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Increasing Public Awareness of MemoClock to Assist the Elderly in Social Isolation During the COVID-19 Pandemic

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Abstract

MemoClock is a phone and tablet app for care partners to send messages remotely to their loved ones with dementia, but it lacks public awareness. Our project, conducted remotely with MemoClock in Denmark as a result of the COVID-19 pandemic, created a marketing strategy to increase MemoClock's public awareness through analysis of competitors and data from app users. Surveys and coded interviews with MemoClock users provided testimonials for marketing materials. We developed a schedule for social media posts and compiled a list of organizations for MemoClock to engage on social media. Finally, we made recommendations for future app features and marketing.

Executive Summary

In December 2019, the first case of a novel coronavirus known as SARS-CoV-2 emerged in Wuhan, China (Cascella, M., Rajnik, M., Cuomo, A., Dulebohn, S. C., & Napoli, R. D, 2020). SARS-CoV-2 causes a disease known as COVID-19 that quickly became a worldwide pandemic. Social isolation is the only effective preventative measure to reduce transmission of COVID-19 as of writing this, and by February 2020 countries around the world began implementing stay-at-home orders. Stay-at-home orders encourage people to self-isolate at home and to leave only to perform essential activities. The elderly, the immunocompromised, and people with existing medical conditions are most at risk for developing fatal complications related to COVID-19 and have been strongly encouraged to stay in self-isolation. While social isolation is an effective preventative measure for COVID-19, it can have detrimental effects on psychological and emotional well-being of the individual. Thus, many elderly people are at risk for developing symptoms of depression since they must now care for themselves while family and friends are unable to visit.

To reduce the effects of social isolation felt by the elderly, an easy and affordable way to communicate with family and friends was needed. MemoClock is an easy-to-use application that aims to improve the lives of the elderly by enabling family and friends to remotely send them messages. There are various forms of messages that can be sent from the sender to the receiver device including images and audio messages. This app helps maintain social distancing, while facilitating communication from family and friends to their older, less technologically savvy, loved ones.

MemoClock was originally intended to provide care partners of people with dementia the ability to send remote reminders. Thus, all of MemoClock's current users are people with dementia and their care partners. Additionally, all of MemoClock's marketing and advertising has been aimed at people with dementia and their care partners. Therefore, MemoClock currently lacks widespread public awareness, adversely affecting its usage among the elderly during the pandemic.

Our aim was to develop innovative ways for MemoClock to utilize social media to increase its public awareness and provide the millions of elderly people in social isolation an easy way to receive messages from their loved ones. We conducted a **market analysis** of MemoClock that informed our decisions when developing a marketing strategy to target potential future MemoClock users. Utilizing the information we gathered from the market analysis, we developed a **marketing strategy** for MemoClock that included a catalog of infographics, a social media posting schedule, and a compiled list of target organizations that could help spread awareness of MemoClock. To develop the catalog of infographics for MemoClock, we conducted interviews of current MemoClock users to determine their use of MemoClock and how it had changed due to the pandemic. We also distributed surveys to current MemoClock users to gather demographic data as well as data regarding their social media and media use.

We developed the following three objectives to accomplish our goal:

1. To interview current MemoClock users to determine app usage
2. To conduct a market analysis and develop effective marketing materials
3. To conduct an assessment of data collected and provide feedback on improvements for MemoClock

Marketing Strategy

A marketing strategy was created for MemoClock to target the children or loved ones of elderly individuals in social isolation due to COVID-19. There are four components of our marketing strategy: infographics, social media posting calendar, social media post analysis, and targeted influencing organizations. The social media platforms that we chose to focus on were Twitter and Facebook. We developed infographics for MemoClock to post on its Twitter and Facebook accounts. After several iterations of infographics, we decided to use quotes from the interviews to make the infographics personable. We used images that were related to the topic mentioned in the quote or examples of a reminder sent by the interviewee. We used a light pastel color scheme in the background of each infographic to elicit happiness and tranquility. Figures 11 and 12 show two of the infographics provided to MemoClock in the infographic catalog.



Figures 11: Example 1 of Finalized Infographic



Figure 12: Example 2 of Finalized Infographic

The most shared and re-tweeted posts on Facebook and Twitter respectively contain a visual component, usually either videos or images. Thus, our infographics will be effective in reaching the widest audience on these social media platforms. We created a social media posting schedule for MemoClock to use on Twitter and Facebook. Figure 16 is a sample week of the social media posting calendar. The blue posts are for Twitter and the red posts are for Facebook. The lifespan of a Twitter post is only 15 to 20 minutes, therefore, multiple posts throughout the day are needed to reach the maximum number of feeds. However, we found that over five twitter posts a day will adversely affect MemoClock. Thus, we recommend MemoClock post four times a day on Twitter. Facebook posts have lifespans of five to six hours. Additionally, content on Facebook is typically more personable and repeated posts are not as useful. Therefore, for Facebook we recommend posting a maximum of five times per month to avoid losing Facebook interactions.

1 Tablet Graphic	2 Infographic 1	3 Infographic 2	4 Infographic 3	5 Infographic 8	6 Infographic 1	7 Infographic 5
Infographic 4	One message feature of MemoClock	One message feature of MemoClock	One message feature of MemoClock	Infographic 4	One message feature of MemoClock	MemoClock is free
One message feature of MemoClock	How MemoClock works-Text or Infographic	Infographic 6	Infographic 7	Tablet graphic	How MemoClock works	One message feature of MemoClock
MemoClock is free	Infographic 5	MemoClock is free	How MemoClock works- Text or Infographic	MemoClock is free	Personal MemoClock story (video or image)	Tablet graphic
Infographic 10						Infographic 9

Figure 16: Social Media Posting Schedule for One Week

To analyze the effectiveness of the posts and social media posting schedule, there are various analytic tools we recommend MemoClock to use. Facebook offers two internal analytic tools—Facebook Business Manager and Facebook Pixel. Facebook Pixel is a section of code that can be added to MemoClock’s website and Facebook page to track audience demographics and help target certain audiences. The Facebook Business Manager gives MemoClock the ability to pay for advertisements and to assess the following features of each advertisement: changes in viewer engagement, views, and likes, select target audiences based on age, location, and gender, connect to Instagram and Facebook Pixel. Twitter also has an internal analytics tool that would give MemoClock the ability to identify their most popular tweets by providing them metrics on all tweets posted. These metrics include the accounts of the people who have viewed, retweeted, liked, and replied to the tweet. Utilizing these metrics, MemoClock would then have the option to use “Quick Promote”, which allows them to select particular tweets to share with targeted audiences. Furthermore, this analytics tool provides MemoClock with accounts that could serve as influencers.

The final component of our marketing strategy was compiling a list of influencing organizations. The list is composed of organizations that relate to the care of people with dementia or the elderly. The compiled list was provided to the sponsor and includes: the contact information for each organization, their social media account usernames, the number of followers they have on each social media account and how their mission relates to MemoClock. Since the followers of these organizations are most likely interested in or support their mission of helping people with dementia or the elderly, we are targeting them as potential interested MemoClock users. We recommend contacting these influencing organizations to see if they are interested in promoting MemoClock on their social media sites.

Developing the Marketing Strategy

To develop an effective marketing strategy for MemoClock, we conducted a market analysis of MemoClock. We identified the target customers of MemoClock as the family members and friends of the elderly who are in social isolation due to the COVID-19 pandemic. We then conducted an analysis of MemoClock’s competitors: RecallCue, CareZone, Reminder Rosie, and Amy A1 Robot. We specifically looked at the functionalities of the competing applications and devices. The below table (Figure 3) highlights our findings that MemoClock has the most features for the lowest price among competitors.

	MEMOCLOCK	AMY A1 ROBOT	RECALLCUE	CAREZONE	REMINDER ROSIE
PRICE	Free	\$7,299	Free	Free	\$79.99
REMOTE REMINDERS	✓	✓	✓	✗	✗
REMINDERS WITH IMAGES	✓	✓	✓	✗	✗
AUDIBLE REMINDERS	✓	✓	✗	✓	✓
PROGRAMMABLE	✓	✓	✓	✓	✓
TABLET OR SMARTPHONE REQUIRED	✓	✗	✓	✓	✗

Figure 3: Comparison of MemoClock and its Competitors

We then gathered additional data from current MemoClock users by conducting interviews and distributing a survey to the MemoClock mailing list. The interviews served to provide us with quotes for the infographics, while the survey responses were used to determine a user profile for potential future users.

Surveys

A total of seven responses were recorded for the survey. The demographic data such as age range was used to identify the target age demographic. Four respondents were between the ages of 51-60, two respondents were between the ages of 41-50, and one respondent was between the ages of 61-70. The survey responses also indicated which forms of social media were most commonly used among the current MemoClock users. The most popular forms of social media among survey respondents were Instagram, Facebook, and YouTube. Thus, from the survey data we decided to focus on Facebook. Twitter was the second social media platform we decided to focus on because it is the platform that allows for the most widespread viewing of a single post.

Interviews

To determine how MemoClock is used before and during the pandemic as well as gather quotes for the development of marketing materials, we interviewed five current MemoClock users. The interviews took place via Zoom—a web-conferencing application—and were videotaped if consent was given. An example of one of the questions asked is “Can you share a story of how MemoClock improved the lives of you and your family or friends?” Following the interview, a transcript of the interview was coded by two of our team members—the interviewer and one team member that was not present during the interview. Once both team members completed their list of codes, they compared their lists to develop a final set of codes for each transcript. This method reduced the risk of bias in the study.

The coding system we developed was used to analyze and mark qualitative data for attributes (codes). A tag is an indicator on whether an excerpt was positive, negative, or neutral in sentiment and was assigned to each coded excerpt. Each sentence the interviewee stated would be analyzed and a code and a tag would be attached. We did this to identify similarities and patterns across the data in a format that could be easily interpreted by the sponsor. Figure A shows the list of categories and codes within each category.



Figure ESI: Categories and Codes Used to Quantify Interviews

After completing an analysis of the coded interview responses, it was evident that the message code category had the greatest number of total responses and the greatest number of positive interview responses (Figure 6). The most positive responses within the message category

were found to be the responses referring to the reminder messages. This is shown in Figure 7 with eleven positive responses referring to reminder messages.

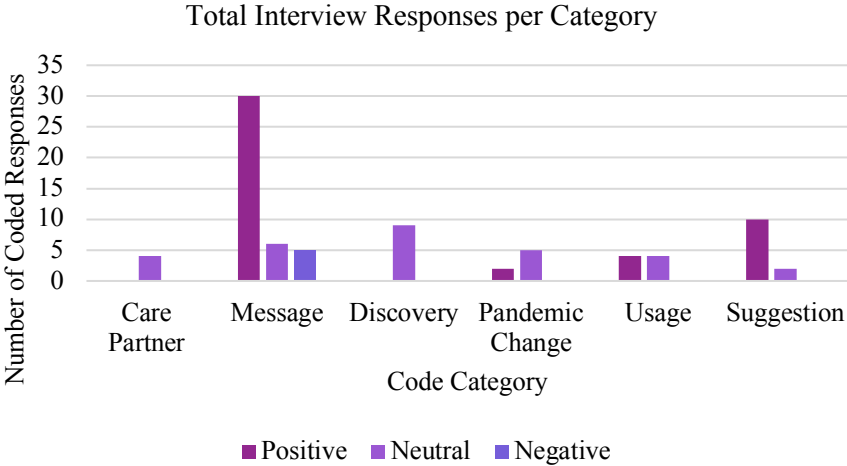


Figure 6: Number of Coded Responses, Sorted by Category and Tag

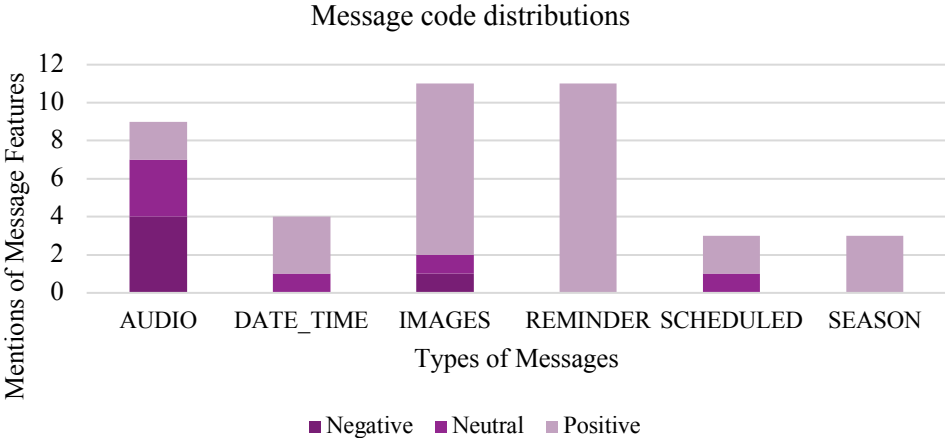


Figure 7: Code Distributions for Message Category, Including Tags

Infographics

We made several iterations and improvements to the infographics over the course of the term. At first, the infographics were too impersonal and lacked emotion as they only explained what MemoClock was and how to use it. To make the infographics more personable, we used quotes from the interviews. The second iteration of infographics lacked a consistency as the color scheme, font, and type of picture included varied. To fix this issue we standardized the font used and began using a light pastel color scheme to elicit happiness and tranquility. We began creating sample MemoClock messages on the app if the interviewee mentioned such a message in their quote. If not, we found stock photos with light colors that represented the quote. We picked quotes from the interviews that told the user’s story and experience with MemoClock. Our final iteration of infographics shown in Figure A were made using all the previous feedback gathered from previous iterations. We believe these infographics look consistent and will elicit positive emotions from viewers.

Recommendations and Conclusions

Our recommendations for MemoClock were focused on app development and marketing. We recommend adding the following features suggested by interviewees: a receiver device capable of receiving messages from multiple mobile sending devices, the mobile sender being able to send messages to multiple receivers, and adding a video chat option within the app.

In terms of marketing, we recommend surveys be sent out annually to get input from users. The current users can also be encouraged to spread awareness of the app by posting on their social media accounts and tagging MemoClock. Furthermore, we encourage the sponsor to follow the social media schedule we created. A sample week of the social media posting schedule is shown in Figure 16. By posting as often as laid out, MemoClock's public awareness can be increased on both Twitter and Facebook. We suggest the infographics in the infographic catalog provided to the sponsor be used as the social media post content. Additional marketing materials can be created by the sponsor from the bank of quotes we provided to him from the interviews. Furthermore, based on survey response data, Instagram is the second most popular form of social media currently used by MemoClock users. Therefore, we recommend the sponsor expand marketing to Instagram by first linking their Facebook account with an Instagram account. Selecting this feature would begin posting all future posts on both Facebook and Instagram simultaneously.

All in all, our project focused on developing a marketing strategy for MemoClock to help increase its public awareness and number of users. To carry out this goal we developed a marketing strategy by conducting a marketing analysis, interviewing current MemoClock users, developing marketing materials, and distributing a survey to MemoClock users.

We faced many of challenges and uncertainties during this project. The biggest challenge was the cancellation of university-based international travel and the subsequent transition to our remote project locations in the United States while completing this project with MemoClock in Denmark. This transition sparked a shift in our project's direction, which everyone involved had to adapt to. A few other limitations included the inability to meet in person due to stay-at-home orders as well as less frequent meetings with our sponsor. Nevertheless, our continued communication and hard work during this project helped us achieve our project objectives. We successfully developed a marketing strategy and compiled results from interview and survey data as feedback for our sponsor. In addition to our marketing materials and marketing strategy, we developed a sheet of potential influencing organizations for our sponsor to explore. We also developed a bank of interview transcripts with multiple quotations available for the creation of future infographics. We hope that with these resources and recommendations, MemoClock can continue to positively impact lives during the COVID-19 pandemic and into the future.

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1.0 Introduction

The novel coronavirus known as SARS-CoV-2 is a severe acute respiratory syndrome that causes the COVID-19 disease, which infects the upper and lower respiratory tracts (Casella, M., Rajnik, M., Cuomo, A., Dulebohn, S. C., & Napoli, R. D, 2020). The first case of COVID-19 was reported in Wuhan, China in December 2019. Since then, the number of confirmed cases of COVID-19 worldwide has increased rapidly, surpassing 4.1 million people as of May 11th, 2020 (CSSE, 2020). There are currently no known treatments for COVID-19 and preventative measures include self-isolation and washing hands. Due to the high rate of transmission and number of deaths, multiple countries have imposed stay-at-home orders in an attempt to curb the spread of COVID-19.

Stay-at-home orders encourage people to self-isolate at home and to leave home only to perform essential activities. As of April 27th, 2020, the COVID-19 pandemic has left over 26.5 million people in the U.S. unemployed, and they and many others are alone and scared for the future (Kelly, 2020). The elderly, the immunocompromised, and people with existing medical conditions are most at risk for developing fatal complications related to COVID-19 and have been strongly encouraged to stay in self-isolation. The elderly population worldwide are especially vulnerable to COVID-19. In the U.S., adults over the age of 65 have accounted for eight of ten deaths due to COVID-19 (Centers for Disease Control and Prevention, 2020). The size of the elderly population worldwide is substantial, and many people over the age of 65 suffer from dementia or other mental impairments. Dementia is a progressive and debilitating neurocognitive disorder that often requires the support and assistance provided by care partners.¹

During the coronavirus pandemic, many elderly people must care for themselves as care partners are unable to visit due to the risk of infection. Social isolation can have detrimental effects on psychological and emotional well-being, prompting the Institute for Mental Health to publish information on panic attacks and anxiety in conjunction with COVID-19 symptoms (National Institute for Mental Health, 2020). A research study conducted at the University of Texas El Paso found that “social isolation, loneliness, and lack of adequate support are social conditions that exact a significant toll on psychological well-being and physical health, with the costs of these conditions particularly high among retired and elder population” (Tomaka, J., Thompson, S., & Palacios, R., 2006).

To reduce the effects of social isolation felt by the elderly, people with dementia, and others during the coronavirus pandemic, an easy and affordable way to communicate with family and friends is needed. MemoClock is an easy-to-use application that aims to improve the lives of the elderly by enabling family and friends to remotely send them messages. This app maintains social distancing, which is recommended by the World Health Organization, while facilitating communication from family and friends to their older, less technologically savvy loved ones. MemoClock currently lacks widespread public awareness, adversely affecting its usage among the elderly.

The original purpose of MemoClock was to provide care partners of people with dementia the ability to send remote reminders. While the ability to send remote reminders does not eliminate the need for a care partner in people with moderate or severe dementia, elderly people with mild forms of dementia could benefit tremendously from MemoClock during the COVID-19 pandemic. Care partners for people with dementia report a 27.2% reduction in productivity in regular

¹Care partner is the preferred term for a person who provides care. Less preferred terms include caregiver, careperson.

activities since assuming the care partner role (Giovannetti, Wolff, Frick & Boult, 2009). Information and communication technology (ICT) can enable care partners to assist the elderly while everyone self-isolates during the COVID-19 pandemic. During the COVID-19 pandemic, MemoClock is free for all private users and hopes to provide family members and friends with the ability to send messages to their elderly loved ones.

Care partners use information and communication technologies to aid in caring for their elderly loved ones suffering from dementia. Some information and communication technologies assist with cognition (memory aids, electronic calendars, and picture phones), while other technologies assist with surveillance (security cameras, window and door alarms, and tracking devices). (Olsson, Engström, Skovdahl, & Lampic, 2011)

Dan Mogensen, the Founder and CEO of MemoClock, first had the idea of creating MemoClock five years ago when his father was diagnosed with Alzheimer's disease. As his father's Alzheimer's Disease progressed, he began having trouble keeping track of time, appointments, and daily activities. At the time, Dan had a full-time job and could not be with his father throughout the day to remind him of his appointments and activities. This prompted Dan to create MemoClock, a versatile reminder message app providing users with the ability to send multiple reminders remotely with the option of adding pictures or audio to the reminders.

MemoClock addresses the needs of family and friends of elderly loved ones, while giving an elderly person in social isolation the sense that they are not alone. Dan Mogensen has attempted to market MemoClock through social media and paid advertisements within app stores. However, these marketing strategies have proven to be ineffective in increasing public awareness of MemoClock on a global scale.

This project focused on developing a social media campaign and strategy for MemoClock, thereby increasing the public's awareness and the number of users. Our mission was to increase the number of lives MemoClock improves by increasing its public awareness. To complete this mission, we developed the following three objectives:

1. To interview current MemoClock users to determine app usage
2. To conduct a market analysis and develop effective marketing materials
3. To conduct an assessment of data collected and provide feedback on improvements for MemoClock

2.0 Background

This chapter will provide information on COVID-19, the elderly with dementia and the needs of their care partners, the competition from other ICTs, and the initial analysis of the market for MemoClock. Discussion of the COVID-19 pandemic and the needs of family or friends of the elderly will contextualize the need for an application like MemoClock. Analyzing competitor ICTs that have the capability of displaying reminder messages will provide a better sense of MemoClock's benefits when compared to its competitors. Finally, the initial analysis of the market for MemoClock will provide information on the best strategies for increasing public awareness.

2.1 COVID-19

COVID-19 spread globally, eventually being characterized as a pandemic by the World Health Organization on March 11, 2020 (WHO, 2020). Due to the long incubation period, high infection rate, and lack of treatment for COVID-19 cases, many countries have implemented stay-at-home orders. In an effort to curb the spread of the virus in the U.S., most public schools, universities, restaurants, and stores were closed as students and workers were told to stay home. The CDC urges people over the age of 65 to stay home as COVID-19 has been shown to be most fatal in the elderly and immunocompromised populations. As a result, elderly people in the U.S. and worldwide have been left feeling alone and scared. Their caregivers and family members are left concerned about how their elderly loved ones will get the care they need.

The coronavirus disease 2019 (COVID-19) is a pandemic that has taken the lives of over 89,000 people worldwide in its first 100 days (CSSE, 2020; UN, 2020). Most of the deaths over the age of 65 are in people who have pre-existing medical conditions or are immunocompromised. The high rate of infection, long incubation time and lack of effective treatments have caused worldwide panic. As a result, many countries have put stay-at-home orders in place to curb the spread of COVID-19. The elderly have been urged to stay isolated in their homes as this virus is most fatal to them. Many elderly people have been left feeling alone and scared. Their caregivers and family members are left concerned about how their loved ones will get the care they need. Worldwide there are over 50 million people with some form of dementia (WHO, 2019). Many of the elderly that are now in social isolation experience dementia symptoms and without their caregivers would forget to perform daily activities.

2.1.1 Elderly

As of 2019, 9% of the world population, nearly 700 million people, are over the age of 65. The percentage of people over the age of 65 is higher in certain continents: 16% in North America and 18% in Europe (Duffin, 2019). Since these adults are more likely to have weaker immune systems, it makes them an at-risk population for COVID-19 (Nania, 2020). As a result, the CDC has recommended extensive social distancing and self-isolating measures for people in this category. This can have a detrimental effect on their mental health, and research has shown that social isolation and loneliness in older people can pose health risks (National Institute on Aging, 2019).

Solutions to this problem include meaningful, productive activities with others, like family members and friends. While this is tough to achieve in the context of social distancing, it can be possible through the use of communication technology.

2.1.1.1 Dementia

In 2015, The World Health Organization estimated that a majority of the 50 million people worldwide who had a form of dementia were over the age of 65, the aforementioned population (WHO, 2019). The Diagnostic and Statistical Manual of Mental Disorders (DSM-V) defines dementia as a neurocognitive disorder with a decline in one or more cognitive domains that interfere with independence in everyday activities (American Psychiatric Association, 2013). Dementia is not a disease or a single symptom, but rather a group of symptoms that are related and interfere with an individual's cognitive function and memory and ability to perform instrumental activities of daily living (IADLs) and activities of daily living (ADLs) (Alzheimer's Association, 2019). The people suffering from dementia, along with their care partners, can often suffer from increased stress and increased economic strain (Alzheimer's Association, 2019).

People with dementia experience memory loss and a decline in various cognitive functions. Many different diseases can cause dementia, the most common of which is Alzheimer's disease, which accounts for 60 to 80 percent of cases (Alzheimer's Association, n.d). There are three specific types of dementia- mild, moderate, and severe. The diagnosis of severity is based on the level of assistance the person with dementia requires. (Atri, 2019). People with mild dementia require assistance only with IADLs. People with moderate dementia require assistance with IADLs and ADLs but are not fully dependent on a care partner. People with severe dementia are fully dependent on a care partner for all IADLs and ADLs (American Psychiatric Association, 2013).

2.1.2 Reducing Risk of Transmission

The best way to reduce risk of transmission is to “avoid being exposed to the virus” (National Center for Immunization and Respiratory Diseases, Division of Viral Diseases, 2020). Because the virus is primarily spread from person-to-person through respiratory droplets, it is advised to avoid contact with others and shelter in place at home. This means staying home as much as possible, and only leaving to go to the grocery store, pharmacy, or other essential needs. It is impossible for everyone to stay at home for an extended time, so certain jobs have been deemed essential while others are working from home.

