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Financing and Fiscality in the Context of Artificial Intelligence at the Global Level

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Abstract

The current financing models, as well as the fiscal models, are based on the current resources available at both the financial system and the fiscal system, but in close interdependence with those existing at the global level, the technology being one of them. Moreover, we consider that increasingly in the resource hierarchy, the place of the human factor is replaced by artificial intelligence (regardless of whether we are talking about industrial robots or intelligent technologies as is the case in the banking financial field). The new ways of approaching and coordinating finances aim to increase the degree of flexibility of financial networks and harmonize the results of those financial institutions that master and use complex but complementary technologies in order to obtain a final product or services optimal and with direct connection to its beneficiary. The defining elements for any financing and control model, regardless of whether we think of Fintech or other programs such as Fiscalis , are given by the following characteristics: digitization (artificial intelligence tools are crucial for digitizing financial services and fiscal), mobilization (virtual space offers not only the possibility but especially the platform for achieving the mobility of services), disintermediation (virtual space offers the possibility of direct access without intermediaries) and automation (through the financial services existing on the online platforms, the beneficiary of the service and the service provider optimizes its time and cost in favor of making the service profitable).

Keywords: financial technologies, artificial intelligence, financial and fiscal inclusion and sustainable development

JEL Classification: E44, F65, O31

Introduction

Currently both at the institutional level and especially at the personal level, we are directly and indirectly involved in the process of the great challenges at the global level, which confirms that we are no longer under the direct influence only of the decisions at the local level but we are predominantly under the decisions at the global level. , especially when discussing the markets for financial and fiscal services. In this context of the challenges, we can say that we are in the stage of redefining the systems, mechanisms and not least of the instruments regarding the new architecture of the financial markets and of the system of supervision at European and global level. Artificial intelligence has a major role in the process of these great challenges and with a direct impact on the financial services architecture. Arthur Bachinskiy presented in his paper "The Growing Impact of AI in Financial Services: Six Examples", six examples of the implication of artificial intelligence in finance, namely: decisions of artificial intelligence and credit; artificial intelligence and risk management; artificial intelligence and fraud prevention; artificial intelligence and trade; artificial intelligence and personalized financial institution; artificial intelligence and process automation.

In this global context, *identifying the tools and mechanisms for accessing financial resources,* especially for those in need, is not only a priority for new researchers in the economic field, but also a challenge in defining the new architecture of financial markets, respectively identifying financial instruments, mechanisms and financial means to ensure societal sustainability, respectively social, economic and financial inclusion. In many advanced economies, the great challenges are due to the growing inequalities between the poor and the rich, between those with resources and those without resources, but especially the impact of technological and climate change on economies, "*the complex impact of globalization - including those related to trade in goods, services and data, and the movement of people and capital. In emerging economies, the sharp decline in poverty and the rise of the middle class have fuelled better aspirations and demands for better public goods; these requirements are now facing slower growth and tightening of government budgets. The order resulting from the adversity principle has produced an economic, financial and ideological polarization. The state we are in is one in which one (state) controls the whole (globe), manages discretionary global powers, exercises unilaterally of decisions and favors levelling diversity (including financial). In this global context, identifying the financial resources to support those who have need is not only a priori for new economic researchers, but also a challenge in identifying financial instruments, mechanisms and financial means to ensure the sustainability of society*

Artificial intelligence influences not only finances, but also the definition of tools and mechanisms of tax and tax management at European and global level, with direct impact on the global phenomenon of "fraud". At European level, the EU Fiscalis 2020 program was promoted, in which fiscal harmonization at European level will be

achieved both through directives and regulations, but especially through artificial intelligence instruments. In many advanced economies, the major challenges are due to increasing inequalities between wealth and resource shortages and the impact of technological and climate change impacts on the economy, the "complex impact of globalization - including those related to trade in goods, services and data, and movement people and capital. In emerging economies, the sharp decline in poverty and the rise of the middle class have fuelled better aspirations and demands for better public goods; these requirements are now facing slower growth and tightening of government budgets. The order resulting from the adversity principle has produced an economic, financial and ideological polarization.

The European Union through its own policies and programs contributes permanently and actively to fight inequality and poverty, especially since "*equality and equity are an integral part of European values and are a cornerstone of the European social model, the EU and the EU member states; whereas both the Member States and the EU aim to promote employment, enabling a high and sustainable level of employment and combating exclusion*. "Given this European and global context, the role and importance of artificial intelligence for financing and taxation is essential, more precisely on the one hand starting from the elements of creation of the financing instruments and mechanisms for the financially excluded (the business environment in the rural area , vulnerable groups, etc.) and, on the other hand, the creation of standardized fiscal instruments at European level leading to a financial-fiscal discipline and actively contributing to sustainable growth at local, national, European and global level both now and in the future. In this global context, in the process of identifying the financial and fiscal resources, a major role is played by the ethical principles, principles that are also valid in research, respectively: the principle of honesty; the principle of replicability, the principle of responsibility, the principle of validity, the principle of reliability; the principle of transparency and the principle of respect are permanent concerns of researchers in the economic field, and beyond. The innovation of products and services as support elements for those in need is not only a priori for new economic researchers, but also a challenge in identifying financial instruments, mechanisms and financial means to ensure the sustainability of the company. Moreover, through the current digital technologies, we believe that together with the identification of financial resources, we should also identify a mechanism for their management and from a fiscal point of view, respectively a better functioning of the tax systems within the European internal market and which would it depends on the efficient and effective processing of cross-border transactions by national tax administrations, on the prevention and combating of tax fraud and on the protection of tax revenues.

