ARTIFICIAL INTELLIGENCE CHANGES THE ROLE OF MANAGER

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Abstract:

In the 21st century, the technological revolution progresses a huge pace and increasingly interferes, even in the form of artificial intelligence, to all the spheres of people's working life. It is not otherwise even in the areas of management. At present, at the time of globally adopted restrictive measures due to pandemics, many activities have moved to a digital environment, which has yet encouraged the integration of artificial intelligence platforms into the practical life of enterprises. In the near future, artificial intelligence will help to take decisions to the managers and projects managers, but it requires the change of their thinking and work. This article is the presentation of the possibilities in the transformation of managerial tasks and management of human resources by managers in the cooperation with artificial intelligence. It also provides the results of research conducted by the authors of the article in the form of guided interviews with a sample of senior managers from different areas of real practice.

Key words: Manager Practices and Tasks, Artificial Intelligence, Management Transformation, Future Management, Enterprise Management, Research

1 Introduction

The definition of artificial intelligence (AI) has seemed ambiguous and very vague for years, but in fact AI is simply a set of theories and techniques developed to produce "machines" capable to simulate the human intelligence. These are systems that have been developed by scientists using advanced technologies in order to create robots or computers with the intelligence that is as close to human intelligence.

Thus, the machines operated by AI will be able to think, to communicate mutually and cooperate with a "natural" manner with people, be created to perform specific tasks, to process a huge amount of data, to understand and analyze models and man's undetectable patterns and be able to simultaneously progress exponentially in their capabilities and performance at the same time. Artificial intelligence does not only concern informatics, but also neurosciences, philosophy and mathematics. The first mention has been mentioned in the 1950s and since then AI does not stop fascinate experts and scientists from all areas of human life.

At the moment, enterprises and government and public institutions are more and more dedicated to the digital transformation of its activities. They realized that, under this transformation, new measures related to the use of AI and its impact on employees must be adopted to accept new ways of working, to innovate workspaces and in particular to develop new skills. Mainly the digital skills are important that employees have acquired the use of new information-communication technologies, agility skills, to integrate new working ways as well as project thinking skills for innovating day-to-day activities and collective cooperation skills.

Regardless of their size, sector of their activities, their public or private dimension, individual enterprises start using the MVP techniques (Minimum Viable Product – Finding Basic Needs and

Solutions), POC (Point-of-Care)[1,] support the teleworking and employee relations with new internal and external ecosystems. They are also inspired by Start-up projects and by reassessing of their processes.

2 Management Transformation

The arrival of artificial intelligence to enterprises sets the mirror to the current understanding of the managerial craft. After the 20th century marked by the vision of a "narcissistical" manager that fulfills the mission of a person authorized by performing the tasks as quickly as possible, as cheapest as possible, and if it is possible in the highest quality, the manager of the 21st century must be mainly the leader.

While the manager of yesterday´s was responsible for orders and cohesion, the leader of tomorrow will give suggestions to the change and development. AI can be a strong accelerator of deep managerial changes. The considerable part of the tasks of today's manager lies in reporting, which can be very well and quickly done on the basis of collected and recorded data. So, a characteristic feature of tomorrow's manager should be a vision and not only the activity of control. He should be able to familiarize with current procedures in order to create a vision, to focus on relationship things and the human factor and be able to adapt to uncertain and innovative procedures.

It seems that AI integration into the enterprise management could lead to a reduction in the number of managers. It is problematic to talk about reducing the number, it would be more appropriate to talk about the transformation of their activities. But let's say sincerely, are all current managers open to such changes? And how to assess their ability to change? One of the management tools that currently is the "annual evaluation", has never worked objectively because it was carried out by the human factor, and therefore the evaluation criteria could not be clearly measured. Through AI, such an assessment will be more objective, because AI in this case will be programmed clearly and the evaluation will not be affected by the evaluator's emotional attitude. And here arises the paradox that we encounter, for example, in the world of education. For example, at the school we can educate, by the sanctioning through worse marks, brilliant individuals, but also cause an absolute distaste to the education. In this stage it is necessary to emphasize the role of AI, which opens the way for new training methods, especially through the continuous education.

Thanks to the adaptive AI, the studying managers can test themselves, they can improve and evaluate their skills without realizing that they were mistaken because the AI returns to address the task in another way until the entrance person does not understand and does not accept it for his/her solution. These new practices could replace the "annual evaluation", and they would more objectively assess the manager's transformation capability to the leader, and the results of his personalized professional progress or coaching.

