Artificial Intelligence Solution in Human Resources Management: Case Study of Chatbot's Implication

Ieva MACIJAUSKIENĖ
Kaunas University of Technology
73 K. Donelaičio St., 44249 Kaunas, Lithuania
ieva.macijauskiene@maatc.lt

Živilė STANKEVIČIŪTĖ
Kaunas University of Technology
73 K. Donelaičio St., 44249 Kaunas, Lithuania
zivile.stankeviciute@ktu.lt

Abstract

Information technology (IT) fuelled by artificial intelligence (AI) is progressively making its way into human resources (HR) functions. AI unequivocally delivers significant value in HR. It offers enhancements which are in help to solve various critical business challenges. Even though this progress is still rather moderate in Lithuania, AI solutions are applied by some companies in order to innovate HR management operations. On the other hand, the lack of know-how on this topic from the perspective of HR management, can cause doubts and uncertainty over AI's influence upon HR functions and discourage business entities to implement AI driven solutions. Thus, the aim of the study is to explore and evaluate main reasons to implement such solution for HR management in Lithuania and to assess any negative or positive outcomes for HR specialists and AI's end-users, together with intention to lay grounds for further and in-depth academic research on this topic. This case study was carried out in UAB X, a Lithuanian company with a focus on the implementation of chatbot's technology in HR processes. The focal point was AI's deployment to serve, grow and engage company's employees. The data was collected by adopting a qualitative research technique: interviews. As results indicate, AI's solutions in Lithuania are still rather on initial level, however they already create added value not only for HR professionals but for other company's employees and its end-users as well. AI comes in great help for those keen on technological progress and can modify the workload of HR specialists: instead of routine and time-consuming queries these specialists can focus on higher level tasks and generate greater added value not only to HR management processes but to business on the overall. As direct benefits of implementing chatbot for HR management are mainly recognized as: reduced workload regarding repetitive queries for HR specialists, complementary internal communication channel, top speed of information acquisition. Surprisingly, the indirect benefits are outstandingly valued: keeping pace with AI driven innovations used within companies around the globe, personal fulfilment for those who develop, maintain and train chatbot due to becoming a part of innovation creation process, personal development, promotion of digitization process within a company, etc. Altogether, this case study respectively encourages developing further academic discussions in order to lay solid theoretical grounds on AI's and, especially, chatbot's use in a field where its implications are still quite new and obscure.

Keywords
HR management; Chatbot; AI; digitalization; Innovation management; AI in HR.

Introduction

Business world has become a fierce environment for all its participants. Every successful company is nowadays forced to implement modern and high-end digital solutions in order to beat off their competition and run efficiently (Marr, 2019). These implementations are no longer limited only for industrial undertakings but include a broad spectrum of high-tech solutions for business management as well (Gil et al., 2020). Recently, much attention has been given to the use of Artificial Intelligence (AI) within companies with regard to change the nature of work, business model and to bring positive impact to management in general (Haenlein et al., 2019). This digitalization process is changing business practices in many niches and industries, although the precise implications are to some extent uncertain (Zbuchea, Vidu, & Pinzaru, 2019).

According to McKinsey Global Institute (McKinsey Global Institute, 2018), AI is believed to become the main factor fuelling the growth of global economy as it can double the yearly growth of the economy and enhance productivity in the majority of countries around the globe. In 2018, European Union (EU) has started an initiative and launched a Coordinated Plan on Artificial Intelligence in which agreed for the EU to become the global leader in AI's creation and implementation(European Commission, 2018). Lithuania was the second EU member state to release its national AI's strategy with general guidelines for country's successful entering into global AI ecosystem (Ekonomikos ir inovacijų ministerija, 2019).

Ground-breaking technologies are applied across various sectors in business and Human resources (HR) are no exception. This area is undergoing a tremendous transformation in order to live smarter tomorrow. From recruiting to automation of tasks and other practices, AI is shifting HR and pressure its leaders to make some actionable insights (Gulliford & Parker Dixon, 2019). The complexity of HR management phenomena is challenging and the use of data science thereby can become complex and difficult.

Though there is a wide range of AI solutions created for HR management, the lack of know-how on this topic from the perspective of HR management, can cause doubts and uncertainty over AI's influence, especially on chatbot's solution, upon HR processes and make companies question the need of such implementations. With this in mind, in order to narrow the gap within academic field, this paper analyses the use of AI specifically for HR processes to retain, develop, grow and serve employees, i.e. how chatbot technology can assist HR professionals who handle various routine queries and help its end-users to access needed credible information as soon as possible without the need to address separate HR specialists. In general, the deployment of high-tech solutions in HR management in Lithuanian companies is still only in its early stages, however there are a few pioneering legal entities that are eager to implement AI strategies in this complex and challenging area. This case study is done in cooperation with UAB "X" and analyses their AI solution for HR management: a chatbot tool.

