Outcome and Data Analysis

Background Survey Section:

2(13.3%) of the subjects have no idea of Augmented reality, they have heard of the name but do not know what it is.

5(33.3%) of the subjects have a vague understanding of AR, some of them confused it with VR technology:

"I heard of it before and my understanding of it is that it's just like a way for you to present reality, try to make real life experiences using your computer. Oh, I was thinking of Virtual Reality."

8(53.3%) of the subjects gave a relatively clear definition of AR:

"With AR, you take what's already existing and you add to it. Some aspect of reality still exists, but you're adding an artificial layer on top of that."

6(40%) of the subjects have not used any AR techniques before.

4(26.7%) of the subjects have seen or heard of how AR devices and applications work:

"I guess I watched some videos like when you use Google Glass or anything, you see the real world like when you are shopping.

It can show this shop sell something, something like that.

When you look at the real shop, but you know it sells anything shown on the screen."

4(20%) of the subjects have tried AR techniques on their own and shared their experience with us:

"A while ago I used an app where you like walk around and find stuff and collect it."

2(13.3%) of the subjects are very familiar with AR technology and even worked on related projects before.

This result shows the fact that they generally have already heard of and tried some AR devices or techniques. As a major user group of our product, we are confident so propose that college students have background knowledge of AR more or less. However, not most of them have used it before so some easy-to-start examples or onboard is a must to give them a feeling of how Argon works.

Screenshot Section:

11(73.3%) of the subjects notice the left sidebar first, the main reasons for that are 'color contrast', 'icons on the menu'. 'Vertical layout' and 'Placement' are both mentioned once. 2(13.3%) of the subjects think the top URL bar catches attention because it is on the top and it looks similar to the URL bar of other browsers.

"The next thing that probably capture my attention would be this box with these icons. It's on the top. Because of the placement."

3(20%) of the subjects talk about the icons, especially the rocket shape icon because it looks so different and unfamiliar compared to others:

"It's different, usually, with my web browser, you don't really, haven't seen a rocket ship in my case."

All the subjects talked about tapping as the primary gesture, it is obvious for smartphones.

12 (80%) of the subjects assume that they can do swiping, one of the reasons is that swiping is very broadly used gesture, another reason is the sidebar, which seems to be a potential target for swiping.

"I feel like I can swipe the sidebar. And I don't know what's there but I guess I can swipe it to left, to see more information."

Others rarely mentioned gestures like dragging, pinch and double tapping are probably based on personal expectation, so they are not further discussed here.

Most of the subjects guessed the possible functions according to the icons they see on this page (like settings, information, notification, bookmark, open camera) as well as their

past experience of using other mobile browsers (like searching/input URL, bookmark). Some of them will refer to what they have experienced using other AR techniques (like adding effect, open camera, zoom in/out and locate).

For the icons part, according to the data, some of the icons are very easy to recognize: Bookmark, notification, refresh, audio control, visibility control, folder, and favorite. The successfully recognize ratios for these icons are very close to 100% if not 100%.

Add bookmark icon caused confusion for 40% of the subjects. Most of them thought it is adding layers or pages according to the shape of that icon, which shows a plus sign on a paper stack.

And because the idea of reading mode is novel and does not exist before, the reading mode icon seems not making any sense to nearly all the subjects.

Due to the same problem, the main view does not come across either.

And Start page icon, which is a rocket ship, is very eye-catching:
"It's different, usually, with my web browser, you don't really, haven't seen a rocket ship in my case."
However, it caused significant confusion. The subjects did not associate it with 'Start' at all. 5(33%) of the subjects have no idea what it is and 4(26.7%) of them went one step further: they think it is a kind of launch or switch on something.

Open new tab did not come across for some reason, subjects know the function 'Open a new website' but only 4(26.7%) made such assumption. The reason behind is probably that in other mobile browsers, no icon is used to open a new website. So there is a lack of mapping.

About the structure and layout of the screen. Nearly half(46.7%) of the subjects guessed that the functions are grouped based on the function type:

"My assumption is that these are related to the browser stuff.