For the elderly with an increased risk of contracting this severe disease, they should be staying home and having family members or friends deliver any needed goods. If one must go out in public, they should cover their mouth and nose with a cloth mask to reduce exposure risk. People should also wash their hands as much as possible, clean and disinfect surfaces often, and continue to cover coughs and sneezes. Due to the social isolation resulting from staying at home, many people may have feelings of loneliness and depression. In order to combat this, people are encouraged to virtually socialize. Because of elderly people's technological issues, younger family members are responsible for reaching out through texts, photos, videos and phone calls.

2.2 Technological Support and Challenges for the Elderly

Information and communication technology (ICT) are applications or hardware that provide care partners and people with dementia with technological assistance to improve cognition or aid in surveillance. An example of these ICTs are day reminder apps and programmable clocks that have the capability of displaying reminder alerts.

Day reminder clocks are becoming increasingly popular among the dementia community and come in the form of software applications and physical hardware. There are various day reminder applications and hardware on the market, each providing customers with different features. As these products have the potential to change the lives of millions of people with

dementia and their care partners along with the millions of elderlies in social isolation due to COVID-19, the market for easy to use remote messaging apps will be explored in the subsequent sections.

There are several ICTs that can be used to support elderly people in isolation. A few examples of ICTs that can help elderly people are automated pill dispensers, clocks, calendars, and day reminder clocks. Day reminder clocks are either software applications or physical devices which can send automated prompts and reminders. MemoClock and most of its competitors are classified as day reminder clocks. Technologies that reduce social isolation include hearing and seeing aids, as well as devices like digital photograph frames, digital puzzles, and photo picture button phones.

As elderly people have not been exposed to technology throughout their lives and in learning environments, they are often less technologically savvy than the younger generations. One study completed in 2015 found that 60% of elderly who completed a survey reported difficulties using technology, and the most common difficulties that elderly people have with technology is communication, managing alarms, and viewing photos (Silva, Santana & Leeson, 2015). Some of the usage problems stem from actual tech specifications such as lack of buttons or the buttons being too small as well as lack of screen contrast. Because of these difficulties, technological skills are deemed as too lengthy to learn and the result is often asking for help but sometimes giving up completely. These difficulties cause feelings of embarrassment and having less capability (Silva, Santana & Leeson, 2015). Elderly people who feel confident in their ability to use electronics were more confident and felt connected to relatives and friends.

A study done on ten individuals with early stage dementia showed that half of them had “never used a smartphone or tablet device” (Kong, 2015). The same participants also indicated that they believed they could all benefit from using technology. Successful apps also need to address the habits frequently displayed by people with dementia such as sundowning, a condition where people with dementia become agitated as the sun sets (Yamagata, Kowtko, Coppola, & Joyce, 2013).

2.2.1 Day Reminder Apps and MemoClock

The purpose of day reminder apps is to alert people of tasks they need to remember to perform as well as provide them with the date and time. These apps give people a wealth of reminder options: dates, times, locations, recurrences, and priorities. These functionalities have made reminder apps an embedded feature in most smartphones.

By adapting and optimizing the model of general reminders apps, organizations are able to create applications specialized towards supporting elderly people in isolation. A sample application, named the TAUT app, designed as a reminder system for elderly people and subsequently tested on nine participants showed signs of success (Hartin et al., 2014). The reminder acknowledgement reported was 73.09%, with a mean response time of 12 seconds. The main reasons for missing reminders were participants being engaged in other activities or participants not carrying their smartphones.

MemoClock offers a unique solution as a reminder app for people with dementia. Available in both Android and Apple app stores, it employs a multi-device, sender and receiver set-up. The care partner accesses the sender-side of the application, setting reminders, recurrences, and messages to be delivered to the receiver for the care partners loved one to see. This allows the app to realize its main purpose: for care partners to remotely support their counterpart with dementia.

This purpose can be generalized to include family members and friends of an elderly person as the sender and the elderly person as the receiver.

The app was officially launched on January 1st, 2019. Its founder, Dan Mogensen, wanted a system to help his father, who had been diagnosed with Alzheimer's five years prior. Because he was working, Dan needed an app to assist his father while he was not physically with him. Basic functionality included the ability to send messages. Since November, Dan and his team of developers have been working on adding an analog clock features, voice message capabilities, and the option to use different languages.

The intent of the application is to repurpose the receiver's smart device into a dedicated clock, ensuring omnipresence. The receiver-side of the application is a clean user interface, as seen in Figure 1, which often includes the time, day, and date. However, these components can be customized by the sender to the receiver's preference.



Figure 1: MemoClock's receiver interface (MemoClock, 2019).

2.2.2 MemoClock's Competitors

RecallCue, another day clock app available in both Android and Apple app stores, employs a similar architecture to MemoClock. Released in 2017, it has accumulated over 500 downloads and has been featured on multiple television networks in the United States (RecallCue, 2017). Figure 2 is a screenshot of the intuitive clock user interface with the ability to send messages and reminders.

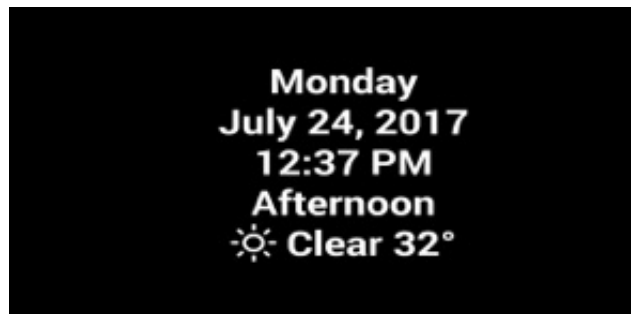


Figure 2: RecallCue's clock interface (RecallCue, 2017).

The major difference between RecallCue and MemoClock is that RecallCue's clock application (the equivalent to the receiver-side MemoClock interface) is a separate app from its connection application (the equivalent to the sender-side MemoClock interface). Furthermore, there are no paid premium or pro versions of RecallCue currently listed.

Another device that accomplishes a similar purpose to MemoClock is Reminder Rosie. Reminder Rosie is a stand-alone clock device that has reminder and alarm capabilities. It features

the capability of recording up to 25 voice messages or alarms that can be set to different recurrences depending on the situation, and it does not require Wi-Fi to operate.

Compiling the information into a table, we can see how MemoClock currently compares to similar products in its domain. There are a lot of similarities between MemoClock and RecallCue, which is expected given that they are both applications intended for smart devices. CareZone can be interpreted to be a medicine-oriented reminder system when compared to MemoClock, a general reminder system (CareZone, n.d.). Reminder Rosie provides functionalities that are also desired by care partners and PwD, and therefore present potential ideas for MemoClock to improve its product. The Amy A1 Robot is a high-tech system designed to assist people with dementia and has many desirable features for MemoClock to implement (Telepresence Robots, 2016). However, some of these features, including the mobility of the robot itself, are not feasible for MemoClock to implement. Ultimately, the comparison of MemoClock to its competitors can provide useful insight for future discussion.

	MEMOCLOCK	AMY A1 ROBOT	RECALLCUE	CAREZONE	REMINDER ROSIE
PRICE	Free	\$7,299	Free	Free	\$79.99
REMOTE REMINDERS	✓	✓	✓	✗	✗
REMINDERS WITH IMAGES	✓	✓	✓	✗	✗
AUDIBLE REMINDERS	✓	✓	✗	✓	✓
PROGRAMMABLE	✓	✓	✓	✓	✓
TABLET OR SMARTPHONE REQUIRED	✓	✗	✓	✓	✗

Figure 3: Table of functionalities compared across competitors.

2.2.3 Limitations of Using Day Reminder Clocks

While these apps and devices offer solutions to assisting people with dementia, their efficacy can be limited. Although one could set medical reminders, there is no guarantee that the task is executed. Care partners may forget to set a reminder for a specific medicine, or people with dementia may not recognize the alarm or reminder. While Wi-Fi compatibility can provide options to send real-time messages, coverage outages can result in the receiver interface not being updated with new information. Audible or visual reminders may also be insufficient depending on the hearing or vision of the people with dementia. As a result, these clock apps and devices often attach disclaimers to their products, protecting them from liability in case of misuse or a missed reminder.

Furthermore, in the more generalized case of using day reminder clocks to assist elderly people, there is an absence of two-way communication. This is not a limitation if the person on the receiver’s side is not technologically skilled enough to operate a device, but it can be otherwise. This makes day reminder clocks as a communication device less effective.

3.0 Methodology

This project aimed to increase the number of lives MemoClock improves by providing the elderly with reminders, images, and voice memos while in social isolation. The key to increasing the public awareness of MemoClock was to identify and obtain powerful testimonials from current MemoClock users and use them to develop targeted marketing materials. Furthermore, ascertaining potential improvements to the application was helpful in expanding its capabilities and use cases. To accomplish this, we set forth the following objectives:

1. To interview current MemoClock users to determine app usage
2. To conduct a market analysis and develop effective marketing materials
3. To assess data collected and provide feedback on improvements for MemoClock

This project focused on publicizing MemoClock as much as possible. This project involved creating effective marketing materials for MemoClock to use to illustrate how it can be used while social distancing. This project also investigated ways for MemoClock to improve.

Furthermore, this project involved mixed methods designs which involved integrating qualitative and quantitative research and data (Creswell & Creswell, 2018). Qualitative data tends to be open-ended, such as interview data, while quantitative data tends to contain closed-ended responses, such as responses to multiple choice questions on a survey (Creswell & Creswell, 2018). The primary design of our study is a convergent mixed methods study. This form of study involved collecting both qualitative and quantitative data at the same time to integrate the information in the overall results (Creswell & Creswell, 2018). The convergent mixed methods design was a way for our research team to conduct an inclusive analysis of our research questions. Our research questions are introduced in the section that corresponds to each objective.

MemoClock's goal is to expand globally. Therefore, we targeted specific countries based on their population sizes, family structures, socioeconomic statuses and internet usage. This project is bound by geography because most of our target population is not in Denmark.

The following sections describe the methods we adopted to achieve each of the objectives listed above.

3.1 To Interview Current MemoClock Users to Determine App Usage

To determine the usability of the MemoClock app during the pandemic as well as improvements that can be made based on user feedback, the following research questions were formulated:

- What are the needs of the current users with regards to connecting with their elderly family members and/or friends?
- How effective is MemoClock in providing support for current users to communicate with their elderly family members and/or friends?

There are various indicators used to evaluate the attitudes of people in target demographic groups toward day reminder apps. The quality, effectiveness, and public awareness of MemoClock were identified through interviews and surveys conducted post-interview. Interviews were used to understand and develop user testimonials, from which we developed marketing materials. The interviews were conducted with volunteer MemoClock users. Following the interview, a survey was sent out to all interviewees to gather demographic and media usage data. A survey provides

a quantitative description of trends, attitudes, or opinions of a population by studying a sample of a population (Creswell & Creswell 2018). The survey research we conducted was an electronically distributed questionnaire made on the survey software Qualtrics. Each participant in the interview and survey were required to sign a consent form detailing the purpose of this project, the type of data to be collected and informing them of their right to remain anonymous or end the interview or survey at any time. The consent form is available in Appendix D: Consent Forms.

3.1.1 Interviews

To determine how MemoClock has helped family members or friends with elderly loved ones communicate, we interviewed MemoClock's current users. Due to the COVID-19 pandemic, MemoClock is now free to all private users. Thus, we had no preference towards interviewing premium users or free users of MemoClock as all users have access to all features. To gather MemoClock user volunteers for the interview, our sponsor sent out the email in Appendix E. The users who volunteered were contacted via email by a team member to schedule an interview. We conducted virtual interviews due to the COVID-19 pandemic and the stay-at-home orders that were put in place. MemoClock users are located in various countries around the world. Therefore, the most efficient way to standardize the interview for all volunteers was to conduct it virtually on Zoom.

To be as informative as possible, we read a description of our project prior to each interview. This description can be found in Appendix B: Pre-Interview Information Used for all Interviews Prior to Giving Interview. Additionally, each interviewee was asked to read and sign a consent form found in Appendix D: Consent Forms. The consent forms were used to inform the volunteer that they had a right to stop the interview at any time, that they did not have to answer all the questions, and to request their permission to videotape the interview for marketing material development. We believed the most effective way of accomplishing our project mission was to get the stories of real users out to the public.

Conducting interviews gave us the ability to get information from a current user perspective while allowing us to control the line of questioning (Creswell & Creswell, 2018). The interviews we conducted followed a semi-structured format. This format allowed us to ask pre-determined questions, while still being open to other questions and conversations that developed during the interview (Creswell & Creswell, 2018). The semi-structured questioning format was the most effective format for our project as it allowed the interview to be more of a conversation than a formal interview, creating a more comfortable environment for the interviewee. A list of interview questions that were asked can be found in Appendix B: Interview. At least two members of our team were on Zoom for each interview. One was the note-taker and the other was the interviewer. The responses to the interview questions were coded and analyzed using quantitative and qualitative data analysis methods described in sections 3.1.4 and 3.1.5. Since the purpose of these interviews was get real user stories on how MemoClock has helped them stay in contact with their elderly loved ones during the COVID-19 pandemic, a comfortable environment and open-ended line of questioning was key to gathering this information. The gathered stories were used to create marketing materials for MemoClock to be distributed on popular social media apps such as Facebook and Twitter.

3.1.2 Surveys

There was a lack of information on three themes of interest to MemoClock: the primary uses of MemoClock, their opinions of MemoClock, and their demographic information. The

purpose of conducting surveys was to obtain the above information from current MemoClock users in our target countries. We used convenience sampling in this survey as we only targeted current MemoClock users. We chose this method of sampling since we had access to their contact information through our sponsor and current users were needed to ascertain improvements that can be made to the application. The results from the surveys were used to create targeted marketing materials using user testimonials to reach people with similar demographics.

We aimed to send out surveys to all MemoClock premium users, its entire current user base. We expected a 20% response rate. We expected this response rate because there was definitely a significant population of premium users that were engaged in helping develop the app, as well as a decent population of free users who are also engaged. This engagement meant that they wanted to help increase the public awareness of MemoClock. This survey was also sent to any MemoClock users who completed an interview. The survey included questions on their demographics, media usage, what they use it for, and how they rate features of the application. A list of survey questions that were asked can be found in Appendix C: Surveys. The data gathered from these surveys provided information on the three themes of interest.

The surveys were created on Qualtrics, an online survey platform. The survey included a small number of questions in order to keep users engaged as well as a progress bar to let people know how far they are in the survey. There were a variety of question formats in our survey including multiple choice, fill in the blank, and check all that apply. Furthermore, the sample survey was conducted with members of the Denmark D-term IQP cohort to determine the efficacy of the survey's language and question styles. To be as transparent as possible, we attached a description of our project at the beginning of each survey. This description can be found in Appendix C: Pre-Survey Information Used for all Surveys Prior to Giving Survey. The responses to survey questions were coded and analyzed using quantitative and qualitative data analysis methods described in the following sections 3.1.3 and 3.1.4.

3.1.3 Quantitative Data

To analyze any quantitative data, we calculated basic statistics and interpreted them in the context of the question. The data analysis was broken down into steps for ease of understanding. The model used was adapted from *Research Design: Qualitative, Quantitative, and Mixed Methods*, A book by reputed research academics John W. Creswell and J. David Creswell.

Step 1: The number of respondents and non-respondents from the conducted surveys was summarized through a table.

Step 2: Statistics were calculated based on all the quantitative data provided. This included optional respondent information like age and numerical feedback on the applications (e.g. ratings out of 5). The statistics calculated included the mean and range.

3.1.4 Qualitative Data

Similar to the previous section, the qualitative data analysis was broken down into steps for ease of understanding. The model used was also adapted from *Research Design: Qualitative, Quantitative, and Mixed Methods*.

Step 1: Interviews responses were typed into documents by the notetaker, and any visuals or instructions provided were attached to the data. Given the nature of the data collection, the questions asked were tailored to be open-ended. For example, when getting the testimonial of a user of MemoClock, a question like “Can you share a story of how MemoClock improved the lives of you and your family or friends?” was followed by a series of elaborating questions to achieve a stronger context around the person's answer.

Step 2: The data was scanned through to identify meaning and common themes. Each piece of data was vetted by at least two members of the team to ensure a holistic analysis. This was useful in identifying answers that were expressed differently but with the same meaning. For example, when trying to understand the impact COVID-19 has had on the usability of MemoClock, one interviewee may have answered “As a family member of an elderly loved one in social isolation, MemoClock has allowed me to care for them without having to be there in person”, while another interviewee may answer “MemoClock lets me send reminders to my mom who doesn’t know how to use her smartphone”. While these two answers are not the same, they convey the same meaning and could therefore be coded under the same grouping, like “help with family member in social isolation”.

Step 3: The text was coded based on the common themes or words identified. The codes were standardized, and a code table was maintained. The code table was universal among answering all four research questions, as answers for a particular question may have helped inform an answer to a different one.

Step 4: A description was developed for each code. This served as the main tool for understanding the sentiment of the coded phrase, word, or paragraph.

Step 5: Visuals were created to illustrate the most common codes and attitudes among interviewees and focus group participants.

To better visualize these steps, the flowchart below was created.

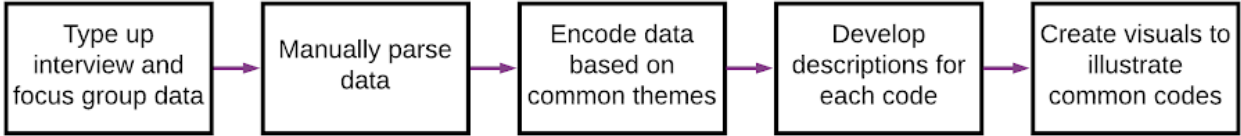


Figure 4: Process for handling qualitative data.

3.2. To Conduct a Market Analysis and Develop Effective Marketing Materials

The purpose for these marketing materials was to increase the public awareness of MemoClock, in accordance with our mission statement. To pinpoint the countries our target customers were in, we needed to identify the scope our marketing plan. Our sponsor’s target countries were English speaking and had active dementia support networks, high numbers of internet and smart device usage, and high GDP per capita. Figure 5 shows the groups of countries with the highest GDPs and internet usage. The group in dark purple includes the U.S., Netherlands, Germany, Sweden, Australia, Canada, the UK, and France. This group was then narrowed down to countries that had English as a primary language. We identified the following target countries (yellow stars): the U.S., Australia, Canada, and the U.K. The use of smartphones or tablet applications, such as MemoClock, in countries of a low GDP per capita is not feasible as this application requires a constant internet connection to function. Therefore, countries that lacked a high percentage of internet usage were not ideal target countries for a MemoClock to be marketed to.

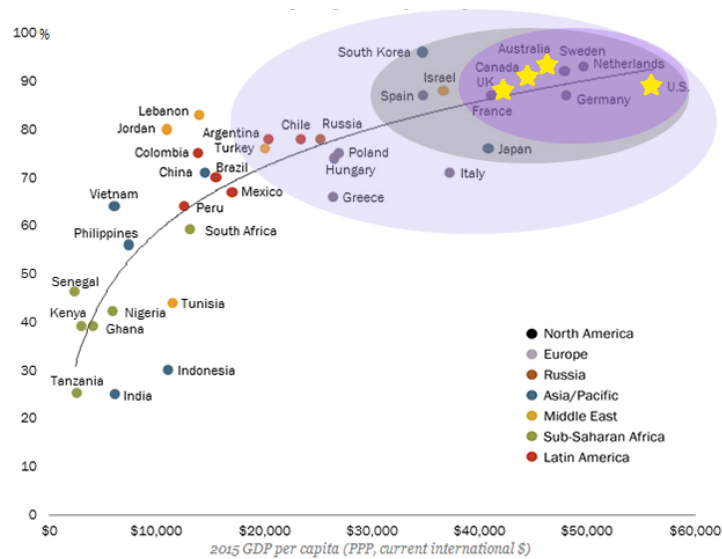


Figure 5: Three groups of countries MemoClock can expand to as well as our target countries

3.3 To Assess Data Collected and Provide Feedback on Improvements for MemoClock

To determine how the feedback data could be provided in a meaningful manner to MemoClock, the following research questions were devised:

- How urgent are these improvements relative to helping the elderly in social isolation due to the COVID-19 pandemic?
- How popular would these improvements be with existing and future users?

Since the data being collected resulted from mixed-method studies, data analysis was conducted on both quantitative and qualitative results. These studies resulted in a well-rounded investigation into how respondents may use MemoClock and how they felt MemoClock could be improved. Based on the data analysis that was conducted, interpretations were made to generate user feedback for the MemoClock team. The final results informed two main questions:

- What improvements can be made to MemoClock’s application?
- Are these improvements needed urgently to help the in social isolation due to COVID-19?”

To evaluate the efficacy of a potential feature or change, the confidence that it would lead to an increase in downloads was considered. Similarly, data from our surveys was distributed by the frequency of selection. These distributions developed an insight as to what forms of media are effective among the target demographic. Additionally, the forms of social media that are most used by ideal users in each country were also shown by this data. This information was critical for us to provide MemoClock with the most effective ways to increase its public awareness to the greatest amount of family members and friends of the elderly in social isolation.

With qualitative data, the feedback was delivered in an understandable way. This was achieved through a summary of the analysis, delivered in the form of an infographic or a presentation. While this was a less statistically secure method of giving feedback, it allowed an opportunity to express how potential users or current users feel about the application. This applied

both to determining the best marketing strategy and deciding how MemoClock can improve its application.

To deliver both the qualitative and quantitative data, the team gave a final presentation to Dan Mogensen and all interested parties. This visuals, graphs, and statistics that concisely delivered the data and results of the improvements that should be made to the MemoClock application.

4.0 Results and Analysis

The following section explains how interviews and surveys were conducted and analyzed. Additionally, our process of developing the marketing materials is described. Furthermore, the market analysis that was conducted is presented and the organizations of interest to MemoClock are identified.

4.1 To Interview current MemoClock Users to Determine App Usage

Interviews were conducted to allow us to identify the various ways current MemoClock customers use the application in addition to how their use of MemoClock has changed due to the COVID-19 pandemic. The MemoClock user profile that was created from survey responses was used to identify the best way to reach others who have similar demographic characteristics as current MemoClock users.

4.1.1 Interviews

To conduct interviews of current MemoClock users, Dan Mogensen, the CEO and Founder of MemoClock, sent an email (see Appendix D) to his mailing list of current MemoClock users. A total of seven MemoClock users volunteered to be interviewed. We interviewed five of the seven MemoClock user volunteers we reached out to via email. Two of the seven volunteers did not respond to our emails when we attempted to schedule the interview. Each interviewee was asked the questions in Appendix A. These interviews provided us with the ability understand the ways MemoClock users discovered the application, how they use the application, and how their uses have changed due to the COVID-19 pandemic. Additionally, the opinions the users have of the features in the MemoClock application were gained through these interviews. Due to COVID-19, all interviews had to be conducted via Zoom, a web-conferencing application. Informative consent was explained to each interviewee and their consent was recorded. The remainder of the interview was videotaped if consent was given by the interviewee for transcription purposes.

All five interviewees gave consent to be videotaped for transcription purposes. The transcripts of these interviews are given in Appendix E. For simplification purposes, we will be referring to each interviewee by their first name for the remainder of this section: Alison, Doug, David, Tara and Tina.

4.1.2 Interview Coding and Analysis

To analyze the interview transcript data, we used an interview coding system. A coding system is a system used to analyze and tag qualitative data for attributes (codes). This was done to identify similarities and patterns across the data in a format that could be easily interpreted by the sponsor.

We created a list of codes by identifying the elements of the interview data we wanted to capture. This included care partner status, types of messages, channel of discovery, nature of usage, and the change in usage from the pandemic. A code for suggestions for improvements to the application was also created based on the opinions of the MemoClock users.

Two members of our team were present for each interview. The main interviewer would inform the interviewee of consent as well as ask all the questions. The main interviewer was also responsible for transcribing the interview and conducting the first round of coding. The second member of the team present would record the answers to each consent question as well as take over the interview if necessary. Each interview was coded by two team members. The first round of coding was conducted by the main interviewer and the second round of coding was conducted

by a member of the team who was not present for the interview. The second round of coding would be completed by watching the recorded interview while reading the transcript of that interview. Each sentence the interviewee stated would be analyzed and a code and a tag would be attached. A tag is an indicator on whether an excerpt was positive, negative, or neutral in sentiment. Once both people completed their list of codes, they compared their lists to develop a final set of codes. This method reduced the risk of bias in the study.

Once the final set of codes was created for each interview, the excerpts based on the codes in the same category were added into a combined table (Appendix G). A description of each code category and the codes within each category can be found in Appendix F. The number of responses and associated tags from interview quotes in each code category can be found in Figure 6.

