New Wine in Old Bottles: Chatbots in Government

Exploring the Transformative Impact of Chatbots in Public Service Delivery

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Abstract. Advances in Artificial Intelligence technologies have revived the interest in Chatbots in both the private and the public sector. Chatbots could improve public service delivery by being able to answer frequently asked questions and conduct transactions, relieving staff from mundane tasks. However, previous e-Government research shows that the adoption of newer technologies does not always mean public services get improved. It is therefore of interest to research to which degree newer, advanced technologies such as Chatbots are able to improve, change and restructure public service delivery. This paper gives an exploratory insight using desktop research into three Chatbots currently used in the public administrations of Latvia, Vienna and Bonn. The findings suggest that minor organisational changes are accompanied with the introduction of Chatbot-technology in public administrations, but question whether Chatbots are able to transform traditional services to digital, integrated public service transactions.

Keywords: Digital transformation · E-Government · Artificial Intelligence · Chatbot

1 Introduction

There has been a big interest in the possible gains of using Information and Communication Technologies (ICT) for the delivery of public services to citizens. Already during the 1990s, there was a strong belief that information technology services are able to create a new, better functioning government of the future [1]. Government operations would be able to become more efficient, of higher quality and also more accessible to the public.

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The internet is always available 24 h every day, so citizens would be able to avoid the slow and hierarchical structures of traditional government. They would not have to rely on the opening times of the government anymore since the Internet allows citizens to find information themselves online and is able to deliver services through the web [1, 2].

Lately, another technology has captured the attention of the field. Coming from the realm of Artificial Intelligence, advances in Natural Language Processing-technologies have revived the potential of Chatbots [3]. Early Chatbots were limited in their functionalities as they were only able to respond to simple queries. Recent advances in Artificial Intelligence technologies, in particular the ability for machines to understand the context of languages better, made it possible for Chatbots to tackle more complex tasks and host more human-like conversations [3]. The optimism for this technology is great; it has already been predicted by Gartner that by 2020, the average person will have more conversations with Chatbots than with their own spouse [4].

In this paper, three cases of Chatbot used in European public administrations are described and briefly discussed on their transformative potential and integrated service delivery. As these Chatbots are frequently mentioned and have won numerous awards, they could be an indicator of how the future of Chatbots in the European public sector might look like in the upcoming years. The main aim of this research is therefore to answer *"Which organizational changes occur within public service delivery due to the introduction of Chatbot-technologies?"*. By analysing the transformative impact of three cases, a greater understanding could be achieved on the impact of Chatbots within the public sector. In order to answer the research question, this paper follows a multiple case study design to identify which kind of changes the Chatbot technology introduced. By analysing three well-known cases of Chatbots technologies, the findings could be more robust and generalizable rather than relying on one single case study [5]. The data collection had been done by document based desktop research. While this enables research from a distance, it does limit the correct interpretation of documents found online and restricts the researcher from gaining additional information not found on websites by for example conducting interviews [6].

2 The Promise of e-Government

An ICT-driven government is argued to be more responsive to citizen-needs, more democratic, transparent and efficient than a traditional government [2]. Early e-Government documents have showed that there was a great wish that technologies would enable a more joined up government apparatus, where different sectors of the government work together across organisational barriers to tackle public problems in an integrated approach, rather than different public organisations working isolated from each other [2, 7]. Government-wide information structures would allow different departments to work together in a more quicker and efficient way as ICT would ease the communication across organisational barriers [8].

The ICT-reformed public services would then improve government-citizen relations, reducing democratic gaps and other disappointments experienced by citizens [9]. For digital public service delivery, it was expected that there would be continuous progress from information provision online to one and two-way communication

between citizens and the public organisation, transactional services and lastly cross-agency integrative e-services with more citizen engagement [10].

However, many of the proclaimed benefits of e-government have not been realized [11]. Despite many investments and projects to realize new innovative forms of governance and government service delivery, no substantial gains have been made in the e-government field. While there are many government services now available online, there is a significant mismatch within the supply and the demand for these online services [11]. The techno-deterministic premise that ICT-introduction within the public sector would eventually lead to significant reforms within public organisations did not come by as expected [9]. In fact, most government agencies did not change their organizational practices towards more citizen-oriented public services if they adopted ICT as there is still a lack of integration between different public organisations [2]. When public organisations actually do provide public services online, it is frequently only possible to gain information from the website rather than being able to conduct interactions or transactions with the public organisation [1, 12]. It has been argued that this strong focus on information provision exists because it is seen as "low-hanging fruit"; implementing transactional digital services would require much more resources and effort [12].

