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'Exploring new channels of Public Service delivery via Chatbots'

An E-government research study by
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MASTER'S THESIS

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Exploring new channels of Public Service delivery via Chatbots

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Abstract

This research contributes to the existing body of literature on chatbot utilization and adoption within the sphere of e-governance. Within it, we have utilized an extended framework based upon models such as UTAUT2 and additional sets of predictors such as innovation to investigate the potential intentions of the citizens of The Hague to use a municipally employed chatbot in order to seek out public services. In this respect, our results demonstrate trust in the bodies involved within such an implementation and the expected performance enhancement they may offer are positively significantly related to the intention of said users to engage with such a chatbot. Following on from this we have delved into the topic of hesitations on the part of potential end-users brought about by a fundamental resistance to change, and the factors surrounding it. As a result, it has been demonstrated that levels of computer literacy and the aforementioned anxieties surrounding technological changes in the citizen have a significant relationship to the uptake of a newly deployed nascent technology such as chatbots. Furthermore, it has been demonstrated that if enough trust in the security of such systems is present then the matter of resistance becomes insignificant.

Our results further demonstrate that citizens and businesses are not necessarily positive by default about the online services provided by the municipality. The layout of websites and their interfaces need to be radically redesigned and the quality of information presented within them must be improved, while paying particular attention to the security and privacy of users and their data in order to foster a better environment of trust. Hence leading to an overall reduction in the resistance to change.

This particular research and online survey amongst residents of The Hague provides us with a clear picture of the channels they prefer and opt to use in seeking municipal services. The more complex or urgent a case is, the more rapidly they will resort to phoning the municipality. This also applies to entrepreneurs and businesses. However, the municipality may stand to gain if they instead opt for an internet based channel, for example because it provides more room for personal attention for those who need it most. This indicates that there are opportunities for channel control; hence providing the chance to stimulate the use of their online services and new channels such as chatbots. If the municipality wishes to capitalize on these opportunities to provide improved online services via chatbots and service channel management, progress should be made step-by-step; taking into account what the technology, the organization and the citizens of The Hague do and can handle. Crucial to this is that The Hague must connect with the personal situations of citizens and entrepreneurs in the city. The needs of the people must be a central concern. Building on the outlined trend and the online behavior of the citizens.

Keywords: Chatbot adoption, e-Government, public e-services, UTAUT2, GAM, municipality of The Hague, cross sectional survey.

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List of Abbreviations

ICT	Information Communication Technology
CBS	Centraal Bureau Statistieken
BCG	Boston Consulting Group
KCC	Klant Contact Center
OECD	Organization for Economic Co-operation and Development
DigiD	Dutch government agency identity management platform
G32	32 Municipalities / Gemeenten
SMS	Short Message Service
TBSS	Technology Based Self-Service
HCI	Human Computer Interaction
AR	Augmented Reality
VR	Virtual Reality
IA	Intelligence Amplification
TAM	Technology Acceptance Model
UTAUT2	Unified Theory of Acceptance and Use of Technology 2
GAM	Government Adoption Model
IS	Information Systems
H	Hypothesis
PE	Performance Expectancy
EE	Effort Expectancy
SI	Social Influence
FC	Facilitating Conditions
PV	Price Value
PA	Perceived Awareness
CSE	Computer Self-efficacy
TOTI	Trust of the Internet
TOTG	Trust of the Government
RTC	Resistance to Change
I	Innovativeness
KMO	Kaiser-Meyer-Olkin
SPSS	Statistical Package for the Social Sciences
P	Probability (P(X) means the probability of the event X occurring.

Executive summary

Within the introduction, we have approached the topic of the potential role of chatbots as a medium within public service delivery channels, with particular regards given to their potential utility within the municipality of The Hague. As digitization stands to be a significant tectonic shift within our society, it is vital that we develop a comprehensive and complete understanding of the implications of such an evolution for local administrations. Otherwise, there is the very real risk of a scenario in which the municipality itself fails to meet the needs of the digital citizen as the onward march of technological progress leaves it behind.

In order to serve the populace we must first grasp the needs and wants of the citizen, and in order to do so, we have approached things from their perspective. As such, a cross-sectional survey has been employed, with 250 respondents via a Qualtrics online survey, in order to capture a snapshot of the opinions of said citizens towards the topic at hand, chatbots, in order to provide advice to the municipality on their potential utilization within a public service capacity. In this context, we have raised several related queries, primarily an investigation of what exact factors effect the implementation of these chatbots within a digital local government. In doing so it will be possible to provide the necessary advice required by the municipality during any potential considerations of whether or not chatbots are suited to the environment of public service delivery. In order to fully flesh out the body of this text, time and space has been given to an overview of the research methodology employed within our cross sectional survey.

Going forward from this, a number of key sub-questions were addressed. Firstly, what chatbots exist within our contemporary environment, and what are the inherent advantages and disadvantages present in each form of the technology. Following on from this we have laid out what exact public services are best delivered via this medium, despite the great potential degree of flexibility in the application of chatbots as a medium; they are not necessarily suited to every single potential service channel. As such, the aforementioned factors must be carefully weighed when employing such a technology. Overly gratuitous application of a chatbot would not be in the best financial interests of the municipality, and as with previous service channel options they should be employed only as and where necessary.

The introduction is followed by the literature review, addressing various topics directly related to the subject at hand. We have observed that the municipality of The Hague provides a key and significant network of digital service channels to its citizens, businesses and relevant agencies. Within the context of e-government, such actions are utterly vital (for without them e-government fundamentally cannot exist) and they allow for a great drive forwards in the endeavor towards a more digitized form of governance. As technology evolves so too must the channels employed to deliver services to the citizen. The goal of the municipality is to listen to its citizens, communicate with them about the progress made in relation to queries and to use this as an opportunity for continuous improvement and development of its own services. As such, chatbots may provide the exact toolset required to accomplish such

objectives. Their naturalistic language and dialogue, in addition to their potential flexibility, opening a new door to communication between citizen and government.
Additionally, following on from this the research methodology employed has been detailed. Therefore providing us with a foundation from which to conduct this research. We have established a basis from which we have been able to draw an understanding of the outcomes of the adoption of chatbot technology. Firstly, we built a solid foundation upon which we may grasp the available related literature. Then from this, we have employed a version of the Technology Acceptance Model, which was then further expanded upon using concepts laid out in Venkatesh's Unified Theory and Use of Technology 2 model and the e-Government Adoption Model. Therefore providing us with an optimal framework for the conceptual model we have employed.

Within our conceptual model, we have applied ten independent variables including Performance and Effort Expectancy, Social Influence, Facilitating Conditions, Perceived Price Value, Perceived Awareness, Computer Self Efficacy, Trust of Government, Trust of Internet and Innovativeness. Additionally, we used Resistance to Change and Behavioral Intention as dependent variables in order to formulate 20 hypotheses in order to test the correlation between the ten variables present and perform evaluations of the coherence with Behavioral Intention and Resistance to Change. Furthermore, we performed an independent sample test and comprehensive regression analysis. In doing so, we have provided a broad and detailed overview of the results of this study. We hereby input the gathered statistics from Qualtrics into SPSS and SmartPLS in order to carry out this analysis-based element of the research.
Moreover, the chapter addressing results provides a comprehensive overview of the outcomes of the research. Unsurprisingly in any assessment of potential governmental approaches, an understanding of the factors by which success is measured and the obstacles that must be overcome is a vital component of a comprehensive plan to adopt a new strategy. As such in the body of this text, we have addressed factors such as these and laid out an overview of how they may be obtained or overcome respectively.

Drawing from these results, we have detailed a discussion, laying out the outcomes of the study in order to provide answers to the sub questions posed within this text. By doing so we will have provided a body of advice to municipal agencies of The Hague on the employment of chatbots within said public context.

1. Introduction

Digitization stands to be a significant tectonic shift within our society, bringing about an evolution in not only governments; but the associated individual citizens and businesses as well. To maintain the growth of efficiency and globalization, administrative institutions must adapt to and embrace this phenomenon in order to stay competitive and provide long-term job security within society at large.

With the global spread of digitalization within the private sector and personal lives of individual citizens there has been a growing trend of governments seeking to cash in on this revolution in order to streamline public services (de Róiste, 2013). Such efforts build towards the core concept of an E-government as laid out in the United Nations E-Government Development Report; ‘‘the use of information and communication technologies and its application by the government for the provision of information and public services to the people” (E-Government Survey, 2014).

It should be noted that while broad generalizations of a nation’s level of progress in this regard can be made, there are in most instances observable disparities in progress on an internal level. In this respect, The Hague ranks as one of the few municipalities at the current apex of such development within the Kingdom of the Netherlands, consistently scoring highly on the Dutch E-Government Development Index over the past six years (Young, 2014). There are however some concerns that must be raised in spite of this stellar performance. It has been argued that the Dutch government’s pre-existing E-readiness index does not make for an accurate measure due to its lack of assessment of the intent to use on the part of the end-user or service recipient. It is the ICT and Media alderman Rabin Baldewsingh of The Hague who said; ‘‘The Hague is e-ready but Hagenaars are not” (Baldewsingh R. S., 2017). As such, it is essential that this ‘intent to use’ be investigated and analyzed further.

There is little point in attempting to open a service channel to citizens who are either incapable of or are unwilling to engage with it, any such attempts will result in little more than a loss in taxpayer’s money and logistical resources (Ozkan, 2011). Henceforth if any further E-government progress shall be made, it would be wise to fully explore and gain a perspective on the factors leading to this circumstance. This is however not a uniquely Dutch issue, engagement between the citizen and available E-government services has been observed to be below the desired level across not only developed nations, but in addition the selection of developing nations making endeavors in the field as well (Zhang, 2014).

The means by which an improved, and most vitally, more engaging service can be delivered must be explored. Within this vein, we shall endeavor to explore the multitude of factors affecting e-government adoption within the municipality of The Hague and the context of digital public service delivery channels. As such we shall ask the following question; what exact factors influence, whether aiding or hindering, the potential for usage of chatbots as a service delivery medium within the public sphere of the municipality of The Hague?

The relevance of this study is further compounded by the perceived growth of the importance of new digital communication channels in governmental settings. The connected citizens began to emerge as the driving force in a dynamic world made up of the fields of innovative and mobile technologies such as chatbots. These forces have put citizens in the driver's seat of digital conversational communication and is giving them power while the government sinks or swims in the digital age. Governments that treat citizens with awareness and cleverness and put them at the center of their strategies will be successful in the digitally connected era.

The following sections of this text will be laid out as follows: firstly, we shall touch upon the issue of e-government adoption in the Netherlands, both its successes and shortcomings, and significantly its future potential for growth. Then we shall bring forward the topic of the research model utilized within our work and the hypotheses that we will propose. Following on we shall lay out the data collection processes used and the methodology via which we will arrive at our findings. To draw a close to the text we will provide our conclusion and an oversight of the limitations and implications of the findings.

1.1 Research background

The municipality of The Hague provides a key and significant network of digital services to its citizens, businesses and relevant agencies. Within the context of e-government, such actions are utterly vital and allow for a great drive forwards in the endeavor towards a more digitized form of governance. ICT is in this respect a deeply important pillar of the economy of The Hague region. The ICT sector is responsible for almost 10% of employment within the region. The municipality of The Hague is for that reason investing in its ICT-infrastructures and in digitally skilled workforces so that businesses, institutions and citizens may benefit from the contributions of ICT. The municipality of The Hague wishes to establish a foundation for information and digitalization in the city whereby they may connect with more citizens within the municipality. This has resulted in new ICT-projects and programs that contribute to The Hague's strength (Ingrid van Engelshoven, 2014). According to the research of Ernst & Young, the municipality of The Hague stands as the frontrunner in offering digital service delivery to its citizens within the Netherlands (Young, 2014).

Moreover, the municipality of The Hague has been ruled as the most significantly developed digital administration on a national level, five times within the last six years (Young, 2014) . Annually four million unique visitors make use of the municipal website of The Hague, wherein new steps in the field of digital services delivery are explored. By exploring these new digital channels, www.denhaag.nl is making its way towards becoming increasingly user-friendly and more reliable (Baldewsingh R. S., 2017). Public Affairs Services (Dienst Publiekszaken) are the initial point via which citizens of The Hague may contact the municipality. All public affairs services are brought together to make processes as efficient and effective as is possible. Within the department of Public Affairs Services, a sub-department is responsible for customer facing contact with the citizens. This department is known as the Customer Contact Center, also referred to as the KCC (Baldewsingh R. , 2016). The KCC has existed since January 1, 2011 and aims to serve every citizen with excellency and with courtesy via traditional but also new digital channels. The KCC has a vitally important role in customer contact care. The KCC is responsible for customer contact within the municipality via the internet (click), the phone (call) and the counters (face) (Baldewsingh R. , 2016).

1.2 Research motivation

The vision statement "Digital government 2017" and the proposal of the Municipal Hague College on the Action Plan for Citizenship Participation 2016-2020: "Choosing Together and Cooperating Together" has led to the conduction of this research regarding the municipality of The Hague (Baldewsing, 2016). The basis for this research is the digitization of the Dutch government. The government agreement has included the goal of improving public service provisions. Businesses and citizens may digitally deal with governmental issues they may have by 2017: such as applying for a license and for a benefit. The Vision Letter of the minister Plasterk "Digital Government 2017" explains how this goal should be addressed. Additionally, the 'Service Delivery' strategy report of The Hague provides guidance on how services should be delivered by the municipality of The Hague. The citizens and businesses are at the heart of this and as such, their needs must be held as the top priority within

any further developments. The aim of the municipality is to listen to its citizens, communicate with them about the progress made in relation to queries and to use this as an opportunity for continuous improvement and development of its own services. Additionally, The Hague aims to offer digital services that are accessible, user-friendly and meet the personal needs of the individual.

1.3 Research problem

The role of the municipality lies in demonstrating initiatives, in strengthening cohesion and cooperation and in self-innovation as a government. In recent years, the municipality has deployed several digital resources for the provision of these services. This includes, among other things, the increasing use of social media, mobile devices, apps, and other technological and social developments. Nevertheless, it is still somewhat challenging for citizens of The Hague to complete their business digitally. The sheer volume of available and oftentimes irrelevant information available to the inquiring citizen can oftentimes make navigation of the website difficult, and as a result can potentially delay the citizen in acquiring the information necessary to them. Additionally for broadly less technologically literate demographics such as the elderly, the prospect of navigating even a straightforward website to seek public services can be a daunting prospect when undertaken without assistance. Additionally, approximately 60% of the citizens that visit the municipality website of The Hague drop out of the digital service delivery and decide to call the municipality instead of finishing the forms online (H. de Kievith, 2015). This can be due to the following factors:

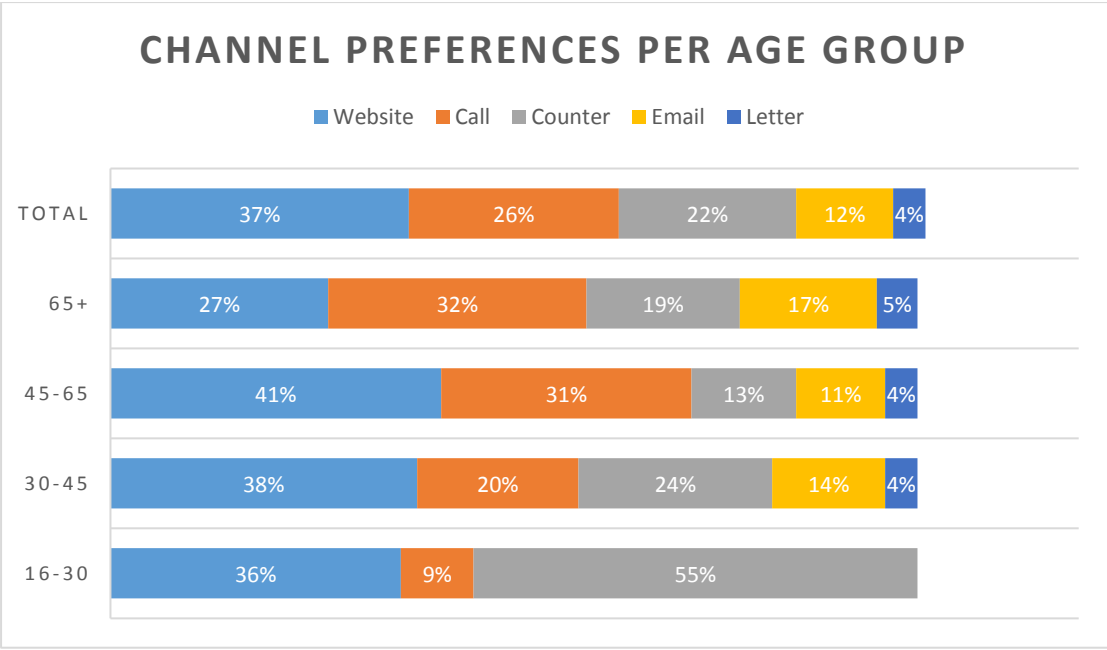
- Service delivery via www.denhaag.nl is too complicated or fragmented; citizens browse rapidly on the website to find information about their problems and drop out halfway, deciding either to call or to go to the counter desk.
- The trust in (online) eGovernment and e-services is low: when they talk to someone by phone, they are more reassured that someone will address their issue.
- Citizens are afraid to do something wrong on the website and cause further issues or not get the chance to fix their mistake.

As such, the employment of a virtual assistant, such as a chatbot, within the role of aiding such individuals may offer a significant level of support in delivering the required information in a timely and expedient fashion. Within this philosophy, we explore the potentials of chatbots as new digital communication channels to remedy said problems. Chatbots have the potential to significantly transform the way we interact and communicate digitally, as described by Newman (2016) “the ultimate goal of chatbots is to replace the most common interfaces we use on computers and in connected devices” (Newman, 2016). It provides the advantage of using natural language to communicate with governments and services through a familiar interface. A chatbot can eventually become a personal assistant capable of providing a range of services in a manner that best suits the given end-user (Shebat, 2016).

To grasp the needs and wants of the citizen, we must first approach things from their perspective. As such, this research will focus on the extent to which the citizens of The Hague are willing to utilize municipal chatbots within a public service delivery context. There is not a significant degree of information available regarding the societal makeup of The Hague and its specific relation to digital means of communication at a municipal level. The target group within this research can not therefore be focused solely on one demographic simply because said society consists of a broad range of citizens with varying needs. Therefore, within this research we will not segregate citizens by sex, nationality or racial background. However, one major factor we do know is the age of the citizens involved. A study conducted by Ernst & Young shows that the actual means of contact between the municipality and people might be clearly broken down dependent on the age group of the individuals in question (Young, 2014).

From the chart, provided below, we can extract the following information. It is given that 36% percent of individuals aged between 16 to 30 make prominent use of digital channels to contact the municipality. Though somewhat surprisingly the demographic that is demonstrated to display the highest utilization of the digital channel is not this 'millennial' section, but instead the Generation X segment of 45 to 65. With up to 41% making use of digital channels to communicate with the municipality, despite this generational segment often being characterized as being less digitally savvy than their younger counterparts. From this, we can conclude that the employment of digital channels of service delivery should not solely be targeted at this 'millennial' demographic, but that any efforts to open up new channels should focus on the population of The Hague as a whole; with all citizens provided the opportunity to utilize them in a straightforward and convenient fashion.

FIGURE 1: THE CHANNEL PREFERENCES PER AGE GROUP



Source: www.denhaag.nl *'Visie op Online Dienstverlening Gemeente Den Haag'*

1.4 Research objectives

Following on from this, this research will aim to investigate the circumstances surrounding the potential utilization of chatbots within a public facing role by the municipality of The Hague. In addition, we aim to identify the success and failure factors in the adoption of chatbots. Within this research, we shall be making a number of observations on the focus of this research, largely in regards to the core definition of an e-Government and its broader implications at a municipal level. However, at times it will be necessary for us to touch upon studies and cases conducted not just at a national, but also at a broader international level to provide examples and best practices. In doing so we will endeavor to the greatest extent possible to convey any and all findings into the context and framework of the municipality of the Hague. The majority of such cases and studies conducted within the country rarely focus on issues at a municipal level, instead focusing on the entire nation itself or just demarcated bodies such as ministries or governmental agencies. As such, we are provided with the opportunity to cast a fresh light on more localized developments and the unique nature of the governance of The Hague. The objective of this research is described as following: *'To determine if the municipality of The Hague should employ chatbots as public service providers by investigating the influencing factors of citizens'.*

1.6 Research questions

As we have stated above, we will raise several related queries, primarily what exact factors effect the implementation of these chatbots within a digital local government. Further on we will discuss digital implementation and potential services from a broad perspective. Additionally we will present the potential research model and the related hypotheses; and in doing so present and describe the methodology and processes via which data will be collected. Then the nature of the data analysis and a discussion of said findings will be brought forward. Then in conclusion, the implications and potential limitations will be laid out for discussion. To address the main query, a theoretical framework must be established, built upon the foundations of pre-existing researches, adoption models and potentially fresh constructs. In order to flesh out the bones of our main question and establish our concepts as primary points of focus, we must provide attributional substance to the query. By assessment of these stated concepts, we may take a more integrated approach towards the analysis of available secondary literature on the utilization of these nascent technologies. In line with the overall grounds for this research, we will be bringing forward the following research questions.

1.7 Main research question

- *Should The Hague use chatbots to provide its services to the community?*

In addition, the following sub-question allows us to make a much deeper evaluation of the potential results. Unlike the primary question, this query will focus in on the possibility of a range of varying propensities relative to the characteristics of the subject of analysis that we will be scrutinizing.

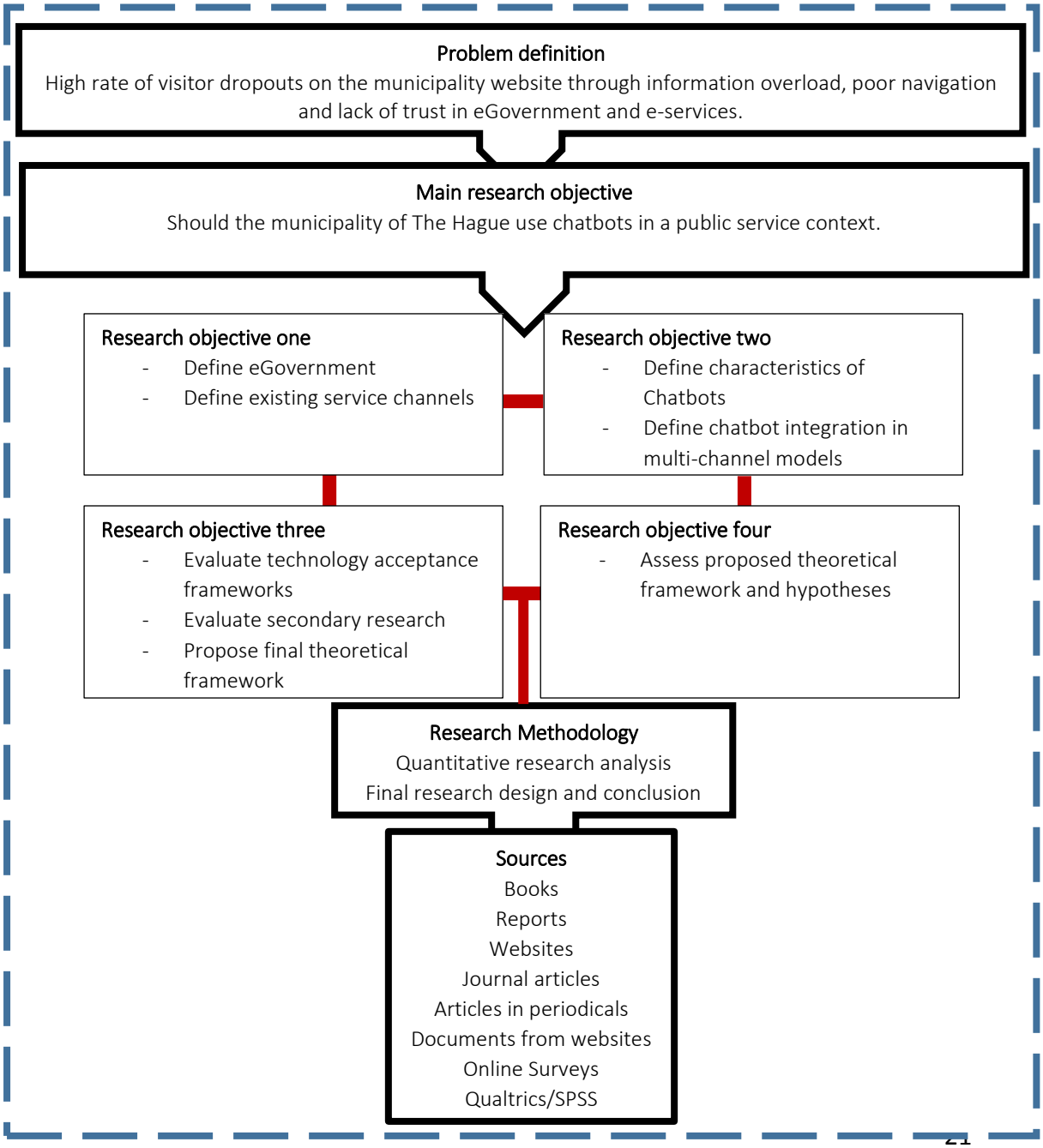
1.8 Sub questions

- *Which chatbots exist and what are their advantages and disadvantages?*
- *Which public services or products are suitable for chattiest?*
- *What are the success factors for adoption and use?*
- *What are the obstacles for adoption?*
- *What is the final advice to The Hague municipality?*

1.9 Research framework

Underneath a research framework has been made to provide a clear overview of the problem and the objective that will be researched. It includes also the elements that will be researched to achieve the thesis objective. It provides an overview of the entire research process.

FIGURE 2: RESEARCH FRAMEWORK



1.10 Academic relevance of the study

With respects to relevancy within the context of municipal chatbot research, the race to maintain adequate service channels to meet the needs of the progressively more digitally aligned citizens of the 21st century is a key issue for municipal governments. The rift between the citizen and municipality fuelled by underlying feelings of disinterest clashes like oil and water with the issues of accountability and transparency necessary in the role of public service channels (Ferguson, 2006). As such it is wholly necessary that when bringing forward new avenues of approach to service delivery that the needs and concerns of the end-user, in this case citizens of The Hague, be addressed adequately.

The employment of a resource such as chatbots within such an administrative role provides us with a significant opportunity to engage with the aforementioned digital generation of citizens. By allowing them the chance to bypass the conventional and traditional service channels with which they have become disinterested, such as town hall meetings and leaflets, while still providing the fulfilment of feeling actively engaged with their municipality. Such nascent channels can provide such citizens with a significantly more stimulating and familiar interface with the local government than would otherwise be possible (EuroSpace, 2009).

However, while such developments can provide significant improvement in quality of service for some, it is important to note that for others this forward march can leave them lagging behind. Those disadvantaged by lack of education, necessary income or simply age, can be left by the wayside during the growth of digitization. And due in part to this factor, offline elements of public service delivery will inevitably be retained to some degree or another for the foreseeable future. As such during the implementation of new digital channels such as chatbots it is essential that the municipalities themselves strike a steady balance between the presented online and offline components. A failure to do so will only lead to a disenfranchisement of key demographics the municipality must serve within its role.

Within the 21st century we have witnessed a rapid rise in the growth of the eGovernment model, digital service delivery has become a key element of government strategy on a global level. As such, if any government wishes to stay on top of this trend they must endeavour to remain at the cutting edge of such developments. Within multiple such scenarios, the failure of such digital initiatives have been observed. When the majority of e-governance efforts are focused inwardly on the internal efficiency of the administration with a lack of equivalent conveniences afforded to the citizens who act as the end users; then said individuals will see little reason to take up such practices themselves in a significant fashion (Axelsson, 2010). Therefore, in order to meet the needs of a progressively more digitally connected citizen base, the service channels via which they conduct business with the municipality must be tailored to them in this regard.

2. Literature review

In this section, we will provide a comprehensive literature review to conceptualize different theories into one fitting framework. Firstly, we shall emphasize on E-government itself. Aside from elaborating on the nature of E-government, we will look into the global developments of e-government adoption and continue with the contemporary developments within the Netherlands. This will be followed by the characterization, background and development of chatbots as service deliverers within this role. Additionally we will introduce the fundamentals of customer service delivery via public facing chatbots. In addition, we will analyse the current state of the most applicable and viable adoption frameworks within this field. Moreover, secondary analysis of adoption frameworks will help in producing a respectable hypothesis, which will subsequently be merged into our proposed framework.

2.1 E-government

In the last few decades, e-government has become a subject of much interest amongst those excited about the initiation of Web 2.0 technologies. In this contribution, we will define E-government as the use of Information Communication Technologies, mainly the Internet, as a strategic instrument to deliver a better government (OECD, 2003). Bertelsmann define eGovernment as "electronic information-based services for citizens with reinforcement of participatory elements to achieve objectives of balanced e-government" (Bertelsmann foundation, 2001).

Bekker and Hornsbrug argue that "e-government became a new form of public organization that supports and redefines the existing and new information, communication and transaction-related interactions with citizens and businesses by using ICT. Particularly by using the Internet and Web technologies to improve government performance and processes" (Bekkers, 2005). In many instances providing public services online, e-services, has long been promoted as a way to innovate public sector operations and to open up a more transparent and democratic society. Additionally governmental agencies and other public organizations have already spent considerable effort on developing e-services as a substitute or complement to the more traditional, manual or face-to-face services (Ancarani, 2005). As a result, e-services have grown to become a routinely used channel of communication and interaction between citizens and public administrations (Bertot, 2016).

The evolution of e-government is distinguished into four stages. According to Bower and Christensen these stages describe the patterns of interaction between digital governments and the public (Bower, 1995). The first stage focuses on digital presence, which provides inactive information on governmental websites. In the second stage are governments providing access to simple email accounts and Web-based interactive forms whereby they can interact with citizens and businesses to provide information. In the third stage are governments providing more interactive and deeper online services such as residence renewal permits, applications and tax payments. The final stage is promoting governmentally shared governance by using seamless information flows and collaborative decision-making (Bower, 1995).

2.1.1 World and regional e-government leaders

As laid out in the United Nations E-Government 2014 Survey (E-Government Survey, 2014) there is an observable disparity in levels of progress towards the furthering of E-government across the globe. Perhaps unsurprisingly this can be attributed to a number of key factors. The relative income level of a nation can be taken as a litmus test for the potential economic capacity and development of a nation, which in turn directly impacts on said nation's ability to build e-government infrastructure. With an absence of necessary funds provision of the necessary training, education and ICT capabilities are limited and as such the potential for E-government development is hindered. Conversely though some states have made significant progress in this regard despite their relatively low wealth, clearly demonstrating that financial hurdles need not be a barrier to development in this regard (E-Government Survey, 2014).

