UiA University of Agder

Master

The Role of Quality, Trust and Empowerment in Explaining Satisfaction with E-government Chatbots

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"No matter how sophisticated or powerful our thinking machines become, there still will be two kinds of people: those who let the machines do their thinking for them, and those who tell the machines what to think about."

- C. J. Lewis

Preface

This master's thesis has been written in the spring 2022 semester as a part of the two-year master's program in Information Systems at the University of Agder (UIA). The thesis is the outcome of a study performed by two master's students interested in emerging technologies that enable improving people's life quality.

The purpose of this mixed methods study has been to investigate the role of quality, trusting beliefs and empowerment in explaining citizen satisfaction with e-government chatbots. Choosing this topic was a result of personal interests and experiences getting presented with research projects revolving around e-government and the use of chatbots in the beginning of our degree. The culmination of this study has been rewarding, demanding and fun at the same time. It has provided us with a lot of knowledge, and we look forward to using this knowledge in the future.

We would like to thank our two supervisors Polyxeni Vasilakopoulou and Ilias O. Pappas at the Department of Information Systems at UiA, for providing useful guidance and support throughout the master thesis. We would also like to thank all the survey respondents and informants who took the time to participate. Your contribution and experiences have been pivotal to the findings of this study. We would also thank our fellow students for their feedback and support throughout this process.

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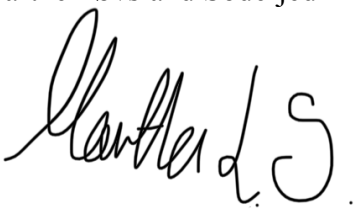

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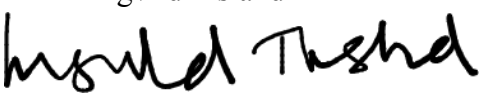

Abstract

With technological advancements within the field of AI there has been an increased interest in chatbots used as a tool in e-government services. Several Norwegian public organizations including the Welfare Services Organization, the Tax Authorities and several municipalities have implemented chatbots for government service delivery. Despite this increased interest in implementing chatbots for government service delivery, there is a knowledge gap in terms of what contributes to the satisfaction with e-government chatbots. To fill this gap, the purpose of this master thesis is to investigate factors affecting the satisfaction with e-government chatbots from a citizen perspective using elements from the updated IS Success Model by Delone and Mclean (2003). Factors focused on in this thesis are citizens' trusting beliefs and perceived degree of empowerment when using e-government chatbots provided by Norwegian public organizations.

The research question raised in this thesis was "*How does the information, system and service quality of chatbots affect citizens' empowerment and trusting beliefs when using e-government chatbots?"*. To be able to answer our research question this thesis has sought to identify 1) to what extent citizens perceive the quality of e-government chatbots, 2) the level of empowerment citizens feel when using e-government chatbots, 3) how quality affects citizens' empowerment and trusting beliefs when using e-government chatbots and 4) how quality, empowerment and trusting beliefs explain satisfaction with e-government chatbots.

The methodology for this thesis is a mixed methods approach consisting of a survey with a questionnaire and follow-up interviews. The survey yielded a sample of 105 citizens or permanent residents of Norway that have used e-government chatbots. A number of 11 follow-up interviews were performed to complement findings from the survey. The survey data was analyzed with partial least square path modeling (PLS-SEM) in SmartPLS and the interviews were analyzed with the open coding technique.

The findings indicate that information and service quality significantly influence citizens' trusting beliefs when using e-government chatbots. Information, system and service quality significantly influence the degree of empowerment felt by the citizens' when using e-government chatbots. The degree of trusting beliefs and empowerment positively affects the degree of satisfaction with e-government chatbots, while satisfaction positively affects intention to use. Based on these findings we suggest a comprehensive model that brings together empowerment, quality and trust in explaining citizens' satisfaction from e-government chatbot use.

This study is one of the very first to address both empowerment and trusting beliefs in the context of e-governmental chatbots. The main contribution of this study is the unveiling of the role of quality on citizens' empowerment and how the level of empowerment affects citizens' satisfaction with e-government chatbots. The higher degree of information, system and service quality, the more citizens' feel empowered to use e-government chatbots. This finding gives valuable insight of the importance of quality and focusing on empowering citizens in order for citizens to use and value e-government services such as chatbots. The findings of this study gives implications for practitioners in developing, managing and maintaining e-government chatbots. Future studies should further investigate and theorize factors affecting citizen empowerment in the context of e-government chatbots.

Keywords: Empowerment, Trust, E-government, Chatbot, IS Success Model

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1. Introduction

The rapid evolution of information technology contributes to improving the delivery of services for both private and public organizations worldwide (Venkatesh et al., 2016). In Norway, novel e-government services are increasingly changing the way citizens interact with the government. Venkatesh et al. (2016) define e-government as “the use of the Internet by government agencies to provide informational and transactional services to citizens" (Venkatesh et al., 2016, p. 87). One of the latest additions to e-government services is artificial intelligence (AI) technology. AI technology enables performing tasks that traditionally were dependent on human intelligence (Thierer et al., 2017). We use the definition by Thierer et al. (2017) to define AI as: “The exhibition of intelligence by a machine. An AI system is capable of undertaking high-level operations; AI can perform near, at, or beyond the abilities of a human.” (Thierer et al., 2017, p. 8). The benefits of introducing AI into e-governmental services are many and include increasing efficiency and cost savings and reducing administrative burdens and waiting time (Wirtz & Weyerer, 2019). There are several use cases for AI in public organizations, and within these, there is especially an increasing trend related to virtual agents, also known as conversational agents or chatbots (Androutsopoulou et al., 2018). Chatbots are virtual service robots that are used for human-computer interactions by an increasing amount of websites (Chen et al., 2015). Reports from private sector firms exhibit efficiency gains as a result of implementing such service robots, hereafter chatbots, which motivates implementing chatbots within the provision of public services (Androutsopoulou et al., 2018). Several Norwegian public organizations including the Welfare Services Organization, the Tax Authorities and several municipalities have implemented chatbots for government service delivery.

Chatbots are an essential emerging technology with the potential to empower citizens (Følstad et al., 2020). The use of chatbots in e-government is not only viewed as a way of improving efficiency, but also as a way of improving information access and enhancing citizens’ control over e-government services (for instance by offering extended service hours). Citizen empowerment is a key aspect for e-government initiatives that is strongly emphasized (Sharma et al., 2022). Citizen empowerment entails more than providing basic access to information and services; it is about transforming citizens from general users into empowered individuals through digital services (Sharma et al., 2022). UNESCO sees citizen empowerment as one of the three main objectives of e-governance, namely: to engage, enable and empower the citizen (Palvia & Sharma, 2022), while OECD sees citizen empowerment as a necessary condition for enhancing the quality of service delivery (OECD, 2001).

1.1 Motivation for the study

Overall, there is limited prior research about the full potential of using AI in e-governmental services and on how AI in e-governmental services affects citizens (Androutsopoulou et al., 2018). In the context of chatbots, citizen empowerment is a potential outcome of users´ competence, self-determination and also, meaningful and impactful chatbot use (Gsenger et al., 2020; Kim & Gupta, 2014). Previous research has inter alia focused on the impact of customer empowerment on e-government success (Alshibly & Chiong, 2015) and how citizens gain value from interacting with chatbots for public services (Scutella et al., 2022). In order to realize citizen empowerment through digital public services, it is crucial to understand how to develop e-government services that match the goals and requirements of citizens (Alshibly & Chiong, 2015).

Prior research within e-government commonly suggests user satisfaction as an indicator of information systems (IS) success (Alshibly & Chiong, 2015). Alshibly & Chiong (2015) suggests that if users are satisfied with an IS, the IS will be considered effective in meeting the users needs (Alshibly & Chiong, 2015). This implies that matching citizens requirements of e-government chatbots will enable empowerment and lead to user satisfaction. To achieve user satisfaction with IS, the information, system and service quality alongside trust are considered critical success factors (Mcknight et al., 2002; Pappas et al., 2018; Teo et al., 2009). Mcknight et al. (2002) found that users' perceived quality of web-based services is correlated with trusting beliefs (Mcknight et al., 2002). Furthermore, prior research has highlighted the importance of building trust in utilizing the adoption and use of e-government services (Kourouthanassis et al., 2016; Pappas et al., 2018; Teo et al., 2009).

Although there is a growing body of research on e-government chatbots (Androutsopoulou et al., 2018; Scutella et al., 2022; Wirtz & Weyerer, 2019), the relationship between empowerment, trusting beliefs and satisfaction when using e-government chatbots has not been previously investigated. Public organizations have been investing and implementing chatbots into their e-governmental services for some years already. Hence, this motivates the authors to perform empirical studies exploring citizens' actual experiences and perspectives by surveying and interviewing citizens. The authors are motivated by the relevance of the topic and the opportunity to contribute with new insights on a topic within a premature research field in the context of information systems, e-governance and empowerment. The thesis provides insights that can be used by government agencies that aim to achieve higher citizen satisfaction with e-government chatbots and build stronger citizen government relationships.

1.2 Research question

This thesis addresses the relationship between quality, empowerment and trusting beliefs in explaining satisfaction with e-government chatbots. Our research question (RQ) is developed by bringing together empowerment and the key dimensions of quality and trust that in prior research have been highlighted as affecting user satisfaction.

RQ: *How does the information, system and service quality of chatbots affect citizens' empowerment and trusting beliefs when using e-government chatbots?*

In order to answer our research question, it is important to develop an understanding of 1) to what extent citizens perceive the quality of e-government chatbots, 2) the level of empowerment citizens feel when using e-government chatbots, 3) how quality affects citizens' empowerment and trusting beliefs when using e-government chatbots and 4) how quality, empowerment and trusting beliefs explain satisfaction with e-government chatbots.

The strategy for problem solution is following a mixed methods research approach, where data is collected with a survey using a questionnaire with follow-up interviews. We propose a comprehensive model for citizens' satisfaction from e-government chatbot use that brings together empowerment, quality and trust. Our research model is developed by extending Delone & Mclean´s IS Success Model (Delone & McLean, 2003, 2004) and emphasizes the role of information, system and service quality by including empowerment and trust. Hence, a model that includes quality, trust and empowerment brings together the key dimensions of user experience affecting satisfaction.

The findings suggest that information, system and service quality of e-government chatbots positively influence citizens' perceived empowerment. Further, information and service quality are found positively influencing citizens trusting beliefs when using e-government chatbots. Both trusting beliefs and empowerment positively influence citizens' satisfaction and the higher degree of trusting beliefs and empowerment, the higher satisfaction with the chatbot. It was highlighted in the analysis of the interviews that the control felt in an interaction with a chatbot is very dependent on how the chatbot provides the information. This also holds for the connection between ease-of-use and how meaningful it is to use a chatbot. Hence, the citizens' perceptions and attitudes are not about chatbots in general but about their specific experiences with specific chatbots and the specific ways they have been developed. Information, system and service qualities of chatbots are of major importance in facilitating citizen empowerment. The interviews further highlight that if citizens have experienced the chatbot service provided as unreliable, they feel insecure and would rather opt for using other communication channels.

Our findings add new insights to theory by adding empowerment as a factor that is affected by the information, system and service quality of e-government chatbots. This finding is a

valuable insight of the importance of prioritizing quality in e-government chatbots in order to empower citizens and enable citizens to use and value e-government services.

1.3 Structure of thesis

The remainder of the thesis is organized as follows:

Chapter 2 - Theoretical Background
Chapter 3 - Conceptual Model and Hypotheses
Chapter 4 - Research Approach
Chapter 5 - Results
Chapter 6 - Discussion
Chapter 7 - Contribution & Road Ahead
Chapter 8 - References
Chapter 9 - Appendices

2. Theoretical Background

This chapter outlines the theoretical foundation for this master thesis. The theoretical foundations are based on prior research within e-government, information, system and service quality, user satisfaction, intention to use, empowerment and trust.

2.1 E-government

For the past two decades, the use of information technologies (IT) in the delivery of governmental services has erupted (Nguyen & Tran, 2022). To improve communication and offer efficient services to citizens, public organizations in countries across the globe have implemented email, internet forums and official websites (Nguyen & Tran, 2022). Governmental services provided online range from simple services like providing public service information, the latest policy information to downloadable forms and more complex services like online tax filing (Hu et al., 2009; Venkatesh et al., 2016). From a citizen perspective, the benefits of e-government include greater service access and ease of interaction with the government (Venkatesh et al., 2016).

E-government has become an important mechanism for citizens to communicate and interact with the government (Venkatesh et al., 2016). Despite the benefits, compelling challenges remain in the provision of e-government services to citizens (Venkatesh et al., 2016). Such challenges include increasing the utilization of e-government services and improving citizens' satisfaction with the services (Venkatesh et al., 2016). The consequence is that e-government is prevented from realizing its full potential to achieve cost savings and efficiency improvements (Venkatesh et al., 2016). This indicates a need to investigate factors that can contribute to citizens' use and satisfaction with e-government (Chan et al., 2010).

2.2 E-government: Chatbots

As technology advances, citizens expect service providers, including governments, to provide responsive and personalized technology in their service delivery (Scutella et al., 2022). The use of chatbots in e-government is rapidly rising and they are being applied as a new channel for government services (Androutsopoulou et al., 2018; Baldauf & Zimmermann, 2020). The use cases for e-government chatbots include answering simple questions asked by citizens, avoiding information overload when searching for information and documents, and routing citizens to the right instance (van Noordt & Misuraca, 2019). Instead of engaging in traditional face-to-face encounters with the government, chatbots enable answering citizen queries at any time and day, regardless of the citizen's location (Castillo et al., 2021). Unlike chatbots used in the private sector, E-government chatbots must meet the needs of the variety of citizens such as elderly, immigrants and citizens with disabilities (Vassilakopoulou et al., 2022). In Norway, e-government chatbots are being used

on the websites of the welfare service organization (NAV), the tax authority (Skatteetaten) and multiple municipalities. Although the use of chatbots in government is rapidly rising, prior research has shown that the use of such chatbots does not always result in a positive outcome for citizens using such chatbots (Castillo et al., 2021; Scutella et al., 2022).
Previous research has identified multiple factors that can cause negative experiences when using chatbots (Scutella et al., 2022). These factors may include absence of information (Järvi et al., 2018), mistakes (Järvi et al., 2018), indifferences and technological failures (Zhang et al., 2018). Hence, identifying conditions under which e-government chatbots can diminish the citizen experience when seeking public information and services is crucial (Castillo et al., 2021).

2.3 Information, System, and Service Quality

E-government chatbots are technological creations, which implies that the technical attributes of these chatbots will affect citizens' attitudes and behaviors against these chatbots (Teo et al., 2009). Previous studies have investigated the role of website quality influencing the users satisfaction and intention to use the website (Delone & McLean, 2003, 2004).
The updated IS Success Model is illustrated in figure 1 and provides an integrated multidimensional view on IS success.

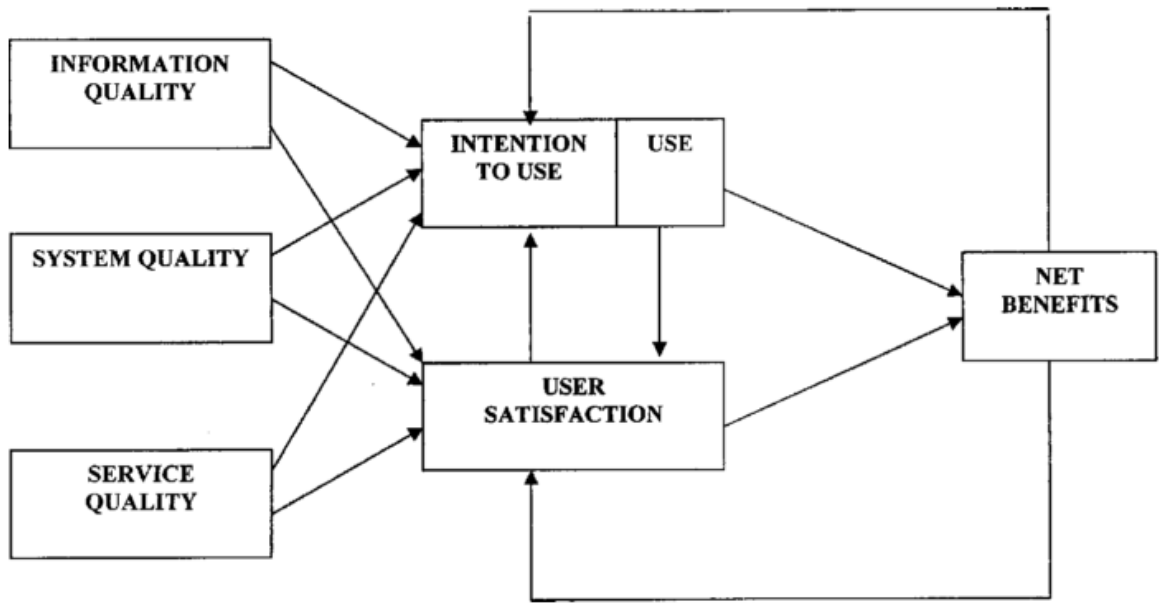

Fig. 1. The Updated IS Success Model by Delone & Mclean (2003).

The model suggests that information quality, system quality and service quality influence satisfaction and intention to use, which in turn influence and are influenced by net benefits. Depending on the context, not all factors from the model need to be included when performing research related to IS success (Delone & McLean, 2003). The focus of this study is factors affecting satisfaction with e-government chatbots. Hence, we adopt information quality, system quality, service quality, user satisfaction, and intention to use from the Updated IS Success Model by Delone & Mclean (2003).

Information quality is the extent of how accurate, relevant, precise and complete the information provided by a system is and how it fits the users needs (Chen et al., 2015; Delone & McLean, 2003; Mensah et al., 2021). Information quality is also described as the extent to which information provided is considered to be of quality in terms of content, form and time characteristics which is of crucial importance to end-users (Eppler & Wittig-Christ, 2000; Mensah et al., 2021). Information quality has been found to positively affect user satisfaction (Chen et al., 2015) and previous studies have found information quality in e-government as a determinant of the intention to use e-government services (Abu-Shanab, 2015; Mensah et al., 2021; Wangpipatwong et al., 2009). Furthermore, information quality has been found to influence trust in government (Mensah et al., 2021). In the context of this thesis, the information quality relates to how well e-government chatbots provide information.

