ARTIFICIAL INTELLIGENCE IN THE BANKING SECTOR

[László Kiss – László Dobák]
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László Kiss and László Dobák presented their vision about the prospects of Artificial Intelligence (hereinafter AI) and robots supporting banking business activity for the first time in 2021. The first manuscript of the book (2021) was revised and further expanded the spectrum of the aspects studied following the 'Bankrobotics' roundtable discussion workshop series organised between 2021–2022. The Bankrobotics roundtable discussions discussed the experiences, benchmarks, organizational challenges, relevant regulations, and future expectations of the banking sector related to artificial intelligence and robots based on the experience of the well-known banking professional invitees.

The central element of the book is organised around the introduction of artificial intelligence-based KISS Robot (**K**ey **I**ntelligent **S**ervice **S**olution) in banking Sales. It also discusses the banking deployment opportunities of Machine Learning (hereinafter ML), Natural Language Processing (hereinafter NLP), Generative Pre-trained Transformer (an autoregressive language model, hereinafter GPT3) and AI-related technologies. The authors also discuss the obstacles of AI introduction, the organisational challenges, and the forms of the added value generated.

The success of the book is the result of its topicality, namely the opportunities of AI and robots' implementation in the banking sector. The authors draw attention to the organisational and managerial challenges associated with the exponential growth of robots and artificial intelligence. The success achieved in the field of quantum computing resulted in the establishment of **BankQ** models that fit into the era of **Bank 5.0**. and represent a turning point in the rise of artificial intelligence and intelligent robots. A management-based approach is relevant, current and details important needs such as change management, employee, and social awareness. Employees' fear of the net negative impact of AI on job creation, managers' concerns regarding the increase in the complexity

of the organisation, clients' expectations of AI and robots, regulatory compliance with the relevant legal framework of AI appear as significant factors that influence organisational transformation. At the forefront of the AI era, these tasks necessarily require the change of managerial "mind-set", the definition of an organisational AI strategy, integration of AI into the organisational culture, and how to improve client satisfaction. The book is even more powerful as the 'Bankrobotics' team members' are enthusiastically committed to AI. They endeavour to establish a Bankrobotics community in Hungary and to build international connections. Their links to knowledge-transfer universities and the market players involved (additional stakeholder group) reflect the attitude of modern finance bestsellers, the importance of the environmental (E), social (S), responsible organizational management (governance, G) issues and emphasise the importance of the diffusion of innovation (social awareness).

The authors state their view aimed to reducing organisational resistance in the first chapter. How can AI and machine learning models and robots implemented into the business processes adopt an inter-disciplinary approach to meet the needs of all functional entities.

Problems are rooted in the underestimation of the dynamics and weight of environmental changes by management and CEOs or in their openness to the implementation of AI and related technologies. If the management underestimate the AI potential, and consequently delay AI-related investment decisions (embodied robot, software-based AI agent, properly skilled staff),it may lead to a competitive disadvantage as a result of unmet needs of clients and the increasing threat of Bigtech, Fintech companies.

So, the question arises what a leader not involved in IT can do to avoid those mistakes. The authors answer the question by offering an itemised analysis of the advantages AI can provide. In *Chapter one*, they describe the inherent challenges of the banking sector and call attention to the importance of the factors identifying competition such as differentiation. In other words, how can AI, or the introduction of robots into an organisation support effective differentiation and creation of specific values? How can it contribute to maintaining market excellence? How can it maximise the effective use of available resources?

It should be noted that AI implementation as well as the simple implementation of well-known operation management methods (lean, TQM and others) cannot work properly if the related organisational skills (technical management, knowledge transfer) are not integrated into the organisational culture and tailored to the specific needs of the company.

Building organizational capabilities related to artificial intelligence is a key factor to be competitive in the hyper-competition of the digital age. Consequently,

the management effort to close the organisational „knowledge gap" is a fundamental building block for the implementation and successful application of AI and robots in the business processes.

The application of KISS Robot in organisations results in key intelligent service solutions that are built on current technical capabilities and contribute to the improvement of organisational effectiveness and performance as well as providing higher quality services for consumers (both internal and external ones).

As a supporting member of the sales team, KISS Robot will promote the time management of employees required for the completion of tasks, which will lead to time saving. Eventually, banks will be able to optimise worktime by allocating human workforce for tasks generating higher added value.

