Chatbots as Part of Digital Government Service Provision – A User Perspective

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Abstract. Chatbots are taken up as part of digital government service provision. While the success of chatbots for this purpose depends on these being accepted by their intended users, there is a lack of knowledge concerning user perceptions of such chatbots and the implications of these for intention to use. In response to this, an exploratory qualitative interview study was conducted with 15 users of a chatbot for municipality service provision. The interviews showed the importance of performance expectations, effort expectations, and trust. In particular, while a municipality chatbot supporting service triaging may be perceived as beneficial for their availability and to provide support navigation of municipality services and information, this benefit is compared by users to the benefit of other digital government channels. On the basis of the findings, we present key implications to theory and practice, and suggest avenues for future research.

Keywords: Chatbot, Digital Government, Technology Acceptance.

1   Introduction

Chatbots are increasingly taken up by public sector administrations as a channel to provide information and services to citizens. This uptake of chatbots is part of the transformation to digital government, where public sector service provision is increasingly digitalized. The potential benefits of digital government include increased efficiency and cost-reduction, but also the opportunity to improve information and service provision and, thereby, citizen satisfaction (Robertson and Vatrapu, 2010). Within governments, there is strategic push for broad uptake of digital services and particular concern for their human-centricity and availability of services (e.g., European Commission, 2021).

In this context, chatbots are seen as a promising complement to other digital government channels as they may be a low-threshold means for inquiry into government services (Makasi et al., 2021). This is particularly valuable given the complexity in government service provision, where relevant services span from policymaking, taxation, and law enforcement to social security, education, and healthcare (Panagiotopoulos et al., 2019). Chatbots, interaction in the users' everyday language, may serve as a flexible

means to help users identify needed information and services across a broad range of government service areas and service providers (Mygland et al., 2021).

Successful digital government chatbots depends on substantial citizen uptake. This to ensure quality in content and prediction models and to realize the benefits of the investment. However, there is a lack of knowledge on how citizens perceive chatbots in digital government and, in turn, how these perceptions impact intention to use.

To address this knowledge gap, we present a qualitative exploratory interview study with users of a chatbot for municipality information services. The aim of the study was to investigate users' perceptions of, and intentions to use such a chatbot. The chatbot has been taken up by about 100 municipalities and is involved in about 1M yearly conversations on government information and services. The study was guided by theory on technology acceptance and contributes new knowledge on user perceptions of government chatbots in terms of performance expectations, effort expectations and trust – and how these perceptions impact intentions for future chatbot use.

2 Background

2.1 Digital Government

Digital government is a deep-rooted area of interdisciplinary research and development. The application of information technology to public sector service provision and may concern access to information, provision of transaction services, and facilitation of citizen participation (Marchionini et al., 2003). The evolving of digital government is typically seen as a development towards more increased complexity and contextualization (Janowski, 2015).

Gil-Garcia and Flores-Zuniga (2020) note that the success of digital government depends on two key factors: How digitalization initiatives are implemented by government agency and how the digital services are taken up by users. Hence, user satisfaction, trust, ease of use, and usefulness are key factors determining digital government success. Likewise, Panagiotopoulos et al. (2019) argue for the benefit of considering digital government from the perspective of public value creation, where improved digital government services are seen as better suited to satisfy those who consume them.

The drive towards public benefit of digital government is also seen in government policy documents. For example, the European Commission policy document on digital transformation in Europe, '2030 Digital Compass' (European Commission, 2021), foresees human-centric digital public services where 100% of services are available online by 2030. Also, the United Nations E-Government survey 2022 (United Nations, 2022) accentuates the importance of digital government to mitigate crises such as the COVID-19 pandemic.

2.2 Chatbots as Part of Digital Government

An increasing number of public sector administrations is taking up chatbots for digital information and service provision where chatbots are employed for a range of purposes such as city information services (van Noordt & Misuraca, 2019), social services

(Simonsen et al., 2020), or as a general guide to government services (Valverde & Vasconcelos, 2019).

