CHATBOT IN HUMAN RESOURCES MANAGEMENT; WORLD EXPERIENCE VS. ROMANIA

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Abstract: *Artificial Intelligence (AI) is rapidly penetrating the public sector as agencies strive for higher efficiency, better quality, and more personalized service to their customers. Social security is no exception. While AI applications are diverse - each with its own far-reaching implications - "IA conversational" or "chatbots" have led the way in terms of AI adoption by government agencies. Chatbots are a useful tool with great potential for government. All types of chatbots have a great benefit and revolutionary impact for users of public administration Describe the basic characteristics of chatbots, their classification, and, in the form of a SWOT analysis of the strengths and limitations of this technology in their application in public administration, it is confirmed that chatbots (and their subsequent changes and development variants, such as VoiceBots or digital assistants) will become an integral part of the modern apparatus that public administration will use for public relations.*

Keywords: *artificial intelligence; chatbot; SWOT analysis, advantages and disadvantages of using chatbots*

JEL Classification: M15; O30; O32

1. Artificial Intelligence and Human Resource Management

■ Artificial Intelligence (AI)

Long-term existence of artificial intelligence (AI), it has several applications over time, but recently it has been developed and implemented in an aggressive form. We will break down the word AI artificial intelligence and we will analyze each part. The definition of "A", that is, artificial, is a universal term and does not need such a complex definition. According to the Oxford Dictionary, the definition of artificial means "made or produced by humans rather than occurring naturally, especially as a copy of something natural" (Oxford Dictionary, which is, 2019).
Another aspect of the definition of artificial intelligence is the need to measure human intelligence in order to compare it to that of robots or machines.
Kaplan (2016) states that from his perspective, artificial intelligence is "the ability to make appropriate generalizations in a timely manner based on limited data". In this article, AI is defined as the ability of things like machines to learn, interpret, and understand on their own in a way identical to humans. (Coursera, 2023; Miaihle, N. and C. Hodes (2017), Johansson, J., Herranen, S. (2019).

2. Chatbots

■ General Characteristics of Chatbots

Various names have been used for chatbots: conversational AI bot, AI assistant, intelligent virtual assistant, virtual customer assistant, digital assistant. They are "intelligent conversational computer systems designed to mimic human conversation to provide online guidance and support" (Caldarini et. al. 2022). Chatbots have become popular among customers around the world because, thanks to modern technologies (mobile), they make it possible to get information about practically anything at any time (day, night) and anywhere. Jurasek (2022).

■ What is ChatGPT?

An artificial intelligence (AI) chatbot that uses natural language processing to create a human-like conversational dialogue. (Heter, 2023). A form of generative artificial intelligence - a tool that allows users to enter requests to receive human-like images, text, or video created by artificial intelligence. (Craciu, 2018). It is similar to the automated chat services found on customer service websites, as people can ask questions or seek clarification on ChatGPT's responses. "Generative Pre-trained Transformer", which refers to how ChatGPT processes requests and formulates responses. Training with learning by reinforcement through human feedback and reward models that categorize the best answers. This feedback helps improve ChatGPT with machine learning to improve future responses.

■ What is Virtual Assistant?

This is a software based on artificial intelligence that uses the most advanced techniques to help users perform daily tasks.
- has the ability to understand the intent of users and provide accurate solutions to their questions, eliminating any trace of ambiguity;
- has the ability to interact with people in an intuitive way and, over time, learn people's habits and preferences;
- in the field of human resources, virtual assistants become important in an HR department that wants to automate repetitive and time-consuming processes, but also increase productivity.

■ What Are the Benefits of a Chatbot?

Companies and users are still exploring the benefits of ChatGPT as the program continues to evolve. (Pophal, 2022; Selvarage, 2023).
Some benefits include the following:
- enough savings;
- improved content quality;
- education and training;
- improved response time;
- increased availability;
- multilingual support;
- personality;
- scalability;
- natural language understanding;
- digital accessibility.

