/basis services of a bank.

The transformation of the digital world has an impact on the financial industries nowadays, reshaping the banking business model. The steps towards digital banking include business process developments, new business models and furthermore an entire change of the banking value chain, with predilection on six interest areas: the banking operational processes, the banks' clients, the revenue models, the digital platforms, data-base driven models and banking value chain (Gasser et. al., 2017).

From moving banking business "on the cloud" to digital rise innovation technologies in the financial services field, all the changes occur rapidly influencing the traditional way of doing banking. Generating important added value in time effectiveness and combining all relevant resources, such as financial investing, transactions, the digital trend starts to facilitate new lines of services for banks. It impacts also via proving lower margins in different areas, credit or foreign transactions fees (including investment management), thus being more sustainable and desirable for a large number of clientele (Dietz, et. al., 2016).

Digital transformation is more about how customers will adopt the new technological enhancements than how the impact of technological development will reshape the internal processes of banking systems. The digital customer behavior, their pattern and choices along with needs and capabilities to adapt to the occurring changes are one of the biggest challenges. The major transformation comes also from the internal management structure within the banks, that will have to adapt to the "new digital picture" in a fast proven processes through transparency and efficiency (Kamra, 2014).

In assessing the impact on banking business, considering the size of each bank, that can be either big or small, timeline response capabilities are key element in assessing productive business solutions for customers. In order to do so, the change through process management implementation stands in the center of this transformation, along with process change and IT development (Pirainen, 2016).

Regarding business banking models of tomorrow, remodeled by the age of technology and digital frame, changes will appear not only for retail client sector of banks but most probably also for SMEs (small and medium enterprises) and corporate clients, with impact on areas such as: money flow implementation within credit application processes, payments, KYC (know your customer procedures) and AML (anti-money laundering) application forms completed on digital platforms, regulation in money creation as current case for banks vs. Fintech companies, not yet fully regulated compared to traditional banks (Lipton et al., 2017).

### **3. ANALYSIS**

Together with policy adjustments, regulatory and supervisory changes, digitalization and financial technology impacts on every segment of the banking business.

Considering the trends presented within the introduction part, a banking organization should analyze and manage change, in a digital environment.

Our analysis proposes a selection that includes 10 of the most relevant challenges for a banking organization, in order to support the transformation process, to comply with the change in regulations, to benefit of digitalization, better serve the customers and provide value added for the shareholders on the long run, in a sustainable manner.

Our analysis emphasizes the need to consider and manage the digitalization process as a strategic project for every bank, representing in fact a transformation project for the operating model of the bank. The project should be conducted by a project team, having clear roles and responsibilities, using management instruments and tools, involving key people from the banking organizations but also strategic partners from outside the banking organization.

This transformation process should be part of a new strategic vision, both at banks level and systemic level.

The output of our analysis includes strategic tasks to focus and manage within the banking organizations but also input for future policy actions.

Challenge 1: Transformation of existing processes, as a way to improve efficiency.

Challenge 2: Change in customer behavior/digital customer experience.

Challenge 3: Technological innovations.

Challenge 4: Data governance and reporting requirements.

Challenge 5: Improved solutions for the bank analysis (Big Data, Advanced Analytics).

Challenge 6: Cyber Security(Examples such as ransomware attacks Petya and WannaCry, reaching more than 150 countries reflect the importance of managing cyber risks)

Cyber security is a top priority for banking business. Banks are using biometrics, behavioral analytics when proving services to the customers.

Challenge 7: Regulatory and supervisory requirements (FinTech, Internet of Things – IoT).

Challenge 8: How to balance and mix Human Capital and Technological Capital.

Challenge 9: New Architecture to accommodate the dynamic development for the ICT infrastructure, within a lively banking organization.

Challenge 10: Strategic relationships with "the right partners".

Our analysis provides input for the 10 challenges. Managing the transformation process at the bank organization level requires a "transformation team", with blended competencies, both banking business and technological competencies.

Change in customer behavior, willingness to replicate pleasant experiences from other industries: quality service, speed, security, data protection, competitive cost, availability 24/7/365. Customers wants that the bank manages incidents and provide adequate advice. Digital relationships with customers involve a permanent contact and a proactive management of any incident.