While the information quality revolves around the user's perception of the quality of the content provided by an IS, the ***system quality*** is the extent of how an IS is consistent, easy to use and fitting to user needs (Chen et al., 2015; Delone & McLean, 2003). The system quality further denotes the user's perception of the technical performance of the IS in question (Teo et al., 2009). How the functionalities of an IS and how it can meet the users needs while encountering as few problems as possible is the core of system quality (Chen et al., 2015; Delone & McLean, 2003). Previous studies have found that system quality impacts user satisfaction significantly if the ease-of-use of a website is of a certain degree (Landrum et al., 2010; Teo et al., 2009). In the context of this thesis, the system quality relates to chatbots' consistency and ease-of-use.

Whereas the system quality focuses on technical characteristics of an IS, the ***service quality*** extends beyond technical characteristics and is the extent of the reliability, responsiveness, assurance and empathy of an IS (Chen et al., 2015). Thus, online service quality focuses on both the target service and the technology that delivers it (Delone & McLean, 2003). The need to evaluate service quality is crucial in e-government as the purpose of e-government systems today is to render some kind of service to citizens (Chen et al., 2015). Compared to services delivered in traditional face-to-face settings, users in online settings generally have more control, they expect greater convenience, and they often exhibit higher efficiency (Hu et al., 2009). Service quality has in previous studies been found as a determinant of satisfaction due to the user expectations of a website providing simplified services that handle the users needs (Hsieh et al., 2013; Landrum et al., 2010; Venkatesh et al., 2012). Additionally, service quality also has the potential to influence future user behavior (Hu et al., 2009). In the e-government chatbots context, service quality relates to how reliable, responsive, assuring and empathic chatbots are.

User satisfaction is the degree of satisfaction felt by the user towards the system and how well it satisfies the user's needs (Delone & McLean, 2003). Satisfaction towards e-government websites measures the citizens psychological or affective state due their

experience with the website in question (Chen et al., 2015). In the context of e-government chatbots, user satisfaction is the extent of satisfaction felt by the citizen based on the experience of using e-government chatbots.

Intention to use is the degree of intention a user has to use a system and has in IS research been found to be a strong predictor of actual system usage (Chau & Hu, 2001; Venkatesh et al., 2003). Intention to use is considered a principal long-term outcome of information system success (Hu et al., 2009). In the context of our study this is about citizens' intention to use e-government chatbots.

2.4 Empowerment

Human empowerment revolves around increasing power in social interactions (Cattaneo & Chapman, 2010). Feeling powerful comprises a range of mechanisms which humans utilize to increase their influence (Cattaneo & Chapman, 2010). Increasing a person's power leads to a greater influence in social relations - including interactions with other humans, systems and machines (Cattaneo & Chapman, 2010). A successful empowerment process is described by Cattaneo & Chapman (2010) as "a personally meaningful increase in power that a person obtains through his or her own efforts" (p. 647). Four dimensions are in the literature emphasized as central for a human to feel empowered (Gsenger et al., 2020):

Competence is described as an individual's belief of having the necessary abilities to perform well (Gsenger et al., 2020; Nguyen & Tran, 2022). In the context of empowering citizens through e-government, a necessary level of competence refers to an individual that has been given the necessary information and skills to utilize e-government services (Nguyen & Tran, 2022).

Impact is described as the level of influence an individual's actions has (Gsenger et al., 2020; Nguyen & Tran, 2022). In the context of empowering citizens through e-government, the impact can refer to an individual's possibilities of utilizing policies published on government websites (Nguyen & Tran, 2022).

Meaning is described as the assessment of the worth of an activity an individual does considering their standards and personal values (Gsenger et al., 2020; Nguyen & Tran, 2022). In the context of empowering citizens through e-government, the meaning can refer to when a citizen contacts government agencies through their websites and how they perceive the quality and worth of the information and services offered through the website (Nguyen & Tran, 2022).

Self-determination is described as the level of autonomous decision-making of an individual (Gsenger et al., 2020). In the context of empowering citizens through e-government services, self-determination can refer to a citizen's sense of responsibility for an outcome resulting from their participation (Nguyen & Tran, 2022).

Kim & Gupta (2014) operationalized these four dimensions into the context of Information Systems:

Table 1. Dimensions of Empowerment based on Kim & Gupta (2014)

Competence of user	"an individual's belief in his or her capability to use the system in tasks with relevant knowledge, skills and confidence" (Kim & Gupta, 2014, p. 658).
Meaning of system usage	"the importance an individual attaches to system usage in relation to his or her own ideals or standards" (Kim & Gupta, 2014, p. 658).
Impact of system usage	"the degree to which an individual can influence task outcomes based on the use of the system" (Kim & Gupta, 2014, p. 658).
Self-determination of user	"an individual's sense of having choices (i.e., authority to make his or her own decisions) about system usage" (Kim & Gupta, 2014, p. 658).

In this thesis we adopt the same four dimensions of empowerment into the context of empowering citizens using e-government chatbots.

Alshibly & Chiong (2015) found empowerment as a key causal mechanism for citizens in obtaining value from e-government (Alshibly & Chiong, 2015). Empowering citizens entails letting citizens influence the decisions and actions made by the government (Naranjo-Zolotov et al., 2018). Li & Gregor (2010) argue that empowering citizens through e-government is important, as the more empowered the citizens, the more likely they are to value government agencies and build a healthier relationship with government (Li & Gregor, 2010). This is further emphasized by the findings of Mensah et al. (2021), showing that empowerment is a determinant for citizen trust in government (Mensah et al., 2021) and the intention to use e-government services (Abu-Shanab, 2015; Mensah et al., 2021).

2.5 Trust

Trust is a complex concept consisting of multiple interrelated dimensions that has been defined in multiple ways in previous literature (Gefen et al., 2003). *Trusting beliefs* is a dimension of trust that has been put forward as an antecedent to consumers' internet behavior in previous research (Mcknight & Chervany, 2002). Trusting beliefs is by Mcknight et al. (2002) defined as "the confident truster perception that the trustee has attributes that are beneficial to the truster" (Mcknight et al., 2002, p. 337). Mcknight et al. (2002) found that perceived website quality is greatly correlated with trusting beliefs and intentions (Mcknight et al., 2002). Additionally, Teo et al. (2009) argues that the trusting beliefs of the citizen towards the e-government website will be affected by the perception of quality of the e-government website (Teo et al., 2009). The trusting beliefs may also be the citizen's previous interactions with the same or related government agency (Teo et al., 2009).

Mcknight (2002) argues that trusting beliefs is established early and may be present before involved parties have significant information about each other (Mcknight et al., 2002).

However, these trusting beliefs might also change just as fast as they were established, as the involved parties gain experience with each other (Mcknight et al., 2002). Hence, in this thesis we introduce a dimension of trusting beliefs, namely *trust in technology* (in our case the technology is the chatbots) as a potential factor affecting satisfaction with e-government chatbots. *Trust in technology* is by Teo et al. (2009) defined as "the extent to which the website users trust the competence and security of the internet" (Teo et al., 2009, p. 105).

Previous studies have described satisfaction as a potential outcome of trust (Balasubramanian et al., 2003; Yoon, 2002) and found a significant correlation between trust and satisfaction (Yoon, 2002). Trust in the context of e-government is complex (Alzahrani et al., 2016) and building trust has been found to be a key factor for achieving success with e-government websites (Teo et al., 2009). Previous research has found that trust combined with quality (information, system, service) are key drivers of e-government success and adoption (Pappas et al., 2018). E-government includes complicated affairs that potentially will be affecting citizens' trust in government and government services (Alzahrani et al., 2016; Belanger & Carter, 2008). Hence, it is essential to include and further examine the role of building trust in the context of e-government chatbots.

3. Conceptual Model and Hypotheses

In this chapter we present our research model hypotheses. To be able to answer the research question, we developed a research model based on key concepts in the theoretical foundations and nine hypotheses to be tested.

3.1 Research Model

We found it important to develop a research model that both consists of and extends already established concepts to ensure a certain quality of our model. Figure 2 presents the comprehensive model developed. Empowerment is modeled as a second-order formative construct with four first-order sub-constructs based on the four dimensions of empowerment by Kim & Gupta (2014): User competence, impact of system use, meaning of system use, and user self-determination.

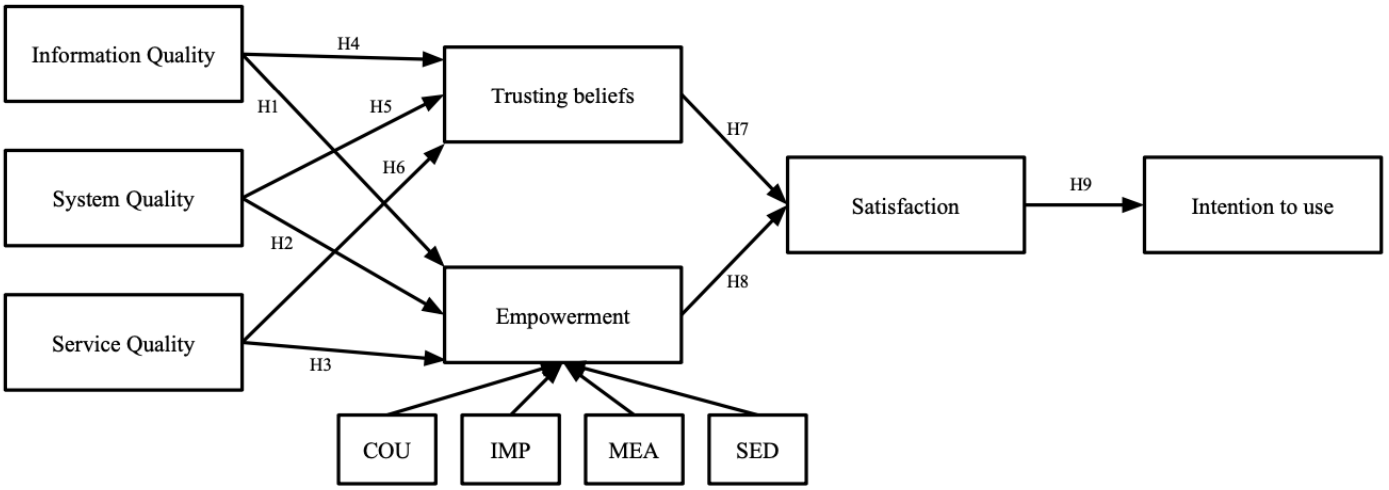

Fig. 2. Research model.

3.2 Hypotheses

In the following sections we present our nine hypotheses that were developed in order to test the connection between the information, system and service quality, empowerment, trusting beliefs, satisfaction and intention to use.

Li & Gregor (2010) argue that the government agency has to increase the service delivery mechanism and improve the quality of the information or service being delivered in the context of advisory services in the public sector (Li & Gregor, 2010). To test if this applies

to the context of e-government chatbots, we developed the following hypotheses with the three quality elements based on the IS Success Model (Delone & McLean, 2003).

Hsieh et al. (2018) investigated drivers for psychological empowerment in online brand communities and found that information quality had a slight significant influence on empowerment (Hsieh et al., 2018). With H1, our aim is to estimate and test the relationship between the information quality and citizens' feeling of empowerment when using e-government chatbots.

> **H_1 = Information quality of e-government chatbots positively influence the citizens' feeling of empowerment**

If e-government chatbots fail to deliver consistency and the ease-of-use required to meet the users needs and expectations, it can result in a negative and disempowering experience for the user. An important and desirable characteristic of an IS is a high degree of system quality and system quality has been found to positively affect user satisfaction (Chen et al., 2015; Delone & McLean, 2003). Matching citizens' needs and requirements is crucial in terms of realizing citizen empowerment (Alshibly & Chiong, 2015). Hence, we hypothesize system quality as a significant factor affecting citizens empowerment when using e-government chatbots. With H2 our aim is to estimate and test the relationship between the system quality and citizens' feeling of empowerment.

> **H_2 = System quality of e-government chatbots positively influence the citizens' feeling of empowerment**

E-government chatbots enable possibilities of delivering government services at all hours of the day and improves service quality in the form of increased timeliness and accessibility of services (Nguyen & Tran, 2022). Previous studies have examined the correlation between public service quality and public empowerment and found that the higher the public service quality, the higher the public empowerment (Nor et al., 2022). Public service quality has been emphasized as the most important factor for public empowerment (Nor et al., 2022); however, how service quality of an IS influences empowerment in the context of satisfaction with e-government chatbots is yet to be discovered. Hence, with H3 our aim is to estimate and test the relationship between the service quality and citizens' feeling of empowerment.

> **H_3 = Service quality of e-government chatbots positively influence the citizens' feeling of empowerment**

Mcknight et al. (2002) found that a high-quality website builds consumers trusting beliefs that the vendor is competent, honest and benevolent (Mcknight et al., 2002). Nordheim et al. (2019) found that chatbot interpretations and responses are key drivers of trust in customer service chatbots (Nordheim et al., 2019). We developed the following hypotheses on quality

and trusting beliefs using quality elements based on the IS Success Model (Delone & McLean, 2003).

Information quality and trust

Previous studies have found a positive correlation between trust and the perceived accuracy of information when using e-government websites (Teo et al., 2009). Thus, the trusting beliefs of citizens should also vary depending on how the citizens perceive the information quality of e-government chatbots.

> **H_4 = Information quality is positively associated with Citizens' trusting beliefs in e-government chatbots**

System quality and trust

Teo et al. (2009) found that trust built when using e-government websites is positively correlated to the system quality (Teo et al., 2009). Government agencies have to ensure the technical reliability and ease-of-use of an e-government website in order to build citizens' trust (Teo et al., 2009). Previous research has found that trust combined with system quality, alongside information and service quality are key drivers for e-government success and adoption (Pappas et al., 2018). This indicates that the trusting beliefs of citizens also vary depending on how the citizens perceive the system quality of e-government chatbots.

> **H_5 = System quality is positively associated with Citizens' trusting beliefs in e-government chatbots**

Service quality and trust

Previous studies have found a correlating relationship between trust and service quality (Chen et al., 2015). Government officials should ensure that there is a high degree of trust in e-government in addition to ensuring high service quality as this will lead to citizens being more tolerant to problems that might occur (Teo et al., 2009). In e-government the citizens' perception of service quality is built in interactions between the citizens and government officials (Teo et al., 2009). Thus, trusting beliefs is expected to vary depending on how the citizens perceive the service quality of e-government chatbots.

> **H_6 = Service quality is positively associated with Citizens' trusting beliefs in e-government chatbots**

Trusting beliefs and satisfaction

As website quality has been found to build trusting beliefs of the users (Mcknight et al., 2002), we test if trusting beliefs can be a potential key factor that affects the satisfaction citizens have with e-government chatbots. Bhattacherjee & Premkumar (2004) found that the level of disconfirmation and satisfaction of a system will affect the degree of trusting beliefs and attitudes towards that system (Bhattacherjee & Premkumar, 2004). Thus, the

degree of satisfaction with e-government chatbots is expected to vary depending on the degree of trusting beliefs towards the chatbot.

H_7 = Citizens' trusting beliefs are positively associated with the satisfaction with e-government chatbots

Empowerment and satisfaction

Satisfied users of an IS indicates that the system is effective in meeting the users needs and requirements (Alshibly & Chiong, 2015). This implies that matching citizens requirements of e-government chatbots will enable empowerment and lead to user satisfaction.

H_8 = Citizens' empowerment is positively associated with the satisfaction with e-government chatbots

Satisfaction and intention to use

Numerous studies have found a correlation between satisfaction with IS and the intention to use (Delone & McLean, 2003, 2004). This indicates that also citizens' satisfaction with e-government chatbots will affect the citizens' intention to use them.

H_9 = Citizens' satisfaction is positively associated with the intention to use e-government chatbots

4. Research Approach

In this chapter we present our philosophical perspective and methods used to collect and analyze data in order to answer our research question,

RQ: *How does the information, system and service quality of chatbots affect citizens' empowerment and trusting beliefs when using e-government chatbots?*

First, we present our philosophical perspective followed in this thesis. Second, we present the overall research approach, third we present the design for the quantitative part of the study, and fourth the design for the qualitative part of the study. Fifth, we reflect on research ethics and challenges related to the mixed methods approach.

4.1 Philosophical Perspective

Addressing the philosophical perspective that this thesis builds upon is important in order to develop an understanding of how the research has been performed and how the results are interpreted (Crotty, 1998). Philosophical perspectives consist of multiple paradigms that are a combination of different views on ontology and epistemology. Ontology alongside epistemology are two interrelated terms within philosophy that are important to address in addition to the methodology when conducting research (Mills et al., 2012). Ontology revolves around how we understand reality while epistemology revolves around our perceptions of how knowledge is acquired (Mills et al., 2012).

When performing mixed methods research of quantitative and qualitative approaches, a frequent concern is that there will be no common paradigms that fit with both quantitative and qualitative approaches (Ågerfalk, 2013). Hence, a pragmatic perspective is followed in this study as it is argued as a paradigm comprehensive enough for mixed methods studies (Ågerfalk, 2013). Pragmatism is by Creswell & Clark (2017) defined as "Singular and multiple realities (e.g., researchers test hypotheses and provide multiple perspectives" (Creswell & Clark, 2017, p. 24). Pragmatism is a paradigm based on the assumption that there are multiple ways to understand reality and that there is no single approach to develop knowledge (Ågerfalk, 2013). Every experience within a pragmatic view starts with a question to be answered or a problem to be addressed (Morgan, 2017). Practicality is a perspective of pragmatic epistemology that knowledge is acquired based on "what works" to address the research question (Creswell & Clark, 2017).

The aim with this study is to test hypotheses with a quantitative survey and provide additional perspectives with qualitative interviews. Thus, we find a pragmatic paradigm with a practical epistemology as the most appropriate philosophical perspective.