In order to bring out the impact of AI's implementation for HR management, this paper seeks to answer the following: (RQ1) what are the main reasons to introduce chatbot's solution for HR management, (RQ2) what are the benefits and (RQ3) what main challenges HR professionals and its end-users face while adopting this solution. The remainder of the paper is structured as follows. The theoretical part gives an overview of literature on AI driven IT solution: chatbot. Then, the research method applied is described. The empirical results and discussion come further. Finally, conclusions are drawn.

As previously annotated, together with intention to answer research questions, this case study aims to contribute academic literature: extend scientific know-how on chatbot's implication for HR management function and its influence on end-users (i.e. other employees), in response to a call of other researchers within a field (Galitsky, 2019; Jatobá et al., 2019; RM von Wolff et al., 2019).

Chatbot for HR management

HR management sector is nowadays understood as a strategic key accelerator in any organization that is impacted by new trends and technologies (Turmidzi et al., 2019). AI's implications in this area cause some major transformations, thus this sector now has to cope with new roles within a company. Under these circumstances and with lack of researchers' interest in this specific field, it is important to understand and analyze the evolution of AI's implication in HR. Thus, this case study shall be understood as of vital importance to evaluate AI's solutions in the market and how they contribute to HR management.

As this case study analyses one specific AI's solution for HR management, it is crucial to define the notions to be manifested. Most relatable, from the perspective of this paper, concepts defining a chatbot are given in Table 1 below.

Table 1. Definitions of chatbot

Author	Description of a concept
Robert Dale	"Whether you call these things digital assistants, conversational interfaces or just chatbots, the basic concept is the same: achieve some result by conversing with a machine in a dialogic fashion, using natural language" (Dale, 2016, p. 1);
	"…any software application that engages in a dialog with a human using natural language"(Dale, 2016, p. 3).
Boris Galitsky	"A chatbot (conversational agent, dialogue system) is a computer system that operates as an interface between human users and a software application, using spoken or written natural language as the primary means of communication" (Galitsky, 2019. p. 13).
Raphael Meyer von Wolff, Sebastian Hobert and Matthias Schumann	"…a chatbot is an application system that provides a natural language user interface for the human-computer-integration. It usually uses artificial intelligence and integrates multiple (enterprise) data sources (like databases or applications) to automate tasks or assist users in their (work) activities" (Meyer von Wolff et al., 2019, p. 96).

With this intention, chatbot tool is hereinafter understood respectively: Chatbot technology is firstly and mainly understood as the main tool to ensure effective communication within a company. Chatbot is generally understood as a machine assistant that acts as a natural language interface for service and data provision. This chatting robot is all about the conversation with the user. AI is here used to mimic human communication, i.e. it allows natural, robust, adequate and effective means to acquire specific knowledge or other requested transaction.

In order to accurately compare existing theories on chatbot uses in HR management and how this AI's solution can benefit HR specialists, it is crucial to firstly determine how HR specialists function within a company.

As the main intention of HR management is to auspiciously maintain company's workload, HR professionals have to perform many tasks challenging this goal (Majumder & Mondal, 2021). However, in scope of this case study, such functions as answering FAQs and assisting employees have to be outlined as of great importance, because these are the functions that can be taken over by the use of chatbot. Regardless these might seem of less importance at first glance, due to their routine and simple nature are perfectly convenient to be digitalized and performed by AI (Gita, 2019). The removal of routine queries and uncomplicated, but time-consuming load from HR personnel shall be understood as of tremendous importance provided that the result of this change brings positive impact not only for HR personnel but to business on the overall. That is to say, HR teams can work more effectively, focus on higher value-added tasks and confront the challenges brought by Industry 4.0 (Sivathanu & Pillai, 2018) while focusing on problems that are more complex and of humanized nature.

In order to transform HR management practices and deliver changes mentioned beforehand, the advantages of chatbot's implication shall be described. Academics within the field of this case study agree that one of the best outcomes of AI's implementation in HR management is the credibility of information/bias reduction. To sum up, it is the elimination of human error and substantially better transparency of HR processes within a company (Jatobá et al., 2019; Zehir et al., 2020; Merlin & Jayam, 2018). For example, Zahir et al. (2020) argue that AI systems and solutions with their ability to analyze vast domains of complex data are perfect for HR management as it eliminates personal judgment and biases from the equation when performing HR tasks (Zehir et al., 2020). This is understood as one of the primary issues of HR specialists to be swiped out by AI. Similarly, from the perspective of other employees, HR specialists' activities often feel advocating organization's demands rather than actual people's needs (Merlin & Jayam, 2018). The elimination of biased activities is understood as a possibility for HR specialists to be treated as more employee-oriented and trustworthy.