■ What Are the Limitations of ChatGPT? How Accurate Is It?

Some limitations of ChatGPT are the following:
- It doesn't fully understand the complexity of human language;
- 2021 - lack of knowledge of dates and events;
- answers may sound machine-like and unnatural;
- citing sources, but not giving the sources;
- doesn't understand sarcasm and irony;
- might focus on the wrong side of a question and can't change.

■ Classifying Chatbots

It is useful to classify chatbots, to distinguish them by criteria. (Trofymenko, 2021). Research and analysis of the characteristics of modern chatbots allowed to divide chatbot programs into seven classes as follows:

● *By Purpose:*

- chatbot for conversations are designed for user dialog on abstract topics and do not have a clear purpose;
- chatbot focused on dialog only on a specific topic or to solve a specific problem or purpose.

● *By Interface Type:*

- button communication - the communication of the user with the bot is organized by pressing the selected button in the list of buttons with different names;
- text communication - the communication with the user is carried out in the form of text messages. Chatbot recognizes words that are common in user query, clarifies questions and offers solutions;
- mixed models to form a text response to inquiries, the bot can provide the user with the buttons with clarifying questions;
- communicates the voicemail to the user. The voicemail is first programmatically converted to text, analyzed, and only then synthesized audio response to it. Voice assistants are more natural and easier to use than graphical interfaces;
- runtime interface without dialog interface. The system is complete without a robust runtime interface, which is required to connect virtual agents to external systems. This interface is necessary to communicate with external systems and obtain dynamic information to continue the conversation or fulfill certain intentions.

● *By Number of Users:*

- personal chatbots, which in turn can be divided into two groups: 1. for personal use without data transfer to others; 2. interactive chatbot - some kind of user assistants in interaction (data exchange) with other users or other programs to perform certain actions on behalf of the user; personal calls, search and playback of audio and video files, etc.
- Business chatbots are designed to allow simultaneous use in business to automatically communicate with many customers without involving employees in the service process.

● ***By the Form of Access:***

- chatbots of certain groups (chats) Messenger are a useful means of communication among its group members and coordination of their interaction;
- chatbots in the Messenger dialog can be called directly in any dialog just by typing the icon and bot name;
- subscribed chatbots allow you to collect a chatbot subscriber base on the site and send mass and personal emails within Facebook Messenger, Slack, Viber and Telegram, among others.

● ***By Algorithm:***

- Simple chatbots interact with users on the basis of a prepared script - a decision tree of a tree structure containing a set of common answers, i.e., the answers are selected from the template phrases of the script by keywords.
- "Intelligent chatbots" are based on an artificial neural network that "understands the meaning of the conversation. The conversation path is determined by default based on the preparation of data (training samples) used to teach the machine learning model.
- Hybrid chatbots are a combination of the first two types of chatbots. Bots of this type communicates with the user in a predetermined way but uses AI to recognize that of the user's intentions, but also extract valuable data from user messages (name, date, point, etc.).

● ***By Functionality:***

- information and communication - a chatbot that does not have a specific purpose and is designed solely to support communication with people, for example, to share information about special offers and discounts;
- "Questions and Answers-" chatbots designed to provide simple answers on the principle of "one question, one answer;
- chatbot that generates data based on user responses to achieve specific goals;
- chatbot that allows immediate execution of certain actions.

● ***By Location:***

- chatbots are found on websites. In large part, companies are willing to embed chatbots on their websites to help the customer to answer questions or resolve other requests or communication issues related to tasks or settings unique;
- in messaging. They are used for quick interaction with customers, even in slow internet or roaming conditions. The reason for the creation and popularity of certain groups in messengers in Facebook Messenger, Slack, Viber or Telegram is a combination of people in groups with certain common interests;
- in specialized software applications, the use of chatbots facilitates and accelerates the process of goods or services.