This implies the exchange of large amounts of information between tax administrations, but also the more efficient functioning of administrations, with the concomitant reduction of administrative, economic and time consuming costs for taxpayers involved in cross-border activities. This can only be achieved through

cooperation between the Member States' tax administrations and third parties. Given the increasing globalization, the effective fight against fraud should also have an international dimension. Therefore, the program will also support the exchange of information with third countries, in the context of international agreements concluded with the third countries concerned"[1]

Research methodology

The *methodology of the paper* will have as direct instruments the collection of data and information from the literature and from the existing practice at the global level in public and private institutions, but especially scientific articles published on specialized research networks (Research Gate, Academia.edu, RePec etc.), articles published in different journals, relevant books in the field of reference, legislation, analyses and studies, official documents of various tax bodies, tax documents and interactive database of the Federal Banks and Central Banks, other relevant sources identified at the libraries Romanian Academy, National Bank of Romania, National and International Library, etc. Moreover, in the methodology we will analyses the documents using the comparative, analytical, descriptive method, no participative and participatory observation, and the use of a set of informational sources, the collection of financial data in the established databases. Also, the paper will be based on annual reports, publications, consolidated statistical data provided by the Federal Banks, the European Central Bank (ECB), the International Settlement Bank (BRI), World Bank, World Economic Forum, CGAP, CFI, the European Commission, OECD, published annually, data to be processed in order to be able to provide a general and analytical picture of the most important changes taking place in the globally - considered representative for the understanding of the phenomena studied. To substantiate the funding model for innovation, we used observation and examination tools, research methods based on the basic principles of scientific research, and we also created procedures based on factual analysis as a result of a significant practical experience and of intensive documentation at the level of national and international literature.

Literature review

The literature and the sources of information are multiple, especially as a result of the impact that artificial intelligence has not only in the field of finance and tax, but especially on our daily lives. A presentation of the evolution of artificial intelligence in finance was made by Bonnie G. Buchanan, PhD, FRSA in the work "Artificial intelligence in finance", respectively: John McCarthy is a parent of the concept and definition of the term "artificial intelligence" since 1956. The Oxford English Dictionary defines AI as "*The theory and development of computer systems capable of performing tasks normally requiring human intelligence, such as visual perception,*

[1] The Growing Impact of AI in Financial Services: Six Examples
https://towardsdatascience.com/the-growing-impact-of-ai-in-financial-services-six-examples-da386c0301b2

speech recognition, decision-making and translation between languages"6 FSB (2017) defines AI as, "*The theory and development of computer systems capable of performing tasks that have traditionally required human intelligence*". At the beginning artificial intelligence was based on algorithms based on logic, now there are working hypotheses that confirm that artificial intelligence is currently based on blockchain technologies, respectively the so-called concept of "machine / technology based decision". Turing (1950) detail an operational test (the Turing Test) for intelligent behavior. In his seminal work, Turing provided the major components for future AI work with language, reasoning, knowledge, learning and understanding. Through the Turing Test, Turing laid the ground work for ML, genetic algorithms and reinforcement learning. The attempt to replicate the logical flow of human decision making through processing symbols became known as the "symbol processing hypothesis" (Newell, Shaw, and Simon, 1957; Newell and Simon, 1961, Gilmartin, Newell and Simon, 1976).

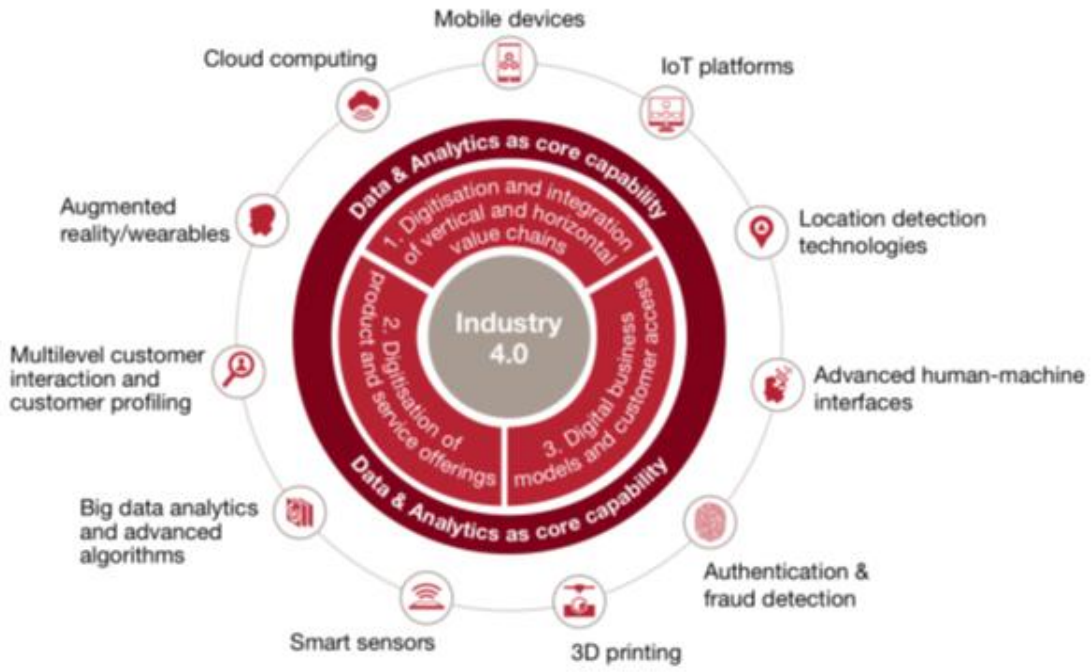
Much of AI in the 1950s and 1960s did not focus on finance applications. In the 1960s, a substantial body of work on Bayesian statistics was being developed that would later be used in ML. Neural networks (which would become a cornerstone of deep learning) were developed in the 1960s and grew rapidly. However, due to a lack of sufficiently available electronic data and computing power, AI fell out of favor into what became known as an "AI winter" (Kaplan, 2016; FSB, 2017). The term "AI Winter" also connotes a slowdown in investment and interest. In 1973, the UK Lighthill Report ended government support for AI research. The 1980s witnessed an AI revival due to new funding and techniques. During the 1980s, Japan, the UK and the USA competed heavily in AI funding. Japan invested $400 million through the Japanese Fifth Generation Computer Project. The UK invested £350 million in the Alvey Program and DARPA spent over $1 billion on its Strategic Computing Initiative. In 1982 AI made inroads into the financial services industry when James Simons founded quantitative investment firm Renaissance Technologies. This included the development of "expert systems" (or "knowledge systems") which is a technique that solves problems and answers questions within a specific context. Brown, Nielson and Phillips (1990) provide an overview of integrated personal financial planning expert systems. They emphasize expert systems that use heuristics and the separation of knowledge and control as well as providing examples of expert systems that were prevalent at the time. Kaplan (2016) describes AI as, "The essence of AI, indeed the essence of intelligence, is the ability to make appropriate generalizations in a timely fashion based on limited data. The broader the domain of application, the quicker the conclusions are drawn with minimal information, the more intelligent the behavior."