As laid out in the aforementioned 2014 survey, Europe currently holds the title of displaying the greatest regional level of E-government development. However, a number of non-European nations currently stand at the current cutting edge of developments in this regard. South Korea leading in first position, followed by Australia and Singapore (E-Government Survey, 2014). Broadly outstripping the various European states on a nation by nation level. If solely focusing on Europe however France and the Netherlands hold the dominant positions, standing at fourth and fifth on the global scale of development respectively. Based on the information contained within this UN survey it can easily be concluded that further developments are vitally reliant on a sufficient level of, not only economic development, but also and perhaps most vitally a political and social attitude in favor of such shifts (E-Government Survey, 2014).

TABLE 1: WORLD AND REGIONAL E-GOVERNMENT LEADERS

World e-government leaders	*Regional e-government leaders*	
Republic of Korea	AFRICA	Tunisia
Australia		Mauritius
Singapore	AMERICAS	United States of America
France		Canada
Netherlands	ASIA	Republic of Korea
Japan		Singapore
United States of America	EUROPE	France
United Kingdom		Netherlands
New Zealand	OCEANIA	Australia
Finland		New Zealand

Source: E-government survey United Nations.

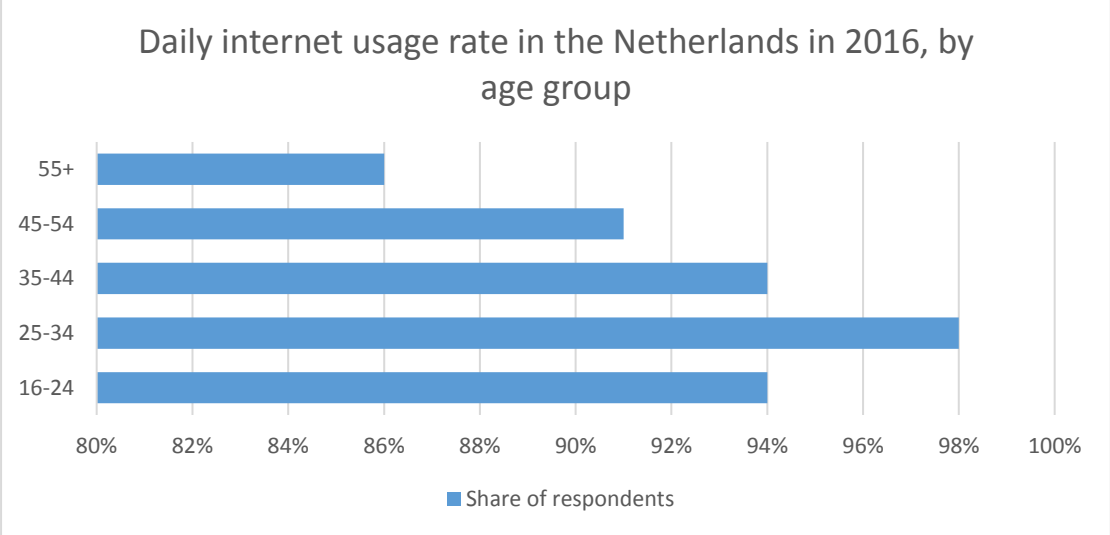
In the following section, we continue with a brief insight into the digital landscape of the Netherlands.

2.1.2 Digital landscape of the Netherlands

ICT stands as a core and vital aspect of the contemporary economy of the Netherlands. Driving innovation and economic growth within the 21st century. The Netherlands is highly regarded among developed nations in this respect, ranking fifth in the world in the 2016 Boston Consulting Group e-intensity index (Boston Consulting Group, 2016). Amsterdam's Internet exchange is one of the largest in the world and is a vital asset for many global corporations and businesses. This dominant position in the world of ICT does not however mean the Dutch government should feel secure or complacent in their efforts to progress. The Netherlands has only reached this pinnacle via a concerted effort to digitize the nation and still has ICT fields in which they are relatively weak. As such, the government should endeavor to continue to strive forward with such progress lest they be overtaken and overshadowed. An outcome that could be devastating for the Dutch economy. Statistics Netherlands (CBS) states that between the period of 1996 and 2009 as much as a quarter of the economic growth within the Netherlands came about as a direct result of growth in the ICT sector, and as such, the vital role ICT plays in the Dutch strength cannot be neglected (CBS, 2017).

Just as ICT plays a vital role in the business sector of the Netherlands, so too does it play a vital role in the individual personal lives of its citizens. In 2016 CBS's survey found that in the 25 to 34 year old demographic of internet users up to 98% make use of the internet on a daily basis (CBS, 2017). Moreover, with the rapid growth of social media and the diffusion of web based news media within the past two decades. The reliance of the younger generations on the internet as a vital channel for communication and discourse cannot be ignored. Such platforms can potentially provide the municipalities and governments with a whole new means of engaging with their citizens. The Municipality of The Hague's coalition agreement 2014–2018 reflects this development, promising to seek greater levels of digital services to capitalize on such channels (Ingrid van Engelshoven, 2014).

FIGURE 3: DAILY INTERNET USAGE RATE IN THE NETHERLANDS.



Source: www.CBS.nl *'Daily internet usage rate in the Netherlands in 2016, by age group'.*

In the following section, we proceed with a more concrete insight of the development of Dutch eSociety.

2.1.3 Developments of Dutch eSociety

Dutch society is undergoing rapid change and the way citizens and local governments interact with each other has evolved as a result. Digital communication has made significant leaps and bounds in recent years. It can offer a broadly speaking faster, easier and cheaper service than communication via paper (Kamp EZ, 2013).

In recent years we have seen the development of an "e-society", focusing on technological possibilities, an information and data based society, in which the flow of information is of the utmost importance. This can allow a transparent municipality that seeks greater digital capabilities with better service and data exchange that places citizens at the heart of its information flow. A potential government that does not hinder the effectiveness and efficiency of trade and day-to-day life, but reinforces it, if the government seeks this goal collaboratively in a positive fashion (Ministerie van Economische Zaken, 2014).

If citizens can conduct their business safely and digitally with all government organizations, it has the potential to greatly improve the relationship between government and society. Citizens may find their local government faster and easier to communicate with and may do business with their government at the place and at the time that is most convenient to them. In addition, the perception of local government pressure on citizens will positively change: processes will be faster, administrative burdens will be reduced and responding to the individual situations of citizens will be significantly easier for the government (Kamp EZ, 2013). In addition, the efficiency of the local government itself can also be improved upon. Through the increased use of these digital channels, the government saves time and money on the sending and processing of conventional paper mail, printing, advertisements, circulars and administrative operations (Mulder, 2017).

The government's digitization process has already been under way for some time and is progressing rapidly. Examples of this are pre-filled digital tax returns for citizens, digital license applications and secure DigiD authentication (Ministerie van Economische Zaken, 2014). Additionally the General Law on Administrative Law provided firm regulations in 2004 regarding such electronic traffic with the government. Nevertheless, wherever digital communication is possible, many options have not yet been fully utilized. For example, if a citizen has submitted an application digitally, he will still receive a response from a government agency by letter (Scientific Council of Government Policy, 2011).

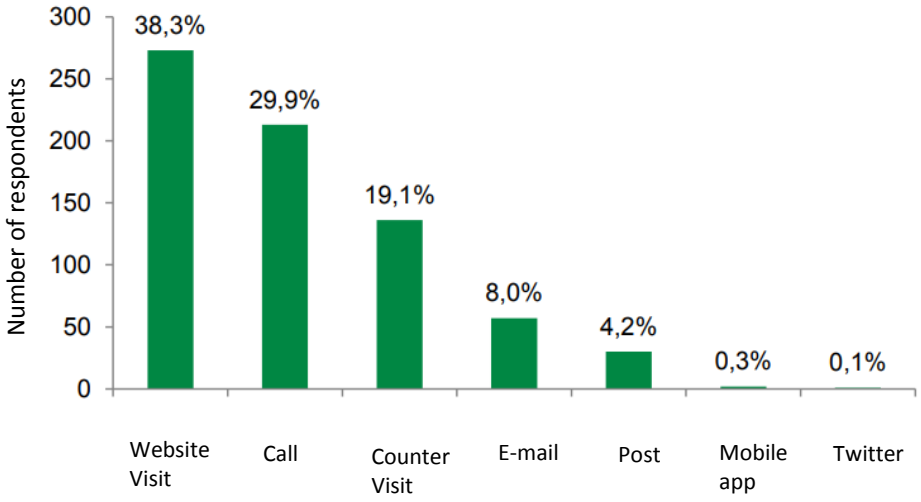
Although more than 100 million DigiD transactions with the government have taken place in the Netherlands this year, developments in other countries have been even more advanced (Zutphen, 2017). In Denmark, the local government requires its citizens to use the step-by-step digital channel for public services exclusively. Their goal being that by the end of 2015 all of these services provided by government agencies should in principle be solely via digital channels. If the Dutch government wishes to combine digitization of their public services with an optimally efficient process, they will have to make the service progressively more digital and concurrently phase out paper channels on a stage by stage basis.

2.2 Online service delivery in perspective

Within this section, we shall provide an insight into the attitudes of the citizens of The Hague towards the contact they have with their local municipality. As our research primarily focuses on (digital) service delivery by the municipality, we will be providing statistical information within the context of (digital) interaction with citizens to create a deeper understanding and basic overview of the target group and the utilized (digital) communication channels.

Firstly, we shall detail the service channel selection of respondents in the past relating to their most recent contact with the municipality. Then we will discuss the familiarity and the usage of mobile apps by citizens within the municipality of The Hague. We shall conclude by discussing the rate at which citizens make use of social media to contact the municipality and the circumstances surrounding this choice. Within this section, we will primarily be discussing The Hague 712 respondents (Wolfgang, 2015).

FIGURE 4: CHANNEL CHOICE OF HAGUE RESPONDENTS AT MOST RECENT CONTACT WITH THE MUNICIPALITY



Source: Center for e-Government Studies; Prof. dr. Wolfgang Ebbers.

The figure above shows that the website is used most frequently (by 38% of the respondents). After the website, telephone calls score highest, 29.9% of the respondents having chosen to call. Then physical visits to a service counter follow at 19.1%. E-mail and mail are used to a lesser extent and apps and Twitter are barely used. The other social media options were not used at all by the respondents in question.

2.2.1 Service category

In addition to channel selection, respondents were asked what the subject was of their most recent contact with the municipality, or the service category that was sought out. Table 2 shows the answers to this question.

TABLE 2: SUBJECTS MOST RECENT CONTACT WITH THE MUNICIPALITY.

Service category	Number of respondents	Percentage
Passport, identification or visa	165	23,2
Waste	71	10
Parking (parking permit, parking management, parking problem)	70	9,8
Taxes	46	6,5
Benefits and aid support	43	6,0
Drive license	40	5,6
Relocation	39	5,5
Notification public space	31	4,4
Population register	30	4,2
Statements (such as marriage or birth)	30	4,2
City regulations	25	3,5
Swimming	11	1,5
Permits	8	1,1
Accessibility city hall / district offices	7	1,0
Subsidies	6	0,8
Events in The Hague	2	0,3
Immigration and naturalization	2	0,3
Other	86	12,1
Total	712	100

Source: Center for e-Government Studies; Prof. dr. Wolfgang Ebbers.

As can be seen from the above table, it is the service category of passports, identification or visas that are by far the most popular (23.2%). Other popular product categories are waste and parking, followed by taxes, assistance / benefits and driver's licenses. Less popular product categories desired by the respondents are subsidies, events in The Hague and immigration / naturalization.

2.2.2 Service category and chosen channel

By asking for channel selection of the most recent contact and about which service category this fell under, the chosen channel can be compared to the desired service category. From this, it can then be observed which channels are utilized for certain product categories. This is shown in the table …. below.

TABLE 3: TEN MOST POPULAR SERVICE CATEGORIES SET AGAINST THE THREE MOST POPULAR SERVICE CHANNELS

Service category / Channel	**Call**	**Counter**	**Website**
Passport, identification or visa	23	46	83
Waste	33	1	29
Parking (parking permit, parking management, parking problem)	20	7	36
Taxes	19	2	19
Benefits and aid support	20	6	11
Drive license	5	15	17
Relocation	11	13	13
Notification public space	13	1	9
Population register	8	12	6
Statements (such as marriage or birth)	6	9	12

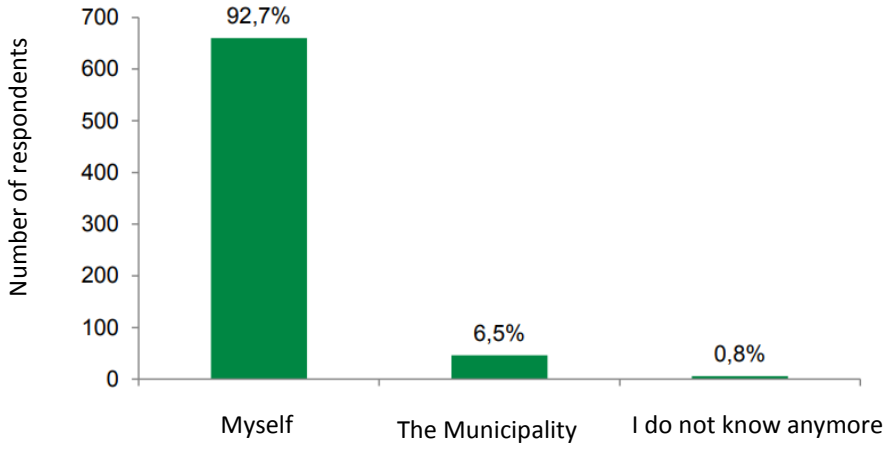
Source: Center for e-Government Studies; Prof. dr. Wolfgang Ebbers.

Table 3 shows which service channel was selected for each specific service category. The statistical analysis shows that a particular service category is significantly related to the chosen service channel in the most recent communications between the citizens and the municipality.

2.2.3 Initiative contact municipality

From the most recent contacts, it can also be displayed whether the citizen or the municipality took the initiative in the contact. This is demonstrated in the following chart.

FIGURE 5: INITIATIVE FOR MOST RECENT CONTACT WITH THE MUNICIPALITY



Source: Center for e-Government Studies; Prof. dr. Wolfgang Ebbers.

It can be observed that almost all respondents took the initiative during their most recent communication (92.7%). Additionally, it can be observed that very few respondents no longer remembered who took the initiative during said contact (0.8%).

2.2.4 Service modes

Within prior scientific literature on service channel selection it has been suggested that there is a strong correlation between the service channel selected and the particular form of service desired. Within this context, the desired products have been broken down into four overarching categories: consultation, registration, progress and transaction Invalid source specified.. The following table demonstrates the forms of service desired during the citizen's most recent contact with the municipality.

TABLE 4: SERVICE MODES

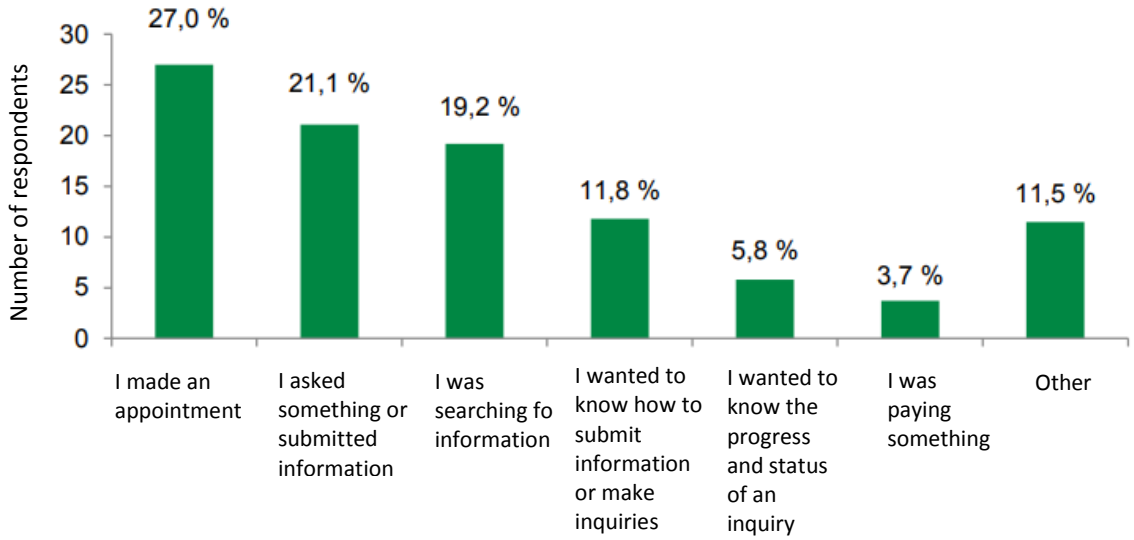
MODES	ITEM (S) IN QUESTIONNAIRE
CONSULTATION	I was looking for information I wanted to know how I should send or request something
REGISTRATION	I was making an appointment I was asking something or sending something
PROGRESS	I wanted to know the progress of a recent application or request
TRANSACTION	I was paying for something

Source: Center for e-Government Studies; Prof. dr. Wolfgang Ebbers.

2.2.5 Reasons for contacting the municipality

The respondents were asked what they had contacted the municipality about during their most recent communication. These items are shown in the following table. The answers to this question are shown in figure 6.

FIGURE 6: REASONS FOR WHICH ONE CONTACTED THE MUNICIPALITY



Source: Center for e-Government Studies; Prof. dr. Wolfgang Ebbers.

2.2.6 Reason and channel

The service channels of post, mobile apps, Facebook, Twitter and others have not been included in this analysis due to the relatively low numbers of users per channel

TABLE 5: SHOWS THE DIFFERENT REASONS FOR CONTACT SET AGAINST THE SERVICE CHANNEL CHOSEN.

REASONS / CHANNEL	COUNTER	CALL	WEBSITE	E-MAIL
CONSULTATION	47	83	68	17
REGISTRATION	54	78	170	22
PROGRESS	5	19	13	4
TRANSACTION	3	7	7	4

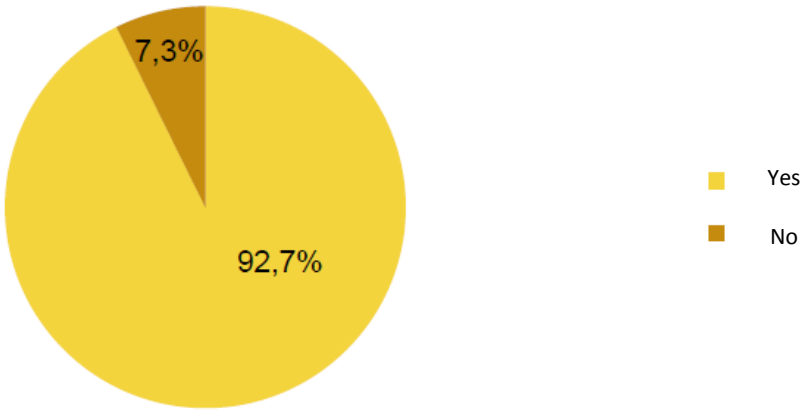
Source: Prof. dr. Wolfgang Ebbers; Center for e-Government Studies.

In the table above it can be observed that certain channels are chosen more often for specific desired services. The statistical analysis also shows that the reasons for which a citizen chooses to interact with an organization is significantly related to the service channel choice. This is the case particularly when seeking registration. When people make an appointment or have to pass on information, they primarily choose to do so via the website.

2.2.7 Visit frequency

Within the survey discussed, 712 respondents were asked whether they had visited the website of the municipality of The Hague in the last two years. Figure 7 shows the answers to this question.

FIGURE 7: VISIT OF MUNICIPAL WEBSITE IN THE PAST 2 YEARS

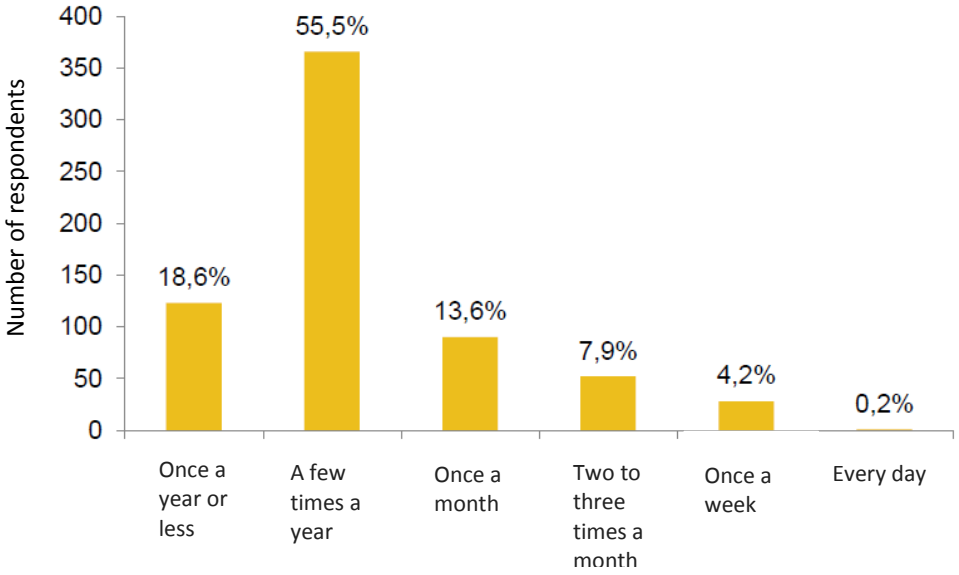


Source: Center for e-Government Studies; Prof. dr. Wolfgang Ebbers.

As can be observed in Figure 7 the majority of the residents of the municipality have visited the website in the past two years (92.7%).

Respondents who had visited the website in the previous two years (n = 660) were asked a number of questions about the website. The respondents who had not visited the website in the past two years were instructed to skip this set of questions.

FIGURE 8: FREQUENCY OF VISITS TO THE WEBSITE



Source: Center for e-Government Studies; Prof. dr. Wolfgang Ebbers.

Additionally, 660 of the respondents within the aforementioned survey were queried on the frequency of their visits to the municipal website. The distribution of said answers are shown in Figure 8.

As shown the majority of respondents (55.5%) visit the website a few times a year. Additionally a minority of individuals visit the website more than once a month (12.3% combined).

2.2.8 Respondents who visit the website a few times a year

In the frequency figures of website visits, it was observed that this group is especially important for the municipality, since it makes up the majority of individuals in question. In this case 366 people (55.5% of the total number of respondents).

In order to further broach the issue of this majority, data was collected on their personal characteristics in order to gain a further insight into this demographic and compared (n=366) with the group of Hague respondents (n = 712). This is shown in Table 6.

TABLE 6: CHARACTERISTICS OF RESPONDENTS WHO VISIT THE WEBSITE A FEW TIMES A YEAR

AGE GROUP	VISIT WEBSITE A FEW TIMES A YEAR (N=366)%	THE HAGUE RESPONDENTS (N = 712)%
15 TILL 19 YEARS	0	0.8**
20 TILL 44 YEARS	37.4	44.8
45 TILL 64 YEARS	43.5	39.2
65 TILL 79 YEARS	17.7	13.6
80 YEARS AND OLDER	0.6	0.7
GENDER		
MEN	45.4	45.4
WOMEN	53.8	53.5
EDUCATION		
NO EDUCATION OR ELEMENTARY SCHOOL	2.2	2.8
PRIMARY EDUCATION	11.7	15.6
SECONDARY EDUCATION	39.9	40.4
HIGHER EDUCATION	45.4	40.0

Source: Center for e-Government Studies; Prof. dr. Wolfgang Ebbers.

The table above demonstrates that this group does not deviate significantly from the sample as a whole. It can be observed however, that the number of people in the age categories of 45 to 64 and 65 to 79 is slightly higher. The number that have received primary education is also slightly higher.

2.2.9 Tendency for the online channel

It is vital that a degree of knowledge on the general technical literacy of the citizens of The Hague is attained. A particular focus is given to two different digital skillsets: information and navigation skills and mobile skills. This is drawn from the foundations of the report 'Internet Skills' by Van Deursen, Invalid source specified.. These authors have developed a set of questions with which online technological literacy can be measured in the format of a survey. Within this survey, 712 Hague based respondents took part.

2.2.10 Online Technological Literacy

Online technological literacy stands as a measure of an individual's competence in searching for and selecting information online. In order to be able to measure this in the Hague respondents, they were presented with a number of statements in which they had to self-assess said ability. Research shows that these self-reported responses provide a good reflection of the actual level of skill present Invalid source specified.. Table 7 provides these average scores.

TABLE 7: * ONLINE TECHNOLOGICAL LITERACY

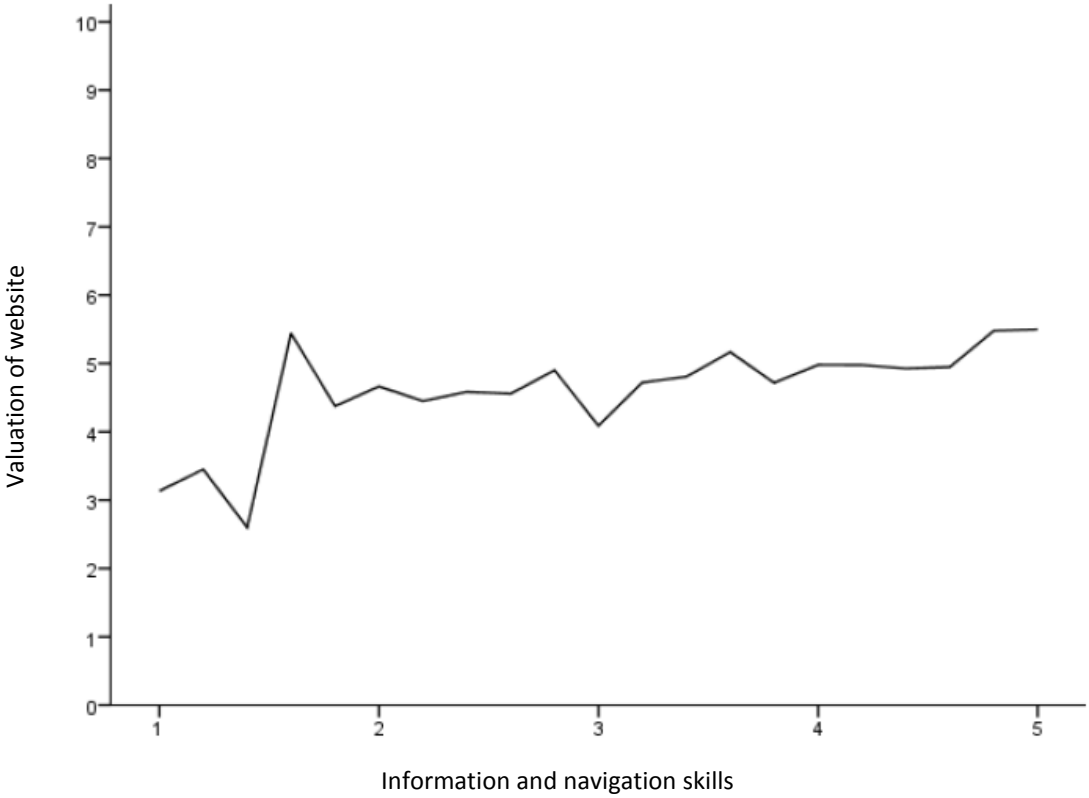
STATEMENT	AVERAGE	MEDIAN	STANDARD DEVIATION
I FIND IT DIFFICULT TO DECIDE WHAT THE BEST KEYWORDS ARE.	3.91	5.00	1.16
I FIND IT DIFFICULT TO FIND A WEBSITE THAT I VISITED BEFORE.	4.02	5.00	1.18
I FIND IT EXHAUSTING TO FIND INFORMATION ON THE INTERNET.	3.93	5.00	1.21
SOMETIMES I AM ON A WEBSITE WITHOUT KNOWING HOW I GOT THERE.	3.65	5.00	1.26
I FIND THE WAY IN WHICH WEBSITES ARE DESIGNED CONFUSING.	3.31	5.00	1.17
MERGED	3.76	4.00	0.93

Source: Center for e-Government Studies; Prof. dr. Wolfgang Ebbers.

*Digital information search skills, average and median per statement, where 1 = completely true and 5 = not at all true. A higher score indicates better information search skills.

In the table, it can be observed that the average scores are high for respondents from The Hague. The average score of information and navigational skills of the broader Dutch population is 3.66 Invalid source specified.. The citizens of The Hague thus score slightly higher than the national average on this skill (3.76), but not by a large margin. Additionally, the relationship between information and navigation skills and the appreciation of the online channel was explored. The statistical analyzes show that the higher the information and navigation skills of people, the greater their appreciation of the website. Conversely, the lower these digital skills are, the less value they place in the website. This relationship is visualized in figure 9.

FIGURE 9: *RELATIONSHIP BETWEEN INFORMATION AND NAVIGATION SKILLS AND VALUATION WEBSITE.



Source: Center for e-Government Studies; Prof. dr. Wolfgang Ebbers.

*Note. This relationship was found to be significant from the regression analysis (β = .261, p <.001).

2.2.11 Mobile digital skill

Mobile digital skills provide us with a measure of an individual's skill and confidence in using mobile devices. Again, the 712 respondents had to assess themselves on a number of statements. Their answers are shown in Table 8. where 1 = completely true and 5 = not at all true. A higher score indicates better information search skills.

TABLE 8: *MOBILE DIGITAL SKILLS, AVERAGE AND MEDIAN PER STATEMENT.

STATEMENT	AVERAGE	MEDIAN	STANDARD DEVIATION
I KNOW HOW TO INSTALL APPS ON A MOBILE DEVICE	3.90	5.00	1.41
I CAN TURN WI-FI ON MY MOBILE DEVICE AND TURN IT OFF	4.15	5.00	1.33
I KNOW HOW TO TRACK THE COSTS OF MOBILE APPS.	3.32	3.00	1.46
MERGED	3.79	4.00	1.18

Source: Center for e-Government Studies; Prof. dr. Wolfgang Ebbers.

The average score of mobile digital skills of the broader Dutch population stands at 3.98 **Invalid source specified.**). The inhabitants of The Hague thus score on average slightly lower than the national average, namely 3.79. However, this is once again only a small deviation from the national average.