4.2 Research Design

Venkatesh et al. (2013) defines mixed methods as follows "Mixed methods research, in contrast, uses quantitative and qualitative research methods, either concurrently (i.e., independent of each other) or sequentially (e.g., findings from one approach inform the other), to understand a phenomenon of interest" (Venkatesh et al., 2013, p. 23). Using several research strategies and methods can provide insights on the same phenomena from different perspectives (Johannesson & Perjons, 2014; Venkatesh et al., 2013). Thus, the method is used when it can be difficult to get the necessary understanding by using only one method (Venkatesh et al., 2013). Mixed methods studies constitute an approach that attracts considerable interest but represents only 3% of published articles within the IS field (Venkatesh et al., 2013). However, the value of using a mixed methods approach in this thesis is to gain a greater understanding and more knowledge of the entirety of the research question, and viewing the topic from a citizen perspective. Furthermore, by using both quantitative and qualitative methods, the qualitative data collected in this thesis is used to complement and explain the quantitative data collected.

This study is designed with a mixed methods approach consisting of a survey with a questionnaire as the main method for data collection and follow-up interviews. Follow-up interviews are included to supplement and enable a deeper understanding of the data retrieved from the survey. The order of the data collection wasas follows; 1) gather quantitative data 2) analyze the quantitative data 3) gather qualitative data 4) explain the quantitative findings further with qualitative interviews. As we base our conceptual model and hypotheses from chapter 3 on previous relevant research that were identified, we consider this a deductive study. The deductive process followed is illustrated in figure 3.

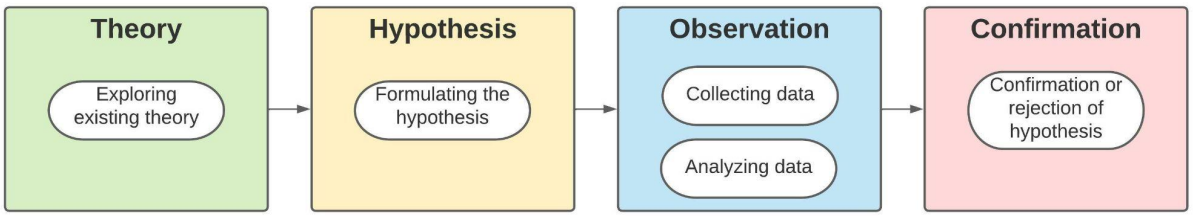

Fig. 3. Four steps of doing a deductive study approach based on Oates (2006).

4.3 Quantitative Approach

Using a survey approach enables us the possibility of collecting data from a broader number of respondents and systemizing this data in a standardized and measurable manner (Oates, 2006). In addition to being able to test our hypotheses and research model, we also believe a survey approach is useful in developing an overall understanding of a topic where there is a lack of existing research. Hence, we saw it fit to start the data collection with a questionnaire to get an overview of citizens perceptions, and supplement with further explanation of the phenomena identified with interviews.

4.3.1 Constructs

To be able to answer our research question, multiple constructs and items leveraged from previous research were adapted. “A construct is the abstract idea, underlying theme, or subject matter that one wishes to measure using survey questions” (Lavrakas, 2008, p. 134). Considerable amount of time was used in preparing constructs to make sure we would end up measuring what the research question implied. The constructs, descriptions and sources are presented in table 2.

Table 2. Constructs

Construct	Description	Source
Empowerment (EMP)	"a personally meaningful increase in power that a person obtains through his or her own efforts" (p. 647)	(Cattaneo & Chapman, 2010; Kim & Gupta, 2014)
Competence of user (COU)	“an individual’s belief in his or her capability to use the system in tasks with relevant knowledge, skills and confidence” (p. 658).	
Impact of system usage (IMP)	“the degree to which an individual can influence task outcomes based on the use of the system” (p. 658).	
Meaning of system usage (MEA)	“the importance an individual attaches to system usage in relation to his or her own ideals or standards” (p. 658).	
Self-determination (SED)	“an individual’s sense of having choices (i.e., authority to make his or her own decisions) about system usage” (p. 658).	
Intention to use (USE)	The degree of intention a user has to use a system	(Belanger & Carter, 2008)
Information Quality (IQ)	The extent of how accurate, relevant, precise and complete the information provided by the IS is and how it fits the users needs	(Chen et al., 2015; Delone & McLean, 2003)
System Quality (SQ)	The extent of how consistent, easy to use and responsive a IS is, and to what degree it fits the users needs	
Service Quality (SVQ)	The extent of the reliability, responsiveness, assurance and empathy of an IS	
Trusting beliefs (TRB)	The confident truster perception that the trustee—in this context, a specific e-government chatbot—has attributes that are beneficial to the truster	(Mcknight & Chervany, 2002)
Satisfaction (SAT)	The degree of satisfaction felt by the user towards the system and how well it satisfies the users needs	(Delone & McLean, 2003; Teo et al., 2009)

First and Second-Order Constructs

A second-order construct is defined as "a theoretical description of the latent factor structure, usually not directly observable" (Allen, 2018, p. 2). Kim & Gupta (2014) and Peterson (2014) propose using empowerment as a second-order construct and applying its four dimensions (COU, IMP, MEA, SED) as observable variables forming the empowerment construct (Kim & Gupta, 2014; Peterson, 2014). Figure 4 illustrates the empowerment construct.

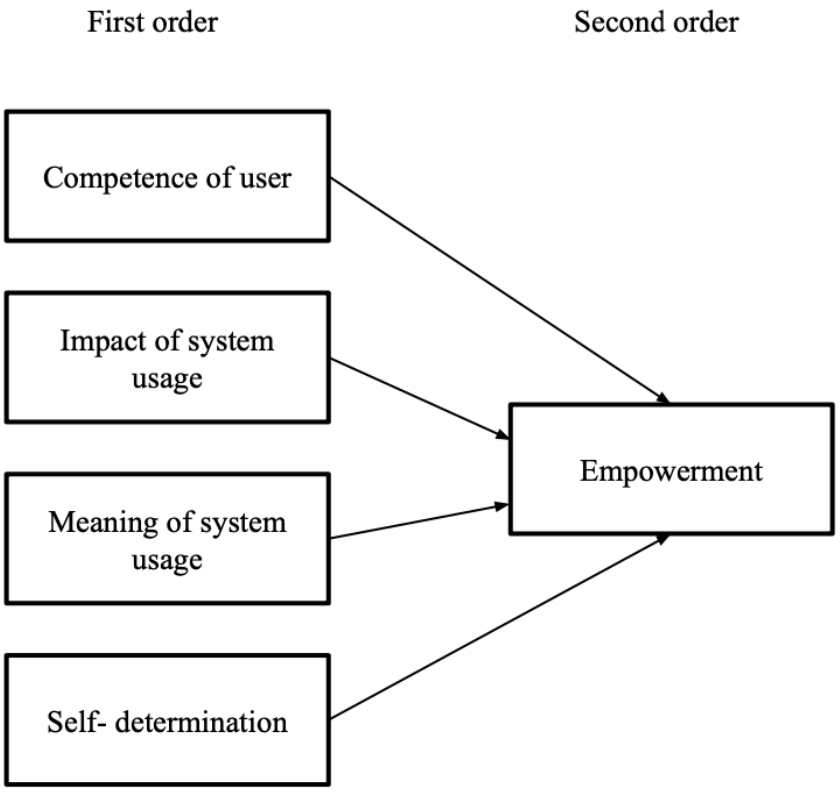

Fig. 4. Empowerment formulated as a Second-order Construct (adapted from Kim & Gupta, 2014)

Construct Quality Assurance

In order to make sure that the questionnaire items would be easy to understand for the respondents, a great amount of time was spent on quality assurance. It was decided that the survey would be available in both English and Norwegian in order to accommodate a broader number of potential respondents. The adapted constructs and items adapted were originally in English, but it was expected that the majority of respondents would answer the survey in Norwegian. Thus, the items were translated into Norwegian. In this process, it was important to make sure that it would be easy to understand the questions in Norwegian and that the meaning behind each item stayed consistent in both languages.

4.3.2 Procedures for Data Collection

We find it important that data can be collected effectively and in an accessible manner for both respondents and us as researchers. Thus, to collect the survey data, an electronic questionnaire was developed using the survey software SurveyXact (University of Agder, n. db). In SurveyXact there is a template that includes the University of Agder logo and colors. We used this template in our questionnaire to add credibility. To inform the potential respondents about the study and to retrieve as many complete samples as possible, we found it important to start the questionnaire by writing a short informative explanation of the purpose of the study (Oates, 2006).

When developing the questionnaire, we divided its content into four parts:

1. An informative page with information about who we are, the study, the topic, who is supervising the study and how we will treat the data collected (Appendix 4).
2. Questions about the respondents demographics.
3. Indirect topic related control statements to potentially identify unknown patterns with a scale in the format of a 7 point likert scale.
4. Direct topic related statements based on constructs and items adapted from previous research with a scale in the format of a 7 point likert scale (statements are found in Appendix 1).

We decided to keep the questionnaire anonymous to potentially reach a broader population. However, we wanted to have an option at the end of the questionnaire where respondents who are interested in the results or would be interested in a follow-up interview could add their email addresses. On the final page of the questionnaire, we therefore added a question of whether or not the respondent would be interested in the final results of the study and if they would be interested in a follow-up interview. As this study has a citizen perspective, we found the following groups as the relevant target population for the questionnaire:

- Norwegian citizens from 18-80 years old that have used e-government chatbots
- Permanent residents of Norway 18-80 years old that have used e-government chatbots

The size of the population for this study is unknown, as it is relevant for all adult citizens and residents of Norway that seek governmental information or services online. To gather samples for the questionnaire we used snowball sampling. Snowball sampling is a sampling technique applied when there is a rare population or studying mutual casualties among population members (Lavrakas, 2011). Hence, we saw snowball sampling as the most effective way of gathering a broader range of samples.

The questionnaire was distributed by sharing posts with a public link to the questionnaire on the authors social media channels LinkedIn and Facebook. Furthermore, we also sent the

link in personal messages to acquaintances we saw fit and encouraged family members and friends to share the link. The survey was performed in February and March 2022 and yielded a number of 105 complete samples. Table 3 provides an overview of the survey respondents.

Table 3. Descriptives Statistics of Survey Respondents

Demographic variable		**Frequency**	**Percentage**
Gender	Female	57	54.2
	Male	46	43.8
	Prefer not to say	2	1.9
Age	18-25	41	39
	26-35	38	36.1
	35-45	12	11.4
	46-55	9	8.5
	56-65	5	4.7

The prevalence of younger adults is assumed to be related to the requirement of including only respondents that have actually used chatbots provided by public organizations in Norway.

4.3.3 Procedures for Data Analysis

After discussing and doing some research on different commonly used approaches, it was decided to use *structural equation modeling (SEM)* for data analysis. SEM is used to model and estimate complex relationships between dependent and independent variables (Hair et al., 2021). It is especially applicable when the concepts investigated are measured indirectly by multiple indicators, when the variables are unobservable and it can easily handle both reflective and formative measurement models (Hair et al., 2021). Thus, we saw SEM as a fitting approach for this study. There are two types of methods for SEM that are widely used within research, and these are covariance-based (CB) and partial least squares (PLS) (Hair et al., 2021). CB-SEM is commonly used to either confirm or reject theory-based hypotheses, while PLS-SEM utilizes explaining the variance in the dependent variables of a research model (Hair et al., 2021). In order to answer our research question, we saw PLS-SEM as a fitting approach to test and explain the variances of our research model.

The empowerment construct was computed into a second-order latent construct by combining the latent variables from its four dimensions (COU, IMP, MEA, SED) forming the empowerment construct (Kim & Gupta, 2014; Peterson, 2014).

In the SurveyXact there is a description of all entries in whether or not each sample has completed the whole questionnaire or not. This helps identify non-complete samples in the dataset after data has been collected. Thus, before being able to perform PLS-SEM, we

developed a step-by-step guide for cleaning the dataset from the questionnaire after extracting it SurveyXact:

- Removing all non-completed samples.
- Reverse coding the answers of several of the statements.
- Merging English with Norwegian entries.
- Removing fields where email addresses could be present.
- Removing samples that have answered "No" when asked if they have used e-government chatbots.

Once the dataset was cleaned, the dataset consisted of 105 samples, and structural equation modeling (SEM) was performed using the software SmartPLS version 3.3.7. The analysis consisted of developing a measurement model and structural model before performing a confirmatory factor analysis. The measurement theory was tested before testing the hypothesis with the structural model.

4.3.4 Validation and Reliability

When performing research, there are multiple sources of error that can occur and compromise research methods, procedures and the research results. Thus, it is crucial to evaluate the validity and test the reliability of the research.

Lavrakas (2008) describes two forms of validity, internal and external validity. In a research setting, these concepts are described as "A research investigation is said to have *internal validity* if there are valid causal implications and is said to have *external validity* if the results are generalizable**"** (Lavrakas, 2008, p. 2). Furthermore, reliability is defined as: "Reliability is concerned with the consistency of results whether or not those results are valid" (Lavrakas, 2008, p. 2).

Evaluating the Measurement (outer) Model

A measurement model illustrates how the constructs (latent variables) are measured (Hair et al., 2021). There are two approaches to measuring variables that are unobservable, these are referred to as ***reflective*** and ***formative*** measurements (Hair et al., 2021). The difference between reflective and formative measurements is how the construct is connected to its indicators. When there is a reflective measurement, it is assumed that the construct is the cause of the covariance of its indicators, while with a formative measurement, it is assumed that the indicators have a causal effect on the construct (Hair et al., 2021). In our research model, all the measurements are set as reflective. Evaluating the reliability and validity of a research model starts with evaluating the measurement model (Hair et al., 2021). This is important as the structural model cannot be tested if the measures are not valid or unreliable (Hair et al., 2021). When the measurement model is confirmed, the structural model can then be evaluated (Hair et al., 2021). Hair et al. (2021) propose a four-step process to start

evaluating the reliability and validity of a reflective measurement model (Hair et al., 2021). The five steps is illustrated in figure 5.

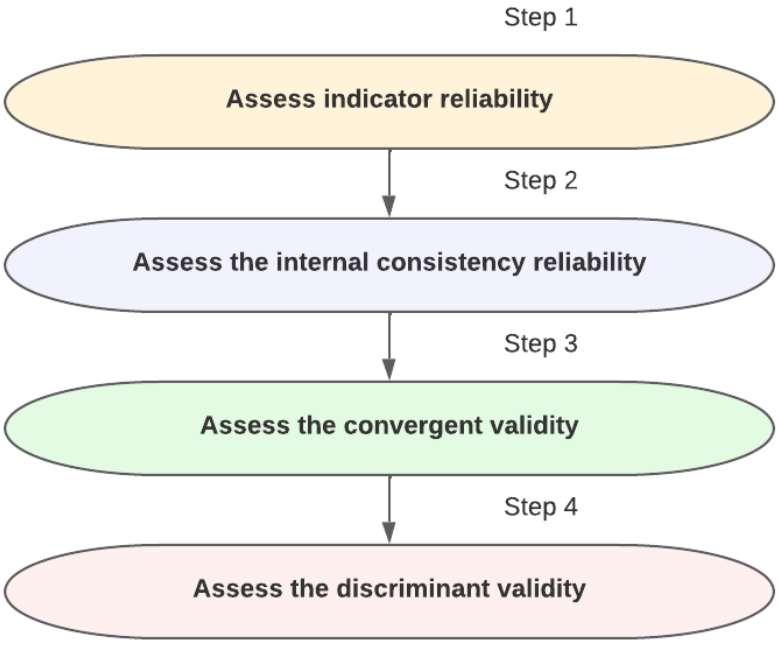

Fig. 5. Four Steps of Evaluating a Reflective Measurement Model based on Hair et al. (2021).

Step 1 - Indicator reliability

Investigating the indicator reliability is the first step in evaluating a reflective measurement model (Hair et al., 2021). Before being able to assess the indicator reliability, all the items from the dataset were connected to the construct they belong to. Further, each construct with its belonging items (indicators) was modeled as variables in SmartPLS. The indicator reliability involves examining to what extent each indicator's variance is explained by its construct and further indicates the communality of an indicator (Hair et al., 2021). Hence, assessing the indicator reliability was done by performing the SmartPLS algorithm in SmartPLS and examining the indicator loading of each indicator (Hair et al., 2021). It is recommended that the indicator loading of each indicator is above 0.708. An indicator loading above 0.708 provides acceptable indicator reliability as it indicates that the construct explains more than 50 percent of the indicator's variance (Hair et al., 2021). The indicator loading of each indicator used to form our constructs is found in Appendix 1.

Step 2 - Internal Consistency reliability

The next step is assessing the internal consistency reliability (Hair et al., 2021). When assessing the internal consistency reliability, it is the degree to which a construct's indicators are associated with each other that are examined (Hair et al., 2021). If indicators belonging to the same construct are inconsistent in what they measure or are too similar to each other, it will reduce the construct validity (Hair et al., 2021). In SmartPLS, we assessed the internal consistency reliability by looking at the composite reliability rho (CR), which is one of the primary measures of internal consistency reliability (Hair et al., 2021). The values of CR are considered acceptable between 0.6-0.7 and satisfactory between 0.7-0.9. If the CR of an

indicator is above 0.9 the indicator may be redundant and should be considered unreliable (Hair et al., 2021).

Step 3 - Convergent Validity

Assessing the convergent validity of each construct is the third step (Hair et al., 2021). The convergent validity is the average amount of variance in a construct that is explained by its indicators (Hair et al., 2021). These variances are commonly caused and affected by the level of measurement errors that are present in the data (Hair et al., 2021). The primary metric used for assessing convergent validity in SmartPLS is average variance extracted (AVE), which is equivalent to describing the level of communality a construct has (Hair et al., 2021). An acceptable level of AVE is values above 0.50, which suggest that the construct explains 50 percent or more of the variances in the indicators that make up the construct (Hair et al., 2021).

Step 4 - Discriminant Validity

The final step in evaluating the reflective measurement model is assessing the discriminant validity (Hair et al., 2021). Assessing the extent to which a construct is empirically distinct from other constructs in the structural research model is the discriminant validity (Hair et al., 2021). We evaluated the discriminant validity in SmartPLS by assessing the Fornell-Larcker criterion (FLC). A FLC value above 0.85 between two constructs indicates that the constructs are obscure, and that discriminant validity is not present (Hair et al., 2021).