Chatbots may provide information and support at different levels. distinguish between service triage, service information gathering and analysis, and service negotiation. On the initial level of service triage, the chatbot provides generic information to anonymous users. On the second level of information gathering and analysis, the chatbot offer assistance on the basis of user profiles, such as public transport information in response to knowledge of the user location. On the top level of service negotiation, the chatbot offers access to transactional services (Makasi et al., 2020; 2021).

Androutsopoulo et al. (2019) argue that chatbots are appropriate for a broad range of citizen interactions, characterized by ambiguity and complexity. At the same time, van Noordt and Misuraca (2019) note that current government chatbots typically provides generic information to citizens reflecting service triage rather than service negotiation. Prospective users of government chatbots have been found to value accuracy, availability, efficiency, and effectiveness (Makasi et al., 2022).

The ongoing covid pandemic has spurred increased interest in chatbots as a channel for information provision to citizens as the public need for support concerning covid-related advice and regulations has far outstripped available resources. Amiri and Karahanna (2022) reviewed use cases of chatbots in public health responses, suggesting that chatbots may complement health workers, alleviate capacity constraints, and counter misinformation. Chatbots have also been piloted by government service providers to reduce negative mental health implications of the covid pandemic (Zhu et al., 2022).

While chatbots may hold substantial value to public sector administrations and citizens, chatbot implementation has also led to controversy in cases where the chatbots have not been in line with public service values such as user-orientation, efficiency, adaptability, and trust (Makasi et al., 2021). Hence, it is critical for public sector administrations to understand both how implemented chatbots are perceived by their users and also the factors which may determine their sustained uptake.

2.3   User Perceptions of Chatbots and Usage Motivation

The study of chatbots in digital government can be informed by the rapidly growing body of knowledge on user perceptions and experiences of chatbots in general. User motivations for chatbot use is highly productivity driven and the pragmatic quality of chatbots seem to be key to how these are perceived by users (Brandtzaeg and Følstad, 2017; Følstad & Brandtzaeg, 2020). At the same time, designing for hedonic quality in chatbots – such as features to strengthen involvement and engagement – may be appreciated by users (Haugeland et al., 2022).

A common distinction between chatbots is a distinction between those oriented towards task completion, such as chatbots for information provision, and those oriented towards social interaction, such as companion chatbots and chatbots for social chatter (e.g., Chen et al., 2017; Shevat, 2017). The importance of pragmatic quality clearly is more important to task-oriented chatbots. However, it should be noted that the open character of chatbot interaction – where users are typically allowed to enter requests in free text – allows distinction between task-orientation and social orientation to blur. For

example, users have been found to perceive chatbots as a channel more resembling interaction with a human than other channels (Laban, 2021), to respond positively to chatbots with characteristics resembling that of human conversationalists (Araujo, 2018; Go & Sundar, 2019), and to engage in collaborative interactions (Laban and Araujo, 2019). At the same time, the open character of chatbot interaction may cause users to hold unrealistic expectations of chatbot capabilities (Luger & Sellen, 2016), which in turn may impact perceptions negatively (Zamora, 2017).

In the current literature, user perceptions of chatbots have been studied from perspectives such as usefulness and ease of use (Ashfaq et al., 2020), social support (Brandtzaeg et al., 2021), and trust (Przegalinska et al., 2019). Usefulness and ease of use are seen as key aspects to determine chatbot uptake among users, in particular as studies suggests that users may struggle to get the expected benefit from implemented chatbots (Adam et al., 2020). Social support may be of particular importance in some use-cases, such as health advice. However, the benefit of chatbots to address users in a supportive or empathic manner has been accentuated also for other domains (e.g., Xu et al., 2017).

Trust in chatbots is considered key to future uptake of chatbots – in particular for more advanced use-cases such as service negotiation. In the customer service domain, key drivers of trust in chatbots have been found to concern factors in the chatbot, such as expertise and responsiveness, factors in the context, such as brand recognition, and factors in the user, such as propensity to trust technology (Nordheim et al., 2019).