2.2.12 Internet experience

Internet experience indicates how regularly someone performs certain activities on the internet. This was quantified by enquiring about prior experience with six online activities and how often the individual performs them. Examples of online activities are the use of social media, online banking and logging in to different services. For each activity it was recorded how often someone has to perform said action in order to score a point on the scale of internet experience. Respondents score a point in internet experience when using the internet with the indicated frequency for the following ten online activities:

- Weekly or more often: seeking information via search engines, online banking and using social media.
- Monthly or more: logging into personalized services
- Yearly or more frequently: logging in with DigiD and searching for governmental information

In this fashion, 712 respondents could score between 0 and 6. If a respondent scores 0, 1 or 2 on this internet scale, they were graded as having limited internet experience. With a score of 3 or 4 they were considered to be of an average level of experience and with a score of 5 or 6 they were considered to have extensive internet experience. The distribution of respondents in these three categories is provided in table 9

TABLE 9: DISTRIBUTION OF INTERNET EXPERIENCE BY HAGUE RESPONDENTS

	RESPONDENTS %
LIMITED INTERNET EXPERIENCE	6.3
AVERAGE INTERNET EXPERIENCE	24.6
EXTENSIVE INTERNET EXPERIENCE	69.1

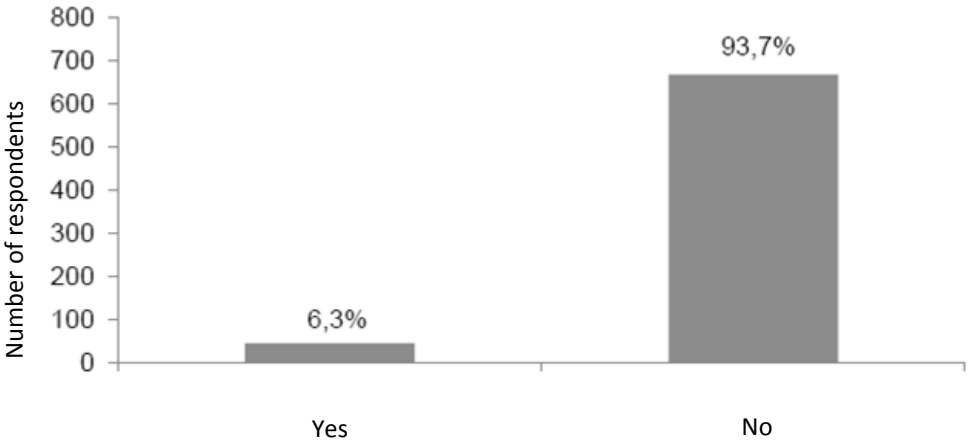
Source: Center for e-Government Studies; Prof. dr. Wolfgang Ebbers.

2.2.13 Social media use

This section touches upon the current usage of social media and the respondent's usage of to communicate with the municipality. Firstly, the group of respondents who 'sometimes' communicate with the municipality via social media are detailed. Followed by the group of respondents who have not yet made contact with the municipality via social media.

The figure below provides information on how many respondents have made contact with the municipality via social media (such as Twitter and Facebook).

FIGURE 10: RESIDENTS OF THE HAGUE WHO CONTACTED THE MUNICIPALITY VIA SOCIAL MEDIA



Source: Center for e-Government Studies; Prof. dr. Wolfgang Ebbers.

This demonstrates that only a small percentage (6.3%) have ever had contact with the municipality via social media.

2.2.14 Users who utilize social media in order to contact the municipality

As can be observed in the above bar chart, only a small number of respondents (n = 45) have ever had contact with the municipality via social media. This is a relatively small group of people, but they can perhaps be considered the 'early adopters' of social media within the municipality.

A set of propositions were presented to said respondents on which matters they would like to have contact with the municipality about via social media. The purpose of these results was not to make statements about the entire population (inhabitants of the municipality of The Hague), but they could hopefully provide valuable indications for a future vision in which social media plays a role within governance.

For the sake of convenience, this group of respondents are referred to as the 'early adopters'. Firstly, it is noteworthy to see who these early adopters actually are, and what their personal characteristics are. The table below shows these characteristics in a summarized fashion, compared with the data from the sample above. It describes the personal characteristics of these early adopters of social media (n = 45) compared with general The Hague respondents (n = 712)

TABLE 10: EARLY ADOPTERS COMPARED WITH THE HAGUE RESPONDENTS

AGE GROUP	EARLY ADOPTERS SOCIAL MEDIA (N=45)%	THE HAGUE RESPONDENTS (N = 712)%
15 TILL 19 YEARS	0	0.8
20 TILL 44 YEARS	62.2	44.8
45 TILL 64 YEARS	24.5	39.2
65 TILL 79 YEARS	11.1	13.6
80 YEARS AND OLDER	0	0.7
GENDER		
MEN	64.4	45.4
WOMEN	33.3	53.5
EDUCATION		
NO EDUCATION OR ELEMENTARY SCHOOL	0	2.8
PRIMARY EDUCATION	15.6	15.6
SECONDARY EDUCATION	46.7	40.4
HIGHER EDUCATION	35.6	40.0

Source: Center for e-Government Studies; Prof. dr. Wolfgang Ebbers.

The table demonstrates that these early adopters are primarily individuals within the 20 to 44 age group. This percentage (62.2) is significantly higher than that of the sample (44.8). Furthermore, it can be observed that this group is predominantly male and that they have a noteworthy level of secondary education.

The table below shows that this group is mainly in agreement with all the provided statements. Particularly regarding actions relating to the municipality and potential emergency situations in the city, people would prefer to contact the municipality.

Statement	*Average*	*Median*	*Standard Deviation*
I would like to ask questions to the municipality via social media, like Twitter or Facebook.	4.71	5.00	1.41
I would like to contact the municipality via WhatsApp.	4.64	5.00	1.46
I like to use Twitter or Facebook to receive notifications to pass on the municipality	4.73	5.00	1.34
I like to hear about fun activities from the municipality via Facebook or Twitter.	5.31	6.00	1.06
I like to use Facebook or Twitter to discuss important issues for me with the municipality.	4.89	5.00	1.35
If there is ever an emergency situation in the city, I would like to stay up to date via social media.	5.45	6.00	1.25
Merged	4.94	5.00	1.02

TABLE 11: STATEMENTS REGARDING MUNICIPALITY CONTACT

Source: Center for e-Government Studies; Prof. dr. Wolfgang Ebbers.

In the following section, we will endeavor to address the potential of chatbots as a new governmental digital communication channel.

2.3 New technologies to improve public services

Citizens now have several channels open to them to contact their local government: via post, at a physical help-desk, by phone, internet, or by e-mail. This is referred to as the "multi-channel approach" (Plasterk, 2017). The government determines which channel for which the service is made available. In the future, citizens should have more digital options made available to them. To this end, the government should be entitled to be able to communicate with the administration in a more progressively digital fashion. This too should apply also to Dutch nationals residing abroad and foreign residents within the Netherlands (Plasterk, 2017).

The use of these digital channels by citizens, is strongly stimulated by the Ministry of the Interior. Within other agencies, service processes will be selected which will positively increase digital traffic. In doing so, government institutions will make optimal use of the projects that run in, among other things, the Digital Cities Agenda and the cooperation contained within the Smarter Cities covenant concluded by the Minister for Economic Affairs on behalf of the Kingdom and the 32 big Dutch cities (G32). Service procurement processes with strong use of digital capabilities will be tackled with end-users, including the ICT-breakthrough project 'massively digital' (Kamp EZ, 2013).

When the local government presents the digital channel towards citizens emphatically as a preferred channel, it demonstrates that the government itself is willing to accept digital traffic. Now, the General Administrative Law Act states that electronic messaging with the government is only possible if the relevant government organization opens up to it as an option. This arrangement will be amended, with the assumption that citizens and businesses will in most cases have the opportunity to make written communication with their government and administration via digital means. In this scenario, local governments should take the initiative to adjust the General Law on Administrative Law in an appropriate fashion. In doing so, it will open up the possibility for making greater demands upon the digital road, with a view towards the reliability and vitally the confidentiality of traffic between the people and their government.

However, we have only truly glanced over the current issues and discourse surrounding the progressing digitalization of the government (and more specifically of the municipality). Within this text, we have provided a reasonably comprehensive overview of the current drive towards the greater integration of nascent social robot technologies into the public sector and their potential to utterly revolutionize the means via which the municipality opens digital channels between itself and the population of The Hague.

As we are presented with such a dynamic and potent set of opportunities to open new channels, it is pertinent that we should also assess their viability and potential for success. This analysis will be the primary goal of our study and one would hope that the findings from it would provide greater insight into the current and dynamic situation.

2.4 Exploring new channels to deliver public e-services

Over the past two decades, the means via which public services have been delivered has evolved rapidly. And with it we have seen the rise of a new innovation; chatbots that may potentially utilize artificial intelligence to deliver desired services (Eeuwen, 2016). On one hand this may unsurprisingly open up new means via which typical public sector services may be delivered, for example their utilization in answering telephone inquiries, but in addition they may also potentially open up new and untapped channels of communication between the citizen and government. In a white collar mirroring of the widespread mechanization of the factories during the Industrial Revolution it has been suggested that roughly 140 million full time employees worldwide could be replaced fully by such programs (Mckinsey, 2017). A shocking concept, but one that sends a clear statement; a potential revolution is brewing in the delivery of public sector services. However, the implications of it will be revolutionary for governments and industries because social robots will fit into our rapidly developing landscape (Mckinsey, 2017).

It is vitally important that we develop an understanding of this fresh landscape. The first and arguably most important factor that should be considered is the raw logistics of any such developments. Cost is a significant factor, each new channel opened up requires its own infrastructure and a commitment of resources (Wirtz, 2017). Staff must be hired, staff must be trained and the means of delivery of the service must be molded to fit the identity of the organization. Sadly, however money is a finite resource, so the nature and scale of such logistics are an incredibly important consideration that must be made. Secondly, the somewhat more nebulous factor of matching the correct services to the correct citizens must be addressed, different channels offer differing qualities, so while one option may be a perfect fit for a specific demographic, the same channel may be wildly unsuited to another (Wirtz, 2017).

Additionally, we come to the relationship between these newer digitized channels and their older and more traditional counterparts. Many argue that the electronic primarily supplements rather than substituting for the conventional means (Madison, 2016). However, we must address and query these interactions and their impacts if we are to gather any understanding of their potential outcomes within the public sector.

As previously mentioned the environment surrounding public sector services has seen significant and rapid change within the last couple of decades. Prior to the current prevalence of the internet the majority of services were delivered by one of three means; in person (for example via appointment), via postal mail, or often via telephone (Reddick, 2011). For conventional purposes, these channels have come to be known as “traditional” to more easily distinguish them from the growing tide of “electronic” service channels (Willem Pieterson, 2017).

Despite its initial infancy in the 1960s, initial adoption of internet technologies by governments can only be clearly traced back to the 1990s (Hafner, 1998). Initial lines of development were heralded as a significant leap forward in the logistical

capabilities of an administration to freely communicate and do business with the general public; in addition to the secondary benefits of reduced cost and required manpower (Layne, 2001). As a result, websites and email were eagerly pushed to the forefront of many governmental strategies during the 1990s. The following table summarizes the primary generations of multimedia channels (Layne, 2001).

TABLE 12: GENERATIONS OF MULTIMEDIA CHANNELS

G	*Period*	*Label*	*Alternative(s)*	*Example Channels*
0	<1990s	Traditional	-	In-person, telephone, mail
1	1990s	Electronic	Digital	Website, email
2	2000s	Social	Social media. Web 2.0, Government 2.0	Social media, (e.g. social networking sites, (micro-)blogging, wikis)
3	2010s	Mobile	M-government	Smartphones, responsive sites, mobile apps
4	2020s	Robot	(Social) Robots, Robotization	Social & conversational robots, artificial intelligence, virtual intelligence.

Source: *'New Channels, New Possibilities, 2017'; Willem Pieterson, Wolfgang Ebbers.*

With the rise of the concisely named Web 2.0, further developments surged forwards and new additional channels for delivery of services were opened up (Chadwick, 2003). The growing prominence of social media within the private sector has led to following widespread adoption of such utilities by governments and administrative agencies. One study within the Netherlands (Kok, 2015), has shown that 90% of all municipalities are active on Facebook, 60% on YouTube and 100% of all municipalities have begun to utilize Twitter as a platform for public service delivery. Such developments and the extensive communication with citizens resulting from them demonstrate the clear potential of an e-government (Kok, 2015).

In addition to this vibrant growth in the usage of social media as a channel of communication, we have also seen the arrival of other modernized approaches to public service delivery. The ubiquitous nature of mobile phone technology within the 21st century has led to attempts by various governments to capitalize on this via "M-government" initiatives (Lawrence, 2002). With the growth of wireless infrastructure in the 2000s, information can now be rapidly conveyed to individuals via SMS, specialized mobile websites or even tailored mobile applications. From these examples it can be clearly demonstrated that the recent steps of digitization have arrived in waves, all of which have been met with great fanfare by their adopters and all of which have been adopted at differing paces by the government and general population. The initial wave of progress is clearly complete (Eurostat, 2017), usage of websites and email are uniform throughout all levels. However, later advances such as the aforementioned drive towards social media are not so universal and are still in the process of widespread adoption. In spite of this, we believe it can be argued that we stand at the threshold of yet another new wave of advances, the utilization of social robots as a tool to more effectively deliver public services (Eurostat, 2017).

2.5 The entry of the conversation era of chatbots.

Chatbots are known by several names, to mention a few: conversational systems, casual conversational agents, robot agents, chat-oriented dialog systems and chatbots. In this research, we shall use the name chatbots to identify this technological phenomenon as it is used in the majority of literature and in practice. Nevertheless, throughout the various approaches we should treat the multitude of terms as being synonymous with one another in order to define their overarching and deeper true meaning (Pieterson, 2017).

The phenomena of chatbots have a long and storied history. Many researchers agree that 'Turings Imitation Game' can be firmly defined as the origin point of today's highly developed and more technologically advanced chatbots (Turing, 1950). At the same time there are also a significant number of researchers who argue that the software developed in 1945 'Memex' is the earliest stage of all subsequent developments in chatbot technologies (Bush, 1945).

At any rate, recent studies have revealed that chatbot developments have been ground breaking since then. The researchers Turban and King argue that "software agents can be divided into resident or mobile agents" (Turban, 2003). Resident agents are interpreted as software embedded systems that strictly execute commands. They generate responses based on relevance to a user's input text. Mobile agents are competent at navigating independently through various software systems, architectures and platforms. According to Yeo said mobile agents are well adapted to the field of e-commerce, e-communication and e-customer service (Yeo, 2002).

The birth of the 'chatbot' allowed for a new and dramatically different means via which the user may interface with a digital service, Human Computer Interaction (HCI) via natural language. With the growth of home and office computing it became increasingly desirable for the end-user to be able to engage in dialogue with a computer in an almost conversational fashion. Addressing them as one might a colleague (Abu Shawar B., 2005). A more naturalistic and potentially more sophisticated approach to HCI that may better suit a significant portion of individuals in which users "express their interest, wishes, or queries directly and naturally, by speaking, typing, and pointing" (Chai, 2000). Within this context 'chatbot' is used as a broad catch all term for a range of concepts, whether they be virtual assistants as often presented in the modern smartphone market, chatter bots or conversational agents. However, in the majority of contexts whether colloquial or academic, chatbot remains as the primary umbrella term. Chatbots as a program "...exploit natural language technologies to engage users in text-based information-seeking and task-oriented dialogs for a broad range of applications" (Fryer, 2006), quite literally a form of intelligent software that can engage a user in text based conversation for some desired means. Despite the broad range of potential definitions of chatbots we shall primarily use the term to refer to one particular phenomenon relevant to our interests, the utilization of a chatbot within a municipal role in order to open up digital channels to citizens and potentially provide them with public services via text based naturalistic conversation (Braun, 2003).

According to Russel and Norvig chatbots are "intelligent agents that implement a function that maps percept sequences to actions, and which cover different ways to represent these functions, such as reactive agents, real-time planners, and decision-theoretic systems" (Stuart Russel, 2010). Notwithstanding, a quite general clarification of the phenomena, which can be construed to be a philosophical definition. With this in mind we should continue to extract a more concrete definition that reveals the full characteristics of the current zeitgeist by discussing complementary references.

According to Rivard chatbots are designed to build connections with prospects in the most efficient way possible (Rivard, 2017). She distinguishes the following five types of chatbots with different functions:

TABLE 13: DIFFERENT TYPES OF CHATBOTS.

TYPE CHATBOT	CHARACTERISTICS AND FUNCTIONS
- CHAT AS CHATBOTS	These chatbots are more focused on entertainment and less on business functions whereby they produce responses based on relevance to a user's input text.
- TRIGGERED TASK CHATBOTS	These chatbots are essentially keyword response systems that interact directly with users. Their interface makes it possible to order products or services and are provided with push and order options.
- INTERACTIVE INFORMATION ACCESS CHATBOTS	These chatbots are used on social platforms as an interactive tool to collect and share information regarding a brands' content. They communicate and make conversation with end-users and provide relevant answers in the most human way possible.
- COMPLEX TASK INTERACTION CHATBOTS	These chatbots are designed for complex task interactions whereby they combine search, triggered task models and as a result also make conversation. They differ from triggered task chatbots in the aspect of having knowledge of the tasks, the information needed to execute commands, and the ability to track already provided information to generate sophisticated conversations.
- SEARCH CHATBOTS	These chatbots use search engine's information to support their conversations wherein they base their tasks and responses on a pre-determined set of keywords. These keywords are labelled by said chatbot as the specific task it seeks to accomplish. Search chatbots are limited in their interaction as they delete the accomplished tasks once the response has been provided.

Source: www.pureb2b.com '*Chatbots next big thing lead generation'.*

In this vein, we must discuss and query the role chatbots should take amongst the multitude of service channels provided by the Dutch government. Multiple pre-existing strategies touch upon the combined properties of available service channels, with a variety of differing focuses. For our purposes, however we hit one significant snag with these models. Namely that none touch upon chatbots as a service channel. Additionally these models treat all channels as single monolithic entities with an unshifting set of properties, and provide no means via which the potential of replacements or additions to services may be gauged.

Below we present an overview of the integration of all existing social robots in the multi-channel models. The provided overview draws upon the known current and future capabilities of digital channels. However, without doubt said capabilities will show clear development in a future context.

TABLE 14: CHARACTERISTICS OF ALL SOCIAL ROBOTS.

Property	Software agents			Virtual and virtuality enhancing robots		Physical social robots	
	Chat bots	conversational bots	Intelligent assistants	AR	VR	Non-humanoid Robots	Humanoids
Speed/ interactivity	Medium	High	High	Medium	Medium	Medium	High
Ease of use	High	Med/High	Med/High	Low/Med.	Low/Med.	Low/Med.	
Stimuli richness	Low	Medium	Medium	High	Med/High	Medium	High
Ability to reduce complexity	Med/High	Med/High	High	Medium	Medium	Medium	Medium
Ability to reduce ambiguity	Medium	High	High	High	High	Medium	High
Short term channel supplement/ long term replacement	Chat, Email	Telephone	Chat, Email, Telephone, Social Media, Apps, Website	Front Desk, Telephone	Front Desk, Telephone,	Front Desk	Front Desk

Source: *'New Channels, New Possibilities 2017'; Willem Pieterson, Wolfgang Ebbers.*

Given their current state, the potential for chatbots as service deliverers seems promising. But due to the ambiguity provided by the aforementioned existing strategies it is rather difficult to forecast what exact role they will play within a multi-channel environment.

There are however limitations to current chatbots that may hinder them within a service role at this time. Firstly as a relatively nascent technology, they are not truly at their most sophisticated apex (Rivard, 2017). The potential for glitches and bugs that

may prove inconvenient to the end-user are an important consideration that should be ironed out as much as is possible. In the same vein chatbots, while referred to as an "intelligent" software, are not yet the artificial intelligences we see in science fiction. They rely largely on predetermined keywords that they seek out in order to formulate a satisfying response (Rivard, 2017). As such, a potential language barrier of sorts can exist between a chatbot and certain individuals who rely on keywords that while synonymous to those understood by said chatbot fall outside of its programming, hence leaving the chatbot unable to make sense of a user's request and failing to satisfy the user as a result. Additionally there is an existing track record of crude chatbots being utilized for the purposes of spam or online scams. As a result, some users may mistake a public service chatbot for spam or may find the actions of a chatbot dubious, untrustworthy or simply just annoying (Rivard, 2017).

2.6 Contextualizing chatbots

In order to fully contextualize the potential role of chatbot technology within the service sector, we must first define the context in which they may best thrive. The Cambridge Dictionary states the following as part of its broader definition of services; *"A government system or private organization that is responsible for a particular type of activity, or for providing a particular thing that people need".* Within this framework, the nature of 'service' can therefore be neatly assumed as a scenario in which the recipient stands to gain from the actions of the deliverer.

2.6.1 Different types of services

Within this context, it should be necessary to distinguish the means by which service can be delivered. One study into the matter of contemporary service channels draws three key conclusions in this respect (Gonzalez- Bree, 2012). Firstly, the delivery of service by humans, the more "traditional" means as discussed in this text. Secondly, via a technological interface that still requires manual action on the part of the end-user, a 'technology based self-service' (TBSS). A common example being automated teller machines, a service channel that has become near-universally commonplace since their inception in the late 1960s. And finally, Bree identifies the potential role of chatbots as a level above and beyond the place of TBSSs, potentially offering an even more streamlined and convenient means of service delivery (Froehle, 2006).

Bree identifies these channels as providing both their own unique advantages and disadvantages. Within the first context, service by a human allows for the full utilization of human intellect (Gonzalez- Bree, 2012). Being guided through a process by an experienced and knowledgeable individual can greatly enhance the experience for the service recipient, and in addition, many recipients may simply prefer to interact with personnel on a one to one level. TBSSs on the other hand can offer a significantly increased streamlining of the process for the service recipient and some such end-users have been identified as deliberately seeking out the inherent novelty they find in such interactions (Dabholkar, 2002). However, given the nascent nature of chatbot service delivery it can be difficult to define exactly what its inherent qualities and weaknesses may be. As such, we must endeavor to explore this matter during our research.

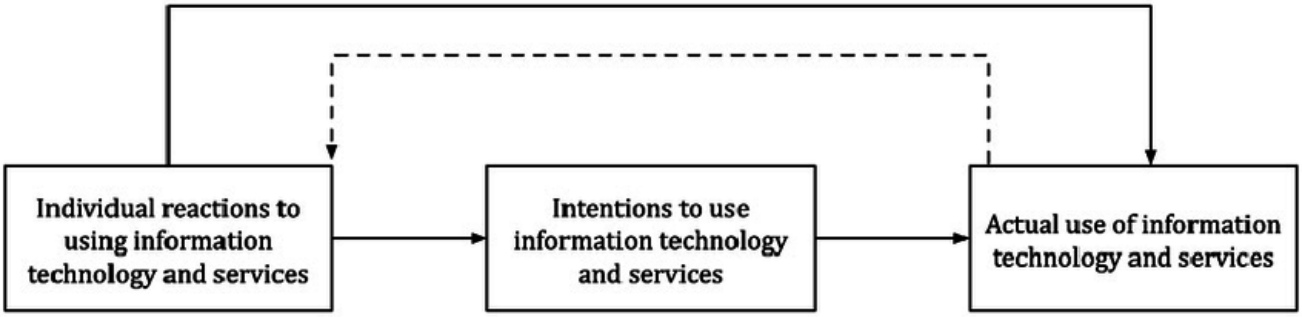
2.7 Analyzing the process of adoption

In order to establish a basis from which we will be able to draw an understanding of the outcomes of the adoption of chatbot technology, we must firstly build a solid and complete grasp upon the available related literature. Within the following section, we will illustrate an overview of the progress made in the field of such research and the associated evolution of the theoretical frameworks.

A significant point that should be established is the usage of terminology throughout the available literature, the terms 'Diffusion' and 'Adoption" are used interchangeably (Sharma, 2014). Thus providing the potential for confusion over exact meaning. Though Rogers establishes that 'Diffusion' refers solely to "the stage in which the technology spreads to general use and application" (Rogers E. M., Diffusion of Innovations. , 1983). In addition, Carr further defines 'Adoption' as "the stage in which a technology is selected for use by an individual or an organization" (Carr, 1999). The latter matter of adoption will stand as our main focus.

Given the nascent and fresh nature of the technology, the ramifications and challenges relating to its inception should be our primary concern. Diffusion of these technologies stands as a matter that must be approached in the future. The diagram below produced by Venkatesh et al. presents this process of adoption.

FIGURE 11: REPRESENTATION OF TECHNOLOGY ADOPTION PROCESSES.



Source: *Venkatesh, 2003: 'User acceptance of information technology: toward a unified view'.*

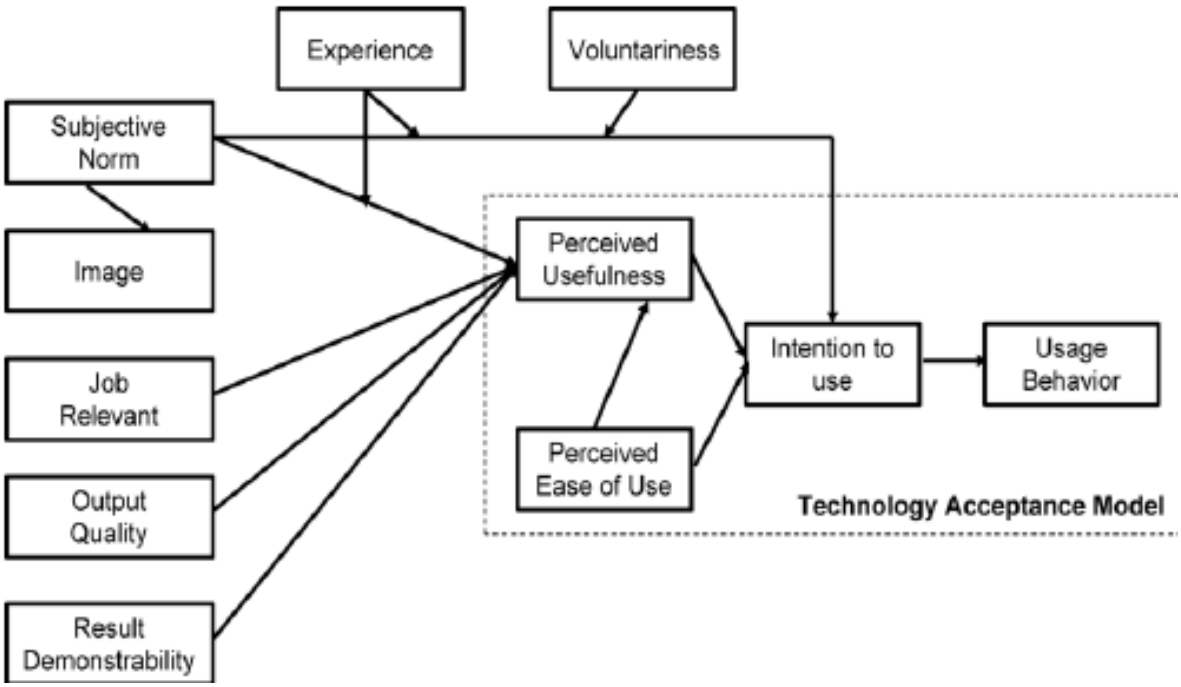
Chatbots as drivers for services are embryotic in terms of the product lifecycle. Therefore, secondary research focusing on the specified technology is scarce. In the following section, we will analyze different theoretical models that are applicable fore this research. Here, we provide an overview of recognized researches that have specified their scope towards digital services in the e-government context. We primarily discussed the process of adoption, and now continue with the 'Technology Acceptance Model' (TAM), the 'Unified Theory and Use of Technology 2' (UTAUT2).

2.8 Technology Acceptance Model

At this time, one of the most heavily cited adoption models provided is the Technology Acceptance Model (TAM). Rather unsurprisingly, this model is primarily aimed at the study of adoption of technologies (Davis F. D., 1989). TAM associates 'Attitude Towards Using' to two primary factors; 'Perceived Usefulness' and 'Perceived Ease of Use'. Davis et al. assert that these elements serve as the primary factors influencing the adoption of new technologies. Within this context 'Ease of Use' correlates with 'Use', in that the end-users degree of satisfaction in making use of the new technologies will directly impact their future willingness and intention to adopt them even further.

In practice, TAM has been found to be a deeply reliable model, accounting for 40% to 50% of user acceptance across a range of varied studies (Park, 2009). Though some remain critical of its capabilities to contain a wide enough range of factors as such further investigations to expand upon the established model may be necessary to accommodate for all potential variables in the process of adoption (Legris, 2003). Such an extension was brought forward by Venkatesh & Davis (2000) and was thusly known as the Extended Technology Acceptance Model (TAM2), which factored in additional influences such as 'image' and 'result demonstrability'. This improved model saw a variance of 60% for user acceptance within studies, a clear and positive improvement over the original TAM model (Venkatesh V. &., 2000).

FIGURE 12: TECHNOLOGY ACCEPTANCE MODEL.

