Improving Accessibility to the City of Reykjavík's Digital Welfare

Chandler Garcia, Theron Howe, Advait Surana, Marko Vila

WPI

Improving Accessibility to the City of Reykjavík's Digital Welfare

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By
Chandler Garcia
Theron Howe
Advait Surana
Marko Vila

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Professors Roberts and Dominko

Abstract

The prevalence of digitization in the modern day enhances the lives of individuals and increases the efficiency of society. City programs have steadily become more digitized and focused on online usage. Despite broad applicability, some citizens still seek in-person service. Reasons range from technological (user authentication, data security concerns, platform design) to personal (comfort with digital technology, literacy and language, awareness of digital services). While the City of Reykjavík, Iceland is an example of efficient use of digital services, there are opportunities to increase online usage. Our project investigated barriers to use of digital services. Working with the City's Digital Service Center, we provided recommendations to improve the use of these services.

Executive Summary

Introduction

On the global level, the expansion of digital access and accompanying technology has enabled rapid exchange and access to information in a matter of seconds at the click of a button. The City of Reykjavík is currently undergoing a process to make most of their services available online and accessible to the public. They face the challenges of increasing their resident's usage of the online system while meeting the time constraints, budget, and expectations from both their citizens and government. In order to optimize their current services, digitization is a route to provide a more effective distribution of services while increasing efficiency and cost effectiveness.

Digital systems themselves provide many benefits, making services like welfare systems such as financial assistance and unemployment as well as daily services such as the weather conditions and bus locations an easy task which can be done at the click of a couple buttons. Currently, the City of Reykjavík has established and is in the process of prototyping a number of digital programs revolving around easier access to the services they provide and are also designing improvements to their inner workflow. Our project addressed the online financial assistance program implemented two years ago that currently receives about 75% of the applications through their online portal. The City would like to understand the barriers that prevent 25% of the applicants from applying online. This will allow the City to better integrate their citizens into the online system and encourage its widespread usage. The barriers faced by in-person applicants to financial services are likely to be the same barriers to other digital services provided by the City. This research will assist the City to increase access to current and future digital services.

Our Approach

In order to achieve our project goals and target the potential causes for the 25% of people still applying in person, our team felt it necessary to investigate why the applicants chose not to apply online, research the demographic information on the applicants, interview the service center workers helping

the applicants through the physical process, and also interview the City of Reykjavík's service designers. We developed a survey to identify potential barriers financial assistance applicants may face and translated it into English, Icelandic, Spanish, Arabic, and Polish in order to reach the most likely potential languages we would find regarding the citizens.

Once our team arrived in Iceland, we began sending our surveys to separate service centers to collect more in-depth data on who is applying to the services in person. While sending out these surveys, we met with each respective Service Center's managers to understand their in-person process and personal experience on who comes in to apply in person, as well as their opinion on the current digitization process being implemented. Lastly, our team met with the City of Reykjavík's service designers to understand the design process for the financial assistance online service and their future projects.

Figure 1: Service Centers in Reykjavík

Note: *The service centers in Reykjavík. From right to left - top: Árbær og Grafarholt, Vesturbær Miðborg og Hlíðar, Breiðholt, bottom: Grafarvogur og Kjalarnes, Laugardalur og Háaleiti*

Findings

From our surveys and interviews with both service center managers and Department of Innovation designers, we were able to define the barriers between users and the digital services, as well as the importance of realistic and feasible solutions to cross them.

One of the major barriers that applicants face is from a lack of an electronic ID. Our findings showed that many applicants either didn't have an electronic ID to begin with or they've lost their phone or are facing phone issues. Either way, without access to an electronic ID, they are not able to apply digitally.

From our survey we found about 19% of the respondents are not fluent in Icelandic. This sample group of the survey was made up of 78 people who came from the in-person population of 319 for the month of July. If we assume that the trend of this percentage continues in this population, then that would mean about 61 people out of 1242 (total number of people who applied in the month before the survey was taken) couldn't speak Icelandic which is 4.9% of the total group.

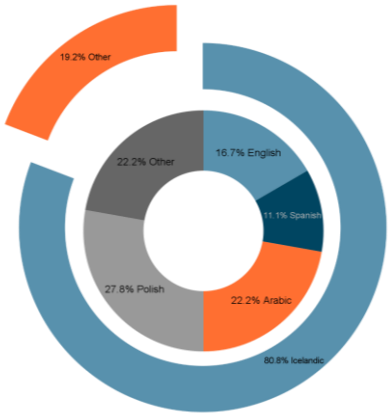

Figure 2: Distribution of Languages

Note: *The outer circle represents the percentage of respondents who are fluent in Icelandic. The inner circle represents the languages spoken by the people who were not.*

When collecting data about what people would want to help assist them in using online services in the future, roughly 15% of respondents said they would like to see tutorials of some sort and 12% said one-on-one help would be the most useful. 18% help with using or acquiring electronic IDs and 19% said increased visibility would be the most helpful.

With the information gathered from our meetings with Service Center managers and what we gathered from our survey we had enough data to create our recommendations for the current services. With this data, we compared it with the project goals and design process of the Department of Innovation at the City of Reykjavík and were able to decide four main points behind how to best design our recommendations. These four points can be summed up into Feasibility, Funding, Benefits, and Timeframe. We also decided with these four in mind that our recommendations should have the ability to be re-used for separate future services and be achievable within a couple months. Our target populations for recommendations were 37% of people who didn't know about the online service, 27%

who didn't have a digital ID, and 19% who weren't fluent in Icelandic. Combined this results in 74% of the physical applicants, or 19% of the total applicants for the financial assistance.

Recommendations

From our findings, we formulated the following recommendations:

1. Automatically refer people to other avenues of welfare if they have applied for financial assistance previously - specifically for individuals where they would be better suited to unemployment or disability systems.
2. Provide digital identities through the city instead of through bank accounts to increase its overall accessibility to newer users who may be unfamiliar with the process of applying for electronic identification.
3. Implement official translations through the City of Reykjavík, removing the need for suboptimal Google based translations so that non-Icelandic speakers can operate the financial assistance application process efficiently.
4. Allow workers at the service centers to personally confirm people who appear in person through prior application processes and allow them to use temporary electronic credentials to use the digital financial assistance application system.
5. Construct online digital help services or easy-to-access tutorial videos in multiple languages to physically show people how to apply online - furthering the humanity behind the website to make it more personable for those who value social interaction.
6. Implement text-to-speech options on the City of Reykjavík websites that allow people who do not speak Icelandic to still operate the financial assistance application process, as well as any other future ones that go digital, efficiently.

Along with these recommendations we have specifically for the welfare department and its digital financial assistance service, there are other, broader recommendations that could further the overall user-centered development of City of Reykjavík digital and in-person services as well as further

Worcester Polytechnic Institute's involvement with global projects in Iceland and with the City of Reykjavík. These broader recommendations include:

1. Expand WPI's connection with other departments of the City of Reykjavík to further the reach of their future digital services with new Interactive Qualifying Projects (IQP) focused on the user's relationship with these services.
2. Further communication through the City of Reykjavík by implementing "Job Swap Programs" among managers working for the city to expand upon the communication between the different divisions, furthering cooperative data research pools and consistent digital systems.
3. Increase the overall visibility of digital services through further advertisement and proper showcases of how to use the system through paper instructions given out at service centers after individuals have physically applied for them for at least three months. These showcases can apply to any system the City of Reykjavík wishes to further advance the online use of its services.

Acknowledgments

We would like to acknowledge and thank the following individuals for making our project possible and for all the assistance that they provided.

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Authorship

Sections	Primary Author(s)	Primary Editor(s)
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Meet the Team

Hi I'm Chandler Garcia, a junior Robotics Engineering and Computer Science double major at WPI and a member of the Underwater Hockey Club.

My name is Theron Howe and I am a Junior at WPI. I'm a Civil Engineering major and International Studies minor and the treasurer for the Alliance at WPI.

Hello! I am Advait Surana and I am majoring in Industrial Engineering and I plan to minor in business at WPI. I am the former treasurer of the chess club.

Hi I'm Marko Vila! I'm a junior studying Computer Science and Data Science here at WPI, serve on the executive board of my fraternity, Alpha Chi Rho, and am part of the Fencing Club.