■ **SWOT Analysis of Chatbots**

A number of studies have conducted a SWOT analysis of chatbots and their use in the private and public sectors. (Jurasek et al., 2022)

● ***The advantages of chatbots, from our point of view, based on the mentioned studies, include:***

- it is a valuable source of customer information;
- offers new ways of customer support;
- it helps to optimize costs and improve customer satisfaction.

● *However, There Are Also Some Disadvantages of Chatbots, for Example:*

- inhuman approach of chatbots can hurt customers;
- (failing to understand requests, misunderstanding the subtleties of human dialog, inaccurately performing tasks, problems understanding accents, providing inaccurate information, triggering false alarms, triggering false alarms, using inappropriate/offensive language);
- implementing chatbots takes time;
- (new data can be added continuously);
- lack of chatbot training data (Help Net Security 2019), which can lead to reduced capacity for conversational nuance.

Internal Factors
A. Forte Points
automation of standardized conversations;
simple without the need to use an external application (+extensibility) compared to other AI technologies;
low cost;
incremental improvements over time;
(conversation, training);
the above mentioned advantages.
B. Weakness
- correct data, because;
- (not the naturalness) of the conversation;
- unemphatic technology;
- the lack of AI technology equipment for sophisticated conversations;
- wrong answers due to mixing keywords with robots that work on the principle of text recognition.

External Factors
A. Opportunities
- the interaction with the more natural and easier chatbot;
- vocal assistants' cause;
- virtual agents' cause;
- new technologies (RCS);
- a friendly and welcoming approach to public administration towards younger generations and technology-based individuals.
B. Management
- negative user attitudes towards chatbots;
- conservative public administration by nature;
- (chatbots are certainly not for everyone).

3. Human Resources Chatbots

An HR chatbot is an advanced conversational AI programmed to handle various HR-related tasks and questions. It is not just a tool for answering basic questions, but an intelligent system equipped with generative AI and natural language processing (NLP) capabilities.

These capabilities enable it to understand and answer various HR questions ranging from benefits and leave policies to more complex issues such as performance appraisals, integration processes and training programs. (Selvaraj, 2023)

The main objective of an HR chatbot is to automate and streamline tedious and repetitive HR tasks. This can significantly improve the employee experience, reduce the workload of HR professionals, and allow them to focus on strategic and complex issues. These chatbots are adept at conducting employee surveys, collecting feedback, and facilitating self-service portals, making them an integral part of the modern HR toolkit.

HR chatbots are versatile and can be integrated across multiple platforms, including intranets, corporate websites, messaging apps, and mobile applications. This multi-platform presence ensures that employees can access HR support whenever and wherever they need it, promoting a more connected and efficient workplace.

■ What are the benefits of HR chatbots?

The integration of HR chatbots is redefining the efficiency and effectiveness of HR departments in various industries. (Selvarrage, 2023)

Here are the key benefits that these digital assistants bring to HR:
- Accelerated processes
- Easy query resolution
- Transparency of responses
- Increased productivity
- Simplified referral processes
- Cost-effective solution
- Facilitates remote work
- Effective processes with real-time analytics

● *Here's a Look at Some Compelling Statistics that Paint a Vivid Picture of the Human Resources Chatbot Landscape:*

1. Improve employee engagement
2. Large-scale adoption and future plans
3. Manage employee requests

● *Future Human Resources with Chatbots*

The role of human resources chatbots is becoming increasingly important in the workplace. They are not just a trend, but an essential tool in the evolution of human resources management. With the ability to streamline processes, improve the employee experience, and provide useful information, HR chatbots are reshaping the HR landscape. As companies continue to navigate the complexities of the modern workplace, the adoption of HR chatbots will be critical to remaining competitive, efficient, and responsive to employee needs.