2.4 Technology Acceptance as Perspective to Understand Intention to Use

Technology acceptance (e.g. Davis 1989, Venkatesh et al., 2012) is a useful theoretical perspective for understanding users' uptake of chatbots in line with theory of planned behaviour. Here, intention to use is seen as determined by users' perceptions of key technology characteristics such as usefulness and ease of use (Davis, 1989).

Technology acceptance models have been widely used to investigate digital government solutions, typically as adaptations to the initial technology acceptance models adding constructs such as trust (Carter & Bélanger, 2005; Nemeslaki et al., 2016), enjoyment (Shyu et al., 2011), or access barriers (Sipior et al., 2011). Technology acceptance has also been shown as a valuable perspective to understand chatbot use (e.g., De Cicco et al., 2021). However, there is a lack of knowledge on how the different drivers of technology acceptance play out for chatbots in digital government.

To understand user perceptions of chatbots in digital government and the implications of these for chatbot uptake, the second version of the unified theory of technology acceptance and use of technology (UTAUT2) may be a suitable theoretical model. The model explains uptake of technology in a consumer context and therefore has a closer fit to the context of citizens' use of digital government than acceptance models addressing workplace technology (e.g. Davis, 1989), and also contains a more comprehensive set of factors than technology acceptance models adapted to the public sector domain (e.g., Shyu et al., 2011; Sipior et al., 2011; Nemeslaki, 2016). In UTAUT2 (Venkatesh et al., 2012), intention to use is determined by the six factors detailed below. In addition,

UTAUT2 includes a seventh factor, price value, which is not considered relevant for free-of-charge chatbots in digital government.

(1) *Performance expectancy* and (2) *effort expectancy*, that is, users' perceptions of the usefulness and ease of use to be expected from the technology. These two factors are key in any model of technology acceptance and typically explain substantial variation in usage intention and use.

(3) *Social influence* and (4) *hedonic motivation*, that is, users' perceptions of attitudes and priorities of significant others as well as their perceptions of the engagement and experiential aspects of the technology. Hedonic motivation is particularly relevant for non-work-related technologies.

(5) *Facilitating conditions* and (6) *habit*: Facilitating conditions concerns technology availability or needed infrastructure to benefit from the technology. Habit concerns users' established patterns of use (Venkatesh et al., 2012).

In line with foundational theory on technology acceptance, it is expected that usage intentions may be determined also by other factors than those included in a generic model (Davis, 1989). Hence, technology acceptance studies often have included additional factors, such as trust (e.g., Carter & Bélanger, 2005; Nemeslaki et al., 2016). Also, trust has been a topic of substantial interest in chatbot research (e.g., Lee et al., 2021; Seitz et al., 2022). Given the importance of trust and trustworthiness in digital government, trust is a highly relevant factor to include in technology acceptance studies for this domain. In the context of technology acceptance for government, trust is taken to concern trust in government and trust in the technology, and encompasses the integrity, security, and reliability of the digital government service (Nemeslaki et al., 2016).

3 Research Question

To allow for needed exploration of citizens' intention to use government chatbots, as their determining perceptions of such chatbots, the following research question was formulated:

How do citizens perceive government chatbots and how does these perceptions impact intention to use?

The research question allows for an exploratory investigation of factors included in theory technology acceptance, to understand how these play out in the context of government chatbots. Furthermore, the research question opens for consideration also of additional factors which may emerge as relevant.

4 Method

An exploratory qualitative approach was chosen to adequately address the research question. Specifically, we conducted a series of semi-structured interviews with citizens which had available a chatbot to support them in enquires towards their local municipality. This choice of method was considered adequate given the current limited knowledge concerning user perceptions of government chatbots. The interviews were

based on the technology acceptance model UTAUT2 (Venkatesh et al., 2012) and set up to explore determining factors from this model as well as other potentially relevant factors.

4.1   Participants and Recruitment

The study was conducted in a Norwegian government context, and participants were recruited from three different sized municipalities for which the same type of chatbot was offered. In total, 15 participants were recruited – five from each municipality. Recruitment was conducted through a national panel service provider, Norstat.
Participants were recruited to include both males and females and to reflect a broad range of occupations. Nine males and six females were recruited, with a median age of 44 years (min = 24, max = 66). All had experience from digital interaction with the municipality through email or website visits.