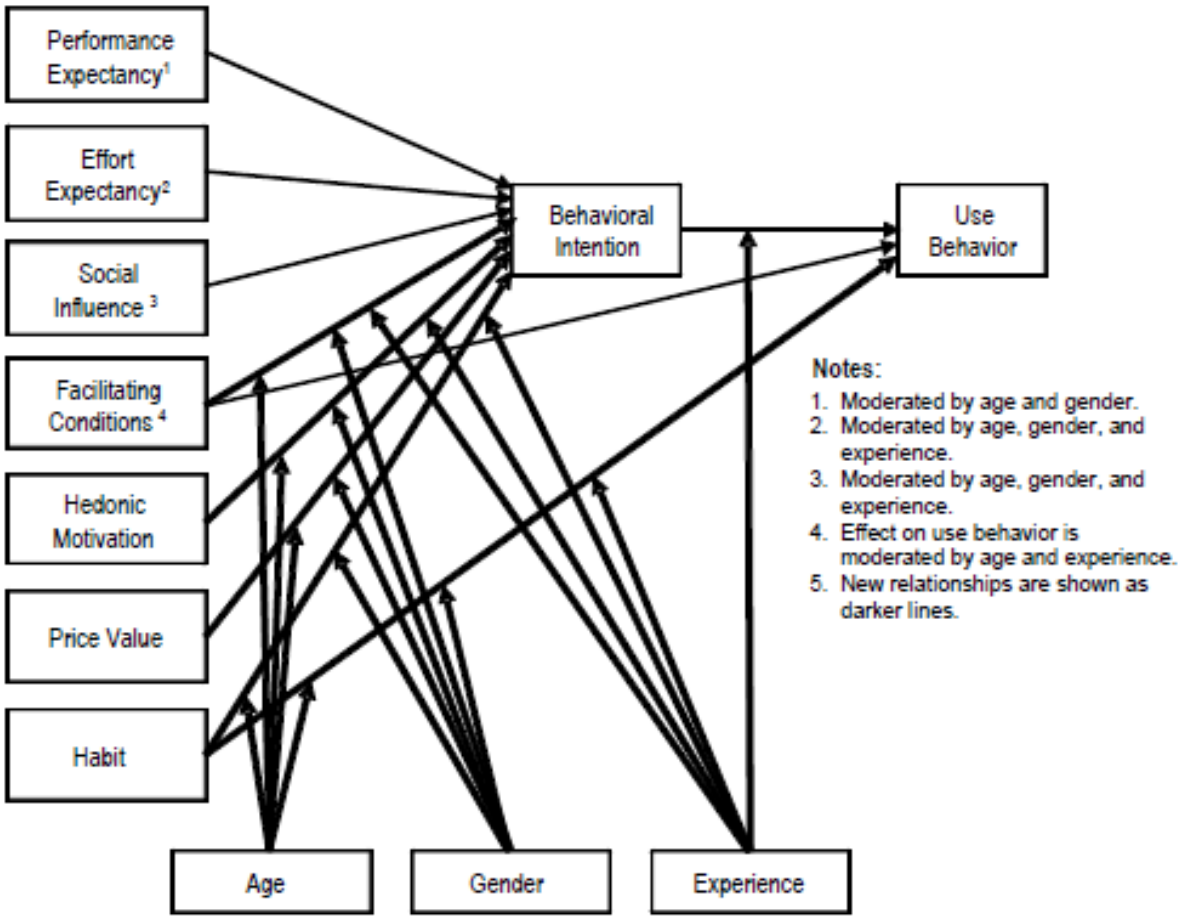


Source: *Davis 1989: 'User acceptance of computer technology: a comparison of two theoretical models'.*

2.9 Unified Theory and Use of Technology 2

Following on from UTAUT, Venkatesh et al. (2012) begun with the development of a more complete and potentially flexible edition of the model, the unified Theory of Acceptance and Use of technology 2 (UTAUT2) (Venkatesh V. T., 2012). Factors such as 'price value', 'Habit' and 'Hedonic Motivation' were woven into the framework in order to attempt to produce a model better suited towards the study of the behaviours and reactions of the individual to technology adoption. 'Voluntariness to Use' was removed from the framework as it primarily lent itself towards study of organisations and agencies rather than the actions of the individual. In addition, 'facilitating conditions' were determined to influence the 'behavioural intention', so a further connection between the two was worked into the model. Both generations of UTAUT and UTAUT2 have shown solid results in the field with 'behavioural intention' displaying a positive significance in the region of 56-74%. However, in spite of these solid findings recommendations indicate a future expansion upon the model to better suit specific contexts (Venkatesh V. T., 2012).

FIGURE 13: UNIFIED THEORY AND USE OF TECHNOLOGY 2.



Source: Venkatesh, 2012: *'Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology'.*

2.10 Secondary research

Multiple studies have delved into the topic of the uptake of digital services via a number of widely used technology acceptance models. Examples being those such as Technology Acceptance Model (TAM) (Davis F. , 1989), Innovation Diffusion Theory (Rogers E. M., Positioning an Innovation. In E. M. Rogers, Diffusion of Innovations, 1995), the Theory of Reasoned Action (Fishbein & Ajzen, 1975) and the Unified Theory of Use and Acceptance of Technology (UTAUT) (Venkatesh V. M., 2003). These standardized models of adoption assume that the potential end user weighs their individual benefits in making use of a nascent technology, and then as a result of that either choses to accept or reject it as an option (Al-Jabri, 2015).

There is however, no universal standardized definition of acceptance in this context provided by the literature. Lallmahomed argues that acceptance primarily refers to a key number of factors (Lallmahomed, 2017). Firstly, the factor of whether an end-user would choose to make use of the technology, secondly the factors that could increase the odds of said end-user choosing to adopt the technology and finally the means by which we may be able to forecast the nature of future use of a specific technology (Lallmahomed, 2017).

Several key studies has been carried out globally regarding e-government progress in developing nations and the areas in which they could potentially be improved. Asiimwe and Lim (2010) analyzed four publicly available Ugandan governmental websites, observing the accessibility of legal policies, website navigation and the site layout; to gain an insight into the level of usability presented by them and any potential flaws (Asiimwe, 2010). They were found to be lacking in interactivity and features that would promote end user accessibility, with the legal framework governing such access to information being left as a vague concept by the Ugandan authorities. Something that could clearly erode citizen trust in such services.

Asiimwe (2010) suggests that such issues could be remedied by providing a much less vague framework that is clearer and more accessible to the citizen (Asiimwe, 2010). For any digital channels to be utilized to the desired extent it is vital that the citizen trust them as an option.

In a similar study, the TAM model and Giddens' structuration theory were utilized to gain an understanding of e-government progress in the nation of Zambia (Bwalya, 2014). The findings from this researched concluded that a more holistic approach should be taken in some scenarios that factors in aspects such as the local cultural situation and marketing campaigns that would make the citizen aware of e-government as an option. A service receiver cannot utilize a digital channel that they are left unaware of. So clearly, it is vital that to engage the citizen in such a way they must first actually be made aware of said option.

Within Gambia yet another TAM based study was carried out (Lin, 2011). Addressing factors such as the quality of the information system, individual's attitudes and the quality of provided information. Within this scenario, the author has stated that for the local citizens a major obstacle in adoption of e-government was the deeply flawed

electricity infrastructure within the nation, suffering frequent downtime and brownouts. Therefore demonstrating that even if a citizen is aware of e-government services, if they lack the means to access them in the first place they simply will not be able to make use of them.

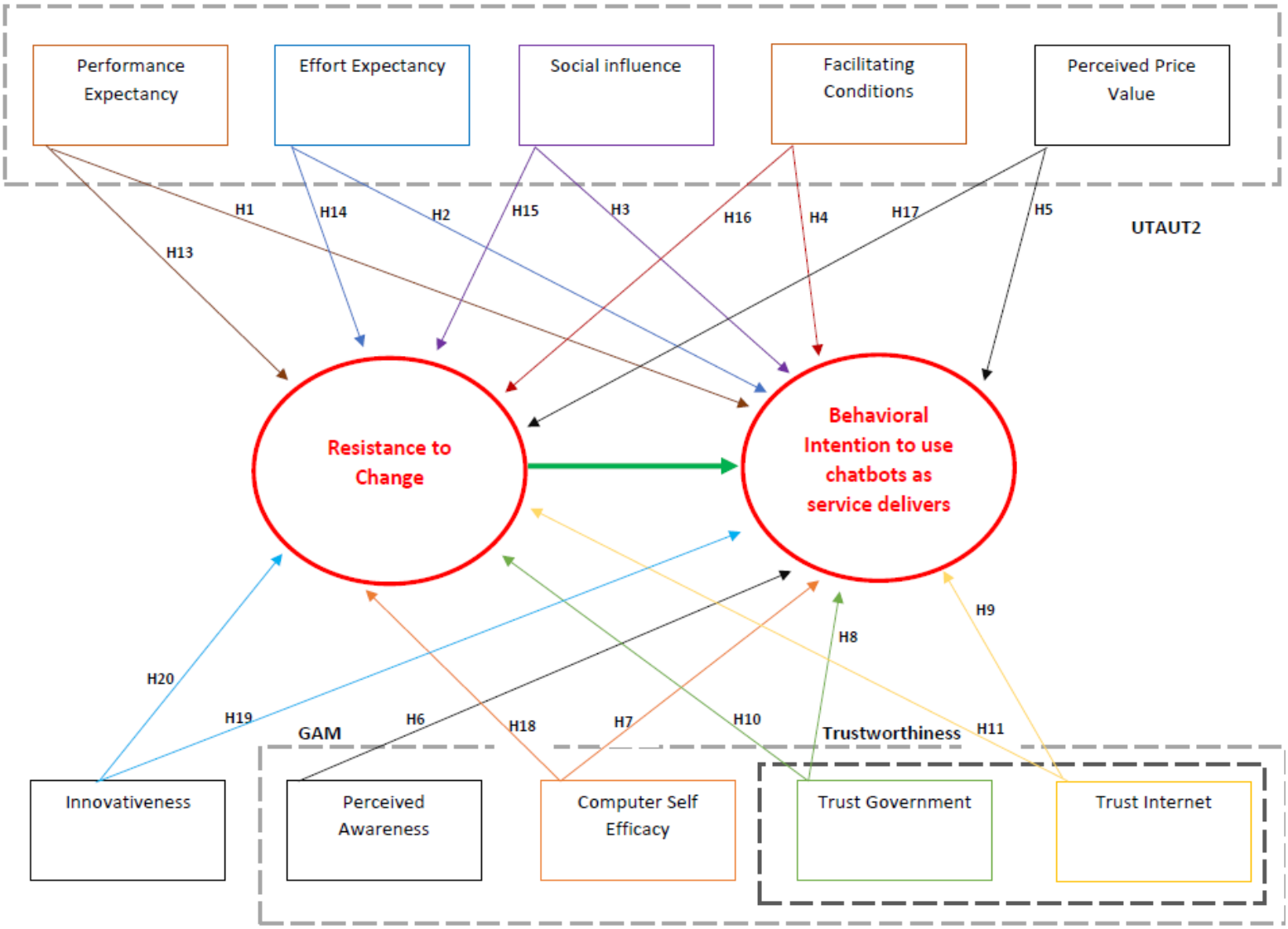
2.11 Proposing the conceptual model

Thus far, we have elaborated extensively on the TAM and UTAUT2 because these models serve as the most robust and frequently quoted models in the school of IS (information system) research. One available unified model is the Unified Theory of Acceptance and use of Technology 2 (UTAUT2) (Venkatesh V. T., 2012). A model primarily geared towards a consumer context. As an e-government scenario is primarily concerned with its consumers, namely citizens, the UTAUT2 model is an ideal tool for this context (Shareef M. K., 2011). UTAUT2 is demonstrably valuable, accounting for an increase in explainable variance of up to 18 percent.

Shareef's related E-government Adoption Model (GAM) (2011) provides for an even greater focus on the consumer within a solely E-government context (Shareef M. K., 2011). Allowing for analysis of both static and interactive levels of development relevant to E-government research. The largely static nature of contemporary digital services within the municipality of The Hague makes GAM a perfect fit for our research. GAM presents three significant key factors, the perceived benefits of a technology, perceived awareness of said technology by the user and the user's perception of their ability to make use of said technology (Shareef M. K., 2011). However, this latter factor of the GAM will not be utilized in our research as this concept is already covered by TAM.

Moreover, one feature that will be included as a new key factor is innovativeness. Innovativeness is observed as one of the fundamental factors that effects our wishes to explore and experience new things (Pearson, 1970). As such, we will make use of performance expectancy rather than the perceived functional benefit. The conceptual model we shall use within this study can be found below in Figure 7.

FIGURE 14: PROPOSED CONCEPTUAL MODEL.



2.12 Defining the hypotheses

The proceeding literature review and the concepts laid out within it have contributed to the framing of the picture for the literature relating to technology adoption. However, as a result this has created difficulties in the establishment of a solid and material framework. It can be concluded that given the nature of TAM, UTAUT2 and GAM, with their proven field-reliability, widespread usage and broad set of potential variances that these constructs would be of the greatest utility to us. The following section provides sources and definitions for each variable made use of to construct our theoretical model.

TABLE 15: CONSTRUCTS AND PROPOSED HYPOTHESIS.

CONSTRUCTS	MEASURE
PERFORMANCE EXPECTANCY, EFFORT EXPECTANCY AND SOCIAL INFLUENCE	H1. 'Performance expectancy' will have a noteworthy positive influence on behavioral intent to use chatbots. H2. 'Effort expectancy' will have a noteworthy positive influence on behavioral intent to use chatbots. H3. 'Social influence' will have a noteworthy positive influence on behavioral intent to use chatbots.
FACILITATING CONDITIONS	H4. The facilitating conditions will have a noteworthy positive influence on behavioral intent to use chatbots.
PRICE VALUE	H5. The price value perceived by the service receiver will have a noteworthy positive influence on behavioral intent to use chatbots.
PERCEIVED AWARENESS	H6. The perceived awareness of the service receiver will have a noteworthy positive influence on behavioral intention to use chatbots.
COMPUTER SELF-EFFICACY (CSE)	H7. Perceived computer self-efficacy will have a noteworthy positive influence on behavioral intent to use chatbots.
TRUSTWORTHINESS: TRUST OF THE INTERNET, TRUST OF THE GOVERNMENT	H8. The perceived trustworthiness of the government will have a negative influence on resistance to the adoption of chatbots. H9. The perceived trustworthiness of the Internet will have a negative influence on resistance to the adoption of chatbots. H10. The perceived trustworthiness of the government will have a positive influence on the behavioral intent to use chatbots. H11. The perceived trustworthiness of the government will have a positive influence on the behavioral intent to use chatbots.
RESISTANCE TO CHANGE	H12. A resistance to change will have a noteworthy negative influence on the behavioral intent to use chatbots. H13. Perceived performance expectancy provided by chatbots will have a noteworthy positive influence on resistance to change. H14. Perceived effort expectancy provided by chatbots will have a noteworthy positive influence on resistance to change. H15. Social influence from colleagues or peers will have a noteworthy positive influence on an individual's resistance to change. H16. The facilitating conditions within the scenario will have a noteworthy negative influence on an individual's resistance to change. H17. The perceived price value of a newly adopted technology will have a noteworthy negative influence on an individual's resistance to change. H18. A user's computer self-efficacy will have a noteworthy negative influence on said individual's resistance to change.
INNOVATIVENESS	H19. Innovativeness will have a positive influence on resistance to the adoption of chatbots. H20. Innovativeness will moderate the effect and will have a positive influence on the behavioral intent to use chatbots.

Performance Expectancy, effort expectancy and social influence (PE, EE, SI)

The UTAUT model was further developed and refined by Venkatesh with a strong focus on the context of the consumer (Venkatesh V. T., 2012). This consumer based perspective has led to 'performance expectancy' being defined in said context as being the ''degree to which using a technology will provide benefits to consumers in performing certain activities". 'Social influence' being the magnitude 'to which consumers perceive that important others believe they should use a particular technology" and 'Effort expectancy' being the ''degree of ease associated with consumers' use of technology" " (Venkatesh V. T., 2012).

These factors have been extensively employed within the model to forecast the end-users behavioral intention (Venkatesh V. T., 2012). UTAUT has been actively applied within the field during studies in Qatar (Al-Shafi, 2009), India (Gupta, 2008) and the Republic of China (Taiwan) (Wang, 2009). Said employments of the UTAUT model have shown a demonstrable correlation between the three aforementioned factors and the behavioral intention of the service receiver. Support for this has also been found directly within the e-government context during equivalent research (Alshehri, 2013).

However it must be noted that this relationship is not universally found, within a Saudi Arabian context Alshieri et al, (2013) found that the factor of 'social influence' was not notably significant in determining the behavioral intent (Alshehri, 2013). The exact reason for this is hard to forecast, but within said context, cultural factors may lead to this deviation from the expected norm. The culture and times in which a model is deployed should always be considered. Analysis of the model however broadly confirms the correlation between the three factors of 'effort expectancy', 'performance expectancy', 'social influence', and the factor of behavioral intention. As such, we propose that:

H1. 'Performance expectancy' will have a noteworthy positive influence on behavioral intent to use chatbots.

H2. 'Effort expectancy' will have a noteworthy positive influence on behavioral intent to use chatbots.

H3. 'Social influence' will have a noteworthy positive influence on behavioral intent to use chatbots.

Facilitating conditions (FC)

A deeply important factor that cannot be neglected is that of the 'facilitating conditions'. Defined within this context as being the service receiver's perception of the available means, resources and support available to allow them to utilize a presented technology. A clear example of this can be found in Lin, et al's aforementioned research within Gambia (Lin, 2011), wherein the deeply unreliable electrical infrastructure has led to a usage of e-government services below the desired level. Citizens lacking power cannot turn on a computer to make use of a

technology, hence making something as elementary as electrical power itself a facilitating condition (Lin, 2011).

However, in the case of a first world developed nation such as the Netherlands, electrical infrastructure is clearly not so major an issue. Within the original UTAUT model however it has been shown that there is little to no relationship demonstrated between facilitating conditions and behavioral intention (Venkatesh V. T., 2012). 'Effort expectancy' fully encompassing the relationship between the two within the scenario (Venkatesh V. &., 2000). As a result, precious little research has dedicated time to the analysis of the relationship between the facilitating conditions and behavioral intention, with the primary focus being on their relationship with the usage behavior of the service receiver. Within the newer framework of UTAUT2 however Venkatesh brought forward the concept that these conditions would play a significant part in behavioral intentions and were integrated into the model as a result (Venkatesh V. T., 2012). As a result a clear correlation between the facilitating conditions and the behavioral intent has been demonstrated ($b = 0.16$, $p < 0.01$).

H4. The facilitating conditions will have a noteworthy positive influence on behavioral intent to use chatbots.

Price value (PV)

Whether within a public or private context, the financial impacts of a technology are almost always given consideration. Budgets, no matter how large, are always finite. And as such, the monetary cost of deploying or making use of a digital channel plays a significant role in the diffusion of said technology. So too does such a factor impact the receiver as well, if the cost of pursuing a service is simply too high for a citizen then they will be deterred from seeking it. For a technology to see widespread adoption its benefits must outweigh its costs. When such a scenario occurs, the 'price value' is stated to have a positive impact on the behavioral intention (Venkatesh V. T., 2012). Previous studies have found such an impact within digital services (Chong, 2013). Therefore, it can be argued that there is a clear correlation between price value and behavioral intent. As such, we propose that:

H5. The price value perceived by the service receiver will have a noteworthy positive influence on behavioral intent to use chatbots.

Perceived awareness (PA)

A commercial product will rarely make its way into the homes and hands of a consumer unless marketed to them in an efficient fashion. This too can be said of e-governmental public services, a citizen who is utterly unaware of a service channel simply cannot make use of it. Within technology adoption this factor is referred to as 'Perceived awareness' the ''gaining and acquiring knowledge, education, and consciousness as much as users perceive to be sufficient to learn the characteristics of a system, use it with skill, and realize its strategic functionality and competitive advantages and disadvantages" (Shareef M. K., 2011). In short, citizens must be informed and made aware of services in order to adopt them and in turn develop an attitude towards them (Limayem, 2007). Multiple figures have contended that

'perceived awareness' plays a key role in inhibiting e-government development (Zhao F. S., 2014). Shareef's (2011) findings demonstrate a clear relation between this factor and that of behavioral intent ($b = 0.23$, $p < 0.001$) (Shareef M. K., 2011). As such, we propose that:

H6. The perceived awareness of the service receiver will have a noteworthy positive influence on behavioral intention to use chatbots.

H7. The perceived awareness of the service receiver will have a noteworthy negative influence on resistance to change.

Computer self-efficacy (CSE)

Perceived levels of self-efficacy have been observed to play a part in influencing behavioral intention. Within the framework of technology adoption Computer Self-Efficacy (CSE) is defined as the ''judgment of one's capability to use a technology to perform a particular task" (Higgins, 1995), for example the technological literacy of the user and their level of confidence in their abilities (Higgins, 1995). CSE was not chosen to be an element of the UTAUT model as over time its impacts were dramatically lessened as the end-user became more familiar with the technology in question. As such, Venkatesh (2003) bundled the concept of self-efficacy into 'effort expectancy' (Venkatesh V. M., 2003). However further studies have found a notable correlation between CSE and other key factors such as a positive relationship between CSE and perceived ease of use ($b = 0.68$, $p < 0.001$) (Hernandez, 2009) and a correlation with effort expectancy itself ($b = 0.10$, $p < 0.001$) (Chan, 2010). With said studies in mind, it is reasonable to suggest that the impacts of CSE are reduced with time as the service receiver becomes familiar with the provided digital service channel. Though in a contemporary context when dealing with as nascent a technology as chatbots, something the average end-user would have little experience of, we would argue that an analysis of CSE in this scenario is absolutely necessary. As such, we propose that:

H8. Perceived computer self-efficacy will have a noteworthy positive influence on behavioral intent to use chatbots.

Trustworthiness: Trust of the Internet, trust of the government (TOTI, TOTG)

Trust plays a vital role in the maintenance of a healthy relationship between a government and its citizens. This is especially true within an e-government service delivery context. Not only must the individual in question trust the institution being communicated with, but so too must the technology that allows for said dialogue in the first place if progress is to be made in e-government development (Carter, 2005). Trust within such technologies is defined as ''the perception of confidence in the electronic marketer's reliability and integrity" (Lean, 2009). For such technologies to be utilized, citizens must feel safe and secure in entrusting that the government has a desired level of control and oversight of said technology's risks (Carter L., 2005).

In the early stages of the diffusion of any technology within a public context it is always likely that citizens will show a degree of wariness surrounding their usage,

many potential or perceived risks involved in the adoption may seem unfamiliar to them (Abu-Shanab, 2014). And as such, a degree of caution is unsurprising. Therefore, we would argue that a shortage of trust in a government's perceived ability to safely and securely handle digital service channels, may lead to hesitation to approach said channels by the citizen (Abu-Shanab, 2014). Hence, we propose that:

H9. The perceived trustworthiness of the government will have a positive influence on the behavioral intent to use chatbots.

H10. The perceived trustworthiness of the Internet will have a positive influence on behavioral intention.

H11. The perceived trustworthiness of the government will have a negative influence on resistance to the adoption of chatbots.

H12. The perceived trustworthiness of the Internet will have a negative influence on resistance to change.

Resistance to Change (RTC)

The growth of e-government has been observed to be impeded by a number of factors, one of which is arguably 'resistance to change'. Whether that be by the individual citizen or the governmental institutions themselves (Woods, 2014). Alas, within the literature we see a distinct shortage of research into this topic (Woods, 2014). Whenever faced with a tidal shift it is inevitable that some users will prefer the familiar, if antiquated, environment of the status quo. Hence placing themselves into a direct and polar opposition from those who attempt to drive this change (Kim, 2009). If a user feels in anyway threatened or intimidated by the effort to use a newly adopted technology then their perception of said technology will unsurprisingly be effected; and so too will their behavioral intent (Kim, 2009). As such, to gain a full and comprehensive understanding of the circumstances surrounding the uptake of nascent technologies it is vitally necessary that we analyse resistance to change as a factor.

The perceived intimidation value of a new technology also plays into the concept of 'effort expectancy'. The level of effort perceived to be required to make use of or learn the fundamentals of engaging with a technology. A user experiencing a significant level of exchange would have to exert more effort in order to engage with and familiarize themselves with a technology to the stage at which they personally feel it satisfies their needs. Hence leaving a negative relationship between the factors of effort expectancy and the resistance to change (Nov, 2008). Some such as Bhattacherjee and Himet (2007) however found a lack of any meaningful relationship between the two factors within their study (Bhattacherjee, 2007).

We however would posit that there is an observable relationship between effort expectancy and resistance to change. Therefore making it a significant factor that must be analyzed within our studies. In addition to effort, the potential improvement in performance perceived by the user must be accounted for in relation to the

resistance to change. A user who approaches a new technology with the expectation that engaging with it may make the service experience more comprehensive or efficient may be more willing to overcome their resistance to the change (Bhattacherjee, 2007). As such, we propose that:

H13. Perceived performance expectancy provided by chatbots will have a noteworthy positive influence on resistance to change.

H14. Perceived effort expectancy provided by chatbots will have a noteworthy positive influence on resistance to change.

Just as an individual's resistance to change can hamper adoption, so too can the lack of resistance shown by those around them. Either via direct "peer" pressure from co-workers to adopt or by simply becoming acclimatized to seeing colleagues and peers utilizing technologies that would otherwise seem daunting, an individual's intent to adopt a technology can be positively altered (Al-Gahtani, 2007). Groupthink and the desire to conform can be a potent motivator. Of course, by this logic it is perhaps no surprise that the inverse can also be true, a standoffish reaction from co-workers and peers to a nascent technology may cause an individual to be more hesitant in adopting it. On the other hand however, Kim (2009) studies into the matter found no major correlation between a reduction in resistance to change and colleague opinion (Kim, 2009). It is however a potentially vital factor that must be considered. As such, we propose that:

H15. Social influence from colleagues or peers will have a noteworthy positive influence on an individual's resistance to change.

Additionally there is a likelihood that aforementioned factors such as CSE, price value and the facilitating conditions may impact upon resistance to change in much the same way that they too could be argued to effect behavioral intent to use chatbots. Within the context of facilitating conditions, greater access to the means of engaging with a new digital channel may ease people into accepting it; hence influencing this resistance to change (Hirschheim, 1988).

If an end-user perceives the costs to outweigh the benefits of a new system then it logically would follow that price value may have a negative influence on resistance to change. It is unsurprisingly hard to reach out to a taxpayer if he feels the act of doing so is a waste of his or her tax money (Kim, 2009). In addition, the individual end-user's perceived self-efficacy in engaging with new technologies may make them more accepting of new developments. An individual who wishes to view himself or herself as having a grasp on the cutting edge should have little issue with accepting new adoptions. Hence providing a potentially negative influence on resistance to change.

H16. The facilitating conditions within the scenario will have a noteworthy negative influence on an individual's resistance to change.

H17. The perceived price value of a newly adopted technology will have a noteworthy negative influence on an individual's resistance to change.

H18. A user's computer self-efficacy will have a noteworthy negative influence on said individual's resistance to change.

Innovativeness (I)

Subsequently, innovativeness is perceived as a deeply ingrained factor due to its ability to induce one's own cognition and consciousness (Pearson, 1970). Likewise, scholars such as Dabhokar and Bagozzi confirmed similar outcomes regarding studies in Technology Based Self-Service (TBSS) in the field of 'seeking for innovation' (Dabholkar, 2002). In this regard, West and Farr (1989) define innovativeness as `the intentional introduction and application within a role, group or organization of ideas, processes, products or procedures, new to the relevant unit of adoption, designed to significantly benefit role performance, the group, the organization or the wider society' (West, 1990). Hence, we propose that:

H19. Innovativeness will have a positive influence on resistance to the adoption of chatbots.

H20. Innovativeness will moderate the effect and will have a positive influence on the behavioral intent to use chatbots.

TABLE 16: THE PROPOSED HYPOTHESES

VARIABLES	MEASURES	CONSTRUCTS
PERFORMANCE EXPECTANCY (PE)	Interacting with a municipality chatbot will aid me in accomplishing tasks more rapidly. Interacting with a municipality chatbot will enhance the quality of my daily interactions with the municipality. Interacting with a municipality chatbot would aid me in my day-to-day activities.	(PE1) (PE2) (PE3)
EFFORT EXPECTANCY (EE)	Interacting with a municipality chatbot would be straightforward for me. The process of interacting with a chatbot in this capacity would be an easy task for me to learn. Chatbot interaction would be straightforward to learn.	(EE1) (EE2) (EE3)
SOCIAL INFLUENCE (SI)	People close to me believe I should make use of chatbots to take care of my business with the municipality. Individuals whose views I respect would like me to utilize a municipality chatbot. Individuals with a strong influence on my daily life believe I should make use of a municipality chatbot.	(SI1) (SI2) (SI3)
FACILITATING CONDITIONS (FC)	I have the available physical means to make use of a municipality chatbot. I have the correct level of skill and technical knowledge required to interact with a municipality chatbot.	(FC1) (FC2)
PRICE VALUE (PV)	Municipality chatbots seem to be a wise usage of funding for the municipality. Municipality chatbots could save me money. Municipality chatbots are a financially viable and frugal option.	(PV1) (PV2) (PV3)
PERCEIVED AWARENESS (PA)	I would likely be aware of a municipality chatbot in The Hague. I have knowledge of the advantages provided by municipality chatbots. I have received training or education on the topic of chatbots and municipal chatbots. I have encountered public service announcements or marketing campaigns related to municipal chatbots.	(PA1) (PA2) (PA3) (PA4)
COMPUTER SELF-EFFICACY (CSE)	I believe I have the level of technical literacy required to use a municipal chatbot. I believe I am qualified enough to utilize a municipal chatbot.	(CSE1) (CSE2)
TRUST OF THE INTERNET (TI)	I believe the internet is a secure enough space to handle public services issues via a chatbot. I feel secure in the existing level of privacy related technology and legislation. I believe that the internet itself is now a sufficiently solid and private enough space in which to conduct public service actions via a chatbot.	(TI1) (TI2) (TI3)
TRUST OF THE GOVERNMENT (TG)	I believe government bodies and agencies are trustworthy. Government agencies are responsible and trustworthy enough to carry out digital services in a secure fashion. I believe that the civil services have my best interests in mind. Broadly speaking, the civil services can be trusted.	(TG1) (TG2) (TG3) (TG4)
RESISTANCE TO CHANGE (RTC)	Even with an available municipal chatbot, I would still prefer to use a more conventional traditional avenue to acquire public services. I would not be willing to go to a chatbot as my first point of contact with the municipality. Broadly speaking, I would prefer to continue to make use of the more traditional public service channels rather than a chatbot.	(RTC1) (RTC2) (RTC3)
BEHAVIORAL INTENTION (BI)	I would be keen to make use of a municipal chatbot. I would be likely to make use of a municipal chatbot. I intend to make use of a municipal chatbot when one becomes available.	(BI1) (BI2) (BI3)
INNOVATIVENESS (I)	When exposed to new technologies I like to explore them. I am usually the first among my group to adopt a new technology. I am slow to adopt new technologies. I enjoy exposure to new technologies.	(I1) (I2) (I3) (I4)

3. Research Methodology

Within this section, we will bring forward our research design and methodology. Firstly, we give an overview of the overall research strategy itself. Then we shall continue by giving a brief explanation of the approaching of citizens regarding the familiarity with chatbots. This is followed by the research philosophy which explains the nature of the study and is followed by the section research approach. Additionally, we give a detailed description of the sampling size we will employ, with an insight into the nature of the participants involved and the means by which the questionnaire will be deployed. Attention will be given to the measures used to guarantee the quality of the data. As conclusion, we will explore the means and reasons for the data analysis methods we have selected. Which in turn will give us the opportunity to delve into the quantitatively analytical aspects of this study.

Within this context, we introduced our theoretical framework to explore the aspects and implications of chatbots in relation to the civilian population of the municipality. The model employed UTAUT2 and GAM provides us with the above-mentioned constructs: This framework will be key to the further exploration of the issues at hand. In order to test our hypothesis and the model it self's capacity, we have designed a questionnaire, which will be utilized in a subsequent online survey. In the elementary stages a pilot survey will be conducted to affirm the solidity and quality of the questions asked of the participants.