The advancement of financial technologies includes robotic financial trading, payments made through encrypted cashless platforms, crowdfunding financial platforms, financial consulting, technical and robotic assistance through virtual space, and not least virtual currencies so developed lately. "The value of FinTech's global investment in 2015 increased by $ 22.3 billion by 75%. Corporations, venture capital

and private equity firms have invested more than $ 50 billion in nearly 2,500 FinTech companies globally since 2010 "(Financial technology (FinTech): Prospects and challenges for the EU, EPRS, Cemal Karakas, Carla Stamegna - Graphics: Christian Dietrich, 2018). However, financial technologies (FinTech), although registering a rapid growth in the virtual space, have positive aspects, especially regarding the speed with which the financial services (adapted and flexible) reach the many financially excluded, but also have risks, challenges such as be especially the data and consumer protection issues, the risk of increasing financial volatility, as well as the alarming increase of cyber-crime). The risks in particular attract the attention of the financial services regulators, and a Financial Technology Task Force (FTTF) has been set up at the European Commission, which together with the European Parliament's Committee on Monetary Affairs (ECON) made the FinTech report published in January 2017. At the global level, respectively the G20, the Financial Stability Committee (FSB) presented the report on FinTech in July 2017. The concerns at global and European level were transposed into discussions / topics / conferences and regulatory initiatives, at national level.

The current process of financial technologies and the definition of financing models start primarily with the contribution of digital technologies to the development of the financial industry, as can be seen in the graph below.

Figure no.2. Industry 4.0. Framework and contributing digital technologies



Source: PwC report, 2019

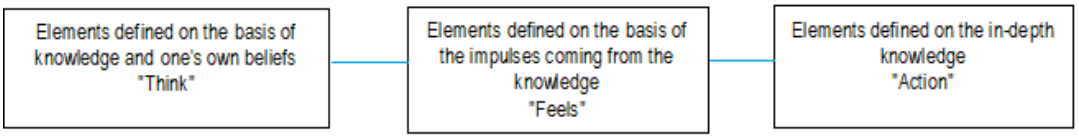
The ***process of globalization*** inevitably leads to the reconsideration (conceptual reconstruction) of the paradigm of growth and economic development, and especially in financial technology (Fintech). The challenge, on the one hand, of the depletion and / or deterioration of resources (especially natural) and, on the other hand, of our optimization model - maximizing the objective functions of economic actors - is likely to require a radical change the options and the means by which we address this important activity of the individual and society: economic activity. At the same time, it is obvious that economic activity can no longer be regarded in itself as a mode governed by a distinct rationality distinct from others, rationality based on a consistent and sufficient logic. Logic and economic rationality must accept, under the pressure of global problems, a permanent and fundamental communication with the other logic of individual and social behavior (praxis). In addition, they must accept the possibility and desirability of re-evaluations, repositions, or even refunds, in light of the new paradigms of the economic process (including paradigms, for the time being, academic, such as the entropic model).

Sustainable development (or growth) is a direct function of resources of the same category, i.e. sustainable resources, inclusive financial resources. The subject of this study is the research of a special resource, namely the financial technology (FinTech). Studying this resource from a sustainable development perspective will lead us to the proposal and the conceptual, methodological and technological development of what we will call a sustainable financial resource. For its part, the concept of a sustainable financial resource will generate some considerations about the sustainable sources of financial resources, including Fintech - our ultimate goal, on the other hand. As we develop more broadly at the right time, the financial sources for sustainable development are more sustainable financial sources for development. This is not just a game of words but an emphasis on an extremely important idea, namely the idea that points to the depth of the sustainability feature. Since, as will be demonstrated, the financial resource (and, as a consequence, the source of the FinTech resource) is one of the foundations of any economic process, it is natural that our attention goes to ensuring this foundation in terms of sustainability in order to be able to speak with some justification and confidence about sustainable economic processes (systems).

Research results

In our empirical research, with direct elements related to the major challenges at European and global level, a problem that impacts both the financing mechanisms and the fiscal ones is given by the problem of inequality, which has become more important in recent years, more chosen in the context of crises. Although we are witnessing increasing developments in the artificial intelligence sector at European level, the effects of the economic crisis on Europe have been and are still present, reversing the convergence process of the standard of living (which has been a priority for several years) with increasing pressure on social protection systems. The degree of inequality has increased in most Member States, the trend being similar to the

global one, generating concerns and concerns both from the perspective of the sustainability of economic growth and from the perspective of social cohesion. However, solutions through financial and fiscal instruments could create the premise of systemic balances at European level, and implicitly at the level of each state. In addition to an inventory of the challenges of global challenges, based on documentation and knowledge of current phenomena, we believe that presenting current developments and trends could be the starting point in defining proposals that can directly support the process social, economic and financial inclusion. The UN 2030 agenda, presents us very clearly the 17 SDGs that are found in our daily tasks, but through the personalized way of involvement and adaptation. While an example of differentiated involvement, but which leads us to the same "sustainable development goals no.1 poverty eradication", the Europe 2020 strategy focuses on poverty reduction, but the challenge of reducing the risk of poverty is related to the inequality debate[1].In the process of challenges our motivation must have elements of determination, respectively our involvement to be governed by something, and that something can be passed through the following defining stages, respectively:



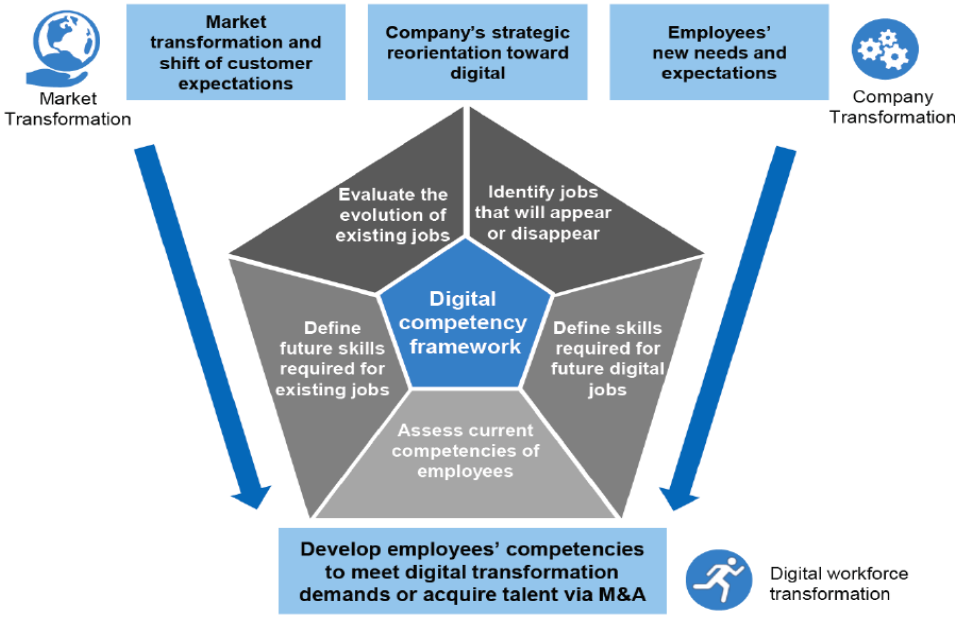
If in the past the decisions were based on the results of the past numerical series, at present due to the involvement of artificial intelligence, the calculation algorithms are given on the existing bars in the global data blocks, respectively based on blockchain technology. Moreover, the speed of penetration of artificial intelligence both in the financial industry and in the control mechanisms, demonstrates how quickly the architecture of the entire system changes, with a change of business, jobs, even in traditionally conservative areas.

The most popular examples regarding the involvement of artificial intelligence in finance: Influence of lending decisions through artificial intelligence decisions; The direct link between risk management and artificial intelligence; The role of artificial intelligence in preventing fraud in the financial-banking field; The impact of artificial intelligence on trade; The direct link between artificial intelligence and personalized financial institution; The impact of artificial intelligence on process automation.

Financing tools and mechanisms directly influenced by artificial intelligence have the following specific attributes, respectively: digitization, mobilization, augmentation, disintermediation, automation[2].

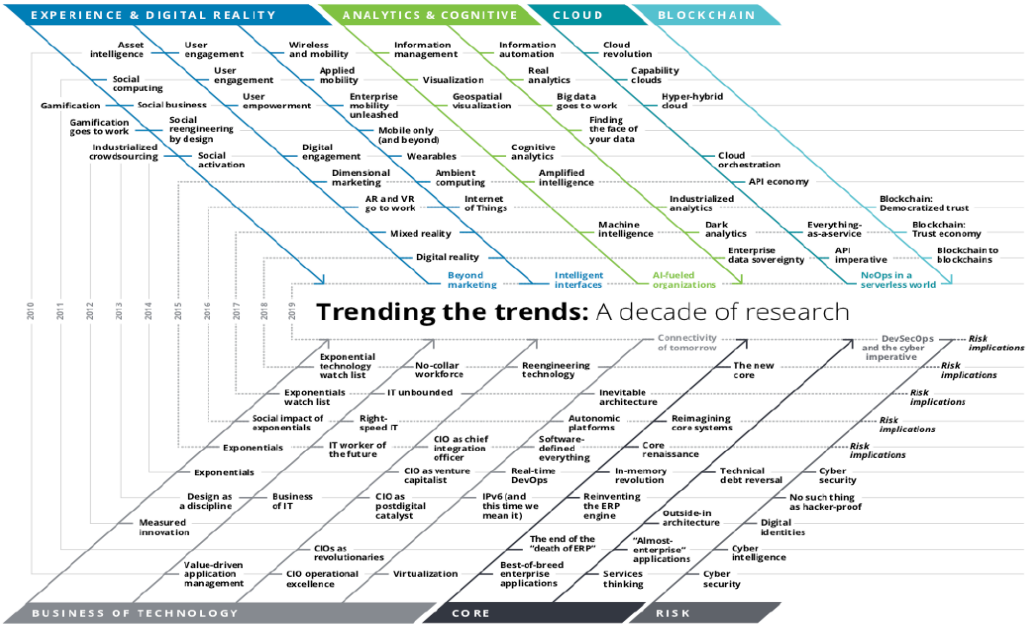
[1] Saez E. (2016), „Striking it Richer: The Evolution of Top Incomes in the United States".
[2] *YouTube; Digital transformation: are you ready for exponential change? Futurist Gerd Leonhard, TFAStudios*

Figure no.3. Digital competency framework



Source: Accenture, 2018

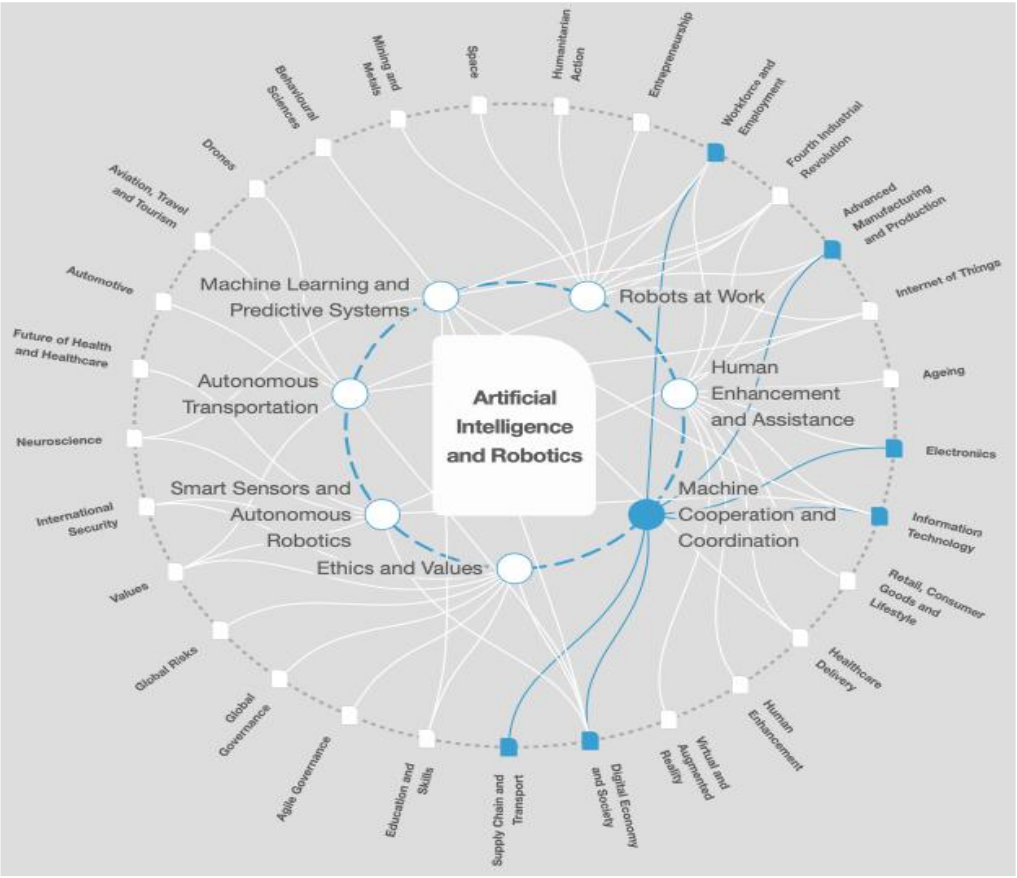
Figure no.4. Current trends of research with impact on finances