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Chapter 1: Introduction

The rapid pace of technological development and the spread of accessibility to information has created an opportunity for cities to digitize parts of their social infrastructure. This necessitates that those cities update their local government systems to provide more efficient services with their users in mind. On the global level, expansion of digital access and accompanying technology (hardware and software) has enabled rapid exchange and access to information in a matter of seconds at the click of a button. Several digital services over the years have been designed to enhance and expand one's personal social interactions while offering the opportunity to be deployed efficiently for broader societal purposes. Technology provides assistance to the development of society and government organizations leading the charge to implement user-friendly services and tuning them to fit the user's needs.

In particular, the City of Reykjavík is currently developing processes to make most of their services available online by designing a brand-new system. In order to optimize the use of services that the City provides, online access to their system can provide a more efficient way for the City to manage applications while continually developing and improving a program with the user as a primary focus. They are striving to increase residents' usage of the online system, as the digitized version of the service provides many benefits to both user and administrator, however, the proportion of citizens who use the services currently online are lower than what the City wishes.

The goal of our project is to identify factors that drive in-person engagement and make recommendations to improve online service usage. This will help the City of Reykjavík Service Design Department's services to close the gap between current and desired use of their online services while focusing on incorporating residents' and stakeholders' perspectives.

Figure 3: City of Reykjavík Digital Design Department

Chapter 2: Background

2.1 Digital Services

Due to the widespread usage of digital technology and the opportunities that arise in creating interconnected networks to provide benefits for citizens, cities and governments are increasingly digitizing their services. With the help of technology, applying for systems like welfare, financial assistance, and unemployment as well as getting updates on weather conditions, bus locations, deciding on which school to send a child can all be done online through different apps and websites that increase the overall quality of life of the user. These systems are created to cater to a specific purpose, making management of daily tasks easier and more efficient for the user. Benefits provided by digital systems are far reaching, and the switch to a digital system allows government and city services to be upgraded from their in-person services that are cumbersome and lack expediency and consideration for the user.

To improve current digital services and plan for more user-friendly systems in the future, it is important to first define what makes a digital service and what benefits it can provide. Public digital services or E-Government services represent integration of information technology (IT) and Communication Technology, with the aim of enhancing the government's ability to address the needs of the public. The purpose of doing so is to simplify processes which include government, citizens, businesses, etc. at local, state, and national levels. Electronic methods improve the efficiency of government when it comes to access and service delivery, information dissemination, and quick and efficient communications (Businessjargons, 2019).

There are many benefits of implementing an effective digital system. With digital services accessible 24/7, there is no need to wait in a queue in an office somewhere that is only open from 9 AM to 5 PM. Online platforms also allow people to log-in and check the status of their applications and documents, rather than waiting hours on a phone line. Digital access also contributes to transparency and political trust as the citizens can access the information the government has on them at any time(O'Farrell, 2020).

With digital services, the efficiency of data sharing can decrease the cost of a service and the necessary time to complete it. For example, in 2011, 79% of all individual tax returns were filed electronically in the US, providing important benefits to taxpayers, including faster refunds reducing the time taken and resulting in more accurate returns, while also providing the IRS a low-cost option to improve enforcement operations and services to taxpayers. Such an implementation saved about $3.50 per return, and if the remaining 21% of people filed their taxes electronically, the IRS would save about $131 million (White, 2011).

2.2 Digital Technology in Reykjavík

As technology advances, it is only natural that availability of new tools to access new technologies is influencing every facet of people's lives. The modern world incentivizes and promotes the idea that new electronic and information technologies make accomplishing day-to-day tasks more convenient. Iceland is no exception to this constant modernization and has taken active steps to try and improve the efficiency of their local city government services with the use of digital technology. However, when these concepts are developed to target a wider community, the challenges of establishing, integrating, and managing these innovations rise in prevalence and require thorough examination.

Currently, the City of Reykjavík's government has established a number of digital programs revolving around digital access to financial assistance and government managed transportation for the sick, elderly, and physically disabled and seek to digitize additional services in the near future. Departments such as the Department of Education and Youth and the Office of Finance already have some services that are accessible online and other departments such as Sports and Leisure and Transportation have working demos in the beta-testing stage. The design process for each department is currently undergoing improvements to their workflow, including building trust within teams, re-defining what a team is and how to find or reach project goals, and improving their communication between teams in order to tackle this complete revamp of the system.

Most of these efforts have begun over the last few years and the city continues to push the boundaries for the use of digital access to services for their citizens, the most recent effort concentrating on online access to school enrollments starting in September 2021. With 97% of the population in Iceland using the internet daily or almost daily (Statistics Iceland, 2019), the implementation of these digital services will be able to reach a large audience of users. In addition to previously mentioned Welfare Department services and upcoming educational ones by the City of Reykjavík, there are also other non-city government services that have been digitized, such as an application for smartphones that manages bus tickets and trip planning for the user when they want to ride Straetó buses, a joint Geographic Information System called Land Information System of the Reykjavík Area (Landupplýsingakerfi Reykjavíkur) that tracks public utilities in the city, and “Better Reykjavík", an online consultation forum for citizens to express ideas about public service issues and operations. These services, including financial assistance as their primary focus, are all being created with the express purpose of providing citizens with more efficient ways to maneuver through their daily life when dealing with city-based tasks. The City of Reykjavík Service Design Department is proactively working to increase the overall usability and user-friendliness of their digital applications and are striving for greater accessibility and integration of these systems into daily lives of all its citizens.

2.3 Reykjavík’s Commitment to Digitization

2.3.1 Implementation of Digital Services in Reykjavík

Two years ago, the Department of Welfare in the City of Reykjavík implemented the first public iteration of their online financial assistance program. From then until July 2021, the service has seen general widespread popularity and about 75% of applicants from around the city currently use the online version of this service over the in-person one. The push to reach that last 25% of the population who still go apply in person to service centers located around Reykjavík is a major goal for the Welfare Department. Service centers are the physical locations in the city where people can go for physical applications. Services offered there include social advisory pertaining to finances, immigration issues, unemployment, and family and personal welfare problems. Each service center covers a specific district

of Reykjavík and only a percentage of the total financial assistance applicants go to each center. Vesturbær, Miðborg og Hlíðar has about 37% of total applicants, Laugardalur, Háaleiti og Bústaðir has about 23%, Breiðholt has about 20%, Árbær og Grafarholt has about 11%, and Grafarvogur og Kjalarnes has about 9%.

Transferring more of the current user base to apply online makes it easier to focus the service center on other topics such as family support, social services for children and the elderly, and welfare programs like unemployment and disability that require a longer application process. With mostly online applications, the digital service team can then focus on the efficiency of the online system to ensure faster disbursement of financial support to those in need.

For digital services to work in Iceland, people need to have access to both the internet and an electronic identification setup through their phone number that allows the user to verify their identity when applying for services like financial assistance. Although the internet is present in essentially all households in Iceland and can easily be accessed in most public buildings, electronic identification is another issue. Without a phone, Icelandic social security number, and bank account, the electronic ID needed to apply online for financial assistance cannot be obtained, fundamentally limiting the number of individuals who even have the choice to apply online.

2.3.2 Reykjavík's Efforts for Improvement

The need to provide adequate accessibility to struggling members of a community who are not familiar or unable to use modern technologies, whether it be due to their age or lack of identification, is one of the struggles faced by Reykjavík. As social and governmental services become more infused with the internet or web programs, there are cases where usability is low among people in certain groups that face issues with online services. These can range from immigrants, the elderly, and people with disabilities specifically, but anyone may face the issue of feeling poorly equipped to use online government services. For the Welfare System, about 25% of applicants do not use the online services provided and must apply every month to continue receiving these benefits. The department currently sees between 1,300 and 1,500 applications every month with between 300 and 450 being in person. A possible barrier to accessibility that has been identified, although not proven so far, has been a language

barrier. Iceland is a hotspot for new immigration as roughly 15% of the roughly 368,000 people that live there are immigrants coming from Poland, the Philippines, and other Scandinavian countries, as well as differing amounts from predominantly Arabic and Spanish speaking countries (Statistics Iceland, 2020). Despite this, the current online services provided are predominantly in Icelandic with some things presented in English due to its place as a lingua franca. However, not everyone will understand these languages and with many people coming into the country that speak Arabic, Spanish, and Polish, there is a barrier between these services and the people who might seek them. As there are influxes of immigrants coming from across the globe, they lack Icelandic citizenship or an Icelandic social security number when they arrive. This means that if they need to apply for financial assistance, they can only do it in person since they lack the necessary electronic ID which requires a passport with an Icelandic social security number, a phone, and a bank account. Alongside this, learning Icelandic as an immigrant presents another social barrier as some face difficulties learning the language. They see this as the largest obstacle towards being accepted and participating in Icelandic society (Skaptadóttir & Innes, 2017), without factoring in the amount of time it takes to become a citizen besides learning the country's native language. Other barriers that prevent online applications may include a confusing or unapproachable application process that could be detrimental to populations that traditionally struggle with online usage such as the elderly and people with disabilities. For some individuals visiting a service center and applying in person provides a connection to the community and a social interaction that has been eliminated by online access.