3.1 Overall research strategy

During this study we shall apply a cross sectional approach to our research. Within this context we define ''cross sectional'' as an approach in which we determine the numerous variables within our sample of subjects and then establish the interconnected relationships between them. Thereby attempting to answer the question posed.

As our end goal is to develop a deeper understanding of the attitudes of citizens of The Hague towards the utilization of municipal chatbots as a service delivery channel, we will engage directly with said citizens via an online survey to gather the required empirical data whereby we will make use of Qualtrics. This web-based survey tool provides us with a straightforward interface in order to conduct data collection activities such as research surveys and data evaluations. Additionally, it provide us with the ability to export any collected data directly into SmartPLS. Within SmartPLS, we will utilize the recognized methodology for both the measurement and structural model. Following on from this, within this section we will continue to address the associated research methodology, for example the sample size, selection, the measures in place to ensure reliable data collection and analysis; and vitally the core basis of our research design.

3.1.1 Citizen Familiarity with Chatbots

A key factor in approaching such an issue is the concept of the potential 'ignorance' of the end-user/citizen, this should come as no great surprise as we are broaching the topic of a relatively nascent technology that is fresh to the public sphere. As such, a lack of user familiarity with such systems is an expected part of any such deployment. Such an issue poses the risk of facilitating potential failure in uptake of said service delivery channels (Martignoni, 2008). In turn, an unfamiliar user is likely to show a great degree of mistrust towards such a nascent technology, a factor that may significantly influence their intention to make use of it (Wu, 2005).

In order to fully and comprehensively investigate such an issue it is necessary that end-users must develop an understanding of the nature of chatbots themselves in order to express their own informed opinions on the matter.

In order to overcome the aforementioned issue of unfamiliarity, we will attempt to inform our participants of the current standing of existing contemporary municipal chatbots by displaying a video to them of 'Missi'. The appropriately named chatbot in current usage by the Mississippi state government as an interface via which state citizens may make administrative enquires at any time via the internet. A clear example of a chatbot based public service delivery channel. Missi is especially innovative within this sphere, being able to direct citizens towards the appropriate state agency and handling a diversity of issues; from hunting licenses all the way through to tax enquiries. As such, Missi stands as a prime example of the potentials of chatbots within a municipal capacity.

3.2 Research philosophy

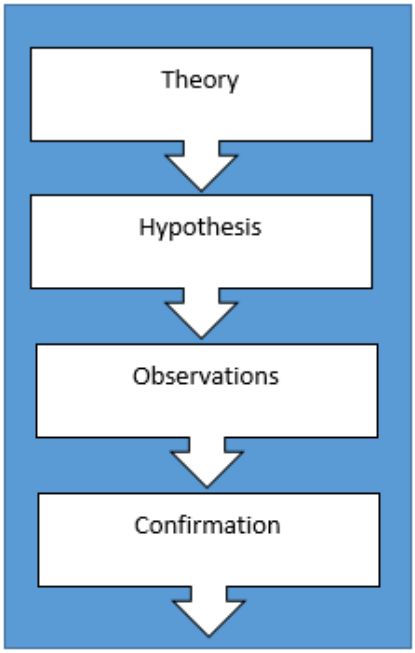
Our particular research philosophy can be defined as being positivist in nature due to our usage and reliance on solidly quantitative approaches such as surveys, structured questionnaires and statistics gathered by the CBS, municipality and national government; data that can be tangibly identified as reliable for our purposes. The application of a positivist approach towards our research within this scenario is especially wise as usage of quantitative analysis can provide us with a broader overview of a larger segment of our society and their attitudes in opposition to the more individualistic nature of the qualitative approach.

When addressing issues of governance at a municipal level the general zeitgeist of a whole population is a vital issue that must be met in order to provide satisfying services. Additionally the stimuli based, cause –effect, aspects of behaviorism are vital to our research approach, we are after all researching the topic of the response of individuals to a stimuli and their relationship and attitudes towards it. Leaving us with a distinct behavioristic streak to our research. Additionally there is a clearly identifiable deductive approach, our hypotheses are drawn from theory and then explored via observation and analysis of data.

3.3 Research approach

Saunders emphasized that no strategy is inherently superior or inferior to any other (Mark Saunders, 2007). According to Saunders, two main research approaches exist: the deductive and the inductive approach. With deductive, a theory and hypothesis are developed and a research strategy designed to test the hypothesis. With inductive, data is collected and a theory developed as a result of the data analysis (Saunders, 2007). Within this study, we will make use of a deductive approach whereby we work from the general to the specific.

FIGURE 16: DEDUCTIVE APPROACH



Source: Research methods for business students; Mark Saunders 2007

3.4 Pilot test

Prior to our initial body of work, we conducted a preliminary test in order to develop a greater understanding of our proposed research model. We gathered data from 25 respondents and subsequently gauged the extent of effectiveness of our initial questionnaire. By analyzing each respondent's standard deviation, an insight is provided on the variance of inputs. Eventually, not all standard deviations scored above 0.5 and we are therefore confident in the quality of our initial questionnaire, and we can therefore proceed to our final test without making any changes.

3.5 Final survey

Within our scenario, we have chosen to focus on an online survey technique hence allowing the participants to respond at their own convenience and eliminating the need for appointments, hence allowing us to reach a far broader audience. There are additional advantages to this non face to face approach, firstly it eliminates the possibility of the interviewer inflicting their own bias upon the respondent. The time

and cost investment is significantly lowered hence providing us with a frugal means of conducting such a survey, and the questionnaire itself can reach out to far more locations within The Hague than otherwise possible. Whether that be the workplace, street or home.

Within this study, 250 respondents were collected and subsequently analyzed for standard deviation. Additionally, eight respondents failed to meet the threshold and scored between zero and 0.5. Therefore, we initiated another batch of outgoing surveys to fill the gap of the deleted respondents (8). Eventually 250 respondents met the requirements of our initial analysis of data quality. This allows us no proceed with the methodological approach towards analyzing the data with SmartPLS, starting off with the evaluation of the measurement modeled and finishing with the evaluation of the structural model.

For the purposes of measuring our variables we have utilized a 5 point Likert scale, following the commonplace and generic range of “strongly disagree” with a value of -2 to “strongly agree” with a value of 2 and a neutral stance at the third point of the scale with a value of 0.

3.6 Data collection method

A quantitative method is one that relies on hard tangible numerical measurements and the analysis of statistical data gathered via the means of surveys and questionnaires or alternatively via the computation of pre-existing numerical data (Babbie, 2010). By gathering such data and making use of it for a broad overview and generalization of a body of individuals it will be possible to provide answers for certain scenarios and phenomenon (Muijs, 2010).

As previously mentioned within this section we shall be collecting our data via an online survey; in this case designed with Qualtrics. Said questionnaire shall consist of two consecutive elements. The first of which addresses the issue of the gathering of demographic data on our participants. Following on from this we will attack the main meat of our questionnaire, addressing statements related to the constructs laid out in our model. Moreover in doing so, we will hopefully be provided with further insight into municipal chatbots potential. As our area of operations is The Hague we shall be presenting the participants with the questionnaire in their native language of Dutch in order to reach the largest possible audience.

The quantitative data will be analyzed following its collection in SPSS. The demographic sections of the questionnaire shall be addressed via the means of descriptive statistics. Following on from this we will analyze the reliability and validity of the data gathered by the section of the questionnaire that addresses the statements. Following on from this, the proposed conceptual model will be trialed via the means of a process of simple regression in order to establish the direction of the relationship between the constructs within it and their tangible strength, i.e. path coefficients, the strengths of relationships and predictive capacity by means of R2 values. Finally, hypotheses testing allows for either acceptance or rejection of the proposed relationships within the structural model.

In addition, partial least squares (PLS) estimation shall be deployed in order to calculate a measurement of the test itself and our proposed conceptual model. As such, we will make use of SmartPLS in order to make key evaluations of our hypothesis. SmartPLS is a graphical user interface (GUI) based software that exists for the purpose of carrying out variance based structural equation modelling (SEM) via the aforementioned PLS method. Within our context, SPSS and SmartPLS may be utilized in order to analyze collected quantitative data and test the resulting hypothesized relationships said data might present.

3.7 Sample Size

In respect to current situation regarding SPSS sample size related literature it should be noted that significantly more ideal measurements may be identified. Within this sphere SPSS research with a sample size below a hundred oftentimes break down and give less significant path coefficients, whereas sample sizes in the region of 500 or below are more reliable in this respect (Chin, 2010). Eskiildsen further expanded on this by touching upon sample sizes between the regions of five hundred to a thousand. Concluding that the benefits of an increased sample size fade when said sample size reaches 250 (Eskiildsen, 2010). Hence providing researchers with a general recommendation of n=250. A recommendation we shall adhere to within our study in addition to our usage of a probability based random sample.

Citizens above the age of 18, and therefore able to fully access e-government services, were targeted within the municipality of The Hague via a cross sectional survey. At this time, the population of the Netherlands stands in the region of 17 million (World Population Review, 2017). Drawing from the figures provided by the Dutch Centraal Bureau Statistieken (CBS), in the region of 94% of the 16 to 24 year old demographic make use of the internet on a daily basis, rising to 98% within the 25 to 34 year old demographic (CBS, 2017). This technologically savvy generation are a key target demographic in the introduction of e-government services as their personal and professional usage of digital services may easily be capitalized upon for the purposes of e-government adoption. It can be difficult to gauge what percentage of the Dutch population is made up of this post baby-boomer generation Y demographic, but CBS provides us with a figure of 4.185.613 individuals between the ages of 20 and 40 resident within the Netherlands as of 2016 (CBS, 2017). Due to these bureaucratic and demographic circumstances, we are thusly justified in targeting an over-18 demographic.

3.8 Data Reliability

Data reliability, the measure via which the magnitude to which each individual indicator provides the required measure of the constructs within the model is established via analysis of the factors of internal consistency reliability and the indicator reliability. In our case we are making use of SmartPLS and as such indicator reliability shall be referred to as the ''outer loadings'' within this framework. Such outer loadings which are greater than 0.40 but less than the sum of 0.70 should be subject to further analysis as demonstrated in the chart below. Additionally outer loadings that lie in the region of being greater than 0.70 should be retained as

indicators due to their tangible and demonstrable reliability. In short, when a higher outer loading is observed it indicates that within the study the provided responses display a strong commonality.

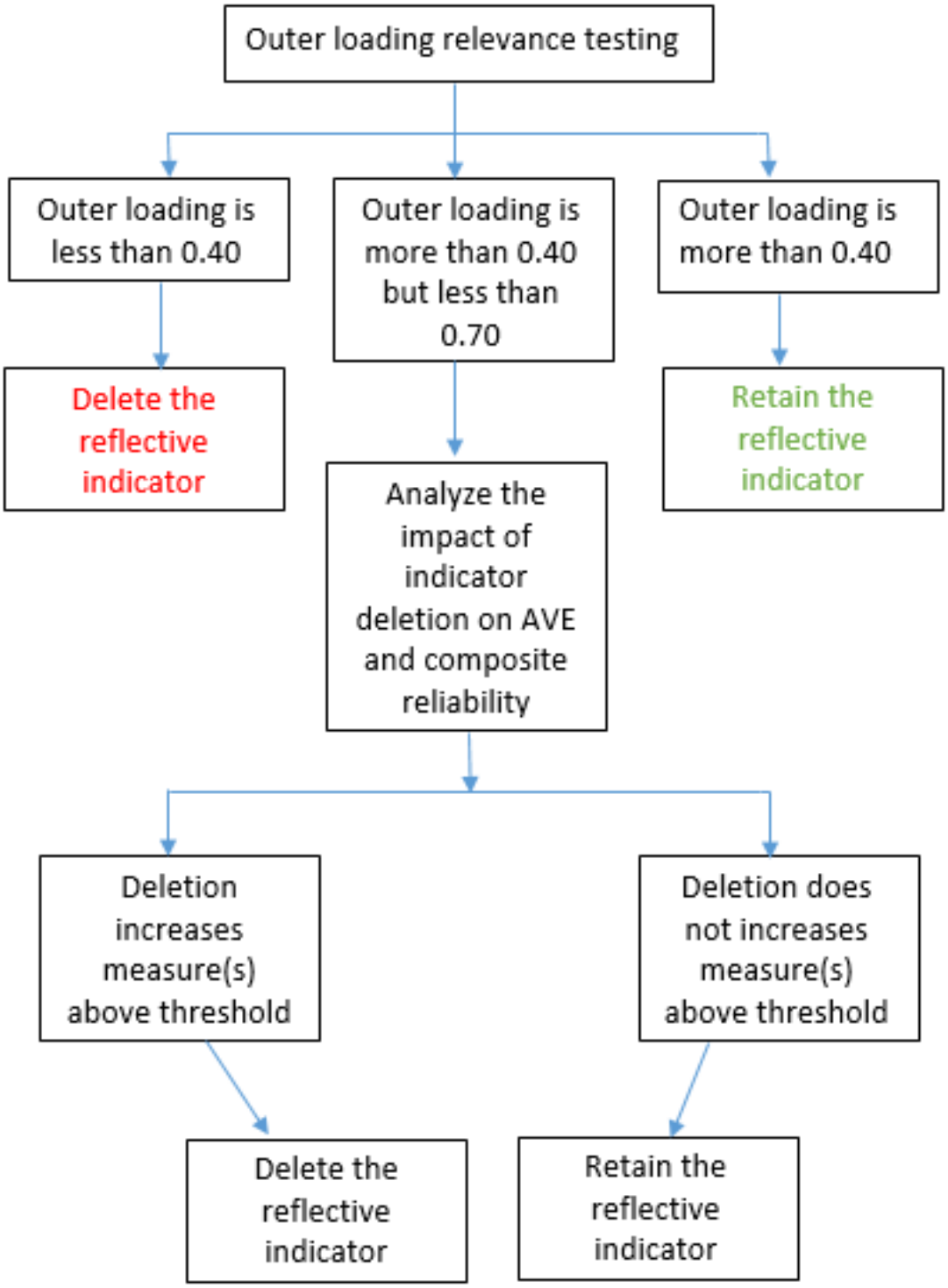
Within this context Cronbach's alpha stands as an oft referenced criteria in the assessment of internal consistency reliability. However, within PLS-SEM studies it is not utilized as the primary means of evaluation. Instead, attention is focused upon composite reliability, hence allowing for a greater degree of discrimination between the initial outer loadings, denoted and non-denoted measurement errors, by taking into account their standardized versions. Courtesy of this approach scores in the region of 0.60 to +- 0.90 may be accommodated within both a hypothetical framework and a more experienced knowledgeable research approach.

3.9 Data validity

In order to develop a grasp on the data validity within such research it is first necessary to assess the convergent and discriminant validities. In the case of the former one must assess the average variance extracted (AVE). And when said AVE produces a figure greater than 0.50 it can be seen to be explanatory for a minimum of half the resulting indicator variance for a particular variable. As the name would suggest convergent validity stands when all appropriate measures correlate with the other measures provided as part of a particular construct. On the other hand, discriminatory validity assesses the degree to which the constructs presented within a model stand to differ from one another. In order to assess said discrimination one must examine the nature of the cross loadings. Calculating and in turn assigning outer loadings to each construct provided within the model. Hopefully providing within a conventional scenario the highest numerical values for the specific relevant constructs with all others ranking below them quantitatively.

The following figure represent the measurement model that will be employed to analyze the results.

FIGURE 17: MEASUREMENT MODEL



Within the following chapter, we provide the results that are retrieved from SPSS and which is followed by a comprehensive discussion.

4. Results

This section shall address the topic of the results obtained during this study and a summary of the following analysis and evaluation of the quantitative values via the means laid out within our methodology. We shall be presenting the sample characteristics in addition to evaluations of the reliability and validity of said data, the cross loadings, Fornell Larcker and a thorough hypotheses testing through correlation testing, independent-samples t-test and regression analysis.

4.1 Characteristics of the respondents

Working from the foundations of our ultimate dataset. It should be possible to establish a comprehensive overview of the demographic makeup of our respondents to the survey. The study shows that the composition of the respondents consists of 125 men and 125 women. Of the 125 men, 78 men have experience with a chatbot and 47 men do not have experience with a chatbot. The sample further consists of 125 women. Of these, 69 women have experience with a chatbot and 56 women do not have experience with a chatbot. Furthermore, the distribution of experience and no experience between the different age categories is shown in the table below. A representation laying out this descriptive data obtained during the survey may be found in the Appendix.

TABLE 17: CHARACTERISTICS OF SAMPLE SIZE

		Frequency	Percent	With experience #	Without experience #
	Gender				
Valid	Male	125	50.0	78	47
	Female	125	50.0	69	56
Total		**250**	**100.0**	**147**	**103**
	Age				
Valid	18-25	87	34.8	43	44
	26-35	88	35.2	61	27
	36-45	60	24.0	38	22
	46-55	14	5.6	5	9
	56+	1	0.4	-	1
Total		**250**	**100.0**	**147**	**103**

The proceeding sections detail the means employed in order to assure and assess the data validity and reliability within our proposed model. We continue with describing, the cross loadings, Fornell Larcker and the hypotheses testing.

4.2 Data reliability and validity

The following Table 20 provides a summarized insight into the first set of reliability and validity tests. As demonstrated, the majority of outer loading values presented exceed the required threshold of 0.7. Thus allowing for their retention. The table below is evidence that our models has both validity and reliability. As we can see, outer loadings (> 0.7), Cronbach's alpha (> 0.7), composite reliability (> 0.7) and average variance extracted (> 0.5) all meet the required threshold values. The next two figures serve as backup to our claim as we provide additional evidence with presenting the cross loadings and the Fornell Larcker criterion (discriminant validity).

TABLE 18: DATA RELIABILITY AND VALIDITY

	Indicator	Outer loadings	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)	Discriminant Validity
BI	(BI1) (BI2) (BI3)	0.958 0.971 0.950	0.957	0.972	0.921	Yes
CSE	(CSE1) (CSE2)	0.655 0.892	0.389	0.755	0.612	Yes
EE	(EE1) (EE2) (EE3)	0.937 0.964 0.953	0.947	0.966	0.905	Yes
FC	(FC1) (FC2)	0.682 0.958	0.714	0.813	0.691	Yes
I	(I1) (I2)	0.923 0.819 0.860 0.933	0.907	0.935	0.783	Yes
PA	(PA1) (PA2) (PA3) (PA4)	0.710 0.849 0.601 0.595	0.708	0.763	0.652	Yes
PE	(PE1) (PE2) (PE3)	0.610 0.849 0.601 0.595	0.820	0.891	0.731	Yes
PV	(PV1) (PV2) (PV3)	0.899 0.881 0.891	0.870	0.920	0.793	Yes
RTC	(RTC1) (RTC2) (RTC3)	0.957 0.963 0.963	0.959	0.973	0.923	Yes
SI	(SI1) (SI2) (SI3)	0.966 0.963	0.957	0.972	0.921	Yes
TG	(TG1) (TG2) (TG3) (TG4)	0.966 0.833 0.966	0.917	0.946	0.854	Yes
TI	(TI1) (TI2) (TI3)	0.923 0.933 0.940	0.924	0.952	0.869	Yes

4.3 Cross loadings

From observing cross loadings, we judge all indicators to sufficiently impact their intended constructs and to a lesser extent the remaining ones.

TABLE 19: CROSS LOADINGS

	BI	CSE	EE	FC	I	PA	PE	PV	RTC	SI	TG	TI
BI1	0.958	0.473	0.490	0.403	0.665	0.438	0.631	0.561	-0.694	0.429	0.219	0.365
BI2	0.971	0.506	0.520	0.416	0.669	0.386	0.651	0.558	-0.720	0.464	0.230	0.329
BI3	0.950	0.471	0.460	0.334	0.618	0.351	0.609	0.499	-0.650	0.439	0.267	0.385
CSE1	0.322	0.655	0.581	0.591	0.312	0.600	0.250	0.465	-0.185	0.234	0.072	0.127
CSE2	0.455	0.892	0.352	0.262	0.311	0.243	0.506	0.447	-0.412	0.946	0.124	0.182
EE1	0.489	0.531	0.937	0.653	0.411	0.539	0.454	0.496	-0.423	0.388	0.133	0.218
EE2	0.459	0.505	0.964	0.714	0.395	0.609	0.361	0.445	-0.380	0.296	0.094	0.189
EE3	0.509	0.518	0.953	0.704	0.427	0.575	0.373	0.458	-0.388	0.315	0.096	0.165
FC1	0.159	0.218	0.331	0.682	0.139	0.320	0.136	0.265	-0.162	0.108	0.063	0.110
FC2	0.430	0.502	0.759	0.958	0.413	0.641	0.322	0.534	-0.385	0.271	0.025	0.195
I1	0.673	0.384	0.438	0.384	0.923	0.359	0.416	0.445	-0.539	0.288	0.140	0.291
I2	0.475	0.319	0.390	0.338	0.819	0.310	0.325	0.339	-0.387	0.234	0.157	0.301
I3	0.561	0.337	0.315	0.297	0.860	0.283	0.275	0.399	-0.466	0.304	0.081	0.245
I4	0.664	0.332	0.389	0.333	0.933	0.342	0.398	0.375	-0.542	0.281	0.183	0.283
PA1	0.108	0.258	0.295	0.311	0.072	0.610	0.171	0.259	-0.011	0.112	-0.048	0.080
PA2	0.425	0.466	0.675	0.727	0.398	0.849	0.289	0.424	-0.292	0.207	0.122	0.127
PA3	0.191	0.165	0.115	0.107	0.158	0.601	0.200	0.202	-0.049	0.109	-0.014	0.118
PA4	0.144	0.217	0.168	0.103	0.104	0.595	0.151	0.139	-0.066	0.134	-0.064	0.075
PE1	0.493	0.434	0.321	0.238	0.333	0.243	0.863	0.437	-0.413	0.450	0.155	0.135
PE2	0.679	0.474	0.442	0.329	0.401	0.310	0.878	0.564	-0.543	0.505	0.276	0.258
PE3	0.470	0.391	0.274	0.191	0.279	0.265	0.823	0.383	-0.340	0.334	0.186	0.157
PV1	0.458	0.476	0.433	0.480	0.381	0.407	0.475	0.899	-0.437	0.410	0.140	0.244
PV2	0.463	0.495	0.406	0.477	0.364	0.338	0.429	0.881	-0.438	0.351	0.135	0.224
PV3	0.572	0.533	0.468	0.438	0.429	0.404	0.563	0.891	-0.468	0.468	0.209	0.291
RTC1	-0.666	-0.373	-0.395	-0.368	-0.516	-0.232	-0.482	-0.486	0.957	-0.406	-0.167	-0.262
RTC2	-0.693	-0.388	-0.384	-0.337	-0.545	-0.228	-0.488	-0.476	0.963	-0.425	-0.167	-0.285
RTC3	-0.708	-0.411	-0.425	-0.349	-0.533	-0.237	-0.529	-0.491	0.963	-0.448	-0.174	-0.270
SI1	0.451	0.809	0.365	0.263	0.290	0.244	0.506	0.463	-0.429	0.966	0.143	0.202
SI2	0.438	0.767	0.325	0.230	0.313	0.177	0.479	0.440	-0.432	0.963	0.141	0.173
SI3	0.444	0.859	0.320	0.244	0.299	0.231	0.493	0.432	-0.418	0.950	0.133	0.174
TG1	0.279	0.139	0.113	0.047	0.180	0.064	0.277	0.191	-0.204	0.177	0.966	0.281
TG2	0.149	0.113	0.049	-0.011	0.117	0.031	0.180	0.160	-0.074	0.059	0.833	0.238
TG3	0.225	0.108	0.133	0.055	0.130	0.073	0.213	0.157	-0.172	0.130	0.966	0.230
TI1	0.343	0.195	0.198	0.195	0.275	0.188	0.197	0.268	-0.246	0.153	0.259	0.923
TI2	0.349	0.181	0.165	0.150	0.301	0.118	0.209	0.247	-0.256	0.181	0.213	0.933
TI3	0.353	0.186	0.198	0.199	0.302	0.123	0.219	0.285	-0.289	0.198	0.282	0.940

4.4 Fornell Larcker

Table 20 provides us with an insight into the discriminant validity values resulting from Fornell-Larcker quality criteria calculations. As we are left with a scenario in which none of the indicators have been removed it can be concluded that the aforementioned discriminant values are proven for each individual construct within the model. The following table provides the results for the Fornell Larcker criterion. As we can see that each green value scores highest on the x-axis while also outperforming on the y-axis. For example, SI is 0.960 which is the highest in the column while also being the highest on the same row.

TABLE 20: FORNELL LARCKER

	BI	CSE	EE	FC	I	PA	PE	PPV	RTC	SI	TG	TI
BI	0.960											
CSE	0.504	0.782										
EE	0.511	0.545	0.951									
FC	0.402	0.480	0.725	0.831								
I	0.679	0.388	0.433	0.382	0.885							
PA	0.409	0.469	0.603	0.626	0.367	0.672						
PE	0.657	0.511	0.418	0.306	0.404	0.323	0.855					
PV	0.563	0.565	0.491	0.521	0.442	0.432	0.553	0.890				
RTC	-0.718	-0.407	-0.418	-0.366	-0.553	-0.242	-0.520	-0.504	0.961			
SI	0.463	0.646	0.351	0.256	0.313	0.226	0.514	0.464	-0.444	0.960		
TG	0.248	0.131	0.114	0.040	0.159	0.064	0.249	0.184	-0.176	0.145	0.924	
TI	0.374	0.201	0.201	0.194	0.314	0.152	0.224	0.287	-0.283	0.191	0.270	0.932

4.5 Correlation

To test whether there is coherence between two quantitative variables, Pearson's correlation coefficient is used. Rxy represents the degree of coherence between the quantitative variables. The degree of coherence can assume a value between $-1 \leq Rxy \leq 1$. If Rxy is equal to -1 or 1, it is referred to as a perfect linear relationship. A negative value indicates a negative relationship and a positive value a positive relationship. The cohesion becomes weaker as Rxy moves to 0. The absolute value of Rxy indicates the strength of correlation.

4.5.1 Coherence with BI

The table below shows a summary of the correlation coefficients. It can be concluded from this, that there is significant positive correlation between all independent variables and BI. Hereby, the correlation between I and BI is the strongest ($r = 0.669 \mid p = 0.000$). This means when I increases by a value of 1, BI will increase by a value of 0.669. The weakest correlation is between TG and BI ($r = 0.237 \mid p = 0.000$). This result only tells us something about the relationship between these two variables. It tells us nothing about the causal relationship.

4.5.2 Coherence with RTC

We also examined whether there is a relationship between the independent variables and RTC. The test result shows that there is significant negative correlation between all independent variables and RTC. Hereby, the correlation between the variables I and RTC is the strongest ($r = -0.542 \mid p = 0.000$). This means when I increases by a value of 1, RTC will decrease by 0.542. The weakest correlation is between the variables PA and RTC ($r = -0.163 \mid p = 0.010$). This result tells only something about the relationship between these two variables. It tells us nothing about the causal relationship.

TABLE 21: CORRELATION

Hypothesis	Structural Path	Correlation (R)	P Value	Results
H1	PE → BI	0, 621	0,000	***
H2	EE → BI	0,502	0,000	***
H3	SI → BI	0,461	0,000	***
H4	FC → BI	0,358	0,000	***
H5	PV → BI	0,561	0,000	***
H6	PA → BI	0,299	0,003	***
H7	PA → RTC	-0,188	0,010	***
H8	CSE → BI	0,322	0,000	***
H9	TG → BI	0,218	0,001	***
H10	TI → BI	0,360	0,000	***
H11	TG → RTC	-0,154	0,015	***
H12	TI → RTC	-0,286	0,000	***
H13	PE → RTC	-0,501	0,000	***
H14	EE → RTC	-0,427	0,000	***
H15	SI → RTC	-0, 443	0,000	***
H16	FC → RTC	-0, 352	0,000	***
H17	PV → RTC	-0,515	0,000	***
H18	CSE → RTC	-0,192	0,002	***
H19	I → RTC	-0,552	0,000	***
H20	I → BI	0,662	0,000	***

4.5.3 Distinction of experience

Subsequently, we investigated what happens to the relationship between the independent variables and the dependent variable when a distinction is made between the respondents with experience and the respondents without experience with chatbots. If we first turn to BI, then we see that the positive correlation between I and BI is again the strongest with experience (r = 0.596 | p = 0.000) and without experience (r = 0.727 | p = 0.000).

It is striking that the relationship with no experience is significantly stronger in comparison with one with experience. This is also plausible, since with no experience there is still a "new" tool that you want to try out. If we turn to RTC, we now also see again that the relationship between I and RTC is the strongest with experience (r = -0.505 | p = 0.000) and without experience (r = -0.592 | p = 0.000). Once again, the relationship is significantly stronger with no experience. This is also plausible, since with no experience, there is still a "new" tool that one does not want to defend because the respondent is innovative and therefore wants to try new tools.

TABLE 22: CORRELATION (EXPERIENCE)

Hypothesis	Structural Path	Correlation (R) With experience	P value	Results	Correlation (R) Without experience	P Value	Results
H1	PE → BI	0,579	0,000	***	0,649	0,000	***
H2	EE → BI	0,444	0,000	***	0,518	0,000	***
H3	SI → BI	0,393	0,000	***	0,542	0,000	***
H4	FC → BI	0,418	0,000	***	0,266	0,000	***
H5	PV → BI	0,557	0,000	***	0,527	0,000	***
H6	PA → BI	0,302	0,000	***	0,229	0,023	***
H7	PA → RTC	-0,242	0,003	***	-0,053	0,597	NS
H8	CSE → BI	0,330	0,000	***	0,274	0,006	***
H9	TG → BI	0,144	0,083	NS	0,270	0,007	***
H10	TI → BI	0,242	0,003	***	0,476	0,000	***
H11	TG → RTC	-0,082	0,330	NS	-0,209	0,034	***
H12	TI → RTC	-0,268	0,001	***	-0,286	0,003	***
H13	PE → RTC	-0,464	0,000	***	-0,523	0,000	***
H14	EE → RTC	-0,411	0,000	***	-0,414	0,000	***
H15	SI → RTC	-0,408	0,000	***	-0,465	0,000	***
H16	FC → RTC	-0,372	0,000	***	-0,284	0,004	***
H17	PV → RTC	-0,486	0,000	***	-0,521	0,000	***
H18	CSE → RTC	-0,150	0,070	NS	-0,206	0,037	***
H19	I → RTC	-0,505	0,000	***	-0,592	0,000	***
H20	I → BI	0,596	0,000	***	0,727	0,000	***

4.5.4 Distinction of gender

Subsequently, we investigated what happens to the relationship between the independent variables and the dependent variable when a distinction is made between genders of the respondents. If we first turn to BI, we see that there is a significant stronger positive correlation in women, the correlation between EE and BI (r = 0.627 | p = 0.000), SI and BI (r = 0.551 | p = 0.000).), FC and BI (r = 0.414 | p = 0.000) with respect to the male. This means that in women the expected effort to use the chatbot, the opinion of the environment, knowledge and resources significantly (p > 0.000) have a stronger positive relationship with the intention to use the chatbot. The difference between the correlations of the other variables between men and women is rather limited.