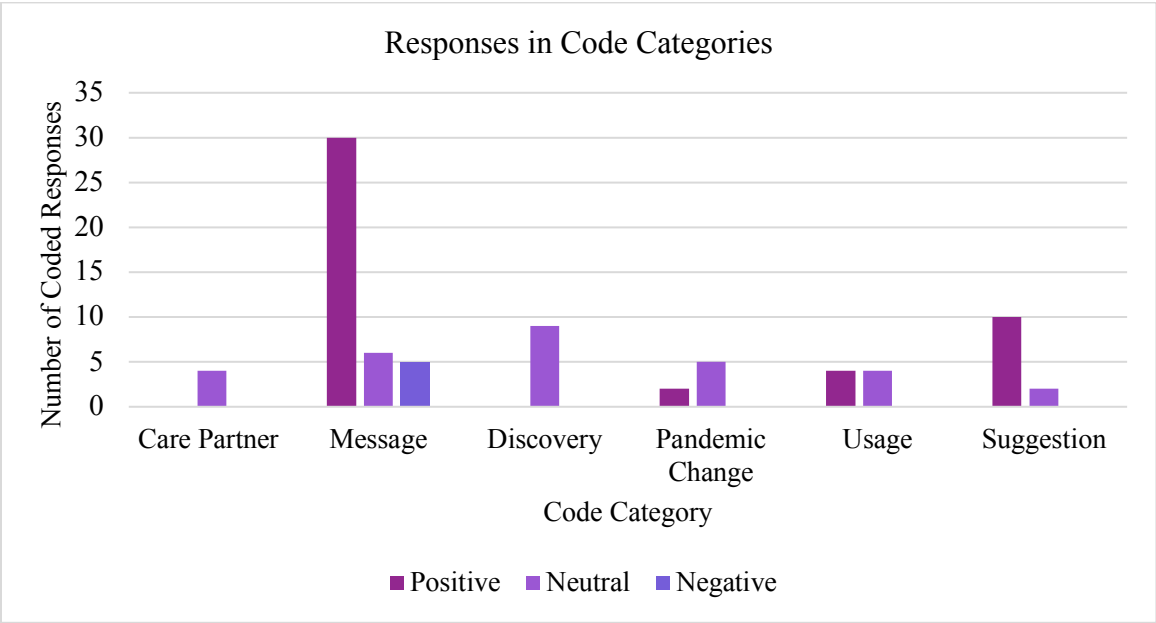


Figure 6: Interview responses by code category

4.1.2.1 Care Partners

The care partner codes indicated whether the family member provided full-time care to their elderly loved one or part-time care. Of those interviewed, all responses tagged with a care partner category were under the partial care partner code, and all care partners were the child of their loved one with dementia. Furthermore, over half of the interviewees’ loved ones with dementia do not live in an independent living home, residential care facility, nursing home, or similar locations. Those who do have their loved one in one of those locations still have multiple family members help out with sharing the responsibility of taking care of their loved one with dementia.

4.1.2.2 Messages

Overall, MemoClock users had a positive experience sending MemoClock messages to their elderly loved ones. Some quotes related to this are from Tara: “What I really like about it is I can have it set for hours...so if he happens to not be home for some reason, he’s never going to miss his message.” And from Tina: “It’s a good way to get these messages to people with dementia.” The full list of quotations in this category are listed in the Message codes section of Appendix G. Among these codes, interviewees responded positively to the reminder messages,

and messages about the season. It is worth noting, however, that Alison, David, Doug and Tara mentioned reminder messages, whereas Tina only mentioned using MemoClock as a tool to indicate the season. Based on this information, it can be concluded that reminders are popular and effective MemoClock messages. Messages about the season, while less frequently mentioned, are also effective.

Among the types of messages that received positive and neutral reactions were the date/time feature and scheduled messages. Both Tina and Tara mentioned the positive impact of having the large date and time on the MemoClock screen. Tina and Tara both said that the data/time feature established a stronger sense of time for their loved ones. Alison mentioned that due to the COVID-19 pandemic, the date/time display is the only thing the MemoClock app is used for as she now lives with her father. Both Doug and David mentioned scheduling messages ahead of time so that they wouldn't have to send reminders in real-time when they might be busy. This indicates that the date/time and scheduled messages features clearly have a good purpose that is effectively used.

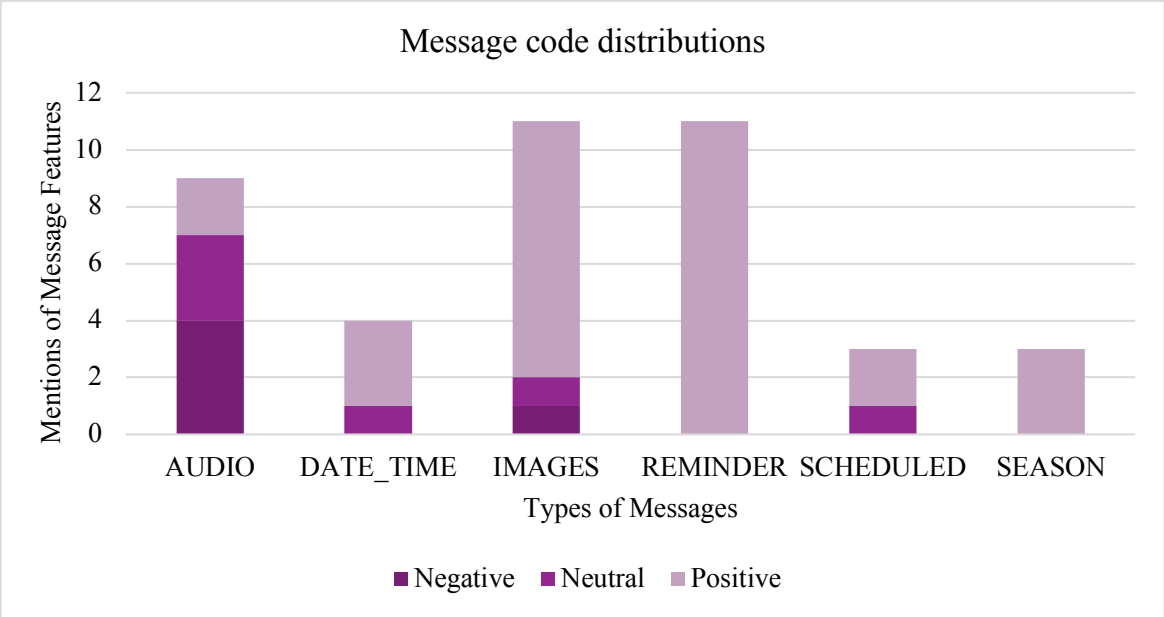


Figure 7: Message code distributions and tags

Image codes were identified a total of 11 times, shown in Figure 7, tying it with reminder codes as the most frequently mentioned message codes. Nine of these responses were positive, with Tina, David, Tara, and Allison citing how coupling text messages with images made the overall message more notable. Doug was the only interviewee who recalled a negative experience with an image message, stating that the picture would take too much space away from his scheduled messages, his main way of using the application. Nevertheless, he did mention that it is a nice feature to be able to send photos of family. The image-based messages, therefore, are a positive feature of MemoClock, as they provide more context around messages and a capacity to share meaningful images with the receiver.

Of all the message types, audio messages were the only form in which the response was mostly negative. Alison, David, and Tara all expressed that they had difficulties with using this feature. Each had a different reason for the difficulty: Alison's iPad was too old, David couldn't make it work, and Tara thought it might be startling for her father to hear audio suddenly. Although

he hadn't tried it, Doug did not see a need for using audio. Tina was the only interviewee to mention positive usage of the audio feature, saying that the audio has filled in for them not being able to visit as often. Overall, the general reaction to the audio feature was one of indifference. Many interviewees noted that if they wanted to communicate with their loved one audibly, they would do so through a phone call, or a two-way communication application, such as FaceTime.

4.1.2.3 Discovery

The discovery code indicates where the interviewees discovered MemoClock. Tina first discovered MemoClock through a professional recommendation made by a social worker. Tara and Doug both discovered MemoClock through its website after searching for an application with similar capabilities on Google. Alison discovered MemoClock on a chat forum post made by a doctor who had heard of it from his patients. David learned about MemoClock from his sister who saw a post about it on a news blog.

4.1.2.4 Usage

All five interviewees said that they use MemoClock in addition to other forms of care. However, the amount of additional care varied greatly from individual to individual. Some care partners needed to provide only slightly more aid than the reminders from MemoClock, while in one case MemoClock wasn't as helpful as it could have been if the dementia had not progressed as far as it had.

4.1.2.5 Pandemic Change

The COVID-19 pandemic has changed the way care partners such as family members or friends can help and communicate with their loved ones. Due to social distancing, care partners are discouraged from visiting their loved ones because the elderly are more susceptible to coronavirus. In our interviews, we found that due to the pandemic, Alison's father moved in with her so she could provide consistent care to him. David moved his father into a care facility after the stay-at-home orders were announced. Doug and Tina reported similar MemoClock use before the pandemic and during the pandemic. They continue to send scheduled updates about the day but get to visit their loved ones less often.

Tara has utilized MemoClock to remind her father that the pandemic is occurring: "He still likes to go out and get food to go, which drives us all crazy. So now we send messages reminding him of the crisis. Reminding him that if he goes out, he needs to take a mask and take hand sanitizer." Tara's father does not realize the severity of the situation and must have reminders about how to protect himself. A way Tara explains social distancing to her father through MemoClock is by sending photos of her dogs walking shoulder to shoulder with a message like "this is not social distancing, don't be like my dogs."

4.1.2.6 Suggestions

Suggestions for application development varied by use case. A list of all suggestions can be found in Appendix G. All interviews expressed a positive reaction towards the development of a receiver acknowledgment feature as well as a video chat interface within the app. Alison and Tara both expressed a desire for the ability to send reminders to multiple receivers within the mobile app as well as being able to utilize multiple senders. During the interview, Alison stated: "mom is in a care home and I got her another old iPad. But I can't send some messages to the device at dad's house and some messages to the device where mom is." Thus, she would like a

feature to be added so that she can send messages to either MemoClock device at her mom's or dad's residences from on the same account.

4.1.3 Survey and Testimonial Form

In order to determine the MemoClock user demographics and the opinions of the MemoClock app from current users, a survey was created. The survey had a link to a testimonial form on the last page. The survey was distributed to MemoClock users, including interviewees via email to the MemoClock mailing list. The survey was completely anonymous, and the testimonial form was a link located on the last page of the survey. The testimonial form was provided in the event a participant agreed to share their name and testimonial of MemoClock. The survey results and their uses can be found in the following sections.

4.1.3.1 Survey and Testimonial Form Results

We created the survey and testimonial form on Qualtrics. The survey and testimonial form was first distributed to our IQP classmates to test the average time it took to take as well as how easy it was to understand. Then, the survey and testimonial form were sent out via email to the MemoClock user mailing list. We got a total of 7 responses to the survey, available in Appendix K, and 0 responses to the testimonial form. The survey was completely anonymous and asked questions about MemoClock as well as demographic questions about the user. This survey provided us with information used to develop a MemoClock user profile.

The testimonial form was a link attached to the last question on the survey. The testimonial form asked users to provide a testimonial about MemoClock. The results of the testimonial form were not connected to the survey results, thus keeping the anonymity of the individual. Testimonials were used to develop marketing materials for MemoClock.

4.1.3.2 Survey and Testimonial Form Analysis

Despite only getting 7 responses, much lower than the hypothesized number of responses, key data was still extracted. Overall, users gave positive feedback about the sender and receiver interfaces with averages of 4 and 4.14 out of 5 respectively. They also responded positively to the usefulness of a potential MemoClock video chat feature, with an average rating of 4.29 out of 5.

Overall, Instagram, Facebook, and YouTube were the most common social media applications, shown in Figure 8. These were used by 5, 6, and 6 respondents, respectively (respondents could pick more than one social media application each). Similarly, television (6 respondents), newspapers (6 respondents), and mobile phones (5 respondents) were the most common forms of media identified. The age demographic was consistent, with 4 respondents aged between 51-60, 2 between 41-50, and 1 from 61-70.

In terms of qualitative data, a few features ideas were given: the ability to repeat a message multiple times in a set amount of time (within hours) and the ability to restart the receiver from the sender side. All 7 respondents provided positive quotes about how MemoClock has helped them. One respondent said "MemoClock is part of my mother's wall and everyday comfort", and another, "MemoClock has been a lifeline to support loved ones when a phone call would cause anxiety." Permission to use these quotes (with anonymity) were given by all respondents, meaning more available marketing quotes for Dan and the MemoClock team.

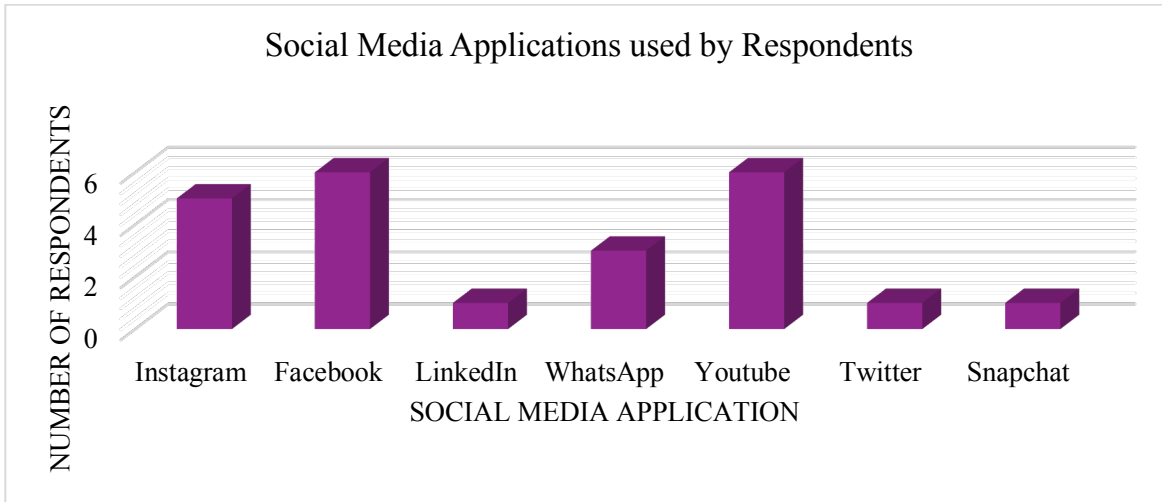


Figure 8: Social media application usage data from surveys

4.2 To Conduct a Market Analysis and Develop Effective Marketing Materials

To increase the public awareness of MemoClock, we conducted a market analysis of the market for reminder messaging apps. We analyzed the industry MemoClock is in, our target customers, and MemoClock’s competitors to develop an effective market analysis. MemoClock is in the healthcare application industry. Thus, an analysis of healthcare advertising was conducted and can be found in Appendix J. An analysis of organizations that have members that would benefit from MemoClock was conducted for four countries – the U.S., UK, Canada and Australia. The target customers in English-speaking countries are the family members and friends of the elderly who are in social isolation due to the COVID-19 pandemic.

After researching the most effective way to advertise healthcare applications, we distributed a survey to the MemoClock mailing list to determine a user profile for current users that provided us with a target age demographic. Additionally, the survey responses indicated which forms of social media were most commonly used among the current MemoClock users.

Utilizing this information, we decided to advertise MemoClock on Facebook and Twitter.

Furthermore, we conducted an analysis of MemoClock’s competitors- RecallCue, CareZone, and Amy AI Robot- analyzing their services and their advertisements. We researched each competitor a second time following the COVID-19 pandemic stay-at-home orders to see what their responses were to the pandemic. We compared their responses to MemoClock’s response of making all versions of MemoClock free for private users. Our analysis was used to inform the development of effective marketing materials.

Creating marketing materials for MemoClock included many decisions, such as identifying the most effective color palette, images, and text. The following section will describe the process we went through to develop marketing materials and the factors that we considered in each of those decisions. Additional marketing materials can be found in Appendix I.

4.2.1 Development of Marketing Materials

Based on our research, posts on Twitter and Facebook that contained a visual element were re-tweeted or shared more often than post that contained only words. Thus, we created infographics about MemoClock utilizing information on how MemoClock works and the data from the interviews and testimonial forms. On Facebook, videos are more likely to be shared, however, all

5 interviewees declined our request to provide us with additional material other than their interview responses. Therefore, we decided to focus on creating infographics for both Twitter and Facebook. Many factors go into creating infographics, such as the platform used to create the images, color scheme, positioning of elements, and the text that is accompanying the image.

We used the website Canva to develop our infographics. This site had a variety of designs, including a Twitter post template. The images added to our infographics were used to convey a feeling of happiness or joy and matched the tones of the color scheme used for that particular infographic. Happiness is usually exemplified by arms hanging by one’s side, shoulder’s hanging, and head facing towards the camera (Wallbott, 1997). In addition to this, one criterion that we searched for in a photo was for the person in the picture to seem as opposed to staged. This would allow for people who view the graphic to feel more connected to the image and take the infographic more seriously as a result.

There have been numerous studies linking color to emotion. We utilized these studies to inform our decisions regarding color scheme. In one report, it was found that among adults, green and yellow were the most likely to invoke happiness (Terwogt & Hoeksma, 1994). “Blue is believed to be expressive of tranquility and tenderness, whereas orange/red is believed to be expressive of desire and sexuality” (Gage, 1999). We used these studies to inform our decision for choosing a color scheme for our marketing materials.

Another part of the infographics was to add quotes from existing users who had been interviewed. After a combined list of codes was created for each interview transcripts, we scanned the coded document to find usable quotes that would present MemoClock favorably. We then compiled a list of the quotes that were selected. If any quotes were deemed by the group to not be as fitting for the materials, we denoted them as such. Before posting any infographic with data from an interview, we would email the interviewee for their approval.



Figure 9: An example infographic from our first set of designs

Figure 9 is an example of our first iteration of infographics. Some of the feedback we received on this set of infographics was that we included too much information for viewers to understand. We were told this made the infographic seem more complicated than it should be and

could potentially defer viewers from downloading the app. Additionally, since the above infographic was solely informational, it had no emotion in it. Emotional infographics are more leaving the materials feel bland. In addition to this, some of the text is hard to read as the background color of the graphic was too saturated at the top and the font size was too small.

Utilizing all this feedback, we came up with a second set of infographics with a different background color and font.



Figure 10: An example infographic from our second set of designs

Following the feedback we received on the first iteration informational infographics such as Figure 9, we created a set of infographics that contained stock images of elderly people and quotes from our interviews, as seen in Figure 10.

This second set of infographics used a different format from the first set infographics such as including a picture on the left side of the graphic and a quote from a MemoClock user on the right. We felt this would make the infographics more effective and emotional. Thus, having a higher probability of reaching a wider audience by being re-tweeted or shared. Some of the feedback we received on this second iteration of marketing materials was to use a color scheme that was calming instead of deep, dark colors. Our color scheme changed to pastel colors such as light blue, light green and light purple. Based on our research, these colors all have blue hues in them and produce the sensation of tranquility (Gage, 1999)

Additionally, the font had to be standardized among all infographics in order for the posts to look cohesive. Therefore, we standardized a color scheme, font, and began displaying the MemoClock logo above the quote in each graphic. The font we used in all future iterations of infographics was Montserrat. This font is used by Dan Mogensen on all MemoClock related

Additional feedback on our second iteration of infographics was that the stock photos we used, such as the photo used in Figure 10, felt too staged and don't match the messages we are trying to get across to potential users. For future iterations of infographics, we decided to change the photos used and shorten the quotes. Furthermore, on the next set of infographics shown in Figure 11 and Figure 12, we removed the word premium as this no longer applies since MemoClock is free for all users.



Figure 11: A finalized MemoClock infographic, with quote from Tara



Figure 12: A finalized MemoClock infographic, with quote from Alison

In the third iteration of infographics created, we decided to use images that were not necessarily of a person but of the topic mentioned in the quote. We changed the color scheme used in this iteration of infographics to include light pastel colors in the background, like in Figure 11, or images with light colors as the background, like in Figure 12. Using a screenshot of the receiver interface with a message that Tara mentioned she had sent to her dad as seen in Figure 11 was an effective way of showing potential users how this app is useful and types of messages that current users send.

Feedback we received on this iteration was that the color scheme, font and message worked well together, and the infographics seemed cohesive. Suggestions for improvement included taking a picture of a tablet displaying the message instead of just screenshotting it. This way it would match the examples provided on the MemoClock website, which keeps the type of advertising consistent.

4.3 Marketing Strategy

To advertise MemoClock, we used various forms of social media that are popular in the age group of 40-60 years old. This age group was identified as our target age group because most

care partners are children or family members of elderly individuals. Initially we identified multiple forms of social media that are used in this age group LinkedIn, Instagram, Twitter, Facebook, YouTube, and Snapchat.

After reviewing survey responses of which forms of social media current MemoClock users use and conducting an analysis of the forms of social media used by organizations that are made of up members that fit MemoClock’s target population, we identified that Twitter and Facebook would be the best forms of social media for advertising MemoClock. Social media allows information to be spread quickly to potential MemoClock users. Additionally, through visual infographics, the benefits of MemoClock and how MemoClock is utilized by current users can be explained in a small amount of words.

The accounts that follow MemoClock can be utilized to spread awareness as well. In the past, MemoClock has found success when a user tweeted about MemoClock’s abilities. Afterwards, the app had a flood of new downloads. The following section explain the strategies we will use to increase public awareness of MemoClock by posting on Twitter and Facebook.

4.3.1 Twitter

Twitter is a popular social media platform that allows people to re-tweet posts which show up on their feed for their followers to see. Including videos and pictures in a tweet is a way to make the tweet more engaging. Tweets that include a video receive 10 time the number of likes, retweets, and replies than tweets with no media included (Cooper, 2019). The use of positive language is more likely to get more retweets as well (Jenders, 2013). Infographics, such as the one in Figure 13 are a good way to share more information in an easy to understand format.



Figure 13: Infographic shared by the Center for Disease Control on Twitter.

One of the most compelling forms of healthcare advertising is the use of testimonials. From interviews with current users we obtained testimonials about MemoClock and created infographics using those testimonials. A real person’s review of a product is the turning point in gaining new users (Smith, 2018). A testimonial advertisement can be as simple as Figure 14, or more detailed like a video review of a product. The infographics we have created are ideal for advertising on Twitter because they are short, colorful and to the point.



Figure 14: Testimonial Advertisement on Twitter.

Since the lifespan of a Twitter post is so short, we recommend posting often on the MemoClock account. Twitter users check their feeds periodically throughout the day and potential MemoClock's users are located worldwide. Thus, Twitter posts should be posted every day, multiple times a day in an effort to reach the most amount of people.

Once MemoClock gains more followers on Twitter, the amount of posts per day can decrease.

The type of tweets can vary among multiple categories. For example, Infographic posts can be alternated with tweets that contain text only about the features MemoClock has, stating the MemoClock is free, or mentioning new updates about the MemoClock app. Other posts can be of photos of a tablet using MemoClock and a reminder on the screen. A fourth type of post can be a video of Dan talking about his personal story. All interviewees declined to provide video testimonials, so Dan explaining why he created MemoClock and how he uses it could be very powerful for potential users. Content can be recycled and posted multiple times to reach different people.

4.3.2 Facebook

The infographics we created can be used for posts on Facebook. First, Facebook tends to have an older userbase than many other social media platforms (Gauss, n.d.). This fits with our target age group of 40-60 years old. In addition, Facebook allows for posts longer than 140 characters (the limit on Twitter). This means that if appropriate, we would be able to send out longer, more informative messages to those following MemoClock, or the stories of users as text write-ups.

However, long text posts should only be used if absolutely necessary as the posts that have the most reach on Facebook contain videos or images (Wilson, 2019). Unlike Twitter, on Facebook a viewer can leave a reaction, which usually resembles an emoji. The types a reaction each post is getting can be an indicator of whether or not that post was successful.

The most popular and engaging posts on Facebook tend to be in video format. Figure 15 shows the results of a study that found that of the top 500 posts on Facebook, 81.8% of them were videos of some form (Peters, 2019). However, videos are more costly to produce. Images, on the other hand, are typically more effective than links or text posts.

Thus, our infographics are still a very effective way to increase the public awareness of MemoClock on Facebook. Additionally, as mentioned in the above section, a video of Dan explaining why he created MemoClock and how it is used could prove to be even more useful on Facebook. Posting on Facebook in addition to Twitter will allow us to engage more with our target audience that might not be on Twitter.

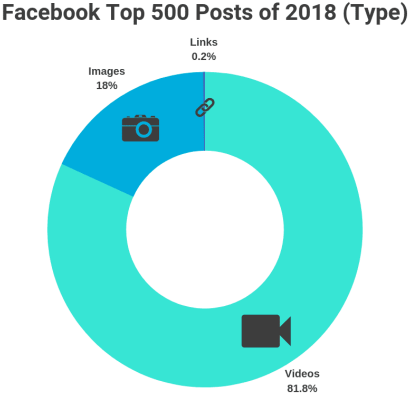


Figure 15: Breakdown of Top Facebook Posts (Peters 2019)

Facebook and Twitter are very different social media forms and therefore have different types of posts that reach the most people. On Facebook, videos reach the most people, followed by images and then text with no visual element attached to it (Wilson, 2019). We found that “brands that posted just 1-5 times per month [on Facebook] saw their engagement nearly double” (Anthony, n.d.). Since “Facebook prioritizes content from friends and family in users’ news feeds”, posts on Facebook should be personable and preferably be made by the MemoClock user that gave the interview or testimonial. Thus, we decided that MemoClock should post no more than 5 times on Facebook in the first month and then increase their post frequency in future months.