Evaluating the Structural (inner) Model

Once the measurement model was confirmed and validated, the first step of evaluating the structural model was examining the ***path coefficients*** by performing the SmartPLS algorithm and testing their ***significance level*** with a bootstrap analysis (Henseler et al., 2016). If an independent variable is increased by one standard deviation and all other independent variables remain constant, the path coefficients are the change in standard deviation of the dependent variables (Henseler et al., 2016). The suggested and commonly used threshold for significance is a 5% significance level (p-value < 5%) (Henseler et al., 2016). To test the significance of the nine hypotheses of our research model, we evaluated the p- and t-statistics with a bootstrap analysis with 500 resamples (Henseler et al., 2016). As the significance level used in this study is 5%, the path coefficients were considered significant if the t-statistics were greater than 1.96 (Wong, 2013). The structural model was further verified by examining the ***coefficient of determination values (R^2)*** which is the explained variance of a dependent construct (Hair et al., 2021). When a research phenomenon is yet to be thoroughly understood, a lower R^2 is acceptable but when the phenomena are well understood, a higher R^2 is expected (Benitez et al., 2020).

4.4 Qualitative Approach

To complement and support our quantitative findings, we decided to perform qualitative interviews. Qualitative interviews are by Kvale & Brinkmann (2019) defined as follows "The qualitative research interview seeks to understand the world from the interviewee's point of view. Bringing out the significance of people's experience and uncovering their experience of the world, prior to scientific explanation, is a goal" (Kvale & Brinkmann, 2019, p. 20). As our target population for this thesis is Norwegian citizens and residents, we believe qualitative interviews can help increase knowledge about their perceptions and experiences with e-government chatbots. Furthermore, the aim is to elaborate and explain the findings from the survey.

4.4.1 The Informants

The person being interviewed is hereafter referred to as the informant. The importance of a varied population was to be able to access information about informants of different ages, with different jobs, some with little experience and others with more experience interacting with e-government chatbots. This is important as society consists of a diversity of people. Our informants consist of both women and men of different ages. There is an even distribution of gender and age. The informants have different backgrounds, work and experience with the use of e-government chatbots. We chose to interview adults, as this gives more flexibility, without needing consent or influence from a parent. Hence, the population for interviews was adult Norwegian citizens or residents of 18-80 years. A number of eleven informants were recruited for interviews through the questionnaire. The informants' demographics are presented in table 4.

Table 4. Informants Demographics

Demographics variable		**Frequency**
Gender	Female	5
	Male	6
Age	18-25	1
	26-35	2
	35-45	3
	46-55	3
	56-65	1
	66-80	1

4.4.2 Procedure for Data Collection

Initially, it was planned to do group interviews to create discussion among the informants in the interview, however, we decided to do one-to-one interviews to eliminate the possibility

for the informants to be influenced by each other during the interviews. The informants have different experiences and skills, therefore it was important to perform separate interviews. It was decided to do semi-structured interviews due to the ability for flexibility during the interviews. It was planned to perform 10 interviews and each interview would have a maximum length of 30 minutes. Eleven interviews were performed in March 2022. Ten out of eleven interviews were done face-to-face and the final one was performed remotely through Microsoft Teams. The interviews were transcribed in order to analyze the contents of the interview in posthence. The interview guide that was developed for the interviews can be found in Appendix 3. Prior to the interview, the informants had to sign a form with information about the interview and assurance that the informant's identity will be stored safely. The form is attached in Appendix 5. In advance of the interviews, the informants received some information about what the interview was about. However, we decided not to share the interview guide in advance as we did not want the informants to be influenced in their answers. Furthermore, the informants were made aware of their rights, based on Oates (2006) when participating in this thesis:

- *The right not to participate*
- *The right to withdraw*
- *The right to give informed consent*
- *The right to confidentiality*

(Oates, 2006, p. 56).

Interview Guide

An interview guide was developed from the data collected in the questionnaire. The questionnaire helped to pull us in the right direction when it came to choosing and making the right interview questions. The survey clearly showed that we needed more detailed answers to get in-depth on what we wanted to research. An interview guide was developed and consisted of three different parts. The interview guide is found in Appendix 3. The first part consists of questions related to empowerment when using e-government chatbots, the second part consists of questions related to trusting beliefs when using e-government chatbots. The questions in part one and two are rather open and the informants were able to speak freely without giving an assessment scale. The final part consists of questions related to the relationship between the three quality dimensions, empowerment and trusting beliefs. This was to see if the informant was able to see a connection between the different constructs from our research model and confirm findings from the survey. The informants were able to grade the relationships in this part from 1 to 7 depending on how strongly they felt that a relationship existed. This was done as we expected that some informants would have difficulties in elaborating on these questions. However, the informants were allowed to speak freely during the whole interview where they felt like it.

Recording

It was decided that all interviews would be recorded and that the recordings would be stored safely. To ensure that the necessary safety measures would be followed, we ended up using

Nettskjema which is the preferred software at the University of Agder. Nettskjema enables recording and storing recordings in a secure way (University of Agder, n. d). All the informants were informed in advance that the interviews were going to be recorded, and we clearly explained that no personal information that can reveal who they are would be mentioned during the interviews.

4.4.3 Procedures for Data Analysis

Based on Oates (2006) each interview was transcribed into separate documents. The interviews were transcribed directly word for word based on what the informant said in order to not create any kind of change in the informant's response. This was done to ensure reliability. In the transcripts, questions like; “repeat question please?” was removed from the transcription as it has no bearing on the informant's answer. After transcribing the interview, the informants were given the opportunity to read their own interview to confirm that the transcribing of the interview was correct.

Open Coding

Once the transcription was done, we started analyzing the interviews. The data from the interviews were coded, and this was done by initially collecting all data in one document. All data was read thoroughly and then divided into three different levels of relevance. The levels of relevance are divided into main headings as: irrelevant, somewhat relevant, and relevant (Oates, 2006). Further, we divided the data into different categories. The categories were based on the constructs from the survey: COU, IMP, MEA, SED, IQ, SQ, SVQ, and TRB. Furthermore, we looked at the segments and categories to identify potential connections (Oates, 2006).

Validation and Reliability

The extent to which we examine what it is intended to examine is crucial in regard to the validation of our results (Kvale & Brinkmann, 2019). As a baseline for validation, we found it important to consider the importance of including informants of different backgrounds, ages, and genders. Further, validation of the qualitative data has been done based on the “Validation in seven stages” by Kvale & Brinkmann (2019). The seven stages address the different stages in a study that explains what is important to consider and think about when it comes to validation in a research study like this thesis (Kvale & Brinkmann, 2019, p. 278). The seven stages of validation were used in this study and are presented in table 5.

Table 5. Validation in Seven Stages based on Kvale & Brinkmann (2019)

Thematization	Validation during thematization is about how stable and solid a research study is when it comes to theoretical assumptions. The link between theory research questions (Kvale & Brinkmann, 2019, p. 278). The theoretical background of this study was carefully reviewed and selected in the beginning. Studies that have been cited multiple times were seen as a strong validation point. The development of our research question and hypotheses were based on the literature from the theoretical background.
Planning	The validation stage of planning is about the validity of the research design. For a research design to be valid, it is important that the quality of the research plan is strong, as the knowledge created in a research study depends on it. It is also important to think about the different methods that can be used in a study as this is about the study's purpose and topic (Kvale & Brinkmann, 2019, p. 278). "From an ethical perspective, a valid research design should produce knowledge that is beneficial to humans and minimize harmful consequences" (Kvale & Brinkmann, 2019, p. 278). Choosing a mixed methods approach was one of the choices made to ensure validity regarding the quality of the research design. Additionally, the literature review, reading relevant studies, and adopting concepts that have already been validated through other studies have been important.
Interviewing	The interviewing validation stage is about both the quality and credibility of the interview itself and the person interviewing. It is important that the person interviewing makes a thorough inquiry about what the informant actually means when the informant answers questions during the interview. The information given during an interview must be checked evenly during the interview (Kvale & Brinkmann, 2019, p. 278). We developed interview questions based on the survey questions that were adapted from previous studies. We had a strong focus on actively listening to what the informants said during the interviews. The questions in the interview guide were formulated in a simple way to avoid confusion and misunderstandings for the informants during the interview. After realizing that one of our questions was difficult for the informants to understand, we removed it and did not use the answers to the questions. This is further explained in chapter 5. As we went for semi-structured interviews, we had the opportunity to follow up the informants during the interview with follow-up questions where it was necessary if there was anything unclear in what they meant. If the data the informant provided could be interpreted in several directions, we came up with control questions to confirm what the informant actually meant.
Transcribing	"When choosing the verbal style of the transcript, the question arises as to what constitutes a valid transfer from oral to written form" (Kvale & Brinkmann, 2019, p. 278). The transcript of the interviews was written

	word for word based on what the informants said. The informants were also given the opportunity to read their own transcript afterwards to confirm whether the contents were correct.
Analyzing	The analyzing stage is about the interpretation of the interview text, and that it is important that the interpretation is logical. It is also about the validity of the questions that are asked to the interview text that has been written (Kvale & Brinkmann, 2019, p. 278). This study has been written in English, but the interviews have been performed in Norwegian due to informants being more comfortable with their native language. This was done in order to avoid language confusion or misunderstandings. The qualitative analysis was conducted in Norwegian, but results from the analysis have been translated into English. As we have translated Norwegian into English, we have been very diligent to translate correctly in order to maintain the credibility and validity of the content that the informants have provided. The quotes from the informants can be read in both Norwegian and English in Appendix 2.
Validation	It must be considered which form of validation should be used when it comes to a specific research study. It is important that the assessment of the form of validation is thoroughly reflected. It is also about the implementation of the procedures that come with the specific form of validation and the determination of what the target group is and the validity of results that the study has arrived at (Kvale & Brinkmann, 2019, p. 278). We believe that our findings are valid for our target group, which is the Norwegian population. In all probability, our findings may be valid in both the public and private sectors because our choice of informants reflects Norwegian society.
Reporting	"This involves the question of whether a report provides a valid description of the main findings of a study, as well as the reader's role as a validity assessor of the results" (Kvale & Brinkmann, 2019, p. 278). All answers from the informants have been included in the analysis, and the results in the qualitative part are based on all the different opinions that the informants have pointed out. Our findings are also quality assured as all interviews were recorded.

4.5 Research Ethics

There are several potential ethical issues to consider when performing and collecting data with a mixed method study. With this study, a great deal of information has been collected from both the questionnaire and follow-up interviews.

In the questionnaire, the anonymity of respondents and confidentiality have been crucial to address. Hence, we made the decision to provide the survey through the SurveyXact software and to keep the questionnaire anonymous. In general, the respondents only had to

inform about general demographics and it was only possible to add an email address if respondents "checked off" that they were interested in participating in follow-up interviews. Furthermore, the questionnaire contained an informative page (Appendix 4) about the purpose of the study and what data would be collected.

In the follow-up interviews, all participants were presented with an informative page (Appendix 5) and their rights as informants in order to make an informed consent to partake in this study. All the informants were given the opportunity to go through and confirm their quotes. A challenge in the follow-up interviews was that some questions were difficult to answer. This may have made informants feel bad about themselves and affected their answers in the direction they felt were the "right" answer. In this instance, it was important to tell the informant in advance that some questions would be difficult to answer if there is a lack of experience with e-government chatbots and that it is perfectly fine not to have a supplementary answer.

Prior to the data collection we submitted our research study to the Norwegian Social Science Data Service (NSD) as this is required if the study is to include any form of identifiable personal information (NSD, n. d). In the data collection of this thesis, it was not necessary to retrieve personal information such as name, religion, ethnicity, etc. However, as we wanted to retrieve email-addresses for potential follow-up interviews and audio record the interviews, we were obliged to apply to NSD. The email-addresses were only stored in SurveyXact and were deleted from the dataset used for the analysis. The audio recordings collected were stored safely, using the Nettskjema software during the period of the research study. The recordings were deleted when the study was finished. The agreement with our informants was that they will always be kept anonymous. Thus, we never made a list with full names of candidates for the interviews. We used passcodes and numbers that were internal between us researchers in the study, and which were impossible for anyone else to understand. Audio recordings that were saved were deleted once the transcription was complete.

4.6 Mixed Methods Approach Challenges

The use of the mixed method has several limitations and challenges. The authors of the study do not have much experience with performing mixed methods studies, and there are few studies in the IS field that have used mixed methods approaches. Thus, it has been a challenge to find inspiration from previous studies. The use of a mixed method is a time-consuming process as two different methods are used and combined. Especially challenging when working with two methods is to be diligent with what method you refer to in your work, and to what purpose. Hence, it is important to have the right focus throughout the study, to make sure we end up measuring what we intended, combining the methods used in order to properly address the research question. It has been crucial for the authors to communicate well and often throughout the study.

5. Results

In this chapter, we will present the results and outcomes of the mixed methods approach with both quantitative and qualitative methods. First, we describe the analysis and results of 1) the quantitative approach 2) the qualitative approach 3) how the qualitative approach complements the quantitative findings.

5.1 Results from Quantitative Analysis

The first step of the analysis in SmartPLS was evaluating the measurement theory and performing evaluations of the reliability. This was done by evaluating the indicator loadings and composite reliability (CR). All the indicator loadings for each of the constructs (Appendix 1) and the CR illustrated in table 6, have values above 0.8, showing satisfactory indices of internal consistency. The validity of the first-order constructs was evaluated with the average variance extracted (AVE) and the Fornell-Larcker Criterion (FLC), shown in table 6. Establishing validity requires that the average variance extracted (AVE) is greater than 0.50, that the correlation between the different variables in the confirmatory models does not exceed 0.8 points, as this suggests low discrimination, and that the square root of each factor's AVE is larger than its correlations with other factors (Fornell & Larcker, 1981).

Table 6. Discriminant Validity and Construct Descriptive Statistics.

Discriminant Validity (FLC)								**Construct**				
	EMP	IQ	USE	SAT	SVQ	SQ	TRB		Mean	SD	CR	AVE
EMP	1.00							EMP				
IQ	0.58	**0.84**						IQ	3.54	1.39	0.87	0.70
USE	0.66	0.61	**0.92**					USE	3.43	1.48	0.94	0.84
SAT	0.76	0.68	0.70	**0.95**				SAT	3.12	1.58	0.96	0.90
SVQ	0.63	0.61	0.67	0.70	**0.84**			SVQ	3.87	1.42	0.88	0.71
SQ	0.60	0.50	0.61	0.64	0.65	**0.87**		SQ	3.76	1.59	0.90	0.76
TRB	0.69	0.70	0.70	0.85	0.79	0.64	**0.91**	TRB	3.67	1.49	0.95	0.82

Diagonal values (in bold) are the square root of the average variance extracted (AVE). Off-diagonal elements are the correlations between constructs.

After confirmation of the measurement model, the hypotheses were tested by assessing the path coefficients and significance in the structural model. To test the hypotheses, the structural model was analyzed by assessing the path coefficients and their significance by

performing the SmartPLS Algorithm and a bootstrap analysis. Figure 6 presents the results of the analysis. All the three quality dimensions were found to have a significant positive influence on empowerment, supporting H1, H2, and H3. The analysis shows that there is a significant positive influence of information and service quality on trusting beliefs, supporting H4 and H6. The effect of system quality on trusting beliefs was not found significant and H5 is therefore dismissed. By looking at the path coefficients, the strength of the relationships differs. Out of the three quality dimensions, service quality has the strongest influence on trusting beliefs with 0.504, while the influence the quality dimensions have on empowerment is more even, with service quality as the strongest relationship of 0.332. There is a significant positive effect of trusting beliefs and empowerment on satisfaction, supporting H7 and H8. Lastly, the analysis also shows that satisfaction has a positive significant influence on intention to use, supporting H9.

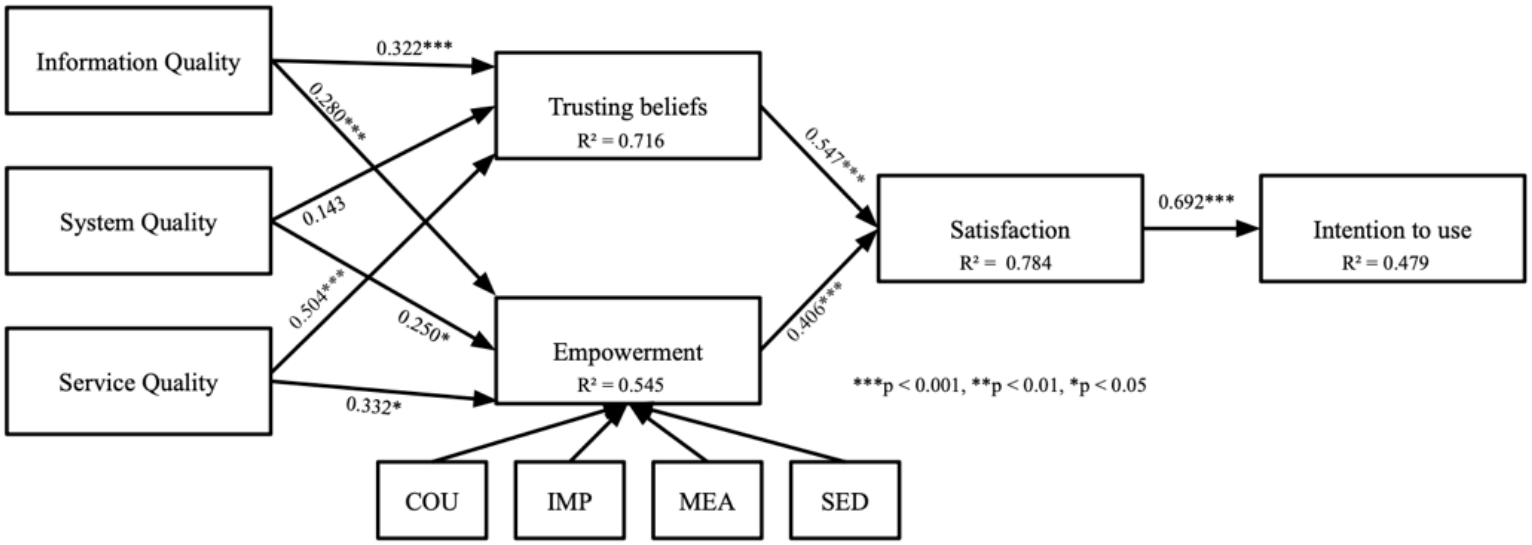

Fig. 6. Research Model with Hypotheses Testing Results.