In the following chapters, the authors focus on the factors determining the competitiveness of AI-supported banks and on the importance of differentiation. Namely: How does the organisational implementation of AI and robots contribute to the effective differentiation and to the generation of distinctly unique (competitive factor) values? How can management support this process to maintain market superiority? How can AI-boosted solutions contribute to maximising available resources

The authors have based their ideas on the concept stating robots are computer-controlled machines used to perform automated tasks, which can work very fast and accurately without being affected by emotional reactions. The authors are of the view that the interpretation of human emotions and the provision of proper responses are inseparable in the banking sales process. The identification and interpretation of banking clients' emotional state (body language, tone, speech patterns) is just one of many tasks. Speech recognition of clients is possible with the help of neuro-linguistic programming (NLP, natural language processing). Other solutions linked to it, such as AI-based autoregressive linguistic model or GPT-3 (generative pre-trained transformer 3) proactively support text generation.

In the 2000s, market players and clients found themselves appreciably close to humanoid robots. Companies believe robots must have a realistic physical likeness to people and imitate human forms of behaviour, in addition to their functionality, so that they can be accepted and can serve customers properly meeting their expectations. 'Sofia' was Saudi Arabia's first robot citizen followed by several humanoid robots whose development is ongoing. 'Sophia', 'Nadine', and 'Erica' are examples of humanoid robots closest to humans in appearance. They can display a wide range of human emotions. Some robots have more than sixty facial expressions. Their response to human communication enables them to take part in and facilitate people's everyday life, for instance, they can

be employed in the entertainment industry or in people's homes as household helps (doing household chores, caring for the sick). Thus, they can contribute to broadening robot-human interactions until they are integrated into people's everyday life.

As humanoid robots gain ground, robots employed in AI-based customer areas are spreading. Following the successful bank branch integration of *'Pepper'*, other humanoids appeared internationally, such as 'EMIEW' by Hitachi, which has functions of speech recognition and navigation, and can also fulfil simple security tasks. The book lists several examples for the application of humanoid robots discussing *'iCub'*, *'Eccerobot'*, *'Lola'*, *'Bertz'*, *'Asimo'*, and *'Roboy'*. Side by side with "imitating" the whole human body, there are companies specialised in producing certain body-parts (hands, feet, head) to be applied as replacements (prosthesis, medical use) or the related movements (facial expressions, body movement). The South Korean company 'Robot Arm' entered the market with an artificial human hand performing realistic movements.

The services offered by AI-based robots with a physical appearance cover a wide range of human-robot interaction. They include *'Robocop'* supporting police work in Dubai or Toyota's *'T-HR 3'* controlled and operated by human manipulation, which allows such robots to be used in any emergency. Regarding human-robot interaction, the question of robots' 'persona' and liability arise. Who will be made responsible if a customer thinks an answer given by a robot was offensive? Is it the software developer, the company employing the robot or the robot itself?

In addition to physical appearance (intelligent robots), AI is present at organisations in the form of software. In the banking sector, several functional units use chatbots, ML models or AI (virtual) Agents. Market-based examples include the services provided by *Siri*, *Alexa*, and *Cortana*.

The authors believe the abilities of KISS Robot can be successfully applied in banking sales processes through the selection of realistic solutions in real time and contributing to the reorganisation of the sales team's capacity.

In terms of the data management challenges of the banking sector (protection of privacy and personal data), the authors review the opportunities of AI, ML models' deployment from the aspect of General Data Protection Regulation (GDPR), which took effect in 2018, and had a major impact on the options and limitations of the application of AI through its clause relating to automated decision making. In that context, the importance of "sandboxes" is discussed, which provide a testing and development platform for AI, ML development without launching real time transactions. Making the AI models under development free of bias (gender, skin colour, other patterns in data bases) and transparent, i.e., reducing

the so termed "black-box" phenomena can promote respect and recognition for the rights of EU citizens and can support discrimination-free decision making. It can be the forerunner of operating AI systems in an optimal manner.

Chapter two is a review of how products have become digital, how organisations have been transformed and how new digital business models have been created. Data generation and the increase of Big Data allows the use of machine learning models under AI in the front/middle/back-office processes. The adoption of AI and ML in banking processes increases bank profitability and improves ROE and ROA as it boosts the efficiency of processes and supports decision making.