Twitter posts that have images attached seemed to reach the widest audience; however, Twitter posts have the shortest lifespan of all forms of social media at just 15-20 minutes (Wilson, 2019). A Facebook post has a lifespan of 5-6 hours. Since the lifespan of a Twitter post is drastically shorter, many more posts have to be made. A study conducted by Socialbakers found that “engagement starts to drop off after the third tweet” (Socialbakers, 2013). Additionally, this study found that “response per tweet peaks at around five tweets per day before taking a dive” (Socialbakers, 2013). Thus, we determined that MemoClock should post on Twitter 4 times a day to attempt to keep high engagements while retaining a high response rate.

Blue – Twitter posts	Red – Facebook posts				1 Infographic 1 MemoClock is Free-Text Personal MemoClock story (video or image) One message feature of MemoClock	2 Infographic 2 One message feature of MemoClock Infographic 3 How MemoClock works-Text or Infographic Infographic 10
3 Tablet Graphic Infographic 4 One message feature of MemoClock MemoClock is free	4 Infographic 1 One message feature of MemoClock How MemoClock works-Text or Infographic Infographic 5	5 Infographic 2 One message feature of MemoClock Infographic 6 MemoClock is free	6 Infographic 3 One message feature of MemoClock Infographic 7 How MemoClock works- Text or Infographic	7 Infographic 8 Infographic 4 Tablet graphic MemoClock is free	8 Infographic 1 One message feature of MemoClock How MemoClock works Personal MemoClock story (video or image)	9 Infographic 5 MemoClock is free One message feature of MemoClock Tablet graphic Infographic 9
10 Infographic 6 One message feature of MemoClock Infographic 1 How MemoClock works	11 One message feature of MemoClock Infographic 7 Infographic 4 Personal MemoClock story (video or image)	12 Tablet graphic One message feature of MemoClock Infographic 8 Infographic 2	13 Infographic 3 MemoClock is free Infographic 6 How MemoClock works	14 Tablet graphic Infographic 5 Personal MemoClock story (video or image) Infographic 9	15 Infographic 10 Tablet graphic One message feature of MemoClock MemoClock is free	16 Infographic 11 Infographic 1 How MemoClock works MemoClock is free

17 Infographic 12 One message feature of MemoClock Infographic 7 Tablet graphic	18 Infographic 4 MemoClock is free Infographic 8 Personal MemoClock story (video or image)	19 One message feature of MemoClock Infographic 2 Infographic 3 How MemoClock works	20 Infographic 6 MemoClock is free Infographic 9 Tablet graphic Infographic 1	21 Infographic 10 One message feature of MemoClock Infographic 5 Tablet graphic	22 Infographic 11 MemoClock is free One message feature of MemoClock Tablet graphic	23 Infographic 1 Infographic 12 How MemoClock works Infographic 7
24 Infographic 3 Infographic 4 Tablet graphic MemoClock is free	25 Infographic 8 Infographic 2 One message feature of MemoClock MemoClock is free	26 Personal MemoClock story Infographic 6 Tablet graphic Infographic 10	27 Tablet graphic Infographic 9 Infographic 5 MemoClock is free Infographic 4	28 Infographic 11 Infographic 12 Tablet graphic Infographic 1	29 How MemoClock works Infographic 10 Infographic 3 MemoClock is free	30 Infographic 4 Infographic 7 Infographic 2 Personal MemoClock story
31 Tablet graphic Infographic 8 Infographic 6 MemoClock is free						

Figure 16: Sample Social Media Schedule for Facebook and Twitter Posts

A sample schedule for posting to social media accounts is shown in Figure 16. The team constructed this schedule following the advice above. A number of commercial tools are also available to schedule and track the effectiveness of social media posts, and those are discussed in the next section.

4.3.3 Social Media Tools

To track the effectiveness of a post, Facebook and Twitter both have internal analytics tools. The internal analytics tool on Twitter allows businesses to identify their most popular tweets by providing the account holder with high-level statistics tracking each post made by the account. Additionally, this analytics tool provides the account holder with other accounts that could serve as influencers for the business. This information is provided to the account holder on the home

screen of the account. An additional feature part of Twitter's internal analytics is the activity dashboard. This dashboard gives the account holder metrics on all tweets posted. These metrics include the accounts of the people who have viewed, retweeted, liked, and replied to the tweet. Utilizing these metrics, an account holder then has the option to use "Quick Promote," which allows them to select particular tweets to share with targeted audiences.

Facebook offers built-in analytic services through Facebook Business Manager. This service allows a user to disconnect from their personal account when managing a professional or business account. This is helpful when multiple people are managing a business account. Facebook also offers more support if issues arise if you are using Facebook Business Manager for your business page. The service also allows you to oversee multiple pages easily. The service is free and provides the following features for advertisements launched on the platform: view changes in engagement, views, and likes; select target audiences based on age, location, and gender; connect to Instagram and Facebook Pixel. Facebook Pixel is a section of code that can be added to your website and Facebook page to measure audience demographics and help target certain audiences. It also tracks a user's movements after engaging with the ad, such as if they visited the website and what they viewed.

There is also a software that is not affiliated with any particular social media platform known as Hootsuite. Hootsuite allows for easier use of social media and provides multiple services that can aid in creating a social media presence. There are several tiers of payment, two of which are meant for larger businesses while the other three are meant for individuals or small teams. There is a 30-day free trial for both the professional and team plans, but there is also a limited free plan, which allows a user to schedule up to 30 messages. This could be helpful, as it could allow MemoClock to send messages at peak usage for United States time while MemoClock operates primarily in Denmark and the EU, in order to gain some overseas users.

4.4 Recommendations

The team's recommendations for MemoClock are focused on app development and marketing. From the interviews, we received a variety of suggestions from current MemoClock users for application developments that could be implemented in upcoming updates. A few features that were requested from the interviewees included the following: the receiver device receiving messages from multiple mobile helper, the mobile helper being able to send messages to multiple receivers, and including a video chat option within the app. With the ability to use multiple mobile devices to send reminders to a tablet, the responsibility of sending messages could be shared between care partners or siblings. It would also give the ability to connect through MemoClock to more family members. If a care partner has multiple family members using MemoClock, the feature of sending messages to multiple devices would be needed. That way they can share different information with each device. The final suggestion shared among multiple interviewees was the integration of a video chat feature within the app. The receiver users may be confused by using phone or navigating between apps. Therefore, the integration of video chat within the app would make it easier for older users to stay connected with their loved ones.

We encourage MemoClock to follow the social media schedule in Figure 16. By posting as often as proposed, MemoClock's public awareness can be increased. We suggest the infographics we developed be posted often. They can be posted multiple times as well. This schedule provides MemoClock with the ability to reach more people in different countries and at different times of the day. Current users can also be implored to spread awareness of the app. By including encouraging messages and a hashtag in emails current users can be encouraged to post

photos of their MemoClock reminders. Additional marketing materials can also be created from selected quotations from already completed interviews. A list of selected quotes and sample messages from interviewees is provided. The team also recommends expanding marketing to Instagram. Facebook posts have the ability to be posted on Instagram as well. Selecting that feature would be an easy way to expand use to Instagram.

5.0 Conclusion

This project focused on developing a social media campaign and strategy for MemoClock to help increase its public recognition and the number of users. Our mission was to increase the number of lives MemoClock improves by increasing its public awareness. To carry out this mission we interviewed current MemoClock users, developed marketing materials, and conducted a survey of MemoClock users.

During this project, we faced a lot of challenges and uncertainties that became limitations. The biggest of these was the cancellation of university-based international travel and the subsequent transition to a remote project. This transition sparked a shift in project direction which everyone involved had to adapt to. A few other limitations include the lower frequency of meetings resulting in fewer iterations of the marketing materials and the low number of completions of the survey.

Nevertheless, our continued communication and hard work during this project helped us achieve our mission's objectives. We successfully compiled results from interview and survey data as feedback for Dan Mogensen and The MemoClock Developers. In addition to our marketing materials and strategy, we also developed a sheet of potential contact leads for Dan to explore and transcribed interviews that have more quotes for future marketing materials. We hope that with these resources and recommendations, MemoClock can continue to impact lives during the current pandemic and into the future.

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Appendices

Appendix A: Interview

All interviews will be conducted via Zoom.

Pre-Interview Information Used for all Interviews Prior to Giving Interview

We are students at the Worcester Polytechnic Institute working with MemoClock in Copenhagen. MemoClock is an application that facilitates one-way communication from one person- the sender- to another- the receiver. Often, this application is used by care partners to send remote reminders to a person with dementia that they care for. Now, the app has been repurposed to provide communication and reminders to the elderly in social isolation due to the COVID-19 pandemic. MemoClock provides family members and friends with a free way to send audible remote reminders that include pictures to their loved one. Our job is to find ways for MemoClock to increase its public awareness, which will allow MemoClock to improve more lives.

Thank you for agreeing to meet with us, because this interview will help us with our research and the development of marketing materials. These marketing materials may include your testimonial of MemoClock and may be published on Twitter, Facebook and/or Instagram. Please be aware that if we have already posted your testimonial and name, we will try our best to delete it but cannot assure you that we can completely erase it from the internet. Please note that you do not have to answer all questions, and you may stop the interview at any time. By continuing in the interview, you consent to the following: videotaping the interview on Zoom and/or quoting your words for a project presentation, report or MemoClock marketing materials. You will be notified via email if we choose to use your testimonial for marketing materials. Your approval will be required prior to us posting on social media.

If you would like to change your permission status, revoke your interview, or if you have any questions, you may contact gr-D20-MemoClock@wpi.edu. At the end of the interview, we will reiterate the consent and ask again if we can still use the data from this interview.

Interview Questions

Demographic Information:

1. What is your name?
 2. What country do you currently live in?
-

Open-Ended Questions:

3. How did you hear about MemoClock?
4. Can you share a story of how MemoClock improved the lives of you and your family or friends?
5. Has your use of MemoClock changed because of the COVID-19 pandemic?
6. Are you currently under stay-at-home orders due to the COVID-19 pandemic? If so, how has this impacted your ability to interact with your loved one?
7. Would you recommend other people use MemoClock to provide reminders to their elderly loved one? If so why?

Appendix B: Surveys

Pre-Survey Information Used for all Surveys Prior to Giving Survey

We are students at the Worcester Polytechnic Institute working with MemoClock in Copenhagen. MemoClock is an application that facilitates one-way communication from one person- the sender- to another- the receiver. Often, this application is used by care partners to send remote reminders to a person with dementia that they care for. Now, the app has been repurposed to provide communication and reminders to the elderly in social isolation due to the COVID-19 pandemic. MemoClock provides family members and friends with a free way to send audible remote reminders that include pictures to their loved one. Our job is to find ways for MemoClock to increase its public awareness, which will allow MemoClock to improve more lives. All surveys will be used as research for us to create an effective marketing materials for MemoClock. These questions provide us with valuable demographic information for healthcare application market analysis.

Please note that you do not have to answer all questions, and you may stop the survey at any time. By continuing, you consent to the following: providing your opinion of MemoClock, providing your demographic information. Your name is NOT in any way connected to this information. If you would like to change your permission status, revoke your survey, or if you have any questions, you may contact gr-D20-MemoClock@wpi.edu.

Survey Questions

1. How did you hear about MemoClock?
 2. What do you think about MemoClock's receiver interface?
 - a. Can you rate it out of 5? 1 being the worst, 5 being the best
 3. What do you think about MemoClock's sender's interface?
 - a. Can you rate it out of 5? 1 being the worst, 5 being the best
 4. Are there any features you would like MemoClock to have?
 5. Are there any features of MemoClock that you dislike?
-
6. Do you know someone who has dementia?
 7. Who do you know has dementia? (Check all that apply)
 - Parent
 - Sibling
 - Grandparent
 - Friend
 - Other relative

8. Are you a care partner?

For the purposes of this question, we are defining a care partner as a person who provides help to a person with dementia with performing activities of daily living (ADLs) or instrumental activities of daily living (IADLs)

- a) Yes
- b) No

9. If yes to question 10, do you provide 40 hours or more of care per week or less than 40 hours of care per week for a person with dementia?

- a) 40 or more hours of care per week
- b) Less than 40 hours of care per week

10. Are you part of a dementia support group or organization, if so, which one? (Fill in the blank)

11. Are you currently employed?

- a. If so, what is your profession?

12. What is your primary language? (fill in the blank)

13. How old are you?

- a) 18-30
- b) 31-40
- c) 41-50
- d) 51-60
- e) 61-70
- f) >70

14. What country do you currently live in?

- (Dropdown menu with all countries)

15. What social media applications do you use? (Check all that apply)

- Instagram
- Facebook
- Snapchat
- LinkedIn
- Twitter
- WhatsApp
- YouTube
- Tik-Tok
- Other _____

16. What forms of media do you use? (Check all that apply)

- Television

- Newspaper
- Consumer magazines
- Desktop
- Radio
- Billboards
- Mobile
- Specialist magazine
- Other _____

17. What form of media are you most likely to take a healthcare recommendation from?
(Check all that apply)

- Television
- Newspaper
- Consumer magazines
- Desktop
- Radio
- Billboards
- Mobile
- Specialist magazine
- Other _____

If you are interested in providing a testimonial about your MemoClock experience, please click the following link and you will be guided to a different survey. The responses provided above WILL NOT be connected to your name or the testimonial you provide.

Testimonial Form

This form aims to capture your MemoClock user experience. You may choose to provide your name with your testimonial. Our goal of gathering these testimonials is to increase MemoClock's public awareness among the elderly population and their family and friends to connect them. Many elderly people are currently socially isolated due to the COVID-19 pandemic. We believe MemoClock can improve their lives by reducing feelings of loneliness. This is a VOLUNTARY form, please be aware that your response may be published on Twitter, Facebook, or Instagram for marketing purposes. If you change your mind regarding sharing your name and testimonial or have any questions, please email gr-D20-memoclock@wpi.edu. Please be aware that if we have already posted your testimonial and name, we will try our best to delete it but cannot assure you that we can completely erase it from the internet.

1. Please share your MemoClock experience (fill in the blank)
2. What is your name? (OPTIONAL fill in the blank)

If you would like to participate in a Zoom interview to provide more details about your MemoClock experience please email gr-D20-memoclock@wpi.edu

Appendix C: Consent Forms

Informed Consent Agreement for Participation in a Research Study

Investigator: Peter Hansen

Contact Information: phansen@wpi.edu

Title of Research Study: Increasing Public Awareness of MemoClock to Assist the Elderly in Social Isolation During the COVID-19 Pandemic

Sponsor: MemoClock

Introduction:

You are being asked to participate in a research study. Before you agree, however, you must be fully informed about the purpose of the study, the procedures to be followed, and any benefits, risks or discomfort that you may experience as a result of your participation. This form presents information about the study so that you may make a fully informed decision regarding your participation.

Purpose of the study:

Social isolation can be caused by a multitude of factors, most recently the global pandemic COVID-19. To reduce the effects of social isolation that may be felt by the elderly and immunocompromised, an easy way to communicate with family and friends virtually is needed. MemoClock is an easy-to-use application that aims to improve the lives of the elderly by enabling family and friends to remotely send them reminders. MemoClock's original purpose was for people with dementia and now has been repurposed to help the elderly in social isolation. This app maintains social distancing, which is recommended by the World Health Organization, while facilitating communication from family and friends to their older, less technologically-savvy family and friends. MemoClock currently lacks widespread public awareness, adversely affecting its usage among the elderly.

Procedures to be followed:

- Survey of MemoClock users to ascertain their demographics, knowledge, and opinions of MemoClock.

AND/OR

- Interviews of current MemoClock users to get a more personal account of their usage of the app during the COVID-19 pandemic.

Risk to study participants:

Participants may experience emotional discomfort when talking about the care they provide to their loved one with dementia.

Benefits to research participants and others:

There are no direct benefits to the research participant. The results of the research will be used to better understand how to improve MemoClock's public awareness to increase the number of elderly people in social isolation it can help.

Record keeping and confidentiality:

Records of your participation in this study will be held confidential so far as permitted by law. However, the study investigators, the sponsor or its designee and, under certain circumstances, the Worcester Polytechnic Institute Institutional Review Board (WPI IRB) will be able to inspect and have access to confidential data that identify you by name.

Compensation or treatment in the event of injury:

You do not give up any of your legal rights by signing this statement.

For more information about this research or about the rights of research participants, or in case of research-related injury, contact:

Primary Investigator: Peter Hansen, Email: phansen@wpi.edu

IRB Manager: Ruth McKeogh, Tel. 508-831- 6699, Email: irb@wpi.edu

Human Protection Administrator: Gabriel Johnson, Tel. 508-831-4989, Email: gjohnson@wpi.edu

Your participation in this research is voluntary. Your refusal to participate will not result in any penalty to you or any loss of benefits to which you may otherwise be entitled. You may decide to stop participating in the research at any time without penalty or loss of other benefits. The project investigators retain the right to cancel or postpone the experimental procedures at any time they see fit.

By continuing with this conversation, you agree to these conditions.

Interview Consent Script

We are students at the Worcester Polytechnic Institute working with MemoClock in Copenhagen. MemoClock is an application that facilitates one-way communication from one person- the sender- to another- the receiver.

Please note that you do not have to answer all questions, and you may stop the interview at any time. By continuing, you consent to the following: videotaping the interview on Zoom and/or quoting your words for a project presentation, report or MemoClock marketing materials. If you would like to change your permission status, revoke your interview, or if you have any questions, you may contact gr-D20-MemoClock@wpi.edu. At the end of the interview, we will reiterate the consent and ask again if we can still use the data from this interview.

Survey Consent Form

We are students at the Worcester Polytechnic Institute working with MemoClock in Copenhagen. MemoClock is an application that facilitates one-way communication from one person- the sender- to another- the receiver. Often, this application is used by care partners to send remote reminders to a person with dementia that they care for. Now, the app has been repurposed to provide communication and reminders to the elderly in social isolation due to the COVID-19 pandemic. MemoClock provides family members and friends with a free way to send audible remote reminders that include pictures to their loved one. Our job is to find ways for MemoClock to increase its public awareness, which will allow MemoClock to improve more lives. All surveys will be used as research for us to create an effective marketing materials for MemoClock. These questions provide us with valuable demographic information for healthcare application market analysis.

Please note that you do not have to answer all questions, and you may stop the survey at any time. By continuing, you consent to the following: providing your opinion of MemoClock, providing your demographic information. Your name is NOT in any way connected to this information. If you would like to change your permission status, revoke your survey, or if you have any questions, you may contact gr-D20-MemoClock@wpi.edu.

Testimonial Form Consent

This form aims to capture your MemoClock user experience. You may choose to provide your name with your testimonial. Our goal of gathering these testimonials is to increase MemoClock's public awareness among the elderly population and their family and friends to connect them. Many elderly people are currently socially isolated due to the COVID-19 pandemic. We believe MemoClock can improve their lives by reducing feelings of loneliness. This is a VOLUNTARY form, please be aware that your response may be published on Twitter, Facebook, or Instagram for marketing purposes. If you change your mind regarding sharing your name and testimonial or have any questions, please email gr-D20-memoclock@wpi.edu. Please be aware that if we have already posted your testimonial and name, we will try our best to delete it but cannot assure you that we can completely erase it from the internet.

Appendix D: MemoClock Email Seeking Volunteers for Interview

From: Dan Mogensen <dan@memoclock.com>
Date: Friday, March 27, 2020 at 1:26 AM
To: gr-D20-MemoClock <gr-d20-memoclock@wpi.edu>
Subject: [EXT] Fwd: MemoClock: To our Premium users



Start på videresendt besked:

Fra: Doug Bloebaum <blabes@gmail.com>
Dato: 26. marts 2020 kl. 22.03.48 CET
Til: Dan Mogensen <dan@memoclock.com>
Cc: Mike Bloebaum <bloebaum@gmail.com>
Emne: Vedr.: MemoClock: To our Premium users

Hi Dan,

Thanks for the email, and thanks for deciding to make MemoClock free during this unprecedented time; great idea. I have no problem continuing to subscribe anyway to help support the app.

Also, please let the WPI students know that I'd be happy to communicate with them. All the best to you and your family, and stay safe!

On Wed, Mar 25, 2020 at 8:16 AM Dan Mogensen <dan@memoclock.com> wrote:

Dear Premium MemoClock user,

I recently wrote a newsletter to announce that due to the corona situation, I am taking down the paywall to make all the Premium features of MemoClock available to everybody. I sincerely believe that MemoClock will be able to make a difference during these times of social distancing.

I am writing to you Premium users specifically because I feel obliged to tell you that you will now be able to unsubscribe from Premium and still be able to enjoy all features, just as you are used to.

I am also writing to you because I would like you to consider volunteering for an interview with some talented students from Worcester Polytechnic Institute. They are doing a project in social science about MemoClock, and they would love to hear your story. If you would like to have more information about this, please hit reply. (If you already volunteered by replying to my original newsletter about this, please write again).

I have enclosed the text from the first newsletter for your information.

Kind regards
Dan Mogensen
Founder
www.MemoClock.com

—

A message to our users

MemoClock has the potential to help the people who are most at risk of getting complications if they get infected by the coronavirus. After realizing this I asked my developers to take down the paywall.

All old and new users now have access to our Premium features: Sending pictures and voice messages, setting messages to repeat, the possibility to connect more than one Receiver to the same Sender. Existing Premium subscribers should unsubscribe and will be able to continue for free.

Personally, I am the only care person for my dad who is 79 years old and suffers from Alzheimer's and respiratory disease. I know I would not be able to enforce social distancing in my family's relation to my dad were it not for MemoClock.

You are probably on this mailing list because you too care for someone who is not entirely fit to look after themselves or someone who is not tech-savvy. I hope that the new free MemoClock can help lessen the strain of social distancing for both of you.

Four talented students from the Worcester Polytechnic Institute - Caroline, Sophie, Achu, and Alex - will be conducting a social science project on MemoClock this spring. They will be collecting feedback users have on the app, which will be taken into consideration for future app improvements. Additionally, these students will be using your story to spread awareness of how MemoClock can improve the lives of the elderly affected by the COVID-19 pandemic.

If you would like to share your story about how you use the app, please let me know by replying to this message.

I hope that you and your family are safe and remain healthy through all this.

Sincerely,
Dan Mogensen
Founder
MemoClock

Appendix E: Interview Transcripts

Alison Interview Transcript

Caroline: As Dan mentioned in his email, we are 4 students from WPI. Our project is to find more ways to increase Memoclock's public awareness because we know Memoclock improves lives and we really want to get the word out there to as many people as we can. This interview will help us with our research and the development of marketing materials. These marketing materials may include your testimonial of Memoclock and may be published on Twitter, Facebook, and/or Instagram. Please be aware that if you change your mind and we have already posted your testimonial and or name- if you give consent- we will try our best to delete it but cannot assure that we can completely erase it from the internet.

Alison: Ok

Caroline: Please know that you do not have to answer all the questions and you may stop the interview at any time. Please state your consent to the following statements by saying agree or disagree after each of the following items: Videotaping the interview on zoom for the purposes of the 4 researchers- the four of us- transcribing the interview. The video portion will be deleted after the interview. We will only be using the audio portion.

Alison: Ok I agree

Caroline: Quoting your words for our project presentation report or for Memoclock marketing materials

Alison: Agree

Caroline: Attaching your first name to the quote

Alison: I agree

Caroline: Attaching your first name to the quote

Alison: Um I am not so sure.

Caroline: So we will put disagree for now. We will be going through this again at the end so if you for some reason change your mind

Alison: Ok

Caroline: You will be notified via email if we choose to use your testimonial for marketing materials. Your approval will be required prior to us posting on social media. If you would like to change your permission status, revoke your interview, or if you have any questions you may contact gr-d20-memoclock@wpi.edu. I am going to put this email in the chat box that way you have it for your records.

Alison: Ok lovely thanks. Ok

Caroline: At the end of this interview we will reiterate consent and ask again if we can use the data from this interview. Do you have any questions before we begin?

Alison: No. I am just going to get us and shut my window because there is some traffic going past and I might not hear you

Caroline: Ok

Alison: A bit too much traffic for a country that is supposed to be on lockdown. There you go. Ok

Caroline: So we are going to start off the interview with just an easy question, what country do you currently live in?

Alison: United Kingdom

Caroline: Oh Awesome. So now these are the questions specifically about Memoclock. The first is how did you first hear about Memoclock?

Alison: Um I was searching the internet for things to help really so it was just by chance that I came across a testimonial in a chat room.

Caroline: Oh awesome, and can you say help with what specifically?

Alison: Um the fact that my father appeared to have early stage dementia and we wanted some way it was a case of giving him messages while we were away at work. So we don't live with my dad, he lives with my mom and he is the main career for my mom. But he just needed if we could send messages to him, yea really. And yeah, I was just looking for things, what could we do to help him with their daily life and came across it

Caroline: Awesome. Can you share a story of how Memoclock has improved the lives of you, your family or your friends?