A concern related also with the transformation of existing processes but also with the data governance and reporting is reflected by the need to avoid redundancy reporting, by developing strategies to cope with complexity in processes and quality assurances. Standardization of the data and a common view over the data extracted and needed by various departments of the bank will add consistency and quality. Another aspect in data governance is related to the aggregate data obtained from the current systems of the banking organizations and the need for more granular data. Integration of data, change in processes and management of the whole cycle at the banking organization level, via cooperative platforms may support data gathering, processing and using for different reporting requirements and business decisions. The approach of „silos" within the banking organizations should be changed and transformed towards a new integrated approach.

Concerning the existent applications, systems, data (including customer relationships, branches), it is necessary to automate processes and to integrate/migrate gradually towards the new systems. The integration process should be managed in order to anticipate changes, to react proactively to future developments, via a modular approach.

In order to use digitalization to comply with the regulatory and supervisory requirements, banks should promote flexibility and cooperation in implementation. RegTech and SupTech solutions include balanced planning, proactive information and communication, allignment with modeling activities. One of the key points is to create a functional communication chain between the central bank and the banks regulated and supervised.

Resilience is another topic that requires specific attention within the transformation process of a bank while managing digitalization. Data governance involves the need to insure capability of resilient workaround for different solutions, development of prototypes for analysis and testing, detailed business concepts provided by the business side, to identify modelling issues.

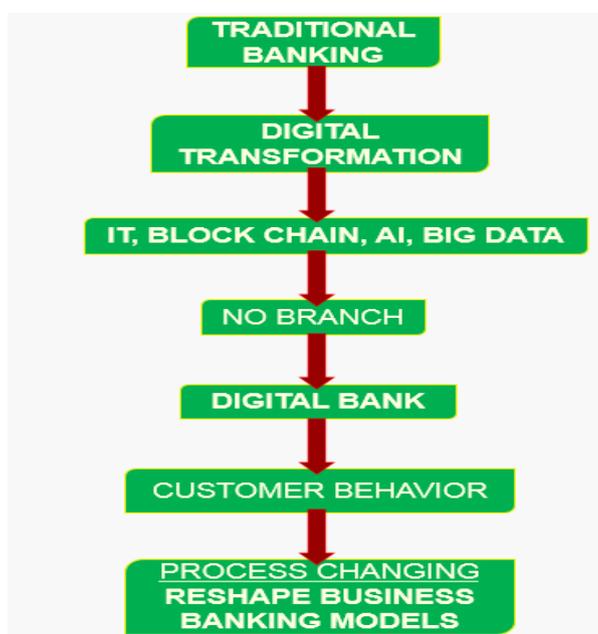
Complex requirements from the regulators, central banks, supervisory authorities impose banks to provide accurate data. The IT department is transforming, from being an infrastructure provider to

becoming a strategic partner with the Bank's business lines that depend on technology to achieve priorities tied to the Bank's areas of responsibility.

Cyber is inside most of the bank's processes, as support to protect bank's reputation, customers, business. Digitalization implies the need to know cyber risk tolerance, cyber risk appetite of the bank, strong authentications methods of the customers when using the systems of the bank. Biometrics solutions, such as fingerprint scanner, iris scanner, face recognition, voice recognition or typing patterns are already used to support authentication processes and mitigate cyber risks.

Cyber security should be integrated in a broader Resilience and Business Continuity Strategy, stressing on the resilience of both people and infrastructures/systems.

In order to present the transformation of the banking business model, from traditional to digital, we have drafted a scheme, presented below, in Figure no. 1. The structure and typology of branch network have changed, changing the banking models, impacting strategically on the three footed relationship: customer – bank – real economy. In addition, green-economy/bio-economy has started to be developed, being also related to the technological progress and compliance towards efficiency, effectiveness and sustainability.



**Figure 1: From traditional to digital banking model**

*Source: authors 'own processing*

The disrupted areas in which the digital process makes an impact in redefining banking models are especially oriented to the customer, but also to the internal structure of the banks, including: operational and revenue models, data management, corporate governance, human resource.

Big Data and customer profiling represent key focus within the digitalization process, reshaping the business models, proposing cloud solutions to the existing systems.

New communication protocols between banks and customers are developed, transformed from physical proximity to digital proximity (through social media channels, the digital world makes the interaction with banks quicker and more accessible on a large scale, not considering geographical/time zone or age discrepancies).