5.2 Results from Qualitative Analysis

The purpose of performing interviews was to complement and elaborate the quantitative findings. Thus, the findings from the interviews are presented together with a summary of the quantitative findings in ten different categories to which the findings belong. Several findings are described in quotes from the informants, but there is also a separate text that the authors have put together as a summary of the various answers that have been collected from the qualitative interviews.

Competence of user (COU)

The mean of COU1, COU2, and COU3 range from 6.13 to 6.39. This indicates that the majority feels that they have the competence to use chatbots. This is not unexpected as the mean age group is quite young and is used to the use of technology. Further, we observe in the interviews that our informants experience their skills in relation to the use of chatbots as affordable and easy, which is in accordance with the results from the survey. The skills are described as good enough which means that they are often able to use a chatbot when they ask simple questions. Some explain that they are more limited when it comes to their skills with chatbots and that this is because they have little experience. The more they have used a chatbot, the more they feel they have mastered interacting with a chatbot. The majority feel that the skills are good enough, while fewer feel that they do not have enough skills.

Informants	Quote
Informant 2	*"I feel I can do it quite well. Now I have not used it very much, but from what I have used the chatbot for when I have asked simple questions, I feel that most of the answers I have received have been fine and the information has been fine as well. I use it more and more."*
Informant 4	*"My skills are good enough."*
Informant 5	*"My skills are limited, but adequate to get the help I need."*
Informant 8	*"I want to say that I feel I can handle it well. I have no problem understanding the way it works."*

Impact of system usage (IMP)

The mean of IMP1, IMP2, and IMP3 range from 3.70 to 4.18. This indicates that the majority is neutral when asked if they feel that they have control over the task that they want to perform, control over the influence over what happens during the interaction and if they feel that they have good control over what happens during the interaction with a chatbot. We observe that the responses vary. When asked about the feeling of control when interacting

with a chatbot, the majority feel in control if the informants know what to ask in advance before interacting with the chatbot. Several informants explain that they feel they are losing control if the chatbot does not understand the question they are asking, and then the informants easily give up and leave the conversation. Communication proves to be a vulnerable point, as the user easily gives up a conversation if the chatbot does not understand the questions being asked. Thus, clear communication is highlighted as important when it comes to interaction between users and chatbots. Additionally, it was highlighted that control can be affected by how experienced you are when using a chatbot and several of the informants emphasize that when asking a question to an e-government chatbot, it is then crucial to write the sentence in an easy way so the chatbot will understand the question.

Informants	Quote
Informant 7	*"I think I feel I have control, but sometimes when I have asked questions that the chatbot does not understand, I no longer have control and then I just end the interaction."*
Informant 10	*"When the chatbot does not send me astray, but answers what I ask, I feel in control. Because right away if I write something the chatbot does not understand, or reformulate, I feel that I lose control and then I usually give up."*
Informant 11	*"[...] Well, I do this in a professional context. And as long as I have a professional grasp of what I am asking about, that is, I must know what to ask about. It is very important. Also .. Eh. Yes, that is the prerequisite. So to start such a process, I prepare myself."*

Meaning of system usage (MEA)

The mean of MEA1, MEA2, and MEA3 range from 2.48 to 3.02. This indicates that the majority slightly disagrees that it is important or meaningful to use chatbots in public services. To further explain why that is, we see in the interviews that the informants have a somewhat mixed opinion of whether it is meaningful to use chatbots. Some people prefer to talk to a person rather than a chatbot, but when that is not possible, it is perceived as meaningful to have access to a chatbot. Thus, an e-government chatbot quickly becomes a second choice. Some informants think e-government chatbots make sense, others do not. However, multiple of the informants state that they are having an open mind towards chatbots, and understand that it is becoming more meaningful to use them. An informant found writing to a chatbot more effective as it responded quickly, and this was seen as meaningful even though the informant would prefer chatting with a human. A disadvantage with e-government chatbots was highlighted by several informants is that the chatbots have a tendency for being poorly designed, and therefore not perceived as meaningful to use. The

informants explained that several of the e-governmental chatbots have given the impression of being a chat, but instead work the same way as the search field on the website.

Informants	Quote
Informant 4	*“It can be very meaningful. It can be time-saving, but I'm not entirely sure if you get all the relevant information because they only answer what you ask, so if the question is not good enough, it can be a bit twisted. Then you can experience that you are not completely sure.”*
Informant 7	*"Medium meaningful, because it depends on if I can talk to someone in person, I prefer it rather than a chatbot. But the chatbot is much faster in time when it comes to chatting with the chatbot.”*
Informant 11	*"It has helped me in my profession, it certainly has. As I said to you earlier, I experience very often that it is difficult to get personal contact with caseworkers in the public sector and then I benefit from these robots as I call it."*

Self-determination (SED)

The mean of SED1, SED2, and SED3 range from 3.60 to 3.99. This indicates that the majority is feeling neutral when they are asked if they have significant autonomy in determining how they use the chatbot and if they feel that they have the opportunity for independence and freedom in how they use the chatbot. To further explain this, we see in the interviews that when asked about how the informants feel that they can decide how they can use a chatbot, there were many varied answers. It was highlighted that this depends on which chatbots were used, as some e-government chatbots are perceived as easier to use than others. Some feel they can easily decide how to use chatbots, and some have experienced it as demanding.

Informants	Quote
Informant 2	*"I probably have too little experience of using chatbots. Maybe eventually when you use it more and more that you feel that you can control it, but it is often the chatbot that leads you a bit to see where you want to go."*
Informant 7	*"I have never thought of that. But I have not used a chatbot very much, so I have not thought about how I can decide for myself how I want to use them."*

Trusting beliefs (TRB)

The mean of TRB1, TRB2, TRB3, and TRB4 range from 3.51 to 3.9. This indicates that the majority is between slightly disagreeing to neutral when they are asked if they believe that chatbots are competent and effective in providing governmental information and that the

chatbots can perform their role of giving governmental information in a good way. In the interviews, it varies among the informants whether they experience e-government chatbots as competent. Several highlights that it varies from chatbot to chatbot, and that some are smarter than others. The majority of the informants believe that chatbots are generally incompetent and explain this by stating that they experience that chatbots do not understand what is being asked, resulting in a feeling of the chatbot being incompetent. It is evident that many people experience that the chatbot lacks understanding and this affects communication between user and chatbot. It was highlighted by several of the informants that the information provided by e-government chatbots is perceived as poor. They experience that the information provided by the e-government chatbots is already easily available on the website by doing a search in the search field. Thus, informants feel that the chatbot becomes less competent when they feel that it does not contribute more than what the search field on the website does.

Informants	Quote
Informant 1	*"Yes, it's a bit mixed. Some chatbots have been competent and in a way give you what you are looking for while others are a little more diffuse so it is a bit mixed. To what extent should I say.. Medium. I feel that there are opportunities for improvement."*
Informant 7	*"It's very important to be able to trust chatbots, and that's one of the reasons I've avoided using it."*
Informant 10	*"I do not find the chatbots to be very competent. It may vary depending on which chatbot you use, but yes. For example, the municipality's chatbot, it is a chat while the others I have used I feel are more like a reference work. You write one thing, and then you get exactly the same as you would write in a search field, so the chatbot is really unnecessary and a waste for someone."*
Informant 11	*"I have a bit of a mixed experience with that. I prefer to talk to caseworkers, but I have experienced that caseworkers can do less than the chatbots I talk to."*

To what extent is it important to be able to trust a chatbot?

Informants	Quote
Informant 2	*"It is very important that you must be able to trust the chatbots. That the answers you get are real. That the answer you get from the chatbot should not be doubted. Because if you doubt it, I will not use it."*

Most of the informants stated that it is very important to be able to trust chatbots and that trust is crucial because if they do not feel they can trust the chatbot, they will not use them. Lack of trust was further explained as a reason for avoiding using e-government chatbots if

not necessary. Another informant also highlights the importance of not using a chatbot uncritically, as with everything technical errors can occur.

Information quality (IQ)

For IQ1, IQ2, and IQ3 the mean ranges from 2.98 to 4.19 indicating the respondents have had a slightly negative to neutral experience in regard to how the information provided by chatbots has met their needs, been accurate and up-to-date. In the interviews, the majority of the informants believe that the information provided by the chatbot is up to date, but some informants have also experienced that the information has not always been updated and that it may vary. One of the informants experienced that an e-government chatbot was not updated on current laws and regulations regarding covid-19 restrictions as these rules changed rapidly at that time during the covid-19 pandemic. Another informant mentions that the person has never been afraid that the information has not been accurate. When the informants were asked if they thought the information provided by such chatbots matched their expectations, the majority answered that e-government chatbots rarely meet the expectations and that they have a great potential for improvement. An informant points out that the answers they received from the chatbots are never as desired. Several informants still state that information quality can vary as the informants experience some e-government chatbots as better than others.

Informants	Quote
Informant 5	*"There it is varying as well. Again, this is with quality so some have higher quality than others. The database of chatbots is probably a little different in size so those that are well developed are good and give good feedback. But some do not quite manage to capture what you ask for and then you get nowhere."*

System quality (SQ)

The mean of SQ1, SQ2, and SQ4 ranges from 3.51 to 3.95, indicating that the majority is neutral when asked about their experience of ease-of-use with the chatbots. However, the standard deviation (std) for SQ is rather high, with SQ1 having an std of 1.95 indicating that the response of this item varies. In the interviews when the informants were asked how they experience the ease-of-use of such chatbots, they answer that it varies. This is further explained by one informant that it is easy to write in a chat to a chatbot, but the way forward can be perceived as difficult as it can be difficult to get the right answer from the chatbot. Another informant believes that ease-of-use is about getting the right help from the chatbot, and here the informant experiences that the chatbot is not always able to help or respond to what is asked. It is then the informant experiences that ease-of-use is not satisfying as the informant does not achieve what is desired. One informant stated that ease-of-use with e-government chatbots can vary, but generally does not find it difficult to use such chatbots.

Another informant experiences the ease-of-use as straightforward, and easier than what the informant had imagined it to be.

Informants	Quote
Informant 4	*"It depends a bit on the questions. I use a chatbot as option 2. I try to search for the information myself. When I do not find the right information, I ask the chatbot, but I do not always know what to ask. This leads me to experience that the usability is not so good. That's when I think I should have called someone to talk to instead. So as long as you know what to ask for, the usability is good. [...]"*

Service quality (SVQ)

The means of SVQ1, SVQ2, and SVQ3 range from 3.54 to 4.50. This indicates that the majority is neutral when asked if they feel that chatbots in the public sector provide dependable service, prompt service to the citizens and that they are designed with the citizens' best interest in mind. In the interviews when the informants were asked if they felt that such chatbots were designed with the best interests of the citizens in mind, the majority said that they generally believe that they are designed with citizens' best interests in mind. However, it was pointed out that the chatbots are also about efficiency, resource use, and for the government agencies to not have to use human resources.

The relationship between IQ and COU

All the three quality dimensions were found to have a significant positive influence on empowerment, supporting H1, H2, and H3. In the interviews, the majority of the informants answer that they experience a high degree of connection between how chatbots convey information and to what extent they feel confident in their skills to use it. The findings from the interviews support the findings from the survey and are further explained with the information conveyed being dependent on how exact the user is able to be in their questions to a chatbot.

Informants	Quote
Informant 10	*"There is a very high degree of coherence in dissemination and use when it comes to a chatbot. Because if you do not know the exact keyword you are going to use, you will not get information. Then you only get an answer from the chatbot; reformulate. And then it does not work. But if you have been inside and looked at the information before and know what words the chatbot uses, it is easy to use, but yes, if you have no idea what to write, only the chatbot answers "I do not understand. Rephrase, write shorter questions or use another word."*

The relationship between IQ and IOS

In regard to the degree of control felt when using e-government chatbots and how this is related to how the chatbot conveys information, the majority of informants experience a high degree of control and that it does depend on how the chatbot conveys information. One informant explains that when chatting with a chatbot and when the chatbot is not understanding or responding to what is being asked, the informant gives up and uses another function on the website to find information. This indicates that the control that a person is feeling can quickly disappear and therefore be affected by the way the chatbot responds to the informant. Thus, supporting the findings from the survey that there is a correlation between information quality and how empowered the user feels.

Informants	Quote
Informant 9	*"I think it's pretty easy to use a chatbot, I think. But then I also think that if you are not confident in using it and just think everything is scary and new or difficult, well of course it has a connection then."*
Informant 11	*"I experienced that quite strongly. It is important that the information is conveyed in a correct way. Not that you do not get confused [...]."*

The relationship between SQ and IOS

The majority of informants clearly answer that they experience to a great extent that the control they feel in the conversation with the chatbot is dependent on the ease-of-use.

Informants	Quote
Informant 5	*"It depends entirely on usability."*

The relationship between SQ and MEA

The majority of informants believe that there is a high degree of connection between the ease-of-use of the chatbot and how meaningful it is to use such chatbots. This correlates with the findings from the survey, but it was highlighted in the interviews by the informants that the connection between the ease-of-use and how meaningful it is to use will vary depending on the chatbot.

Informants	Quote
Informant 10	*"There will be a high degree of coherence if the chatbot is user-friendly and if it is meaningful to use. If it is not user-friendly then the chatbot is not meaningful. It depends on the chatbot."*

The relationship between TRB and IQ

The majority of the informants confirm that there is a high degree of correlation between trusting beliefs and information quality. This is in accordance with the findings from the survey that information quality has a positive influence on trusting beliefs. When the informants were asked to what extent does the way such chatbots provide information affect the extent to which you feel the chatbot is competent. The majority say that there is a high degree of affect, but some are uncertain. One of the informants who does not feel that there is a high degree of affect points out that a chatbot can be competent, but still conveys misinformation and does not see that the competence of a chatbot can affect the way a chatbot is providing information.

Informants	Quote
Informant 10	*"Yes, there is a big connection with that. An example is if it is a bad chatbot that only gives you a link to a page that you would normally find in a category field in the menu on the website or in the search field, or if he leads you through and is a proper chatbot and not just an encyclopedia. So there is a big connection, yes. If the chatbot is not competent then he only gives you a short "read this article and find out for yourself", while if it is competent he guides you through the whole article and says "these and these things most likely apply in your context and if it is uncertain then he says "you have to contact a proper person, the normal guidelines do not apply to you, you have to talk to a proper supervisor."*

When it comes to trusting beliefs and information quality, these two can influence each other, and this is a clear result from the interviews with the informants. When a chatbot provides information that is correct and up to date, this helps the user to feel that they can trust a chatbot. When the informants were asked whether they believe that the information provided by e-government chatbots is up-to-date at all times, the opinions are a little divided. Several say that they expect the information to be updated at all times and trust the information that is provided by the chatbots. Others state that they are insecure, and do not think that the information is always updated. The following quotes are presented with different opinions about how up-to-date they have felt a chatbot has been on information.

Informants	Quote
Informant 2	*"I feel that for the most of the time, the chatbot has been updated for the public to what I have used it for."*
Informant 7	*"Medium, because I can feel a little insecure."*
Informant 8	*"I think it is. In most cases. There is certainly a variable there as well, but in most cases I think so."*

The relationship between TRB and SQ

In the survey, the relationship between system quality and trusting beliefs was not found to be significant, thus, H5 was dismissed. However, in the interviews, the majority of the informants emphasize that they feel there is a high degree of correlation between ease-of-use and how competent the chatbot is. Ease-of-use is associated with how competent a chatbot is at conveying information. And when a user gets the help the user needs, then the chatbot is perceived as competent and user-friendly.

Informants	Quote
Informant 1	*"So the ease-of-use is really how competent it is at conveying information. Then you can write something simple or ask about something in a sentence, and you get the right answer, more than what you personally are looking for, I would say that the chatbot is highly competent. And then I want to say that the usability is good. To a large extent."*
Informant 4	*"I'm a little more insecure there. Maybe not so much because I think it is very up to the user about what is being conveyed."*

The relationship between TRB and SVQ

The majority of the informants stated that there is a high degree of correlation between how competent a chatbot is and their perception of whether it is designed with the citizens' best interests in focus. When the information that the chatbot provides to the user is correct, and the chatbot is able to provide service at the same time, a connection is experienced.

Informants	Quote
Informant 8	*"Well, I think there is a great deal of connection there. The chatbots are designed to provide service and give you the best. And if the information provided by the chatbot is correct then the chatbot is competent. Yes, with the best of intentions."*
Informant 9	*"I think it's very important that people trust the chatbot. And if we humans think that chatbots do not have people's best interests in mind, then we will not use them so I think that is very important."*

The majority of the informants also mean that there is a high degree of connection between how competent a chatbot is and how reliable it is. A chatbot is seen as competent if the informant feels that the chatbot is reliable. It is mentioned in the interview that it is important to be skeptical when it comes to a chatbot, but it is also important that the users get a feeling that the chatbot is reliable and competent. A chatbot will no longer be useful to use if a user does not find the chatbot reliable.

Informants	Quote
Informant 3	*"We should always be a little skeptical, but if there is a public agency, I probably think they are reliable and think they are competent. To a high degree."*
Informant 9	*"I think it is very important. It must be credible and reliable. If you miss one of them, it falls, yes it just falls."*

Key takeaways from the interviews

To summarize and get an overview of the key findings from the interviews, the key takeaways are listed in table 7.