Development of HR Management Vision

Jean-Philippe Couturier[2] recognizes that there are some obstacles to the implementation of such transformations that it is necessary to handle, especially on the side of human resources (HR). "We still

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[1] POC (Point-Care) system is a system used for work and tasks where tools and simplification and standardization of workflows are connected by informatics, thus dramatically reduces employment workloads through automated processes and centralized management.

[2] Jean-Phillipe Couturier is an entrepreneur, extraordinary professor and international lecturer. He graduated from ENSIMAG (leading University in informatics and applied mathematics in Grenoble) and for more than fifteen years, he supports companies in their strategic and operational challenges in digital transformation. It is a Vice President of the Executive Board of ENSIMAG, President ENSIMAG Think Tank and the founder and member of the Board of Directors of several startups (in more than 15 companies) and the member of "Business Angels Clubs". He is the lecturer at HEC (École des Hautes Etudes Commerciales de Paris) and lectures on new technologies. He is CEO Whoz.com, who is specialized in the artificial BTB intelligence. Source : https://www.linkedin.com/authwall?trk=ripf&trkInfo=AQFm-LNjhOsa-
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have the HR control in practice in the form we had in the 20th century. However, the HR control must be in the conjunction with starting technological innovations and more reflect in their application in the practice." As an example of such management, it provides a skill mapping to help better know the resources of the organization. "One brake is the pace of slow adoption as well as the fear of changes induced by the technological evolution. However, the leader of the 21st century will have to learn to work with artificial intelligence ", notes Jean-Philippe Couturier. By integrating new technologies to enterprises and companies, such as the facial recognition, new practices could be introduced by AI, but they may be disputed in terms of ethics. "Through the face recognition, AI will be able to allowing the identification who is working and who does not, who is concentrated at the work and who does not, what way the employees communicate with customers, ... ", notes Jean-Philippe Couturier. Currently, the use of AI in the HR management is already one of the reasons why Google, Apple, Facebook and Amazon have already started to implement internally the "Good Conduct Codes".

The scientific research in the management area leads us mainly to identify two areas of creating new skills with AI. At first, managers and their co-workers will need to obtain specific skills for the cooperation with AI and then they have to train for this cooperation their employees, but also to integrate so-called soft skills, which include the attention, the intention and the time management. These skills AI is not able to perform without synergies with man.

3 Project management transformation

Artificial intelligence is considered to be one of the main technological trends in the world. But what impact does it have to the management and project management? In a pure form, project management is controlled by artificial intelligence by the system that allows everyday management and management of projects without the need of human element. This claim "without the need of human element" is questioned by the project management community, even by all the people.

Artificial intelligence has to automate not only simple tasks, but also to develop understanding of key components of the project. This understanding of project management with AI can then find new ideas, perform automation of more complex tasks or propose recommendations and adopt new decisions.

Project management with AI provides a level of services that exceeds the number of robots available today. For example, Stratejos[3] is an intelligent robot that is aimed to manage the project budget and the individual project stages. MEMO[4] is focused to help with the reporting and the management of knowledge and conversations of team members. The robot Aurora represents the first intelligent software planning which generates orders and uses advanced artificial intelligence. This robot has been originally developed to help NASA to solve heavy and critical issues of planning with comprehensive constraints by integrating the judgment and experiences of human experts in the area of planning.

It is necessary to realize that all these project management tools from the beginning to the end of the process are based on people who properly record data, update data and tools and record repairs. The basis, that is often ignored, for the use of artificial intelligence is the quality and the actuality of data.

If you enter into another robot Trello[5] the task, you are interested in a particular estimation as you can trust the robot in its task solution. You will probably require a minimum 90% level. Why? Because

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[3] Stratejos is an intelligent assistant for managing software projects and their edits. Stratejos creates artificial intelligence that allows you to accelerate software team management. It automates routine work until the proposal of specific ways, based on data, to improve team performance. The project management is getting into a condition when the project manager and the teams, managed by him, must focus and solve only great tasks because Stratejos takes care of everything else. [Available online at https://www.appengine.ai/company/stratejos - 1.7.2022]

[4] MEMO is the intelligent memory robot that contains data on all project solvers and all their conversations. [Available online at https://docs.nativechat.com/docs/1.0/cognitive-flow/bot-memory.html - 1.7.2022]

[5] Trello is the robot that helps in projects management, so at work as well as at home. It is a team management tool that will help things complete and retain them organized. [Available online at https://www.microsoft.com/sk-sk/p/trello/9nblggh4xxvw#activetab=pivot:overviewtab - 1.7.2022]

generally, the aim of every project manager is not to be unpleasantly surprised only at the end of the project.