TABLE 23: CORRELATION (GENDER)

Hypothesis	Structural Path	Correlation (R) Male	P value	Results	Correlation (R) Female	P Value	Results
H1	PE → BI	0,596	0,000	***	0,662	0,000	***
H2	EE → BI	0,366	0,000	***	0,627	0,000	***
H3	SI → BI	0,359	0,000	***	0,561	0,000	***
H4	FC → BI	0,269	0,003	***	0,414	0,000	***
H5	PV → BI	0,551	0,000	***	0,575	0,000	***
H6	PA → BI	0,289	0,001	***	0,303	0,001	***
H7	PA → RTC	-0,132	0,149	NS	-0,182	0,043	***
H8	CSE → BI	0,260	0,004	***	0,375	0,000	***
H9	TG → BI	0,180	0,048	***	0,281	0,002	***
H10	TI → BI	0,358	0,000	***	0,384	0,000	***
H11	TG → RTC	-0,151	0,094	NS	-0,153	0,090	NS
H12	TI → RTC	-0,318	0,000	***	-0,239	0,007	***
H13	PE → RTC	-0,591	0,000	***	-0,402	0,000	***
H14	EE → RTC	-0,335	0,000	***	-0,497	0,000	***
H15	SI → RTC	-0,430	0,000	***	-0,449	0,000	***
H16	FC → RTC	-0,176	0,051	NS	-0,450	0,000	***
H17	PV → RTC	-0,504	0,000	***	-0,505	0,000	***
H18	CSE → RTC	-0,135	0,134	NS	-0,221	0,013	***
H19	I → RTC	-0,524	0,000	***	-0,560	0,000	***
H20	I → BI	0,647	0,000	***	0,691	0,000	***

If we turn to RTC, we see that there is a significantly stronger negative correlation between PE and RTC in men (r = - 0.591 | p = 0.000) than in women (r = -0.402 | p = 0.000).

4.6 Independent-Samples T-test

To test whether there is no difference between men and women for the dependent variables BI and RTC, the Independent-Samples T-test test is applied. The connection between a quantitative and dichotomous qualitative variable is tested. In order to use the T-test, an F-test must first be performed. The F-test tests the similarities between the variances.

4.6.1 Gender → BI

The test result show that there are no significant differences between the averages of men and women for BI assuming a significance level of 5% (t = -0.266 | p = 0.790). This means that gender does not matter in the behavioral intent to use chatbot.

4.6.2 Gender → RTC

The test result shows that there are no significant differences between the averages of men and women for RTC assuming a significance level of 5% (t = -0.710 | p = 0.478). This means that gender does not matter in the behavior to fend off to change. To test whether there is no difference between experience and no experience for the dependent variables BI and RTC, the Independent Sample test is applied.

4.6.3 Experience → BI

The test result shows that there are significant differences between the averages of experience and no experience for BI assuming a significance level of 5% (t = 2.914 | p = 0.004). This means that the outcome of BI of a chatbot depends on having experience with the use of a chatbot. The test result shows that the intention to use a chatbot among the respondents who do have experience is significantly higher on average than with the respondents who do not have experience.

4.6.4 Experience → RTC

The test result shows that there are significant differences between the averages of experience and no experience for RTC assuming a significance level of 5% (t = -2,100 | p = 0.037). This means that the outcome of RTC of a chatbot depends on having experience in the use of a chatbot. The test result shows that resistance to change among respondents who do have experience is significantly lower on average than among respondents who do not have experience.

4.7 Regression analysis

To analyze whether there is a causality between the independent variables and the dependent variable, the regression analysis is applied. The causality direction runs from the independent to the dependent variables. Before looking at the separate effects of the independent variables on the dependent variable, the degree of explanation, also known as Goodness of fit (R^2), is considered first. The more the yardstick moves towards 1, the stronger the degree of explanation of the regression model. The more this moves towards the 0, the weaker the degree of explanation of the regression model.

4.7.1 Behavioral intention

The degree of explanation of the model is reasonably strong, namely R2 = 0.653. This means that 65.3% of the model is explained by the named independent variables. The test result also shows that the degree of explanation is significant assuming a significance level of 5% (F = 42.596 | p = 0.000). If we look at the separate effects of the independent variables, we see the following: the variables PE (t = 6.090 | p = 0.000); EE (t = 2.402 | p = 0.017); TI (t = 2.944 | p = 0.004); I (t = 8.705 | p = 0.000) are significant assuming a significance level of 5%. It can therefore be stated that these variables have an effect on BI. Subsequently, the extent of the effect of these independent variables on BI can be examined by analyzing the standardized beta. The test result shows that I (b = 0.405) shows the greatest effect on BI. This means that when I increases by a value of 1, then BI increases by a value of 0.405. This seems plausible since it can be assumed that when one has the urge to try out new things, the intention is to use the chatbot of the municipality of The Hague, as this would be a new tool for the municipality. Next, the following variables show the following significant positive effect on BI: PE (b = 0.305); EE (b = 0.142); TI (b = 0.124). The other variables have a p > 0.05 and are therefore not significant.

4.7.2 Resistance to change

The degree of explanation of the model is again reasonably strong, namely R2 = 0.499. This means that 49.9% of the model is explained by the independent variables. The test result also shows that the degree of explanation is significant assuming a significance level of 5% (F = 22.619 | p = 0.000). If we look at the separate effects of the independent variables, we see the following: the variables PE (t = -3.275 |p = 0.001); EE (t = -1.892 |p = 0.040) SI (t = -2.526 | p = 0.012); PV (t = -2.500 | p = 0.013); I (t = -6.014 | p = 0.000); CSE (t = 2.765 | p = 0.006) are significant. It can therefore be stated that these variables have an effect on RTC. Subsequently, the extent of the effect of these independent variables on RTC can be examined by analyzing the standardized beta. The test result shows that I (b = -0.336) shows the largest opposite effect on RTC. This means that when I increases by a value of 1, RTC decreases with a value of 0.336. This seems plausible since it can be assumed that when one has the urge to try new things, one will be less likely to resist the introduction of a chatbot at the municipality of The Hague, as this would be an innovative tool for the municipality. This is also in line with the outcomes under the regression analysis at BI. Also shown are PE (b = -0.198); EE (b = -1.892) SI (b = -0.142), PV (b = -0.167) have a significant negative effect on RTC. Strangely enough, despite being small, CSE has a significant positive effect on RTC, namely b = 0.178. This means that when CSE

increases by a value of 1, RTC will increase by a value of 0.178. In other words, when one has more than the right level, skills and level to use a chatbot, one will resist the arrival of a chatbot. A potential explanation for said relationship is the possibility that the individual in question already has a degree of experience in the use of chatbots or a history of interaction with them. Therefore, having the correct skillset and level of technical literacy to utilize said technology, however said past experience was not found to be positive in nature. An unpleasant track-record such as this could result in an individual being resistant to the adoption of a chatbot.

4.7.3 Multi-collinearity

Multi-collinearity is a strong dependency between independent variables in the regression model. A problem arises when the separate contribution of the variables concerned to the declaration of the dependent variable cannot be regarded as reliable. (Fall, Share, 2009: p.526) As a result, the collective explanation is high by these variables, but the individual parameter estimates are not significant. Multi-collinearity is detected by studying tolerance (TOL) or Variance Inflation Factors (VIF) of the independent variables. The rule of thumb associated with TOL and VIF is equal to TOL <0.2 (VIF> 5). (Van Dalen, 2015: 7-24) The test result shows that, based on the rule of thumb, there is no question of the multi-collinearity problem. All TOL values are well above 0.2. The lowest TOL value is equal to 0.435 (EE). Also, all VIF values are well below 5, where the highest value is 2.297 (EE). Since the rule of thumb of TOL and VIF have not been exceeded, the conclusions that have been taken remain.

FIGURE 18: REGRESSION ANALYSIS (EXPLANATORY MODEL)

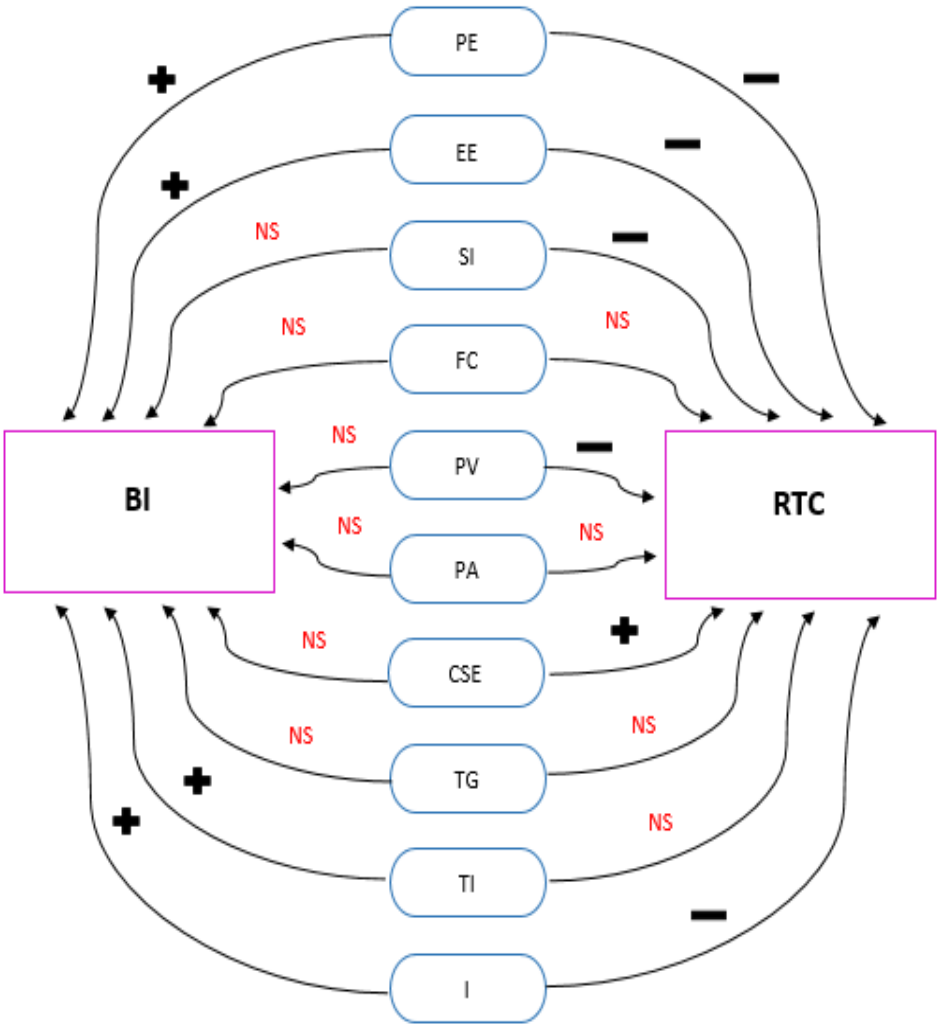


Table 24 Description of symbols

	Independent variable
	Dependent variable
+	Assumed positive effect
−	Assumed negative effect
→	Direct effect on dependent variable
NS	No significant effect

4.7.4 Categorisation by age

Finally, the effects of the independent variables upon the dependent variables was compared amongst the categorized age groups. If we first turn to BI, the research results show that PE and Innovativeness have a significant positive effect on BI in the 18-25, 26-35 and 36-45 age groups. The other variables within these age categories do not show any significant influence upon BI. In the age categories of 46-55 and 55+, we observe that no independent variables have a significant effect on BI. If we turn to RTC, we can observe that in the age group 18-25 EE, PV and Innovativeness have a significant negative effect on RTC. In the age category 26-35, PE has a significant negative effect on RTC and CSE displays a significant positive effect on RTC. In the age category 36-45, PE and Innovativeness have a significant negative effect on RTC. Again, the independent variables display no significant influence upon RTC in the 46-55 and 55+ age categories.

Table 25 Regression analysis categorization by age.

		T-value	P value	Beta	Results
Age	Path				
18-25	PE → BI	3.584	0.001	0.343	***
	I → BI	5.094	0.000	0.467	***
	EE → RTC	-2.699	0.009	-0.277	***
	PV → RTC	-2.086	0.041	-0.244	***
	I → RTC	-5.012	0.000	-0.501	***
26-35	PE → BI	3.965	0.000	0.389	***
	I → BI	4.504	0.000	0.394	***
	PE → RTC	-3.254	0.002	-0.398	***
	CSE → RTC	2.406	0.019	0.290	***
36-45	PE → BI	2.589	0.013	0.300	***
	I → BI	2.791	0.008	0.285	***
	PE → RTC	-2.435	0.019	-0.322	***
	I → RTC	-3.070	0.004	-0.356	***
46-55	-	-	-	-	NS
55+	-	-	-	-	NS

We can demonstrate the results drawn from this research show that the independent variables impart a tangible significant influence upon the dependent variables within the 46-55 and 56+ age groups; it would be wise to delve further into an investigation as to what exact factors influence the CI within said demographics. Additionally, a clear priority would be focusing attention on the PE and I variables, as the results indicate that said variables significantly influence the BI and RTC variables within the 18-25, 26-35 and 36-45 age demographics. Said group makes up 94% of the total sample size of respondents and as such can be said to be broadly representative of the municipal populace of The Hague. As such, by paying specific attention to this aforementioned group the municipality will be able to reach out to a much broader target group during any future research on this matter.

4.8 Hypotheses testing

T-value is 1.96 and significance level is 0.05. Taking this into account our analysis proves there to be 10 significant hypotheses overall which means that the hypotheses is accepted.

TABLE 26: HYPOTHESES TESTING

Hypotheses	Structural Path	T Statistics	P Values	Beta	Results
H1	PE → BI	6.090	0.000	0.305	***
H2	EE → BI	2.402	0.017	0.142	***
H3	SI → BI	1.473	0.142	0.069	NS
H4	FC → BI	-0.668	0.505	-0.037	NS
H5	PV → BI	1.873	0.062	0.105	NS
H6	PA → BI	0.474	0.636	0.022	NS
H7	PA → RTC	1,232	0.219	0.070	NS
H8	CSE → BI	-0.699	0.485	-0.037	NS
H9	TG → BI	1.057	0.292	0.043	NS
H10	TI → BI	2.944	0.004	0.124	***
H11	TG → RTC	-0.187	0.852	-0.009	NS
H12	TI → RTC	-1.400	0.163	-0.071	NS
H13	PE → RTC	-3.275	0.001	-0.198	***
H14	EE → RTC	-1.892	0.040	-0.135	***
H15	SI → RTC	-2.526	0.012	-0.142	***
H16	FC → RTC	-1.339	0.182	-0.088	NS
H17	PV → RTC	-2.500	0.013	-0.167	***
H18	CSE → RTC	2,765	0.006	0.178	***
H19	I → RTC	-6.014	0.000	-0.336	***
H20	I → BI	8.705	0.000	0.405	***

Based on these results we can establish down the following conclusions:

1. PE has a significant positive effect on BI.
2. EE has a significant positive effect on BI.
3. TI has a significant positive effect on BI.
4. I has a significant positive effect on BI.
5. PE has a significant negative effect on RTC.
6. EE has a significant negative effect on RTC.
7. SI has a significant negative effect on RTC.
8. FC has a significant negative effect on RTC.
9. CSE has a significant positive effect on RTC.
10. I has a significant negative effect on BI.

For a full report of the outcomes of these tests, please refer to appendix A.

Within the following section, we provide a comprehensive discussion that specifies the above-analyzed outcomes.

5. Discussion

The primary goal of this study was to explore the factors surrounding the adoption of chatbots within a municipal public service channel context in order to conclude whether the municipality should implement the chatbots as new public service channel. In order to further said goal we laid out a theoretical framework incorporating constructs adapted from a number of established pre-existing frameworks that in turn operated under the auspices of the considerations of available secondary research. By developing an understanding of such factors, we can develop a key set of valuable insights into the circumstances surrounding the uptake of such public service channels within The Hague. Within this scenario, one such factor may be the degree of perceived difficulty inherent for the end user in the utilization of such a channel.

As demonstrated within the study Effort Expectancy (t = 2,402, p= 0.017,) is significantly positively related to Behavioral Intention. Hence implying that within this scenario the level of effort required may have a significant impact upon the individual's willingness to make use of a service. At this time, The Hague itself stands as the frontrunner amongst all Dutch municipalities in providing digital options in service delivery to its population (Young, 2014). Yet in spite of this, the municipal websites that provide services to the citizen do not stand as the most popular websites amongst the population (Kievith, 2015). As previously discussed, the attitudes of the citizens and local businesses towards such channels are not exactly glowing with positivity (Ebbers, 2015). In reflection of these attitudes, only a minority of the respondents in question had chosen to make use of the available online public services. In addition, amongst those who had a commonplace commentary was that usage of the websites in question was not as straightforward as they had wished (Ebbers, 2015).

Along these lines our findings demonstrate that Computer Self-efficacy has no significant relationship with Behavioral Intention (t = -0,699, p=0,485). Suggesting that while the majority of citizens have the technical skillset necessary to make use of the provided online channels, they instead opt not to as the perceived level of effort required does not justify the result. Preexisting studies such as those carried out by Chan et al. (2010) and Hernandez et al. (2009) have primarily examined the relationship between the perceived ease of use and the individual in question's level of computer self-efficacy (Chan, 2010). As such, our findings provide an additional degree of insight into the relationship between self-efficacy and behavioral intention. In the case of Luarn and Lin (2005) they argued that the perceived level of self-efficacy brought about an effect upon the behavioral intention to use, whether that be directly or indirectly (Luarn, 2005). Therefore in a scenario in which a website is poorly designed, provides a low quality of information or was not implemented with the correct guiding principles in mind; then uptake in usage by citizens may be low. This in turn has an impact on the willingness of users to make use of a channel such as a municipal chatbot. Within this context, we can demonstrate that computer self-Efficacy has a positive significant relationship with Resistance to Change (t = 2,765, p= 0.006)

These findings confirm our assertion that poorly designed interfaces and a lack of overall quality is a major driving factor in the overall resistance to change within the field of online services, and in order to implement a system such as a chatbot within a municipal role; such issues must be addressed (Abu-Shanab, 2014). Within this line of inquiry, Effort Expectancy has a significant negative relationship with Resistance to Change (t = -1,892 p= 0.040). As such, if the perceived ease of use of such online services is built upon, for example via an improved and higher quality interface, then public resistance to change potentially brought about by chatbots will be reduced. As the option of online services becomes more tantalizing, then so too will any new options provided in the same vein.

In addition, within our study we have demonstrated that there is no significant relation between peer pressure and intention to use. It can be demonstrated that within this context Social Influence (t = 1,473, p= 0,142) does not display a significant relation to Behavioral Intention. As chatbots are a relatively nascent technology that are yet to hit the critical mass of users required to result in such societal pressure, then such factors are yet to fully establish themselves. If such a pool of users can be established, critical network effect theory asserts that uptake and perceived value will be increased (Van Slyke, 2007). As such, within the contemporary scenario social influence is not significant to the intention to make use of chatbots. At this time for the vast majority, they are still a technology that is perceived as being far off on the horizon. Such critical mass predictors have been previously observed in the instances of social networking sites (Zledgianovski, 2009) and the usage of instant messaging (Lee, 2011). This can account for the established significant negative relationship between Social Influence and Resistance to Change (t = -2,526, p= 0.012). As a greater foundation of users is established, the more in turn an individual will view a technology such as a chatbot as bringing inherent value to the table (Zhou, 2011).

Additional factors of vital significance include that of the perceived level of trust in the security of the internet and government. Within Dutch culture, the sanctity of personal privacy is held as a tantamount pillar of society, and as such, it can be argued that being able to provide a safe platform via which such data can be transferred is a vital aspect of getting the citizen on board with the usage of such a channel (Himma, 2007). Within our research, it has been demonstrated that when there is a lack of trust in the internet, the resistance to change to adopt chatbots will increase. We therefore confirm that Trust of Internet is not significantly related to Resistance to Change (t = -1,400, p=0,163). Hence, such trust may account for the variance inherent in the resistance to change. On the other hand, Trust of Internet is significantly positive related to Behavioral Intention (t= 2,944, p=0,004). Therefore, by further securing connections and hence instilling more trust in the user, uptake of existing service channels may be increased and adoption of new channels such as chatbots may potentially be more readily rolled out. It is utterly vital that the end-user/citizens have trust in the security of a public service channel (Himma, 2007).

With respects to the governmental institutions themselves and their relationships with the citizen, Trust of Government has no significant relationship with Resistance to Change (t = -0,187, p=0,852). Additionally, as demonstrated this is also true regarding intention, wherein Trust of Government has no significant relationship with

Behavioral Intention (t=1,057, p=0,292). Not all of the factors explored within this work have been observed to have an overall negative effect on uptake of channels. The perceived performance expectancy of the user, their logistical and technical facilitating conditions and the perceived value that a channel (such as chatbots) can bring to the table have all been observed to have a positive relationship with the intention to use of a significant nature.

Performance Expectancy and Behavioral Intention have a significant positive relation (t = 6,090, p= 0.000) and the significant negative relationship between Performance Expectancy and Resistance to Change (t = -3,275, p= 0.001), reinforce this concept. When a citizen believes that a channel such as a chatbot can add significant levels of value and satisfaction to their interactions with the municipality, then their uptake will be positively impacted.

Our results also demonstrate that Facilitating Conditions are not significant related to Behavioral Intention (t = -0,668, p=0,505). As previously discussed, the matter of facilitating conditions is a key factor in the matter of digital services uptake. When said individuals meet the facilitating conditions to do so, for example sufficient levels of technological literacy and digital efficacy, then it is conventionally argued that the intention to use would be positively impacted. However, our results have provided us with an inversion of this scenario.

Furthermore, Facilitating Conditions are not significantly related to Resistance to Change (t= -1,339, p= 0.182). A key consideration that must always be addressed during any municipal stratagems or programs is that of the price value of a given project. For the sake of the municipality, it is vital that the citizen views the services delivered to them and the channels used to do so as being worth the money spent implementing and maintaining them. Municipal services are after all taxpayer funded and as such, they must satisfy the taxpayer to one degree or another. Within this context Price value (t = 1,873, p=0,062) is demonstrably not significantly related to Behavioral Intention and in turn Price Value and Resistance to Change are significantly negative related to each other (t= -2,500, p=0,013).

Hence implying that the monetary factors involved do play a key role in informing the respondent's willingness and intention to make use of such channels as they become available. Within the same realm as issues of financial funding we are also confronted by the topic of marketing and public awareness of a service channel. Rather unsurprisingly, an individual who is utterly unaware of an available service channel option will not make use of it. However as demonstrated in this research Perceived Awareness and Behavioral Intention do not display a significant relationship (t= 0.474, p=0.636). To put it in simple terms, just because a particular individual is aware of a product, that does not necessarily mean they will utilize it. Other factors must come into play to stimulate uptake of a new channel such as chatbots beyond simple awareness of their existence.

One such key factor may be that of 'innovation'. Amongst society in addition to those who lag behind in uptake there will always be those who will go out of their way to take up new technologies, finding pride and/or pleasure in being the first among their

peers to experience a new development. Such users are absolutely vital in the formation of the aforementioned critical mass for the purposes of deploying a new technology and oftentimes make up a significant chunk of such a group. Within our study we have found that Innovation and Behavioral Intention do have a significant positive relationship (t= 8,705, p=0,000). Therefore reinforcing our stance on these key innovators. And in turn these levels of innovation have a significant negative relationship in relation to the Resistance to Change (t= -6,014 p= 0.000). As such, for any fresh public service channel to be successful that in anyway offers an advanced new stance and perspective over the more traditional approaches, reaching out to these 'innovators' is vital.

Within the following section, we will answer the five sub research questions, which will be followed by answering the main research question.

6. Sub-questions

6.1 Which chatbots exist and what are their advantages and disadvantages?

As previously discussed, our contemporary environment provides us with a diverse and broad range of available forms of chatbots and associated means of service delivery. These may be segregated down into three key groups, namely conventional chatbot software agents, conversational bots and 'intelligent' agents (Rivard, 2017).

The initial group of chatbots offers an agent that focuses almost entirely on written text, often providing predetermined answers that are reached via preprogramed keywords sought out in the end user's queries (MG, 2017). A classic example of such a chatbot employed within a public service role is the Mississippi state government's Missi, which uses such a model to provide a channel via which state citizen's may enquire and engage with the state government on a wide range of issues. Such a software agent essentially replaces a human within the office who handles mundane day-to-day enquiries via straightforward and concise answers (MG, 2017). However, there are inherent disadvantages to such an agent, while relatively easy to design and implement, their simplicity can lead to a potential lack of flexibility in addressing issues that fall beyond their usual scope of keywords or preprogramed responses. For example, an end-user with an unconventional or colloquial vocabulary may rapidly encounter obstacles in acquiring the desired services if the words used remain unrecognized by the chatbot in question (Rivard, 2017).

The second aforementioned category is that of the conversational bot, one that at this time can oftentimes be encountered within the context of call centers handling basic telephone based interactions with enquiring individuals (Rivard, 2017). Such bots focus primarily on spoken rather than written interaction and as such are significantly more difficult to realize and implement due to the inherently complicated nature of fluent spoken language, and as such, a failure to utilize or develop them correctly can merely frustrate rather than aid an end-user as a result (Willem Pieterson, 2017). Though when correctly implemented and designed they offer the potential for a chatbot to handle far more nebulous and ambiguous concepts than would otherwise be possible via written text, as a significant portion of end users may more readily express otherwise difficult enquiries more fluidly in a spoken context (Willem Pieterson, 2017).

Finally, we are presented with the category of the 'intelligent agents', a form of chatbot that has become especially pervasive and widespread within a commercial and private context over the last few years (Rivard, 2017). Such software combines the text-based approach of conventional chatbots with the spoken interface of conversational bots in order to execute a wide range of tasks (Willem Pieterson, 2017). Classic examples include Siri, the virtual assistant universally found on Apple's modern range of smartphones and tablets and the first of such agents to make a significant impact on the commercial market. And Cortana the virtual assistant that is commonplace on the most recent versions of Microsoft's Windows operating systems, with its pop culture inspired name, that stands as a direct competitor to its Mac OS counterpart. Such agents offer a great degree of flexibility in their utility and

their uptake may be more readily accepted by citizens due to the familiar and naturalistic nature of interactions with them due in part to their pre-existing penetration into the commercial environment. As such, while intelligent agents can be time consuming and difficult to implement fully they offer great potential within the context of public service delivery (Willem Pieterson, 2017).

Additionally, the broader family of chatbots as a whole carry their own inherent advantages and disadvantages that are broadly speaking a universal trait of this specific form of service channel. Firstly, the inherently digital nature of chatbots and their deployment lends themselves towards being readily available to citizens without the need to physically step into the municipality building itself (Willem Pieterson, 2017). Chatbots can be accessed via computer, mobile devices or even potentially telephone calls. Hence allowing the end-user a great deal of flexibility in where and when they may employ the services a chatbot can provide (Stuart Russel, 2010). In addition, within the contemporary context chatbots have evolved to the stage at which they do not necessarily require the installation of specialized applications or programs beyond a standard web browser in order to make use of them. As such it makes them as simple a matter for a citizen as being able to access the municipal website in order to seek them out, thereby establishing them as being far more accessible than a number of other forms of digital channels for the less technologically literate (Braun, 2003).

In respect to the aforementioned inherent disadvantages, it is essential that the topic of privacy be touched upon. Each new form of service channel of communication opened up, whether that be between customers and a commercial enterprise or citizens and the local administration carries with it an inevitable number of privacy and security related concerns (Himma, 2007). It is utterly vital that users feel safe and secure in utilizing an available channel in order for them to be willing to employ it in the first place. As such, during the development and deployment of any potential municipal chatbot such issues must be addressed during the formative stages as a top priority (Himma, 2007).

With respects to the inherent advantages, a chatbot would present in order to succeed within such a capacity we are presented with a number of factors that may come into play. Firstly, chatbots can offer the citizens performance enhancements over their conventional public service experience, such as trawling through a great quantity of information rapidly while still interfacing with the user via a familiar interface (Braun, 2003). Therefore when implemented properly such factors of resistance to use on the part of the citizen should be mitigated if the advantages offered seem great enough. In addition, chatbots may present an opportunity, if budgeted for correctly, to undercut the current cost of relying solely upon human based interaction between the municipality and citizen, a single human supervisor working in concert with public service chatbots could potentially fulfill the same role and workload as an entire office of customer facing employees (Chai, 2000).

In spite of the opportunities that chatbots may provide citizens, in turn there are a number of inevitable stumbling blocks. A key factor that is frequently identified in such scenarios regarding new innovations is that of lack of uptake due to the matter

of user resistance to adoption (Ram & Sheth, 1989). Additionally as previously discussed, there is the matter of the nascent level of current technology as of 2017. We are still yet to see a chatbot that can truly pass for a human in a conversational capacity, Turing test style (Bush, 1945). Lengthy and legitimately fluid conversations are markedly difficult to automate and build for during the development of a chatbot. If a chatbot is to be deployed within a multi-channel public service capacity then such processes must be accommodated for in its programming (Ram & Sheth, 1989).

6.2 Which public services or products are suitable for chattiest?

It is important to note that the utilization of chatbots is not truly applicable to a single monolithic channel of delivery, nonetheless one kind of single suitable product or service for the chatbots; they both stand to be viable within a diverse range of potential avenues of approach to a fitting service or product delivery (Abu Shawar B., 2005). Namely via municipal websites, mobile devices and even potentially in a conversational capacity via telephone enquiries. Such capacities can be demonstrated clearly via chatbots preexisting utilization within the private sector; where they have been deployed in exactly these aforementioned roles and displayed significant success within their capacities (Braun, 2003). As such, it is clear that chatbots provide rich potential within the multi-channel nature of public service delivery via interface with municipal citizens.