Alison: Yea um so I use it. It is set up on an iPad on a mantel piece at my parent's house. While I am at work, I can send a message to remind my dad to make a cup of tea for my mom or to get some lunch cause she can't get it herself cause she is physically disabled. So it depends on him getting it but he forgets that it was lunch time or that he needed to do it and she wouldn't tell him so yea. It was a way of getting around that and send messages to him.

Caroline: Awesome. You mentioned earlier that you saw a testimonial and that is how you heard about it [Memoclock]. Do you remember what area or what forum you saw this testimonial on?

Alison: I don't I'm afraid. It was a Doctor I think. It was a Doctor talking about a patient of his that had come across it. Just in a chatroom about people looking for help with Alzheimer's

Caroline: Perfect thank you. So how has your use of Memoclock changed because of the COVID-19 pandemic, if at all?

Alison: Uh we are not using it really because now I am living with my dad because of COVID so I don't need to send him messages cause now I am living here and working from here. So he still uses it actually to remind him what time it is, what day it is, what month of year it is. He sits looking at it all day, but we don't use it for messaging or anything at the moment.

Caroline: So when you did use it for messaging did you use any of the picture- like where you could send pictures- or the audio features?

Alison: We did upgrade to premium to send pictures. Um because I felt maybe sending messages about "do you fancy a cup of tea?" to give a picture of it might just help rather than sounding like giving him instructions. I don't want to do it, telling him what to do. And it just added variety and livened up the day a bit. We can't because it's such an old iPad, we can't use the audio messages on it.

Caroline: Ah ok.

Alison: So any of the new features we can't use. But that's because of the software we are using

Caroline: Ok. So are you currently under stay at home orders due to the COVID-19 pandemic? If so, how has this impacted your ability to interact with your loved one?

Alison: Um it has made it better cause I am here all the time. As opposed to yea that it made it better for him. Not my family or not here.

Caroline: And is the entire UK under stay at home orders?

Alison: So the entire country is stay at home as long as you can work from home. Um if you are an essential worker you can go to work. Um and you should not go out except to buy medicine or food. Um or if your delivering things for vulnerable people or whatever. So yea

Caroline: Awesome. So would you recommend Memoclock to provide reminders to other people with elderly loved ones that may or may not have dementia.

Alison: I would. Um you've got to be able to uh there has been a few glitches and I know Dan is always upgrading it and stuff and he is brilliant in his responding to queries because I am always getting it wrong or something goes wrong on the software and it knocks out and I get stuck. Um but because there are those glitches that is the only thing that stopped me from putting a testimonial on his site um just because sometimes it's a faf when it goes wrong and I don't want to put somebody else in that position if it's going to be a faf really. Just because I know I live locally to my mom and dad and I can come around and sort it out, but I don't know how I would sort it out if I couldn't come around and do it.

Caroline: Ok

Alison: But we have had no problems since the upgrade

Caroline: And are there any features that you would like to see in Memoclock other than it not faffing out?

Alison: Um so it's a case of I got a sister. Um so a couple of things so I've got the account, I send the messages. I've given her my login so she can send messages as well cause we share care for my parents. So it was a case of before lockdown I would come around every night um and send the messages during the day and during the week my sister would do it and in the weekends I would be here. So we were doing that. So if she was out during the day doing something, she might want to send him a message so she used my login on her phone so she could send messages as well. Um we sometimes wish we could know whether they read them or not, but we understand why Dan doesn't want to put an interactive button on there for them. Because it is keeping it simple and I think my dad would be very confused as to what they are doing and even if it said it out loud, I think that would freak him out. Um so sorry the question was additions. So the thing is now my mom is in Respa in a care home so we got another old iPad that we were gonna give to her. But I can't do it on my account. I can't send some messages to the one at my dad's house and some messages to the one where my mom is. And the only way I can see at the moment of doing it is to get another phone with another phone number to do it. And I don't know if Dan can create something around that. That would be really useful.

Caroline: That is a great recommendation. I will definitely note it down and talk about it with Dan to see if it's at all possible.

Alison: Yea I am trying to look at the ethics of "can I load it onto my work phone?" because at least that is another number but hmm I don't know how I feel about that. But um yea that's really the only improvement

Caroline: So would it work as well if you could potentially- so I know other apps not reminder apps, but uber you can use an email instead of a phone number so would it work if you could use it like the accounts under two different emails?

Alison: Sorry say that again I am not quite with you.

Caroline: So the reason you need another phone number is because in order to have a different account you need a different phone number to be able to send the messages.

Alison: Yea

Caroline: So if Dan makes it possible that instead of using a phone number you use an email would that work?

Alison: That would work because I got a couple of different email addresses so that would work. Yea, yea that a good idea. Yea

Caroline: Do you follow Memoclock on any forms of social media? If so which ones?

Alison: No I don't. I didn't know there was. What social media have they got?

Caroline: Facebook, Instagram, and Twitter

Alison: Oh ok. Ok that would be quite interesting actually to see how other people are doing. Ok

Caroline: You mentioned your mom is now going to potentially be using a different iPad with Memoclock on it.

Alison: Yea

Caroline: Do you foresee the messages you send to your mom being different than the messages you send to your dad?

Alison: Yes. Um because moms at the moment in Respa in a residential home, it would just be greetings. So "hello, here we are, we haven't forgotten you", "how's your day?". Whereas dad will be instructions sort of or letting him know I mean we leave a board telling him where we are and what is going on but it might just be "I'll be home at 6 o'clock" or you know "are you thinking about having lunch yet?" or something like that you know "don't forget to have a drink" so his would be more instructional and mom's would be more social really.

Caroline: Um so that is really it. Our interview was meant to be really short we just wanted to hear from the users and how they use it. So that is really it thank you so much for providing all that information. I am now going to reiterate the consent so please state your consent by saying agree or disagree after each of the following items: videotaping the interview on zoom for the purposes of transcribing this interview. The video portions will be deleted after the interview.

Alison: Agree

Caroline: Quoting your words for a project presentation report or for Memoclock marketing materials

Alison: Agree

Caroline: Attaching your first name to your quote

Alison: Yea agree

Caroline: Attaching your last name to your quote

Alison: That's fine yea I agree. Wasn't sure what I was gonna say (laughs)

Caroline: Uh if you would like to change your permission status or revoke your interview or if you have any questions you may contact gr-d20-memoclock@wpi.edu which is in the chat still and if you forget it for any reason you can email me and I would be happy to provide you with that email again

Alison: Thanks Caroline

Caroline: yea of course. At the end of this interview oh well we are at the end of this interview (laughs)

Alison: (laughs)

Caroline: So this officially concludes the interview. After the interview you will be getting a post-interview survey which takes less than 5 minutes to complete. The purpose of this survey is to gather demographic data which can be used for our market analysis of Memoclock. The results of the survey are completely anonymous and are not linked to your name or the interview. As part of our marketing materials we wanted to know if you would be willing to send us a picture of you or you and your loved ones this is at all mandatory it is completely optional if you feel comfortable.

Alison: No (laughs) thank you

Caroline: Ok finally thank you for sharing your amazing story if we do end up using any of your quotes for testimonials and marketing purposes you will be getting that by email and you will have to approve it before we use it at all.

Alison: Brilliant thanks Caroline. So, I just wanted to check, how many people are you interviewing for this?

Caroline: So far we have five. The bigger portion of the project is the survey so we are going to be sending that out to all Memoclock users. And since it is so short we are expecting a big response rate. You'll see when you get to it. I took it and it took me about 2 minutes to complete. (laughs) so we say less than five minutes. But yea our market analysis is basically on the survey.

Alison: How many subscribers does Dan have?

Caroline: So his mailing list has 300 people. Actual subscribers he has a little under a 100

Alison: Ok ok so well goodluck with it. Well thank him yea its great.

Caroline: Thank you so much Alison

Alison: Goodluck with your project. Thanks a lot

Caroline: Bye

Alison: Bye Alex

Alex: Bye

Doug Interview Transcript

Alex: I just want you to know, this part of the survey, or this part of the interview rather, is being recorded just so we can get your consent before we move into the actual interview. This interview will help us with our research and our development of marketing materials. These marketing materials may include your testimonial of MemoClock and may be published on Twitter, Facebook, and/or Instagram. Please be aware that if you change your mind and we have already posted your testimonial and name we will try our best to delete it, but we cannot assure you that we can completely erase it from the internet. Please note that you do not have to answer all questions, and you may stop the interview at any time. Please state your consent by stating agree or disagree to each of the following items: Videotaping the interview on Zoom, and/or quoting your words,

Doug: Agree

Alex: Quoting your words for the following items: Project Presentation, Report, and/or marketing materials.

Doug: Agree

Alex: Attaching your first name to your quote.

Doug: That's fine, I agree

Alex: And lastly, attaching your last name to your quote.

Doug: Disagree.

Alex: Okay. You will be notified via email if we choose to use your testimonial for marketing materials, and your approval will be required prior to us posting on social media. If you would like to change your permission status, revoke your interview, or if you have any questions, you may contact gr-D20-MemoClock@wpi.edu, which I'm going to share in chat right now. You can write that down somewhere if you wish. At the end of the interview, we will reiterate the consent and ask again if we can still use the data from the interview. Do you have any questions before we begin?

Doug: That all sounds good.

Alex: Alright, great, now that that's out of the way... sorry about that. Firstly, we just wanted to know how did you hear about MemoClock?

Doug: Let's see... It was a couple of years ago, I was searching for something based on a recommendation that my younger brother, he's about 6 years younger than I am, to find something that's exactly what MemoClock is, to help my mom out with remembering appointments, meetings, stuff like that. Basically it was a Google search that led me to MemoClock.

Alex: Do you know how your younger brother heard about it, or do you just know that he recommended it to you?

Doug: No he had recommended it, and he had said ' Hey, we need something along the lines of an app that Mom can look at or use, I wonder if anything out there exists.' And that's when I took the initiative to do the search on my own. So he didn't know what it is, and I found it based off of some fairly uncreative Google Searching.

Alex: That's good to hear, it means that MemoClock is getting it's word out there. Can you share a story of how MemoClock improved the lives of you, your family, or your friends?

Doug: Yeah so the only experience I have is with my mom, so that's my only touchpoint with the app. So my brother and I are the more technically inclined of the three children, so my Mom is on her own, we lost my dad about four years ago, and she's living in an independent living environment, about 30 minutes from my brother. I live in Dallas, Texas, so I'm a long ways away from her. So it's helped us a bunch, the main thing being she has a hard time remembering schedules throughout the day. What I do is, I type in the daily schedule for her so that it displays on MemoClock all the time, all day long. So I think my use of the app is a little bit atypical where I put the entire day's events in. From 8 to 9 you have this, from 9 to 10 you have this, and that displays all day long. So it really helps her to be able to go look at the iPad that we have it running on, and look at the whole day schedule and say 'oh, right now I can see it's 8:30 so in half an hour I have to be at...' So instead of her missing things which would frustrate her, or forgetting that Mike's going to pick her up for a football game, you know, something like that, she can look at that clock, 10, 20, 15 times a day, which we know she does, and see what's coming up next. So it was a huge help for her, and peace of mind for us as well.

Alex: That's good to hear. Has your use of MemoClock changed due to the COVID-19 Pandemic?

Doug: Not really, I still enter the days, I still get the schedule of events from the independent living place where she lives at the end of the previous month then I spend some time typing in the events of the upcoming month, as future reminders of MemoClock on a day-to-day basis, and I've continued to do that throughout the COVID virus pandemic. I don't think much has changed with how I use the app

Alex: Okay... Has the COVID-19 pandemic impacted your ability to interact with your loved one at all?

Doug: Yeah definitely. More so for my brother than me since I live a number of states away, Texas versus Ohio, my brother would go over at least once a week to go see my mom and they would go pick her up, go see a high school sporting event. That, of course, has stopped but they shut down any external access to anyone in the facility towards the beginning of the outbreak, Ohio was, sort of, out ahead of other states in that regard so they did the shelter in place about a week before other states did. So, she's been on her own, which she's fine with, lest you worry about that she's very happy to be on her own, she doesn't have any person-to-person contact but we're still able to put things on her list of things to do today through MemoClock. And also, if Mike is going to go over to deliver something to the front desk, he'll add something to the MemoClock for the day, saying "Mike's dropping something off at 9 o'clock so be sure to stop by the front desk at some point today" so that little bit has changed. He definitely has less contact with her personally than he used to prior to the COVID-19 Outbreak.

Alex: Would you say that Memoclock has... I forgot what my question was going to be, I'm sorry.

Doug: Not a problem.

Alex: So would you recommend MemoClock to be used for other people who have an elderly loved one or who may have... who MemoClock might help out.

Doug: Yeah absolutely, I recommend it 100%. For my mom it's a huge deal for her to be able remind herself multiple times a day what's coming next in three or four hours that at 5 o'clock Mike's going to come pick me up for a football game tonight. But if she looks at it every 20 minutes or 30 minutes she can be confident that she's not going to forget, it's always there, and she doesn't have to do anything to remind herself, it's always there on the screen. So that's huge and I'd recommend that for anyone who has short term memory issues that many older people have so yeah it gets a huge recommendation from both my brother and me.

Alex: That's good to hear. Do you have any experience using the app yourself other than typing in the programmed reminders? Does your brother use the app at all as well?

Doug: Yeah so all three of us children - So I have a Brother Mike and my sister Elisa and all three of us can use it. I do most of the bulk insert work myself but then he'll go into a day and edit the existing information I already put in and add some things for a given day so I mentioned the example - he's going to pick my mom up and do a shopping trip with her and he'll say "Mike's going to be meeting you at 3." It's awesome for us to see that she'll be down, waiting for him in the lobby. So she remembered, she looked at it, she showed up at the right time, and that makes her happy and it's good for us to know that she's actually reading the stuff we put in and it makes a difference for her. So I do the entry but he'll also do the editing for a daily appointment. My sister Elisa is not as technically inclined as the two of us are, but once in a while she'll add something to say "oh, today's your granddaughter's birthday don't forget to give her a call and here's her number and that kind of thing helps her to have the phone number right there and she can look at it look at the phone and enter it in without having to go into her date book and figure out for her to dial so all three of us do the entry and all three of us can use the app. I usually use the website version of it just because it's easier for me to have the big screen when I'm doing the bulk entry. I would say Mike probably is more inclined to use either the iPhone or the Android app version of it

Alex: And how easy would you say it is for you to use and would you say it's easier than you expected initially, harder than you expected initially for something like MemoClock?

Doug: I think it does a really good job for the use case it was designed for, I'm sorry I'm speaking IT language now, It does a really good job for what it was designed to do. I think our use of it is not what it was designed for, for me preloading an entire months worth of information on one day, it doesn't handle that use case very well. I'm able to work around it by using a Google sheet and throwing a bunch of stuff in there and copy pasting , then going to the next da So the work flow for me is not super easy, but like I say it's being used for something it wasn't designed to be used for and still manages to handle it which I think speaks for it's good design since it was flexible to handle my weird use case. For using it the way it's supposed to be used it does really well so if I want to go in and add something for, just a quick hit go, it works great, it's really quick and easy to do. Like I said for my not typical use case, it doesn't do quite as well as I'd wish. I kind of wish as an IT nerd that there would be an API gateway for it where I could throw a bunch of stuff at it at once, give it a date in some format, date description, and just let it rip through the entire month. But again, it handles the way I use it, maybe not super elegantly, but it works.

Alex: That's good to hear. So I think we're mostly done with the questions that we've pre-set out for you guys, however does the rest of my team, can you think of any questions that you want to ask Doug?

Caroline: I have one. So you mentioned that you use the app basically every day to give your mom this schedule, which sounds great, do you ever use the features including the voice, audio feature that you can add into the reminder or adding pictures to your reminders?

Doug: I've used pictures a few times and when I talk to my mom on the phone about it she's like "I like to get the pictures but it takes up too much space I like to see the schedule more than the pictures" So I haven't done that really but it's nice to throw up a picture of her grandson at college or something and she enjoys seeing that but she says "I need that to go away so I can see the rest of the schedule" so I think the font gets bigger if the picture is out of the way and she likes to have a bigger font so she can see that. I have not used the audio; I can't think of a good reason for me to use the audio at this point, but the pictures I've definitely used.

Caroline: Great, that's all great thank you.

Alex: Anybody else have any questions? Including you Doug, you can feel free to ask us questions, this doesn't have to be us just talking at you.

Doug: No, I've been going back and forth with Dan, the original designer, founder of the app. He's been really responsive which is great, he definitely has a personal stake in making the app good because he's using it for his own family as well. He's been really responsive to suggestions and questions I've had, so that's been nice. The bigger an app gets the less access you have to the people who can make a change to it, so it's nice that it's a small app which is probably good, a small to medium sized user base, so it's nice to have access to the person who can make changes. What else can I say about it... To us the big differentiator for this is that our mom doesn't have to do anything to access it, it's just there. She doesn't have to remember to check her email, which she doesn't use email, she doesn't use smartphones or anything. Just the fact that she can go over and look at it multiple times per hour is great for us, she doesn't have to click, drag, swipe anything, it's just always there and we have access to change it whenever it's needed which is good. So let me ask you guys, what's your goal, are you doing a report on the efficacy of the app during COVID or is it more general about the app for use in the aging population?

Alex: So, we started this project back before the COVID pandemic really kicked in, we started it back in January, and back then we weren't planning asking questions on is the covid pandemic affecting your loved one but... Things changed, we've been working closely with Dan on this project, and he wanted to regear this project to something that can be used for social isolation. You probably saw his email, actually you must have seen his email if you responded, saying that, it's now free for everyone because of COVID-19 and that he's been looking for volunteers. But other than that, we've been working with him to try and expand its audience mostly. Into this COVID-19 pandemic so that more people know about it, because not everyone might know that if you do a quick Google search you can find an app like MemoClock and that they exist even. It's amazing the amount of apps that exist for all different purposes, and you don't always think about it really.

Doug: That's a good point and I should bring that up too is that my brother Mike said that we need to find this app, and I said oh I'm certain, there's got to be, this such a breadth of people thinking about it, and he said "well you can write it if you have to" and I said "No, I don't want to write this thing it's a whole lot more complicated than you think it is." And I was glad to find MemoClock because it wasn't like there was 35 different ways to do this. MemoClock was the first thing I found and it was the only thing that was available that we were looking for, so, I was surprised but also happy to find out that there was something out there.

Alex: That's good, that's very good to hear. Caroline, did you have something to say?

Caroline: Yeah, just an add-on to what you mentioned, so before our plan was to create more of a business plan for MemoClock, so encompassing everything that goes into running this type of app, the costs, marketing. So, we're just going to provide a plan. Now, instead of spending a whole 2 and a half months coming up with a plan, we're coming up with a plan and quickly implementing it, to really get its word out there and increase its public awareness, so it can help people like your mom that now have to be in social isolation, and maybe don't know how to use the super crazy technology that we have now, I know my grandma doesn't, so she would benefit from an app like this.

Doug: Yeah absolutely, the less interaction that's required the better.

Alex: Alright, one last call for any last questions? I know we're ending a little early but, more time for you guys, I guess. So I'll just reiterate the consent one more time. I'll just go through the whole thing, feel free to... yeah. This interview will help us with our research and our development of marketing materials. These marketing materials may include your testimonial of MemoClock and may be published on Twitter, Facebook, and/or Instagram. Please be aware that if you change your mind and we have already posted your testimonial and name we will try our best to delete it, but we cannot assure you that we can completely erase it from the internet. Please note that you do not have to answer all questions, and you may stop the interview at any time. Please state your consent by stating agree or disagree to each of the following items: Videotaping the interview on Zoom.

Doug: Agree

Alex: Quoting your words for the following items: Project Presentation, Report, and/or marketing materials.

Doug: Agree

Alex: Attaching your first name to your quote.

Doug: That's fine, I agree

Alex: Attaching your last name to your quote.

Doug: Disagree.

Alex: You will be notified via email if we choose to use your testimonial for marketing materials - And just to add onto that we're going to email this marketing material saying "hey you said this can we post this on these sites" and obviously you'll have one another chance to say I want this posted or I don't want this posted, back to the spiel - your approval will be required prior to us posting on social media. If you would like to change your permission status, revoke your interview, or if you have any questions, you may contact gr-D20-MemoClock@wpi.edu. At the end of the interview, we will reiterate the consent and ask again if we can still use the data from the interview. Do you have any questions before we end?

Doug: No I don't think so, I think that all sounds fair and I wish you all good luck and I'm sorry that your academic year is being interrupted by this stupid coronavirus. I hope it goes well from here on.

David Interview Transcript

Achu: This interview will help us with our research and the development of marketing materials. These marketing materials may include your testimonial of MemoClock and may be published on Twitter, Facebook and/or Instagram. Please be aware that if you change your mind and we have already posted your testimonial and name, we will try our best to delete it but cannot assure you that we can completely erase it from the internet. Please note that you do not have to answer all questions, and you may stop the interview at any time. Please state your consent by saying "Agree" or "Disagree" to each of the following items:

- Videotaping the interview on Zoom for record-keeping purposes

David: I'm not sure why you need to do that; you've talked about Twitter and Facebook, so I don't agree to that. It depends on what the use is. If you just need it purely for your internal use, I don't have a problem, but if it's anything other than within your own research institution then obviously that would be different. That would be a no.

Achu: So, when I say videotaping the interview on Zoom for recordkeeping purposes, that's just for us to transcribe the interview and potentially use quotes. There's another section which you can specify the level of anonymity you want attached to the quote.

David: Yup, alright.

Achu: Yeah, so for each of them just say agree or disagree.

- Videotaping the interview on Zoom for record-keeping purposes

David: Agree

Achu:

- Using the Audio from the Zoom interview for marketing purposes

David: Agree, but without my name

Achu:

- Using the Video from the Zoom interview for marketing purposes

David: Disagree

Achu:

- Quoting your words for a project presentation report or for MemoClock marketing materials

David: Is that internal use? You and MemoClock. I agree but without my name

Achu:

- Attaching your first name to your quote

David: Agree

Achu:

- Attaching your last name to your quote

David: Disagree

Achu: You will be notified via email if we choose to use your testimonial for marketing materials. Your approval will be required prior to us posting on social media.

Achu: If you would like to change your permission status, revoke your interview, or if you have any questions, you may contact gr-D20-MemoClock@wpi.edu. At the end of the interview, we will reiterate the consent and ask again if we can still use the data from this interview. Do you have any questions before we begin?

David: Nope

Achu: How did you first hear about MemoClock?

David: My sister told me about it, and she'd seen reference to it in some publication relating to dementia.

Achu: Got it. Can you share a story about how MemoClock has improved the lives of your family or friends?

David: It's helped – well I've used it for my father. My father is 90 and he's had a dementia diagnosis for four or five 5 years. So, we use it to give him reminders about things like when it's okay to go out and when it's not a good idea to go out. In particular, one of the things he liked to do was go to a café to get a full English breakfast every morning but he would sometimes show up before it opened. Sometimes several hours before it opened. So I set up a daily thing where it would say "It's night time, don't go out – Luigi's isn't open yet." And a quarter of an hour before opening time I would say "you can leave now if you want to." And if it was Sunday it would say "Don't forget they're closed all day today." So that helped with his daily routine and he found that very helpful.

Achu: Got it. And you mentioned that your sister had mentioned it to you. Do you and your sister, and any other siblings, share responsibilities when it comes to being the care partner for your father?

David: Yes, we do.

Achu: Got it. Has your use of MemoClock changed at all or varied a bit due to the COVID-19 pandemic?

David: Yes. What happened was that a day after the country went on lockdown and essential travel only we took my father and put him into a residential care home. Then I installed the MemoClock next to his TV so it would be in his line of sight. I was able to use that, in particular with pictures; I would send him text messages with photographs. He was confined – he IS confined – to his room because they're on a pretty strict lockdown and they don't want the virus sweeping the whole care home. He has to stay in his room, he doesn't really get it. So I've taken some photos of the queue of people outside the supermarket spaced 6 feet apart and familiar shops that are shuttered at 10 in the morning and said "Dad, this is it. It's real. The [unknown] High Street where you're used to going is basically shut." He's found that very surprising and it's all helping him come to terms with something that he can't really process without physically seeing it for himself.

Achu: Got it. Before the pandemic, were you or your siblings in pretty close contact with your dad? Were you seeing him very often?

David: Yeah, we would both go and see him once a week. Occasionally I would send him a MemoClock postcard like "Hi Dad here's the Yellow Submarine outside Liverpool airport." – that kind of thing. It's a nice facility to have but the fact of the matter is that he's a bit too far gone with his dementia to really get much benefit from it these days. It was more beneficial when we first had it I would say

Achu: Got it. How many years have you been using MemoClock?

David: I'll have a look. Not that long but I'll do a little bit of a... while we do the interview. Let's come back to that one. If I do a search for MemoClock in all my mailboxes it will surely tell me... Oh! I can tell you where she [sister] found it. It's an article on the BBC (<https://www.bbc.com/news/blogs-trending-47056039>). It was only in February last year. That's interesting because it kind of tells me how much he's deteriorated in the last year quite honestly. You've probably seen it, I guess. Somewhere in the news article. That was where she found it and it was February last year.