2.4 Summary

This background research helped us develop a methodology to evaluate usage of digital services provided by the City of Reykjavík's Welfare Department. The Department needed assistance identifying ways to improve the overall accessibility, usability, and efficiency of the digital financial assistance system. This system is used by citizens in dire short-term (1-3 months) financial need and provides a temporary solution. The City of Reykjavík also offers other financial assistance, such as welfare, unemployment, pensions, and disability compensation. The financial assistance service has

been available online for the past year. Our team focused on identifying challenges that need to be overcome to increase online participation.

Chapter 3: Methodology

Our project goal was to identify the key factors that hinder citizens from using digital applications and develop recommendations to increase participation for the City of Reykjavík's online financial assistance. Current data from the City indicated that the number of monthly online applications was about 75% for their financial assistance service. While the current usage of the service is high, the City wants to increase online usage as much as possible. The remaining percent of the applicants apply to this service by visiting one of the five service centers located in Laugardalur og Háaleiti, Árbær og Grafarholt, Vesturbær Miðborg Hlíðar, Breiðholt, and Grafarvogur og Kjalarnes, the five districts of Reykjavík, and receive approximately 300 to 450 physical applications each month.

3.1 Barriers to Use of Digital Access

To understand why people aren't using the online financial assistance application, we found it necessary to use an in-person survey to reach the in-person applicants across all five service centers. While working alongside our sponsors, we developed a survey consisting of six questions. As per the recommendation from our sponsor, we designed the survey to fit on one page with easy-to-read language. In addition, we made the survey anonymous. Our sponsors also made us aware that the most spoken languages in Reykjavík are Icelandic, English Polish, Arabic, and Spanish so we chose to work with our sponsor's resources to translate our survey into Icelandic and Polish, and translated the survey into Arabic and Spanish by two Worcester Polytechnic Institute professors (see Appendix A).

We collected information relating to demographic, accessibility, and interest of the citizens who are applying to the financial assistance service in person. In terms of demographic data, we asked about the applicants' age and fluent languages. We asked questions that would reveal if the citizen had been made aware of or had knowledge about the existence of an online application. If they were aware, the follow up question asked what prevented them from applying through the online service. The last two questions targeted the applicant's interest in the service. This included a question on what would make the application through an online service more appealing to them and if they were likely to use the

application electronically in the future. A follow up question asked about their willingness to use the online service in the future.

Our surveys were distributed by the center managers at the five service centers. We collected survey responses from 78 respondents: 17 from the Laugardalur og Háaleiti service center, 4 from the Árbær og Grafarholt service center, 21 from the Vesturbær Miðborg Hlíðar service center, 8 from the Breiðholt service center, and 26 from the Grafarvogur og Kjalarnes service center.

3.2 Leadership Insight on In-Person Applicants

We interviewed the managers in the five different service centers of Reykjavík to get more insight about the citizens and the system citizens use to apply for financial assistance. The interviews were structured to understand the situation of the people coming to apply in person from the centers' perspective. With the help of one of our sponsors, Styrmir Erlingsson, the digital leader for the Department of Welfare, we learned the digital application process, and with the help of the service center managers, we learned about the physical application process and their opinions and thoughts on it as well. We also asked questions about any patterns that they saw at each of their service centers which were later used to find similarities and differences between the five centers.

During the interviews, we asked about the entire application process that the applicants go through, we also asked about the different demographics that are prevalent and what they think could improve the overall experience (see Appendix B). We mainly discussed what documentation people would need and the steps that they take when doing an in-person application and gathered information on noticed demographics of applicants as well as the service center managers' opinions on any recommendations and/or changes that they would like to see in the system.

Figure 4: Service Centers in Reykjavík

Note: *The service centers in Reykjavík. From right to left - top: Árbær og Grafarholt, Vesturbær Miðborg og Hlíðar, Breiðholt, bottom: Grafarvogur og Kjalarnes, Laugardalur og Háaleiti*

3.3 Digital Leaders and Team Dynamics

Lastly, we set up interviews with the professionals in the Department of Innovation at the City of Reykjavík who designed the existing digital systems. We asked questions about the digital financial assistance program and other ongoing and developing electronic systems in the City of Reykjavík. Our interviews with the designers were primarily focused on understanding the decision-making process behind the construction of current and upcoming digital services.

During these interviews, we gathered information about their design process and what types of information and input they take into account through their processes (see Appendix C). We discussed the organization of the company, including who they report to, what positions were relevant to the design process, what their staff consisted of, and the communication process between departments. We next asked questions about how they produced the current and upcoming digital systems, what factors were the most prevalent in the construction of these systems, and how the team decided where to focus their work. We further went into what key factors they considered when deciding to invest into a project.

In accordance with Worcester Polytechnic Institute's ethical protocols, the Institutional Review Board approved this project to be exempt from further IRB review on the 25th of May 2021. The IRB deemed this project ethical for its conduction of study and research. The project's protocol number is

IRB-21-0639. The City of Reykjavík approved this project and gave us permission to conduct our methodology.

Chapter 4: Findings and Results

We identified several factors that contributed to in-person application for financial aid. Through our survey questions, we uncovered patterns and pinpointed reasons as to why people were preferring in-person application. Our interviews and conversations with the managers of the service centers added further insight into reasons that were not included in our surveys. Our interview with the digital service designers gave us an understanding of how the existing digital services got implemented and their workflow pipeline. Data collected from these three target groups of subjects (the user, the managers, and the designers) allowed us to identify reasons behind why people aren't using the digital services.

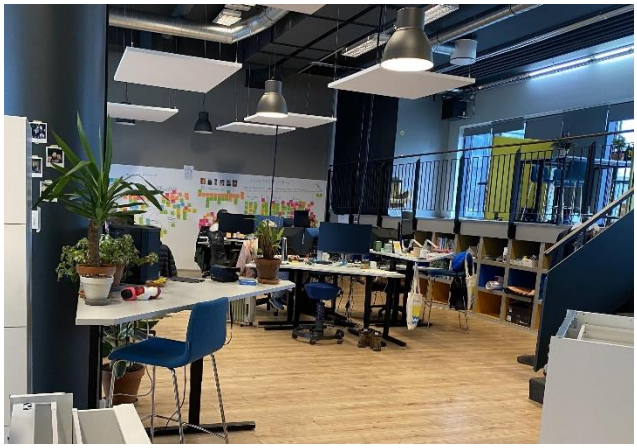

Figure 5: City of Reykjavík Design Department Workspace

4.1 Electronic ID

The electronic ID system is a nationally implemented verification system. In this system, Icelandic citizens establish a unique pin that they use as verification when applying to online services. This pin is tied to their cell phone SIM card. When they go online to apply, they are sent a confirmation text message where they authenticate their login.

Through our survey, we discovered that 20 out of the 78 responses (26%) cited not having an electronic ID as their reason for not using the digital application, making it the largest proportion of in-person applications. In addition, 19 out of the 78 (24%) wrote down their own answer to that question and reported having issues with their ID. These were issues such as not having received their ID, their Electronic ID doesn't work, or they've lost their electronic ID (see Figure 6). Some citizens reported that they were having issues related to their phone in general, not just issues with the ID. These were physical device issues such as SIM card or phone failure. From our findings, we also saw that citizens between 24-29 years of age chose ID issues as their main reason for applying in person. Our interviews with the

service center managers provided some context for younger people most frequently citing issues with ID, such as substance abuse issues that could be contributing to them losing their phones. We also found that 19 out of 78 of our applicants faced issues relating to computers, such as not being skilled at using a computer or not having internet access.