The promise of fully integrated public service delivery, without the need to go to multiple organisations, is usually not implemented [13]. This lack of integration among different public organisations was one of the challenges e-Government was supposed to solve, but rather, it is one of the greatest challenges which hinder the potential of e-Government [2]. IT-adoption in governments rather supports current organisational practices and power rather than changing the processes towards citizen's needs [14].

The introduction of eGovernment-technologies has been argued to enable changes of different magnitudes within public administrations: at the workplace level, organisational level and inter-organisational level [15]. Firstly, technology allows for small, incremental changes by automating existing processes and thereby improving the efficiency of government operations. Secondly, ICT could allow more general organizational changes to support the introduction of newer technologies. These changes are small adaptions and internal changes, commonly referred to as first-order changes [16]. Technology introductions in the public sector frequently bring about these kinds of changes [15]. Thirdly, ICT could also enable transformative or even disruptive changes by enabling new mechanisms for public service delivery or policymaking, but limited empirical examples of these changes exist. Lastly, there could be more radical changes which change the governance systems or radically transform policy-making mechanisms [16]. These second-order changes are much more substantial as they radically alter traditional practices, but are more difficult to organize, especially in the public sector [15].

3 The Revival of Chatbots

Chatbots, shorter for conversational agents, are computer programmes which are able to detect and understand language, through text or through speech, and have the ability to communicate back [3]. Simply put, Chatbots are computer programs which are able

to recognise the input from a user using pattern matching technologies, access information and reply with the information found in the knowledge database [17]. Conversational agents are not really a new technology; the first Chatbot was already programmed in 1966 in order to discover if humans would be able to find out if they would be talking to a person or a machine [18]. However, the potential for Chatbots is now taken much more seriously due to advances in AI-technologies and changing communication patterns. A lot of our daily communication occurs through messaging apps and we have grown quite comfortable with communicating with them; this makes the introduction of Chatbots quite frictionless [19]. Currently, there are already numerous applications of Chatbots used by the private sector, with the most well-known being the virtual assistants of our mobile phones: Siri, Alexa and Google. Chatbots are starting to appear into numerous other business sectors in order for people to obtain information or to complete interactions without the need for humans [3]. Common usages of Chatbots are as customer service assistants, making reservations, paying bills and allowing customers to buy products or services online [20].

The public sector has also been looking into the usage of Chatbots to improve public service delivery. The main proclaimed benefits of Chatbots are that they allow organisations to reduce their administrative burden and enhance communication with citizens [3]. In addition, Chatbots would enable people to overcome information overload; rather than having to find information themselves, the Chatbot will help them to find what they need [21]. Early use cases of Chatbots within public organisations focus on answering citizen's questions or complaints through customer support, searching documents, routing citizens to the correct office, translations or drafting documents [22]. Most Chatbots are well suited to help citizens navigate through websites with lots of information, answer simple questions or conduct transactions.

This removes the need for humans to answer the same kinds of questions over and over again, allowing human operators to spend more time on complex cases [23, 24]. Others even see the potential of Chatbots to radically improve the citizen experience, improve citizen engagement and enabling new forms of decision-making with the help of citizen's interactions with Chatbots. Chatbots could be used to conduct surveys and gain feedback on public services in a more useful way as the Chatbot would be able to ask follow-up questions [25, 26]. There is certainly a potential value for government organisations to embrace Chatbots, but based on the history of e-Government progress, there is a strong need to gather empirical evidence from its effects.

4 Current Chatbots in Government Service Delivery

4.1 UNA in Latvia

In 2018, the Register of Enterprises of Latvia introduced the Chatbot UNA to answer frequently asked questions regarding the process of enterprise registration. The name UNA has a symbolic meaning as it stands for the Future Support of Entrepreneurs in the Latvian language. This way, UNA acts as an indicator for the future of the Latvian public administration; Chatbots are available 24/7 and thus able to make communication between citizens and the state accessible and friendly [27]. UNA is available on

both the website of the Register of Enterprises as well as on the Facebook page as part of the Facebook messenger application [28]. UNA is able to answer frequently asked questions about the registration of their businesses as well as the liquidation, merchants, companies and organizations. If citizens already have an application in progress, they are also able to ask about the progress of their documents. At the moment, UNA only works in the Latvian language [27].

The Chatbot has been developed because the organization had to respond to a lot of calls and emails, which were more or less the same each time. The high numbers of organizational resources spent to answering the same kinds of questions could easily be lessened by using Artificial Intelligence, especially Natural Language Processing techniques [29]. A Latvian company, Tilde, specializing in Artificial Intelligence technologies cooperated in the development of UNA. The usage of the conversational agent has been argued to be highly successful and has been nominated for numerous awards such as the OECD's Public Excellence, World Summit Awards and others [30, 31]. According to the first performance indicators, 44% of the questions asked on UNA are considered to be general of nature and easily taken care of by the Chatbot.