Chapter three carries a provocative message aimed at management. What should be done to achieve that company management support AI/robotics efforts. For the answer, the authors recount how attitudes changed during the development of KISS Robot and the related issues of change management. Resistance by top managers and employees could be traced back to the following positive features of robots: they can fulfil their tasks more accurately at high standard; they are operational in every minute of every day; they are never sick; they do not lack motivation. Those capabilities (may) induce fear of redundancy, increase of expectations or client complaints that result in additional workload for managers. Other questions also surface. How can a robot feel loyalty to corporate vision, mission, or values? How can it fit into formal and informal management? How can it treat stakeholders or the unwritten elements of protocol, rules, and additional – untold- elements of the company culture?

The authors point out that KISS Robot is for the team not instead of the team. By integrating AI and robots into work processes, time saving is a critical factor. It allows to allocate human labour force to activities creating higher added value and to increase service quality in general due to increasing organisational performance. The integration of robots into the organisational framework supports client satisfaction (customer journey) and data security in addition to supporting the operation and the workflow. As to change management, visionary managers have a major part to play.

Chapter four discusses the options of applying AI in different industries and its appearance in the fields of healthcare, medicine, education, transport, and agriculture.

Chapter five reviews the potential transformation of the banking sector based on past experience of AI adaptation and the related problems. Will communication between customer service representatives and clients collapse if robot advisors gain ground? Will bank branches be needed? Based on company experience, the authors argue that state-of-the-art technology contributes to success,

on the other hand, it does not automatically mean the replacement of human workforce.

The development of AI is exponential, and it offers intelligent business solutions but it is alien to several human factors (emotions, morals, ethics), which are the cornerstones of business life. On the other hand, the lack of human factors (emotions, frustration, enthusiasm, etc.) is also an opportunity, as deals must be made eventually. The simultaneous presence of the two aspects is controversial, on the other hand, it reinforces the importance of change. As Einstein said, „The measure of intelligence is the ability to change."

Chapter six discusses the phenomenon termed "Robocalypse". It is the general opinion of pessimists stating the net rate of job generation will be lower than job elimination due to the disruptive effect of AI and robots. Back office, bank branches, call centres, office jobs (routine, monotonous, repetitive tasks), as well as customer service, and analytical jobs are predicted to be substituted -partially or completely – with AI software.

Chapter seven, the last one, describes the banking sector as the authors foresee it by 2030, i.e., a quantum-supported business world, Business5.0. The authors' experience can be a guidance for successful change management and robot integration driven by AI. As AI is inter-disciplinary, the book does not only analyse the implementation of innovative technologies from the aspect of the banking sector, but it also discusses how a dynamically changing economic environment can be successfully managed from the aspect of management.

The author of this paper believes that the integration of human-robot interaction into company culture also requires, in addition to rethinking the business processes and workflow, the training and sensitisation of users (internal/external customers)) to improve corporate skills and knowledge. Management skills and the organisational knowledge generated (organisational knowledge bases, including in-house development and implicit knowledge) guarantee a long-term competitive edge as they can only be copied with difficulty, and they require a long time to be built up as opposed to AI-based solutions that can be accessed on the market easily and can be integrated by means of investment. In this context, the question of the legal personhood of AI software is interpreted as a supporting intangible asset. The role of a visionary management that can respond to dynamic business environmental changes is an extremely important competitive factor.

Social sensitisation is another key issue, which contributes to the need of innovation diffusion in every society. Artificial intelligence will transform our world radically, it will create or disrupt whole industries and professions. AI will free up more time – instead of spending it on routine, monotonous, repetitive tasks

– and create the opportunity to allocate employees' capacity to higher value-added tasks. Tasks which require creativity and critical thinking are more likely to generate higher added value in the business process. This is an important contribution to achieving a new, artificial but more humane level of economic prosperity.

Alexandra Prisznyák[1]

1   *Alexandra Prisznyák*, senior consultant and Artificial Intelligence & CBDC Program Manager at International Training Centre for Bankers Ltd., PhD Candidate at Pécs University, and professional supervisor of the book. The team deals with the market implementation opportunities and best practices of AI, ML, and robotics at the banking sector. Together with Hungarian and international professionals, the team discusses the most relevant and current topics of AI and robotics and tries to raise social awareness for AI and robot adoption. E-mail: aprisznyak@bankarkepzo.hu.

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