Source: Prof. Adrian Curaj, research paper Economic Model 2040, Quo Vadis Romania?, 2019

In order to be able to develop financial instruments and mechanisms in line with current trends globally and under the direct influence of artificial intelligence, we believe that adapting to current digital financial technologies and creating models using them is the basic pillar in the development of the new architectures of financial services connected on the one hand to the real needs of the society, but especially connected to the global trends as they are reflected in the figure above.

Figure no.5. Artificial Intelligence and Robotics



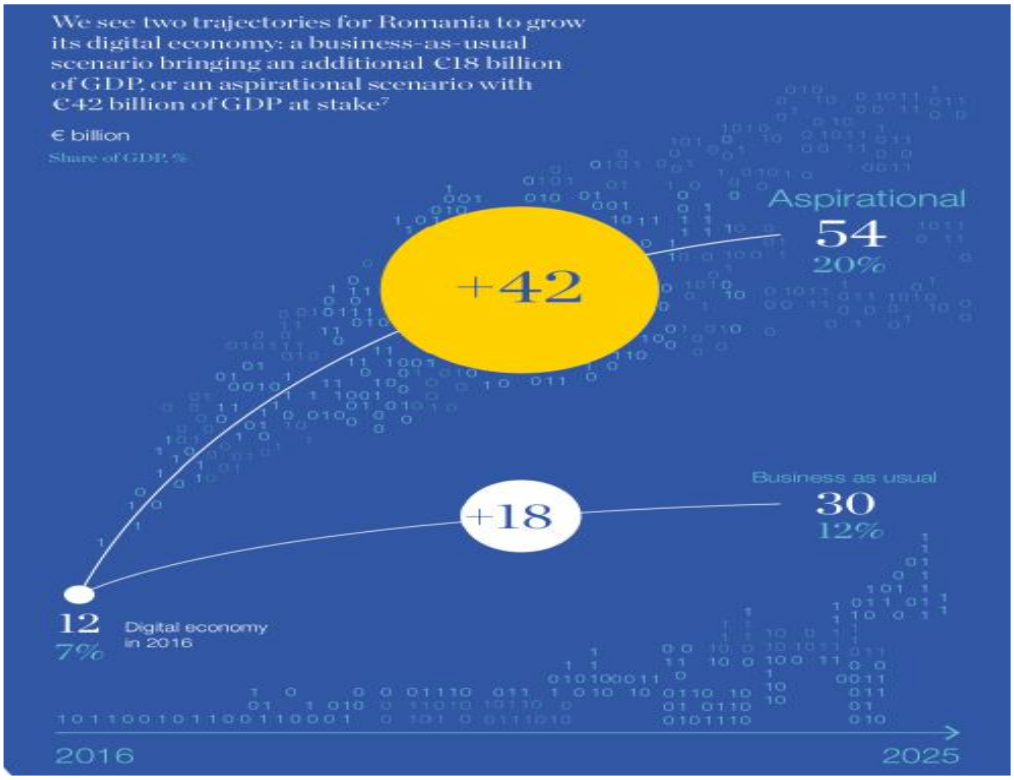
Source: World Economic Forum, 2019

Between artificial and robotic intelligence for finance, there is a direct connection and a direct impact on the service provided in the financial-banking field. Moreover, many of these services will be provided directly by robots as a result of the resource optimization process, as can be seen in the figure above. The trend of digitization is not just in the field of finance, it is found in the vast majority of the economic branches.

In our work to reflect the impact of artificial intelligence on the real economy, we will also find our analysis on the main indicators of stability of the real economy.

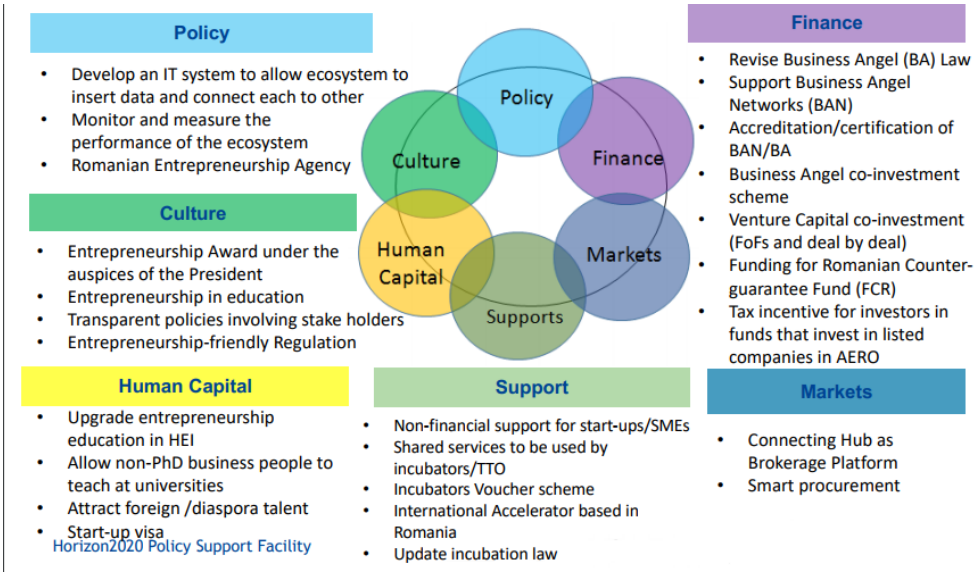
The holistic approach of the phenomenon of expansion of financial innovations, respectively of current financial technologies, as otherwise abbreviated to FinTech, knows very specific elements and adapted to the global financial context, and lately the share of financial services in the virtual space is dominant compared to their traditional form. Moreover, this new financing instrument has arisen mainly due to the need to streamline the financing system, based on technology, either to provide financial services adapted to the current needs of consumers (especially those who are in need of financing, this is also the real reason for the fintech coupling of the financial inclusion of the financially excluded), as well as the design of new financial products that are reliable and responsive to the market. The impact of these financial technologies will be directly on the real economy, more precisely its digitalization.