With regard to RQ1 and RQ2, the promise of improved credibility and bias reduction of HR management can be treated as one of the basic reasons to introduce AI solutions in this area and as a deeply beneficial outcome correspondingly. However, the latter observation seems rather controversial. For example, this solution seems favorable when situations of discrimination in the workplace are at risk to arise; e. g. employees

that experienced any form of harassment within a company are to avoid the discomfort of being identified or any preconceived notions. Eubanks argues that because of bias, these kinds of situations are still sometimes critical because of HR's inactions (due to various reasons), while chatbots, because of unemotional interaction, can draw out more accurate information, prevent preconception, defensiveness, thus, it can be a toll for flexibly, 24/7 and credibly when handling these types of situations (Eubanks, 2018, p. 81). On the other hand, the lack of human interaction might be the downside in this kind of situation. People prefer to communicate with other real, like-minded people when in sensitive situations, thus the chatbot technology is understood as common and serious weakness (Godulla et al., 2021). This controversy shall be taken as deeply individual.

Another demand for the implementation and preferred outcome of AI solutions in HR management (RQ1 and RQ2) is instant data accessibility. Human interaction with systems becomes a dominant phenomenon and people now prefer instant data availability and access, especially the new millennial workforce (Tadvi et al., 2020). Thus, this instant query answering tool is fast and safe solution for those seeking information. Chatbot solutions not only can answer various employees' queries but also support them through the paper work and other formalities. This implication is by no doubts argued to be in help for HR specialists to improve their operational excellence because instead of time-consuming routine procedures they can focus on higher level, forward-looking tasks and dedicate their time for the needs and development of the workforce (Majumder & Mondal, 2021; Merlin & Jayam, 2018; Jatobá et al., 2019; RM von Wolff et al., 2019; Johannsen et al., 2021). Even though this implication seems to be beneficial to both, the business processes and employees, the downside of this solution is likewise related to the lack of human interaction. Though communicational behaviors change with the implication and development of technologies, people are still in need for human interaction. For example, some employees might prefer going directly to HR professional to handle their query just because of basic need to interact with another human being (preferred colleague, etc.) rather than unemotional technology. On the other hand, because people interact with the machine, interconnection is of another kind.

Methodology

To complement literature analysis, a qualitative empirical research method was applied by conducting semi-structured face-to-face interviews with 5 employees from HR and IT departments in UAB "X". Interview guide was sent for the interviewees in advance and organized as follows: preparative questions (interviewees introduce themselves), questions regarding chatbot usage (e.g. Describe a chatbot used within your company. What processes are supported by this AI solution? What were the primary problems HR specialists dealt with that encouraged the implementation of a chatbot? Do HR specialists and the end-users of a chatbot trust this AI solution? How HR management shifted after the implementation? etc.) and conclusive questions (e.g. What are the advantages and disadvantages of chatbot's implementation for HR management? Are there any plans for future development of a product or the implementations of other AI driven solutions?).

Interview participants were selected by their knowledge about the topic and ability to provide necessary information. As of pandemic situation in the region of research, all interviews were conducted via Zoom software program. The interviews were conducted on May 2021 and recorded with the consent of the interviewees. Interviews were conducted in Lithuanian. Average duration of an interview was 36 minutes. Interview guide was sent to the interviewees in advance. An overview of interviewees is given in Table 2 below:

Table 2. Interview participants

ID	Position	Seniority	Relation to Chatbot
1	HR Development Partner	5 years	Project manager from HR department's perspective for the initiation of Chatbot implementation
2	HR Manager/ Employee Relations Partner	3 years	Maintenance and training
3	Senior RPA Developer	4 years	Software architecture, design, & development. Creator
4	Help Desk Team Leader	3 years	Maintenance, training and development
5	Analyst in digital transformation team	4 years	Initiator and developer

For this case study UAB "X" was chosen provided that this company is keen on implementing high-end and high-tech solutions for their business operations. UAB "X" is the largest electricity and gas supplier in Lithuania (geographic market is the Republic of Lithuania) and provides people all key energy service. The company belongs to the National Lithuanian Energy Association.

