Creating a prototype with the most important features in a mobile system for real estate brokers

Daniel Fehrm
Abstract

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Mspects is a web application used by real estate brokers and is primarily used on devices with larger screens but it can also be used with a mobile phone. However, from a user perspective the mobile version is difficult to use since real estate brokers have to spend a lot of time searching for the feature they are looking for. This thesis aims to find a possible solution by creating a new mobile view that contains shortcuts to the features the real estate brokers really need when they must use their phone. This is done by first identifying the most important features by sending out a survey to a group of Mspects users. With those features in place, the next steps are to create a prototype and evaluate how many fewer clicks and how much less time it takes to reach a specific feature with the prototype. From the survey we identify 7 features that are considered important to have in the new mobile view. From the prototype we conclude that reaching the 7 features takes one click and less than one second to reach, which is a large decrease compared to the current solution.
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1 Introduction

A real estate broker is a person who can be hired by those looking to sell or buy a house. The purpose of a real estate broker is to aid the buyers and sellers throughout the entire process. Real estate brokers are generally responsible for several houses at the same time and need to keep their work structured. In order to achieve this, real estate brokers can use a system called Mspecs.

Mspecs (Mäklarspecifikation) is a cloud-based web application used by real estate brokers. The purpose of Mspecs is to aid real estate brokers in their daily work. In Mspecs, real estate brokers can manage all the houses they are responsible for through all the steps from listing and marketing to viewings and contract signing.

Mspecs is primarily meant to be used on devices with larger screens e.g. computers or tablets but it can also be used on a mobile phone. From a technical perspective, Mspecs is optimized for mobile phones but from a user perspective, it is not well optimized. Let’s say a real estate broker wants to change a certain value e.g. the starting price for a house. To reach the location where they can change the starting price, many clicks and a lot of searching is required. This means that they have to spend more time on finding the features in Mspecs and less time doing their actual job.

The creators of Mspecs wants to improve their mobile solution so that real estate brokers can spend more time doing their work. The idea is to create a new mobile view that will contain a number of shortcuts to the most important features that real estate brokers need when they must use their mobile phone and don’t have access to their computers or tablets. With this new view, real estate brokers will have quicker access to the features that they need.

1.1 Purpose

The purpose of this thesis is to improve the usability of the mobile version and improve the daily work for real estate brokers so they don’t have to spend too much time finding the features that they are looking for in Mspecs.

1.2 Goal

The goal is to identify which features are most important in the mobile view and put these into a prototype for a new mobile view.

1.3 Research questions

To make the purpose and goal more concrete, the following questions will be answered:
• Which features are most important in a mobile view from an end-user perspective?

• How many fewer clicks and how much less time does it take to find a specific feature with the prototype, compared to the current mobile solution?

1.4 Delimitation

The features which are considered as potential important features are those connected to houses. Mspecs has several other features that are not connected to houses e.g. creating new users. However, these features are not primarily used by real estate brokers and are therefore not considered as potential important features.

Another delimitation is that the prototype will display screenshots of where you will end up in Mspecs if you press on a shortcut.


2 Background

When people want to sell or buy a house in Sweden, they can hire a real estate broker. The purpose of a real estate broker is to aid those looking to sell or buy a house throughout the entire process [1]. Real estate brokers typically aid with marketing, evaluation, host viewings, handle bidding, handle admittance etcetera [2].

A real estate broker is an impartial middleman and is not a part of the actual deal between the buyer and the seller. They must therefore treat both the sellers and buyers interests equally. This means that they do not have an exceeding amount of responsibilities but they do still have some legal responsibilities that they must follow e.g. helping the buyer and seller resolve an eventual dispute [2].

When a real estate broker is hired, they are a part of the whole process (unless the agreement is terminated prematurely) of buying or selling a house. Most real estate brokers are a part of this process for several houses at once. The processes for houses are usually in different phases at the same time. Some are having viewings while some might be signing the final contract between the buyer and the seller.

In order to keep their work structured, real estate brokers can use Mspecs. In Mspecs they can keep track of the houses they are responsible for and store all the necessary information about the houses. They can also manage upcoming viewings and biddings etc. Real estate brokers primarily use Mspecs when they are at their office and have access to their computer or tablet.