Figure no.6. Scenarios regarding the digitization of the economy in Romania



Source: McKinsey, The rise of Digital Challengers, Perspective on Romania, 2018

Figure no.7.Transforming accelerators in Romania: EC Recommendations



Source: H2020 PSF Report, 2017

In order to be able to estimate at national level our capacity for innovation, technological transfer and entrepreneurship, especially in the financial field, we consider that besides the elements related to intelligent specialization, industrial transformation, a knowledge of the real economy at the level of each state could lead to the realization a financial architecture based on both the combination of the traditional form of financing and the current financial technologies.

Figure no.8. The business accelerator model in the context of AI

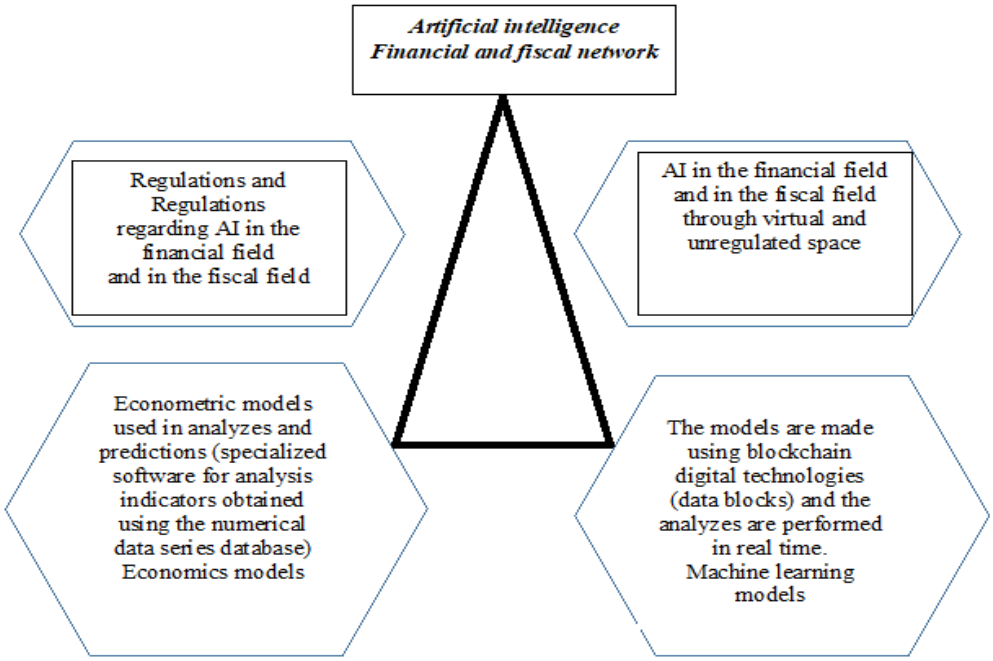


Source: H2020 PSF Report, 2017

In order to be able to rethink the architecture of financial services, in the context of the real economy (direct beneficiary of the finances), as well as the impact of artificial intelligence on these economic sectors, we consider that we should reflect some

relevant information about the real economy, more precisely the reference indicators regarding the financial state of the real economy.

Figure no.8. Financial and Fiscal Network (concept) based on AI



Source: own processing

As we mentioned in the figure above, the economic models differ depending on the positioning of the network, more precisely on the regulatory mode. Moreover, at European level, artificial intelligence in finance and fiscal, we believe should be directly connected to the three key factors for economic growth, provided by the European Commission, respectively:

smart growth (promoting knowledge, innovation, education and digital society);

sustainable growth (a more competitive production, with a more efficient use of resources);

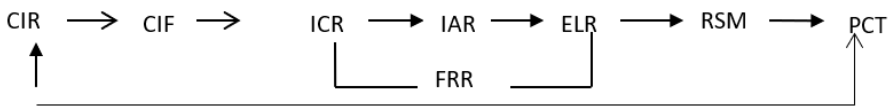
inclusive economic growth (increased participation in the labor market, skills acquisition and the fight against poverty).

We are currently witnessing a dynamic of the economic models at European level, the business model being "the most intellectual and the most surviving species" if we were to paraphrase Charles Darwin ("The surviving species is the one who is capable of adapt best to the changing environment in which it is found "). This famous quote summarizes the essence of transforming the business model into the context of the economic model. It is applied in particular for the development of international

business, in which the organization faces different, yet unexplored markets. The economic model of the country is conditioned by the internal resources (human resource from health, education, etc.) and the way of managing them in the medium and long term. A correct way of administration starts from the inventory of sources and resources, followed by the creation of a mechanism by which these resources are exploited. The mechanism of transformation from source to resource is related to the policy addressed at the level of the European institutions, the national policy of the state, the policy at regional level and the policy at local level.

The risk of the network, it acquires concrete forms of action, of manifestation, of certain forms, as a rule, of the characteristics of the network that are affected by the decoupling, distortion of the phase, the distortion, the weakening of the force of a characteristic of the financial network. Obviously, these forms target the impact of the radiant of the institutional characteristic of the network, materialized in norms, bodies, rules, structures, etc. on the interactive features of the network. The instinctive radiant of the network represents the force, the ability of the interactive feature of the network to influence, in a negative sense, to alter the performances of the components. Based on these aspects, the global risk of financial and fiscal networks must be evaluated in the current context of the challenges regarding the functionality of the financial network principle based on artificial intelligence. The complex relationship in which the network risk acts on the performances, on the aims, functionalities and potentialities of the network, is presented in figure no. 1, in the form of an impulse relation.

Figure no.1: The impulse relations between risks and performance



The meaning of the symbols is as follows:

DIM = institutional deficiencies of the financial and fiscal network;

CIR = the institutional characteristic of the network;

CIF = the interactive features of the network;

ICR = network interconnections;

IAR = network interactions (real-time and virtual interactive flows);

ELR = network elements;

FRR = risk forms of the network;

RSM = risks specific to the financial network;

PCT = losses and costs.

