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HOW CHATBOTS WILL IMPACT PUBLIC SECTOR AND ACCOUNTING

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Abstract

The digital transformation of accounting will affect the daily activity of companies and will profoundly impact the employment landscape. The scope of this research is to present the components of the high-level architecture for public service chatbots and the usage of chatbots in the public sector. The last part of the research is analyzing how chatbots will impact accounting and how digitization of work will have an effect on jobs.

Artificial intelligence is expanding and there are many benefits of using chatbots in the public sector for user interface, dialog management, interaction recording, and filtering and feedback from the customers. In the last decade, there has been a significant rise in interest for artificial intelligence, non-humanoid robots, chatbots, and encryption. Chatbot technology could speed up communication between advisers and clients/citizens, and more recently between accountancy and public authorities.

Several European countries have implemented chatbots for providing public services in order to respond to the increasing demand of information

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from citizens towards public administration. The European Union encourages the use of open data portals for taxes and reporting purposes, but also for improving the quality of public services while increasing public sector efficiency. The chatbot network could improve the European public system in the near future and boost economic growth

Keywords*: chatbot; economy; accounting; education*.

JEL Classification: C88, E02, M41, I25

Introduction

The paper offers an interesting scenario, particular aspects of digital culture and artificial intelligence, the position of chatbots in the economic context and how chatbots are one of the most popular uses of this new technology. Digital culture became important for public entities and public sector accounting, due the flexibility and sustainable stakeholder impact. Artificial intelligence will impact public sector and supports public services to improve policy challenges, and to respond to citizens' expectations across public service efficiency, inclusiveness, convenience and sustainability. Thus, chatbots could improve public service delivery by being able to answer frequently asked questions and conduct transactions, relieving staff from mundane tasks (Noordt, C, Misuraca, L., 2019).

According to the Annual Report from World Economic Forum 2021, technology governance could provide solutions during the pandemic. Thus, the Centre for the Fourth Industrial Revolution acted as an important accelerator in the last year, on directions such as: Big Data, Artificial Intelligence, the internet of things, data policy, drones autonomous vehicles, blockchain, etc.

The driving force of digital transformation

The digital transformation is imperative in the public sector and has empowered users and providers and made it possible for them to choose how to access or deliver a service, how to communicate, when to engage on policy areas or issues, which social groups to join or business areas to invest in, and how to participate more actively in local, national or even global challenges (OCDE, 2019).

All over the world, governments are implementing digital transformation projects and initiatives in order to deliver beneficial digital services which improve the lives of citizens. In our opinion, governments and state agencies have an enormous

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opportunity to implement digital tools, Artificial Intelligence (AI) and robots to optimize public sector management, service delivery, and overall state capacity, which can lead to transparency and accountability. Also, citizens expect governments to offer public services that are designed with a user-driven perspective and adaptable to different user profiles (OCDE, 2019). In the last decade, the digital transformation projects and initiatives became a priority for businesses and public administrations, and the development of digital transformation also aims to set up true European data space and facilitate safe access to and storage of large datasets and energy-efficient cloud infrastructure1. The spending of digital transformation technologies and services could be observed in figure no. 1.

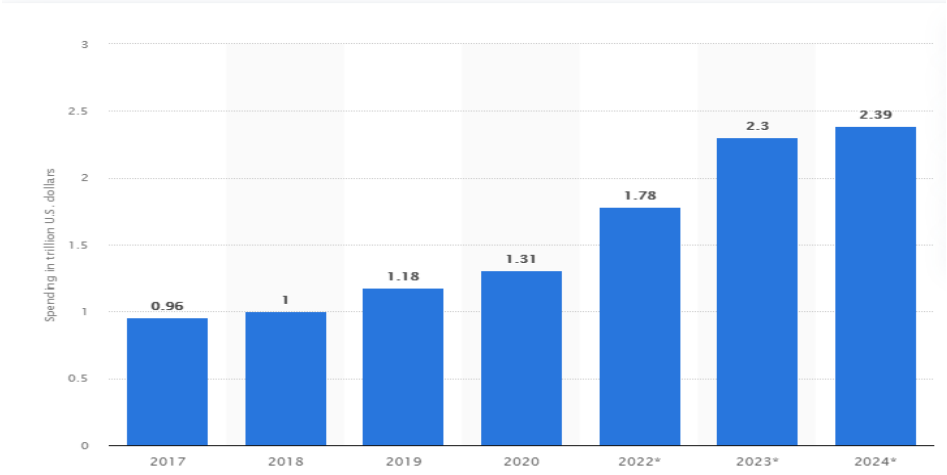

Fig. 1. Spending on digital transformation technologies and services worldwide from 2017 to 2024