The municipality of The Hague stands as the primary governmental contact point for 514.861 of its citizens and in doing so aspires to offer a customized service delivery via a multichannel approach (Baldewsing, 2016). In the region of The Hague, four million unique visitors make annual use of the municipality's website wherein they may make use of the available digital services and provided forms such as forwarding relocations, parking permit requests, the renewal of passports, driving licenses and many more such services (Baldewsing, 2016). Varying demographics bring different needs to the table within the context of digital service delivery. Therefore, in order to better develop a comprehensive understanding of the needs of the citizens of the municipality we have opted for a research approach that revolves around an understanding of the target groups of our surveying (Axelsson, 2010). As such, it is important that the surveying not only encompassed Dutch- born citizens living in The Hague. But also, businesses and entrepreneurs operating in the local area, in addition to naturalized migrants and expats with a firm foundation in the Dutch language (Bekkers, 2005). In doing so, we aimed to accomplish a reliable overview of the demands placed upon the public service delivery framework by citizens, without which a full understanding of the potentials of chatbots within a municipal role is not viable. We identify therefore the following target groups for different services and products:

- Entrepreneurs
- Expats
- Migrants
- Citizens who are less technologically literate
- Individuals with language deficits

The swing towards an e-government based model has in its tide brought with it a great diversity of new forms of digital service channels that stand as compliments to the more traditional forms of communication between citizen and municipality (i.e. postal letters, telephone and physical service counters) (Ebbers, 2015). This modernized digital model has presented governments with a truly significant opportunity to streamline and build upon the efficiency of not only their external channels of communication, but in addition their internal processes and systems (Hirschheim, 1988). Therefore, bringing about potential cost saving both financially

and in terms of the labor required. Prior to now external service channels relied solely upon the aforementioned traditional means of dialogue, means that key younger and more digitally interconnected demographics have grown disinterested in. As such in order to capture the attentions of said demographics and leave them feeling engaged and fulfilled by their service delivery experience it is vital that the e-government model continues to be enthusiastically pursued (Chan, 2010). The existing public services and products can be required through different service channels which can be categorized under the umbrellas of the traditional, electronic, social and mobile channels. Citizens may apply for public services and products via letter, internet, phone or in some cases by visiting a service counter at the municipality offices (Limayem, 2007).

As we identified within this research a clear picture of the applied online services and the multiple-approach channels that citizen prefer for their local services we conclude that the following services and products are the most popular and wanted requested online (Ebbers, 2015). It is the service category of passports, identification or visas that are by far the most popular (23.2%). Other popular product categories are waste 10% and parking 9,8%, followed by taxes 6,5%, assistance / benefits 6% and driver's licenses 5,6%. Less popular product categories desired by the respondents are subsidies 0,8%, events in The Hague 0.3% and immigration / naturalization 0,3%. We conclude therefore that these services are well suited to chatbots (Wolfgang, 2015).

Within this research we also have recognized that how more complex or urgent a case is, the readily citizens will choose to use the phone to contact the municipality. This image also applies for entrepreneurs and businesses. However, it may be possible, that given the opportunity citizens may opt for an internet based approach if such services met the expectations they would normally draw from a telephone based channel, for example because phone based enquiries provide more room for personal attention and flexibility for those who desire it (Baldewsingh R. , 2016). This shows that there are opportunities for the chatbots: which are potentially stimulating the use of municipality online services.

6.3 What are the success factors for adoption and use?

Within this research, we have identified the essential factors that need to be present to make the introduction of a municipal chatbot successful. These factors relate to the municipality directly and suggest that ultimately the municipality needs to become a progressively more technologically driven organization (Alshehri, 2013). The main ingredients to do so, are the creation and embracement of a technologically driven environment, one which capitalizes upon the opportunities that the digital age can offer. When the local government present a chatbot as a new digital channel to its citizens, it should demonstrate that they as a municipality are willing to accept a greater degree of digital traffic (Plasterk, 2017). This is key to the successful introduction of chatbots within this environment, as if they focus more on technological possibilities presented to them, the municipality will become a data based government, in which the flow of information is of the utmost importance (Plasterk, 2017). This should make the municipality of The Hague a transparent organization that seeks greater digital capabilities with better customer-aimed services and fluid data exchange that places the citizen at the heart of its information flow. The Hague administration will become a local government that does not hinder the effectiveness and efficiency of trade and day-to-day life, but instead reinforces it, if they seek this digital goal collaboratively in a positive and constructive fashion (Ingrid van Engelshoven, 2014). Furthermore, success can be defined as the demand and behavioral intention of citizens to adopt and use chatbots as virtual assistants that will aid citizens in conducting their business quickly and with a greater degree of safety (Carter L., 2005). The number of citizens that intend to adopt this nascent technology plays a vital role in the success or failure of chatbots. It is therefore crucial that The Hague makes use of promotional campaigns and makes citizens aware of these new developments. This will aid the municipality in their goal of improving the relationship between government and society (Plasterk, 2017). Citizens may find their local government faster and easier to communicate with and may do business with their government at the place and time that is most convenient to them without phoning or visiting service counters at the municipality offices (Kok, 2015). In addition, the perception of local government pressure on citizens will be improved: processes will be more efficient, administrative burdens will be reduced, response times will be shorter and the amount of money that will be saved by the municipality can be instead be used in the town's best interest (Shebat, 2016).

Moreover, the municipality may stand to gain if they opted for municipal chatbots, as it can provide more room for individual attention to those who need it most (Plasterk, 2017). This indicates that there are great opportunities provided by such innovative digital channels. In turn providing the chance to stimulate the use of new channels such as chatbots. If the municipality wishes to capitalize on the opportunities to provide improved online services via chatbots, progress should be made in a step-by-step fashion; taking into account what the technology, the organization and the citizens of The Hague do and can handle. Crucially for this, it is essential that The Hague connect with the personal situation of citizens and entrepreneurs in the city (H. de Kievith, 2015).

The needs of the people must be a central concern. Building on the outlined trend and the online behavior of the citizens, the following points can be formulated to

make the introduction of the chatbots successfully (Baldewsingh R. S., 2017). The municipality should actively seek out residents on the internet: listening to them, giving space and support to their ideas and opinions. For example, the municipality should involve citizens in the improvement of their online services and (in time) in the development and implementation of new policies. The municipality must consider that there are citizens and entrepreneurs who are not waiting for them, and therefore must be patient and open to criticism (Ebbers, 2015). Whoever visits The Hague, the municipality should help with accessible and understandable online information and support via virtual assistants. After all: for visitors from outside of the region, the municipal website is their primary point of contact with The Hague (Ebbers, 2015). As we have mentioned above, The Hague citizens should be able to find all online services via chatbots on the municipality website for all matters: from relocation papers to permits, from specialized assistance to subsidies. Citizens should be able to handle their business with the municipality anytime and anywhere, regardless of which device they may choose to use. To comply with all these requirements, the municipal chatbots should be well designed, easy to use, efficient and make use of an understandable and concise natural language interface (Venkatesh V. M., 2003). This means that the municipal chatbots needs to have an in-depth knowledge of user behavior, which can be obtained via artificial intelligence and machine learning (Madison, 2016). Citizens indicate that they want to do business online, but when it comes to complex matters, they still rely on the phone. With better online services, which can be provided via chatbots, citizens could be assisted quicker, cheaper and there can be more room for individual support for those demographics that require it (Rivard, 2017). The most important steps that need to be taken to make the introduction of the municipal chatbots successful are:

- Putting the perspective of the user first when developing municipal chatbots;
- Involving citizens in the improvement of online services via chatbots;
- Providing an unambiguous, familiar and reliable online environment.
- The offering of tailor-made services based upon registered preferences and behavior, and where possible the offering of pro-active services via chatbots;
- An optimally responsive website that works for all target groups;
- More deployments of apps where they are judged to be useful and in turn linking them with chatbots;
- Translation of the most popular topics on the phone into chatbot based services;
- Coordination of online services with other relevant authorities;
- Digital and physical support via chatbots for the users of digital services.
- Listening online to what residents think of the municipality, picking up on signals and
- letting citizens know what they do with said collected data;
- Inviting residents to work with the municipality to provide better services and new policies;
- Further support for platforms and communities and thus giving residents an online space in which to resolve matters.

6.4 What are the obstacles for adoption?

The adoption obstacles that we identified within our research can be categorized into governance (policy-making) and technical obstacles towards chatbot adoption. The municipal governance obstacles imply that:

- Citizens should be put as first when developing the chatbots by using the User Experience discipline;
- The municipality should reach all target groups within The Hague;
- Control should be given to a multi-channel approach;
- Connection should be established to existing e-government digital infrastructure;
- An open data environment should be created.

If the municipality wants to tackle the above-mentioned obstacles in the coming years, a lot must be done. We have therefore highlighted the following critical obstacles to bring the chatbot potential in The Hague to a higher standard. Before introducing the chatbots, there are a number of matters that need to be adapted. By tackling these obstacles, chatbots may be introduced in order to elevate the municipality online public services to the next level (Carter L., 2005).

The municipality should make use of the User Experience discipline (UX) for the design of the municipal chatbots and all its website(s) and platform(s) (Ebbers, 2015). UX uses imaginary people and narratives to visualize the predicted customer journey. The Hague should respond to the increasing use of mobile devices with a website that is even more responsive and adaptive than at present (Ebbers, 2015). Chatbots could be deployed to link and lead citizens to use municipal service apps more often, where this is shown to be useful and relevant (users on the move, linking to cameras and mobile payments). The municipality should organize the website according to top tasks for the sake of efficiency: the matters for which residents come to denhaag.nl the most and implement this data into the top tasks of chatbots (Axelsson, 2010). For these top tasks they should ensure that the customer journeys are well mapped and optimally supported. For The Hague website, in addition to providing service channels, is also a space for information and politics (EuroSpace, 2009). The municipality should use more customer panels for the development and improvement of their online services. They will have to provide a digital online environment that is unambiguously designed in all communications and on all platforms (computer, tablet, smartphone) and makes use of a one-time login (Kim, 2009). This ensures convenience and a familiar environment.

Different groups of residents bring different needs to the table when it comes to online services and chatbot usage. In order to better connect with the questions and (digital) experiences of the citizens, the municipality should therefore opt for a target group approach (Alomari, 2012).

Together with the service channels, they should investigate the needs of users, map out customer journey and improve the user-friendliness of their online service and include this knowledge in the chatbots (Axelsson, 2010). They must not only have an eye for the residents, but also for the following target groups:

- Business owners, whereby the municipality should support customer trips stronger or more prominently than now at the different stages of entrepreneurship. For example, information services and registration services for permits, subsidies and market developments.
- Expats and migrants: they can be supported via denhaag.nl in close collaboration with The Hague International Center in several languages above and beyond English, hence hopefully providing the municipality with the means to help them on their way to their establishment within The Hague's society.
- Individuals with a low level of technological literacy or language deficits should receive special attention, especially when in regards to online services. The municipality will have to choose the appropriate language level, offer continuous aid and, if necessary, work with demonstrative illustrations or videos.

The main technical obstacles that we identified within this research are in the fields of data, privacy and security and customer comfort, which if the municipality does not overcome them, will result in users resistance to chatbot adoption (Himma, 2007). Chatbots need a lot of data input to make full use of their learning capabilities. For the most use cases, there is presently not sufficient data to practice on and train the chatbots. This nascent technology needs different kinds of data, ranging from in-depth knowledge and data of customer's behavior, data from answers, data from internal systems and data from external resources (Eeuwen, 2016). Providing citizens of The Hague chatbots that are disconnected from the municipality internal systems will limit the services that chatbot can provide. Missing data from the municipal internal systems will form a huge obstacle for adopting the chatbot since internal systems provide accurate answers (Fryer, 2006). Chatbots need therefore access to existing internal information to extract data from them. Integrating chatbots into the municipal internal systems can be challenging as well, since some internal hardware and software systems are outdated technologies (Fryer, 2006). In addition, it is also vital to overcome the challenges of having chatbots that are disconnected from external sources and data flows. Chatbots work better, more accurate and offer greater answers when they are connected to external data and sources. Within this context, the municipal chatbots should be interconnecting via web links with every part of The Hague (governmental) online platforms and digital communities to gain all the available data on these sites, which can be pushed further to redirect end-users to the right service, website or platform (Fryer, 2006).

It is essential to know what end-users ask, the type of language they use and the way they make queries (Fryer, 2006). Even when the municipality would use previous data from earlier (customer) correspondents, this data would not certainly be suitable and would not entirely reflect the way of how other end-users would communicate with

the same chatbot. The difference lies in the fact that people behave differently when they exchange messages through real-time software applications (instant messaging) than when they are writing emails, making phone calls and even participating in live chats (Ferguson, 2006). It is therefore crucial for the chatbot developers to cooperate as closely as possible with the municipality, and to shed light on questions such as:

- What are the answers to queries that citizens make?
- What are the best and clearest ways to communicate those answers?
- Are these answers recurring or do they change from time to time? If they do change, does it happen in a foreseeable way that can be absorbed?

As chatbots bring potential advantages to the table, so to do they carry with them a few potential disadvantages. Miscommunications due to scripting issues can lead to nonsensical responses from the chatbot, a commonly experienced issue with the most primitive early forms of the technology (Ferguson, 2006). Such issues can frustrate the end user and only reduce the fluidity of the uptake of such a technology by the desired user base. Additionally, the prevalence of spam oriented primitive chatbots in the modern online environment has further degraded trust in their potential capacities (Kim, 2009). As such, even when such fears are groundless. Public concerns over security and privacy must be addressed in order for a chatbot to be successful. If such matters are to be addressed adequately enough that the chatbot can be given the chance to flourish as a success within a public service environment, then a considerable amount of time, effort and money must be put into the development and deployment of such a technology. Implementation of such a technology is not a simple matter of just 'copy and pasting' a chatbot into place (Himma, 2007). Therefore, any municipality wishing to make use of chatbots must carefully weigh up the inherent advantages and disadvantages in order to determine whether such an investment is worthwhile.

6.5 What is the final advice to the Hague municipality?

Within this section, we shall provide our final advice to the municipality of The Hague resulting from this study. Our advices are retrieved from the data gathered and analyzed during this study and touches upon the fields of the success factors for adoption and the obstacles that need to be tackled in order to successfully implement the chatbot technology. The research results demonstrate that Performance Expectancy has a positive influence on Behavioral Intention and a negative influence on Resistance to Change. This means that when the expectation of citizens towards the use of chatbots is perceived as meaningful, the intention to make use of the chatbot will increase and the resistance towards chatbots becomes less. Price Value has a negative impact on Resistance to Change. Similarly, this means that when the value of chatbot is estimated high, citizens will resist less to the change of traditional government services by means of chatbots. For both variables, it is all about influencing the perception of the end-user/citizens. We advise the municipality therefore to influence The Hague citizens perception towards the users value of the chatbots by means of, for example, promotional campaigns via telephone while waiting for a telephone operator, at the counters in the municipality of The Hague, on the website, via newsletters, and post. In this way, the citizens are constantly informed about the possibilities of chatbots and become familiar with their new virtual assistants.

Additionally, Effort Expectancy has a positive influence on Behavioral Intention. This means that when the effort expectation of citizens towards chatbots is perceived as easy to use, citizens will have quicker the intention to make use of the chatbots. The given advice is therefore to influence the perception of the ease of use of The Hague citizens by means of using a test group that will use the chatbots for a longer period of time. It is essential that the composition of this group is a reflection of the citizens of The Hague. This group will use the chatbots, share their feedback with the municipality, and then, the municipality will adapt the chatbots to improve it to the needs of the users. The municipality should repeat this until they are satisfied with the user-friendliness of the chatbot. Subsequently, this test group should announce through reviews through all their channels how they experienced the user-friendliness (in a positive sense). This will help increase the level of accessibility of the municipality.

Furthermore, Trust of Internet has a positive influence on Behavioral Intention. This means that as the trust in the Internet increases, people are more inclined to use the municipal chatbots. Once again, this also concerns influencing the perception of citizens towards the use of chatbots. The given advice is to further investigate what exactly the factors are, that citizens do not trust the Internet, considering the fact that the Internet is a broad term. Perhaps this research will show that the website of The Hague municipality is trusted, which also belongs to the Internet.

Likewise, Innovation has a positive influence on Behavioral Intention and a negative influence on Resistance to Change. Our research shows that if citizens are inclined to experiment new technologies, they are more willing to use chatbot and will resist less to change. Within this context, the municipal chatbots should be interconnecting via

web links with every part of The Hague (governmental) online platforms and digital communities to gain all the available data on these sites, which can be pushed further to redirect end-users to the right service, website or platform. In this way, the chance to reach the Innovation target group is optimized. After all, it is plausible that when this group comes into contact with this nascent technology, they will also use it, given that this is a new technology.

As well as, Social Influence has a negative impact on Behavioral Intention. This means that as someone's environment is positive towards chatbots, the less likely someone is to oppose the use of chatbots. The ideal situation is, of course, when the residents are positive about chatbots in order to get more potential users through word of mouth, or social influence. The given advice is to use surveys to find out whether one will advise the use of chatbots to his / her environment. This must show who will not do this. Advice is to invite this group to "group analysis meeting" to find out in terms of content why they will not advise this to subsequently come to new insights. This involves residents to contribute to the development of the chatbots

Moreover, Computer Self Efficiency has a positive influence on Resistance to Change. This means that as people have the necessary resources and knowledge to use chatbot, they will resist more. This may be due to a rather worse experience with chatbot. However, more in-depth-knowledge should be sought to determine the exact cause of this movement. Advice is therefore further research into this relationship in order to arrive at the correct conclusions.

As a final point, we advise on the nature and range of current technologies and the inherent advantages and disadvantages they carry. As such, we have identified the factors involved in the adoption and implementation of such technology as a new form of digital service channel. Therefore, we advise the municipality to adopt a chatbot that provide general information such as FAQs, local news stories and push notifications. Furthermore, the chatbots should allow citizens to handle transactional services and interact with the administration for the most popular and requested services online, for example passport renewals, identification or visas and other popular services such as making appointments. It is crucial that as chatbot technology evolves further that consideration be given to the possibility self-learning chatbots that develop based upon user interactions being utilized within an advisory capacity. It is of utmost importance that the adoption of chatbots is lead and driven by available data on their utilization and that they provide a richer and more satisfying user experience. Furthermore, chatbots will enable the municipality services to operate on a 24/7 basis, with the chatbots treated as if they were a trusted and reliable employ which is always available to perform its role.

7. Main research question: Should The Hague use chatbots to provide its services to the community?

As a result of this investigation, we conclude that the municipality of The Hague should offer chatbots as a new form of service channel to its citizens.

In conclusion, our research has demonstrated that there is a considerable demographic within The Hague that would be willing to make use of a public service chatbot, 60.32% of the respondents indicated that they would intend to make use of a chatbot in this capacity. On the other hand, 31.33% of the respondents stated that they would be resistant to such a change within the municipality of The Hague, as such the majority of the citizens of The Hague will be heard if such an action is taken. However, this study has also shown that the municipality of The Hague must take a number of factors into account in the process of deploying such a chatbot, with Performance Expectancy and Innovativeness being two factors that recur in all age categories and affect the intention of said individuals to make use of such a channel. In addition, account must be taken during development of the experience level of individual citizens. After all, one who has experience will likely display a greater intention to use a chatbot as opposed to one who has no experience. On the contrary, one who has no experience, will more likely oppose such a change in comparison with those who do have experience. Having prior experience is therefore of crucial importance in a positive outcome with respects to BI and RTC. Finally and conveniently, BI and RTC are not found to be determined by gender, hence the municipality of The Hague will not have to focus on the matter of gender in any further research on this topic.

Finally, it can be stated that the introduction of a public service chatbot would be a worthwhile endeavor. Naturally, the municipality of The Hague should further investigate under which conditions such an introduction would ultimately lead to success, with this research simply being square one of any such future efforts.

Concerning our conclusions on the advantages and disadvantages that public service chatbots entail; we can make several key remarks. Firstly, via a chatbot, data can be processed and filtered more rapidly and on a larger scale than currently existing means of public service communication will allow. In addition, the service will be available to every citizen everywhere and at all times. Finally, the usage of a chatbot is inherently accompanied by a naturalistic language-based interface, which can make fluid usage significantly easier for some demographics.

An important obstacle that must be overcome by the municipality of The Hague is winning the trust of the citizen, particularly concerning worries over the security of personal data on the internet. After all, 62.25% of citizens state they have little to no confidence in the internet. Given that the chatbot exists in an online environment, this is a crucial factor that must be addressed by the municipality of The Hague. History of malicious spam chatbots may have degraded user trust with regards to privacy concerns about the handling of personal data. Furthermore, the technology of

the chatbot needs to be further developed, since confusion over keywords on the part of the chatbot can lead to frustration on the part of the user and contemporary chatbots cannot yet handle lengthy or overly complex conversation without the assistance of a human supervisor

With regards to the crucial matter of finances, the implementation of a chatbot has two potential outcomes. On one hand, the capacity for a chatbot to handle the same workload as an entire team of employees in a tireless fashion could offer a truly significant cost saving to the municipality and dramatically reduce the workload inherent in public service delivery for municipal employees. On the other hand however, for a chatbot to be of true and genuine utility to the local government it would require an extensive investment of time and money into its development. Financially public service chatbots could be a double-edged sword, offering major cost savings when implemented correctly, or a simple waste of money if the commitment to their application is half-hearted.

8. Limitations

Within this study, we have perhaps unsurprisingly been impacted by a limitation of resources. It is simply not possible to reach out to every resident of The Hague and the time in which any research can be carried out is finite. Additionally as with any study, there is the consideration of researcher bias. Sadly, we simply do not live in a utopian world where human beings may make absolutely objective assessments and observations at all times in a robotic fashion. As such, all research (including our own) runs the risk of being affected to some degree or another by the researcher's own personal biases. In order to attempt to remedy this issue we have paid especially close attention to the objective nature of our survey layout and design, and made rigorous efforts to ensure any deviations from our initial methodology are closely mediated.

Additionally, due to the nature of cross-sectional studies we have been limited to capturing the zeitgeist surrounding chatbots within such a role in a single frame snapshot of the contemporary attitude at this exact time. However, it is vital to recognize that public attitudes change and evolve at all times and are not a single monolithic 'code of Hammurabi' carved into granite. Zeitgeist is fundamentally fluid and as such to truly capture a full knowledge of the future potential of these service channels it would be necessary to conduct a number of such cross-sectional studies over the course of several years. The needs and wants of the citizen are constantly evolving, so rather unsurprisingly any such research into public services can only really capture the contemporary dynamic situation as it occurs. This is especially true with such a nascent technology as chatbots, that while very much a part of our contemporary reality, most individuals are only aware of such technologies in the context of science fiction. Therefore, misconceptions regarding their nature are widespread, potentially influencing public opinion on them in a somewhat warped fashion. Imagine for example telling a viewer of Star Trek in the early seventies that the communication technology depicted in the such fiction would not only become a commercial reality within a decade or two, but within their lifetimes ''futuristic'' devices such as smartphones and tablets would become a key tool in public and private life for the majority in the first world.

A concept that would have seemed inconceivable and quite possibly absurd for many outside of the specific academic fields concerned with such technologies at the time. Nonetheless, mobile devices have grown to become one of the key avenues of approach for service delivery in the 21st century. As such, it is important to note that a significant number of respondents will be utterly unfamiliar with the concept or mechanisms behind a chatbot. Which could significantly affect their stance on their utilization. In order to address this factor, questions relating to respondent familiarity were included in the survey itself.

With respect to the secondary literature used within this text, the aspect of there simply being a lack of it of course limits us. As previously discussed chatbots within a non-research or entertainment based environment are still incredibly nascent in nature. Hence making the academic analysis of something such as a municipal chatbot a bit of an uncharted frontier.

It should also be considered that there are demographic limitations effecting the survey. While in an ideal scenario a cross-sectional study such as this would be able to capture data from the entirety of society as a whole, there are of course factors that limit the ability of a survey to reach all individuals. In the example of a physical and more traditional survey, only a smaller number of individuals can be reached without significant logistical effort and the act of responding to the survey can take up a significant chunk of a person's time. Hence making participation unappealing for those with hectic schedules such as businesspeople. An online survey (such as the one used in our case) eliminates many of these issues by reaching people wherever best suits them and in a less time consuming fashion. However, perhaps unsurprisingly this digital method limits the respondent group down to those with the logistical capabilities and digital efficacy to access the survey in the first place. As such, this method can easily end up largely excluding two key demographics from a municipal perspective, the elderly (who are broadly speaking less technologically literate) and those without the financial means to access the internet in the first place.

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Appendix A

Correlations

Correlations

		AVGPE	AVGEE	AVGSI	AVGFC	AVGPV	AVGPA	AVGCSE	AVGTG	AVGI	AVGTI	AVGBI	AVGRTC
AVGPE	Pearson Correlation	1	,394**	,496**	,266**	,533**	,284**	,259**	,214**	,373**	,186**	,621**	-,501**
	Sig. (2-tailed)		,000	,000	,000	,000	,000	,000	,001	,000	,003	,000	,000
	N	250	249	250	250	248	246	250	248	249	249	247	249
AVGEE	Pearson Correlation	,394**	1	,349**	,656**	,494**	,467**	,585**	,100	,423**	,188**	,502**	-,427**
	Sig. (2-tailed)	,000		,000	,000	,000	,000	,000	,116	,000	,003	,000	,000
	N	249	249	249	249	247	245	249	247	248	248	246	248
AVGSI	Pearson Correlation	,496**	,349**	1	,230**	,464**	,202**	,235**	,137*	,307**	,176**	,461**	-,443**
	Sig. (2-tailed)	,000	,000		,000	,000	,001	,000	,031	,000	,005	,000	,000
	N	250	249	250	250	248	246	250	248	249	249	247	249
AVGFC	Pearson Correlation	,266**	,656**	,230**	1	,485**	,415**	,534**	,050	,329**	,178**	,358**	-,352**
	Sig. (2-tailed)	,000	,000	,000		,000	,000	,000	,429	,000	,005	,000	,000
	N	250	249	250	250	248	246	250	248	249	249	247	249
AVGPV	Pearson Correlation	,533**	,494**	,464**	,485**	1	,375**	,466**	,173**	,435**	,273**	,561**	-,515**
	Sig. (2-tailed)	,000	,000	,000	,000		,000	,000	,007	,000	,000	,000	,000
	N	248	247	248	248	248	244	248	246	247	247	245	247
AVGPA	Pearson Correlation	,284**	,467**	,202**	,415**	,375**	1	,491**	-,014	,246**	,112	,299**	-,188**
	Sig. (2-tailed)	,000	,000	,001	,000	,000		,000	,827	,000	,082	,000	,003
	N	246	245	246	246	244	246	246	244	245	245	244	245
AVGCSE	Pearson Correlation	,259**	,585**	,235**	,534**	,466**	,491**	1	,098	,312**	,121	,322**	-,192**
	Sig. (2-tailed)	,000	,000	,000	,000	,000	,000		,123	,000	,056	,000	,002
	N	250	249	250	250	248	246	250	248	249	249	247	249
AVGTG	Pearson Correlation	,214**	,100	,137*	,050	,173**	-,014	,098	1	,127*	,239**	,218**	-,154*
	Sig. (2-tailed)	,001	,116	,031	,429	,007	,827	,123		,046	,000	,001	,015
	N	248	247	248	248	246	244	248	248	247	247	245	247
AVGI	Pearson Correlation	,373**	,423**	,307**	,329**	,435**	,246**	,312**	,127*	1	,296**	,662**	-,552**
	Sig. (2-tailed)	,000	,000	,000	,000	,000	,000	,000	,046		,000	,000	,000
	N	249	248	249	249	247	245	249	247	249	248	246	248
AVGTI	Pearson Correlation	,186**	,188**	,176**	,178**	,273**	,112	,121	,239**	,296**	1	,360**	-,286**
	Sig. (2-tailed)	,003	,003	,005	,005	,000	,082	,056	,000	,000		,000	,000
	N	249	248	249	249	247	245	249	247	248	249	246	248
AVGBI	Pearson Correlation	,621**	,502**	,461**	,358**	,561**	,299**	,322**	,218**	,662**	,360**	1	-,724**
	Sig. (2-tailed)	,000	,000	,000	,000	,000	,000	,000	,001	,000	,000		,000
	N	247	246	247	247	245	244	247	245	246	246	247	246
AVGRTC	Pearson Correlation	-,501**	-,427**	-,443**	-,352**	-,515**	-,188**	-,192**	-,154*	-,552**	-,286**	-,724**	1
	Sig. (2-tailed)	,000	,000	,000	,000	,000	,003	,002	,015	,000	,000	,000	
	N	249	248	249	249	247	245	249	247	248	248	246	249

Correlation: With experience

Correlations

Heeft u ervaring met een chatbot?			AVGPE	AVGEE	AVGSI	AVGFC	AVGPV	AVGPA	AVGCSE	AVGTG	AVGI	AVGTI	AVGBI	AVGRTC
Ja	AVGPE	Pearson Correlation	1	,305**	,462**	,270**	,524**	,235**	,189*	,162	,323**	,187*	,579**	-,464**
		Sig. (2-tailed)		,000	,000	,001	,000	,004	,022	,052	,000	,024	,000	,000
		N	147	147	147	147	146	145	147	145	147	146	147	146
	AVGEE	Pearson Correlation	,305**	1	,304**	,680**	,425**	,384**	,518**	,033	,366**	,128	,444**	-,411**
		Sig. (2-tailed)	,000		,000	,000	,000	,000	,000	,689	,000	,122	,000	,000
		N	147	147	147	147	146	145	147	145	147	146	147	146
	AVGSI	Pearson Correlation	,462**	,304**	1	,231**	,449**	,234**	,165*	,116	,267**	,182*	,393**	-,418**
		Sig. (2-tailed)	,000	,000		,005	,000	,005	,046	,166	,001	,028	,000	,000
		N	147	147	147	147	146	145	147	145	147	146	147	146
	AVGFC	Pearson Correlation	,270**	,680**	,231**	1	,484**	,367**	,432**	-,003	,381**	,201*	,418**	-,372**
		Sig. (2-tailed)	,001	,000	,005		,000	,000	,000	,972	,000	,015	,000	,000
		N	147	147	147	147	146	145	147	145	147	146	147	146
	AVGPV	Pearson Correlation	,524**	,425**	,449**	,484**	1	,340**	,373**	,123	,454**	,232**	,557**	-,486**
		Sig. (2-tailed)	,000	,000	,000	,000		,000	,000	,140	,000	,005	,000	,000
		N	146	146	146	146	146	144	146	144	146	145	146	145
	AVGPA	Pearson Correlation	,235**	,384**	,234**	,367**	,340**	1	,482**	-,018	,257**	,147	,302**	-,246**
		Sig. (2-tailed)	,004	,000	,005	,000	,000		,000	,827	,002	,079	,000	,003
		N	145	145	145	145	144	145	145	143	145	144	145	144
	AVGCSE	Pearson Correlation	,189*	,518**	,165*	,432**	,373**	,482**	1	,026	,288**	,148	,330**	-,150
		Sig. (2-tailed)	,022	,000	,046	,000	,000	,000		,759	,000	,074	,000	,070
		N	147	147	147	147	146	145	147	145	147	146	147	146
	AVGTG	Pearson Correlation	,162	,033	,116	-,003	,123	-,018	,026	1	,085	,161	,144	-,082
		Sig. (2-tailed)	,052	,689	,166	,972	,140	,827	,759		,307	,055	,083	,330
		N	145	145	145	145	144	143	145	145	145	144	145	144
	AVGI	Pearson Correlation	,323**	,366**	,267**	,381**	,454**	,257**	,288**	,085	1	,200*	,596**	-,505**
		Sig. (2-tailed)	,000	,000	,001	,000	,000	,002	,000	,307		,015	,000	,000
		N	147	147	147	147	146	145	147	145	147	146	147	146
	AVGTI	Pearson Correlation	,187*	,128	,182*	,201*	,232**	,147	,148	,161	,200*	1	,242**	-,268**
		Sig. (2-tailed)	,024	,122	,028	,015	,005	,079	,074	,055	,015		,003	,001
		N	146	146	146	146	145	144	146	144	146	146	146	145
	AVGBI	Pearson Correlation	,579**	,444**	,393**	,418**	,557**	,302**	,330**	,144	,596**	,242**	1	-,730**
		Sig. (2-tailed)	,000	,000	,000	,000	,000	,000	,000	,083	,000	,003		,000
		N	147	147	147	147	146	145	147	145	147	146	147	146
	AVGRTC	Pearson Correlation	-,464**	-,411**	-,418**	-,372**	-,486**	-,246**	-,150	-,082	-,505**	-,268**	-,730**	1
		Sig. (2-tailed)	,000	,000	,000	,000	,000	,003	,070	,330	,000	,001	,000	
		N	146	146	146	146	145	144	146	144	146	145	146	146