Considering the related information of technological development in digital area, the business models of banks are evolving especially in fields such as:

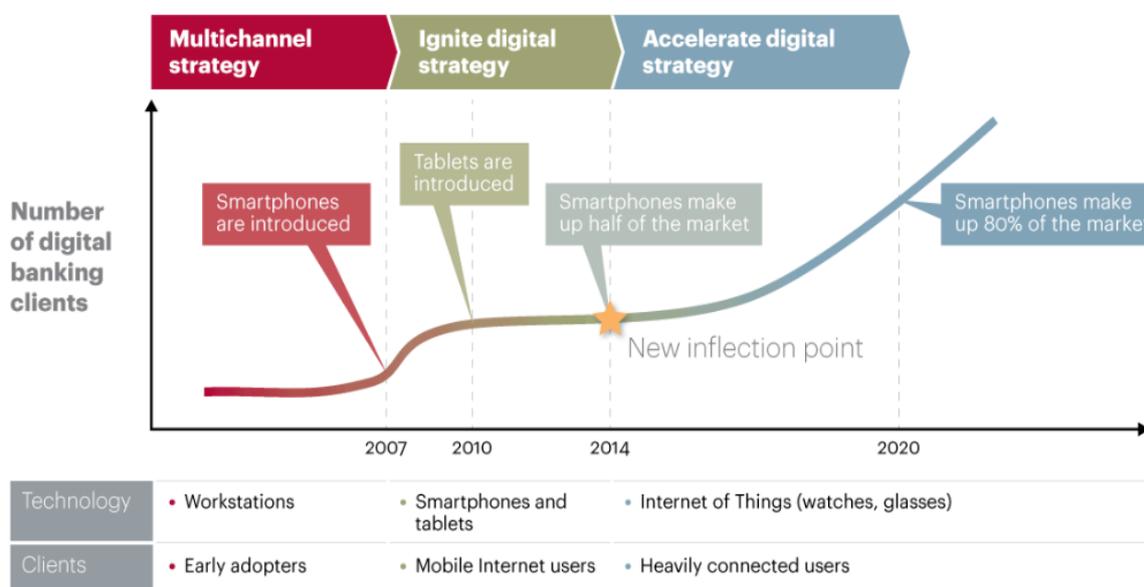
(a) Mobile banking: a game changer in retail activity where services and solutions are provided quicker by the usage of online capabilities, making the interaction with client much more convenient.

(b) Credit applications online: because nowadays banks use integrated solutions to survey and assess specific information of individuals in order to grant credits, applicability of AI components combined with data base usage makes scoring profile availability more easier; in this way, banks can assure the customer with a less paper base and high complexity document processing, for obtaining a loan.

(c) Fast-improved operational payments platforms: speed and digital traffic capabilities are transforming the payment sector, improving the work flow, not only for the final beneficiary of this type of service (the consumer) but also for the bank.

(d) New branch models: rethinking the role and addressability of products and services provided by branches through the network sales channel, making experiences more in accordance with the needs of the 21th century banking models new paradigm, with highly focus on creativity in delivering added value advisory to the clients.

In order to adequately summarize some of the main challenges and implication that arise from the digital development in reshaping the business models of the banks, we include below, in Figure no.2, the description of some of the processes transforming the banking market, from 2007 to perspectives upon future, until 2020.



**Figure 2: Acceleration process of digital development in the banking market**

*Source: A.T. Kearney Analysis*

Because going digital is more about individuals than corporate businesses, it might be considered that banking digitalization is more about Human-to-Human relation than Business-to-Business one. Some of the changes presented previously can be found in a graphical representation in Figure no. 3 below, where a forward-looking approach in the digital banking transformation models is detailed: from technology trends to evolving customer behavior and changing branch networks.

Technology trends	Evolving customer behavior	Changing branch networks
<ul style="list-style-type: none"> <li>• Internet of Things</li> <li>• Full penetration of smartphones and tablets</li> <li>• Convergence</li> <li>• Explosion of cloud services</li> </ul>	<ul style="list-style-type: none"> <li>• Digital usage crossing generations</li> <li>• Mobile Internet use increasing</li> <li>• Digital culture spreading worldwide across industries</li> <li>• Emerging markets increasingly adopt mobile banking</li> </ul>	<ul style="list-style-type: none"> <li>• Branches activity decreasing</li> <li>• Less traffic than on mobile</li> <li>• Fewer but bigger branches integrated in the customer experience embedded with digital (flagship, showroom)</li> </ul>

**Figure 3: Looking ahead: digital transformation until 2020**

*Source: A.T. Kearney Analysis*

As a previous decision-based conclusion, it can be stated that the path for redefining the traditional banking models into a more digitalized, online, high-tech ones, has been a past proven concern from the financial industry. Nevertheless, where there is change there is reluctance, presented upon diverse aspects of business nature, whether in the form of policy making, security reliability reasons, value chain processes, corporate governance, management productivity, human resource capability, all in direct connection with revenues and profitability margins, through gaining of more customers (age wise, risk wise, profile wise) and market share.