Source: https://www.statista.com/statistics/870924/worldwide-digital-transformation-market-size

[1] https://digital-strategy.ec.europa.eu/en/activities/artificial-intelligence-digital-programme

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The digital transformation in private and public sector is accelerating due to the COVID-19 pandemic. According to a global survey published in July 20212, more than 90 percent of respondents think that the COVID-19 pandemic sped up digital transformation processes in their organizations, as we can observe in figure no. 2.

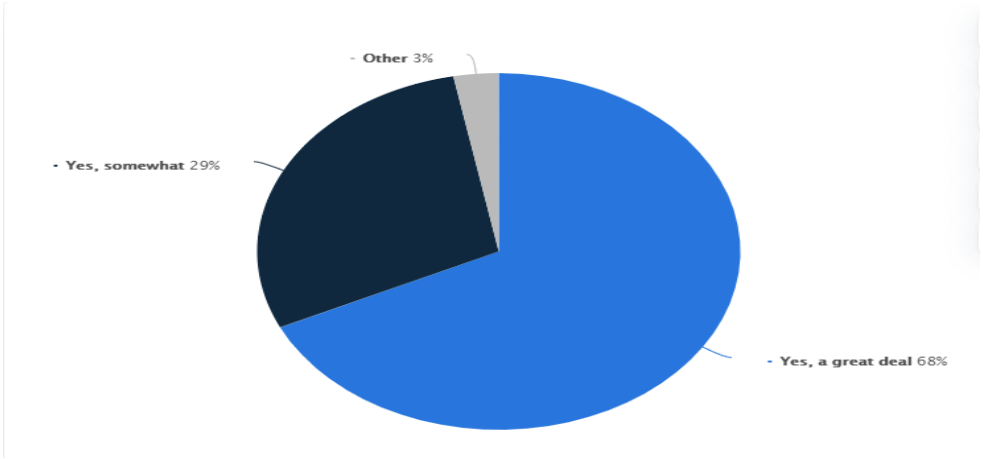

Fig. 2. The COVID-19 pandemic speeding up digital transformation
Source: /www.statista.com/statistics/1200465/covid-digital-transformation-global

We observe in the figure above that many respondents are interesting in the new technology because digital transformation is becoming necessary to the human life in general. In the last few years, more citizens and customers are requesting digital public services delivery and digital products, because the digital age has brought forth the quest and desire for greater public engagement and spaces for collaboration in our societies and economies (OCDE, 2019). As a consequence of the COVID-19 pandemic, more than half of customer interactions and companies' products and services became digitalized, compared to just a third right beforehand.

The Chatbot Implementation in Government

Digital transformation is connected to workforce transformation and Chatbot-technology in public administration. Recently, have been noticed a big interest in

[2] https://www.statista.com/statistics/1200465/covid-digital-transformation-global

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public sector innovation and Artificial Intelligence (AI), because digital technologies play an indispensable role in public digital transformation. In the last decade, the digital transformation in public administration has revived the potential of Chatbots. Early Chatbots were limited in their functionalities as they were only able to respond to simple queries, but recently, the Chatbots could perform complex tasks and host more human-like conversations (Noordt, C.; Misuraca, G. 2019).