Correlation: Without experience

Nee	AVGPE	Pearson Correlation	1	,449**	,535**	,187	,507**	,278**	,307**	,249*	,404**	,152	,649**	-,523**
		Sig. (2-tailed)		,000	,000	,058	,000	,005	,002	,011	,000	,124	,000	,000
		N	103	102	103	103	102	101	103	103	102	103	100	103
	AVGEE	Pearson Correlation	,449**	1	,392**	,591**	,518**	,508**	,636**	,126	,451**	,214*	,518**	-,414**
		Sig. (2-tailed)	,000		,000	,000	,000	,000	,000	,208	,000	,031	,000	,000
		N	102	102	102	102	101	100	102	102	101	102	99	102
	AVGSI	Pearson Correlation	,535**	,392**	1	,205*	,473**	,121	,310**	,151	,347**	,157	,542**	-,465**
		Sig. (2-tailed)	,000	,000		,038	,000	,227	,001	,127	,000	,114	,000	,000
		N	103	102	103	103	102	101	103	103	102	103	100	103
	AVGFC	Pearson Correlation	,187	,591**	,205*	1	,427**	,403**	,625**	,059	,205*	,105	,226*	-,284**
		Sig. (2-tailed)	,058	,000	,038		,000	,000	,000	,551	,039	,289	,024	,004
		N	103	102	103	103	102	101	103	103	102	103	100	103
	AVGPV	Pearson Correlation	,507**	,518**	,473**	,427**	1	,351**	,537**	,190	,373**	,290**	,527**	-,521**
		Sig. (2-tailed)	,000	,000	,000	,000		,000	,000	,055	,000	,003	,000	,000
		N	102	101	102	102	102	100	102	102	101	102	99	102
	AVGPA	Pearson Correlation	,278**	,508**	,121	,403**	,351**	1	,467**	-,059	,171	,017	,229*	-,053
		Sig. (2-tailed)	,005	,000	,227	,000	,000		,000	,558	,089	,867	,023	,597
		N	101	100	101	101	100	101	101	101	100	101	99	101
	AVGCSE	Pearson Correlation	,307**	,636**	,310**	,625**	,537**	,467**	1	,150	,307**	,058	,274**	-,206*
		Sig. (2-tailed)	,002	,000	,001	,000	,000	,000		,131	,002	,564	,006	,037
		N	103	102	103	103	102	101	103	103	102	103	100	103
	AVGTG	Pearson Correlation	,249*	,126	,151	,059	,190	-,059	,150	1	,148	,307**	,270**	-,209*
		Sig. (2-tailed)	,011	,208	,127	,551	,055	,558	,131		,139	,002	,007	,034
		N	103	102	103	103	102	101	103	103	102	103	100	103
	AVGI	Pearson Correlation	,404**	,451**	,347**	,205*	,373**	,171	,307**	,148	1	,395**	,727**	-,592**
		Sig. (2-tailed)	,000	,000	,000	,039	,000	,089	,002	,139		,000	,000	,000
		N	102	101	102	102	101	100	102	102	102	102	99	102
	AVGTI	Pearson Correlation	,152	,214*	,157	,105	,290**	,017	,058	,307**	,395**	1	,476**	-,286**
		Sig. (2-tailed)	,124	,031	,114	,289	,003	,867	,564	,002	,000		,000	,003
		N	103	102	103	103	102	101	103	103	102	103	100	103
	AVGBI	Pearson Correlation	,649**	,518**	,542**	,226*	,527**	,229*	,274**	,270**	,727**	,476**	1	-,709**
		Sig. (2-tailed)	,000	,000	,000	,024	,000	,023	,006	,007	,000	,000		,000
		N	100	99	100	100	99	99	100	100	99	100	100	100
	AVGRTC	Pearson Correlation	-,523**	-,414**	-,465**	-,284**	-,521**	-,053	-,206*	-,209*	-,592**	-,286**	-,709**	1
		Sig. (2-tailed)	,000	,000	,000	,004	,000	,597	,037	,034	,000	,003	,000	
		N	103	102	103	103	102	101	103	103	102	103	100	103

Correlation: male

Correlations

Wat is uw geslacht?			AVGPE	AVGEE	AVGSI	AVGFC	AVGPV	AVGPA	AVGCSE	AVGTG	AVGI	AVGTI	AVGBI	AVGRTC
Man	AVGPE	Pearson Correlation	1	,318**	,462**	,212*	,546**	,257**	,200*	,236**	,301**	,176*	,604**	-,599**
		Sig. (2-tailed)		,000	,000	,018	,000	,004	,026	,008	,001	,050	,000	,000
		N	125	125	125	125	123	123	125	125	124	125	122	125
	AVGEE	Pearson Correlation	,318**	1	,339**	,547**	,390**	,380**	,532**	,079	,320**	,173	,374**	-,343**
		Sig. (2-tailed)	,000		,000	,000	,000	,000	,000	,384	,000	,054	,000	,000
		N	125	125	125	125	123	123	125	125	124	125	122	125
	AVGSI	Pearson Correlation	,462**	,339**	1	,210*	,399**	,149	,197*	,053	,195*	,245**	,365**	-,435**
		Sig. (2-tailed)	,000	,000		,019	,000	,099	,028	,556	,030	,006	,000	,000
		N	125	125	125	125	123	123	125	125	124	125	122	125
	AVGFC	Pearson Correlation	,212*	,547**	,210*	1	,453**	,327**	,487**	-,005	,231**	,212*	,278**	-,186*
		Sig. (2-tailed)	,018	,000	,019		,000	,000	,000	,955	,010	,018	,002	,038
		N	125	125	125	125	123	123	125	125	124	125	122	125
	AVGPV	Pearson Correlation	,546**	,390**	,399**	,453**	1	,312**	,411**	,179*	,439**	,297**	,553**	-,506**
		Sig. (2-tailed)	,000	,000	,000	,000		,000	,000	,047	,000	,001	,000	,000
		N	123	123	123	123	123	121	123	123	122	123	120	123
	AVGPA	Pearson Correlation	,257**	,380**	,149	,327**	,312**	1	,504**	-,025	,220*	,125	,306**	-,152
		Sig. (2-tailed)	,004	,000	,099	,000	,000		,000	,786	,015	,168	,001	,093
		N	123	123	123	123	121	123	123	123	122	123	121	123
	AVGCSE	Pearson Correlation	,200*	,532**	,197*	,487**	,411**	,504**	1	,053	,258**	,122	,263**	-,139
		Sig. (2-tailed)	,026	,000	,028	,000	,000	,000		,554	,004	,176	,003	,121
		N	125	125	125	125	123	123	125	125	124	125	122	125
	AVGTG	Pearson Correlation	,236**	,079	,053	-,005	,179*	-,025	,053	1	,150	,225*	,193*	-,164
		Sig. (2-tailed)	,008	,384	,556	,955	,047	,786	,554		,095	,012	,033	,067
		N	125	125	125	125	123	123	125	125	124	125	122	125
	AVGI	Pearson Correlation	,301**	,320**	,195*	,231**	,439**	,220*	,258**	,150	1	,291**	,648**	-,526**
		Sig. (2-tailed)	,001	,000	,030	,010	,000	,015	,004	,095		,001	,000	,000
		N	124	124	124	124	122	122	124	124	124	124	121	124
	AVGTI	Pearson Correlation	,176*	,173	,245**	,212*	,297**	,125	,122	,225*	,291**	1	,363**	-,324**
		Sig. (2-tailed)	,050	,054	,006	,018	,001	,168	,176	,012	,001		,000	,000
		N	125	125	125	125	123	123	125	125	124	125	122	125
	AVGBI	Pearson Correlation	,604**	,374**	,365**	,278**	,553**	,306**	,263**	,193*	,648**	,363**	1	-,764**
		Sig. (2-tailed)	,000	,000	,000	,002	,000	,001	,003	,033	,000	,000		,000
		N	122	122	122	122	120	121	122	122	121	122	122	122
	AVGRTC	Pearson Correlation	-,599**	-,343**	-,435**	-,186*	-,506**	-,152	-,139	-,164	-,526**	-,324**	-,764**	1
		Sig. (2-tailed)	,000	,000	,000	,038	,000	,093	,121	,067	,000	,000	,000	
		N	125	125	125	125	123	123	125	125	124	125	122	125

Correlation: female

Vrouw	AVGPE	Pearson Correlation	1	,493**	,544**	,358**	,547**	,308**	,356**	,180*	,470**	,191*	,647**	-,405**
		Sig. (2-tailed)		,000	,000	,000	,000	,001	,000	,047	,000	,034	,000	,000
		N	125	124	125	125	125	123	125	123	125	124	125	124
	AVGEE	Pearson Correlation	,493**	1	,360**	,748**	,601**	,560**	,637**	,129	,528**	,210*	,625**	-,513**
		Sig. (2-tailed)	,000		,000	,000	,000	,000	,000	,158	,000	,019	,000	,000
		N	124	124	124	124	124	122	124	122	124	123	124	123
	AVGSI	Pearson Correlation	,544**	,360**	1	,252**	,538**	,261**	,277**	,237**	,429**	,098	,559**	-,453**
		Sig. (2-tailed)	,000	,000		,005	,000	,004	,002	,008	,000	,280	,000	,000
		N	125	124	125	125	125	123	125	123	125	124	125	124
	AVGFC	Pearson Correlation	,358**	,748**	,252**	1	,516**	,513**	,572**	,114	,418**	,167	,435**	-,498**
		Sig. (2-tailed)	,000	,000	,005		,000	,000	,000	,209	,000	,063	,000	,000
		N	125	124	125	125	125	123	125	123	125	124	125	124
	AVGPV	Pearson Correlation	,547**	,601**	,538**	,516**	1	,458**	,520**	,172	,430**	,254**	,577**	-,523**
		Sig. (2-tailed)	,000	,000	,000	,000		,000	,000	,057	,000	,004	,000	,000
		N	125	124	125	125	125	123	125	123	125	124	125	124
	AVGPA	Pearson Correlation	,308**	,560**	,261**	,513**	,458**	1	,492**	-,006	,279**	,093	,293**	-,233**
		Sig. (2-tailed)	,001	,000	,004	,000	,000		,000	,948	,002	,309	,001	,010
		N	123	122	123	123	123	123	123	121	123	122	123	122
	AVGCSE	Pearson Correlation	,356**	,637**	,277**	,572**	,520**	,492**	1	,160	,370**	,132	,388**	-,245**
		Sig. (2-tailed)	,000	,000	,002	,000	,000	,000		,076	,000	,145	,000	,006
		N	125	124	125	125	125	123	125	123	125	124	125	124
	AVGTG	Pearson Correlation	,180*	,129	,237**	,114	,172	-,006	,160	1	,102	,254**	,244**	-,147
		Sig. (2-tailed)	,047	,158	,008	,209	,057	,948	,076		,261	,005	,007	,105
		N	123	122	123	123	123	121	123	123	123	122	123	122
	AVGI	Pearson Correlation	,470**	,528**	,429**	,418**	,430**	,279**	,370**	,102	1	,306**	,678**	-,580**
		Sig. (2-tailed)	,000	,000	,000	,000	,000	,002	,000	,261		,001	,000	,000
		N	125	124	125	125	125	123	125	123	125	124	125	124
	AVGTI	Pearson Correlation	,191*	,210*	,098	,167	,254**	,093	,132	,254**	,306**	1	,356**	-,247**
		Sig. (2-tailed)	,034	,019	,280	,063	,004	,309	,145	,005	,001		,000	,006
		N	124	123	124	124	124	122	124	122	124	124	124	123
	AVGBI	Pearson Correlation	,647**	,625**	,559**	,435**	,577**	,293**	,388**	,244**	,678**	,356**	1	-,687**
		Sig. (2-tailed)	,000	,000	,000	,000	,000	,001	,000	,007	,000	,000		,000
		N	125	124	125	125	125	123	125	123	125	124	125	124
	AVGRTC	Pearson Correlation	-,405**	-,513**	-,453**	-,498**	-,523**	-,233**	-,245**	-,147	-,580**	-,247**	-,687**	1
		Sig. (2-tailed)	,000	,000	,000	,000	,000	,010	,006	,105	,000	,006	,000	
		N	124	123	124	124	124	122	124	122	124	123	124	124

Independent-samples t-test: gender

T-Test

Group Statistics

	Wat is uw geslacht?	N	Mean	Std. Deviation	Std. Error Mean
AVGBI	Man	122	3,3798	1,22891	,11126
	Vrouw	125	3,4213	1,22485	,10955

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
AVGBI	Equal variances assumed	,705	,402	-,266	245	,790	-,04155	,15614	-,34910	,26599
	Equal variances not assumed			-,266	244,812	,790	-,04155	,15614	-,34911	,26601

```
T-TEST GROUPS=Gender(1 2)
  /MISSING=ANALYSIS
  /VARIABLES=AVGRTC
  /CRITERIA=CI(.95).
```

T-Test

Group Statistics

	Wat is uw geslacht?	N	Mean	Std. Deviation	Std. Error Mean
AVGRTC	Man	125	2,6720	1,29237	,11559
	Vrouw	124	2,7849	1,21656	,10925

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
AVGRTC	Equal variances assumed	2,097	,149	-,710	247	,478	-,11295	,15909	-,42629	,20040
	Equal variances not assumed			-,710	246,326	,478	-,11295	,15905	-,42622	,20033

Independent-samples t-test: experience

T-Test

Group Statistics

	Heeft u ervaring met een chatbot?	N	Mean	Std. Deviation	Std. Error Mean
AVGBI	Ja	147	3,5918	1,10471	,09112
	Nee	100	3,1200	1,33881	,13388

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference Lower	Upper
AVGBI	Equal variances assumed	15,967	,000	3,021	245	,003	,47184	,15617	,16423	,77945
	Equal variances not assumed			2,914	185,031	,004	,47184	,16194	,15234	,79133

```
T-TEST GROUPS=Experience(1 2)
  /MISSING=ANALYSIS
  /VARIABLES=AVGRTC
  /CRITERIA=CI(.95).
```

T-Test

Group Statistics

	Heeft u ervaring met een chatbot?	N	Mean	Std. Deviation	Std. Error Mean
AVGRTC	Ja	146	2,5890	1,20792	,09997
	Nee	103	2,9256	1,29683	,12778

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference Lower	Upper
AVGRTC	Equal variances assumed	2,446	,119	-2,100	247	,037	-,33653	,16026	-,65217	-,02088
	Equal variances not assumed			-2,074	209,787	,039	-,33653	,16224	-,65635	-,01670

Regression (BI)

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	AVGTI, AVGPA, AVGTG, AVGSI, AVGI, AVGFC, AVGPE, AVGCSE, AVGPV, AVGEE[b]	.	Enter

a. Dependent Variable: AVGBI

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,808[a]	,653	,638	,74078

a. Predictors: (Constant), AVGTI, AVGPA, AVGTG, AVGSI, AVGI, AVGFC, AVGPE, AVGCSE, AVGPV, AVGEE

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	233,749	10	23,375	42,596	,000[b]
	Residual	124,018	226	,549		
	Total	357,767	236			

a. Dependent Variable: AVGBI

b. Predictors: (Constant), AVGTI, AVGPA, AVGTG, AVGSI, AVGI, AVGFC, AVGPE, AVGCSE, AVGPV, AVGEE

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-,342	,268		-1,276	,203
	AVGPE	,336	,055	,305	6,090	,000
	AVGEE	,156	,065	,142	2,402	,017
	AVGSI	,074	,050	,069	1,473	,142
	AVGFC	-,048	,071	-,037	-,668	,505
	AVGPV	,124	,066	,105	1,873	,062
	AVGPA	,036	,076	,022	,474	,636
	AVGCSE	-,036	,051	-,037	-,699	,485
	AVGTG	,047	,045	,043	1,057	,292
	AVGI	,411	,047	,405	8,705	,000
	AVGTI	,127	,043	,124	2,944	,004

Regression (RTC)

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	AVGTI, AVGPA, AVGTG, AVGSI, AVGI, AVGFC, AVGPE, AVGCSE, AVGPV, AVGEE[b]	.	Enter

a. Dependent Variable: AVGRTC

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,706[a]	,499	,477	,91095

a. Predictors: (Constant), AVGTI, AVGPA, AVGTG, AVGSI, AVGI, AVGFC, AVGPE, AVGCSE, AVGPV, AVGEE

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	187,695	10	18,769	22,619	,000[b]
	Residual	188,370	227	,830		
	Total	376,065	237			

a. Dependent Variable: AVGRTC

b. Predictors: (Constant), AVGTI, AVGPA, AVGTG, AVGSI, AVGI, AVGFC, AVGPE, AVGCSE, AVGPV, AVGEE

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	5,954	,325		18,303	,000
	AVGPE	-,223	,068	-,198	-3,275	,001
	AVGEE	-,150	,079	-,135	-1,892	,060
	AVGSI	-,154	,061	-,142	-2,526	,012
	AVGFC	-,117	,087	-,088	-1,339	,182
	AVGPV	-,201	,080	-,167	-2,500	,013
	AVGPA	,116	,094	,070	1,232	,219
	AVGCSE	,174	,063	,178	2,765	,006
	AVGTG	-,010	,055	-,009	-,187	,852
	AVGI	-,348	,058	-,336	-6,014	,000
	AVGTI	-,074	,053	-,071	-1,400	,163

Multicollinearity

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	AVGTI, AVGPA, AVGTG, AVGSI, AVGI, AVGFC, AVGPE, AVGCSE, AVGPV, AVGEE[b]	.	Enter

a. Dependent Variable: AVGRTC

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,706[a]	,499	,477	,91095

a. Predictors: (Constant), AVGTI, AVGPA, AVGTG, AVGSI, AVGI, AVGFC, AVGPE, AVGCSE, AVGPV, AVGEE

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	187,695	10	18,769	22,619	,000[b]
	Residual	188,370	227	,830		
	Total	376,065	237			

a. Dependent Variable: AVGRTC

b. Predictors: (Constant), AVGTI, AVGPA, AVGTG, AVGSI, AVGI, AVGFC, AVGPE, AVGCSE, AVGPV, AVGEE

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	5,954	,325		18,303	,000		
	AVGPE	-,223	,068	-,198	-3,275	,001	,606	1,650
	AVGEE	-,150	,079	-,135	-1,892	,060	,435	2,297
	AVGSI	-,154	,061	-,142	-2,526	,012	,699	1,431
	AVGFC	-,117	,087	-,088	-1,339	,182	,510	1,962
	AVGPV	-,201	,080	-,167	-2,500	,013	,495	2,019
	AVGPA	,116	,094	,070	1,232	,219	,686	1,458
	AVGCSE	,174	,063	,178	2,765	,006	,531	1,884
	AVGTG	-,010	,055	-,009	-,187	,852	,897	1,114
	AVGI	-,348	,058	-,336	-6,014	,000	,705	1,418
	AVGTI	-.074	.053	-.071	-1.400	.163	.858	1.166

Descriptive

Frequencies

Statistics

Leeftijd gecategoriseerd

Man	Ja	N	Valid	78
			Missing	0
	Nee	N	Valid	47
			Missing	0
Vrouw	Ja	N	Valid	69
			Missing	0
	Nee	N	Valid	56
			Missing	0

Leeftijd gecategoriseerd

Wat is uw geslacht?	Heeft u ervaring met een chatbot?			Frequency	Percent	Valid Percent	Cumulative Percent
Man	Ja	Valid	18-25	24	30,8	30,8	30,8
			26-35	29	37,2	37,2	67,9
			36-45	23	29,5	29,5	97,4
			46-55	2	2,6	2,6	100,0
			Total	78	100,0	100,0	
	Nee	Valid	18-25	18	38,3	38,3	38,3
			26-35	10	21,3	21,3	59,6
			36-45	14	29,8	29,8	89,4
			46-55	4	8,5	8,5	97,9
			56+	1	2,1	2,1	100,0
			Total	47	100,0	100,0	
Vrouw	Ja	Valid	18-25	19	27,5	27,5	27,5
			26-35	32	46,4	46,4	73,9
			36-45	15	21,7	21,7	95,7
			46-55	3	4,3	4,3	100,0
			Total	69	100,0	100,0	
	Nee	Valid	18-25	26	46,4	46,4	46,4
			26-35	17	30,4	30,4	76,8
			36-45	8	14,3	14,3	91,1
			46-55	5	8,9	8,9	100,0
			Total	56	100,0	100,0	

Appendix B

Universiteit Leiden
The Netherlands

Voorwoord,

Het is u niet ontgaan dat de hedendaagse technologieën elkaar in rap tempo opvolgen, waarbij ook de chatbots nu in opmars zijn. De wens om gesprekken te voeren met een machine bestaat al een lange tijd, zelfs al voordat moderne chatbots of zelfs het internet uitgevonden was.

Wat is dat nu precies, een chatbot, en hoe werkt het? Een chatbot is een geautomatiseerde gesprekspartner die voorzien is van kunstmatige intelligentie en machine learning. Een goede chatbot is in staat om op een menselijke manier de dialoog aan te gaan met klanten en transacties uit te voeren. Dankzij kunstmatige intelligentie (AI) is een chatbot ook in staat om vast te stellen wanneer voor het vervolg van het gesprek een medewerker nodig is om de klant verder te helpen. Vanwege de doorbrekende ontwikkelingen binnen dit domein nemen de functionaliteiten en mogelijkheden van chatbots toe.

Koplopers op het gebied van klantcontact en dienstverlening voorspellen een revolutie in de dienstverlenende sector, waarbij klantinteracties worden afgehandeld door chatbots. Technologische bedrijven zijn zodoende hard bezig met het verfijnen van de gebruikservaring van chatbots, om deze in te zetten als de nieuwe generatie online dienstverleners.
Dit brengt verandering in ons dagelijks leven. In het bijzonder, in de manier waarop wij met elkaar communiceren en ons zaken online regelen.

Ook de gemeente Den Haag ziet potentie in de inzet van chatbots om burgers een betere dienstverlening te bieden. Stelt u eens voor dat u te allen tijde van de dag waar u zich ook bevindt uw burgerzaken online kunt regelen op www.denhaag.nl. En indien u een vraag heeft, staat er altijd een chatbot klaar om u te assisteren.

Om de animo en potentie van deze opkomende technologie te onderzoeken, is deze enquête voor u opgesteld. Het doel van deze enquête is om de intentie van de Haagse burgers te onderzoeken ten opzichte van het gebruik van chatbots als nieuwe dienstverleners van de gemeente Den Haag.

Dit onderzoek maakt deel uit van mijn masterscriptie *ICT in Business and The Public Sector* te universiteit Leiden. Indien anders verzocht, graag één antwoord per vraag geven. U doet anoniem mee aan het onderzoek en kunt daarom volledig eerlijk zijn. U wordt gegarandeerd dat alle gegevens vertrouwelijk worden behandeld. Onderzoeksgegevens worden niet gedeeld of verstrekt aan derden.

Abdessamad Taounza
ICT in Business and the Public Sector

Wat is uw geslacht?

Man

Vrouw

Wat is uw leeftijd ?

Heeft u ervaring met een chatbot?

Ja

Nee

Opmerking: alle onderstaande enquêtevragen hebben betrekking op enkel de gemeente Den Haag.

Vraag 1

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Het gebruik van de gemeentelijke chatbot zal mijn dagelijkse prestatie verbeteren.	○	○	○	○	○

Opmerking: alle onderstaande enquêtevragen hebben betrekking op enkel de gemeente Den Haag.

Vraag 1

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Het gebruik van de gemeentelijke chatbot zal mijn dagelijkse prestatie verbeteren.	○	○	○	○	○

Vraag 2

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Ik denk dat het gebruik van de gemeentelijke chatbot mij zal helpen om sneller mijn publiekszaken af te ronden.	○	○	○	○	○

Vraag 3

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Ik vind de gemeentelijke chatbot nuttig in mijn dagelijks leven.	○	○	○	○	○

Vraag 4

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Ik zou een chatbot van de gemeente makkelijk weten te gebruiken.	○	○	○	○	○

Vraag 5

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Ik denk dat het voor mij makkelijk is om behendig te worden in het gebruik van de gemeentelijke chatbot.	○	○	○	○	○

Vraag 6

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Het leren gebruiken van de gemeentelijke chatbot zal makkelijk voor mij zijn.	○	○	○	○	○

Vraag 7

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Mensen die belangrijk voor mij zijn, denken dat ik gebruik moet maken van de gemeentelijke chatbot om mijn publiekszaken af te handelen.	○	○	○	○	○

Vraag 8

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Mensen die mij beïnvloeden, vinden dat ik de chatbot van de gemeente moet gebruiken.	○	○	○	○	○

Vraag 9

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Ik heb de nodige middelen om de gemeentelijke chatbot te gebruiken.	○	○	○	○	○

Vraag 10

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Ik heb de nodige kennis om de gemeentelijke chatbot te gebruiken.	○	○	○	○	○

Vraag 11: In vergelijking met de kosten van het gebruik van de traditionele dienstverlening:

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Ik geloof dat het gebruik van de chatbot van de gemeente een goede prijs-kwaliteitverhouding is.	○	○	○	○	○

Vraag 12

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Ik geloof dat het gebruik van de gemeentelijke chatbot mij minder geld zal kosten.	○	○	○	○	○

Vraag 13

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Ik geloof dat het gebruik van de gemeentelijke chatbot een goede (meer)waarde biedt.	○	○	○	○	○

Vraag 14

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Ik ben op de hoogte van de gemeentelijke chatbot.	○	○	○	○	○

Vraag 15

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Ik heb educatieve / trainingsprogramma's doorlopen over de algemene kenmerken van de chatbot van de gemeente.	○	○	○	○	○

Vraag 16

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Ik ben overheidscampagnes / advertenties tegengekomen voor het gebruik van de gemeentelijke chatbot.	○	○	○	○	○

Vraag 17

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Ik heb de nodige vaardigheden om de chatbot van de gemeente te gebruiken.	○	○	○	○	○

Vraag 18

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Ik heb de nodige kwalificaties om de chatbot van de gemeente te gebruiken.	○	○	○	○	○

Vraag 19

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Het internet heeft genoeg veilige systemen om mij vertrouwd te maken met het gebruik van de chatbot om te communiceren met de gemeente.	○	○	○	○	○

Vraag 20

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Ik ben ervan overtuigd dat juridische en technologische maatregelen/structuren mij adequaat beschermen tegen problemen op het internet.	○	○	○	○	○

Vraag 21

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Over het algemeen is internet nu een robuuste en veilige omgeving om transacties uit te voeren met de gemeentelijke chatbot.	○	○	○	○	○

Vraag 22

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Ik denk dat ik overheidsinstanties kan vertrouwen.	○	○	○	○	○

Vraag 23

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Ik vertrouw erop dat overheidsinstanties mijn belangen niet uit het oog verliezen.	○	○	○	○	○

Vraag 28

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Ik heb de intentie om in de toekomst de gemeentelijke chatbot te gebruiken.	○	○	○	○	○

Vraag 29

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Ik voorspel dat ik in de toekomst de chatbot van de gemeente zal gebruiken.	○	○	○	○	○

Vraag 30

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Ik ben van plan om de chatbot van de gemeente in de toekomst te gebruiken.	○	○	○	○	○

Vraag 31

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Als ik van een nieuwe technologie hoor, zou ik manieren zoeken om ermee te experimenteren.	○	○	○	○	○

Vraag 32

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Onder mijn collega's ben ik meestal de eerste om nieuwe technologieën uit te proberen	○	○	○	○	○

Vraag 32

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Onder mijn collega's ben ik meestal de eerste om nieuwe technologieën uit te proberen	○	○	○	○	○

Vraag 33

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Ik ben huiverig om nieuwe technologieën uit te proberen.	○	○	○	○	○

Vraag 34

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Ik experimenteer graag met nieuwe technologieën	○	○	○	○	○

Vraag 35

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Mensen die belangrijk voor mij zijn, denken dat ik gebruik moet maken van de gemeentelijke chatbot om mijn publiekszaken af te handelen.	○	○	○	○	○

Vraag 33

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Ik ben huiverig om nieuwe technologieën uit te proberen.	○	○	○	○	○

Vraag 34

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Ik experimenteer graag met nieuwe technologieën	○	○	○	○	○

Vraag 35

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Mensen die belangrijk voor mij zijn, denken dat ik gebruik moet maken van de gemeentelijke chatbot om mijn publiekszaken af te handelen.	○	○	○	○	○

Vraag 36

	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
Mensen wier mening ik waardeer, adviseren mij om de gemeentelijke chatbot te gebruiken.	○	○	○	○	○

Dit is het einde van de enquête. Dank u hartelijk voor uw medewerking.