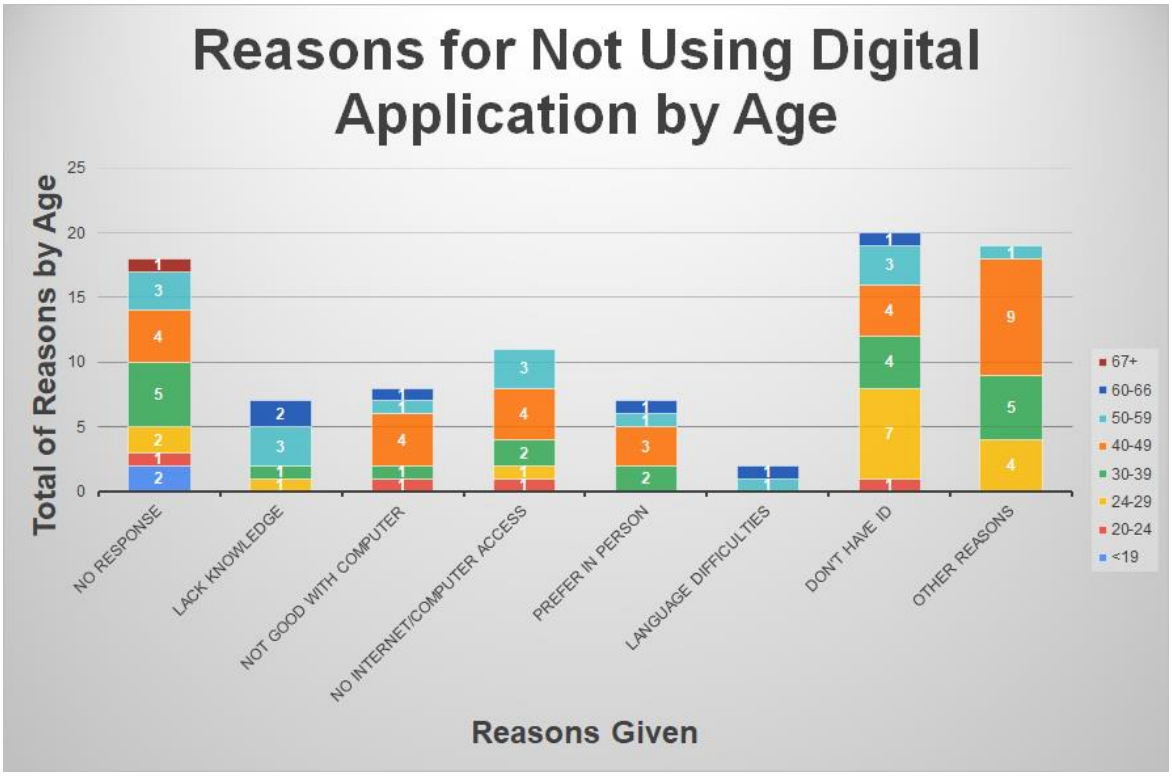

Figure 6: Reasons for In-Person Application for Financial Assistance Within Different Age Groups

Note: *The "Other Reasons" allowed respondents to identify reasons not listed in the survey, such as "did not have a passport" or "electronic ID doesn't work".*

Though some people have issues with their electronic ID and/or use or access to a computer, there's also a number of individuals who apply in person, despite having access to their phone, electronic ID, and internet. According to the statements from some of the service center managers, this could be because they value the social interaction of going to the center more than the convenience that digital applications provide. Oftentimes, these individuals tend to be elderly who may not receive much social

interaction in their day-to-day life. The Laugardalur og Háaleiti service center, for example, is in an area with a high population of elderly people and nursing homes where many of the applicants are citizens, have access to their ID, and have computer access, but chose to come in person to apply.

The lack of electronic IDs is also a main problem specifically for no-Icelandic citizens. When touring the Service Centers, the directors of Vesturbær, Miðborg, og Hlíðar and Breiðholt specifically mentioned that large portions of those applying in person lacked the necessary information to apply for electronic IDs, such as Venezuelan and Polish immigrants that were frequent in person applicants.

4.2 Language Barriers and Immigration

Iceland has a population of 360,000 of which 15% are immigrants that have come over from various parts of the world, many of which aren't fluent in Icelandic. From our survey we found 15 out of the 78 responders (19%) could not speak Icelandic and 7 out of the 78 (9%) spoke both Icelandic and another language. The most spoken language from our responses was Icelandic by a large margin followed by English (Figure 7).

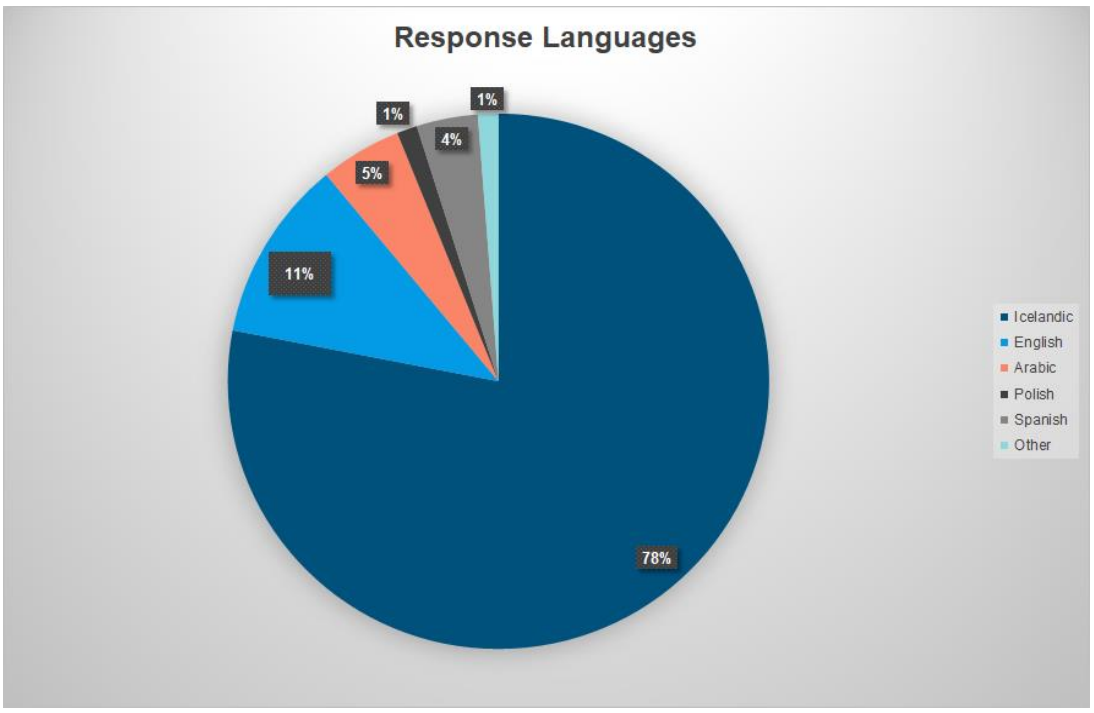

Figure 7: Language Fluency of In-Person Applicants.

Note: *Languages spoken by the respondents including multiple answers across all service centers.*

Furthermore, when we analyzed the data for each service center, we saw a similar trend. The responses from the Grafarvogur og Kjalarnes and Árbær og Grafarholt service centers (we combined the data from these centers as we only received 4 responses from Árbær og Grafarholt and these two centers are going to be combined soon) reported that 88% of the respondents spoke Icelandic (Figure 8). The only other reported languages were English and Spanish.