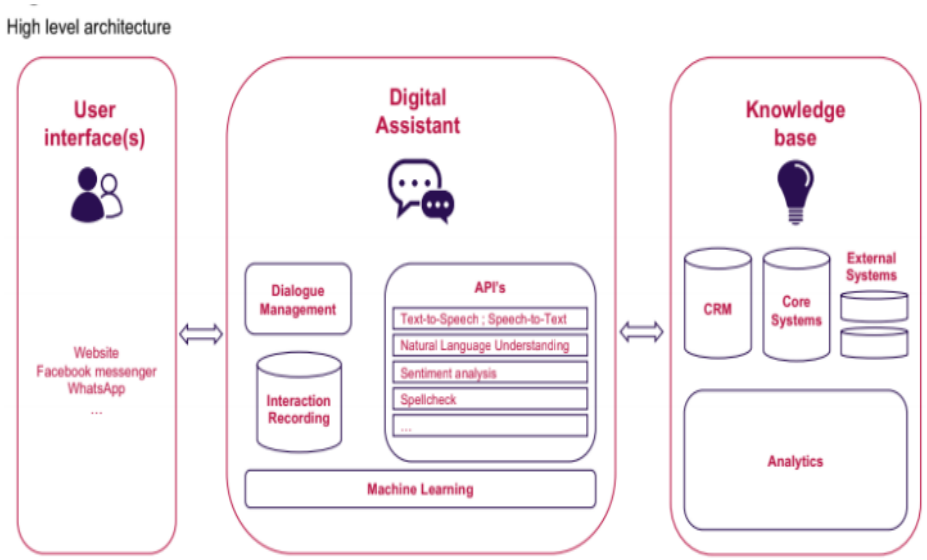

Fig. 3. The chatbot architecture
Source: https://joinup.ec.europa.eu/sites/default/files/news/2019-09/ISA2_Architecture%20for%20public%20service%20chatbots.pdf

Chatbot is a virtual assistant, a conversational agents, or a software application used to conduct an on-line chat conversation via text or text-to-speech, in lieu of providing direct contact with a live human agent3. Chatbot is an online application that can help users solve problems without a human advisor and respond faster and more accurately. Chatbot is related to disruptive technologies and gaining

[3] https://en.wikipedia.org/wiki/Chatbot

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popularity, organizations are forced to reconsider the channel enablement strategies and for sure the related architectural approach (Khan, R. 2017). The Chatbot is part of digital culture and useful for better way of doing business in the future world. The Chatbot has been developed because the public entities must respond to a lot of calls and emails from the citizens (Noordt, C.; Misuraca, G. 2019). We present the chatbot architecture in figure no. 3 above.

According to the Future of Jobs Report 2018 from World Economic Forum 2018, the digital transformation and new technologies, including automation and digitization, create new high-quality jobs and rapidly shift the frontier between the work tasks performed by humans and those performed by machines and robots. Also, digital economy and new technology can harm workers on average or even all workers (Caselli, F.; Manning, A. 2019).

Table no. 1. Chatbots advantages

Low costs for implementation and maintenance
Lower the barriers to contact
24/7 available
Greater efficiency then humans
Simple interface with citizens
Instant response to any query
Eliminating discrimination

Source: Author's own work

The European governments have a particular interest in Chatbots in order to improve the public service delivery. Chatbots can be trained exponentially faster than humans can, they are 24/7 available and react instantly to user queries, also the

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Chatbots could lower the barriers to contact or ask public administrations for help4. One of the most important advantages of using Chatbots is about saving resources by the decrease in user queries to human operators (e.g. through the helpdesk).

The need for the Chatbot is increasing because is a global push to digitize public services on the European Union member states. In the last decade, the European Union encourages the use of open data portals, starting from the implementation of the European Data Portal to foster transparency of the Public Sector5. Training a chatbot happens considerably faster and on a larger scale than via human training, and many countries consider Chatbot technology perfect to fit in the Digital Single Market Strategy. Some European countries implemented public services based on Chatbots, such France, UK, Finland, Portugal and soon a European network of public service chatbots will be developed.

The Chatbot in Accounting

Chatbot is transforming finance and accounting services in European Union and improving finance, banking and accounting processes. Invoice processing, procurement and purchasing processes can be a complicated process and involves many time-consuming and numerous personnel in finance departments. Chatbots in accounting could be trained to identify the accounting codes that should be assigned to each type of invoice and can automatically update the necessary systems of record. Also, Chatbots in accounting can be used to help scan and process new documents and to quickly and easily find existing electronic documents.

Chatbots are already have been used in the accounting industry for answering customer's inquiries. Many accountancy firms are using a Chatbot program to communicate with a customer over text to answer a number of questions they may have. Chatbot in accounting is developed as a virtual accounting assistant for tens of thousands of customers. Chatbot and AI is developing the company's cloud-based accounting software and improving financial reporting and financial management. The first Chatbot used in accounting was Pegg, very popular for checking expenses and track receipts for small business (figure no. 4).