To ensure that all participants had sufficient recent experience with the municipality chatbot, they were requested to use the municipality chatbot at least two times in the week leading up to the interview, for at least three to five minutes each time. Participants were provided a list of possible topics which could represent relevant enquiries to the chatbot and informed that their use of the chatbot would be anonymous.

The research procedure was approved by the Norwegian Centre for Research Data (NSD). Participation in the study only followed informed consent where the participants were informed on the study purpose, their role, the use of study data, and their right to withdraw their consent and discontinue their participation any time.

4.2   The Municipality Chatbot – Kommune-Kari

The study involved a Norwegian chatbot, called Kommune-Kari, which is available to citizens in about 100 municipalities. The chatbot provides information on the municipality and relevant government services, and citizens may use it for enquiries either through the municipality website or through a dedicated smartphone app.

The chatbot provides information on a broad range of topics, ranging from health services and education to municipality infrastructure, planning and regulation. All use of the chatbot is anonymous, and the chatbot provides generic answers to citizens questions – either within the chatbot dialogues or through links to the municipality website or other resources. As such, the chatbot provides *service triage* according to the classification of Makasi et al. (2020; 2021).

The chatbot is based on an artificial intelligence language model and predicts users' intents on the basis of citizens' messages, that is, the assumed goals which the users' have in mind when entering the question. The breadth of municipality services and information require the chatbot to include 6000 such intents and corresponding actions. Users may also refine chatbot responses through selecting among buttons provided as part of chatbot replies. Due to the commonalities of service provision across municipalities, the chatbot is hosted by a service provider Prokom who provides needed AI training and content updates to the chatbot. The chatbot sees extensive use with about 1 million yearly conversations and is as such a useful context of this study, given its

proven success in digital government service provision. The chatbot content is written in a conversational style, intended to be easily digestible by users while keeping up with public sector requirements for precision and quality. The chatbot appearance is a female cartoon avatar and the chatbot name also suggests a female character.

4.3   Interview Process

The interviews were semi-structured, following an interview guide with options for going into depth on relevant themes and reflections by the participants. The interview guide was set up with basis in key factors of UTAUT2: performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, and habit. In addition, the interviewer asked the participants to detail their experiences with chatbots in general and the municipality chatbot, and also asked them to detail aspects concerning trust in the chatbot. The interview guide was designed so as to allow the participants to reflect freely on each topic and detail how and why each of the theoretical factors were seen as relevant with regard to the municipality chatbot and also prompted for explorations of additional factors or themes.

In preparation to the interviews, five pilot interviews were conducted which allowed for adjustment of the interview guide. The pilot interviews included participants recruited from the authors' personal networks.

The interviews were conducted online over the Zoom video application and lasted between 24 and 60 minutes. The interviews were audio recorded.

4.4   Analysis

All interview audio recordings were transcribed. The transcripts were then made subject to thematic analysis in line with the guidelines of Braun and Clarke (2006), including the steps of (a) familiarizing with data, (b) generating initial codes, (c) searching for themes, (d) reviewing themes, (e) defining and naming themes, and (f) reporting.

The objective of the analysis was to establish data-driven themes associated with the theoretical constructs of UTAUT2; that is, to understand why and how the theoretical drivers were seen as relevant for intention to use the chatbot, as well as to identify any other relevant drivers or themes.

The thematic analysis was conducted by the first author and conducted in the analysis software nVivo. To strengthen quality in the analysis process, the analysis was made subject to critical reflection during analysis meetings involving one or both the co-authors at each step of the analysis process. Here, the authors collaboratively examined the analysis at its current state, e.g., for possible alternative interpretations of data or clarification of themes.

5   Results

In the following, we provide an overview of the key themes from the analysis. The themes are structured under the main factors of the applied technology acceptance mode and

provides an overview of key findings from the interviews concerning the factors and how these may impact intention to use. The main factors are structured according to prevalence in the analysis, in the following order: Performance expectancy, effort expectancy, trust, hedonic motivation, habit, social influence, and facilitating conditions.