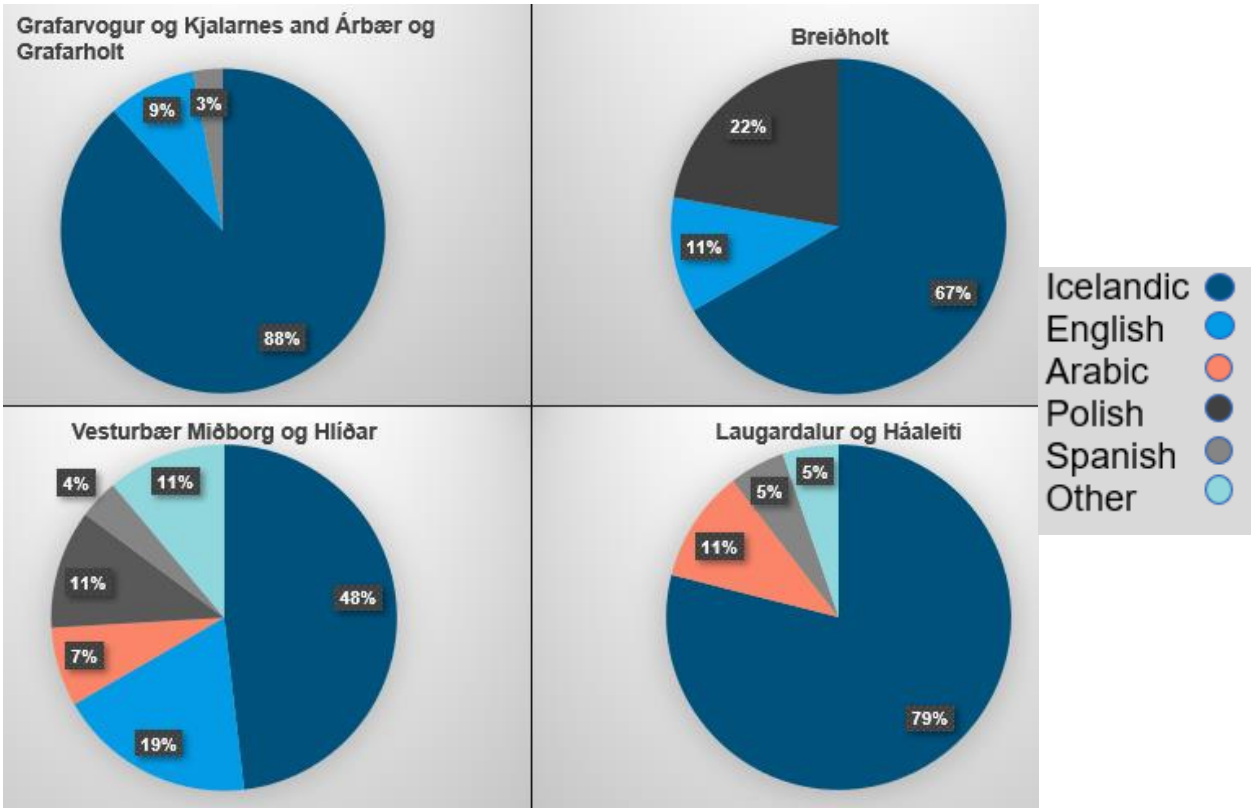

Figure 8: Language distributions of in person applicants at each service center.

When looking at the responses from Breiðholt, we again saw Icelandic receive the majority of responses with 67%. The surveys also reported people spoke Polish and English. The data from Vesturbær Miðborg og Hlíðar provided a larger variety in the reported languages. Here, we saw that again Icelandic was the majority with 48% speaking Icelandic. However, we also saw a large number of English (19%) and Polish (11%) speakers. We also saw 3 languages that were listed under the option "other". These languages were Romanian, Latvian, and Tigrigna. The trend of Icelandic being the dominant language from respondents continued at the Laugardalur og Háaleiti service center with

79% of respondents reporting that they speak Icelandic. This was followed by Arabic and Spanish at 11% and 5% respectively. We also saw another instance of a respondent answering with "other", citing Dari as the only language they spoke.

Through our interviews with the service center managers, we found the service centers have workers on hand who help people who cannot speak Icelandic. In addition to translations, some people also have special needs that require human accommodation. These needs can range from illiteracy (the service centers reportedly see large numbers of refugees who cannot read or write) to mental or physical disabilities. People in these situations are physically unable to complete an online application without some form of assistance. Through our survey we found that 44% of the people would be more likely to use online services if they were to receive one-on-one help and tutorials.

4.3 General Awareness

We found that 24 out of the 78 applicants (31%) were unaware of the existence of the online service (Figure 9) and that of the 54 responses that said yes, 5 applicants (9%) who said they knew of the online system were not aware of how they could apply to the aid online before coming into the service center. Combined, 37% of the applicants were unaware of the availability of online applications.

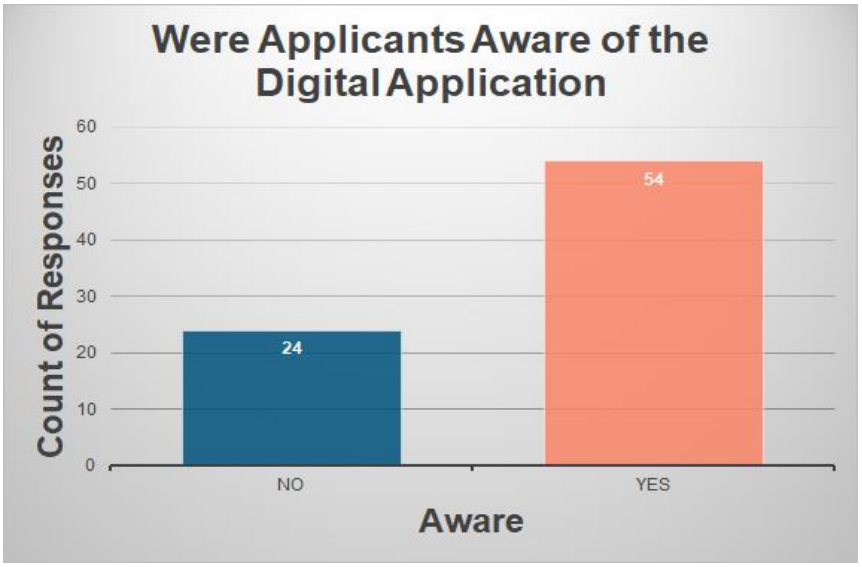

Figure 9: Awareness of Digital Application Service

When we analyzed the survey results by service center, we observed that applicants were digital applications. At the Grafarvogur og Kjalarnes and Árbær og Grafarholt service centers, 58% said yes (Figure 10). 75% of Breiðholt respondents said they were aware of the digital application. The Vesturbær Miðborg og Hlíðar service center reported 67% as saying yes. Lastly, the Laugardalur og Háaleiti service center cited 89% as having said yes to knowing of the digital service.

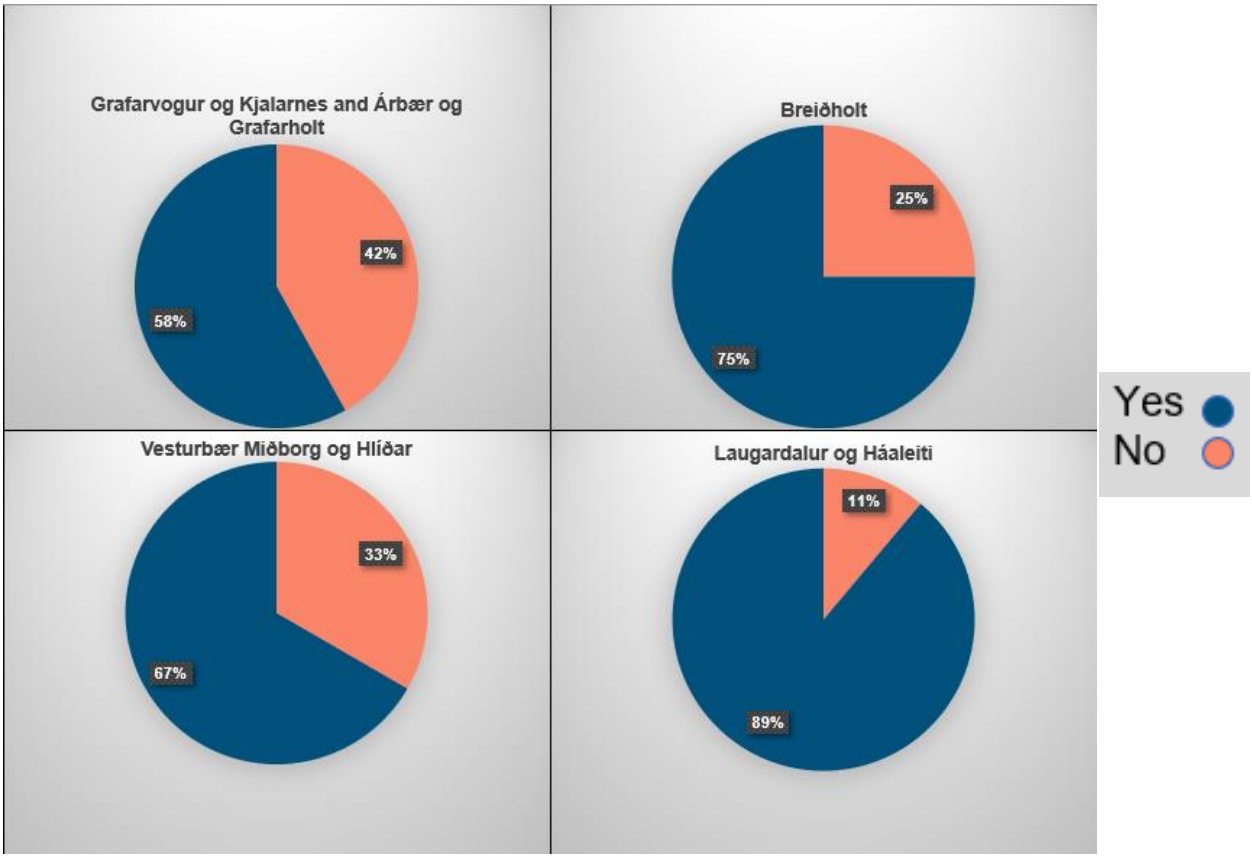

Figure 10: Awareness of the Digital Application Service at Each Service Center

Interviews with center managers revealed that they try to promote the online application to people who come to apply in person as much as possible. For example, at the Árbær og Grafarholt and Grafarvogur og Kjalarnes service centers, the clerks ask everyone who comes in to apply in person if they know about applying online and if they can (have electronic ID, can read the webpage, etc.). They inform applicants that computers are available at the service center for electronic application. In

addition, at the Laugardalur og Háaleiti service center, they have a protocol in place where if someone has applied digitally in the past, but comes in to apply in person, the clerk will tell them to apply online instead. However, from our interviews with the managers, the other service centers didn't necessarily actively promote online application.