Interview results

At the time of interviews, the company has been using chatbot for their internal communication for over 1 year. Notwithstanding its early stage, the potential of chatbot was recognized by all interviewees as considerable. Chatbot used within UAB "X" is named "Angelė", however, for reasons of text clarity and flow for non-Lithuanian speakers, it is hereinafter referred to as A-Chatbot.

A-Chatbot used within UAB "X" was developed by ID3, based on RASA Open Source Conversational AI assistant and its architecture flow. A-Chatbot acts as a FAQ interaction in python based on natural conversation: a text from the end user is entered, NLP (Natural Language Processing) subset processes human language data, breaks it down, then feeds to NLU (Natural Language Understanding) to interpret and understand the meaning of data to be processed accordingly (depending on policy) and following feeds to NLG (Natural Language Generation) which produces answers easy to understand for end user. This solution was chosen and created due to FAQ interaction convenience for end user, however, after more than 1 year of implementation and development, the interviewees agreed that changes need to be introduced and A-Chatbot is going to be augmented with Decision-Tree solution. At the beginning A-Chatbot was launched regarding only HR questions, but was gradually updated and at the time of interviews covered 7 topics (HR, public procurement, law, etc.). Due to overlap of various key words in different topics A-Chatbot sometimes is

confused and can deliver non-sufficient answer, thus the introduction of Decision-Tree shall come into advantage in these situations.

As the first step, the primary aim of this research was to understand the main reasons to introduce AI driven solution, chatbot, and answer RQ1 correspondingly. This was in help not only to understand primary intentions for implementation but to clarify main functions of chatbot (Table 3) in help for those dealing with HR queries correspondingly:

Table 3. Reasons to introduce chatbot and its functions

No.	Reason to introduce/function	ID	Citations
1	Answer FAQ, routine inquiries and relieve the workload of Helpdesk and HR professionals	All	"Repetitive routine questions are the main time-consuming challenge for HR professionals and Helpdesk" (ID1).
2	Instant, 24/7 data access for end-users	All	"People nowadays seek instant data access and want to receive it from the first source they addressed" (ID3).
3	Become market leaders from technological and innovative perspective, encourage the implementation of other AI driven solutions	1; 5	"Our company seeks to become market leader and AI driven solutions are a perfect tool to encourage future technological development" (ID1);
			"When executives understand that some AI's solutions can benefit the business, they are keen on searching for further ways on how technologies can be implemented in other fields within a company" (ID5).
4	Develop employees' self-support and autonomy	2; 4; 5	"People tend to choose the easiest access to information and are not willing to look for it for themselves. Chatbot can here help to deal with queries autonomously and by doing it by themselves, next time they remember the whole process better and find information quicker, also they are no longer dependent on HR specialist to answer their question" (ID2).

1st and 2nd reasons to introduce chatbot and its functions are here considered as direct and efficiency-enhancing because the impact directly affects HR management processes within a company. 3th and 4th reasons and functions can be considered as indirect potential benefits whereas the implementation of chatbot can not only positively influence company's image but as well serve as a factor to attract potential new work force that is keen on innovations and can encourage current employees to foster their self-reliance because by using chatbot they memorize specific processes easier and next time can solve their query without the interference of HR specialist.
In like manner shall be considered the benefits of chatbot for HR and business (RQ2). Interviewees accentuated the following main benefits, which can be categorized into

two groups (Table 4 and Table 5) (direct benefits were accentuated by all IDs, thus no citations are included):

Table 4. Direct benefits of introducing chatbot

Direct benefit	ID
Reduced workload regarding repetitive queries for HR specialists (and other related specialists)	All
Complementary internal communication channel	All
Top speed of information acquisition	All

Table 5. Indirect benefits of introducing chatbot

Indirect benefit	ID	Citation
Keeping pace with AI driven innovations used within companies around the globe	1; 5	"You have this feeling inside as if you truly are a part of creating future and keep pace with leaders around the world" (ID1).
Personal fulfilment for those who develop, maintain and train chatbot due to becoming a part of innovation creation process, personal development	All	"Everyday day you learn something new, interact with people from various departments within company and perceive better understanding of how they function. This is like inspiration to come up with entirely new ideas whilst team-building" (ID2).
Promotion of digitization process within a company	1; 3; 5	"This is not only another channel for internal communication but also as encouragement to implement further AI solutions for better business and HR management" (ID1).
Primary education of employees about AI	5	"The implementation of chatbot is like primary education within the field of AI, because it can encourage employees to engage into IT revolution and become a part of a change" (ID5).