While the analysis is a qualitative exploration, it may be of relevance to the reader to know the proportions of the participants reporting on the different themes. We use the following phrases to provide information on such proportions of the participants: nearly all (13-15), most (8-12), some (4-7), a few (1-3).

5.1   The Participants' Chatbot Experience and Intention to Use

All participants reported on prior experience with chatbots, and some also had experience with the municipality chatbot prior to their participation in the study. Most participants described their prior experiences with chatbots in general as being unsatisfactorily, where chatbots were reported not to be able to provide sufficient support. Most, however, also reported on the studied municipality chatbot to exceed their expectations. The participants noted that this was due to the chatbot being able to provide useful help on general questions. Most participants also noted that they intended to use the chatbot for future requests or as a means of navigating municipality service provision.

5.2   Performance Expectancy

The participants expectations on the chatbot performance, was closely associated with its ability to provide sufficiently nuanced and detailed support. The participant reports also show that usefulness expectations were key to their assessments of their own intention to use the chatbot in the future. The performance expectancies in the chatbot were discussed with regards to the foreseen purpose of chatbot use and the type of support needed. The participants also reflected on the possible usefulness of the chatbot from the perspective of the municipality.

Performance Expectancy Depends on Purpose of Use. Most participants reported to see the chatbot was a useful tool for navigating content in the municipality website. That is, by using the chatbot, information and services which otherwise could be difficult to access due to the complexity in public sector service provision was easily identified through the chatbot. This benefit of the chatbot as a tool for navigation seemed a consequence of participants acknowledging the challenge of navigating municipality information and services. As noted by one of the participants:

"You can ask about relatively difficult things that are rarely asked about, but which [the chatbot] perhaps will be able to find faster if I cannot find it myself." (p2)

However, some participants noted such navigational use of the chatbot as redundant as it may be possible to find needed information also by other means such as browsing the municipality website or using general search engines such as Google. As noted in this example quote:

"I feel that the things I ask [the chatbot] are the same links which I had been able to identify myself" (p9).

Performance Expectancy Depends on Type of Support Needed. Most participants reported that their view on chatbot performance depended on the complexity and personal character of requests. Most noted that the chatbot could only respond to general questions and not provide, e.g., answers adapted to their personal situation. In consequence, some participants specifically noted positive performance expectations for general requests with a specific answer:

"It is useful when it comes to simple things. Useful in the form of concrete things which are not nuanced" (p13)

However, most participants reported low performance expectations for personal, subjective or complex questions. For such questions, the chatbot could be seen as an unneeded intermediary, as illustrated by this quote:

"When I write 'when do you pick up paper garbage at my address' [the chatbot] could have responded 'this is Thursdays of such and such week', instead of 'here is the garbage pickup calendar'" (p2)

Taking the Municipality Perspective. During the interviews, some participants also alluded to the potential usefulness chatbots may have seen from the perspective of the municipality. For example, participants noted that the chatbot may reduce the number of calls to the municipality and may also provide insight into what kind of information is needed. At the same time, some made note of the possible trade-off inherent in the uptake of chatbots, and that automating service provision could ultimately reduce human contact with the municipality. As exemplified in the following:

"It may distance you from the municipality. [...] It may be a statical, dead thing you interact with instead of a municipality representative. But so be it, as those in the municipality likely have better things to do than answer questions which a bot might answer" (p3).

5.3   Effort expectancy

The promise of available and efficient information provision was seen as a key driver for intention to use the chatbot. We detail the participants reflections on this relative to the importance of efficient interactions and, also, its 24/7 availability.

The Importance of Efficient Interactions. Given that the chatbot was seen as particularly useful to facilitate navigation and get answers to simple questions, efficient interactions were reported as key to the participants usage intentions.

Most participants noted the initiating of chatbot interaction to be fast and easy, as it was directly available from any municipality webpage. Some, however, noted that the threshold for initiating use would be further lowered by making the chatbot initiation even more prominent, e.g., by moving the initiation icon from the bottom right corner of the screen to the top or to centre stage.