Accounting firms can implement chatbots to initiate conversations with stakeholders seeking assistance on taxes, fees, and other services, turning them from potential customers into business partners. Chatbot in accounting can manage costs

[4] European Commision- ISA2_Architecture for public service chatbots, p. 9
[5] https://data.europa.eu/en

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for better payments and positive cash-flow, according to the schedule of contracts. In this case, Chatbot will contribue to automate back-office functions through the use of cloud technology. The emerging uptake of chatbots for social and emotional purposes entails opportunities and concerns regarding non-human agents as sources of social support Brandtzaeg, P.B.; Folstad, A.; Skjuve, M.B. (2021).

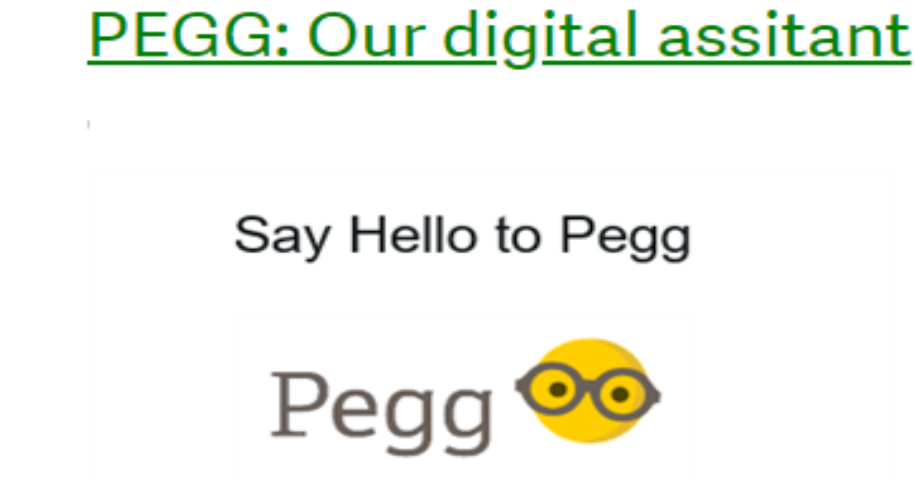

Figure no. 4 Accounting Chatbot Pegg, UK
Source: www.sagecity.com/tags/Pegg

Conclusion

Chatbot technology had a significat impact of public sector and accounting. In the last decade, Chatbot became a a cloud-based human capital management system for midsize for the public sector and small businesses. In our opionion, global interest in Chatbots is growing due the multiple advantages for public sector, accounting, finance and banking, and soon will be implemented in education and service industry.

Digital technology is an important tool for the successful transformation of processes, interactions, transactions, technological evolutions, for regional and global economic and social progress all over the world.

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References

[1] Brandtzaeg, P.B.; Folstad, A.; Skjuve, M.B. (2021) When the Social Becomes Non-Human: Young People's Perception of Social Support in Chatbots Social Support in Chatbots. Available at https://www.researchgate.net/publication/350603567

[2] Khan, R. (2017) Standardized Architecture for Conversational Agents a.k.a. ChatBots, International Journal of Computer Trends and Technology (IJCTT), Volume 50, Number 2, August 2017.

[3] Noordt, C.; Misuraca, G. (2019) New Wine in Old Bottles: Chatbots in Government: Exploring the Transformative Impact of Chatbots in Public Service Delivery. Available at https://www.researchgate.net/publication/335231447_New_Wine_in_Old_Bottles_Chatbots_in_Government_Exploring_the_Transformative_Impact_of_Chatbots_in_Public_Service_Delivery.

[4] Susskind R, Susskind D. (2015), The Future of the Professions. How Technology will Transform the Work of Human Experts, Oxford University Press

[5] Zahour, O. et al (2020) A system for educational and vocational guidance in Morocco: Chatbot E-Orientation, International Workshop on Artificial Intelligence & Internet of Things (A2IoT) August 9-12, 2020, Leuven, Belgium.

[6] EU (2019) Architecture for public service chatbots, Available at https://joinup.ec.europa.eu/sites/default/files/news/2019/ISA2_Architecture%20for%20public%20service%20chatbots.pdf

[7] OECD (2019) Strengthening Digital Government, Availabe at https://www.oecd.org/going-digital/strengthening-digital-government.pdf

[8] WEF (2020) The Future of Jobs Report, Available at https://www3.weforum.org/docs/WEF_Future_of_Jobs_2020.pdf