Other non-standard issues are still handled by the support staff, but now they have more time to focus on more complex tasks [30]. While there are plans for UMA to perform the registration of legal subjects and legal facts in the future, currently, the Chatbot is only available to provide information to commonly asked questions. Citizens are still required to collect and fill in numerous documents, sign and stamp, send the filled in documents to the Register and pay the fees using the traditional processes [32].

Another element worth considering is that UMA is not designed to assist citizens with the whole process of starting a business, but solely answers questions about the process of registering the Enterprise as this is the task of the Register of Enterprises of Latvia. Arguably, there are numerous other services which new business owners have to conduct such as applying for licenses, permits, getting a business bank account, buying property, paying taxes and others which UMA is not able to answer questions about.[1]

4.2 WienBot in Vienna

In 2017, the Chatbot WienBot was launched in Vienna. This conversational bot has been designed to provide answers to frequently asked questions people have. The City of Vienna discovered that there are thousands of searches every month on the municipal website in order to gain more information about the online services available in the city. WienBot improves this process by enabling citizens to find information "quickly, smart and on-the-go" [33]. Rather than having to search for the correct page on the municipal website, citizens are able to ask the WienBot which will provide an immediate answer. The amount of information WienBot provides is very broad and

[1] Starting a business is considered a "life event", whereby numerous processes from different (public) organizations have to be followed by a citizen. See also the Quality of Public Administration Toolbox from the European Commission about why redesigning digital services based on these events has many benefits to citizens.

diverse as the website of the municipality has many different online services [33]. At the moment, WienBot is able to provide answers to around 350 different topics and services of the city. WienBot works solely in the German language, but is also able to reply in the local dialect [34].

The WienBot has been developed in order to make the information about the different services the City of Vienna provides more easy and understandable. It follows the current trend that much more information about the municipal services is looked up on the smartphone. However, rather than having the citizen to look up the information themselves, the Chatbot will give a quick answer to any question someone might have [33].

Citizens will still be able to find additional information on the websites, but for quick information, WienBot should be sufficient. Especially information about the availability of public parking spaces in the city is mentioned as a well-desired functionality of WienBot [33]. The City of Vienna was responsible for the development of the application themselves. It won the World Summit Award in 2017 for the best Government & Citizen Engagement application [35].

Even though there are a large number of topics WienBot is able to answer, the Chatbot is solely aimed at information provision for already existing governmental information. It is not possible to transact any governmental services through the Chatbot. Instead, citizens will get a link with more information about where to go to in order to obtain certain government services [33]. While the WienBot is arguably very useful to gain information, there is no possibility to avoid going to the office by conducting transactions online through the Chatbot. It is unclear if there are future plans in order to incorporate the future of transactions through the applications. For example, if a person tells the WienBot that he has lost an item; it will provide him or her with a link to the relevant pages of the lost property office (Fundamt) rather than allowing citizens to use the services through the Chatbot [33].

The transformative potential for the WienBot is hereby severely reduced as citizens would still be required to go through the traditional public services in order to gain what they need, rather than being able to ask WienBot to conduct these transactions for them.

4.3 GovBot/Botty Bonn in Bonn

In the City of Bonn, Germany, the GovBot [36] has been implemented in order to assist citizens with their administrative services. Citizens are able to ask for application forms, opening hours or are able to book an appointment through an interactive process with the Chatbot [37]. The City of Bonn didn't develop the Chatbot themselves but are using the GovBot developed by the software companies Publicplan and Materna. They developed a Chatbot which has been specifically designed for usage in the (German) public administration. Currently, the GovBot technology is used in the search engine of the administration of North-Rhein Westphalia, the City of Bonn and in the City of Krefeld [38]. Citizens are able to access the Chatbot on a specialized website.

GovBot is a Chatbot based on machine learning and an integrated knowledge base of administrative knowledge. The main aim of GovBot is to relieve the administrative staff within the public administration with labour-intensive and recurrent tasks of

handling the same kind of citizen requests. Rather than having citizens ask the civil service themselves with questions, they are able to gain the same answers immediately through the use of the GovBot [37, 39].

In addition, the GovBot is able to assist citizens with administrative processes by helping citizens fill in administrative forms. Citizens are then able to come prepared to their appointment with the documents filled in correctly, such as the application of a license plate [40]. Currently, the Chatbot is still in a testing phase and will be added with more information in the future [37].

Even though the Chatbot is still in a testing phase, the main aim of the GovBot is to facilitate better information provision to citizens about general affairs or current administrative procedures. As of now, it seemed not to be possible to conduct any transactions or government services through the Chatbot rather than scheduling an appointment at the office. There is much to praise about assisting citizens with difficult forms and the GovBot definitely could play a big role in this. However, there is no actual change on existing administrative processes with the introduction of the Chatbot; citizens still need to make an appointment at the civil service after filling in the forms and go through the standard procedure, rather than being able to finish the transaction through the GovBot.