As a result of our survey, participants were asked if they would be more likely to use digital services in the future, specifically for financial assistance. We found that 46 out of the 78 respondents (59%) said they would be likely or very likely to use these services while only 9 of the 78 (12%) said they would be unlikely or very unlikely to use them (Figure 11).

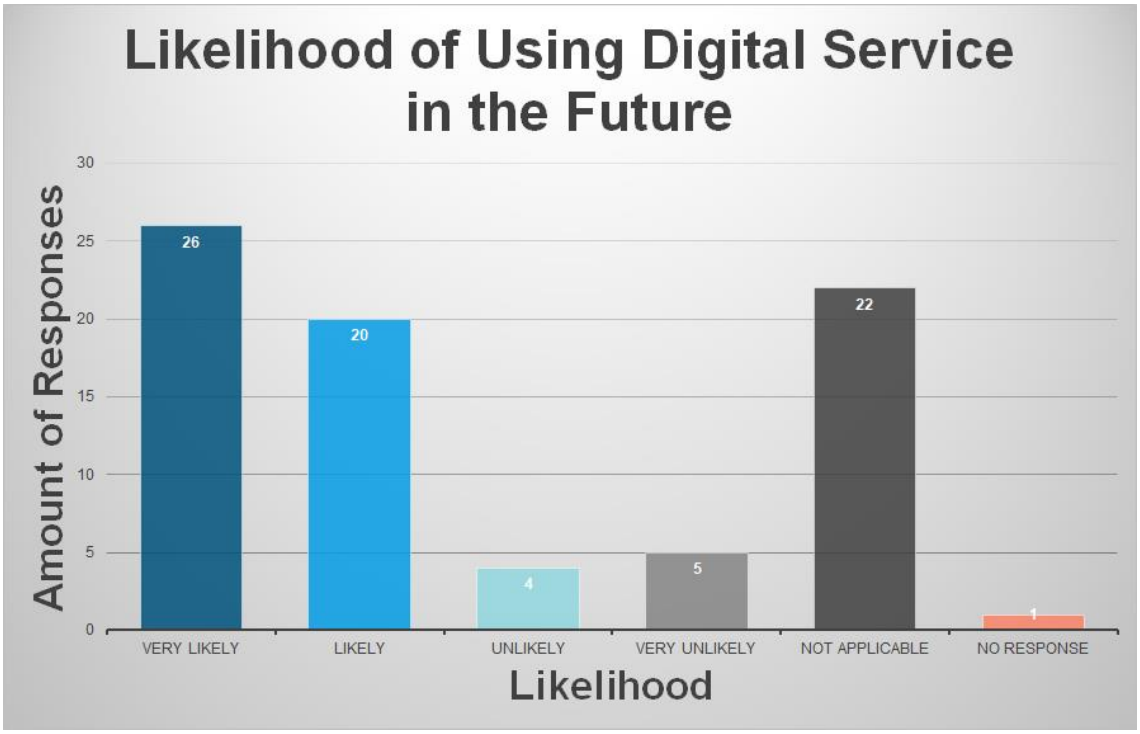

Figure 11: Likelihood of Using Digital Service in the Future

Depicted is the likelihood of applying via digital avenues in the future of each respondent on the survey. Some respondents either did not answer this question, saw no change in their future behavior, or had specific responses that caused them to mark down "not applicable".

4.4 Communication and Collaboration between Service Centers

The City of Reykjavík has five different service centers located in different parts of the city to cover all the people that live in the city. The service centers provide many different services in addition to financial assistance, such as help with educational requirements and disability transportation services. The service centers form the backbone of the connection between the city government departments and the population of Reykjavík as these are the locations where individuals go in person to interact with front line personnel to help resolve whatever issue is most present at the time. Each service center has front line workers, psychologists, and social workers who assist with whoever comes into the center and each center is given instructions on how to direct individuals to the online financial assistance service after they apply in person too many times. Each center has a manager who works as a liaison with the City of Reykjavík and a director who manages center operations.

We interviewed each manager and toured each service center to get a clearer idea of their insights and personal experiences with in-person applicants for financial assistance. Due to the differences in locations, it is hard for each service center to remain consistent and each manager worked within different demographic makeup of their center - areas around Laugardalur og Háaleiti had larger Arabic populations, Árbær og Grafarholt and Grafarvogur og Kjalarnes had more Icelanders and elderly, Vesturbær Miðborg og Hlíðar, the largest one, had a large mix of young to middle aged Icelanders and other immigrants, and Breiðholt had the most social inequality and Polish speakers.

We found that the service centers operate as five different entities with little to no communication between them causing some to operate somewhat differently. As we interviewed the managers at each service center, an interesting trend became visible where the service centers operate as if they were separate entities that work independently rather than operating as a part of a larger organization. The managers at each service center operate individually and there is a lack of consistent communication between each other and with other City of Reykjavík services and departments.

However, the managers and certain workers do keep close contact with the governing heads above their service center and lines of communication to digital centers are present.

4.5 Digital Design Driven by Social Values

From the barriers we previously identified, we felt that it was important to gather insight into the "backend" process of designing and building the services used within the city. From our interview with Búi Bjarmar Aðalsteinsson and Andri Geirsson and discussions with our sponsors we were able to obtain a great deal of information on what is being considered during the design process, funding, and implementation of their services. While digitizing all services within the city would be ideal, implementing brand new digital services is not feasible within a short timeframe and limited funding. Due to these limitations, the digital leaders, service designers, product designers, and user researchers needed to decide between balancing gains or losses, including moral, monetary, and efficiency reasons. Because of heightened scrutiny as to what should be implemented, digital leaders responsible for a specific department within the city and department-specific specialists are added to teams. Together, they identify all the benefits of the new product by going into both the minor details of what the product will need to serve and potential faults in the product, as well as the grand scope of the project and how beneficial it will be to the entire system. Data mapping and the necessity for the product are considered along the way; defining how it's driven, if it's worth investing in, and if it's socially or financially motivated, as well as what form it will take and how it will be implemented (digital or workflow).

One of the biggest challenges to the myriad of current City of Reykjavík services is the lack of connectedness with the digital design department. The different divisions were described as "silos" with each one focusing on one issue that relates to their specific department (see Figure 12). All silos tackle their own individual projects with their own individual solution. It is left to the manager of each division to decide whether they want to work with digital designers or not. While this was a larger issue in the past, efforts towards creating a dedicated digital avenue for each department has decreased its prevalence. However, much of the information and research done by each department is dedicated just for an individual project which reduces the amount of overall information the city as a whole has access to.