#### 4. FINDINGS AND DISCUSSIONS

One of the key questions related to the digitalization process is the future role for FinTechs: „, FinTechs act as competitors or business partners for banking organizations?“. The answer will be confirmed by the market realities, customer experience and regulatory framework being the main influencers.

Banks are enjoying trust from the society/customers to store their data. FinTech adoption is important within financial markets, developments were done in payments/other areas(\* Digitalization extended the number of gadgets used as channel for payments: laptops, smartphones, smartwatches, fitness trackers and even via cars).

A partial answer to the above mentioned question may be Cooperation. Under a banking organization umbrella, benefiting of a client data base, the bank may increase quality/speed for its services by inviting Fintechs to develop synergies. The bank offers access to the data base, provides compliance services, products and services (e.g. bank accounts, cards) and the Fintechs may offer: payments, crowdfunding, remittances. The bank should analyse and understand benefits, risks and impact on its business from new technologies and collaborative partnerships.

We include in this part of the paper a selection of relevant examples for specific business segments explored by the FinTechs:

- Related to payment industry: Gocardless, Yapstone, Marqeta, Paystack, PayNearMe;
- Related to mobile banking: Monzo, ClarityMoney, Digit, Propell;
- Related to consumer lending: SocietyOne, ActiveHours, FinanceIt, Smava;
- Related to wealth management: Wealthsimple, Robinhood, GuiaBolso;
- Related to monet transfer: Revolut, Worldremit, BitPesa, Currencyfair, LevelUp;
- Related to blockchain developments: Ripple, Coinbase, Axoni, Digital Asset;

Other example representing the innovative use of technology but also a fast-growing trend in FinTech industry is Robo-advisory, used mainly for wealth management purposes. Robo-advisors

create client portfolios online by applying algorithm-based methods, directed towards better optimization and higher efficiency.

Managing digitalization in banking requires time, flexibility, huge testing effort, money, regulatory restrictions. The bank organizations should allocate financial and time resources, train their staff, parachute external expertise, measure and adopt the right balance between online and off-line, insuring data privacy, managing security risks and in the same time keeping up with the current business.

Building strategic partnerships with technological companies, buying and adapting business solutions, but also developing internal capacities and knowledge may support the change in paradigm and the digitalization process in banking.

Traditional banks versus digital banks, traditional banks with digital banking arms represent strategic options for the banking organizations. New concepts as Open banking, Internet-only banks (e.g. direct banks), mobile only-banks (e.g. mobile banks) are digital entities that offer accelerated business practices, providing banking products and services.

Concerning the positive technological and digital transformation of the banking system and financial markets, along with influence comes great responsibilities. Authorities, regulators, supervisors in the banking industry are constantly trying to recalibrate the rules of "the game", in order to balance the impact of the innovating technologies on the real-world base economy.

From data security to human resources and corporate governance management, policy has to be drafted and markets should be regulated and supervised to reach equilibria, where the comfort and secure line transactions go hand in hand with transparency, quick processing and mobility for the final beneficiary – the client.

In this respect, managing big data security patterns is a challenge for an industry where information is a key element that defines profitability, in the line with the mass-market client and market share overviews. In order to obtain a regulatory requirement, banks have to provide storage of their data for many years after collection, but facing specific policy changes, such as provided by the recent statements of the General Data Protection Regulation, starting at 25<sup>th</sup> May 2018 (known as GDPR, The first European regulation on data protection). Trust is essential in banking and specifically when adopting new technologies, and the new regulations may have a positive effect.

The banking industry is among the most data-driven of industries. Regulatory and supervisory requirements impose banks must store many years of transaction data. The challenge is knowing how to translate that information into meaningful insights.

Big Data provides significant opportunities for banks to outshine their competition. Moving data onto a cloud platform provides a 360-degree view of every customer. This deep insight reflects a sort of border, where banks may provide a higher level of service and create value added. Big Data allows also the use of disruptive technologies, such as artificial intelligence, block chain to map the customer journey and gain a competitive edge.

Digital proximity, from branch network to digital banking, from paper-based processes to pocket (IT) Internet mobile bank, represent several of the changing aspects of the new digital paradigm.

In this cultural and technological environment, based on the interaction between "man and machine", the banks business functions and IT ecosystem are working together on primordial tools of enhancing and building a one-off microsystem towards digitalization, as follows: mobile tools, Digital Analytical Zone, Fintech and E-currency.