"If [the chatbot] is only available as the small icon in the corner, I would rather use Google, in contrast to [the chatbot] being available on top" (p4)

The efficiency of the actual interactions was discussed by most participants, and was reported to depend on a range of aspects such as the chatbot's ability to handle typos

and dialect terms. The participants also noted it as important for them to understand how to pose questions to be most likely to get a relevant response, such as to refrain from very long messages. A few participants mentioned that it can be challenging to know exactly which words to use, while others noted it as a strength that the chatbot is tolerant in understanding different ways of phrasing a request. Efficiency in use was by most seen as one of the main drivers for future use, as in the following example:

"[Ease of use] means a lot. That it is precise, simple, and that you get the needed answers. It does not take many experiences of not getting an answer before 'no, I will just move on and to this the old way'". (p13)

A few participants also noted that simple closing or dismissal, as provided in the chatbot, was important to efficient use. In particular as this lowers the threshold for trying to use the chatbots for simple questions and requests.

24/7 Availability. For some participants, the availability of a chatbot was important to perceptions of effort expectancy. For example, as a substitute to get simple clarifications – in particular outside office hours. As exemplified in this quote:

"Concretely, if I had questions outside office hours, I would use it. Then it is useful." (p1)

5.4 Trust

Trust in the chatbot was reported by the participants as important to their future use of the chatbot. This trust was in part associated with their trust in the municipality and in part due to aspects of the chatbot such as performance and efficiency.

Trust in the Chatbot Dependent on Trust in the Municipality. Most participants reported that their trust in the chatbot is closely dependent on their trust in the municipality as a responsible actor. Hence, they expected the chatbot to be professional and reliable. As noted by one of the participants:

"This is public information from the municipality, so I assume that it is correct" (p5).

Trust Dependent on Performance and Efficiency. When reflecting on aspects of the chatbot of importance to trust, a few participants noted the importance of chatbot performance and efficiency. That is, trust in the chatbot – apart from its association with the municipality as a trusted actor – was seen as depending on the chatbot delivering value on these two aspects. In particular, participants appreciated means to help them confirm performance and efficiency. As noted in this example quote:

"I liked the closed loop communication with [the chatbot saying] 'did you mean this or that?'. This provides a confirmation that my question is understood." (p15)

Privacy of Lesser Perceived Relevance in a Chatbot for Anonymous Use. While privacy often is seen as important for trust in digital technology, the character of the chatbot as provider of navigation aid and support with simple, general questions, implied that the participants did not see any major privacy issues. Hence, privacy was not considered of substantial relevance for this chatbot.

5.5 Hedonic motivation

Hedonic motivation concerns the chatbot's ability to engage or provide experiences of emotional character. This factor was seen as of lesser importance to the participants' intention to use the chatbot. However, some aspects were nevertheless reported which may strengthen the hedonic quality of the chatbot use, including hedonic implications of pragmatic aspects of chatbot use, as well as implications of the conversational style and use of human likeness in the chatbot.

Hedonic Implications of Performance and Efficiency. Some participants noted that the pragmatic aspects of the chatbot could also serve to strengthen their sense of engagement from the interaction. For example, it was noted that the chatbot feature for refining answers – where users are provided buttons with alternatives paths to the further interaction – may give insight into municipality relevant content and services which might be unknown to them and, thereby, be seen as stimulating or engaging. Likewise, some participants noted that their sense of having an efficient interaction with the chatbot could also be perceived as a form of engagement, from their appreciation of easily address different topics and rapidly get to needed information. Also, the some noted that the chatbot seeking confirmation as part of its responses, to ensure a fit to users' intents, was seen as nurturing a sense of engagement.

"If I go through the municipality, I need to go through different links and spend time looking. With [the chatbot], I can just search 'garbage-collection' and get it served. It is so much easier. It will be fun. It is fun." (p7)

Some participants noted that the hedonic implications of performance and efficiency also implied that lack of performance and efficiency would be harmful to engagement, potentially leading to frustration.

Hedonic Implications of Conversational Style and Human Likeness. Some participants reflected on the conversational style and visual appearance of the chatbot. For some, an informal style and humanlike avatar image and name was see as contributing positively to the chatbot interaction being engaging. However, others were critical of these same features. The participant reports, hence, suggests marked differences between participants in how conversational style and chatbot appearance is perceived.