Some project managers record the minimum of data or non-existent data in their project management tools. Even those disciplined managers sometimes have problems with the data interpretation by machines. There is a possibility that they enter their tasks incoherently or they enter to the AI machines the minimum of data. And what can be a solution? By using metadata, with better data quality and better understanding of the different project problems, AI project management will be able to provide really useful advice to each project manager.

Let's imagine the situation that AI automatically redistributes the tasks in the next project stages, so the team of solvers can get the solution faster. AI will do this on the basis of knowledge about the quality of people in the use of various technologies and various parts of the system. It is meaningful, powerful and useful.

Mutual dependencies within the project and external changes make results unpredictable. Estimates and numerous forecasts are in the best case in intuitive, in worst puzzles. Modern management techniques, including agile and continuous supply of task results, are designed to reduce the uncertainty through a constantly successfully proceeding work, but they still do not guarantee the final delivery. During the management of the project's portfolio, you need to select a combination of projects and tasks that balance the risk and the success. It is difficult to stay competitive if the project manager is trying to work only safely and without the risk. However, the risk evaluation with some accuracy is very difficult, particularly due to external impacts on the project, as well as possible shifts within the original project implementation plan.

With additional project adjustments, the success is not always guaranteed at the end of the project. The achievement of the success is more probable, if KPI (Key Performance Indicators) are set with regard to the quality and the reliability. Whether the performance of the project manager fulfills the initial expectations, can help identify AI during the implementation of the project, based on the data flow that are recorded for individual tasks, stages, but also for individual project solvers. AI can identify trends of the development that are significant for the project, but sometimes they are visible with difficulty or ignored by people, even though they see them.

Currently, the most projects managed by AI exist in the field of transport. Its goal is to use various optimizations where AI automatic learning could be used. One example may be the optimization of the delivery route combined with the savings on fuel, the optimization of transport car loads, the optimization of vehicle loading based on transport requirements and the creation of more optimal time schedules for individual drivers.

4   Management of Complex Project

In large complex projects with a big number of solvers and the ultimate goal of something repeatable, such as the establishment of a new data center or the transmission of the application to a container platform, the project manager can have sufficient data from previous implementation of a similar project to identify deflection values from the original plan.

5   Role of AI in management in the enterprise

Artificial intelligence has undoubtedly the effect on managers' tasks. Managers are not yet ready to be replaced by AI in their functions, but the experiences from the practice show that even at the present time the realization of manager´s tasks are directly affected by AI. Practically, it is possible to distinguish three cases of managerial tasks in synergies with AI:

- Tasks that can be performed by AI alone and it is no longer needed the intervention of manager.

- Tasks where the manager can be assisted by AI and the manager can carry out his tasks in the cooperation with AI.
- Tasks that the manager can solve just thanks AI.

Thus, we distinguish three categories of managerial tasks transformation in synergies with AI:
- replacement,
- assistance,
- added value.

Schema 1: Forms of manager cooperation with AI

AI replaces manager at	AI assists manager to	AI is the added value to manager at
Process automation	Creating prototypes	Creativity
Organization of meetings	Management of human capacities	Decision making
Data processing	Planning	Empathy
Detection of errors and deviations	Project Management	Creativity improvement
Division of tasks and human capacities	Pre-selection of solutions	Artificial empathy
Checking of task fulfillment time	Analysis of views	Interpretation
Personalization		Optimization
Analysis of solution status		

Source: [6]

Artificial intelligence has an affect not only to solve tasks, but also to the practices used by managers. Currently, managers tend to use primarily a leader practices whose task is to create favorable conditions for the creation and the work of agile solvers teams involved in the enterprise activities. The introduction of AI to managerial practices will bring a new type of practices that we can imagine as practices for the time management and for the management of human capacities.