But the concern comes in the eyes of product digitalization beneficiaries, that work on developing a culture of innovation, supporting capabilities towards the customers realiance and realibility on new digital banking products and servicies, by creating an increase bank organization familiariation with all types of business related digitalization processes.

In banking, there is the need to Re-engineer many aspects, to invert relationships (cyber being inside most of the processes), to get an "agreement wise pact" between human and digital. Cyber should not be considered only an IT problem. Cyber focus on business must provide, in the near

future, specific documentation and contribute to prioritize the most important outcomes of the banking organization.

From a risk approach, both top down and bottom up, efforts should be done to identify risks, to understand the insights of digital connection between "the old and the new", how it will impact the customer generations of tomorrow. External events may change present environment, change behaviors, but regulators, authorities and banks should build an integrated educational strategy, to support a gradual implementation of digitalization across the banking organization. Strong business area partnerships are being developed upon the new digital era, in order to extend also the security expertise related to business areas and enhance cooperation, sharing information and the understanding of the impact of new technologies for critical activities of the banking business.

Banks provide continuous flows of data, combine data sets and perform analysis, Stress Tests, necessary in creating a stability performance platform, evolving to a new level, towards an "Intelligent Era". Those capabilities should act within a proper law and regulatory framework, insuring stability and business continuity.

The valuable interactions between human and machine, between machine and machine assisted by humans, represent key elements of the business models, in many industries, including banking. Digital banks and especially leading innovators, such as FinTech companies, provide a mix between technology, IT development and banking related tasks, that are being operated within minutes and processed constantly, without and delay in the "pocket & hand" of the final beneficiary of products and services, the consumer.

Technologies have evolved, in a rapid manner, increasing pressure on banking models to change and adopt the new digital environment (such as mobile banking, Internet Banking, System Process payment compatibilities through digital smart banking, process automatization) in order to remain competitive. Alongside with the FinTech concept, almost in the same timeline period, came the concept of digital money/currency (e.g. Bitcoin, Ethereum, Ripple), creating a new market, called cryptocurrency market, which is in a very significant proportion related to the digital innovation (That have started to be used broadly since 2016). The pattern to which the system of cryptocurrency works is almost entirely based upon a mathematical enhanced IT algorithm called block chain.

Other relevant innovating technology for banking is represented by Artificial Intelligence (AI). From software products that work with less and less human in-put, to IT applications that can take over processes managed by human workers, AI is gaining momentum. AI today is present almost every ware, in mobile applications, in banking applications, almost in every aspect of our daily interaction with services and products, in order to facilitate and ease our life. The development of AI is especially based on Big Data and Data Science concepts, being an integrated development technology, support by the interactions between human to machine, and machine to machine.

Regarding the digital landscape, should be considered new responsibilities for all the participants. Involving such a complex set of new rules, the new "digital era" impacts on the human labor market. It is important to analyze the implications and to draft strategies to imbed new technologies, insure continuity, resilience and long-term value added for all the stakeholders.

## 5. CONCLUSIONS

Digital innovations and developments, connected under digitalization umbrella, transform the banking industry and individually, every banking organization.

The transformation of a bank involves a strategic management process, a management team with mixed competencies, both business and technical.

Managing digitalization represents also a deep cultural change, both outside and inside the banking organization. Customer behavior, expectation, experiences from other industries influence the digitalization processes of the banks.

A strategic partnership between IT function and business functions of a bank represent a key concern within the management process of digitalization. The IT function will continue to adapt its capabilities to rapid market changes and adopt an agile operating model, to allow rapid-value delivery and resource mobility inside the bank, in order to support outside reporting and compliance requirements.

Other relevant aspects reflected by our analysis, emphasize that the behavior of every banking organization should be based on responsibility/accountability, when providing innovative technologies, the adopted technologies should be validated, audited in order to build trust for regulators, customers, bank's employees. Adaptability and flexibility within the management process of digitalization represent key aspects, in order to transform challenges (also the top 10 mentioned in our paper) in opportunities.

Strategic management process of digitalization needs specific tools, activities and instruments to plan, attract and coordinate Human & Technological Resources, test & modify, asses and impact, change and Re-engineer.

Managing successfully digitalization in banking requires Educational Pack & Sale of this transformation project, to all stakeholders (shareholders, bank employees, customers, regulators, authorities) in order to gain support in implementation and bring value added.

We conclude our research with a strategic question: will banking industry become a Platform Industry, such as music industry?

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