5.6 Habit

For a government chatbot to become an effective channel of information and support, it is important that citizens form a habit to use it. The participants reported on life situation, awareness, and chatbot quality to determine habit of use.

Awareness and Chatbot Quality Determine Habit Formation. Forming a habit to use the chatbot depends on awareness of its existence as well as its perceived performance and required effort. These aspects of habit formation were noted as particularly important as chatbots are a relatively novel technology, and all users may not be aware

of what the chatbot can be used for, and also that the value of chatbot use depends on it being efficient and effective to use. As noted by one of the participants:

"If it is faster for me to find the needed information without using [the chatbot], I will not use it. It needs to have a time-saving function." (p2)

Life Situation Determines Habit Formation. Some participants noted that life situation will be important for actual habit to form. In some life situations, such as for young adults, the need to get in touch with the municipality may be low – which directly will impact habit. However, following major life changes, needs may change. In these situations, it will be important to be aware of the chatbot to form habit.

5.7 Social Influence and Facilitating Conditions

The participants also reflected on social influence and facilitating conditions as potential drivers of use for the municipality chatbot. None of these were seen as highly important to future use, but the participants nevertheless provided interesting reflections on both.

Social influence was reflected on as a potential driver of future use, provided that important others or professional marketers were to recommend the chatbot for municipality use. None of the participants had experienced such social influence, but some noted the possible impact of social influence provided they had not themselves already used the chatbot. A few participants also noted that increased visibility of the chatbot in the municipality webpage would be a more efficient way to have citizens use the chatbot than social influence.

Facilitating conditions was seen as of lesser importance to the participants intention to use. They discussed the intention to use the chatbot as depending on available other channels. Some reported to likely use the chatbot as a faster means of gathering information available also on the municipality website, whereas others would use the chatbot as a last resort. Likely, the ease of accessing the chatbot and availability of technical infrastructure may have made this factor of lesser relevance to the partners. A few, however, expressed that their intention to use is strengthened by the chatbot being available as a smartphone app – further accentuating the importance of availability and efficiency in interaction for future use.

6   Discussion

6.1 Citizen Perceptions of Government Chatbots and Implications for Intention to Use

The study findings provide a rich source of insight into user perceptions of government chatbots, as well as how such perceptions may impact intention to use. Key among the factors were performance expectancy and effort expectancy. This finding is fully in line with existing theory of technology acceptance (e.g., Davis, 1989, Venkatesh et al.,

2012), and also in line with the findings of a recent vignette study of government chatbot usage scenarios (Makasi et al., 2022).

In the current context of digital government where chatbots are an alternative channel to information and support – paralleled with information provided on government websites – the benefit of a government chatbot is not that it is a necessary point of access, but that it is a potential aid to make access easier and more efficient. Furthermore, as the habit-forming potential of a government chatbot may be limited, as government service use may be dependent on, for example, life situation, citizens may have low threshold for not using the chatbot if it does not clearly provide the expected performance to the least possible effort.

The findings indicate that users may see substantial benefit in government chatbots used for purposes of navigating available information and services, as well as for simple requests. Chatbots for this purpose corresponds to what Makasi et al. (2020; 2021) refers to as service triaging, where the chatbot has a retrieval-based model where user requests are mapped to predefined responses without access to user profiles. Such chatbots may serve as a point of departure for conversational digital government, and perceived benefits for this purpose is promising for future more advanced chatbot solutions.

The findings also show the potential benefit of chatbots as a channel for efficient provision of information and services in digital government. Efficiency in use is important for government services, as such services are seen as highly functional with little or no benefit associated with more extensive interactions that what is needed (reference). At the same time, the request for efficient interactions represents a substantial challenge to government chatbots for service triaging as it will continuously be compared to other available channels for information or support. Hence, it will be important for government chatbots not just to provide information and support in an effective manner, but also in a manner more efficient that other channels.