This is about the website itself.

So whatever you have opened, this will give you information about that. These are actual actions you can perform on the page."

4(26.7%) of the subjects think it might be based on usage frequency and another 4(26.7%) considered that the rule here is to match to other mobile browsers.

And there are 2 subjects talked about the importance and priority of the functions.
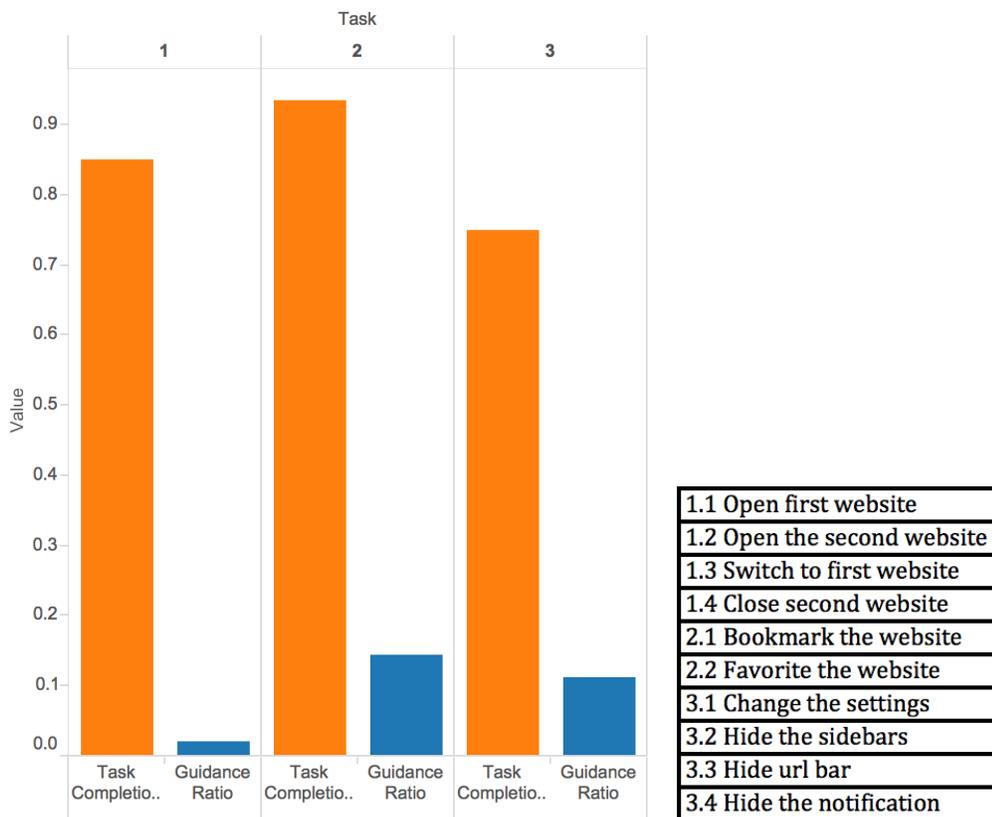
Benchmark Tasks Section:

Chart 1: Main task completion and guidance ratio

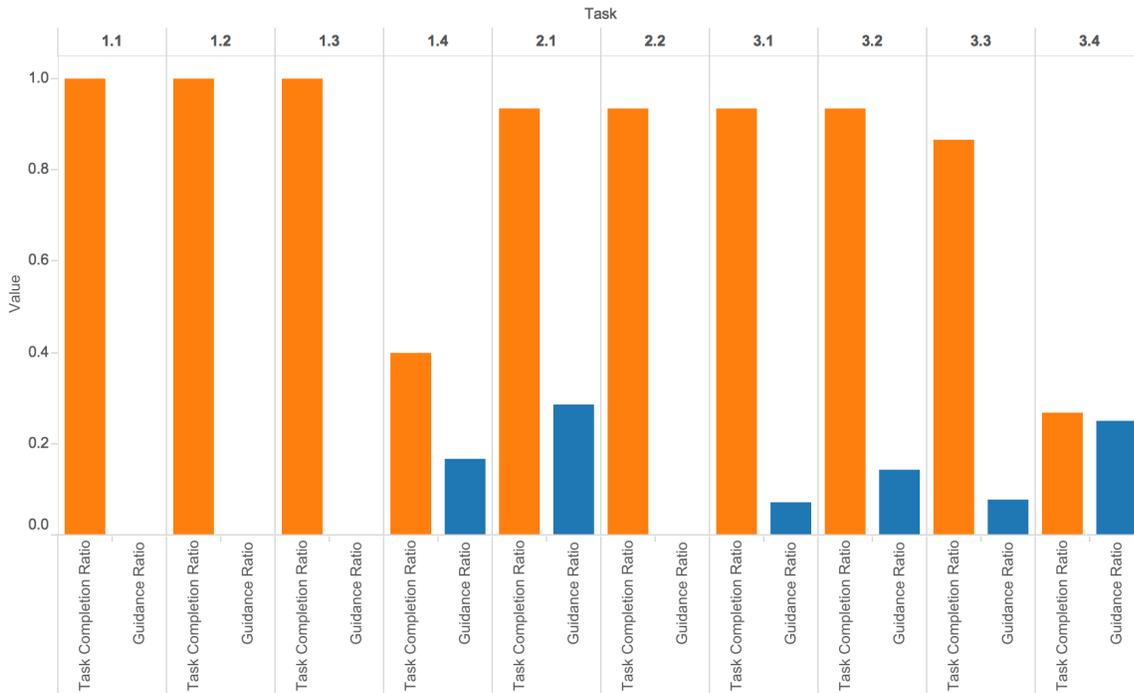**Subtasks completion and guidance ratio**