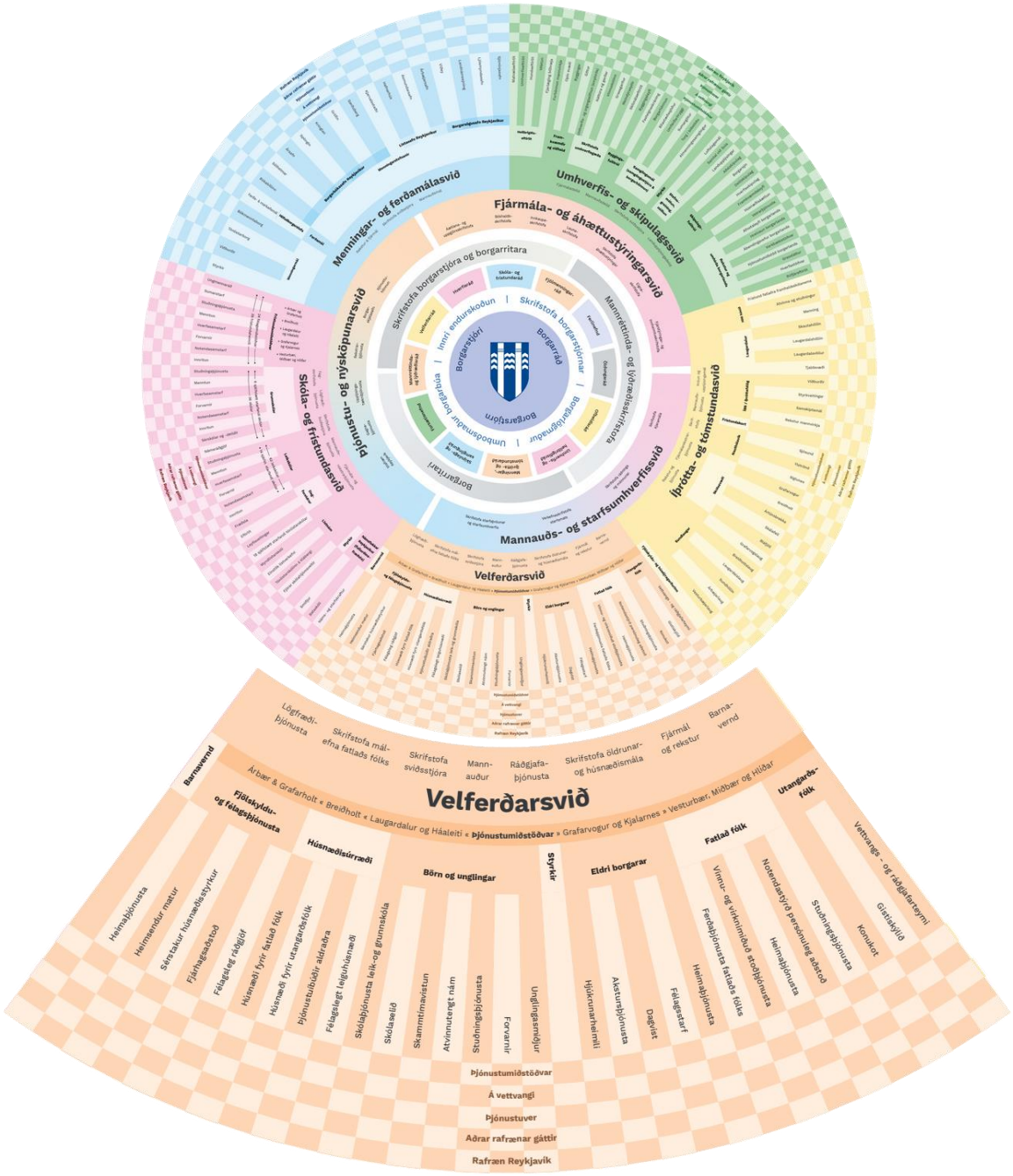

Figure 12: City of Reykjavík's Department and Organization

Velferðarsvið, the Welfare Department highlighted in orange. The outer circle represents departmental project teams: Welfare, Sports and Leisure, Environment and Planning, Culture and Tourism, and Schools Department. The circle inside represents the digital leaders. The centermost circle represents elected officials and city councils.

Chapter 5: Recommendations and Limitations

5.1 Recommendations

From our findings, we formulated the following recommendations:

1. Automatically refer people to other avenues of welfare if they have applied for financial assistance previously - specifically for individuals where they would be better suited to unemployment or disability systems.
2. Provide digital identities through the city instead of through bank accounts to increase its overall accessibility to newer users who may be unfamiliar with the process of applying for electronic identification.
3. Implement official translations through the City of Reykjavík, removing the need for suboptimal Google based translations so that non-Icelandic speakers can operate the financial assistance application process efficiently.
4. Allow workers at the service centers to personally confirm people who appear in person through prior application processes and allow them to use temporary electronic credentials to use the digital financial assistance application system.
5. Construct online digital help services or easy-to-access tutorial videos in multiple languages to physically show people how to apply online - furthering the humanity behind the website to make it more personable for those who value social interaction.
6. Implement text-to-speech options on the City of Reykjavík websites that allow people who do not speak Icelandic to still operate the financial assistance application process, as well as any other future ones that go digital, efficiently.

Along with these recommendations we have specifically for the welfare department and its digital financial assistance service, there are other, broader recommendations that could further the overall user-centered development of City of Reykjavík digital and in-person services as well as further

Worcester Polytechnic Institute's involvement with global projects in Iceland and with the City of Reykjavík. These broader recommendations include:

1. Expand WPI's connection with other departments of the City of Reykjavík to further the reach of their future digital services with new Interactive Qualifying Projects (IQP) focused on the user's relationship with these services.
2. Further communication through the City of Reykjavík by implementing "Job Swap Programs" among managers working for the city to expand upon the communication between the different divisions, furthering cooperative data research pools and consistent digital systems.
3. Increase the overall visibility of digital services through further advertisement and proper showcases of how to use the system through paper instructions given out at service centers after individuals have physically applied for them for at least three months. These showcases can apply to any system the City of Reykjavík wishes to further advance the online use of its services.

5.2 Limitations

For our methodology, some limitations we faced included our sample size from the surveys was only applied to people applying for financial assistance. This was relevant to our overall goal of assisting the Welfare Department, but a wider scope concerning other digital systems could have been useful in acquiring more reasons as to why people do not use online applications. Our surveys could not be administered over the course of a full month which resulted in the small number of overall results. We also found the limited number of responses from certain service centers like Vesturbær Miðborg og Hlíðar and Breiðholt was a limitation of our methodology.

5.3 Conclusion

The main reasons for applying in person were concentrated around electronic ID issues, lack of awareness of the digital system, or lack of access to the internet or the individual's phone. With our recommendations targeting awareness, language barrier, and digital ID, the online financial assistance applications can receive up to 93% electronic applicants. We are proud to have assisted with this project

and it is our hope that this information was valuable for the City of Reykjavík as they try to eliminate the challenges that have arisen around their digital services.

References

Businessjargons. (2019, November 23). *What is E-governance? definition, benefits and types*. Business Jargons. https://businessjargons.com/e-governance.html

How Iceland is using digital to increase public participation in politics. (n.d.). University of Birmingham Blog Service. https://blog.bham.ac.uk/cityredi/iceland-digital-public-participation

Reykjavíkurborg.(n.d.).Reykjavíkurborg. https://Reykjavík.is/sites/default/files/Myndir

Skaptadóttir, U. D., & Innes, P. (2017). *Immigrant experiences of learning Icelandic and connecting with the speaking community*.

Statistics Iceland, (2019). *Frequency of individuals' use of computer and Internet 2003-2019-PX-Web*. PX. (n.d.).

Statistics Iceland, (2020). *Migration between countries by sex, country, and nationality 1986-2020 2003-2019-PX-Web*. PX. (n.d.).

White, J. R. (2011). E-Filing Tax Returns: Penalty Authority and Digitizing More Paper Return Data Could Increase Benefits. *Report to the Subcommittee on Financial Services and General Government, Committee on Appropriations, U.S. Senate*, 1. Retrieved: https://digital.library.unt.edu/ark:/67531/metadc295699/m1/6/

Appendix A: Survey for Barriers in English, Icelandic, Arabic, and Polish

This Survey is completely anonymous, meant to help improve the current digital services the City of Reykjavík has to provide to its citizens, written by college students at Worcester Polytechnic Institute, working with The City of Reykjavík Service Design Department.

Select all that apply (Circle best fit answers)

1. What is your age?

   <19 | 20-24 | 24-29 | 30-39 | 40-49 | 50-59 | 60-66 | 67+

2. What languages are you fluent in?

   Icelandic | English | Spanish | Polish | Arabic

   Other_____

3. Were you aware that you are able to apply for Financial Assistance online as well?

   Yes | No

4. If you answered "Yes" to the previous question, what is preventing you from using this online service?

   Lack of knowledge of the online services | Not good with computers / smartphone

   No internet/ Computer / smartphone | Prefer in-person methods

   Language Barrier

   Other_____

5. Would any of these be beneficial to you to start using this service online?

   A tutorial on how to use this service | 1 on 1 digital help

   Increased visibility of this service | General computer help

   Assisting getting electronic ID | Assistance using electronic ID

   Other_____

6. How likely is it you would use this service online in the future?

   Very Likely | Likely | No affect | Unlikely | Very Unlikely | Not Applicable

Þessi könnun er framkvæmd af nemum við Worcester Polytechnic Institute háskólann í Boston í samvinnu við Reykjavíkurborg. Farið er með svör sem trúnaðarmál og ekki er hægt að rekja einstök svör til þátttakenda. Markmið könnunarinnar er að bæta rafræna þjónustu borgarinnar.