In addition to performance and effort expectancies, trust was identified as an important determinant of future intention to use. As previously observed (Carter & Bélanger, 2005; Nemeslaki et al., 2016), trust in digital government may depend both on trust in the technology and trust in the government institution using the technology. This was found also for the use of government chatbots in our study where participants explicitly associated their trust in the chatbot with the municipality as a known and trusted actor. Likewise, trust in the chatbot was also reported to depend on its performance and efficiency in use. This complements current applications of trust as part of technology acceptance models (Carter & Bélanger, 2005; Nemeslaki et al., 2016), as we found trust in the technology to be dependent on other drivers of technology adaption rather than orthogonal to these other drivers.

Hedonic value, habit, social support, and facilitating conditions were interestingly found to be of lesser importance to the participants intention to use the municipality chatbot than performance expectations, effort expectations, and trust. This to some extent is counter to our initial assumption that UTAUT2, with its comprehensive set of drivers for technology acceptance, would be a best possible starting point for understanding intention to use government chatbots. The original technology acceptance model (Davis, 1989), tailored to workplace technology use and only including

constructs corresponding to performance expectancy and effort expectancy, clearly would have been too restricted given the importance also of trust found in our study. At the same time, UTAUT2, tailored to explain technology acceptance in a consumer context, may possibly include constructs of lesser relevance for the government context. It, hence, seems as if existing attempts to extend the original technology acceptance model toward public sector by including trust as a separate factor (e.g., Carter & Bélanger, 2005; Nemeslaki et al., 2016) may be as relevant to explain government chatbots as the later, more comprehensive UTAUT2 model.

6.2   Implications

The study findings entail important implications for theory and practice. We see the following as particularly relevant for theory building:

- Intention to use chatbots as part of digital government may be particularly determined by user expectations of performance and effort, as well as trust in the technology and the relevant government body. Hence, future adaptations of technology acceptance models may benefit from taking these three constructs as a starting point for future theory building.
- Performance and effort expectancies with the chatbot were typically made with reference to the chatbot as part of the larger digital service system including also the municipality website and personnel resources. Theorizing on user perceptions and intentions to use chatbots in digital government need to incorporate a service system perspective to fully capture the impact of this context.

The following are considered particularly relevant implications for practice:

- Chatbots for service triage (Makasi et al., 2020; 2021) is found to provide value to citizens. However, in line with the participants' pointing out of limitations to performance expectancy, it will be important to consider how government chatbots can advance also to personalized service negotiation to increase their public value.
- Intention to use a government chatbot for service triage is highly dependent on the chatbot being seen as more efficient than other channels for the same purpose. Hence, service providers need to make sure that that chatbot not only provides relevant answers but that it does so with least possible user effort.

6.3   Limitations and Future Research

The study is an exploratory qualitative study to gain initial knowledge on user perceptions of chatbots in digital government and how these may impact intention to use. As such, the study entails some limitations which suggests possible directions for future research.

The study was conducted in a specific context with only one chatbot; a chatbot for Norwegian municipalities. This characteristic of the study was beneficial to allow for in-depth insight, but also represent a limitation as it does not cover chatbots in an international context nor chatbots from different providers at different levels of

sophistication. Future research is needed to gather insight into potential implications of such variation.

The study was conducted at a single point in time, not following chatbot users over a longer timeframe. Furthermore, the users were requested to use the chatbot as part of the recruitment procedure to ensure sufficient recent experience. This limits the study findings as we cannot make claims of how user perceptions and intentions to use may vary over time, or whether there may be differences between planned and spontaneous use. We anticipate future longitudinal studies following users over longer periods of time to understand how their government chatbot use evolve.

Finally, the study was based on the participants self-reports only. While this allowed for participants self-reflection on their perceptions and intentions to use, it did not enable contrasting of participant reflections with their actual behaviour. It will be highly interesting to see future research combining users' self-reports and logs from user chatbot interactions to better understand the correspondence between user perceptions and actual use.

In spite of these limitations, we find the study to represent a useful first step towards understanding user perceptions and intentions to use government chatbots. Hopefully, our study findings motivate needed future research in this engaging field of research.

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