Chart 2: Subtask completion and guidance ratio

(See Chart 2) The low completion rate of task 1.4 and task 3.4 shows that the workflow and interaction are far from intuitive and accessible, we need probably redesign that. And we noticed that extra guidance needed for Task 2.1, which means that we should make the function more obvious.
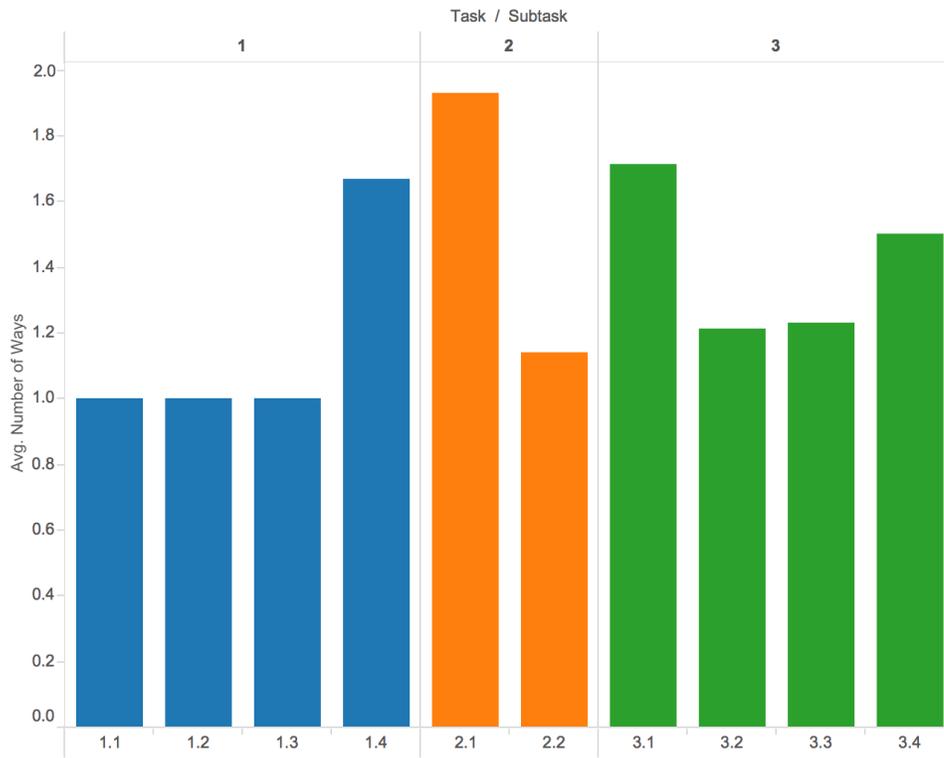
Chart 3: Average number of ways subjects tried to perform the task
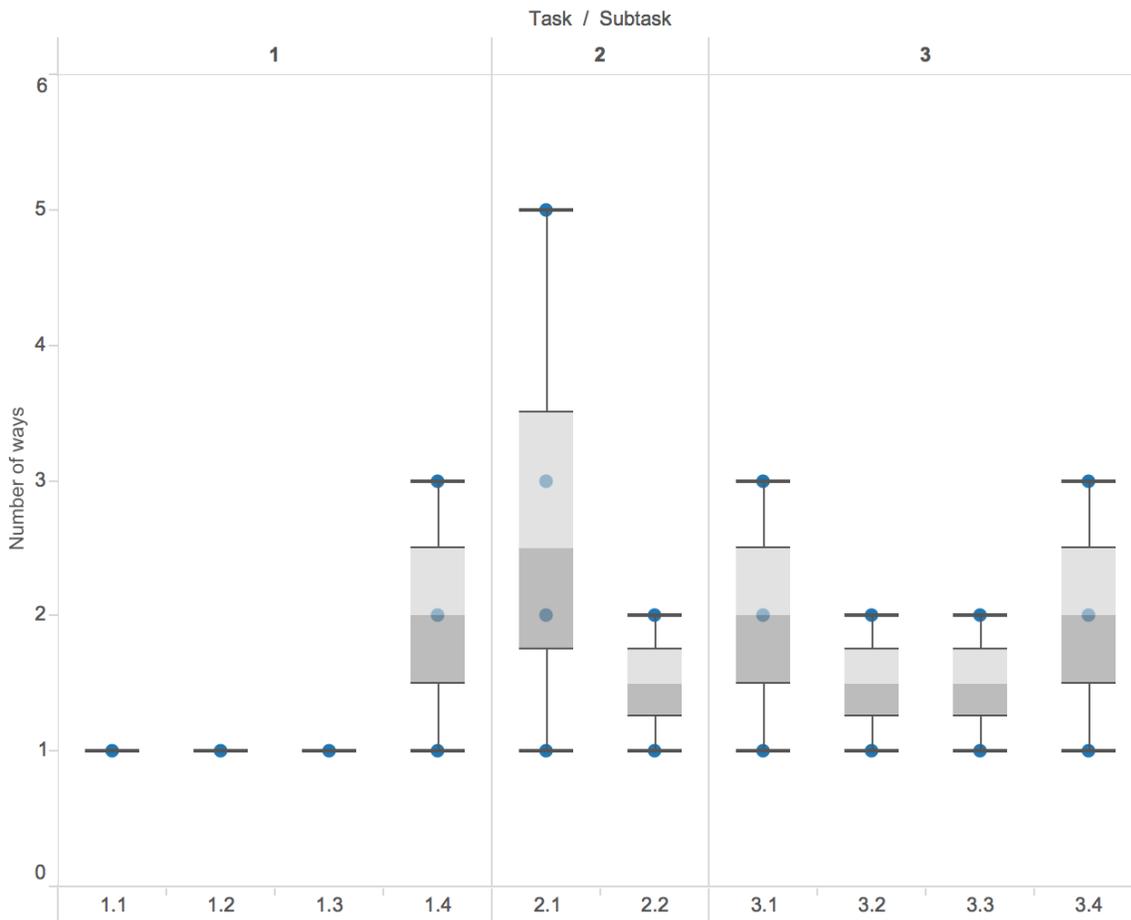
Distribution of number of ways

Chart 4: Distribution of the number of ways subjects tried to perform the task

The process of Task 2.1, adding bookmarks, is causing confusion.