4. Artificial Intelligence in the Public Sector Using Chatbots

Artificial Intelligence in Social Security: The Case for Intelligent Chatbots

Artificial Intelligence (AI) is rapidly entering the public sector, as public institutions seek to develop efficiency, excellent quality and personalized service for their customers. Social security institutions are no exception to this phenomenon. While AI applications are diverse, "IA conversational" or "chatbots" are leading to the adoption of AI by government agencies. In a survey of 166 government agencies around the world, chatbots emerged as a leader, with 26% of public agencies already implementing them and another 59% of public agencies

planning to implement them within three years. In an analysis of 230 AI-enabled public services in the European Union, chatbots emerged as the first choice, accounting for more than one-fifth of the cases (European Commission, 2020). The global market for conversational artificial intelligence, including chatbots and intelligent virtual assistants, is expected to grow at a compound annual growth rate (CAGR) of 22% between 2020 and 2025, reaching nearly $14 billion (USD) (Deloitte, 2017).

A chatbot (or virtual assistant) is an algorithm that conducts a textual or verbal conversation. While chatbots are not really a new technology - for example, the first chatbot was planned back in 1966 to find out if people could figure out if they were talking to a person or a car - the potential of chatbots is now significantly higher due to advances in AI technologies and ever-changing communication models (Van Noordt and Misuraca, 2019).

Chatbots are computer programs that are able to recognize a user's input using technology matching models, access information, and respond with information found in the knowledge base. While basic chatbots communicate through pre-programmed responses, the most advanced use AI, which allows machines to better analyze and process the context of language (known as natural language processing, or NLP), which in turn allows chatbots to handle more complex tasks and have more human-like conversations. Chatbots are increasingly being used by governments to manage large volumes of contact with citizens, helping them navigate complex policies and laws to ultimately access quality public services (Henman, 2020).

While chatbots can improve petitioner satisfaction, which can improve operational efficiency, implementing a chatbot is not an easy process. The opportunities, costs, and risks associated with chatbots can vary significantly depending on the implementation techniques, means of communication, objectives, operational capacity, and communication channel (ISSA, 2021).

The International Social Security Association (ISSA) promotes the responsible use of chatbots through its guides. ISSA Guide on communication by social security administrations (ISSA, 2019), Guide 10 refers to the "strategic use of new communication technology" in all areas related to the use of chatbots in social networks and messaging systems, Guide 14 is about customer-centric information. In the ISSA Guide on Quality of Service (ISSA, 2019), Guide 5 focuses on "understanding users' needs and experiences", which also applies to the development process underlying chatbots. Finally, the ISSA Guide on Information and Communication Technology (ISSA, 2022) refers to the implementation of a service and processing office of requests, applications, and, including virtual service offices and potential uses of emerging technologies, which contextualize the use of chatbots as an application of artificial intelligence.

The ISSA has facilitated discussions among member institutions to highlight the complex nuances surrounding chatbots. In particular, a session dedicated to artificial intelligence at the 16th ISSA International Conference on Information and Communication Technology in Social Security highlighted the opportunities and complexities associated with AI-enabled chatbots.

The National Employment Office (Office national de l'empoi - ONEM) in Belgium launched a chatbot to alleviate the pressure on the contact center caused by unprecedented volumes following the COVID-19 crisis (National Employment Office, 2021 and 2022).

The first chatbot, called Marc, was launched on the ONEM website in May 2020. In its initial phase, the chatbot was designed to handle only one type of customer request: it provided citizens with quick access to the copies of tax certificates they needed and helped them file their tax returns. In May 2021, the chatbot's capabilities were significantly expanded and a new chatbot named Ori was launched. Based on the analysis of the questions customers asked Ori, an updated version was released in December 2021.

Finland's Social Insurance Institution (Kela) has launched two chatbots, Kela-Kelpo and FPA-Folke, to help customers find information about benefits on Kela's self-service web portal. Based on natural language processing, the chatbots speak two languages, Finnish

and Swedish, and understand English. Kela initially launched chatbots in 2017, which were supplemented with information about a growing number of benefits in 2017 and 2021. Different chatbots were consolidated as Kela-Kelpo/FPA-Folke in 2020 to prevent customers from switching between different chatbots to learn about different benefits. These conversational chatbots make it easier to discover and interpret information, and complete benefit applications. In addition, the enhanced chatbot provides personalized advice based on contextual variables when customers complete applications for parental benefits and social support. During the COVID-19 crisis, a dedicated chatbot was temporarily installed to answer questions about COVID-19-related social assistance.