In the decision-making process, in which AI is not cooperating, the manager adopts decisions based on a certain number of data that he has chosen for analysis, on the base of his intuition and negotiations with participating parties about the conditions suitable for his decisions to be successful and confirm his strategy. In the decision-making process, where AI is implemented, the manager does not make data analysis, but it is the work of the information systems that display weaknesses of solved tasks based on the setting filters. These systems can also offer to the manager the activities that need to be made and that are based on predictive models filled with the enterprise data. In this case, the manager does not need to make intuitive decisions, usually based on his experiences, but he can make decisions based on data analysis performed by AI. Next decisions of AI will already be based on the experience that AI stored in memory from the solutions of previous tasks and which will be applied thanks to itself learning mechanism. In this way, AI introduces new managerial practices taking into account two basic variables - time and level of interaction with AI. Based on the values of these variables, we can divide managerial practices into the following four types:
- prediction,
- individualization,
- notification,
- data culture.

Management based on prediction

The reception of the strategy by managers will be replaced by a predictive model, which will lead to a prioritization of some category of data before others and to optimization of resources and offers, depending on the conditions in which the enterprise in a particular situation is located. The predictive tools take account not only of the beginning of the enterprise tasks, but also a possible crisis in the solvers team. AI algorithms evaluate the level of the probability of the departure of each employee in real time, which rises according to the demand of a particular position in the labor market.

Management based on individualization

In this type of practices, the role of the manager is directly affected by AI for several reasons. He must take into account the level of the familiarization of individual workers with culture and AI possibilities, to accompany them and explain them the redistribution of the tasks between man and AI, he must consider the new tasks that need to be implemented thanks to AI, he must manage the risks and possibilities of AI, introduce new competencies, consider AI participation and not only on tasks but also on projects, and introduce the data management. In addition to these tasks, managers must be educated not only in the area of the use and integration of AI systems to enterprise practices, but also in the coworkers' education to identify them with the culture and possibilities of AI.

Management based on notification

In this type of the managerial practices, it is possible to imagine the management on the basis of AI notifications. AI will notify its decisions, by this way, to the manager and his co-workers. This management method is already possible to see at AI used in Uber, whose platform announces information to drivers and customers about transport requirements, about the receipt of the requirement, about the proposed optimized route, about tariffs and about other options related to the transport. In the future, however, the artificial intelligence systems will be able to go further and provide managers through a range of predictions for accelerating actions, tendencies and priority directions to encourage the manager to make specific solutions.

Management based on data

This managerial practice is based on AI algorithms that arise on the basis of expert systems, which in practice means transforming experiences of experts from the area of management to the data form and the use of the teaching abilities of these algorithms to offer the most optimal management of specific tasks and requirements.

6 Research conducted through guided interviews with a sample of managers working in real practice

The authors of this article wanted to test the interestingness of the described theory about the application of artificial intelligence in managerial practice among managers working in top management positions. Their aim was to approach selected managers in the Slovak and Czech Republic and ask them the following set of questions:

1. Have you encountered AI-based systems in your management practice?
2. If yes, in which activities of your work?
3. If no, in which areas can you imagine AI-assisted support?
4. If the answer to question 1 was yes, do you see the benefits of AI for your management practice?
5. If the answer to question 4 was no, please give a reason.
6. Can you imagine AI helping you in creative activities?
7. Can you imagine AI helping you to optimize task and project management?
8. Do you believe AI will save you time in decision making?
9. Can you imagine that AI will help you in correcting errors and deviations?

10. Are you concerned that AI will gradually replace your managerial position?

Between November 2021 and May 2022, 11 managers were contacted, 5 from the Czech Republic and 6 from Slovakia. The scope of their influence was in several sectors, ranging from the academic sector, to business, sports, communications, agricultural production and small-scale manufacturing of final products. The authors of the article deliberately did not approach any IT managers, as they assumed that AI is certainly already implemented in their working lives.

Evaluation of research results

Only 4 managers answered positively to the question (Have they already encountered AI-based systems in their practice?). Seven had not encountered, or some admitted that they were not aware that they indirectly used such a system. These findings suggest that senior managers are not sufficiently trained in the use of information technology and therefore may have a negative view of its wider implementation in the environment they manage.

In response to the follow-up question (In which activities of their work have they encountered AI-based systems?), they listed the following activities:

- data processing,
- reporting,
- analysis,
- project management,
- planning.

For the follow-up question for those who have not yet encountered AI-based systems in their practice, (In which areas do you envision AI support?), respondents provided the same answers as those who answered the previous follow-up question, namely data processing, reporting, analytics, project management, and planning.