Table 7. Key takeaways from the interviews

Construct	Key takeaways from interviews
COU	Generally, the informants have experienced that they have the skills necessary to use e-government chatbots.
	If there's limited competence towards using chatbots, it is caused by lack of experience.
IMP	Clear and simple inputs to the chatbots is crucial.
	If the chatbot does not understand the question asked, the informant's feeling of control is lost and they easily end the conversation if this happens.
	Control can be affected by how experienced you are with chatbots.
	It is crucial to write in an easy way when chatting with a chatbot so it will understand.
MEA	There are mixed opinions on whether it is meaningful to use e-government chatbots.
	Having access to a chatbot is perceived as meaningful, however, communicating with a human agent is commonly preferred over a chatbot.
	Generally, informants have an open mind towards chatbots, and understand that it is becoming more meaningful to use them.
	If chatbots are perceived as poorly designed, and they are not perceived as meaningful to use.
SED	It depends on which chatbots were used when it comes to if the informants feel that they can or can not decide how they use a chatbot.
TRB	The informants feel that it varies from chatbot to chatbot whether it is competent or not.
	Chatbots are generally perceived as incompetent by the informants because the chatbot often do not understand what is being asked.
	When there's a lack of understanding between chatbots and informants, trusting beliefs are affected.
IQ	Generally, information provided by e-government chatbot is up to date.
	It is common that the information provided by e-government chatbots do not meet the informants expectations.
	There is a potential for improvement in regards to information quality.

Construct	Key takeaways from interviews
SQ	The ease-of-use of e-government chatbots varies depending on the chatbot.
	In general, informants do not find it difficult to use e-government chatbots.
SVQ	The informants generally believe that e-government chatbots are designed with citizens' best interest in mind but that such chatbots are more about increasing efficiency and saving resources for the government agency than citizen centric.
IQ and COU	The informants experience a high degree of connection between how chatbots convey information and to what extent they feel confident in their competence to use it.
IQ and IOS	The informants experience the level of control felt when using e-government chatbots is related to how the chatbot conveys information.
SQ and IOS	The majority of informants experience to a great extent that the control they feel in the conversation with the chatbot is dependent on the ease-of-use.
SQ and MEA	There is a high degree of connection between the ease-of-use of the chatbot and how meaningful it is to use such chatbots.
TRB and IQ	There is a high degree of correlation between trusting beliefs and information quality.
	A chatbot can be perceived as competent or not based on the way it provides information.
	Trusting beliefs and information quality influence each other.
	When a chatbot provides information that is correct and up to date, this helps the user to feel that they can trust it.
TRB and SQ	There is a high degree of correlation between ease-of-use and how competent the chatbot is.
	Ease-of-use is associated with how competent a chatbot is at conveying information.
TRB and SVQ	There is a high degree of correlation between how competent a chatbot is and their perception of whether it is designed with the citizens' best interests in focus.
	A chatbot is seen as competent if the informant feels that the chatbot is reliable.

6. Discussion

In this chapter we will discuss our findings from the mixed methods study, how they answer the initial research question, and put it into context with previous literature and research. This study was set out with the aim of answering the initial research question:

RQ: *How does the information, system and service quality of chatbots affect citizens' empowerment and trusting beliefs when using e-government chatbots?*

In order to answer our research question, we used the data collected from the questionnaire to test nine hypotheses and additionally performed follow-up interviews. A summary of the hypothesis testing result is illustrated in table 8.

First, we will discuss to what extent citizens perceive the quality and empowerment when using e-government. Second, we discuss how quality affects empowerment and trusting beliefs. Third, we discuss how trusting beliefs and empowerment affects satisfaction. Fourth, we discuss the road ahead with implications and limitations before we conclude.

Table 8. Summary Hypotheses Testing Results

Hypotheses	Supported	Not supported
H1 = Information quality of e-government chatbots positively influence the citizens' feeling of empowerment	x	
H2 = System quality of e-government chatbots positively influence the citizens' feeling of empowerment	x	
H3 = Service quality of e-government chatbots positively influence the citizens' feeling of empowerment	x	
H4 = Information quality is positively associated with Citizens' trusting beliefs in e-government chatbots	x	
H5 = System quality is positively associated with Citizens' trusting beliefs in e-government chatbots		x
H6 = Service quality is positively associated with Citizens' trusting beliefs in e-government chatbots	x	
H7 = Citizens' trusting beliefs are positively associated with the satisfaction with e-government chatbots	x	
H8 = Citizens' empowerment is positively associated with the satisfaction with e-government chatbots	x	
H9 = Citizens' satisfaction is positively associated with the intention to use e-government chatbots	x	

6.1 Quality

To measure citizens' perceived information, system and service quality when using e-government chatbots we used the quality dimensions information, system and service quality based on the Delone & Mclean (2003) updated IS success model. The results from the questionnaire indicate that for all the quality measures, the perceived quality of e-government chatbots is rather midrange. It could be argued that this is a result of the quality of e-government chatbots not meeting citizens' expectations. Previous studies have noted that if the information quality of a chatbot is perceived as poor, users may seek the required information and services elsewhere (Ashfaq et al., 2020). This requires more time and effort, resulting in the user perceiving the company as unable to provide them with the desired quality service (Ashfaq et al., 2020). This is further verified and explained in the follow-up interviews to be a result of information not always being up to date and that information that the chatbot provides does not meet the users expectations.

6.2 Empowerment

To measure the extent of empowerment felt by citizens when using e-government chatbots we used the four dimensions of empowerment in the context of IS by Kim & Gupta (2014).

6.2.1 Competence of user

The results from both the survey and follow-up interviews reveal that the majority of respondents feel that they have the necessary competence to use e-government chatbots. This finding is not unexpected as the majority of samples gathered in the questionnaire is represented by younger adults. The prevalence of younger adults is assumed to be related to the requirement of including only respondents that have actually used chatbots provided by public organizations in Norway. As far as we know, there are no available statistics on the age distribution of chatbot users in Norway, but it is known that chatbots are primarily used by the younger population. The most recent related statistics available come from a survey performed in November 2020 on a representative sample of the French population by the public opinion institute (IFOP) (IFOP, 2020). The survey showed that chatbots (in a commercial or public service context) have been used at least once by 62% of the younger population (aged 35 or less) but only by 39% of the population aged above 35 years (IFOP, 2020). The findings from the IFOP report are in accordance with our findings and indicate that as of now, the majority of users of e-government chatbots in Norway are younger adults. With the rapid evolution in technology, it is reasonable to assume that the use of AI technology in the provision of government services will only continue to increase. On one hand, it can be argued that it is and will continue to be challenging to prevent the older population from falling behind on e-government adoption. On the other hand, this highlights the importance of developing e-government chatbots that are more inclusive and enable empowering citizens of all age groups in the population with e-government chatbots.

6.2.2 Impact of system usage

The results from both the survey and follow-up interviews indicate that the respondents are rather neutral when it comes to the degree of perceived impact when using e-government chatbots. This result may be explained by the fact that the respondents have not experienced a sufficient level of control in the interaction with e-government chatbots. This finding emphasizes the importance of providing citizens with the feeling that they are in control and that they have the ability to influence the services an e-government chatbot provides. This is in accordance with the findings of Alshibly & Chiong (2015), who argue that the level of e-government success will increase by providing users with the perception of being in control (Alshibly & Chiong, 2015). This finding is further explained in the follow-up interviews as the e-government chatbots being dependent on queries from citizens being clear and simple enough for the chatbot to interpret correctly. If the chatbot does not understand the question correctly, the citizens' feeling of control is diminished. This finding emphasizes the importance of making citizens feel like they are in control when interacting with e-government chatbots.

6.2.3 Meaning of system usage

The results from both the survey and follow-up interviews indicate that the respondents do not find the use of e-government chatbots particularly meaningful. A possible explanation may be that the chatbot technology used in e-government chatbots as of now is only able to handle rather simple questions. Chen et al. (2015) noted that citizens reflect their expectations to online service encounters based on their prior experiences with existing offline government services (Chen et al., 2015). On one hand, it could be argued that for e-government chatbots, the citizens' previous experiences with a governmental agency will affect their expectations towards an e-government chatbot from that same agency. On the other hand, prior chatbot experience could also affect the citizens' expectations towards e-government chatbots. If a citizen has had an interaction with a chatbot previously and the chatbot did not meet the citizen's needs, the meaning of usage could be diminished. In the follow-up interview, it was indicated that prior negative experiences with chatbots affect their expectations towards e-government chatbots and that if there is a choice, a human agent is preferred.

6.2.4 Self- determination

The results from both the survey and follow-up interviews indicate that the respondents are rather neutral when it comes to the degree of self- determination citizens' perceive when using e-government chatbots. In the follow-up interviews, it was highlighted that the degree of self-determination felt when using e-government chatbots depends on which chatbot and what government agency it belongs to. This result may be explained by the fact that we in this study have not focused on a particular e-government chatbot but rather on e-government chatbots in general.

6.3 How Chatbot Quality affects Citizens' Empowerment

The key findings of this study relate to how quality influences citizens' feeling of empowerment when using e-government chatbots. The results indicate that all the three quality dimensions have significant effects on empowerment, with service quality having a slightly higher influence than information and system quality. This finding indicates that in the context of e-government chatbots, the chatbot quality affects citizens' perceptions of their competence, the level of impact, the meaning of usage, and self-determination towards using such chatbots. Hence, the higher degree of quality in information, system and service, the more empowered citizens feel when using e-government chatbots. Few studies have addressed quality in the context of citizen empowerment. One of the identified studies addressed the role of information quality on empowerment in the context of online brand communities (Hsieh et al., 2018). Our findings are consistent with their findings suggesting that information quality has a significant influence on empowerment (Hsieh et al., 2018). The interviews highlighted that the control felt in an interaction with a chatbot is very dependent on how the chatbot provides information. This also holds for the connection between ease-of-use and how meaningful it is to use a chatbot.

In previous studies, information quality has been found as the most important quality dimension in measuring the success of a system (Chen et al., 2015; Delone & McLean, 2003)**.** Even though measuring the success of e-government chatbots (including net benefits) was out of the scope of this study, it is interesting to see that in this study the influence of the quality dimensions on empowerment is more even, with service quality having the greatest influence. This indicates that in terms of quality considerations of e-government chatbots, all the three quality dimensions should be addressed. As chatbots are dependent on user input and can engage in proactive or reactive behavior (Castillo et al., 2021), it can be argued that citizens will be expecting a higher degree of system and service quality compared to an e-government website. The findings from the follow-up interviews emphasize that not only the information provided, but also the chatbot's ease-of-use and how reliable the chatbot is, influence how empowered they feel during the interaction.

If the chatbot quality is not sufficient in terms of information, system and service the potential consequence is that citizens will end the interaction and seek the required information or service elsewhere. On one hand, citizens may interact with a chatbot motivated by the potential benefits of using chatbots, such as time-saving or availability at any time and day (Castillo et al., 2021). If however, the chatbot quality does not satisfy the citizens' expectations, they might end up feeling that they lost more resources than what was gained from using the chatbot (Castillo et al., 2021). Alshibly & Chiong (2015) found that the greater the extent to which an e-government website understands and represents the personal needs of the user, the more empowered the user becomes (Alshibly & Chiong, 2015). This emphasizes that increased personalization of e-government chatbots can be an important factor in utilizing the full potential of such chatbots. Personalization in the context

of e-government chatbots would mean enabling possibilities of tailoring how and what information is provided through the chatbots and customizing how chatbots guide citizens through different service choices (Alshibly & Chiong, 2015).

6.4 How Chatbot Quality affects Citizens' Trusting Beliefs

The results of the survey indicate that information and service quality have a significant effect on the citizens' trusting beliefs when using e-governmental chatbots, with service quality as the strongest influence on trusting beliefs out of all the quality dimensions. Thus, the higher degree of information and service quality a chatbot has, the higher trusting beliefs citizens will have towards the chatbot. The follow-up interviews complement these findings and further elaborates that if the information provided by e-government chatbots is inaccurate, this indicates that citizens' builds a lower degree of trusting beliefs towards e-government chatbots. The interviews further highlight that service quality is crucial in determining citizens' trust. If the citizens find that the service provided is unreliable, it will lead to insecurities among citizens. It can be argued that the intention to use such chatbots also will decrease due to a lower degree of trusting beliefs towards the chatbot. These findings are consistent with previous studies that have investigated quality and trust and found trust as a key success factor in achieving user satisfaction with an IS (Alzahrani et al., 2016; Mcknight et al., 2002; Pappas et al., 2018; Teo et al., 2009). Furthermore, our findings on information and service quality are consistent with the findings by Mcknight et al. (2002) on website quality and trusting beliefs (Mcknight et al., 2002) and the findings of Nicolaou & Mcknight (2006) on information quality and trusting beliefs in data exchanges (Nicolaou & Mcknight, 2006). Our study adds to their findings by adding information and service quality as significant factors affecting citizens' trusting beliefs when using e-governmental chatbots. This indicates that the higher the quality of e-government chatbots the more citizens will build trusting beliefs towards such chatbots.

Interestingly, the findings from the survey revealed that system quality was not found to have a significant effect on trusting beliefs towards e-government chatbots. However, in the interviews it was emphasized that the degree of ease-of-use a chatbot has, will affect how competent the chatbot is perceived. Hence, we argue that the system quality of e-government chatbots to some extent will affect citizens' trusting beliefs. However, the importance of system quality on trusting beliefs may be less crucial than that of information and service quality.

6.5 Satisfaction

6.5.1 Trusting beliefs

The results of this study indicate that the degree of trusting beliefs experienced by citizens when using e-government chatbots influences their satisfaction with such chatbots. Previous studies have identified quality and trust as critical success factors in achieving user satisfaction with IS (Mcknight et al., 2002; Pappas et al., 2018; Teo et al., 2009). Thus, it is

not unexpecting that in this study trusting beliefs is found to significantly affect citizens' satisfaction with e-government chatbots. The findings of this study complement previous findings by showing how trusting beliefs directly influence citizens' satisfaction with e-government chatbots. Our findings indicate that a higher degree of satisfaction is an outcome when there are higher trusting beliefs among citizens using e-government chatbots. This is in accordance with the findings of Bhattacherjee & Premkumar (2004) that level of satisfaction is correlated to the trusting beliefs towards a system (Bhattacherjee & Premkumar, 2004). Unlike human agents and regardless of how developed and advanced chatbots become in the future, one of the main weaknesses of chatbots is that they are not able to show empathy. Thus, it can be argued that a more extensive use of chatbots collaborating with human service agents and smoother handovers between them can promote building trust, and therefore increase citizens' satisfaction with e-governments (Ashfaq et al., 2020; Vassilakopoulou & Pappas, 2022).

6.5.2 Empowerment

Another central finding of this study suggests that the higher level of empowerment experienced when using e-government, the more satisfied citizens become. Ashfaq et al. (2020) found that information and service quality are crucial determinants in increasing user satisfaction and continuous intention to use chatbots (Ashfaq et al., 2020). Our finding suggests that in explaining satisfaction with e-government chatbots, it is not only technical factors such as information, system and service quality that are determining citizens' satisfaction. It can be argued that in order to achieve the full potential with e-government chatbots, government agencies must consider citizens' perceptions of empowerment as a key causal mechanism for success. Citizen empowerment goes beyond providing basic access to information and services, towards transforming citizens from general users into empowered individuals through digital services (Kim & Gupta, 2014). Our findings support previous arguments on user empowerment as a key mechanism in relation to user behavior (i.e., using the system to its full potential in an extended, integrative, and emergent way) in the IS usage context (Kim & Gupta, 2014). The findings in this study are also in accordance with the findings of Nguyen & Tran (2022) on citizen empowerment significantly influencing citizen adoption of e-government services (Nguyen & Tran, 2022).

7. Contribution and the Road Ahead

This thesis is one of the very first studies that have investigated factors affecting citizens' satisfaction with e-government chatbots in Norway. To do that, we performed a mixed methods study to get a thorough understanding of the role of quality, trusting beliefs and empowerment in explaining user satisfaction. Our empirical data consists of 105 samples collected with a survey and 11 follow-up interviews. The main contribution is the unveiling of the role of quality on citizens' empowerment and how the level of empowerment affects citizens' satisfaction with e-government chatbots. The higher degree of information, system and service quality, the more citizens' feel empowered to use e-government chatbots. This finding gives valuable insight of the importance of quality and focusing on empowering citizens in order for citizens to use and value e-government services such as chatbots.

7.1 Implications for Practitioners

The results from this study reveal a demand for government agencies in increasing awareness on the relationship of quality, trusting beliefs and citizen empowerment when developing, managing and maintaining e-government chatbots. In order to empower citizens with e-government chatbots, it is crucial for practitioners to raise awareness and facilitate developing appropriate measures. A crucial determinant is including citizens representing all groups of the society in this process. Table 9 represents our recommendations to practitioners in increasing focus on empowerment in e-government chatbots.

Table 9. Recommendations to Practitioners

Empowerment	**Recommendations to Practitioners**
Competence of user	Develop initiatives to increase competence to use e-government chatbots for all groups in society: ● What knowledge do citizens need to use the chatbot? ● What skills do citizens need to use the chatbot? ● What contributes to citizens feeling confident when using the chatbot?
Impact of system usage	Develop an environment where citizens feel like they are in control and that they influence the outcome of using e-government chatbots: ● What individual needs do citizens have of the chatbot? ● How can the chatbot be adjusted to fit citizens' individual needs?

Empowerment	**Recommendations to Practitioners**
Meaning of system usage	Develop a transparent approach stating clearly the meaning of why the chatbot exists and the meaning of using it: ● Why has the chatbot been implemented by the government agency? ● What is the purpose of using the chatbot? ● How do chatbots help citizens? ● How is the use of the chatbot valuable to citizens?
Self-determination	● Establish and address the relationship between citizens expectations and what the chatbot is capable of ● Show transparency to citizens in how the chatbot is supposed to behave

7.2 Limitations and Implications for Further Research

As with any research, there are limitations to this study. Our findings show the importance of quality affecting citizens trusting beliefs and empowerment and how these factors influence citizen satisfaction. These factors and relationships can be further understood and theorized by analyzing data from observations and logs of citizens' interactions with e-government chatbots. Five of the six constructs from the IS Success Model were adapted, as the main objective of this study was to investigate satisfaction and usage rather than the success of e-government chatbots. Thus, we excluded sixth, net benefits. Future studies can extend our work by also investigating the overall success of e-government chatbots. Previous studies have found personalization of e-government services as a factor that contributes to more empowered users (Alshibly & Chiong, 2015). Based on this, future studies should address the role of personalization of e-government chatbots. Recent research has addressed how to improve efficiency with e-government chatbots while keeping the characteristics of humane satisfying service with hybrid teams; chatbots and human service agents collaborating (Vassilakopoulou et al., 2022; Vassilakopoulou & Pappas, 2022). Their findings suggest that the discovery of ***affordances*** (what a human can do with a technological object) made human service agents recognise the potential of hybrid service teams (Vassilakopoulou et al., 2022). Future studies could address affordance theory and the impact hybrid service teams have on citizens' empowerment.