Achu: Yeah that would definitely be appreciated. I don't know about you **Caroline** but I didn't know MemoClock had a BBC article. That's awesome, that's great to hear. And leading off of that, would you recommend other people use MemoClock to provide reminders to their elderly loved one, and if so, why?

David: Yeah, I would. I think it's easy to set up in the first instance. You have to get over the confusion of the fact there's two versions of the app. But all in all, it wasn't terribly difficult to set up. Adding another tablet or smartphone helper is pretty easy. It's pretty foolproof – not a 100%, it can't be a 100% - it's pretty foolproof on the user's end because so long as it's plugged in it stays live the whole time. So that's as easy as it can be. And it's just really nice to be able to send messages to someone who absolutely does not have any ability with technology at all. I really like the picture facility - being able to send them pictures is just a lot more meaningful than just words for someone that age.

Achu: Absolutely. Have you taken advantage at all of the audio message feature?

David: No. I've seen it's been added recently, but I haven't. I think I tried once, but not very hard, but it didn't work, or I couldn't figure out how to make it work. I'm not quite sure what I'd do with the audio thing. What happens? You record a clip and they have to press on it to play?

Achu: Yes, I think? We have to review that functionality.

Caroline: I could just talk real quick. From what I understand, when you send a reminder the audio is supposed to play like how the message plays. Like how the message just shows up, the audio plays. But if it's not working we can definitely pass that on to Dan to let him know to look into it.

David: Nope. I sort of tried once and I wasn't... See, the other thing is – what's he's got as well as a MemoClock in his room, is he's also got a telephone. That's really, really good. You can pick it up and have a conversation two-way with that. It works really well. So I'm not really bothered about the audio thing.

Achu: That makes sense. And kind of lastly, do you follow MemoClock on any forms of social media?

David: No. Coming back to the audio thing, if you want to see it as a dementia aid, the problem with audio is it's a one-time thing they're going to forget. Having a reminder that's there and stays on the screen...that's my opinion – I'm not bothered about the audio thing.

Achu: Yeah, got it. That's actually part of the things we were looking into when we were doing research into the market of these apps –the efficacy of having audio for apps like these. That's definitely very valuable information and we'll definitely make use of it for our project. Aside from that, I don't really have anymore questions from the script or from the pre-prepared list of questions we had. **Caroline**, if you'd like to chime in with anything you'd like to ask, or **David** if you have any questions for us, feel free.

Caroline: No, I just think – thank you so much for sharing your story! It's really awesome to hear how you use MemoClock. Hearing the differences of what people use it for and what types of different messages people send; it's really great.

David: Yeah, I kind of wish we had it earlier because he is deteriorating gradually. It would have been more useful in the early days of his dementia. I think it might be slightly mistargeted if it's sold as a dementia aid. I think as people get old; they get more forgetful even if they don't actually have Alzheimer's disease. There is this catchall term 'dementia' which is a bit sort of forgetfulness and you can have that to a small extent. I think that the more 'with it' people are, the more they're able to take on board that "this is useful for me to see a message or notice that the picture is different to what it was yesterday." When I showed it to the manager at the care home when we checked dad in a couple weeks ago, she was really impressed, I mean, she absolutely loved it. And I think her mind really was on not the people on the dementia wing but for the residents more generally. In a care home, a message being pinged out to all the residents like "don't forget the scrabble club is in 15 minutes" would be really, really handy. I mean goodness knows I don't know how I would live my life if I didn't have Outlook reminders. You know that kind of thing pinging up. I certainly would've completely forgot this meeting as opposed to forgotten it was a video rather than a phone call. So, she's absolutely fascinated by it. All the people that she's interested in sort of need a little nudge but they're basically not really actually mentally impaired. So, what was the other thing I was going to say. I guess you're into sort of marketing and how it's used. One issue that they've got is that it's not available on the Kindle Fire. You have to be sort of a tech-whiz to be able to do it because Kindle Fire doesn't have the Google Play. And the other sort of little technical thing which is probably not solvable is if a device goes offline, you're stuffed unless you have someone there to sort it out. I don't know what might have caused it to go offline but it did in the care home. So, we let the manager know and she sorted it out – maybe it became unplugged. But how would you do it, I don't know. I'm not a technology dude. Maybe it's possible to set the thing up so it can be remotely pinged to switch it to MemoClock.

Caroline: Are there any features – I know you had mentioned that maybe marketing it towards dementia isn't the best way of marketing it – are there any features that you feel would be beneficial to have it as a dementia app. Is there anything that you think is missing for your dad?

David: Well, I guess it comes back to the voice thing. Can you kind of record a message and have it play at a certain time? I suppose you probably can. With my father the issue is always going to be – it was things like "Hey, there's a film you'd really enjoy at 2 o' clock in the community center on Monday" – and he never, ever managed to take himself off to one of those films because he'd just forget. The issue would be that he would be out so he wouldn't hear a recorded message so it wouldn't make much difference. No, I think that the only thing – one other suggestion I suppose would be that there is absolutely zero interactivity from the point of view of the person being supported. Suppose you could send a message and have that message alternate with a photograph, something like that. So that you're seeing "'happy birthday, dad" and then a photograph of the family or, you know, "don't forget to go to see the film" and then a photograph of the film or whatever. When you've got movement like that it tends to catch the eye a lot more. Because my father does tend to just, just sort of let the world go by. And he almost stubbornly – comes across like that – you know, not going to bother looking at anything. He's reached a point, and by the way, he's not completely gone. The only reason he's now in a care home is because of COVID. Otherwise, he would continue to be caring for himself. You know, brushing his own teeth, going and getting his cooked breakfast, and having a carer come in once a day to get him to take his tablets. But he would still be hanging in there so long as he gets his daily visit. But he's nevertheless already too far gone to benefit much from MemoClock. It needs to be a bit more 'in your face' like 'hey at look at me, hey look at me.' So, something that moves, like for instance alternating between text and a picture might be an idea. But then if you did that, you'd need a way to have a thing on the screen that you could sort of press and say 'cancel', otherwise it's going to get really annoying.

Achu: Right, yeah. I've definitely thought about that as well in terms of what you said – there's no possibility for communication from the receiver end. Having some very easy dashboard of like quick responses. Like a check mark for "received."

David: Yeah, yeah. I've seen this and that would be good! That's a nice idea because the fact that it's so one way means you've got absolutely no idea whether there's any point in doing this at all. So, yeah, I like that. Tick mark that says, "I've seen this" and changes the flashing, alternating text and pictures to the combination that it currently has of a static text and picture.

Achu: Absolutely, yeah. These are definitely great ideas. Usually what happens at the end of these interviews is we'll also send a survey which will help us collect information about what you think of the current MemoClock interface and all that other stuff as well. So be on the lookout for that. The information you've provided is really useful. So, that's about all I had for the interview. We'll definitely pass this information on to Dan and help make these changes happen if possible. So, since we're ending it soon, we should also go over reiterating the consent. But before that, if you want to ask us anything, feel free.

David: No, I remember the consent and I'm perfectly happy to say I will stick with my original agreements if that's fine with you. But if you're legally required to do it by your IRB then go on.

Achu: Unfortunately, we do. So please state your consent by saying "Agree" or "Disagree" to each of the following items:

- Videotaping the interview on Zoom for record-keeping purposes

David: Agree

Achu:

- Using the Audio from the Zoom interview for marketing purposes

David: Agree

Achu:

- Using the Video from the Zoom interview for marketing purposes

David: Disagree

Achu:

- Quoting your words for a project presentation report or for MemoClock marketing materials

David: Agree, but you haven't stipulated... it's just the words without attribution then? Agree

Achu:

- Attaching your first name to your quote

David: Agree

Achu:

- Attaching your last name to your quote

David: Disagree. Your questions could be a lot clearer, you know?

Achu: Yeah, so just for the sake of full disclosure you're the second interview we've done. So after the first interview we kind of went back and iterated this. So, we'll fix that up for next time. But thank you for bearing with us through that. Again, if you would like to change your permission status, revoke your interview, or if you have any questions, you can contact the aforementioned email. And once again, to reiterate, if we do choose to use any of your testimonials for marketing materials, we will email you to get your consent beforehand. Aside from this, as part of our marketing materials, and this is completely optional as well, we want to know if you would be willing to send us a picture of you, or you or your loved one. This is completely optional; you don't have to agree.

David: Not for marketing, just for your own...?

Achu: This would be for marketing materials.

David: Yeah, I think I'd rather not, thanks.

Achu: That's fine. That's about all we had for the interview. Once again thank you for taking the time out of your schedule to do this.

David: You're welcome.

Caroline: Thank you so much, we got so much valuable information

David: I'm glad, cheers guys.

Caroline: Have a nice rest of your day.

Achu: Take care.

Tara Interview Transcript

Sophie: Hi Tara, how are you?

Tara: Hello, good.

Sophie: Before we begin the interview, we have to go through the consent process. This portion of the interview has to be recorded for our records per the WPI institutional review board.

As Dan mentioned in his email, we are 4 students from WPI. Our project is to find ways for MemoClock to increase its public awareness, which will allow MemoClock to improve more lives.

This interview will help us with our research and the development of marketing materials. These marketing materials may include your testimonial of MemoClock and may be published on Twitter, Facebook and/or Instagram. Please be aware that if you change your mind and we have already posted your testimonial and name, we will try our best to delete it but cannot assure you that we can completely erase it from the internet. Please note that you do not have to answer all questions, and you may stop the interview at any time. Please state your consent by saying “Agree” or “Disagree” to each of the following items:

Videotaping the interview on Zoom for the purpose of transcribing this interview. The video portion will be deleted after this interview.

Tara: Agree

Sophie: Quoting your words for a project presentation report for MemoClock marketing materials

Tara: Agree

Sophie: Quoting your words for MemoClock marketing materials

Tara: Agree

Sophie: Attaching your first name to your quote

Tara: Agree

Sophie: Attaching your last name to your quote

Tara: Disagree

You will be notified via email if we choose to use your testimonial for marketing materials. Your approval will be required prior to us posting on social media.

If you would like to change your permission status, revoke your interview, or if you have any questions, you may contact gr-D20-MemoClock@wpi.edu. At the end of the interview, we will reiterate the consent and ask again if we can still use the data from this interview. Do you have any questions before we begin?

Sophie: Can you state your name and the country you are currently living in?

Tara: Sure, Tara Goode and the US.

Sophie: How did you hear about MemoClock?

Tara: I was actually googling online for some sort of resources for people with memory loss and it just kind of came up on the search engine. So I wasn't particularly looking for it it was just aimless googling on things that could help people with memory loss.

Sophie: And how long have you been using it for?

Tara: Oh gosh... several months. I'm trying to think when we started using it. Gosh, somewhere between 3-6 months I would say.

Sophie: great, and can you tell us a little about how MemoClock has improved the lives of you and your family or loved one?

Tara: Sure, so my dad has a memory issue. We believe its dementia, he is going through the process of a formal diagnosis. So like a lot of people with memory problems he doesn't really recognize how impaired he actually has become. He has a sister a couple years old who has dementia so we are pretty sure that's where we were headed with this. Some of the things her children have gone through with her we've kind used as reference as for things we should intervene with with Dad so he didn't get himself in any sort of trouble. So he started to have trouble finding his way places. He relies on his navigation system in his car but he needs and address to get there and he needs a reminder on when to leave to get there. He would forget things like dr appt. He missed like 3 in a row and got a letter from his doctor that they weren't going to let him come back. He forgets family events, what time he had to be there, where he was going. So this actually worked out really well because he had an old tablet at home so we just put it on his kitchen wall which is where he is when he makes coffee and the room he walks through most of the day. And we billed it as he was having trouble remembering which day of the week it was so we were kind of like “ oh well this will tell you what day of the week it is and also I can send you reminders so it was kind of a very gentle thing to do for him. You know it didn't offend him he found it very handy immediately. So we send reminders for pretty much everything. If he has a doctor appt I send a reminder the day before: “hey dad you have a doctor appt in the morning. Make sure you set your alarm.” What I really like about it is I can have it set for hours. So I can put it up at 5 o'clock and run it to midnight. So If he happens to not be home for some reason he's never gonna miss his message and then he sets his alarm and I have it start again in the morning. If he has a 9 o'clock doctor appt I start it at 6 in case he gets up early so he doesn't leave the house forgetting his appt. I can put in when he needs to leave to get to that appt, I an put in directions. Sometimes we put in pictures which is pretty fabulous and that's more just like a break up his day. Get

him to kind of look at the clock. He really does rely on it. Its one of the few things he talks about. In fact some of the times if we have technical problems and it gets disconnect because the app updates he's pointed it out immediately. SO one of his kids hell say "hey my thing in kitchen isn't working!" so he remembers to look at it and check on it. So its been a huge help and now with the virus issue.. he's a widower and he doesn't cook for himself so he's always gone out to eat a lot. Used to be with friends which he cant do now. But he still likes to go out and get food to go which drives us all crazy. What are you gonna do? So now we can do this when its not displaying another message I have messages reminding him of the crisis. Reminding him that if he goes out he needs to take a mask. That he needs to take hand sanitizer. If he needs groceries to ask one of his kids and we'll get them for him. If he's gonna get food reminding him to call ahead for take out. Otherwise hell go to a restaurant and expect to wait for it. So he cant quite understand the safety issues but we can remind him of them so right before he leaves the house he does see that. So I do think it has helped with this particular crisis. My brother lives with him but works a lot. My sister and I obviously were trying not to visit right now because we don't want to introduce anything to him with as careful as were trying to be. So this is kind of nice because we can send him pictures and maybe more reminders than normally. Because normally we try and stop by regularly and make sure things are taken care of so were using it more now than we usually do. I mean its wonderful its very easy to use and he likes it. He actually has a second MemoClock display upstairs now he had my brother dug up another tablet and we put it in the bathroom. So when he gets up in the morning and is brushing his teeth its right there next to the mirror telling him what day it is and what he's got going on.

Sophie: that's great he likes it so much!

Tara: I know we were concerned he'd feel... you know. People with memory loss like this they really get nervous about losing independence. So you kind of handle these situations, you probably know from researching this, but you have to be really careful you don't offend their sense of independence. He doesn't want his children meddling in his life. So this is an easy way to not meddle but still make sure he's getting what he needs and he's as safe as possible.

Sophie: definitely and that's great its still so useful even though he lives with your brother he can have more independence. So, you mentioned that you have been sending reminders about the coronavirus crisis so he can see them in between other things, would you say you have increased your usage of MemoClock by sharing photos or using the audio feature more so since this has begun to stay connected with him?

Tara: I haven't used the audio feature yet. I have used the photo feature more. This morning I sent him a picture of 3 of my dogs walking shoulder to shoulder and a little note that said "this is not social distancing, don't be like my dogs." Things like that I have been using the pictures more, but I haven't tried the voice. I think id have to warn him if he walks in the kitchen and its talking to him. But well get there.

Sophie: and would you recommend using MemoClock to other people for their elderly loved ones?

Tara: absolutely! I had my own regular doctor appt. a couple of months ago and I was chit chatting with my doctor and recommended it to her. Because you know I had mentioned my dads issue before and she was curious about his neurologist and what we thought about it and I mentioned the app. She actually made a note of it. She likes to have that info on hand for when her own patients come in with stuff like that so I'm hoping she shared it with a few people too.

Sophie: that's wonderful. And Dan is looking at another feature to add for the next update of MemoClock which would be potentially a video chat option where you could call him through the app, would that be useful for you guys?

Tara: I think it would. He is 67 right now and he's not entirely comfortable with his iPhone so he does not use the video chat features. He has a Facebook account but he mostly uses it to look at pictures of other people, family pictures. If it were very user friendly through the app like he just had to one touch he would do that. I think it would be easier. The phone gets too complicated, he can answer the phone and sometimes he remembers to answer our texts but that's about it. But yeah I think it would be a good feature.

Sophie: he has some problems with the phone, do you ever worry about him not seeing the messages... another feature that was discussed was a feedback feature like a button when he receives a message that he could click when he saw it and it would send you that feedback?

Tara: um yeah I could see that being helpful. There are times I follow up with a phone call if there's an early morning doctors appt I do try to follow up with a phone call to make sure. Io could see it being useful. It would be something that could be turned on or off. Not everyone would want to have that on the screen I think it might be confusing for some people but he would be able to handle that I think. There are times I'm not sure if he acknowledged it but I would want to know if it disappeared or not. Like I would want the message to stay up still. That would be one to think about.

Sophie: great, we'll note that. Do you have any other ideas for things you'd like to see in future updates or things that could help you?

Tara: You know the one thing is it might be nice if there was some way for another person to also send updates to it. Now I do all updates for my dad from my phone but there are times when my sister calls me to ask me to put something on it too. So it might be nice if there was a family accessible interface where.. I don't know where you could offer it if someone actually needed it or were able to pay a little more for it. That would help if there are multiple siblings caring for someone to kind of split those duties up. I do worry my boyfriend and I camp and hike a lot. Sometimes were off grid for a week I'm not sure how well handle the MemoClock if it goes down for changes when were not able to have cell service I do worry about that a bit.

Sophie: that's fair. I know that through the MemoClock website you can send reminders that way through the web so if you wanted to give siblings the login they could send messages to your dad as well. Having that interface through the app as well would be helpful so we'll note that as well.

Tara: yeah, ill have to do that on the web when were out of town then on the web.

Sophie: and do you use any social media and do you follow MemoClock on any forms of it?

Tara: that's a good question. Yeah I have a Facebook, Instagram, and twitter. I'm not sure if I follow MemoClock on any of those or not.

Sophie: that's alright, its not updated all that often currently but were trying to increase the amount. Of posts on there as well.

Tara: ill take a look.

Sophie: Well you really answer all my questions with the first question. Unless you've got any questions for us.

Tara: I don't really but if you have any follow up questions just shoot me an email. Ill be happy to help you guys.

Sophie: I do need you to reiterate the consent and have you agree or disagree again. . Please state your consent by saying "Agree" or "Disagree" to each of the following items:

Videotaping the interview on Zoom for the purpose of transcribing this interview. The video portion will be deleted after this interview.

Tara: Agree

Sophie: Quoting your words for a project presentation report for MemoClock marketing materials

Tara: Agree

Sophie: Quoting your words for MemoClock marketing materials

Tara: Agree

Sophie: Attaching your first name to your quote

Tara: Agree

Sophie: Attaching your last name to your quote

Tara: Disagree

Sophie: If you would like to change your permission status, revoke your interview, or if you have any questions, you may contact gr-D20-MemoClock@wpi.edu. At the end of the interview, we will reiterate the consent and ask again if we can still use the data from this interview. Do you have any questions before we begin?

This officially concludes the interview. After this interview you will be getting a post-interview survey which will take less than 5 minutes to complete. The purpose of this survey is to gather demographic info which can be used for our market analysis of Memoclock. The results of this survey are completely anonymous and are not linked to your name or interview.

As part of our marketing materials we wanted to know if you would be willing to send us a picture of you or you and your loved one?

Tina Interview Transcript

Sophie: Hello Tina

Technical difficulties

Sophie: Hi Tina, thank you for agreeing to meet with us. We would first like to introduce ourselves. I am Sophie and this is Achu. Before we begin the interview, we have to go through the consent process. This portion of the interview has to be recorded for our records per the WPI institutional review board.

As Dan mentioned in his email, we are 4 students from WPI. Our project is to find ways for MemoClock to increase its public awareness, which will allow MemoClock to improve more lives.

This interview will help us with our research and the development of marketing materials. These marketing materials may include your testimonial of MemoClock and may be published on Twitter, Facebook and/or Instagram. Please be aware that if you change your mind and we have already posted your testimonial and name, we will try our best to delete it but cannot assure you that we can completely erase it from the internet. Please note that you do not have to

answer all questions, and you may stop the interview at any time. Please state your consent by saying “Agree” or “Disagree” to each of the following items:

- Videotaping the interview on Zoom for the purpose of transcribing this interview. The video portion will be deleted after this interview.

Tina: agree

Sophie: Quoting your words for a project presentation report or for MemoClock marketing materials

Tina: agree

Sophie: Attaching your first name to your quote

Tina: agree

Sophie: Attaching your last name to your quote

Tina: agree

Sophie: You will be notified via email if we choose to use your testimonial for marketing materials. Your approval will be required prior to us posting on social media.

If you would like to change your permission status, revoke your interview, or if you have any questions, you may contact gr-D20-MemoClock@wpi.edu. At the end of the interview, we will reiterate the consent and ask again if we can still use the data from this interview. Do you have any questions before we begin?

Tina: No, I don't think so.

Sophie: So my first question is, you're in Denmark, correct?

Tina: Yes

Sophie: Ok, and how did you hear about MemoClock?

Tina: If I remember correctly it was through a social worker. We went to a social help center. A social worker showed us how to use the app. Someone else who had come in had knowledge of the app.

Sophie: So someone else who had been there had told the social worker about it?

Tina: Yes, and we wouldn't have known about it if it wasn't because of the social worker who could help us and told us about it.

Sophie: That's great, how long have you been using the app for?

Tina: Oh about eight months or so.

Sophie: Can you tell us a bit about it has helped care taking for your loved one and how that's become easier using MemoClock?

Tina: The main issue is my mother kept asking what day it was so we mostly have used it for information about the date and the year and we put in pictures to show if it was morning, afternoon, or night. That helped a lot because she's not asking as much for the same questions over and over again. So that helped a lot.

Sophie disconnected from call

Achu: You shared how you heard about MemoClock, how has it helped improve your life as a care partner for your mother?

Tina: it has definitely helped. My mother doesn't have to ask the same questions over and over again. The pictures make it so much easier in a way to understand. It is still afternoon even though it is dark outside. In the winter time she thought she had to go to bed earlier because it was dark. All of these to us is strange. It's easier for her to have it in writing on the screen. My daughter has sent speaking messages as well and that worked well. That helped improve daily life because it is sometimes difficult to get there.

Sophie: Hello, sorry about that. My internet went out in the middle of it.

Achu: When you left I continued to ask Tina questions.

Sophie: Where does your mother live? With you guys or nearby?

Tina: She lives nearby with her husband. They both need help. She is ready to go to a nursing home but she refuses. She can't see that she is ill at all but it's kind of obvious to everyone else that she has problems.

Sophie: So you live nearby, has your use changed at all due to covid-19 pandemic

Tina: Not really, they don't get a lot of help so we need to go by them. Of course, it's easier because she can get a different kind of information from the MemoClock. We can also text my father and he can tell her but it's easier because she sees it right away and gets the feeling she's part of the family as well.

Sophie: Would you recommend using MemoClock to provide reminders to others?

Tina: yes, I would definitely. It's a good way to get these messages to people with dementia. I like the picture feature. It's easy to put pictures in of people she is connected to. I like that you can put in pictures of the year, like it is spring. It's not always easy to look out the door if its very windy. We had snow yesterday, which is really weird, and to tell her it's still spring even though it's snowing that works. I would definitely recommend.

Sophie: Dan is looking at adding a video chatting interface in MemoClock, would that be useful for your purposes?

Tina: Yeah, I do. We don't have time to get by them all the time. It would be easier to make sure you have contact every day. Then you can see now she is doing. If you call you get a short conversation and you're not able to get the feeling of how well she's doing or if it's a bad thing. It's easier on the video chat you can see her face and her eyes and see how well she's doing.

Sophie: Would she be able to have interface with the tablet? Could she press accept or would she be able to confirm she saw a message?

Tina: I think if it's very clear, bright green. She does get some signals but it's very difficult. People like us who function normally we don't understand... she gets the message but she can't remember 10 minutes after. I don't think it would help to know she saw a message half an hour ago. I get the idea it's nice for the relative to know but I don't know if it really helps. Does that make sense?

Sophie: yes, some of the features aren't useable for everyone.

Sophie: do you use the audio feature?

Tina: Yes, my daughter thinks it's great but I'm not that good at it. But it will come but she has tried it and thinks it works. She mostly chatted with my father but the interaction is great.

Sophie: I think that's all our questions for today. Thank you. Now I will reiterate the consent:

Please state your consent by saying "Agree" or "Disagree" to each of the following items:

Sophie: Videotaping the interview on Zoom for the purpose of transcribing this interview. The video portion will be deleted after this interview.

Tina: agree

Sophie: Quoting your words for a project presentation report or for MemoClock marketing materials

Tina: agree

Sophie: Attaching your first name to your quote

Tina: agree

Sophie: Attaching your last name to your quote

Tina: agree

Sophie: If you would like to change your permission status, revoke your interview, or if you have any questions, you may contact gr-D20-MemoClock@wpi.edu. At the end of the interview, we will reiterate the consent and ask again if we can still use the data from this interview. Do you have any questions before we begin?

This officially concludes the interview. After this interview you will be getting a post-interview survey which will take less than 5 minutes to complete. The purpose of this survey is to gather demographic info which can be used for our market analysis of Memoclock. The results of this survey are completely anonymous and are not linked to your name or interview.