In the main view of Mspecs (shown in figure 1) the real estate brokers can see which houses they are responsible for and which phase the house currently is in. When a house reaches a new phase, the real estate broker can drag it to the new phase. Generally the houses go through the phases from left to right. If one of the houses is clicked, the view in figure 2 is shown. In this view, the real estate broker can add all necessary information about the house and it is here that they can manage viewings and biddings for the house.
An important part in the work of real estate brokers is that they must by law document all steps that are made in the entire buying/selling process. The buyer and seller must also get a copy of this documentation once the process is finished [3]. In Mspecs, there exists a feature called the broker journal. In this journal, real estate brokers can check off the tasks that they have performed so that they can keep track of what they have done so far and must do next. They
also have the possibility to print the journal once the process is finished.

The creators of Mspeks have a desire to improve the mobile version of Mspeks so that real estate brokers can use Mspeks in their phone when they don’t have access to their computer or tablet. However, this desire comes with a cost. Not all features are suitable on smaller screens which means that not all features can be included in a mobile version. However, since Mspeks is primarily used on larger screens, the real estate brokers only need access to the features that they really need when they have to use their phone.

3 Theory

3.1 Usability

The tradeoff between functionality and usability is a topic that, from an academic point of view, is investigated in the field of human-computer interaction, and especially in usability research. The ISO standard defines usability as

[the] extent to which a system, product or service can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use [4].

When a system is designed it should strive towards a high usability. A high usability means that the system fulfills the ISO standard, meaning that the system is easy to use, can be used efficiently and leads to a correct completion of the task that the user will perform. A high usability with the system leads to an increased productivity [5, p.1-2] since users have to spend less time and energy figuring out how the system works.

One of the principles of human-computer interaction is to know your user. This principle states that the interaction and interface of the system should cater to the target user of the system. Ideally, information about the users (e.g. age, gender, education etc.) should be collected and analysed to determine their behaviours and skill level. This information can then be used to properly model how users will interact with the system which will simplify picking the right interface for the target user [5, p.4].

3.1.1 Quantitative task performance

One way of measuring how usable a system is, is to perform a quantitative task performance. A quantitative task performance typically measures the completion time of a specified task and how well that task is performed. This type of measurement is only meaningful when you compare the results to another design since you need a reference to see if the usability has been improved or not [5, p.130].
3.2 Creating the survey

When creating a survey there are four general categories (factual questions, questions about behaviours, attitude questions and demographical questions) of questions that can be asked. A good survey should contain questions from all these categories. There are also two general categories of response format: closed-ended and open-ended questions [6, p.31, 33].

3.2.1 Open-ended and closed-ended questions

Closed-ended questions are questions that have predefined answers that the respondents must choose from for example multiple choice questions, rating scales etc [6, p.33].

Open-ended questions are questions where the respondent have to write their own answer and they have no predefined response options. Open-ended questions have the potential to collect valid and detailed information but they require more analysis than closed-ended questions [6, p.36].

3.2.2 Factual questions

Factual questions asks respondents to reply with specific information from their knowledge. These questions have correct answers unlike attitude questions.

3.2.3 Questions about behaviours

Questions about behaviours ask respondents what they do instead of what they know.

3.2.4 Attitude questions

Attitude questions asks participants about their feelings for something. These questions are usually measured with a series of items which can be combined on a scale.

3.2.5 Demographical questions

Demographical questions asks participants about their background. Demographical questions can be used to compare how different subsets of participants answer. Demographical questions should be placed at the end of the survey since the participants are more likely to answer these questions if they are placed at the end.

3.2.6 Rating scale

A rating scale is a type of response format that “capture varying degrees of emotion about a particular topic”[6, p.33]. When using a rating scale on a question, you provide the participants with a number of options which they can
choose from. These options reflect various degrees for how the participant feels toward the item asked about in the question. An example is to have a scale going from strongly disagree to strongly agree.

3.3 React
React is “a JavaScript library for building user interfaces” developed by Facebook. React uses components that renders a particular element in the user interface. The components can be completely stateless but they can also manage their own state [7]. These components can then be used together in order to create the user interface.