The German Pension Insurance (Deutsche Rentenversicherung Bund - DRV-Bund) introduced a chatbot to answer frequently asked questions from its members (Deutsche Rentenversicherung Bund, 2021). The main goal was to ensure 24/7 access to information. The chatbot simulates natural language based on artificial intelligence technologies and has the potential to free up staff time for more complex issues. The chatbot is in the early stages of implementation and usage remains at 5%. DRV-Bund plans to expand the capabilities of the chatbot to include form filling assistance in the near future.

The Malaysian Employees Provident Fund (EPF) launched the ELYA (EPF Loves You Always) chatbot, a bilingual virtual assistant that uses natural language processing and is supported by live chat (Employees Provident Fund, Fund, 2021 And 2021). EPF has a contact center to manage questions, the daily volume of 5,000 calls, which exceeded its capacity of 4,000 calls per day, resulting in the removal of 25% of calls. At the same time, 82% of the questions had already been answered on the EPF website, indicating an inefficient use of the contact center. Another survey showed that 55% of customers found the EPF website difficult to navigate. Therefore, ELYA was introduced to help customers find information themselves and to reduce the workload of civil servants.

The launch of the ELYA chatbot was preceded by a detailed analysis of problems and needs in 2017-2018. A basic bot was first introduced in 2019-2020, followed by the current conversational bot in 2021-2022. EPF plans to further enhance ELYA's capabilities in 2023-2024 to enable the bot to provide advice. ELYA knows both English and Bahasa, the Malaysian language, and provides conversational and interactive queries on 30 EPF products and services. It is available 24/7 on the EPF website and is supported by real-time escalation to a human agent during business hours. ELYA is based on a representative knowledge base that has been carefully consolidated based on input from customer agents, customer emails and FAQs received by the contact center. ISSA Guidelines on Communication by Social Security Administrations, in particular Guide 14. Customer-centered information was mentioned in the design of ELYA. It also supports the four principles of the ISSA Guidelines on Good Governance (ISSA, 2019), namely transparency, predictability, participation and dynamism, as well as the use of clear and simple language, with a focus on user-centered platforms.

According to some estimates, by the end of 2022, on average, people will talk to robots more often than to their own husbands (Deloitte, 2017).

Therefore, chatbots will become an integral part of the overall strategy of communication with customers of social security institutions. They have some characteristics:

They are complementary to existing digital and human channels: they can replace some channels, improve others, and in some cases other channels will coexist because chatbots may not be desirable due to privacy and legal frameworks. The development cycle associated with chatbots cannot be underestimated: the absolute complexity of developing algorithms to translate administrative information into conversational content, taking into account the customer's context.

Chatbots need to be built on customer insights, which means regular interaction with customers for feedback. Finally, chatbots raise new legal and ethical concerns for social security institutions (Henman, 2020). For example, ONEM had to ensure that the bot did not collect personal data in accordance with strict privacy laws. As AI becomes more

sophisticated, a key concern is that it could learn harmful behaviors from customer interactions (ISSA, 2020).

As the above experiences show, public institutions proactively manage any liability and customer protection issues and are better positioned to fully reap the benefits of intelligent chatbots. The ISSA supports member institutions to successfully adopt chatbot technology and address implementation challenges, particularly those related to the application of AI, through guidelines (ISSA, 2022), sharing of institutions' good practices (ISSA, 2020 and 2022), and organizing meetings.