Task 1.4 (Closing a channel), 3.1 (Changing settings for a channel), 3.4 (Hide indicators) also need several tries. Therefore, we still need to spend some efforts to refine the workflows for these tasks.

The bigger variation also shows that people get more confused in Task 1.4, 2.1, 3.1 and 3.4.People cannot form a similar assumption while being provided the tasks.

Subjects talked about the confusions they had during the task session. Nearly half of the subjects (7 out of 15) mentioned that the icons confused them:

"Beyond that, possibly some the icons still cannot indicate what I actually expect. So could be confusing for me. It's kind of confusing that, not accurate, based on personal perception."

These issues are addressed in the previous section as well.

These frequently mentioned confusing icons are: Reading mode(1 time), Start page(3 times) and Main view(2 times).

3 subjects talk about the notification part, the way to hide the notification and the idea of notification itself are both confusing:

"Yes, like the notifications, I can't make a lot of sense. These icons are still confusing, the close thing. You need to use this to hide."

The idea of starting page and reading mode were both mentioned twice when it came to confusions:

"Yes, I am not sure what this does (start page)."

"I don't know what the icon is for (reading mode icon)."

And there were two subjects wondering the difference between start page and bookmarks page.

"I am not exactly sure what is the difference between the start and bookmarks. Is the bookmark like you save it and the start is like you can go to other websites to do that."

Then two of the subjects were actually not sure the idea of the whole application:

"My question is, what I am using it for?

M: Its..

It's a small screen, project something why I need..

M: Show another panorama example. ..

Why didn't I just use my..

M: But it is realer, just like you are in that specific location.

Okay, got you. I know what it is doing, but it is too weird for me."

Closing Interview Section:

There are several issues subjects complained about most.

The top four are the unfamiliar icons (7 times), which have been discussed in previous parts, the size of font/icon (5 times), too many function panels (5 times), and visibility issue (5 times).

3 subjects talked about the overlapping of sidebars, another 3 proposed that the workflow of adding favorite is too long. 2 mentioned that there are too many items on the screen and another two thought the way to hide notification is weird, which is also obviously shown in the Benchmark Task data.

There are 2 subjects saying that the swiping gesture is hard to perform but it is probably due to the limitation of the prototyping tool so it will not be further discussed.

About the positive aspects, most of the subjects like the general design, including color, design style. And another pro is that the layout is clean and simple, which turns to be a big concern in next part.

When it comes to the top considerations while using a new application, most of the subjects talked about learnability (8 times) and easy to use (6 times), which are overlapped with each other. Another hot issue is the appealing visual design (7 times), which is no wonder a key concern.

6 subjects cared about whether the application is really helpful and functional enough. 5 subjects emphasized the importance of simple and clear interface. Other subjects are going for good performance and some of them even mentioned the cross-platform issue. And there are 4 subjects assumed that if the application is novel or complicated, a smartly designed onboarding process will be helpful and acceptable.

Suggestions

We also got suggestions from subjects and some of them are worth carefully considerations. I just list them here:

- Replace the Reading mode icon for an AR icon.
- Use another way to color code the tabs.
- Use special gesture as a shortcut to swipe all the widgets away.
- Use examples and floating text to help onboarding.
- Hide the notification when no data coming in.
- Show only one control panel at a time.
- A quick way to add favorite website.

Feedback from developers

The browser development teams give great feedback on this prototype,
They like the idea of having audio/visual control on running channels.
They think it is good to enable the users start with a page where there are feature channels users can start with soon.
And the idea of favorite pages, which means the user want to visit frequently, is attractive and makes a lot of sense.

They also suggested

- A full-screen mode button, which enable the user to hide all widgets.
- Swiping from both sides for deleting channels.
- A clear tutorial page, which can be accessed within the application.