With regard to A-chatbot used within UAB "X", interviewees correspondingly outlined further indirect benefits. Those, who maintain and develop A-chatbot (ID1, ID2 and ID4), emphasized the acquaintance with processes executed by colleagues from other departments, i.e. when the database of topics covered by A-chatbot had to be broadened, employees of different operational profile had to collaborate and communicate, henceforth they had to become familiar with broad spectrum of various unfamiliar processes within a company. This resulted in better communication between different departments. Another correspondent benefit with regard to solution's development is team-building (ID2) as specialists have to communicate and work with colleagues from various spheres and are constantly developing interest in up-to-date or previously non-existent solutions and this promotes effective peer-learning.

In view of main challenges HR professionals face while adopting chatbot solution (RQ3), interviewees emphasized the process of chatbot's training. In order for chatbot to run efficiently it has to be trained properly for a long period of time. Given the fact that A-chatbot is in use for only more than 1 year within UAB "X", it is still in its early phase and requires constant training and development. Thus, specialists working with it are now concentrating on its development and do not feel any workload reduction. On the other hand, they are not performing any routine tasks and are focused on

higher added value queries. Another challenge accentuated is the age of specialists. As presumptive, elders do face more challenges while using chatbot in comparison to younger specialists. In case of UAB "X", younger specialists help and train their elder co-workers in order to develop necessary skills for those who lack knowledge.

With regard to end users' of chatbot experience tendencies remain as predicted. People are still insecure about AI's implementations and do not trust it until proven contrary. In case of A-chatbot use, end users were and are facing uncertainty (ID1, ID2, ID4 and ID5). At the beginning of A-chatbot introduction there were only about 30 queries addressed to A-chatbot per month. As this technology progressed, the quantity of queries grew accordingly. Now A-chatbot receives 200-300 queries per month. This might seem as a rather low number; however, it is still considered as progress. Main concerns expressed by end users are the credibility of received information: people are still insecure about received information and tend to double check it with HR specialist via Helpdesk (only 20% of UAB "X" employees' use A-chatbot, while the rest of 80% tend to deal with their queries via Helpdesk or other channels). On the other hand, the distinction of separate age groups of end-users is more than likely: interviewees affirmed (ID1, ID2, ID3 and ID4) that younger employees are keen on technologies and tend to avoid direct conversation, thus A-chatbot becomes a convenient tool to answer their questions in real time without any direct confrontation with HR specialist.

Discussion and conclusions

To sum up, AI's implementations are not only encouraged but create a higher value for business as well. Though there are many more positive outcomes of chatbot's implementation as an additional communicational channel within a company, the downsides are still prominent. Even though the inner chatbot might be considered as sunk cost, because its usage within a company might disappoint at the beginning due to distrust of the technology and insufficient usage of it, the indirect benefits of such solution can bring a truly positive impact for company's digitalization process. Chatbot can be used as a tool to entice new workload, encourage employees to use and develop technologies, and become a part of constant process of innovation creation.

As future depends on technological progress, AI's solutions are inevitable. It can not only bring independence, instant data access and self-support for end users, but relieve the workload for HR specialists considering routine tasks and queries. HR specialists can focus on higher value-added tasks and develop new, unmapped solutions in order to elevate business into another level. Though the initial level of AI's implementation can cause various effects, continuous development can surely bring positive impact on workforce management. As interviewees of this study indicated, the future depends on technology, thus these solutions are deeply encouraged and welcome into any business.

Might there be any misunderstandings, AI's solutions can seem incredible only at the beginning, but after proper training, it can become a perfect tool for those seeking instant data access and self-support. It can not only train its end users to access data 24/7 but also to learn and develop skills for future use of AI's solutions for business. Even though the credibility of information delivered is questionable at the initiation

phase, it causes no problems for those, who are keen on technology and trust it. Problems only occur with those of elderly age. However, after proper education people tend to trust technology. To sum up, the results of this case study complement findings from academic research: the leading advantages of chatbot are flexibility, instant and 24/7 data access, reduction of workload for HR personnel and elevated, higher value-added HR management (Godulla et al., 2021; Merlin & Jayam, 2018; Majumder & Mondal, 2021; Johannsen et al., 2021).

In view of limitations of this case study, it has to be kept in mind that this is only the case study of one Lithuanian company, the A-chatbot use is still on its very early stage, and the opinion of chatbot's use is not expressed by the end-users fully within this research. However, these limitations open the avenue and strongly encourage any further research within the field. The results of this case study, especially the indirect benefits of chatbot's use within a company can strongly encourage other companies to implement AI driven solutions and perceive a chatbot as a tool to resolve key-issues rising in contemporary companies to strengthen their HR management.

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