

INFO 690 Survey Report

UX Team Antelope, Drexel University, Summer 2020
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It is known that technology is a part of a person's everyday life and is beneficial in many aspects. Map and navigation applications are making it easier for users to travel near, far, and everywhere in between through the use of step by step directions, recommended landmarks, and live traffic updates. There are many popular navigation applications that have their strengths and weaknesses among a variety of special features. The following report discusses the findings of a survey study completed to discover, "What features of a map or navigation application are most valuable to users and what application is the best fit for that user?" This survey was designed in order to understand what features users felt were most valuable and important in a navigation application. The participants, all with excellent technical capabilities, gave insight into what they value in a navigation application and made it known that they will use their preferred application, regardless of the make or type of device they use.

RESEARCH QUESTIONS

This report discusses the development of a survey designed to answer the question, "What features of a map or navigation application are most valuable to users and what application is the best fit for that user?" In order to answer this research question, we conducted a small competitive analysis of popular map/navigation applications (Appendix A) to determine which applications had what specific features. We hope to be able to determine which navigation application is best suited for each user based on their desired features.

The primary applications analyzed: Apple Maps, Google Maps, Waze, and Yahoo Maps, all have directional and turn by turn features. What separates the applications is their extra features, like different navigational views, recommendations, and traffic updates. We wanted to know how valuable these additional features are to the user in order to determine which application is best for them. Each application has its specialty and we wanted to be sure that users with specific desired features were paired with the appropriate application based on a variety of factors including but not limited to: device interface, primary goal, and age.

MATERIALS

Survey

The survey was primarily designed to answer the aforementioned research question. Secondly, the survey probes into the background of the participants, both in their personal attributes and their engagement with technology.

After consent, participants are asked to provide some basic information about themselves. This includes information about their age, gender, educational attainment, race/ethnicity, employment status, and current industry if employed. The purpose of these questions is to later use this information to determine end user groups and provide insights for building personas.

When planning to address the media and technology use of our participants, we originally had a larger item set to determine media and technology use and attitudes. Given the length of the later sections of the survey we opted to change it out for a much shorter item. The replacement item instead asks participants to rate their own tech-savviness with desktop computers, laptops, tablets, and phones as either poor, below average, average, above average, or excellent. Similar to the background questions, this will be used to determine end user groups but intended to determine the weight of responses to later parts of the survey. For example, if they responded that they were poorly skilled at tablet use but exclusively use map and navigation apps on tablets then their response might be less helpful than others. We also ask questions about what make or OS the participant uses for desktop/laptop (Mac or PC), tablet (Apple, Android, Microsoft), and phone (Apple, Android, Microsoft). They also have the option to say they don't use that type of technology or provide another make or OS. This is helpful as not all navigation apps work the same across various platforms. This may also be helpful in developing user groups, as some platforms come preloaded with a specific map or navigation app and determine whether users prefer their pre-loaded navigation application or not. This is notable because users of Apple devices have access to Apple Maps and have the ability to use and download other applications, however an Android device will come preloaded with Google Maps and does not have access to Apple Maps.

The next section covers the main questions of the survey. We ask participants to identify not only what map applications they use but also what technology they use them on. This is a multiple selection item because people may use one map or navigation app across multiple technology platforms. For example, one may use Google Maps on the computer to check a route and then load it on a mobile device to use the turn by turn navigation while driving. We also allow participants to write in additional map or navigation apps if they use any that are not on our initial list. One of the purposes of this was that if an app kept coming up during the pilot it might be useful to add it to the survey later. We also ask what users primarily use the map or navigation app for, that is, what task are they trying to complete when they use a map or navigation app. The hope is that this will also provide information for determining user

groups, but it could also be coded into common answers and turned into a multiple choice item in later versions of the survey.

We continue by asking participants to identify what map or navigation app they have been using the longest. We also wanted to know how long they have been using maps and navigation apps. Another key question was inquiring how often they have been using map and navigation apps, that is a frequency usage scale from nearly all the time to less than once a month. This we expect can be very differentiating in that people who drive for a living such as rideshare or delivery drivers may have different desires and needs than the more casual users of maps and navigation apps.

The main question of the survey is next, where we list the features identified in the competitive analysis and ask participants to rate their importance from not important to very important. This is where we expect to determine based on what features they find important what map or navigation app they should be using. We also allow people to submit their own features if it is not already on the list just in case we missed one. The final question is a long answer question where we ask people to identify the features that are most important to them from the list or from the submitted features. For this we played with the idea that they could either rank or otherwise select their top five from the list but also did not want to induce fatigue by repeating that long list again.

The full text of the survey is in Appendix B.

Consent

The informed consent was designed to provide the requisite information to the participants. It included an introduction, explanation of the purpose of the study, information about the expected duration of the study, any procedures that the participant would need to know prior to the study, information about any possible risks involved, a confidentiality claim, information about possible compensation, and the contact information of the researchers for additional questions or queries.