Question 4 (If the answer to question 1 was yes, do you see the benefit of AI for your management practice?) was answered by only 4 respondents, of which only two see the benefit of AI for their management practice. Unfortunately, another two answered that they do not see the benefit of AI for their practice and in the supplementary question 5 they gave as a reason that they do not trust the results provided from AI systems and prefer to check using classical methods, which of course needs more time for making management decisions and thus loses an advantage in the competitive market.

To the next question (Can you imagine AI helping you in creative activities?), up to 10 respondents answered negatively and only one respondent answered positively. It seems that the vast majority of managers do not yet see the potential of AI in the artistic, design, emotional and creative activities associated with the imagination and fantasy of human individuals. Also, in this area of creativity, there is a lack of education and information about the possibilities of AI-based systems. Here, the authors of the article see potential in academia, where new accreditations could add more courses aimed at educating about the possibilities of implementing AI in different sectors.

The following three questions (Can you imagine AI helping you optimize task and project management? Do you believe AI will save you time in decision making? Do you imagine AI will help you in correcting errors and deviations?) was to find out what the respondents' perception of AI's help in optimizing management, decision making and correcting deviations caused in many cases by flawed management decisions. The answers negatively surprised even the research authors themselves. Only 18% of respondents believe in AI help and up to 82% do not count on AI help in their decision making. One of the reasons for the negative perceptions may be the age of the respondents. It is true that most of the executives selected for the research were middle-aged and upper-middle-aged. But at the same time, the authors of the research have to state that both in the Slovak Republic and in the Czech Republic, managers younger than 35 years of age are more of a rarity than a reality in top management positions.

The last question (Are you worried that AI will gradually replace your managerial position?) also confirmed the opinion of the majority of research respondents (up to 9 out of 11 respondents) that they do not see the prospect of AI as a potential future top manager. Perhaps the fact that their managerial positions could be at least partially replaced by IT solutions also has a significant impact on their reluctance to embrace the innovative IT solutions that AI represents.

As a final conclusion of the research, it can be considered that education and training in the possibilities of using AI in supporting managerial activities lags far behind its potential use. This shortcoming could be remedied by universities in particular, but also by IT companies through their educational programs.

7   Perspective of AI future development

In the future, it will be necessary to accept that AI invites itself to the management sphere and will not be reserved only for computer projects or customer solutions. This trend will also try to enforce in the enterprise practice areas and to design the optimal direction of the enterprise's activities. However, it also has its limits because AI algorithms are not yet able to have emotions, and thus in the future it will be necessary to create expert systems, that would draw from the experience of managers specialists who have already worked for a long time with AI, how to lead interviews on the basics of changes with the enterprises employees.

AI will not replace the manager at this moment, but the manager will have to adapt to start to trust what AI can do instead of him, what with him and what for him. If in the past, the difference between the good and bad manager was founded in his intuition, in his art to gain good information, in his ability to listen and negotiate, in the future, these abilities will not be sufficient. He will have to understand the width of AI technological options, create his system how to familiarize with the management of robots and start thinking about the development of his occupation and the occupation of their coworkers in conjunction with the use of AI.

Even for the future it remains a lot of areas that stand before the creators of AI algorithms. They must solve the expansion of the abilities of technological systems insensitive to human emotions to be able to negotiate with the human subjects, to take an opinion on issues at the negotiations and interviews with people as to integrate them into businesses and to adapt to corporate process and corporate culture.

However, the originality of each sector and each enterprise should be taken into account in the future development of AI with the goal to maintain the culture of uniqueness that distinguishes the enterprise individuality and thus makes them for people interesting and irreplaceable.

Conclusion

Will the artificial intelligence gradually replace people in the area of management? No way. Project managers remain, also in the artificial intelligence era, irreplaceable, if they focus on basic project management skills and take tasks that require in particular the following human skills:

- Leadership
- Management of people and parties involved in the project
- Communication verbal and non-verbal
- Empathy
- Emotional intelligence
- Negotiation

And what will be the impact of artificial intelligence to the future management? According to experts, AI should be able to deal with various tasks that have been done in the company exclusively by people so far. Already in the present time, entrepreneurs can delegate the document management to the corresponding computer controlled by AI. Current cases of such use of AI include the automated preventive maintenance management that eliminates potential risks of the production stopping. Another

area of AI use is the management of logistics that at huge quantities of commodities, that need to be transported, is a difficult and complex management.

And what to say to the conclusion? Thanks to AI, the management of the manager is changing. And what should his main mission be in the future? The following motto it zooms: "The vision rather than a control should characterize tomorrow's manager."[6]

Resources:

Internet resources

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