Appendix F: Code Descriptions

Care Partner Codes:		Description		Pandemic Change Codes:		Description	
PARTIAL_CARE_PARTNER		Partial care partner		NO_CHANGE		No difference in usage	
FULL_CARE_PARTNER		Full care partner		SOME_CHANGE		Some small differences in usage	
				SIGNIFICANT_CHANGE		Very different usage due to the pandemic	
Message Codes:		Description		Suggestion Codes:			
IMAGES		Picture-based messages		VIDEO_CHAT		Potential video chat feature	
AUDIO		Voice messages		RECEIVER_ACKNOWLEDGEMENT		A way for the receiver to acknowledge messages	
DATE_TIME		Date/Time display on MemoClock home screen		MULTIPLE_DEVICES			
SEASON		display of current season on Memoclock Home screen		GENERAL			
SCHEDULED		Scheduled messages					
REMINDERS		Reminder messages					
Discovery Codes:		Description					
WEBSITE		MemoClock website					
FAMILY_FRIEND		Recommended from family member/friend					
PROFESSIONAL		Recommended from professional					
SOCIAL_MEDIA		MemoClock's social media					
NEWS		News Article					
CHAT_FORUM		Chat forum					
Usage Codes:				Tags:			
FULL		Uses MemoCock for entirety of care		Positive			
COMPLEMENTARY		Uses MemoClock along with other forms of care		Negative			
				Neutral			

Appendix G: Interview Code Analysis

Care Partners Codes

Person	Category	Code	Tag	Excerpt from interview
Alison	CARE_PARTNER	PARTIAL_CARE_PARTNER	NEUTRAL	my father appeared to have early stage dementia and we wanted some way it was a case of giving him messages while we were away at work.
David	CARE_PARTNER	PARTIAL_CARE_PARTNER	NEUTRAL	Um so it's a case of I got a sister. Um so a couple of things so I've got the account, I send the messages. I've given her my login so she can send messages as well cause we share care for my parents.
Tara	CARE_PARTNER	PARTIAL_CARE_PARTNER	NEUTRAL	My brother lives with him but works a lot. My sister and I obviously were trying not to visit right now because we don't want to introduce anything to him with as careful as were trying to be. So this is kind of nice because we can send him pictures and maybe more reminders than normally.
Tina	CARE_PARTNER	PARTIAL_CARE_PARTNER	NEUTRAL	She lives nearby with her husband. They both need help. She is ready to go to a nursing home but she refuses. She can't see that she is ill at all but it's kind of obvious to everyone else that she has problems.

Message Codes

Person	Category	Code	Tag	Excerpt from interview
Alison	MESSAGE	AUDIO	NEGATIVE	We can't because it's such an old iPad, we can't use the audio messages on it.
Alison	MESSAGE	DATE_TIME	NEUTRAL	Uh we are not using it really because now I am living with my dad because of COVID so I don't need to send him messages cause now I am living here and working from here. So he still uses it actually to remind him what time it is, what day it is, what month of year it is. He sits looking at it all day, but we don't use it for messaging or anything at the moment.
Alison	MESSAGE	IMAGES	POSITIVE	We did upgrade to premium to send pictures. Um because I felt maybe sending messages about "do you fancy a cup of tea?" to give a picture of it might just help rather than sounding like giving him instructions. I don't want to do it, telling him what to do. And it just added variety and livened up the day a bit.
Alison	MESSAGE	REMINDER	POSITIVE	So "hello, here we are, we haven't forgotten you", "how's your day?"
Alison	MESSAGE	REMINDER	POSITIVE	Whereas dad will be instructions sort of or letting him know I mean we leave a board telling him where we are and what is going on but it might just be "I'll be home at 6 o'clock"

				or you know “are you thinking about having lunch yet?” or something like that you know “don’t forget to have a drink”
Alison	MESSAGE	REMINDER	POSITIVE	Yea um so I use it. It is set up on an iPad on a mantel piece at my parent’s house. While I am at work, I can send a message to remind my dad to make a cup of tea for my mom or to get some lunch cause she can’t get it herself cause she is physically disabled. So it depends on him getting it but he forgets that it was lunch time or that he needed to do it and she wouldn’t tell him so yea. It was a way of getting around that and send messages to him
David	MESSAGE	AUDIO	NEGATIVE	Achu: Absolutely. Have you taken advantage at all of the audio message feature? David: No. I’ve seen it’s been added recently, but I haven’t. I think I tried once, but not very hard, but it didn’t work, or I couldn’t figure out how to make it work. I’m not quite sure what I’d do with the audio thing.
David	MESSAGE	AUDIO	NEGATIVE	Coming back to the audio thing, if you want to see it as a dementia aid, the problem with audio is it’s a one-time thing they’re going to forget. Having a reminder that’s there and stays on the screen...that’s my opinion –
David	MESSAGE	AUDIO	NEUTRAL	I’m not bothered about the audio thing.
David	MESSAGE	IMAGES	NEUTRAL	Occasionally I would send him a MemoClock postcard like “Hi Dad here’s the Yellow Submarine outside Liverpool airport.” – that kind of thing. It’s a nice facility to have but the fact of the matter is that he’s a bit too far gone with his dementia to really get much benefit from it these days
David	MESSAGE	IMAGES	POSITIVE	I was able to use that, in particular with pictures; I would send him text messages with photographs.
David	MESSAGE	IMAGES	POSITIVE	So I’ve taken some photos of the queue of people outside the supermarket spaced 6 feet apart and familiar shops that are shuttered at 10 in the morning and said “Dad, this is it. It’s real. The [unknown] High Street where you’re used to going is basically shut.” He’s found that very surprising and it’s all helping him come to terms with something that he can’t really process without physically seeing it for himself.
David	MESSAGE	REMINDER	POSITIVE	And a quarter of an hour before opening time I would say “you can leave now if you want to.”
David	MESSAGE	REMINDER	POSITIVE	And if it was Sunday it would say “Don’t forget they’re closed all day today.” So that helped with his daily routine and he found that very helpful.
David	MESSAGE	SCHEDULED	POSITIVE	So I set up a daily thing where it would say “It’s night time, don’t go out – Luigi’s isn’t open yet.”
Doug	MESSAGE	AUDIO	NEUTRAL	I have not used the audio; I can’t think of a good reason for me to use the audio at this point,
Doug	MESSAGE	IMAGES	NEGATIVE	“I like to get the pictures but it takes up to much space I like to see the schedule more than the pictures” So I haven’t done that really but it’s nice to throw up a picture of her grandson at college or something
Doug	MESSAGE	REMINDER	POSITIVE	he’s going to pick my mom up and do a shopping trip with her and he’ll say “Mike’s going to be meeting you at 3.”
Doug	MESSAGE	REMINDER	POSITIVE	“oh, today’s your granddaughter’s birthday don’t forget to give her a call and here’s her number and that kind of thing helps her to have the phone number right there and she can look at it look at the phone and enter it in without having to go into her date book

Doug	MESSAGE	SCHEDULED	NEUTRAL	What I do is, I type in the daily schedule for her so that it displays on MemoClock all the time, all day long
Doug	MESSAGE	SCHEDULED	POSITIVE	look at the whole day schedule and say ‘oh, right now I can see it’s 8:30 so in half an hour I have to be at...’ So instead of her missing things which would frustrate her, or forgetting that Mike’s going to pick her up for a football game, you know, something like that, she can look at that clock, 10, 20, 15 times a day
Tara	MESSAGE	AUDIO	NEGATIVE	but I haven’t tried the voice. I think id have to warn him if he walks in the kitchen and its talking to him. But well get there.
Tara	MESSAGE	AUDIO	NEUTRAL	: I haven’t used the audio feature yet.
Tara	MESSAGE	DATE TIME	POSITIVE	So this actually worked out really well because he had an old tablet at home so we just put it on his kitchen wall which is where he is when he makes coffee and the room he walks through most of the day. And we billed it as he was having trouble remembering which day of the week it was so we were kind of like “ oh well this will tell you what day of the week it is and also I can send you reminders so it was kind of a very gentle thing to do for him.
Tara	MESSAGE	IMAGES	POSITIVE	Sometimes we put in pictures which is pretty fabulous and that’s more just like a break up his day. Get him to kind of look at the clock. He really does rely on it. Its one of the few things he talks about.
Tara	MESSAGE	IMAGES	POSITIVE	I have used the photo feature more. This morning I sent him a picture of 3 of my dogs walking shoulder to shoulder and a little note that said “this is not social distancing, don’t be like my dogs.” Things like that I have been using the pictures more,
Tara	MESSAGE	REMINDER	POSITIVE	So we send reminders for pretty much everything. If he has a doctor appt I send a reminder the day before: “hey dad you have a doctor appt in the morning. Make sure you set your alarm.” What I really like about it is I can have it set for hours. So I can put it up at 5 o’clock and run it to midnight. So If he happens to not be home for some reason he’s never gonna miss his message and then he sets his alarm and I have it start again in the morning. If he has a 9 o’clock doctor appt I start it at 6 in case he gets up early so he doesn’t leave the house forgetting his appt. I can put in when he needs to leave to get to that appt, I an put in directions.
Tara	MESSAGE	REMINDER	POSITIVE	He actually has a second MemoClock display upstairs now he had my brother dug up another tablet and we put it in the bathroom. So when he gets up in the morning and is brushing his teeth its right there next to the mirror telling him what day it is and what he’s got going on.
Tara	MESSAGE	REMINDER	POSITIVE	. People with memory loss like this they really get nervous about losing independence. So you kind of handle these situations, you probably know from researching this, but you have to be really careful you don’t offend their sense of independence. He doesn’t want his children meddling in his life. So this is an easy way to not meddle but still make sure he’s getting what he needs and he’s as safe as possible.
Tara	MESSAGE	REMINDER	POSITIVE	he’s a widower and he doesn’t cook for himself so he’s always gone out to eat a lot. Used to be with friends which he cant do now. But he still likes to go out and get food to

				go which drives us all crazy. What are you gonna do? So now we can do this when its not displaying another message I have messages reminding him of the crisis. Reminding him that if he goes out he needs to take a mask. That he needs to take hand sanitizer. If he needs groceries to ask one of his kids and we'll get them for him. If he's gonna get food reminding him to call ahead for take out. Otherwise hell go to a restaurant and expect to wait for it.
Tina	MESSAGE	AUDIO	POSITIVE	My daughter has sent speaking messages as well and that worked well. That helped improve daily life because it is sometimes difficult to get there.
Tina	MESSAGE	AUDIO	POSITIVE	Yes, my daughter thinks it's great but I'm not that good at it. But it will come but she has tried it and thinks it works. She mostly chatted with my father but the interaction is great.
Tina	MESSAGE	DATE TIME	POSITIVE	The main issue is my mother kept asking what day it was so we mostly have used it for information about the date and the year and we put in pictures to show if it was morning, afternoon, or night. That helped a lot because she's not asking as much for the same questions over and over again. So that helped a lot.
Tina	MESSAGE	DATE TIME	POSITIVE	It is still afternoon even though it is dark outside. In the winter time she thought she had to go to bed earlier because it was dark.
Tina	MESSAGE	IMAGES	POSITIVE	The main issue is my mother kept asking what day it was so we mostly have used it for information about the date and the year and we put in pictures to show if it was morning, afternoon, or night. That helped a lot because she's not asking as much for the same questions over and over again. So that helped a lot.
Tina	MESSAGE	IMAGES	POSITIVE	My mother doesn't have to ask the same questions over and over again. The pictures make it so much easier in a way to understand
Tina	MESSAGE	IMAGES	POSITIVE	I like the picture feature. It's easy to put pictures in of people she is connected to. I like that you can put in pictures of the year, like it is spring. It's not always easy to look out the door if its very windy. We had snow yesterday, which is really weird, and to tell her it's still spring even though it's snowing that works. I would definitely recommend.
Tina	MESSAGE	IMAGES	POSITIVE	It's a good way to get these messages to people with dementia. I like the picture feature. It's easy to put pictures in of people she is connected to. I
Tina	MESSAGE	SEASON	POSITIVE	The main issue is my mother kept asking what day it was so we mostly have used it for information about the date and the year and we put in pictures to show if it was morning, afternoon, or night.
Tina	MESSAGE	SEASON	POSITIVE	It is still afternoon even though it is dark outside. In the winter time she thought she had to go to bed earlier because it was dark.
Tina	MESSAGE	SEASON	POSITIVE	I like that you can put in pictures of the year, like it is spring. It's not always easy to look out the door if its very windy. We had snow yesterday, which is really weird, and to tell her it's still spring even though it's snowing that works. I would definitely recommend.

Discovery

Alison	DISCOVERY	CHAT_FORUM	NEUTRAL	I was searching the internet for things to help really so it was just by chance that I came across a testimonial in a chat room.
Alison	DISCOVERY	PROFESSIONAL	NEUTRAL	I don't I'm afraid. It was a Doctor I think. It was a Doctor talking about a patient of his that had come across it. Just in a chatroom about people looking for help with Alzheimer's
David	DISCOVERY	FAMILY_FRIEND	NEUTRAL	My sister told me about it, and she'd seen reference to it in some publication relating to dementia.
David	DISCOVERY	SOCIAL_MEDIA	NEUTRAL	Achu: That makes sense. And kind of lastly, do you follow MemoClock on any forms of social media?
David	DISCOVERY	NEWS	NEUTRAL	My sister told me about it, and she'd seen reference to it in some publication relating to dementia.....Oh! I can tell you where she [sister] found it. It's an article on the BBC (https://www.bbc.com/news/blogs-trending-47056039).
Doug	DISCOVERY	WEBSITE	NEUTRAL	So he didn't know what it is, and I found it based off of some fairly uncreative Google Searching.
Doug	DISCOVERY	FAMILY_FRIEND	NEUTRAL	No he had recommended it, and he had said ' Hey, we need something along the lines of an app that Mom can look at or use, I wonder if anything out there exists.' And that's when I took the initiative to do the search on my own.
Tara	DISCOVERY	WEBSITE	NEUTRAL	I was actually googling online for some sort of resources for people with memory loss and it just kind of came up on the search engine. So I wasn't particularly looking for it it was just aimless googling on things that could help people with memory loss.
Tina	DISCOVERY	PROFESSIONAL	NEUTRAL	If I remember correctly it was through a social worker. We went to a social help center. A social worker showed us how to use the app. Someone else who had come in had knowledge of the app.

Usage Codes

Alison	USAGE	COMPLEMENTARY	NEUTRAL	But he just needed if we could send messages to him, yea really
David	USAGE	COMPLEMENTARY	NEUTRAL	we took my father and put him into a residential care home.
Doug	USAGE	COMPLEMENTARY	NEUTRAL	the main thing being she has a hard time remembering schedules throughout the day. What I do is, I type in the daily schedule for her so that it displays on MemoClock all the time, all day long. So I think my use of the app is a little bit atypical where I put the entire day's events in. From 8 to 9 you have this, from 9 to 10 you have this, and that displays all day long. So it really helps her to be able to go look at the iPad that we have it running on,

				and look at the whole day schedule and say ‘oh, right now I can see it’s 8:30 so in half an hour I have to be at...’ So instead of her missing things which would frustrate her, or forgetting that Mike’s going to pick her up for a football game, you know, something like that, she can look at that clock, 10, 20, 15 times a day, which we know she does, and see what’s coming up next. So it was a huge help for her, and peace of mind for us as well.
Doug	USAGE	COMPLEMENTARY	POSITIVE	To us the big differentiator for this is that our mom doesn’t have to do anything to access it, it’s just there. She doesn’t have to remember to check her email, which she doesn’t use email, she doesn’t use smartphones or anything. Just the fact that she can go over and look at it multiple times per hour is great for us, she doesn’t have to click, drag, swipe anything, it’s just always there and we have access to change it whenever it’s needed which is good.
Tina	USAGE	COMPLEMENTARY	POSITIVE	That helped a lot because she’s not asking as much for the same questions over and over again. So that helped a lot.
Tina	USAGE	COMPLEMENTARY	NEUTRAL	it has definitely helped. My mother doesn’t have to ask the same questions over and over again. The pictures make it so much easier in a way to understand.
Tina	USAGE	COMPLEMENTARY	POSITIVE	All of these to us is strange. It’s easier for her to have it in writing on the screen
Tina	USAGE	COMPLEMENTARY	POSITIVE	My daughter has sent speaking messages as well and that worked well. That helped improve daily life because it is sometimes difficult to get there.

Pandemic Change Codes

Alison	PANDEMIC	SOME_CHANGE	NEUTRAL	Uh we are not using it really because now I am living with my dad because of COVID so I don’t need to send him messages cause now I am living here and working from here. So he still uses it actually to remind him what time it is, what day it is, what month of year it is. He sits looking at it all day, but we don’t use it for messaging or anything at the moment.
David	PANDEMIC	SOME_CHANGE	NEUTRAL	What happened was that a day after the country went on lockdown and essential travel only we took my father and put him into a residential care home.
Doug	PANDEMIC	NO_CHANGE	NEUTRAL	Not really, I still enter the days, I still get the schedule of events from the independent living place where she lives at the end of the previous month
Doug	PANDEMIC	SOME_CHANGE	NEUTRAL	More so for my brother than me since I live a number of states away, Texas versus Ohio, my brother would go over at least once a week to go see

				my mom and they would go pick her up, go see a high school sporting event.
Tara	PANDEMIC	SIGNIFICANT_CHANGE	POSITIVE	So now we can do this when its not displaying another message I have messages reminding him of the crisis. Reminding him that if he goes out he needs to take a mask. That he needs to take hand sanitizer. If he needs groceries to ask one of his kids and we'll get them for him. If he's gonna get food reminding him to call ahead for take out. Otherwise hell go to a restaurant and expect to wait for it. So he cant quite understand the safety issues but we can remind him of them so right before he leaves the house he does see that. So I do think it has helped with this particular crisis.
Tara	PANDEMIC	SOME_CHANGE	POSITIVE	This is kind of nice because we can send him pictures and maybe more reminders than normally. Because normally we try and stop by regularly and make sure things are taken care of so were using it more now than we usually do.
Tina	PANDEMIC	NO_CHANGE	NEUTRAL	Not really, they don't get a lot of help so we need to go by them.

Suggestion Codes

Alison	SUGGESTION	GENERAL	POSITIVE	Um you've got to be able to uh there has been a few glitches and I know Dan is always upgrading it and stuff and he is brilliant in his responding to queries because I am always getting it wrong or something goes wrong on the software and it knocks out and I get stuck. Um but because there are those glitches that is the only thing that stopped me from putting a testimonial on his site um just because sometimes it's a faf when it goes wrong and I don't want to put somebody else in that position if it's going to be a faf really. Just because I know I live locally to my mom and dad and I can come around and sort it out, but I don't know how I would sort it out if I couldn't come around and do it.
Alison	SUGGESTION	RECEIVER_ACKNOWLEDGEMENT	POSITIVE	Um we sometimes wish we could know whether they read them or not, but we understand why Dan doesn't want to put an interactive button on there for them. Because it is keeping it simple and I think my dad would be very confused as to what they are doing and even if it said it out loud, I think that would freak him out.
Alison	SUGGESTION	MULTIPLE_DEVICES	POSITIVE	I can't send some messages to the one at my dad's house and some messages to the one where my mom is. And the only way I can see at the moment of doing it is to get another phone with another phone number to do it. And I don't know if Dan can create something around that. That would be really useful.
David	SUGGESTION	RECEIVER_ACKNOWLEDGEMENT	POSITIVE	So, something that moves, like for instance alternating between text and a picture might be an idea. But then if you did that, you'd need a way to have a thing on the screen that you could sort of

				press and say 'cancel', otherwise it's going to get really annoying.
David	SUGGESTION	RECEIVER_ ACKNOWLEDGEMENT	POSITIVE	Yeah, yeah. I've seen this and that would be good! That's a nice idea because the fact that it's so one way means you've got absolutely no idea whether there's any point in doing this at all. So, yeah, I like that. Tick mark that says, "I've seen this" and changes the flashing, alternating text and pictures to the combination that it currently has of a static text and picture.
Tara	SUGGESTION	VIDEO CHAT	POSITIVE	: I think it would. He is 67 right now and he's not entirely comfortable with his iPhone so he does not use the video chat features. He has a Facebook account but he mostly uses it to look at pictures of other people, family pictures. If it were very user friendly through the app like he just had to one touch he would do that. I think it would be easier. The phone gets too complicated, he can answer the phone and sometimes he remembers to answer our texts but that's about it. But yeah I think it would be a good feature.
Tara	SUGGESTION	RECEIVER_ ACKNOWLEDGEMENT	POSITIVE	um yeah I could see that being helpful. There are times I follow up with a phone call if there's an early morning doctors appt I do try to follow up with a phone call to make sure. I could see it being useful. It would be something that could be turned on or off. Not everyone would want to have that on the screen I think it might be confusing for some people but he would be able to handle that I think.
Tara	SUGGESTION	RECEIVER_ ACKNOWLEDGEMENT	NEUTRAL	There are times I'm not sure if he acknowledged it but I would want to know if it disappeared or not. Like I would want the message to stay up still. That would be one to think about.
Tara	SUGGESTION	MULTIPLE_DEVICES	POSITIVE	You know the one thing is it might be nice if there was some way for another person to also send updates to it. Now I do all updates for my dad from my phone but there are times when my sister calls me to ask me to put something on it too. So it might be nice if there was a family accessible interface where.. I don't know where you could offer it if someone actually needed it or were able to pay a little more for it. That would help if there are multiple siblings caring for someone to kind of split those duties up. I do worry my boyfriend and I camp and hike a lot. Sometimes were off grid for a week I'm not sure how well handle the MemoClock if it goes down for changes when were not able to have cell service I do worry about that a bit.
Tina	SUGGESTION	VIDEO_CHAT	POSITIVE	Yeah, I do. We don't have time to get by them all the time. It would be easier to make sure you have contact every day. Then you can see now she is doing. If you call you get a short conversation and you're not able to get the feeling of how well she's doing or if it's a bad thing. It's easier on

				the video chat you can see her face and her eyes and see how well she's doing.
Tina	SUGGESTION	RECEIVER_ ACKNOWLEDGEMENT	POSITIVE	I think if it's very clear, bright green. She does get some signals but it's very difficult
Tina	SUGGESTION	RECEIVER_ ACKNOWLEDGEMENT	NEUTRAL	I don't think it would help to know she saw a message half an hour ago. I get the idea it's nice for the relative to know but I don't know if it really helps. Does that make sense?

Appendix H: Market Analysis

A market analysis will be conducted for MemoClock using the steps shown in Figure 17. The purpose of our study is to increase the number of lives MemoClock improves by increasing its public awareness. The industry MemoClock is in is the healthcare application industry. Thus, one of our research questions is to analyze the advertising strategies of other healthcare applications. An analysis of healthcare advertising was conducted and can be found in Appendix J. We are now advertising MemoClock on social media to all English-speaking countries as our marketing materials are all in English. An analysis of companies and organizations that have members that would benefit from MemoClock was conducted for four countries – the U.S., UK, Canada and Australia. The target customers in English-speaking countries are the family members and friends of the elderly who are in social isolation due to the COVID-19 pandemic. A few of MemoClock’s competitors- RecallCue, CareZone, and Amy A1 Robot- are described in detail in 2.3.3. Additional data of potential user demographics and media usage will be gathered by a survey send out to the MemoClock mailing list. Our analysis will be put into action by developing effective marketing materials utilizing the testimonials from the interviews and information from survey responses.



Figure 17: The steps followed to conduct MemoClock’s market analysis (Kappel, 2019)

In order to clearly identify MemoClock’s target customers, we will generate a user profile of the future ideal user. This user profile will be made using the data gathered by the survey sent to MemoClock’s current users. This will allow us to gain a better understanding of their background, their media and social media usage and their feedback of the MemoClock app. These surveys will serve a dual purpose-to construct a user profile of MemoClock’s current users and to identify improvements that MemoClock can make to their application. The demographic information that will be identified from current users through the survey will include: their age group, socioeconomic status, and technology usage. A detailed analysis of companies that would benefit from MemoClock such as care homes and residential care facilities was conducted for four countries- U.S., UK, Australia, and Canada. Organizations in these countries that had missions of helping the elderly or people with dementia or Alzheimer’s were identified as potential promoters

of MemoClock. The companies and organizations in these countries were compiled into a list and provided to MemoClock.

By combining the known user data with other research about the demographics of MemoClock users, their technology usage, and their media and social media usage, we can develop the most successful marketing materials to reach groups of people with similar characteristics that have elderly loved ones in social isolation. We will change our marketing materials for each form of social media as needed. For instance, on Twitter short 100-130 character tweets are the most effective at being re-tweeted (Jenders, 2013). While on Facebook, a video is most likely to be shared (Facebook, 2014).

Research for data regarding the worldwide impact of COVID-19, number of elderly people worldwide, and technology usage among this population was conducted in our background chapter. While it would be ideal to increase public awareness of MemoClock in every country affected by COVID-19, due to time constraints we are focusing on promoting MemoClock on social media in English and through the organizations in our four target countries. We used background information including overall technology, internet, and social media usage as well as countries with a large population of English speakers and number of COVID-19 cases to determine our target countries. These factors were outlined by our sponsor as being important. The targeted countries have been determined as Australia, Canada, the U.K., and the U.S. The scope of our project is to increase the public awareness of MemoClock to as many people as possible, therefore, if our marketing materials become popular in a country that is not one of these four, we will add it to the list of target countries.