In the introduction we lay the purpose of the consent form. The purpose of the study includes information about what the research topic is and why the survey is being given. We informed the participants that we expected the study to take ten minutes or fewer, and that it would be a simple survey with multiple choice and open ended questions only. When it comes to risks, we assessed this study as minimal risk, and informed participants that their participation is voluntary and they can refuse to participate or discontinue at any time. Although not specifically stated in the confidentiality section, the survey is theoretically anonymous. Anonymity is hard to perfectly ensure, so we state instead that the survey is confidential instead. Results should only be reported at an aggregate level to outside parties, but IDs or other identifying information will be excluded from publications to protect their

identities. In the consent we also inform our participants that we will be not providing compensation for their work, and instead thank them for their time despite there being no compensation. Finally, in the availability of information section we provide ways to contact the researchers if they have additional questions or want to follow up with the researchers concerning their data.

The final section is the anonymized consent language that by selecting they agree is considered as agreement to the consent. This avoids collecting signatures and names to maintain the confidentiality of the participants. This is allowable under federal law as the study has no more than minimal risk.

Full text of the informed consent can be found in the first page of Appendix B.

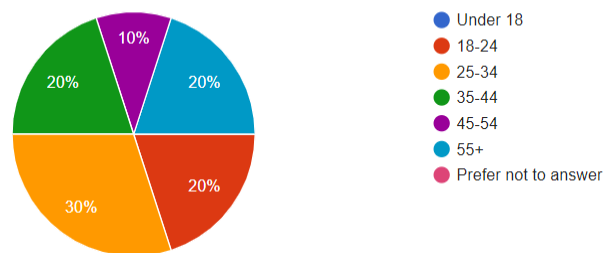
PARTICIPANTS

This survey was primarily distributed to friends, family, and co-workers of the researchers. This was a decision made to ensure a quick turn around of responses and the ability to have personal contact information of users to ensure the completion of the survey by each user. Survey data is available in Appendix C.

Demographics

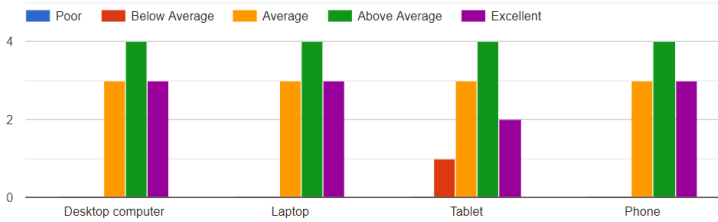
60% of the users who completed the survey identify as female and 40% of the users identify as male. The majority of users who completed the survey identify as White (n = 8) when asked their race/ethnicity followed by Hispanic (n = 2) and Asian (n = 1). While there are much more female responses to the survey, the users are of a variety of ages as seen in the chart below. With regards to the level of education of these users, all respondents have some form of an advanced degree passed high school with the majority of users obtaining an Advanced Degree (Master's, Ph.D, M.D, etc) and work in a variety of fields of study.

Ages of survey respondents.



The respondents of this survey are all 18 years old and older, mostly 25-34 years old, and the oldest respondents are 45-54. It is notable that there is a wide variety of ages.

Media and technology use.



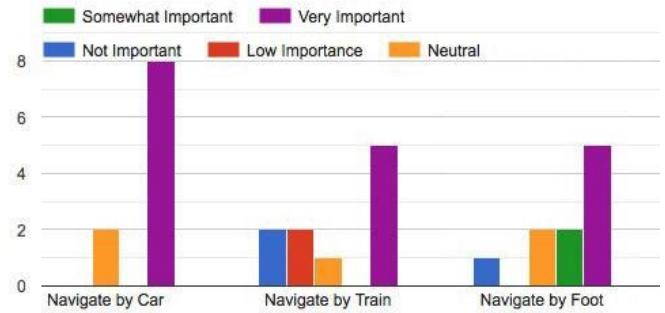
The majority of users consider themselves “Above Average” or “Excellent” with respect to their tech-savviness. In addition, these technologically experienced users are primarily Windows/PC users (80%) but also primarily use Apple tablets (70%) and mobile (60%) devices. This contrast in desktop software to mobile phone software is an interesting standout. With regards to map/navigation applications, respondents primarily use a mobile or web-browser interface.

RESULTS

In order to determine if the results can answer the research question we would have to compare the most desired features against the competitive analysis (Appendix A). Then we would have to determine if they are using a map or navigation app that aligns with their desired features.

The data obtained by the survey indicate which features are most valued by users. Despite having a small sample, the responses obtained were very similar, indicating which tools are considered essential in this type of app. Of the 10 survey participants, 90% responded that the primary goal when using a map app is to find directions to locations. Only one respondent seeks to know about traffic conditions when he goes to use a map or navigation app. The predominance of the response shows as expected: apps, digital or analog, are used to indicate a path, normally unknown by the user.