3.4 Related work
A similar study was made by Mierzecka and Suminas (2018). They wanted to find out which features that were most important on two different academic libraries websites. They did this by conducting a survey among a group of students. In the survey they provided a few open-ended questions where they asked the students for their own suggestions for what features they find important. They followed the open-ended questions with close-ended questions where they suggested features which the students got to vote on a 10-degree Likert scale [8]. With this survey they found which features were most important for the libraries websites.

4 Methods
4.1 Analysis method - Conducting the survey
The first step was to create a survey and send it out to a group of real estate brokers that use Mspecs. This survey consisted of two major parts. The first part consisted of 3 open-ended questions where the participants got to reflect about how and when they use the mobile version of Mspecs and suggest at least 5 features they would like to see in a potential mobile view.

The second part consisted of a closed-ended question where the real estate brokers were presented with a list of 10 suggested features that were suggested by the project manager of Mspecs. The suggested features are listed in table 1. This way the project manager could provide their own ideas of what these features could be. The real estate brokers were asked to rate how much use they would have of each suggested feature on a 5-degree rating scale.
<table>
<thead>
<tr>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change starting price</td>
</tr>
<tr>
<td>Bidding</td>
</tr>
<tr>
<td>Create a new viewing</td>
</tr>
<tr>
<td>Add a new potential buyer</td>
</tr>
<tr>
<td>Contact the seller</td>
</tr>
<tr>
<td>Contact the buyer</td>
</tr>
<tr>
<td>Update the house on the website</td>
</tr>
<tr>
<td>Update the house on another housing service</td>
</tr>
<tr>
<td>Change basic information</td>
</tr>
<tr>
<td>Check of tasks in the broker journal</td>
</tr>
</tbody>
</table>

Table 1: The 10 suggested features in the closed-ended question

The open-ended questions were placed before the closed-ended so that the suggested features wouldn’t affect the participants answers [9, p.39].

This survey also consisted of two minor sections where the participants got to write any other ideas or thoughts that had not been brought up earlier in the survey and a demographic sections. The demographic section was included to see if different groups of real estate brokers want different features. The reason that the demographic section is placed in the end is that participants are more likely to answer these questions after they have filled in the rest of the survey [6, p.33].

The survey was sent out to 8 real estate brokers. 5 answered, 2 opted out and 1 did not answer. 3 of the real estate brokers have worked in their profession for more than 10 years and the remaining 2 have worked between 0 to 2 years. All 5 brokers primarily work with houses.

4.2 Design method - Implementing the prototype

The prototype was implemented using React and uses icons from the FontAwesome library. The reason is that Mspecs already uses React and FontAwesome which means that if the prototype is to be implemented in Mspecs, it will be much easier.

The purpose of the prototype is to display the most important features. The prototype appears when a real estate broker clicks on one of their houses in the Mspecs starting view. This is because the most important features are only features that are connected to a house. The prototype consists of 4 different components.
4.2.1 Header

The header component is sticky and is always displayed at the top of the screen. The header displays the address of the currently selected house so that the broker can identify which house they are currently working with. The header is inspired by the current header in Mspecs (shown in figure 3). It also displays two buttons with contact information for the buyer and seller.

![Figure 3: The current header for a house in Mspecs](image)

4.2.2 Short information

Below the header comes a section with short information about the house. The short information component displays the image and the information in the four squares in the current header of Mspecs (as shown in figure 3).

4.2.3 Shortcuts

The shortcut components are links to other features in Mspecs. This is where the most important features will be placed. When a real estate broker clicks on one of the shortcuts, they are redirected to that specific feature in Mspecs. Since the prototype is not connected to Mspecs, the shortcuts lead to screenshots of the place they will lead in Mspecs. Each shortcut also has an icon from the FontAwesome library.

4.2.4 Footer

The prototype also features a footer component. This component is also sticky and is always shown at the bottom of the screen. The footer contains a button that takes you to the current mobile view. The reason for this is if a real estate broker needs access to a feature that is not one of the most important features, they need to be able to bypass the new mobile view and return to the current mobile view.