A challenge when collecting data was recruiting respondents of different age groups and with varying backgrounds. The majority of the survey sample in this study are mainly young adults. Thus, it is expected that the majority of the respondents is familiar with the use of technology and can easily adapt to developments within e-governmental services and chatbots. This limitation can be a result of the snowball sampling approach not being

sufficient in reaching out to the older population. Additionally, as a result of the sampling method, the respondents that chose to participate might not represent the general capabilities of the population or might have had particularly negative experiences with e-governmental chatbots etc. Future studies should investigate how e-government chatbots empower or disempower the general population including more responses from the elderly and non-native Norwegians. Another limitation is the translation of items in the questionnaire to Norwegian, with items adapted and translated from English. This may have affected how the items were interpreted and some may have been misunderstood from its original meaning by the respondents. For further research, a larger qualitative study can be carried out where more informants can be interviewed so that the reflection of opinions and experiences of the population in Norway comes out even more clearly. Based on our findings, we further recommend conducting more empirical research on the use of e-government chatbots with a higher number of informants from the Norwegian population included in the study.

7.3 Conclusion

In this thesis we have investigated citizens' satisfaction and intention to use e-government chatbots in Norway. We have had a focus on the role of information, system, and service quality in forming citizens' empowerment and trusting beliefs, which in turn may explain citizens' satisfaction and intention to use chatbots. With this thesis, our aim has been to answer the initial research question:

How does information, system and service quality of chatbots affect citizens' empowerment and trusting beliefs when using e-government chatbots?

To answer the research question, a mixed methods study was performed that yielded 105 responses from the survey and 11 follow-up interviews. Based on the data collected we suggest a comprehensive model to illustrate the role of quality, trusting beliefs in explaining citizens' satisfaction with e-government chatbots. The key findings of this study suggest that information, system and service quality positively affects citizens empowerment when using e-government chatbots. The higher information, system and service quality of the chatbot, the more empowered citizens feel when using it and the more satisfied they become. Further, the level of empowerment experienced by citizens positively affects their satisfaction with e-government chatbots. In the interviews, it was emphasized that the control felt in an interaction with a chatbot is very dependent on how the chatbot provides the information. This also holds for the connection between ease-of-use and how meaningful it is to use a chatbot. Furthermore, our findings suggest that information and service quality positively affects trusting beliefs, which again positively affects citizens satisfaction. The results of this study reveal a demand for government agencies in increasing awareness on the relationship of quality, trusting beliefs and citizen empowerment when developing, managing and maintaining e-government chatbots. The findings from this study contribute by yielding valuable insight of the importance of focusing on empowering citizens in order for citizens to use and value e-government services such as chatbots.

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9. Appendices

Appendix 1

Survey Item Descriptions

Construct	Item	Loading	Mean	Std	Statement
Information Quality	IQ1	0.87	2.98	1.770	In my experience information provided by such chatbots meets my needs
	IQ2	0.84	3.55	1.732	In my experience information provided by such chatbots is accurate
	IQ3	0.82	4.19	1.612	In my experience information provided by such chatbots is up-to-date
Satisfaction	SAT1	0.96	3.09	1.671	I feel that chatbots meet adequately my needs for interaction with the government
	SAT3	0.95	3.14	1.608	Chatbots are effectively fulfilling my needs for interaction with the government
	SAT4	0.94	3.15	1.758	Overall I am satisfied with chatbots
System Quality	SQ1	0.93	3.95	1.958	In my experience, such chatbots is easy to use
	SQ2	0.94	3.51	1.793	In my experience, such chatbots is user-friendly
	SQ3	0.72	3.79	1.785	In my opinion, such chatbots requires a lot of effort to use
Service Quality	SVQ1	0.89	3.54	1.587	In my opinion, such chatbots provides dependable services
	SVQ2	0.85	4.50	1.749	In my opinion, such chatbots gives prompt service to citizens
	SVQ4	0.82	3.54	1.819	In my opinion, such chatbots is designed with citizen’s best interests at heart
Trusting beliefs	TRB1	0.88	3.91	1.665	I believe that such chatbots are competent and effective in providing governmental information
	TRB2	0.93	3.51	1.727	I believe that such chatbots perform their role of giving governmental information very well
	TRB3	0.91	3.69	1.660	I believe that such chatbots are capable and proficient governmental information providers
	TRB4	0.91	3.70	1.659	In general, such chatbots are very knowledgeable about governmental services
Intention to use	USE1	0.92	3.94	1.870	I would use chatbots for getting government information
	USE2	0.93	3.73	1.745	I would use government services provided by chatbots
	USE3	0.93	3.67	1.774	Interacting with the government using chatbots is something that I would do

Construct	Item	Loading	Mean	Std	Statement
Empowerment	COU1	0.93	6.39	1.005	I have the skills necessary to use chatbots
	COU2	0.96	6.13	1.169	I am self-assured about my capabilities of using chatbots
	COU3	0.97	6.18	1.090	I am confident about my ability to use chatbots
	IMP1	0.87	4.18	1.818	Based on using chatbots, I feel that I'm in control of the task I want to accomplish
	IMP2	0.90	3.73	1.734	Based on using chatbots, I have significant influence over what happens in the interaction
	IMP3	0.92	3.70	1.709	Based on using chatbots, I have a great deal of control over what happens in the interaction
	MEA1	0.93	2.86	1.745	Using chatbots for public services is very important to me
	MEA2	0.93	3.02	1.743	Using chatbots for public services is meaningful to me
	MEA3	0.90	2.48	1.624	My chatbot activity are personally meaningful to me
	SED1	0.93	3.99	1.644	I have significant autonomy in determining how I use the chatbot
	SED2	0.89	3.60	1.690	I have considerable opportunity for independence and freedom in how I use the chatbot
	SED3	0.88	3.82	1.849	I can decide on my own how to go about using the chatbot

Appendix 2

List of Quotes from the Interviews

ID	Category	Quote (Norwegian) Original	Quote (English) Translated
2	*COU*	*“Jeg føler jeg klarer det ganske greit. Nå har jeg ikke brukt det så kjempe masse, men av det jeg har brukt chatboten til så føler jeg at de fleste svarene på enkle spørsmål som jeg har hatt, og opplysningene jeg har fått har vært greit. Så det synes jeg. Bruker det mer og mer.”*	*"I feel I can do it quite well. Now I have not used it very much, but from what I have used the chatbot for when I have asked simple questions, I feel that most of the answers I have received have been fine and the information has been fine as well. I use it more and more.”*
8	*COU*	*“Jeg vil si at jeg føler jeg mestrer det greit. Jeg har ingen problemer med å forstå virkemåten nei.”*	*"I want to say that I feel I can handle it well. I have no problem understanding the way it works. ”*
5	*COU*	*“Mine ferdigheter er begrenset, men tilstrekkelig til å få den hjelpen jeg trenger.”*	*"My skills are limited, but adequate to get the help I need."*
4	*COU*	*“Mine ferdigheter er gode nok.*	*“My skills are good enough.”*
10	*IMP*	*“At chatboten ikke sender meg på villspor rundt forbi, men at han svarer på det jeg spør om. For med engang hvis jeg skriver noe chatboten ikke forstår det, eller omformuler så føler jeg at jeg mister kontrollen og da gir jeg som regel opp”*	*"When the chatbot does not send me astray, but answers what I ask, I feel in control. Because right away if I write something the chatbot does not understand, or reformulate, I feel that I lose control and then I usually give up."*
7	*IMP*	*“Jeg tror jeg føler jeg har kontroll, men av og til når jeg har stilt spørsmål som chatboten ikke forstår så har jeg jo ikke kontroll lenger og da avslutter jeg det jo bare.”*	*"I think I feel I have control, but sometimes when I have asked questions that the chatbot does not understand, I no longer have control and then I just end the interaction ."*
11	*IMP*	*“[...] Altså, jeg gjør jo dette i faglig sammenheng. Og så lenge jeg har et faglig grep på det jeg spør om, altså jeg må vite hva jeg skal spør om. Det er veldig viktig. Også.. Eh. Ja, det er forutsetninga. Så for å sette i gang en sånn prosess så forbereder jeg meg jo.”*	*“[...] Well, I do this in a professional context. And as long as I have a professional grasp of what I am asking about, that is, I must know what to ask about. It is very important. Also .. Eh. Yes, that is the prerequisite. So to start such a process, I prepare myself. ”*
11	*MEA*	*“Det har hjulpet meg i mitt yrke, det har det absolutt. Som jeg sagt til deg tidligere så opplever jeg jo veldig ofte at det er vanskelig å få personlig kontakt med saksbehandlere i det offentlige og da har jeg nytte av disse robotene som jeg kaller det for.”*	*"It has helped me in my profession, it certainly has. As I said to you earlier, I experience very often that it is difficult to get personal contact with caseworkers in the public sector and then I benefit from these robots as I call it."*
4	*MEA*	*“Det kan være veldig meningsfylt. Det kan være tidsbesparende, men jeg er ikke helt sikker på om en får all relevant informasjon for de svarer jo bare på det man spør om så hvis ikke spørsmålet er godt nok så kan det jo være litt vrient. Da kan man jo oppleve at man*	*“It can be very meaningful. It can be time-saving, but I'm not entirely sure if you get all the relevant information because they only answer what you ask, so if the question is not good enough, it can be a bit twisted. Then you can experience things that you are not completely sure about. ”*

ID	Category	Quote (Norwegian) Original	Quote (English) Translated
		ikke er helt sikker."	
7	*MEA*	*"Middels meningsfylt, fordi det kommer an på hvis jeg kan snakke med noen personlig så velger jeg heller det fremfor en chatbot. Men chatboten er jo mye kjappere på tid når det kommer til å prate med chatboten."*	*"Medium meaningful, because it depends on if I can talk to someone in person, I prefer it rather than a chatbot. But the chatbot is much faster in time when it comes to chatting with the chatbot. "*
2	*SED*	*"Det har jeg nok for lite erfaring med å bruke chatboter. Kanskje etter hvert når en bruker det mer og mer at en føler at en kan styre det, men det er jo ofte chatboten som leder deg litt for å se hvor du vil hen."*	*"I probably have too little experience of using chatbots. Maybe eventually when you use it more and more that you feel that you can control it, but it is often the chatbot that leads you a bit to see where you want to go."*
7	*SED*	*"Det har jeg aldri tenkt på. Men jeg har jo ikke brukt en chatbot så veldig mye, så har ikke tenkt på at jeg kan bestemme selv hvordan jeg vil bruke de."*	*"I have never thought of that. But I have not used a chatbot very much, so I have not thought about that I can decide for myself how I want to use them."*
1	*TRB*	*"Ja det er jo litt blanda. Noen chatboter har jo vært kompetente og på en måte gir deg det du er ute etter mens andre er litt mer diffuse så det er jo litt blanda. I hvilken grad jeg skal si ... Midt på treet. Jeg føler jo at det er forbedringsmuligheter."*	*"Yes, it's a bit mixed. Some chatbots have been competent and in a way give you what you are looking for while others are a little more diffuse so it is a bit mixed. To what extent should I say ... Medium. I feel that there are opportunities for improvement."*
11	*TRB*	*"Jeg har litt sånn blanda erfaring med det. Jeg foretrekker jo å snakke med saksbehandlere men jeg har opplevd at saksbehandlere kan mindre enn de chatbotene jeg snakker med."*	*"I have a bit of a mixed experience with that. I prefer to talk to caseworkers, but I have experienced that caseworkers can do less than the chatbots I talk to."*
10	*TRB*	*"Jeg opplever ikke chatbotene som så veldig kompetente. Det kan variere ut ifra hvilke chatbot du bruker, men ja. For eksempel kommunen sin chatbot, den er jo en chat mens de andre jeg har brukt føler jeg er mer som et oppslagsverk. Du skriver en ting, og så får du akkurat det samme som du skulle skrive i søkefelt så chatboten er egentlig unødvendig og bortkastet hos noen."*	*"I do not find the chatbots to be very competent. It may vary depending on which chatbot you use, but yes. For example, the municipality's chatbot, it is a chat while the others I have used I feel are more like a reference work. You write one thing, and then you get exactly the same as you would write in a search field, so the chatbot is really unnecessary and a waste for someone."*
2	*TRB*	*"Det er jo kjempeviktig at du må kunne stole på chatbotene. At de svarene du får er reelle. At svaret du får fra chatboten ikke bør tviles på. For hvis du tviler på det så kommer jeg ikke til å bruke det."*	*"It is very important that you must be able to trust the chatbots. That the answers you get are real. That the answer you get from the chatbot should not be doubted. Because if you doubt it, I will not use it. "*
7	*TRB*	*"Det er veldig viktig å kunne stole på chatboter, og det er en av grunnene til at jeg har unngått å bruke det."*	*"It's very important to be able to trust chatbots, and that's one of the reasons I've avoided using it."*
5	*IQ*	*"Der er det å variabelt. Igjen, dette med kvalitet så har noen høyere kvalitet enn andre. Databasen til chatboter er nok litt ulike i størrelsen så de som er velutviklet er gode og gir fine tilbakemeldinger. Men noen klarer ikke*	*"There it is varying as well. Again, this is with quality so some have higher quality than others. The database of chatbots is probably a little different in size so those that are well developed are good and give good feedback. But some*

ID	Category	Quote (Norwegian) Original	Quote (English) Translated
		helt å fange opp det man spør om og da kommer man ingen vei."	*do not quite manage to capture what you ask for and then you get nowhere."*
4	*SQ*	*"Det kommer jo litt an på spørsmålene. En chatbot bruker jeg som alternativ 2. Jeg prøver å søke etter informasjonen selv. Når jeg ikke finner riktig informasjon så spør jeg chatbot, men det er ikke alltid jeg vet hva jeg skal spør om. Dette fører til at jeg opplever at brukervennligheten ikke er så god. Det er da jeg tenker at nå skulle jeg ha ringt til noen å snakket med istedenfor. Så så lenge man vet hva man skal spør om, så er brukervennligheten god. [...]*	*"It depends a bit on the questions. I use a chatbot as option 2. I try to search for the information myself. When I do not find the right information, I ask the chatbot, but I do not always know what to ask. This leads me to experience that the usability is not so good. That's when I think I should have called someone to talk to instead. So as long as you know what to ask for, the usability is good. [...]*
10	*IQ & COU*	*"Det er jo en veldig høy grad av sammenheng i formidling og bruk når det kommer til en chatbot. Fordi hvis du ikke vet akkurat det stikkordet du skal bruke så får du ikke informasjon. Da får du bare til svar av chatbot; omformuler. Og da funker det jo ikke. Men hvis du har vært inne og sett på informasjonen før og vet hvilke ord chatboten bruker så er den jo grei å bruke, men ja, hvis du ikke har peiling på hva du skal skrive så svarer bare chatboten "jeg forstår ikke. Omformuler deg, skriv kortere spørsmål eller bruk et annet ord."*	*"There is a very high degree of coherence in dissemination and use when it comes to a chatbot. Because if you do not know the exact keyword you are going to use, you will not get information. Then you only get an answer from the chatbot; reformulate. And then it does not work. But if you have been inside and looked at the information before and know what words the chatbot uses, it is easy to use, but yes, if you have no idea what to write, only the chatbot answers "I do not understand. Rephrase, write shorter questions or use another word."*
9	*IQ & IOS*	*"Jeg tenker jo at det er ganske enkelt å bruke en chatbot, det tenker jeg. Men så tenker jeg samtidig at hvis man ikke er trygg på å bruke det og bare synes alt er skummelt og nytt eller vanskelig, ja så klart så har det en sammenheng da."*	*"I think it's pretty easy to use a chatbot, I think. But then I also think that if you are not confident in using it and just think everything is scary and new or difficult, well of course it has a connection then."*
11	*IQ & IOS*	*"Det opplever jeg ganske sterkt. Det er viktig at informasjonen blir formidlet på en riktig måte. Ikke at du ikke blir forvirret [...]."*	*"I experienced that quite strongly. It is important that the information is conveyed in a correct way. Not that you do not get confused [...]. "*
5	*SQ & IOS*	*"Den er helt avhengig av brukervennligheten."*	*"It depends entirely on usability."*
10	*SQ & MEA*	*"Det blir jo en høy grad av sammenheng om chatboten er brukervennlig og om den er meningsfylt å bruke. Hvis den ikke er brukervennlig så er jo ikke chatboten meningsfull. Det kommer an på chatboten."*	*"There will be a high degree of coherence if the chatbot is user-friendly and if it is meaningful to use. If it is not user-friendly then the chatbot is not meaningful. It depends on the chatbot. "*
10	*TRB & IQ*	*"Ja det er jo en stor sammenheng med det. Et eksempel er jo om det er en dårlig chatbot som bare gir deg link til en side som du normalt ville funnet i en kategori felt i menyen på nettsiden eller i søkefeltet, eller om han leder deg gjennom og er en ordentlig chatbot og ikke bare et oppslagsverk. Så det jo en stor sammenheng ja. Hvis chatboten ikke er kompetent så gir han deg bare et*	*"Yes, there is a big connection with that. An example is if it is a bad chatbot that only gives you a link to a page that you would normally find in a category field in the menu on the website or in the search field, or if he leads you through and is a proper chatbot and not just an encyclopedia. So there is a big connection, yes. If the chatbot is not competent then he only gives you a short "read this article and find out for*