When analyzing the results it was possible to understand that the vast majority of users use map and navigation apps when driving. “Navigate by Car” was listed as very important by 80% of users, while only five attributed the same degree of importance to “Navigate by Train” and “Navigate by Foot.” Like this, it is natural that the most important features were those considered most useful by drivers. Full importance results are available as a graph in Appendix D.



The expectation was confirmed by analyzing the open-ended question that directly asked which features were considered the most important and why. Among those listed, users cited turn-by-turn and live traffic in similar quantities. The result obtained shows that users value the tools that optimize their time, guiding them along the shortest path, and also choosing the routes with the best flow. Thus, it was possible to understand the key features in map apps, but the results made it impossible to define the application that best fit the user since the main features mentioned are present in all selected applications.

LIMITATIONS

It was possible to partially answer the research question. Unfortunately, it was not possible to define which app is the best fit for the user, although we know which is the most used by the respondent group (Google Maps was preferred by 70% of the survey participants, against 20% of Waze and 10% of Apple Maps). This question could be corrected in a second phase of the study, evaluating how the functions considered most important by users are implemented in each application and verifying the users' opinion regarding the primary use tools of the app. As such functions are practically common among the evaluated apps, it would be more valuable to discuss the quality of the service delivered on these tools, leaving aside questions regarding features considered less important.

Thus, even if not finding the desired answer in full, the survey was useful to help define the actions to be taken to mitigate the problem. The collected data remains useful since they can discard irrelevant features and indicate the appropriate route for defining the app that best suits the opinions of the study participants.

In the future we would revise our survey to include an open ended final question for our participants to provide any additional information about the topic or survey if they desire. This method allows participants a chance to speak out about any portions that we did not cover elsewhere in the survey if they so desire and can be helpful to the research team in future surveys. Another way that we could revise the survey would be to have the participants suggest what they would like to see

added to their map or navigation app. This may make it easier to see what their most desired additional content would be.

Appendix A - Competitive Analysis of Map and Navigation Apps

	Apple Maps	Google Maps	Waze	Yahoo Maps	Mapquest
Street View	Y	Y	N	N	N
Satellite View	Y	Y	N	Y	Y
3D view	Y	N	N	N	N
Terrain View	N	Y	N	N	N
Turn By Turn	Y	Y	Y	Y	Y
Places (buildings on map)	Y	Y	Y	Y	Y
Road Speed/Speedometer	Y	Y	Y	N	Y
AutoComplete	Y	Y	Y	Y	Y
Ride Sharing	Y	Y	Y	N	N
Route details based on departure time	?	Y	Y	N	N
Avoid Routes based on tolls/Highways/etc.	Y	Y	Y	N	Y
Live Traffic Updates	Y	Y	Y	N	Y
Speed Traps/Cops	Y	Y	Y	N	N
Other Road Hazards (Construction, Water on Road, etc)	Y	Y	Y	N	Y
Lane Recommendations	Y	Y	N	N	Y
Preview Directions before you Go	Y	Y	Y	Y	Y
Share directions from Desktop to Phone	Y	Y	N	N	N
Suggested Places	Y	Y	Y	N	Y
Download Routes for Offline Use	Y	Y	Y	N	Y
Incognito Mode	N	Y	Y	N	N
Add a Stop to your Trip	Y	Y	Y	Y	Y
View Parking near Destination	Y	Y	Y	N	N
Remember where you Parked	Y	Y	N	N	N
View how Crowded a Train will Be	N	Y	N	N	N
Accessibility (Wheelchair)	N	Y	N	?	?
Navigate by Car	Y	Y	Y	Y	Y
Navigate by Train	Y	Y	N	N	N
Navigate by Taxi	N	Y	Y	N	N
Navigate by Motorcycle	N	Y	Y	N	N

Navigate by Foot	Y	Y	N	N	Y
Navigate by Bus	Y	Y	N	N	N
Share Arrival Time with a Friend	Y	Y	Y	Can send a route	Can send a route
Drop a Pin	Y	Y	N	Y	Y
Share a Pin	Y	Y	N	N	N
Augmented Reality	N	Y	N	N	N
Adjust Map Icons	N	N	Y	Y	N
Sync Calendar Events	Y	Y	Y	N	N
Time to leave notifications	Y	Y	Y	N	N
Indoor maps (malls, airports, etc.)	Y	Y	N	N	N
Interface - Web Browser	N	Y	Y	Y	Y
Interface - Mobile	Y	Y	Y	N	Y

APPENDIX B - Full Text of the Survey

[See attached INFO 690 - Google Forms.pdf]

APPENDIX C - Survey Data

[See attached INFO 690 Survey (Responses).xlsx]

APPENDIX D - Average Importance of Map and Navigation App Features

Most valued would be closer to 5 and least valued would be closest to 1.