Dragðu hring utan um þá möguleika sem eiga við þig

1. Á hvaða aldursbili ert þú?

<19 | 20-24 | 24-29 | 30-39 | 40-49 | 50-59 | 60-66 | 67+

2. Hvaða tungumál hentar þér best þegar þú sækir um fjárhagsaðstoð?

Íslenska | Enska | Spænska | Pólska | Arabíska
Other_____

3. Veist þú að þú getur sótt um fjárhagsaðstoð rafrænt?

Já | Nei

4. Ef þú svaraðir "Já" við fyrri spurningu, hvað kemur í veg fyrir að þú sækir um rafrænt? (þú mátt velja marga möguleika)

Kann ekki að sækja um rafrænt | Er ekki fær í að nota tölvur/snjallsíma

Á ekki síma / tölvu / internet | Kýs að mæta á staðinn og hitta fólk

Tungumálaörðugleikar

Annað _____

5. Gæti eitthvað af eftirfarandi atriðum hjálpað þér við að sækja um rafrænt?

Kennsluefni um rafræna umsókn | Aðstoð frá starfsmanni

Aukinn sýnileiki rafrænnar umsóknar | Almenn tölvu/snjallsímaaðstoð

Aðstoð við að sækja um rafræn skilríki | Aðstoð við að nota rafræn skilríki Annað _____

6. Hversu líklegt telur þú að þú munir nýta rafræna umsókn í framtíðinni?

Mjög líklegt | Líklegt | Hvorki líklegt né ólíklegt | Ólíklegt | Mjög ólíklegt

| Veit ekki / Vil ekki svara

هذا الاستطلاع يهدف إلى المساعدة في تحسين الخدمات الرقمية الحالية التي تقدمها مدينة ريكيافيك لمواطنيها .الاستطلاع كتب من طرف طلاب في معهد وسستر المتعدد التخصصات في نطاق العمل مع مديرية تصميم الخدمات لمدينة ريكيافيك .ليس من الضروري كتب اسمكم والمعلومات ستبقى سرية.

اختر كل ما ينطبق

1. ما هو عمرك؟

<19 | 20-24 | 24-29 | 30-39 | 40-49 | 50-59 | 60-66 | 67+

2. ما هي اللغات التي تتكلمها بطلاقة؟

الأيسلندية \ الإنجليزية \ الإسبانية \ البولندية \ العربية

آخر_____ :

3. هل كنت على علم بأنك قادر على التقدم بطلب للحصول على المساعدة المالية عبر الإنترنت؟

نعم|لا

4. إذا أجبت بـ" نعم "على السؤال السابق، فما الذي يمنعك من استخدام هذه الخدمة الرقمية على الأنترنيت؟

قلة المعرفة بالخدمات عبر الإنترنت | لا يوجد إنترنت / كمبيوتر / هاتف | لا تعرف استخدام أجهزة الكمبيوتر | تفضل الأساليب الشخصية

آخر_____ :

5. هل ستكون أي من هذه الطرق مفيدة لك لبدء استخدام هذه الخدمة عبر الإنترنت؟

برنامج تعليمي حول كيفية استخدام هذه الخدمة | زيادة اشهار هذه الخدمة | مساعدة رقمية شخصية | مساعدة عامة في تشغيل الكمبيوتر

المساعدة في الحصول على الهوية الإلكترونية | المساعدة في استخدام الهوية الإلكترونية

آخر_____ :

6. ما مدى احتمالية استخدامك لهذه الخدمة عبر الإنترنت في المستقبل؟

من المحتمل جدا | من المحتمل | لا تأثير | من غير المحتمل | من المستبعد جدا|لا اجابة

Esta encuesta es completamente anónima, busca mejorar los servicios digitales actuales que la ciudad de Reykjavík puede ofrecer a sus ciudadanos, escrita por estudiantes universitarios del Worcester Polytechnic Institute, trabajando con el Departamento de Diseño de la Ciudad de Reykjavík.

Marque todas las que apliquen con un círculo

1. ¿Cuántos años tiene?

   <19 | 20-24 | 24-29 | 30-39 | 40-49 | 50-59 | 60-66 | 67+

2. ¿Cuáles lenguas domina?

   islandés | inglés | castellano | polaco | árabe

   Otras _____

3. ¿Sabía que podría pedir ayuda financiera en línea también?

   Sí | No

4. Si contestara "sí" a la pregunta anterior, ¿qué le previene de usar ese servicio en línea?

   Una falta de conocimiento de los servicios en línea | No manejo bien las computadoras

   No tengo Internet o computadora | Prefiero métodos presenciales

5. ¿Cuáles de las opciones a continuación le ayudarían a comenzar a usar este servicio en línea?

   Un tutorial sobre cómo usar el servicio | Ayuda digital a solas

   Más visibilidad del servicio | Ayuda general con las computadoras

   Ayuda para conseguir una ID electrónica | Ayuda para usar una ID electrónica

   Otro _____

6. ¿Es probable que use este servicio en línea en el futuro?

   Muy probable | Probable | No tengo opinión | improbable | Muy poco probable

Poniższa ankieta została przygotowana przez studentów bostońskiego uniwersytetu Worcester Polytechnic Institute we współpracy z Miastem Reykjavík. Podczas przetwarzania odpowiedzi zachowana jest poufność i nie ma możliwości powiązania odpowiedzi z osobą, która jej udziela. Celem tej ankiety jest ulepszenie usług elektronicznych Miasta Reykjavík. ***Otocz kółkiem odpowiedzi, które do Ciebie pasują***

1. Jaki jest Twój wiek?

<19 | 20-24 | 24-29 | 30-39 | 40-49 | 50-59 | 60-66 | 67+

2. W jakim języku jest Tobie najwygodniej ubiegać się o wsparcie finansowe?

islandzki | angielski | hiszpański | polski | arabski

Inne_____

3. Czy wiesz, że o wsparcie finansowe możesz się ubiegać elektronicznie?

Tak | Nie

4. Jeśli w poprzednim pytaniu odpowiedziałeś/aś „tak", to co powstrzymuje Cię przed złożeniem elektronicznego wniosku o pomoc finansową? (Możesz zaznaczyć kilka odpowiedzi)

Nie umiem złożyć wniosku elektronicznie | Nie umiem obsługiwać komputera/smartfona

Nie mam telefonu/komputera/ internetu | Wolę przyjść osobiście i spotkać się z ludźmi Problem językowy

Inne _____

5. Czy któryś z poniższych czynników mógłby Tobie pomóc w ubieganiu się o pomoc finansową drogą elektroniczną?

Materiały instruktażowe o formularzu elektronicznym | Pomoc pracownika

Większe wyeksponowanie formularza elektronicznego | Ogólna pomoc w obsłudze komputera/smartfona

Pomoc w ubieganiu się o e-dowód | Pomoc w użyciu e-dowodu

Inne _____

6. Na ile jest to prawdopodobne, że w przyszłości skorzystasz z formularza elektronicznego?

Bardzo prawdopodobne | Prawdopodobne | Ani prawdopodobne, ani nieprawdopodobne

Nieprawdopodobne | Bardzo nieprawdopodobne | Nie wiem / Nie chcę udzielić odpowiedzi

Appendix B: Service Center Interview Topics

Topics Covered

1. Understanding of the physical application and general paperwork required
    i. Walk in process
    ii. Necessary government ID
    iii. What does the service provide?
2. Demographics and patterns found in people coming in to apply in-person
    i. What barriers are stopping users from using the electronic system
    ii. Why do people prefer going in person?
    iii. Patterns among people with different demographics
3. Understanding service center worker's opinions on current system
    i. Is the system beneficial
    ii. Changes seen since implementation of the electrical system
4. Recommendations for the current digital system
    i. Guides, Tutorials, Online help
    ii. UI improvement, Digital process improvement

Appendix C: Digital Service Design Topics

Topics Covered

1. Considerations taken into account for who is using the services
    i. Text to speech conversion
    ii. Self-explanatory instructions
    iii. Text size considerations
2. Proper management with user's private information
    i. Two factor authentications using electronic ID
    ii. Who can access information?
3. Necessities of using universal language on the front end
    i. Updating website to have simpler language for online translation
4. Pre-existing systems and services they may be using as a guide
    i. financial assistance system
    ii. Background research into user centered design

Appendix D: Consent Scripts

Survey consent

This Survey is completely anonymous, meant to help improve the current digital services the City of Reykjavík has to provide to its citizens, written by college students at Worcester Polytechnic Institute, working with The City of Reykjavík Service Design Department.