4.3 Evaluating the prototype

In order to measure how much difference the prototype makes, an expert evaluation was made where the prototype was compared to the current mobile solution for Mspecs. For each of the features in the prototype, the number of clicks and how much time it takes to reach the feature in the current mobile solution was measured. The time was measured from the first click until the location of the
searched feature was found and the page was fully loaded.

The starting point for all features was the view that opens when you press on a house in the start page of Mspecs since this is where the prototype would be placed. The starting point was also chosen so that each feature could not be found with one click. This is because we want to measure the worst case scenario when you have to search for the feature and don’t have instant access to it.

The prototype was not measured since all shortcuts takes the user to the feature with one click and the only time spent is waiting for the page to load in. Because of this all features in the prototype are considered to take one click and less than one second to reach. One exception is calling or texting a buyer or seller. This features requires two clicks since the contact information is only displayed when pressing on one of the buyer or seller button. However this feature still takes less than one second to perform since this feature is displayed in the prototype and there is no need to wait for another page to fully load.

5 Results

5.1 The survey

One of the answers have been ignored due to that the person wrote that they use another system alongside Mspecs. This means that the person does not use some of the features we have suggested in the closed-ended question and has therefore voted that they don’t find those features useful. The person also suggested features that none of the other brokers have suggested. Therefore, this person’s answer has not been accounted for.

5.1.1 Open-ended questions

Table 2 shows which features the participants suggested and how many participants suggested each feature.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Number of suggestions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bidding</td>
<td>4</td>
</tr>
<tr>
<td>Viewing</td>
<td>4</td>
</tr>
<tr>
<td>Basic information</td>
<td>3</td>
</tr>
<tr>
<td>Contact information for buyer and seller</td>
<td>2</td>
</tr>
<tr>
<td>Publishing houses to website and other services</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 2: The number of times a feature was suggested by the participants
5.1.2 Closed-ended question

In order to better analyze the results from the closed-ended question, the results have been converted from their text representation in the survey to numbers in the following way.

1 - Not useful
2 - Somewhat useful
3 - Neutral
4 - Pretty Useful
5 - Much useful

In table 3, the results from the closed-ended question are displayed.

<table>
<thead>
<tr>
<th>Feature</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bidding</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Add a new potential buyer</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>4.5</td>
</tr>
<tr>
<td>Contact the seller</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>4.5</td>
</tr>
<tr>
<td>Contact the buyer</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>4.5</td>
</tr>
<tr>
<td>Update the house on the website</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>4.5</td>
</tr>
<tr>
<td>Update the house on another housing service</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>4.5</td>
</tr>
<tr>
<td>Create a new viewing</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>4.25</td>
</tr>
<tr>
<td>Change basic information</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Check of tasks in the broker journal</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Change starting price</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2.25</td>
</tr>
</tbody>
</table>

Table 3: How useful each suggested feature was voted, sorted by their average score

5.2 The prototype

The prototype is displayed in figures 4 and 5.
Figure 4: A screenshot of the prototype
5.3 The evaluation

Table 4 shows the number of clicks and how long time it took for each feature during the expert evaluation. Viewing details and follow up viewings have been grouped together since they are found in the same place. Publishing the house takes the same time as viewing details and follow up viewings since it also is in the same place as them.

Calling or texting a buyer or a seller takes longer time than the others but only
takes 4 clicks. This is because those features are more hidden and requires more scrolling. This is the reason why it has few clicks but a high measured time.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Number of clicks</th>
<th>Time (seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bidding</td>
<td>3</td>
<td>5.91</td>
</tr>
<tr>
<td>Viewing details and follow up viewings</td>
<td>3</td>
<td>3.85</td>
</tr>
<tr>
<td>Publishing the house to website</td>
<td>3</td>
<td>3.85</td>
</tr>
<tr>
<td>Change basic information</td>
<td>3</td>
<td>4.56</td>
</tr>
<tr>
<td>Check of tasks in the broker journal</td>
<td>3</td>
<td>4.61</td>
</tr>
<tr>
<td>Calling or texting a buyer and seller</td>
<td>4</td>
<td>8.57</td>
</tr>
</tbody>
</table>

Table 4: The worst case number of clicks and time it takes to reach a feature

6 Discussion

6.1 Survey Results

The most important feature according to the survey is being able to access bidding and placing new bids. In the closed-ended question it has an average of 5, meaning that all real estate brokers find this feature much useful. Bidding was also suggested by all real estate brokers in the open-ended questions.