5 Discussion and Conclusions

This brief exploratory insight suggests that current Chatbots which have been implemented within the European public sector certainty provide a certain value for the citizens. All three Chatbots aim to improve the communication between citizens and the administrative bodies by providing easy answers to often asked questions. Citizens are able to find the information they are looking for in a quick and reliable way without the need to navigate the governmental websites themselves or contact the customer service, enabling staff to spend their time on other tasks (Table 1).

Table 1. Overview of Chatbots in government

Chatbot value	UNA	WienBot	GovBot
Information provision	Yes	Yes	Yes
Transactional services	Planned	No	No
Integrated information	No	No	No
Organisational changes	First order changes by having staff focus on more complex tasks	None identified	None identified

Even with the introduction of advanced technologies, there is a significant focus on information provision towards citizens, rather than using them to provide better government services to citizens. Instead of using Chatbots in such a way that citizens don't

even need to come to the administrative office, citizens are still required to follow the traditional procedures, although this time empowered by the knowledge provided by the Chatbot. It would be truly a change if citizens would be able to send the documents online as well or conduct the whole process through the Chatbot. There seems to be awareness that transactions provide more value towards citizens. The developers from UNA in Latvia aim to facilitate transactions in the future through the Chatbot, but at the moment this is not yet the case.

There are technologies in place to facilitate these transactions; most countries have some form of e-ID system in place already which citizens could use to identify themselves with. An online payment system or e-Signature system would make it possible for citizens to conduct their government transactions fully digital. However, this does require that the actual administrative procedures should be replaced, a task which is significantly more challenging to accomplish.

Just like the lack of transactions, the e-Government literature frequently mentions that the lack of an integrative approach with joined-up public services hinders the potential of e-Government services. All of the mentioned Chatbots seemed to be fully based on the knowledge from the developing organization and don't take into account the knowledge from other, relevant public organizations. This is unfortunate as citizens frequently have to contact different public institutions when they are in need of public services.

The aim of this paper was to explore whether the introduction of Chatbot-technology within the public sector woul be accompanied with transformational changes. However, based on these early findings, we suggest that only first-order occur: namely the automation of current activities and some (minor) organizational changes to facilitate or as an effect to its introduction. Civil servants would be able to devote more time towards more complex cases when many questions get answered by the Chatbots, but the actual nature of their work doesn't seem to change at all.

They are still conducting the same processes as before, even when some of these tasks could be done by different technologies too.

Our findings do not suggest that any second-order changes happened due to the introduction of Chatbots. Public service delivery has not been radically changed, nor was there any mentioning of changes in the governance system, citizen engagement or reforms of the policy-making processes due to the implementation of the Chatbot.

If these practices are left unchanged, more institutions might implement Chatbots in order to improve their information provision towards their citizens. While this goal is very noble and paved with good intentions, there is a serious chance that these Chatbots are going to reflect the current fragmented landscape of governance. Instead of the current practice that citizens have to find the information they need from 10 different government websites, they will have to "talk" with 10 different Chatbots because the knowledge bases of the Chatbots are not integrated. Each of the Chatbots will only be able to answer the citizens the questions they have that correspond to the activities of the organization, rather than giving citizens a full, integrative respond that will cover the whole journey they will take.

If there is no sufficient amount of data sharing between public organizations, citizens will still be required to provide the same kind of information multiple times. Filling in the same kind of information on a government form is, with or without a

Chatbot, a tedious and annoying task for all. Just having a Chatbot is not going to make this procedure any more value adding. If the public sector truly wants to gain maximum benefits from emerging technologies, such as Chatbots, it will require massive public reform, a change in administrative culture and a strong reflection on the current organizational practices. Rather than having technology help understand citizens with the current administrative procedures, there should be questions raised if certain administrative procedures could be made easier or removed at all!

There is much more research needed to make more valid conclusions as this paper so far briefly scanned a couple of Chatbot implementations within the public sector. The field is still rapidly evolving and the reflections given here might quickly become invalid if multiple public organisations realise the potential which digital transformation could provide them. Furthermore, the lack of interviews limits the scope of changes which might have been introduced with the Chatbot technology. Possibly, certain organisational changes did occur but were not mentioned online. This restricts the current conclusion but should be seen as an invitation to conduct further research on these cases. Artificial Intelligence technologies such as Chatbots are an intriguing set of new technologies, likely to leave a big impact on our society in the near-future. However, it is advisable to take the transformative discourse of these technologies with a pinch of salt. A true understanding of the impact these technologies will bring the public sector requires a clear and realistic view on how they get adopted and used in practice, by institutions and by citizens.

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