In our background section 2.3.3, we identified competing day reminder clocks and applications. We analyzed their price, hardware requirements, reminder capabilities, internet accessibility, and marketing tactics. To look into our competitor's marketing tactics, we will investigate what types of advertisements they have employed in the past, website features, social media presence, and outside media coverage, such as news stories. To do this we will conduct archival research. We will find examples of advertising from competitors and mimic successful strategies in our marketing materials.

All in all, the steps listed in Figure 17 will be carried out to conduct a comprehensive market analysis which will be used to generate effective marketing materials for MemoClock in the following section.

Appendix I: Additional Marketing Materials




"My father appeared to have early stage dementia and I wanted to be able to send him messages while I was away at work"
 -Alison, MemoClock User




"I think it does a really good job for what it was designed to do... It works great and is really easy to use."

Doug, MemoClock user

MemoClock is now FREE!
 Keep your family connected at www.memoclock.com




"I recommend MemoClock 100%, for my mom it's a huge deal for her to remind herself multiple times a day of what's coming next."

Doug, MemoClock User

MemoClock is now FREE!
 Find out more at www.memoclock.com




"My dad is still processing the current pandemic. Although he is confined to his room, I can still send him familiar pictures using MemoClock, which has helped him."
 - David, MemoClock User




"Every morning, before the lockdown, my father loved to go to a café to get a full English breakfast. However, sometimes, he would show up several hours before it opened. MemoClock has helped me remind him when not to go out."
 -David, MemoClock User

"The main issue is my mother kept asking what day it was so we mostly have used it for information about the date and the year and we put in pictures to show if it was morning, afternoon, or night. The pictures make it so much easier to understand. It is still afternoon even though it is dark outside. In the winter time she thought she had to go to bed earlier because it was dark."



-Tina, MemoClock user

Appendix J: Healthcare Advertising

The majority of healthcare advertising in Denmark is done online (Rodriguez, 2014). In 2010, Pharmaceutical companies were poised to increase overall spending on online marketing from \$1.03 Billion to \$1.86 Billion in 2015 (Iskowitz, 2011). Online forms of advertisement include banners, pop-ups, product reviews, and social media. Utilizing social media is very important because businesses can have a free profile and purchase advertisements. Search engines can be utilized to advertise directly, either by promoting the website to the top of the search or by incorporating key searched words into the website. Healthcare advertising is moving away from advertising in print, on billboards, and on television. Advertising on billboards has been found to be more effective at gaining existing client awareness rather than new client awareness (Fortenberry, Elrod, & McGoldrick, 2010). One of the most persuasive forms of healthcare advertising is the use of testimonials (Rodriguez, 2014). When recommendations are taken more seriously, as with medical products, testimonials can heavily influence consumer's use of a product.

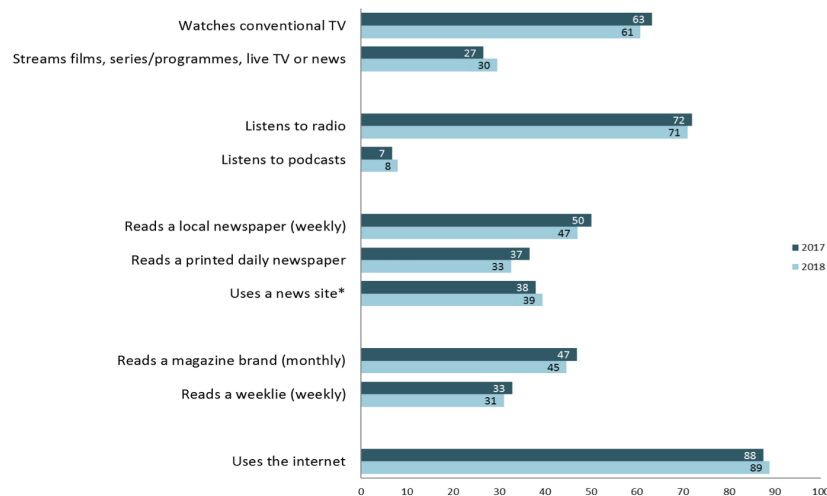


Figure 18: Percentage of Danes who use varied media forms daily (Ministeriet Agency for Culture and Palaces, 2019).

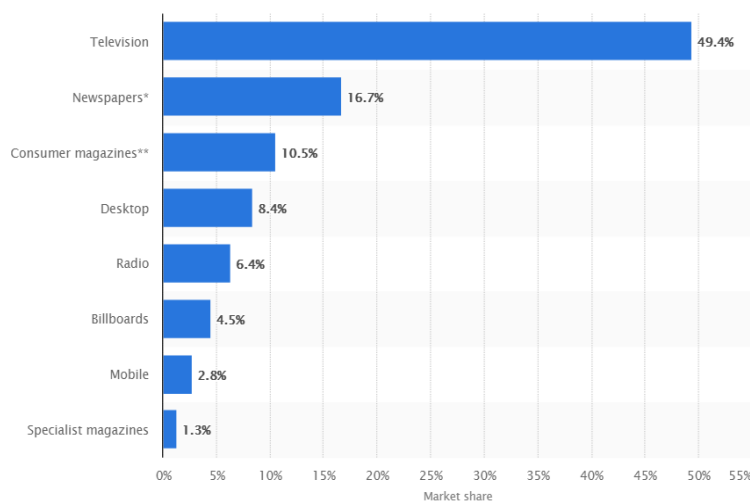


Figure 19: Media types ranked by advertising market share in Germany from January to April 2018, (Koptyug, 2018)

Figure 18 was published by the Ministeriet Agency for Culture and Palaces. Every year, the agency publishes information about the Danes' media usage. This Figure shows the percentage of subjects who use a certain type of media every day. The majority of subjects used the internet daily. Radio, TV, and local newspapers were the next most popular. All of these media forms have advertisement options that are utilized by healthcare companies. This year-by-year comparison is indicative of a constant media usage among Danes. Therefore, it is likely that the most popular forms of media will continue to be used at the same level during the project timeline.

In Germany, television dominates as the primary mode of advertisements, consisting of almost half of the advertising market share in early 2018 (Koptuyug, 2018). While this concerns general advertising, we can theorize that healthcare marketing follows a similar distribution. With television advertisements being so powerful, testimonials and video reviews would be channels of advertising worth exploring when marketing MemoClock in Germany.

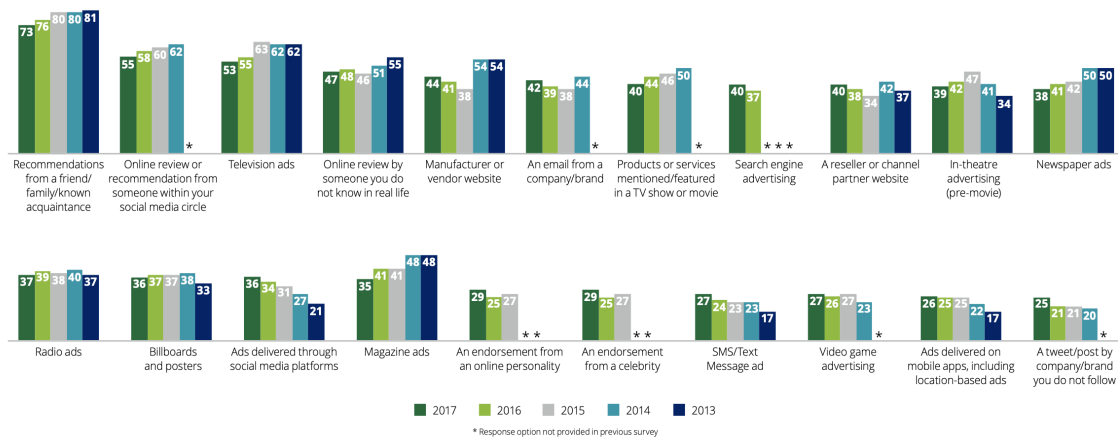


Figure 20: Influential Advertising in Australia (Alcorn, N., & Buchanan, L., 2017).

In Australia, reviews and recommendations are the most effective way of finding new products, as seen in Figure 20. Based on the data, ads delivered through social media platforms have been rising (the degree of influence increased from 21 to 36 out of 100, from 2013 to 2017). Nevertheless, personal recommendations, online reviews, and television ads (at the top left of the Figure) continue to remain more influential forms of advertising. As a result, leveraging testimonials and encouraging word-of-mouth advertising are likely to be more effective to raising awareness in Australia about MemoClock. Emails, newspaper, radio, billboards, and magazines are all at similar levels of engagement-and have been declining (Alcorn, N., & Buchanan, L. 2017).

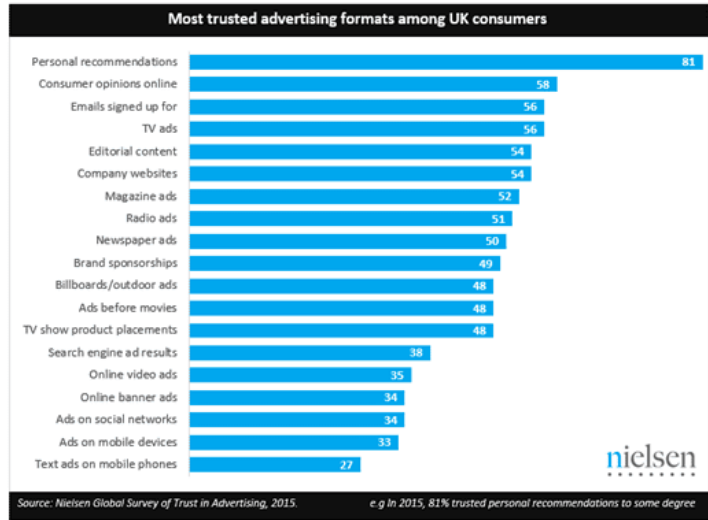


Figure 21: Influential Advertising in UK (Allen, 2015).

Successful advertising in the UK revolves around opinions and recommendations, as evidenced in Figure 21. Ads on social networks and mobile devices scored significantly lower as sources people in the UK trust. Therefore, similarly to Australia, testimonials and generating word-of-mouth about MemoClock would be the best way to approach this market.

Media spending in Canada from 2007 to 2019, by medium
(in million Canadian dollars)

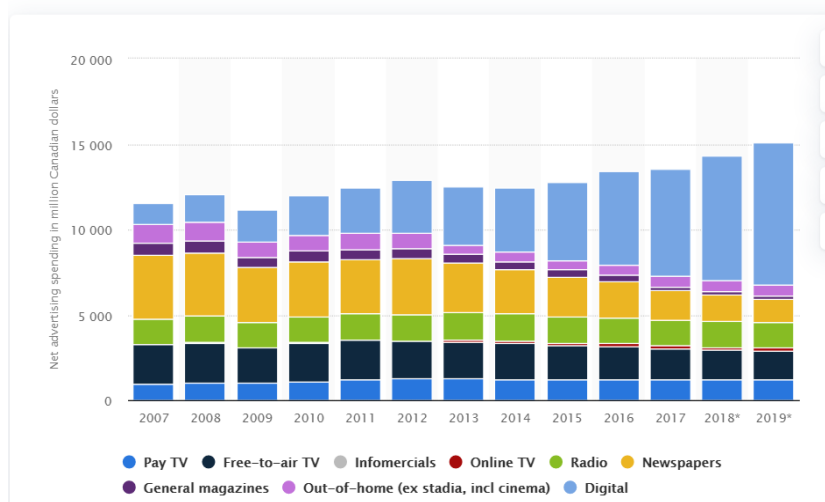


Figure 22: Media spending in Canada from 2007 to 2019 (Guttman, 2020).

From Figure 22, we can see that Canada has had an uptick in media spending for digital ads over the years. This would include devices like smartphones and tablets. It would also include websites and app store advertising. Based on this information, the best way for MemoClock to target the Canadian market would be through digital advertising.

Appendix K: Survey Results

How did you hear about MemoClock?	Please rate the following MemoClock application interfaces: - Receiver (Clock) Interface	Please rate the following MemoClock application interfaces: - Sender Interface	How would you rate the usefulness of a potential MemoClock video chat feature?	Are there any features you would like MemoClock to have?
BBC article	5 (Excellent)	4	3	
I heard about MemoClock from a social worker, who helps relatives with devices which can help patients with dementia/Alzheimers.	3	4	4	I would like the possibility to repeat a message with in hours, so it could show up more times without having to write the message a lot of times.
searching on the internet for support for dementia	3	3	4	no - only idea is already suggested (chat)
Found it in AppStore	5 (Excellent)		4	
I was looking for a app like this	5 (Excellent)	5 (Excellent)	5 (Very useful)	No
Web search for an app with a senior watch	4	4	5 (Very useful)	
A friend	4	4	5 (Very useful)	If i could restart receiver from sender position....

Are there any features of MemoClock that you dislike?	Do you know someone with dementia or a memory-related disorder (e.g. Alzheimer's Disease)?	Who do you know has dementia or a memory-related disorder? (Check all that apply)	Are you a care partner? For the purposes of this question, we are defining a care partner as a person who provides help to a person with dementia with performing activities of daily living (ADLs) or instrumental activities of daily living (IADLs)?	Do you provide 40 hours or more of care per week or less than 40 hours of care per week for a person with dementia or a memory-related disorder?
The service has been unreliable. I have had several issues and am currently cut off due to a programming mistake.	Yes	Parent	No	
Only when I have problems with my password.	Yes	Parent	No	
no	Yes	Parent	Yes	Less than 40 hours of care per week
	Yes	Parent	Yes	Less than 40 hours of care per week
No	Yes	Parent	Yes	Less than 40 hours of care per week
	Yes	Parent	No	
No	Yes	Parent, Friend	No	

Are you part of a dementia support group or organization? If so, which one? - Selected Choice	Are you part of a dementia support group or organization? If so, which one? - Yes - Text	What is your primary language?	List of Countries	How old are you?
No		English	United Kingdom of Great Britain and Northern Ireland	51-60 years old
Yes	Alzheimer foreningen (Danish Alzheimer Organisation)	Danish	Denmark	41-50 years old
No		English	United Kingdom of Great Britain and Northern Ireland	51-60 years old
No		Danish	Denmark	51-60 years old
No		Danish	Denmark	41-50 years old
No		Danish	Denmark	61-70 years old
No		Danish	Denmark	51-60 years old

What Social Media applications do you use? (Check all that apply)	What forms of media do you use? (Check all that apply)	What forms of media are you most likely to take a healthcare recommendation from? (Check all that apply)	Other people in a situation like yours might not know about MemoClock. Could you provide a quote about how MemoClock has helped you and your loved ones?	May we use your quote? (This is completely anonymous)	Would you be interested in providing a testimonial about MemoClock?
Instagram, Facebook, LinkedIn, WhatsApp, YouTube	Television, Newspaper	Television, Newspaper	Memoclock provides easy to set reminders for my father. I really like the ability to send pictures, too	Yes	No
Instagram, Facebook, YouTube	Television, Newspaper, Radio, Mobile	Television, Newspaper, Radio	Information about date, season and year has been easier to give to my mother. As well as appointments.	Yes	No
Instagram, Facebook, WhatsApp, YouTube	Television, Newspaper, Desktop, Radio, Mobile	Other (sceptical of all)	MemoClock has been a lifeline to support loved ones when a phone call would cause anxiety.	Yes	No
Instagram, Facebook, Snapchat, YouTube	Television, Newspaper, Desktop, Radio, Mobile	Television, Newspaper, Desktop, Mobile	Made daily life easier for my mother and me-	Yes	No
Facebook	Television, Mobile	Television	It's very helpful	Yes	Yes
Instagram, Facebook, Twitter, YouTube	Television, Newspaper, Consumer Magazines, Desktop, Radio, Mobile	Television, Newspaper	MemoClock is part of my mother's wall and everyday comfort. It has brought her a safe idea of current date and time.	Yes	No
WhatsApp, YouTube	Newspaper	Newspaper	Made Mom less lonely and me with less bad consience	Yes	


Appendix L: Final Presentation




Increasing Public Awareness of MemoClock to Assist the Elderly

By: Akshaj Balasubramanian, Alexander Bell, Caroline Johnson, and Sophia Henehan


About Us




Akshaj Balasubramanian
Math and Computer Science
Class of 2021



Alexander J. Bell
Computer Science
Class of 2021



Caroline M. Johnson
Biochemistry
Class of 2021



Sophia Henehan
Aerospace Engineering
Class of 2021



What is MemoClock?

- Developed to assist care partners of people dementia
- Sender and receiver interfaces
- Send messages that include photos and audio recordings



Mission Statement

We will increase the number of lives MemoClock improves by increasing its public awareness.

Project Objectives



To interview current MemoClock users to determine app usage



To conduct a market analysis and develop effective marketing materials



To conduct an assessment of data collected and provide feedback on improvements for MemoClock

MemoClock User Interviews

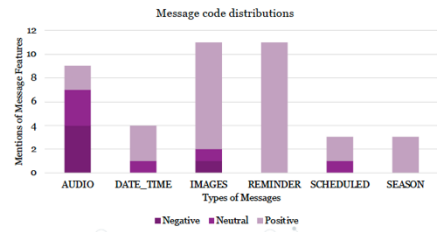


Coding of MemoClock User Interviews



"We did upgrade to premium to send pictures. I felt sending messages such as 'do you fancy a cup of tea?' would be better as a picture rather than sounding like giving my father instructions. It added variety and livened up the day a bit." - Alison

MemoClock Users Favor Reminder Messages



Objective 2



To conduct a market analysis and develop effective marketing materials

Market Analysis

1. Identified Target Users: Family members and friends of the elderly in social isolation due to COVID-19
2. Analyzed MemoClock's Competitors
3. Additional Data Gathered by Interviewing and Surveying MemoClock Users
4. Market Analysis Used to Develop Marketing Materials

Social Media Strategy

- Social Media Platforms: Facebook and Twitter
- Videos and images are top shared posts
- Lifespan of posts:
 - Facebook Posts last 5-6 hours
 - Twitter Posts last 15-20 minutes



Development of Marketing Materials

- Quotes from interviews
- Stock images
- Sample MemoClock reminders
- Light color scheme



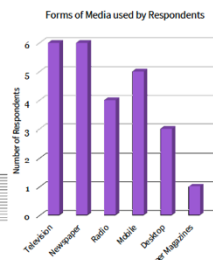
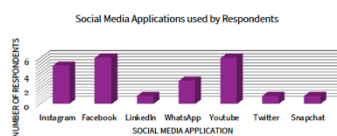
Objective 3



To conduct an assessment of data collected and provide feedback on improvements for MemoClock

Survey Data

- Survey Data Analysis
- 7 Survey Responses
- Demographics and Feedback



Contacts List

- Compiled target organizations data
 - Social Media Platforms and Number of Followers
- Across the USA, Canada, UK, EU, and Australia
- Over 50 potential leads



Analysis of Social Media Posts

- Analytics Manager
 - Twitter
 - Facebook



Recommended Next Steps



Social Media Calendar



MemoClock User Feedback



Marketing Materials

Social Media Posting Calendar

1 Tablet Graphic Infographic 4 One message feature of MemoClock MemoClock is free Infographic 10	2 Infographic 1 One message feature of MemoClock How MemoClock works-Text or Infographic Infographic 5	3 Infographic 2 One message feature of MemoClock Infographic 6 MemoClock is free	4 Infographic 3 One message feature of MemoClock Infographic 7 How MemoClock works-Text or Infographic	5 Infographic 8 Infographic 4 Tablet graphic MemoClock is free	6 Infographic 1 One message feature of MemoClock How MemoClock works Personal MemoClock story (video or image)	7 Infographic 5 MemoClock is free One message feature of MemoClock Tablet graphic Infographic 9
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Facebook Posts
Twitter Posts

MemoClock Features for Future Updates



Multiple Senders



Multiple Receivers



Video Chat

Expanding Social Media Reach



- Current user survey feedback
- Facebook post connection

Special Thanks

Dan Mogensen

Poul Jensen

Advisors:

Professor Bruce Bursten

Professor Peter Hansen

Volunteer Interviewees:

- Alison
- David
- Doug

- Tina
- Tara



Appendix M: MemoClock Final Poster



WPI

Increasing Public Awareness of MemoClock to Assist the Elderly in Social Isolation During the COVID-19 Pandemic

Akshaj Balasubramanian, Alexander Bell, Sophia Henehan, Caroline Johnson

Sponsor: Dan Mogensen Advisors: Professor Peter Hansen, Professor Bruce Bursten



Introduction

In December 2019, SARS-CoV2, known as COVID-19, quickly became a worldwide pandemic beginning in Wuhan, China. Social isolation is the only effective preventative measure to reduce transmission of COVID-19 as of writing this, and by February 2020 countries around the world began implementing stay-at-home orders. The elderly, the immunocompromised, and people with existing medical conditions are most at risk for developing fatal complications related to COVID-19 and have been strongly encouraged to stay in self-isolation. While social isolation is an effective preventative measure for COVID-19, it can have detrimental effects on psychological and emotional well-being of the individual.

To reduce the effects of social isolation felt by the elderly, an easy and affordable way to communicate with family and friends was needed. MemoClock is an easy-to-use application that aims to improve the lives of the elderly by enabling family and friends to remotely send them messages. This app helps maintain social distancing, while facilitating communication from family and friends to their older, less technologically savvy loved ones.

Our aim was to develop innovative ways for MemoClock to utilize social media to increase its public awareness and provide the millions of elderly people in social isolation an easy way to receive messages from their loved ones. We conducted a market analysis or MemoClock that informed our decisions when developing a marketing strategy to target potential future MemoClock users.

Objectives

1. To interview current MemoClock users to determine app usage
2. To conduct a market analysis and develop effective marketing materials
3. To conduct an assessment of data collected and provide feedback on improvements for MemoClock

Marketing Strategy

A marketing strategy was created for MemoClock to increase its public awareness by targeting marketing materials towards the children or loved ones of elderly individuals in social isolation due to COVID-19.

Infographics



- Quotes from the interviews
- Images related to the topic mentioned in the quote
- Light pastel color scheme in the background to elicit happiness and tranquility

Social Media Posting Schedule

1 Tablet Graphic Infographic 4 One message feature of MemoClock MemoClock is free Infographic 10	2 Infographic 1 One message feature of MemoClock How MemoClock works-Text or Infographic 5	3 Infographic 2 One message feature of MemoClock MemoClock is free Infographic 6	4 Infographic 3 One message feature of MemoClock MemoClock works-Text or Infographic 7	5 Infographic 5 Infographic 4 Tablet graphic MemoClock is free Personal MemoClock story (video or image)	6 Infographic 8 One message feature of MemoClock works MemoClock is free	7 Infographic 1 MemoClock is free Tablet graphic Infographic 9
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- Blue posts are for Twitter, Red posts are for Facebook
- Lifespan of a Twitter post is 15 to 20 minutes, multiple posts throughout the day are needed to reach the maximum number of feeds
- Lifespan of a Facebook post is five to six hours. Recommended posting up to five times per month

Social Media Analysis Tools



- Facebook Pixel is a section of code that can be added to MemoClock's website and Facebook page to track audience demographics and help target certain audiences.
- Twitter analytics gives MemoClock the ability to identify their most popular tweets by providing them with the accounts of who has viewed, retweeted, liked, and replied to their tweet.

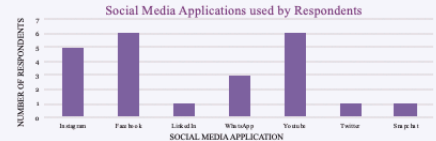
Developing a Marketing Strategy

1. Identified Target Users: Family members and friends of the elderly in social isolation due to COVID-19
2. Analyzed MemoClock's competitors
3. Additional data gathered by interviewing and surveying MemoClock users
4. Market Analysis used inform marketing strategy decisions

	MEMOCLOCK	AMY AI ROBOT	RECALLCUE	CAREZONE	REMINDER ROSIE
PRICE	Free	\$7.299	Free	Free	\$79.99
REMOTE REMINDERS	✓	✓	✓	✗	✗
REMINDERS WITH IMAGES	✓	✓	✓	✗	✗
AUDIBLE REMINDERS	✓	✓	✗	✓	✓
PROGRAMMABLE	✓	✓	✓	✓	✓
TABLET OR SMARTPHONE REQUIRED	✓	✗	✓	✓	✗

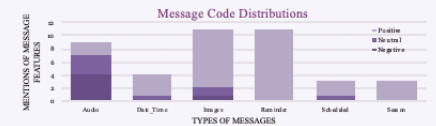
Surveys

- Sent out to all MemoClock users
- Seven survey respondents
- Recorded demographic information, application feedback, and social media usage of respondents



Interviews

- Interviewed five current MemoClock users
- Transcribed and coded interviews into six main categories
- Categories also were tagged as positive, negative or neutral



Recommendations & Conclusion

- We identified the following features as potential improvements to the app:



- To carry out our mission, we interviewed current MemoClock users, developed marketing materials, and conducted a survey of MemoClock users. We successfully compiled results from interview and survey data as feedback for The MemoClock Team. We also transcribed interviews that have more quotes for future marketing materials. We hope that with these resources and recommendations, MemoClock can continue to impact lives during the current pandemic and into the future.

Acknowledgements

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