5. Technostress – the Dark Side of Technology

Although technology is largely beneficial to employees and public institutions in general, it can also have "dark sides", such as technostress. Technostress is a psychological state of stress associated with the use of IT or the demands of using IT. It is associated with feelings of anxiety, mental fatigue, skepticism, and ineffectiveness. Workplace technologies can be intrusive, contribute to a sense of techno-invasion, and become overwhelming, leading to high pressure in daily work, perceptions of work overload, information fatigue, frustration, demoralization, loss of motivation, exhaustion at work, poor performance at work, poor performance at work, intentions to quit a job regardless, and job dissatisfaction.

The effects of technostress have consequences such as anxiety, fatigue, skepticism, and ineffectiveness related to the use of ICT, with computer anxiety being one of the most studied technostress experiences. Research on attitudes towards computers and the Internet, more recently from the invasion of artificial intelligence through the use of chatbots in public institutions, have reported that some adults manifest a high level of anxiety towards the computer, technology in general, and experience feelings of unease, discomfort, and frustration and stress, anticipating the disastrous consequences of their mistakes. The sense of professional instability in the use of ICT is another component of technostrain and refers to the perceived level of inefficiency in the use of ICT (Schaufeli & Salanova, 2007).

Researchers have also often examined computer anxiety and computer self-efficacy in relation to the dimensions of the technology acceptance model (Venkatesh, 2000), such as perceived usefulness, perceived ease of use, and behavioral intention, behavior, and computer skills. In institutional settings, the technology acceptance model has been linked to issues such as the reasons for collaboration, the costs and benefits of collaboration, the characteristics of the work group, and attitudes toward change. Previous research has shown that public institutions that want to promote the use of an IT system should provide monitoring support and improve extended peer relationships to facilitate a more favorable attitude toward IT systems (Lee, Rhee, and Dunham, 2009).

Another dark side of technology could be explained by excessive and compulsive work with ICT, namely technodependence.

Technodependence is considered a form of workaholism (Porter & Kakabadse, 2006), (Salanova et al., 2013).

Thus, technodependence is a form of technostress due to an uncontrollable compulsion to misuse ICT for long periods of time (Salanova et al., 2013). As expected, higher levels of technodependence are associated with lower levels of well-being (Huang, 2010).

6. Iris Chatbot for Human Resources Management in Romania (IRIS, Virtual Assistant for HR)

Changes in the labor market, the digitalization of HR, the need to streamline work processes determine companies and public institutions to put more and more emphasis on the employee experience. In recent years, an HR department has become a priority the need to

create physical and digital spaces that provide employees with experiences that increase job satisfaction, retention, loyalty, productivity. For this phenomenon, a virtual chatbot assistant has been created that provides constant support to employees and reduces the workload of the HR department.

The IRIS virtual assistant can be found in the Employee Self Service application of the colorful.hr platform. To communicate with IRIS, the user must have access to the Me (Employee Self Service) application of the colorful.hr platform. IRIS knows how to respond to you in both Romanian and English and adapts according to the language you have chosen to authenticate to the platform. The role of the IRIS assistant is as follows:

- employees get the answers they need immediately.
- provide employees with interactive and user-friendly experiences.
- improve employee productivity.
- it eliminates human errors.
- reduce the workload.
- reduce costs.

Iris is used to make the best decisions.

- Let's find out what problems employees have and offer customized solutions.
- s Identify the professional training opportunities in the company.

Who needs IRIS?

- Small companies that don't have an HR department.
- Large companies where the HR department is overburdened.
- Entrepreneurs who want to focus on business development and delegate repetitive tasks.

What can you find out with IRIS? Once you have made your request, IRIS will show you the latest version of your payroll. Situation of the remaining days of leave. IRIS displays

- the number of days of leave according to the employment contract.
- number of additional days of leave.
- Number of vacation days taken.
- the number of planned leave days.
- the remaining leave balances.

Conclusion

With the help of this virtual assistant, Romania could introduce the recruitment and selection of public employees, including in the pension houses, an essential condition is the increase of salaries and new visions in the new salary grid by hiring high performance people and reducing people, equipping them with high performance IT technology.

A chatbot helps the economy of the country and the well-being of both civil servants and petitioners.

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