ID	Category	Quote (Norwegian) Original	Quote (English) Translated
		kort "les på denne artikkelen og finn ut av det selv", mens dersom den er kompetent så guider han deg gjennom hele artikkelen og sier "disse og disse tingene gjelder mest sannsynlig i din sammenheng og hvis den er usikker så sier han "du må ta kontakt med en ordentlig person, de normale retningslinjene gjelder ikke deg, du må snakke med en ordentlig veileder."	*yourself", while if it is competent he guides you through the whole article and says "these and these things most likely apply in your context and if it is uncertain then he says "you have to contact a proper person, the normal guidelines do not apply to you, you have to talk to a proper supervisor."*
8	*TRB & IQ*	*"Det tror jeg nok den er. I de fleste tilfeller. Det finnes sikker variabelt der også, men i de fleste tilfeller tror jeg nok det."*	*"I think it is. In most cases. There is certainly a variable there as well, but in most cases I think so."*
7	*TRB & IQ*	*"Middels, for jeg kan føle meg litt usikker."*	*"Medium, because I can feel a little insecure."*
2	*TRB & IQ*	*"Jeg føler jo det at stort sett så er chatboten oppdatert for det offentlige til det jeg har brukt an til."*	*"I feel that for the most of the time, the chatbot has been updated for the public to what I have used it for."*
1	*TRB & SQ*	*"Så brukervennligheten er jo egentlig hvor kompetent den er på å formidle informasjon. Så kan du skrive noe enkelt eller spør om noe i en setning, og du får riktig svar, mer enn hva du personlig er ute etter så vil jeg jo si at chatboten er høy grad på kompetent. Og da vil jeg å si at brukervennligheten er god. Så høy grad."*	*"So the ease-of-use is really how competent it is at conveying information. Then you can write something simple or ask about something in a sentence, and you get the right answer. More than what you personally are looking for, I would say that the chatbot is highly competent. And then I want to say that the usability is good. So high."*
4	*TRB & SQ*	*"Der er jeg litt mer usikker. Kanskje ikke så høy grad for jeg tror at det er veldig opp til brukeren om hva som blir formidlet."*	*"I'm a little more insecure there. Maybe not so much because I think it is very up to the user about what is being conveyed. "*
8	*TRB & SVQ*	*"Jo altså jeg tror det er en stor grad av sammenheng der altså. Chatbotene er jo designet for å yte service og gi deg det beste. Og hvis informasjon som chatboten gir er riktig så er chatboten kompetent. Ja med beste mening."*	*"Well, I think there is a great deal of connection there. The chatbots are designed to provide service and give you the best. And if the information provided by the chatbot is correct then the chatbot is competent. Yes, with the best of intentions."*
9	*TRB & SVQ*	*"Jeg tenker at det er kjempeviktig at folk har tiltro til chatbot. Og hvis vi mennesker tenker at chatbotene ikke har mennesker beste i interesse så vil vi ikke bruke de så det tenker jeg er kjempeviktig."*	*"I think it's very important that people trust the chatbot. And if we humans think that chatbots do not have people's best interests in mind, then we will not use them so I think that is very important. "*
3	*TRB & SVQ*	*"En skal jo alltid være litt skeptisk, men hvis det er offentlig instans så tror jeg nok at de er pålitelig og tror de er kompetente. Så høy grad"*	*"We should always be a little skeptical, but if there is a public agency, I probably think they are reliable and think they are competent. To a large extent"*
9	*TRB & SVQ*	*"Det tenker jeg er veldig viktig. Den må være troverdig og pålitelig. Mangler du en av de så faller det, ja faller det bare."*	*"I think it is very important. It must be credible and reliable. If you miss one of them, it falls, yes it just falls."*

Appendix 3

Interview Guide

Norsk:

Competence of user (litt om ferdigheter)

1. Hvordan opplever du ferdighetene dine når det kommer til å bruke slike chatboter?

Impact of system usage (litt om hvilken innvirkning bruk av chatboten)

1. Hva er det som skal til/gjør at du opplever at du har kontroll når du kommuniserer med en chatbot?

Meaning of system usage

1. I hvilken grad opplever du at det er meningsfullt å bruke chatboter?

Self-determination

1. Hvordan opplever du at du selv kan bestemme hvordan du skal bruke slike chatboter?

Disposition to trust

1. I hvilken grad opplever du slike chatboter som kompetente?
2. I hvilken grad opplever du at det er viktig å kunne stole på chatboter? Begrunn.

Information quality

1. I din erfaring med slike chatboter, opplever du at informasjonen gitt av slike chatboter har vært oppdatert?
2. I hvilken grad føler du informasjonen gitt at en slik chatbot samsvarer med dine forventninger? (Kan f eks graderes 1-7 hvis de er usikre)

System quality

1. Hvordan opplever du brukervennligheten til slike chatboter? (Enkle/Vanskelige)? Utdyp.

Service quality

1. I hvilken grad opplever du at slike chatboter er designet med innbyggernes beste i fokus?

How IQ, SQ and SVQ influence empowerment:

1. I hvilken grad opplever du at det er en sammenheng mellom hvordan chatboter formidler informasjon og i hvilken grad du føler deg trygg på dine ferdigheter til å bruke den? (IQ and COU)

2. I hvilken grad opplever du at graden av kontroll du føler i samtalen med chatboten er avhengig av hvordan chatboten formidler informasjon? (IQ and IOS)

3. I hvilken grad opplever du at graden av kontroll du føler i samtalen med chatboten er avhengig av brukervennligheten? (SQ and IOS)

4. I hvilke grad opplever du en sammenheng mellom brukervennligheten til chatboten og hvor meningsfullt det er å bruke slike chatboter? (SQ and MEA)

5. Opplever du at det er en sammenheng mellom i hvilken grad du føler du kan bestemme hvordan du skal bruke chatboter og i hvilken grad slike chatboter er designet med innbyggernes beste i fokus? (SED and SVQ).

How IQ, SQ and SVQ influence trusting beliefs about the chatbot:

1. I hvilken grad påvirker måten slike chatboter formidler informasjon og i hvilken grad du opplever den er kompetent? (TRB and IQ)

2. I hvilken grad opplever du på at informasjonen chatboten formidler er oppdatert til enhver tid? (TRB and IQ)

3. I hvilken grad føler du at det er en sammenheng mellom brukervennligheten til chatboten og hvor kompetent du føler chatboten er til å formidle offentlig informasjon? (TRB and SQ)

4. I hvilken grad føler du det er det sammenheng mellom hvor kompetent chatboten er og din oppfattelsen av om den er designet med innbyggernes beste i fokus eller ikke? (TRB and SVQ)

5. I hvilken grad opplever du at det er en sammenheng mellom hvor kompetent chatboten er og hvor pålitelig den er? (TRB and SVQ).

English:

Competence of user

a. How do you experience your skills when it comes to using such chatbots?

Impact of system usage

a. What makes you/does it take for you to feel like you are in control when communicating with such chatbots?

Meaning of system usage

a. To what extent do you experience it meaningful to use such chatbots?

Self-determination

a. How do you feel you are able to decide how to use such chatbots?

Disposition to trust

a. To what extent do you feel that such chatbots are competent?
b. To what extent do you find it important to be able to trust chatbots?

Information quality

a. In your experience, has the information provided by such chatbots been up-to-date?
b. To what extent do you feel the information given that such a chatbot matches your expectations?

System quality

a. How do you find the usability of such chatbots?

Service quality

a. To what extent do you experience that such chatbots are designed with the citizens' best interests in focus?

How IQ, SQ and SVQ influence empowerment:

a. To what extent do you experience that there is a connection between how chatbots provide information and to what extent you feel confident in your skills to use the chatbot? (IQ and COU)

b. To what extent do you experience that the degree of control you feel in the conversation with the chatbot depends on how the chatbot provides information? (IQ and IOS)

c. To what extent do you experience the degree of control you feel in the conversation with the chatbot is dependent on the usability? (SQ and IOS)

d. To what extent do you experience a relation between the usability of the chatbot and how meaningful it is to use such chatbots? (SQ and MEA)

e. Do you feel that there is a relation between the degree to which you feel you can decide how to use chatbots and the extent to which such chatbots are designed with the best interests of the citizens in focus? (SED and SVQ).

How IQ, SQ and SVQ influence trusting beliefs about the chatbot:

a. To what extent does the way such chatbots provides information affect the extent to which you feel the chatbot is competent? (TRB and IQ)

b. To what extent do you feel that the information the chatbot provides is up to date at all times? (TRB and IQ)

c. To what extent do you feel that there is a relation between the usability of the chatbot and how competent you feel the chatbot is at providing public information? (TRB and SQ)

d. To what extent do you experience that there is a relation between how competent the chatbot is and your perception of whether it is designed with the citizens' best interests in focus or not? (TRB and SVQ)

e. To what extent do you experience that there is a relation between how competent the chatbot is and how reliable it is? (TRB and SVQ)

Appendix 4

Informative Page For The Survey

Vil du delta i forskningsprosjektet

”The role of quality, trust, and empowerment in explaining satisfaction and use of chatbots in e-government”

Dette er et spørsmål til deg om å delta i et forskningsprosjekt hvor formålet er å evaluere og få en forståelse på hvordan chatboter brukt av offentlige organisasjoner påvirker innbyggerne i Norge. I dette skrivet gir vi deg informasjon om målene for prosjektet og hva deltakelse vil innebære for deg.

Formål
Formålet er å evaluere og få en forståelse på for befolkningens tillit til chatboter brukt av offentlige organisasjoner og hvilken sammenheng tillit har til intensjon om å bruke slike chatboter. I dette prosjektet kommer vi til å undersøke innbyggeres inntrykk og forventninger ved bruk av chatboter i offentlig sammenheng.

Hvem er ansvarlig for forskningsprosjektet?
Institutt for informasjonssystemer, Universitetet i Agder.
Veileder for prosjektet: Polyxeni Vasilakopoulou

Hvorfor får du spørsmål om å delta?
Du får spørsmål om å delta i dette forskningsprosjektet fordi du har gitt uttrykk for at du har hatt en form for kontakt med en chatbot fra en offentlig organisasjon. Du er derfor relevant for vårt studiet ettersom vi forsker på hvordan chatboter av offentlig organisasjoner påvirker innbyggere i Norge. Det vil delta rundt 20-200 personer i dette forskningsprosjektet.

Hva innebærer det for deg å delta?
- Dersom du takker ja til å delta så innebærer det å svare på et elektronisk spørreskjema
- Spørreskjemaet består av en rekke påstander som vil basere seg på hvordan du som bruker oppfatter bruken av en chatbot i offentlige tjenester.
- Spørreskjemaet kan besvares helt anonymt men du vil få et valg om du ønsker å oppgi e-postadressen din til helt til slutt dersom du ønsker mer informasjon om prosjektet eller kan tenke deg å stille til et oppfølgingsintervju.
- Du som person vil anonymiseres i prosjektoppgaven, og ingen som leser rapporten vil kunne linke deg opp til intervju svarene dine.

Det er frivillig å delta
Det er frivillig å delta i prosjektet. Hvis du velger å delta, kan du når som helst trekke samtykket tilbake uten å oppgi noen grunn. Alle dine personopplysninger vil da bli slettet. Det vil ikke ha noen negative konsekvenser for deg hvis du ikke vil delta eller senere velger å trekke deg.

Ditt personvern – hvordan vi oppbevarer og bruker dine opplysninger
Vi vil bare bruke opplysningene om deg til formålene vi har fortalt om i dette skrivet. Vi behandler opplysningene konfidensielt og i samsvar med personvernregelverket.

- Kun prosjektgruppen bestående av Ingvild Tisland (student), Marthe Løvsland Sodefjed (student), Polyxeni Vasilakopoulou (veileder) og Ilias Pappas (veileder) vil ha tilgang til opplysningene som samles inn.
- Lagring av e-postadressen gjøres separat fra annen data i dette prosjektet og slettes ved prosjektslutt.

Hva skjer med opplysningene dine når vi avslutter forskningsprosjektet?
Opplysningene anonymiseres når prosjektet avsluttes/oppgaven er godkjent, noe som etter planen er juni 2022. Ved prosjektslutt vil personopplysningene som er hentet inn, i dette tilfellet e-postadresser slettes.

Hva gir oss rett til å behandle personopplysninger om deg?
Vi behandler opplysninger om deg basert på ditt samtykke.

På oppdrag fra Institutt for Informasjonssystemer ved Universitetet i Agder har NSD – Norsk senter for forskningsdata AS vurdert at behandlingen av personopplysninger i dette prosjektet er i samsvar med personvernregelverket.

Dine rettigheter
Så lenge du kan identifiseres i datamaterialet, har du rett til:

- innsyn i hvilke opplysninger vi behandler om deg, og å få utlevert en kopi av opplysningene
- å få rettet opplysninger om deg som er feil eller misvisende
- å få slettet personopplysninger om deg
- å sende klage til Datatilsynet om behandlingen av dine personopplysninger

Hvis du har spørsmål til studien, eller ønsker å vite mer om eller benytte deg av dine rettigheter, ta kontakt med:

- Institutt for Informasjonssystemer ved Universitetet i Agder ved Polyxeni Vasilakopoulou, polyxenv@uia.no

- Studenter Ingvild Tisland, ingvit18@uia.no og Marthe Løvsland Sodefjed, mlovsland@gmail.com

Vårt personvernombud: Johanne Warberg Lavold, Personvernombud@uia.no

Hvis du har spørsmål knyttet til NSD sin vurdering av prosjektet, kan du ta kontakt med:

- NSD – Norsk senter for forskningsdata AS på epost (personverntjenester@nsd.no) eller på telefon: 53 21 15 00.

Med vennlig hilsen

Polyxeni Vasilakopoulou (Forsker/veileder)	Marthe Løvsland Sodefjed (Student)	Ingvild Tisland (Student)

Samtykkeerklæring

Jeg har mottatt og forstått informasjon om prosjektet "Trust in and intention to use chatbots by public organizations", og har fått anledning til å stille spørsmål.

Jeg samtykker til:

- Å svare på spørreskjema
- At mine opplysninger behandles frem til prosjektet er avsluttet.

Appendix 5

Informative Page For The Interviews

Vil du delta i forskningsprosjektet

” The role of quality, trust, and empowerment in explaining satisfaction and use of chatbots in e-government”

Dette er et spørsmål til deg om å delta i et forskningsprosjekt hvor formålet er å evaluere og få en forståelse på hvordan chatboter brukt av offentlige organisasjoner påvirker innbyggerne i Norge. I dette skrivet gir vi deg informasjon om målene for prosjektet og hva deltakelse vil innebære for deg.

Formål
Formålet er å evaluere og få en forståelse på hvordan chatboter brukt av offentlige organisasjoner påvirker innbyggerne i Norge. I dette prosjektet kommer vi til å undersøke innbyggeres inntrykk og forventninger ved bruk av chatboter i offentlig sammenheng.

Hvem er ansvarlig for forskningsprosjektet?
Institutt for informasjonssystemer, Universitetet i Agder.
Veileder for prosjektet: Polyxeni Vasilakopoulou

Hvorfor får du spørsmål om å delta?
Du får spørsmål om å delta i dette forskningsprosjektet fordi du har gitt uttrykk for at du har hatt en form for kontakt med en chatbot fra en offentlig organisasjon. Du er derfor relevant for vårt studiet ettersom vi forsker på hvordan chatboter av offentlig organisasjoner påvirker innbyggere i Norge. Det vil delta rundt 20-30 personer i dette forskningsprosjektet. Du er blitt kontaktet fordi du er en del av vår målgruppe.
Hva innebærer det for deg å delta?

- Dersom du takker ja til å delta så innebærer det å delta på et intervju som vil være i ca 1,5 time. Det vil være en pause i midten på 5-10 minutt. Dine svar i intervjuet vil bli tatt opp på lydopptak. Selve intervjuet vil enten skje over Zoom, eller fysisk.
- Spørsmålene i intervjuene vil basere seg på hvordan du som bruker oppfatter bruken av en chatbot i offentlige tjenester.
- Opplysninger som vi samler inn om deg er lydopptaket og navnet ditt.
- Du som person vil anonymiseres i prosjektoppgaven, og ingen som leser rapporten vil kunne linke deg opp til intervju svarene dine.

Det er frivillig å delta
Det er frivillig å delta i prosjektet. Hvis du velger å delta, kan du når som helst trekke samtykket tilbake uten å oppgi noen grunn. Alle dine personopplysninger vil da bli slettet. Det vil ikke ha noen negative konsekvenser for deg hvis du ikke vil delta eller senere velger å trekke deg.

Ditt personvern – hvordan vi oppbevarer og bruker dine opplysninger
Vi vil bare bruke opplysningene om deg til formålene vi har fortalt om i dette skrivet. Vi behandler opplysningene konfidensielt og i samsvar med personvernregelverket.

- Kun prosjektgruppen bestående av Ingvild Tisland (student), Marthe Løvsland Sodefjed (student), Polyxeni Vasilakopoulou (veileder) og Ilias Pappas (veileder) vil ha tilgang til opplysningene som samles inn.
- Lagring av lydopptak gjøres separat fra annen data i dette prosjektet og slettes ved prosjektslutt.
- Navnet ditt vil erstattes med en kode som lagres på egen navneliste adskilt fra øvrige data.

Hva skjer med opplysningene dine når vi avslutter forskningsprosjektet?
Opplysningene anonymiseres når prosjektet avsluttes/oppgaven er godkjent, noe som etter planen er juni 2022. Ved prosjektslutt vil personopplysningene som er hentet inn, navn og lydopptak slettes.

Hva gir oss rett til å behandle personopplysninger om deg?
Vi behandler opplysninger om deg basert på ditt samtykke.

På oppdrag fra Institutt for Informasjonssystemer ved Universitetet i Agder har NSD – Norsk senter for forskningsdata AS vurdert at behandlingen av personopplysninger i dette prosjektet er i samsvar med personvernregelverket.

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Med vennlig hilsen

Polyxeni Vasilakopoulou (Forsker/veileder)	Marthe Løvsland Sodefjed (Student)	Ingvild Tisland (Student)

Samtykkeerklæring

Jeg har mottatt og forstått informasjon om prosjektet "Human perceptions and expectations of chatbots in public organizations", og har fått anledning til å stille spørsmål.

Jeg samtykker til:

- Å delta i intervju.
- At mine opplysninger behandles frem til prosjektet er avsluttet.

(Signert av prosjektdeltaker, dato