Starting from the principles listed in the paper and correlating with the impact of artificial intelligence on finances, we can mention the forms of the network risk, respectively:

The credibility risk, represents the essential form of risk of the financial network, the attenuation or distortion of the confidence of the economic subjects in the forms of currency, in the financial instruments, the financial-monetary institutions, due to the malfunctions that appear, induces, directly or indirectly, by contagion, immediately or offset, with a time lag, all the specific risks and, first of all, the risk of currency depreciation.

The financial networks are irreducible to the simple economic reasoning centered on the profit-oriented economic interest, the monetary transactions, the operations and the financial flows, being based on the confidence of the entities, the economic subjects, in the financial network, in the network of transactions, the fiduciary dimension being vital for the reproducibility of the networks and for their continuity over time. Trust is an integral part of maintaining interconnections and interactive financial flows, especially considering the uncertainty and complexity of transactions.

The profit-oriented economic rationality does not cover the trust space in the currency, these being dependent on different factors, the economic rationality depending on the individual interests, selfish, competing and confronted in the market, while the confidence is conditioned by the coexistence, social, political, cultural relations, but also economic, trust assuming reciprocity, while economic rationality implies exclusion through competition (even if the market harmonizes, through profits, interests).

Trust is an essential property of the currency, an abstract feature of money in general, which does not imply the stability and validity of the concrete forms of the currency, because trust in the stability and validity of a monetary form, a financial instrument, means trust in institutions and rules, in regulations and rules, directly responsible for the administration of this form of currency. In this sense, the nature of the risks involved in financial transactions, in interactive flows, reflects their unique character in the modern world, namely that they are generated by human-created institutions. It can be stated that, the risk of credibility is not associated with trust in money as a social institution, but with trust in social institutions, i.e. regulations and organizations, which create and manage specific monetary forms, financial instruments traded on markets.

The risk of credibility in the financial network is determined by economic conditions, but especially extra-economic, placing the monetary forms in an environment centered on economic rationality, dependence on financial transactions, the interactivity of the financial network of interests and economic gain denature and vitiate the functions of the currency, its transitive potential, the aims of the network, serving the concrete forms of the currency of improper and adverse purposes and

functionalities. In this sense, the forms of speculative capitalization or financial derivatives, as quaternary, anticipatory forms of currency, at the same time constitute extreme forms of the credibility risk, which generates risk, covering it.

The vulnerability risk, represents a generic risk of the financial network, determined by the inadequate, caused instinctively, of some characteristics of the flows and of the financial network, such as: reliability, complexity, integrability, intensity, connectivity, affecting the network considered as a whole, but differentiated by elements, interconnections and interactivities.

The vulnerability expresses the weakening of the transitive potential of the interactive flows of the network, this favoring, in particular through the channel of inadequacy, but also through the one of inactivation, the emergence of the specific risks, such as the exchange rate risk, monetary depreciation, the interest rate risk, the market risk.

Organizational, configurational incoherence of the financial network, inconsistency of financial instruments, currency forms in the financial asset hypothesis, inadequacy of financial operations, stiffness and temporal or dimensional incongruence of sources and destinations of interactive flows are causal institutional factors of the network vulnerability risk perceived by the participants in the network by diminishing the reliability of the flows, which may generate liquidity or solvency risk, through the volatility of the asset prices, through the conjuncture of network nodes, i.e. financial institutions or markets, which may ultimately lead to bankruptcy risk and so on

The *risk of vulnerability* is, therefore, par excellence a risk of institutionalizing the financial network and derives from the inadequacy of the network to the environmental conditions, to its requirements and needs, and in this sense, the direct effect of this network risk, the currency depreciation, in its form transactional, interactive, currency risk, is connected with the degradation of these conditions, with the relationship between internal and external environment.

The *risk of desynchronization*, is a risk of the flows, of their interconnection in the network, affecting the interactivity of the network, i.e. its essence, being generated formally by the institutional regulation and organization of the network, so by the implementation of the network, and functionally, by the relation between the attributions, that is, the activities, responsibilities and competences of the component entities.

The institutional causes of this risk are connected and often dependent on economic, social, and political causes (if we do not consider monetary policy itself as an institution), but it is obvious that the way of building the financial network, its architecture, its size and its institutional adequacy, contributes significantly to the occurrence and maintenance of this risk.

The risk of agglomeration, of agglutination, correlated with the two previous risks, is manifested by the abundance, segregation and concentration of currency forms and financial instruments in flow, in certain areas of the network, by regionalization, and polarization, phenomena with different etiologies , but highlighting the institutional inadequacy of the network, creating favorable conditions, especially through the incapacity channel, for the occurrence of the risks of rate, insolvency and, of course, of market risks, of the price of financial assets, of the currency.

The *management of this network risk* is mainly a problem of institutionalization and, functionally, a problem of evaluation and supervision, because the flexibility of the currency, its equitable freedom should also be found in its capitalized forms, financially instruments, between the trust in the currency, which- it confers its omniscience, and the economic reasoning, which regulates fragmentary rule, segregating the capital flows, of the saved currency, manifesting contradictions, crisis-generating confrontations, which partly reflects the existence of this agglomeration risk, with speculative openings.

The risk of detachment and polarization is the specific network risk, respectively:

The *risk of detachment* is manifested by detaching the financial network from the whole socio-economic environment, from its real markets, including the health, culture, education, financial network, sometimes becoming adverse to the specific evolution of these human areas, and this is essentially due to the way of speaking of the guiding principles of its configuration and architecture, so that the detachment induces in the financial network specific risks, such as the rate and the rate, the real, not speculative-arbitrary, volatility and coverage of them, generating local crises, regional, absorbed hardly, with losses and costs by the environment, but also liquidity risks, finalized by bankruptcy of the banking entity, as well as non-financial ones.