Next after bidding comes creating a new viewing and adding a new potential buyer on a viewing. The reason for combining them together is because they both regard viewings and they are both located in the same location in Mspecs. In the survey, they received an average of 4.25 and 4.5 respectively in the closed-ended question. Like bidding, viewings was also suggested by all real estate brokers in the open-ended questions.

Following viewings comes contacting a seller or a buyer and publishing a house to the company’s website or a house marketing service. All these features got an average of 4.5 in the closed-ended question. In the real estate brokers own suggestions contacting a seller or buyer was suggested twice while publishing a house was only suggested once. However, given that they have the same average and that one of them was suggested by one more broker, they will be seen as equally useful.

Changing the basic information about a house shares a similar usefulness as viewings and publishing houses. It received an average score of 4 but it was also suggested by three real estate brokers.

A feature that was not as important was checking of tasks in the broker journal. It received an average of 3 and was not suggested by any of the real estate brokers. To the real estate brokers this feature does not seem to be as important as the others but since real estate brokers have to document the entire business
process (using the broker journal) by law, this feature can still be regarded as one of the most important features.

The last feature is changing the starting price which does not seem to be very useful for the real estate brokers. It received an average of 2.25 and was not suggested by any of the real estate brokers.

6.2 Survey Correctness

Due to practical reasons, only 8 people were invited to participate in the survey and only 5 of them answered. Mspecs has roughly 2400 users (Kenneth Fehrm, personal communication)[10] which means that many users of Mspecs, who might have different opinions on which features are most important, are missed. Another aspect about these 8 people is they all work with houses. There are real estate brokers who work with other fields such as farming. Those real estate brokers might have a completely different view from the ones working with houses.

The 10 suggested features in the closed-ended question were chosen because the project manager believes that they are features that are most important in a mobile view. There might however be some features that has been missed in this selection. However, the answers in the open-ended questions did not seem to bring up any feature of this kind. Some answers brought up features that were not in the closed-ended question but they were only brought up by one or two answers. This could also be something that is affected by the low number of participants.

6.3 Evaluating the prototype

Since the evaluation was an expert evaluation, the evaluator knew exactly where to click to find each feature. This means that the times presented in table 4 are likely to differ when a user performs the same actions. This is because they don’t know exactly where to click to find the features and have to spend more time searching. However, when comparing the results to the prototype, there is still a decrease in the number of clicks and the time needed to reach a certain feature.

If a user wants to find a feature that is not listed as a shortcut, it would take one extra click and some extra time since the user has to press the button that returns them to the current mobile view. This does slow the user down but this is a tradeoff for having the shortcuts.

7 Conclusion

When combining the results from the survey and the points made in the discussion, the most important features according to the surveyed real estate brokers
in a mobile view seems to be the following:

- Bidding
- Create a new viewing
- Add a new potential buyer
- Contact information for Buyer and Seller
- Publishing a house to website or other house marketing service
- Changing basic information
- Checking of tasks in the real estate broker journal

The following remaining features are not as useful in a mobile view.

- Changing the starting price

When putting these features into a prototype that contains shortcut to these features, the number of clicks and time searching for the features become smaller and it gets easier for the user to find the features. The features that do not have a shortcut require an extra click and some extra time to reach.

8 Future work

If this prototype is implemented in Mspecs, one can measure how many real estate brokers click on the shortcuts and how many click on using the normal mobile view. This way it is possible to get a more real-life result if the features found by this thesis are the most important ones and how much they are used. The implementation can also feature anchors that guide the user to the exact place of a feature on the page so that users don’t have to scroll to it.

Another improvement is that more real estate brokers could answer the survey to better improve the correctness of the survey. The real estate brokers should also have various backgrounds and fields they are working with e.g. farming, housing etc. Doing this will provide more different views on what features are the most important.

References