The risk of polarization highlights the tendency of the network to create competitive poles, financial centers, officially represented, through the Central Bank, which, beyond the attributes of coordination and regulation, becomes, in the name of monetary policy, an operator in the markets, conferring "confidence" in the currency. , in its purchasing power, but also operational financial centers, which concentrate with currency, financial instruments, the power to influence, to intervene, sometimes unbalancing the markets in ″desire″ to balance them according to already esoteric objectives, or at least selectively beneficial. Polarization is a phenomenon common to all networks, from mineral, natural to neural and spiritual ones, but the polarizing institutionalization of the financial network can have perverse, sometimes unexpected effects, polarization contributing to the accentuation of network risks, of those specific to the financial network, to the extent in which polarization does not serve the network, the currency, the confidence in the currency, exacerbating, for example, the orientation towards profit, according to the economic reasoning.

A significant effect of the risk of detachment and polarization, which potential, but also real, effect generates devastating specific risks, consists in the unmatched expansion of the value of financial flows compared to the value of real flows, most financial flows grinding into empty currency, obviously for the gain, for its transfer, rarely converted into real, consumer or investment assets.

The five types of network risks developed above do not cover the entire range of risk possibilities intrinsic to the financial network, only highlighting their existence, specificity and relevance in the monetary space, as well as their decisive institutional etiology. At the same time, the above approach wanted to point out that the risk of credibility is paramount, being the generic network risk, placing the currency, its forms and instruments, in an area dominated by economic reasoning, centered on interest and profit, diminishing currency credibility, the ability of the currency to perform its original functions.

The network risk, its five types delimited above, are generated by determinative or conditional factors, and in turn generate direct and indirect effects, through the risks specific to the financial and fiscal network, the network risk being placed in a structure of interdependencies, immediate and immediate influences.

Conclusion and indications for future research

Artificial intelligence in the financial and fiscal field is still at the beginning of laying the foundations, especially due to the fact that networks are found especially in the virtual space, hence the multiple challenges and vulnerabilities (regulation including in the virtual, ethical, economic, and social). However, due to the digital technologies that are part of our current life, we believe that artificial intelligence will become predominantly present in the financial and fiscal fields, contributing to current technologies and to the continuous development, to the creation of complex but easy eco-glotech-system financial models. Although the opinions of the specialists are different regarding the involvement of companies in the development of these technologies, we researchers believe that these financial and fiscal models based on artificial intelligence come with a focus on optimizing resources for each individual, which determines us to appreciate that artificial intelligence combined with the Internet of Things (IoT) will result in physical things becoming more adaptive and responsive, extending their useful lives.

Along with the big data, AI is regarded in the financial services sector as a technique that has the potential to offer immense analytical power. However, many risks still need to be addressed. Many AI techniques remain untested in financial crisis scenarios. There have been several cases in which the algorithms implemented by the financial firms appeared to act in unexpected ways by their developers, which led to flash errors and crashes (in particular the flash crash of the pound following the 2016 Brexit referendum). Lo (2016) calls for the development of a more robust technology,

capable of adapting in favor of people, so that users can use these tools safely, efficiently and effortlessly.

Much remains to be done. And clearly more education is needed on the competence and awareness of AI. The late Stephen Hawking summarized: "Raising strong AI will be the best or worst thing that has ever happened to humanity. We don't know yet. "

Appendix

Timeline of artificial intelligence milestones *(Bonnie G. Buchanan PhD (2019): Artificial Intelligence in Finance, the Alan Turing Institute).*

1937 Claude Shannon proposes that Boolean algebra can be used to model electronic circuits;

1943 McCulloch & Pitts recognize that Boolean circuits can be used to model brain signals;

1950 Alan Turing develops the Turing Test;

1950 Minsky and Edmonds build the first neural network computer (the SNARC);

1956 The term “artificial intelligence” is coined by John McCarthy;

1956 Newell and Simon create the Logic Machine;

1957 Economist Herbert Simon predicts that computers would defeat humans at chess within the following decade;

1958 Frank Rosenblatt introduces a new form of neural network known as “perceptron”;

1958 Early genetic algorithms experiments;

1959 Arthur Samuels demonstrates that a computer can play checkers better than its creator, and even play against itself to practice;

1961 Newell and Simons creates General Problem Solver;

1964 Computers understand natural language enough to solve algebraic and word problems;

1965 Herbert Dreyfus’ report severely criticizes the emerging AI field;

1967 Marvin Minsky predicts that within a generation the problem of creating “artificial intelligence” would be solved;

1969 Bryson and Ho develop a back propagation algorithm;

1971 Terry Winograd’s program SHRDLU answers questions in natural language;

1973 UK Lighthill Report ends British government support for AI research;

1974 – 1980 First “AI Winter”;

1980 Expert Systems, or Knowledge Systems, emerge as a new field within AI;

1980s Early part of decade – Benioff and Feynman create Quantum Computing;

1982 Plan Power is conceptualized by Applied Expert Systems (APEX);

1982 James Simons starts quant investment firm Renaissance Technologies;

1984 American Association for AI coins the term "AI Winter";

1987 Personal Financial Planning System (PFPS) used by Chase Lincoln First Bank;

1987 – 1993 Second "AI Winter";

1988 David Shaw founds D.E. Shaw and is an early adopter of AI among its hedge funds;

1990s The AI industry shows renewed interest in neural networks;

1990 Neural net device reads handwritten digits to determine amounts on bank cheques;

1993 FinCen puts FAIS (its AI system) into service to monitor money laundering;

1997 Deep Blue defeats Garry Kasparov, world chess champion at the time. IBM's stock price increases by $18 billion;

2005 The DARPA 132-mile challenge sees AI applied to autonomous driving;

2007 The DARPA Urban Challenge;

2009 Google's first self-driving car;

2010 Flash Crash occurs on 6 May. In 36 minutes, the S&P crashed 8%, before a rebound;

2012 On 1 August, Knight Capital loses $440 million 45 minutes after deploying unverified trading software;

2014 Man Group starts to use AI to manage client money;

2016 Google's DeepMind AlphaGo applies ML algorithms to win at international Go championship;

2017 Two Sigma hedge fund which uses ML, crosses the $50 billion in assets under management;

2017 Beijing announces plans to lead the world in AI by 2030;

2018 UBS announces development of recommendation algorithms;

2018 The Merkel government announces €3 billion will be spent on AI capabilities;

2018 President Macron announces that all algorithms developed for government use will be made publicly available;

2018 Alibaba announces plans to bring AI chips to market the following year;

2018 MiFID II takes effect;

2018 GDPR takes effect on 25 May;

2018 Baidu becomes the first Chinese tech giant to join a US led consortium on AI safeguards.

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