

project:	e-books usability of e-readers, user interaction application development
project client:	DocWolves DocWolves assist in simplifying document streams by combining the use of the e-reader with a unique publishing system. The services and products DocWolves offer are cost and time reducing. DocWolves helps offices prepare for a hardcopy-free future. <i>http://www.docwolves.nl/</i>
project manager:	Frank Kloos
students:	Abbrederis Bianca Brunner Natalie Strikwerda Anne-Pieter
version:	04 april 2011/ version: concept_1.3

CONTENTS

- 1. introduction page 04
- 2. concept page 06
 - 2.1 research page 06
 - 2.2 critical viewings page 06
- 3. personas page 07
- 4. use cases page 09
 - 4.1 common usage page 09
- 5. flowchart page 12
- 6. usability page 15
- 7. scenarios page 17
- 8. user interface page 19
- 9. motives page 20
- 10. mindmap page 22
- 11. visualizations page 23
- 12. closing words page 27
- 13. sources page 28

1. introduction

The Hogeschool van Amsterdam received an assignment from project client DocWolves, to develop a user-interface for a tablet such as the iPad. The application is named NotuBox. It creates a safe and paperless environment where important documents, agenda points and minutes of council meetings are gathered and linked. NotuBox was developed for municipal councils. We are going to enhance the existing application during our semester.

We are a group of 3 students. We are from different countries and we have a different background of knowledge. Two of our team are incoming students from Austria and will be interacting as designers for this project. Both are studying InterMedia at the University of Applied Sciences Vorarlberg and are doing their fourth term at the mediaLAB of the HvA. The other teammember is from the Netherlands and is working as a researcher for the project. He is in his last term of mediamarketing and -publishing at the Hogeschool van Amsterdam.

partners

Our first contact person is our project manager Frank Kloos, who is working for the mediaLAB at the HvA. He receives all the information about the workflow and the intermediate results. The contact person from DocWolves is Eelco Kodde from NotuBiz, who receives the most important results of the main steps during the workflow from the project manager.



personal goals

We want to achieve a deep knowledge of the whole issue of e-books, e-readers and tablets. Furthermore we want to specialize ourselves in usability, design and the digital reading experiences of tablets. We are glad that we have the opportunity to work on a project, which will be used more and more in the future and will displace books, magazines ect. and therefore will contribute to a paperless environment.

We intend to develop the application in a way that it is as similar as possible to reading on a normal piece of paper. The use of the application must be as easy as possible, with a clear structure that collects all the features which are necessary, so that every member of the target group will not hesitate using it.

goal of project

The main reason of this project is that the target group prefers tablets over paper for reading their documents. The council members of the government are already using tablets instead of paper, though the NotuBox-application still misses some important features and needs to be improved. This way the high number of the waste of paper can be reduced enormously.

The goal of this project is to upgrade the existing application, which means that the usability and the layout have to be improved, as well as some further features have to be added. Finally every single person from the target group should be able to handle the app as self-evident like reading a book. Moreover we have to develop a long term solution for the application, that it will be successful over the next years, even though the fun factor may get lost, as well as that the users prefer the application of Notubiz instead of the competitor's supply.

workflow and planning

Our workflow consists on 5 different phases: the research- & analysis-phase, the concept phase, the design-phase, the development-phase and at least the implementation-phase. Our group works independent, for further questions we have meetings with the project manager, who is in direct contact to the client. Next to the project we are writing a documentation about the project and we also post important steps of the workflow onto our blog of the mediaLAB.



briefing and debriefing	15.02.11
research presentation	11.03.11
first concept presentation	31.03.11
final concept presentation	06.04.11
design presentation	15.04.11
develop questions	18.04.11
first prototype or demo	02.05.11
final prototype or demo	30.05.11
end of project	30.05.11

2. concept

2.1 referring to research

This concept document is based on our research document. What we've learned from our research is that gestures, features and navigation are the key elements of the application.

Related to the demographic research of council members we represent three personas in the research document, which allows us to identify the user motivations, expectations and goals which are responsible for the online behaviour on tablets. Although each persona is fictitious, they are based on our knowledge of the demographic data of council members. A big part of the research document are the technical insights - we want to give a short overview about the advantages and disadvantages of EPUB and PDF, the different Readers and the Fonts and Typesetting for eReaders. As mentioned above the key elements of the application have to be clearly structured and developed exactly for the target group, whom should be able to handle the app as a normal day tool. We also want to allude that we have implemented the research results in our sketches, the concept description and the mind map.

2.2 critical viewings

After some years of using the tablets instead of normal paper, the users will might loose the fun factor! Therefore the application must be so comfortable, that they will also prefer the tablet after some years. Furthermore it could happen that some users do not want to invest their time in learning a new way of reading, so we must be sure that the use of the application is as easy as possible..

3. personas

facts:

- Council members spend around 17 hours on council work. 60% of this time, so 11 hours is spend on reading.
- The percentage of female council members is 25%.
- Male council members result in 75%.
- The average age of council member is 54 and 70% of the age range of council members is between the age of 40 and 63.
- About 70% of the councillors are working or studying beside their work in the council.
- Besides the documents the secretary sends them, they also search the web when investing a certain topic.
- They do not actually read everything but more or less scan the documents the secretary sends them.
- They want fast switching between different documents, chapters, bookmarks and conclusions.
- Efficiency, saving money and a better environment are good motives to invest in going digital (so taking some time to learn new features)
- Council members still prefer paper over digital in stressful situations
- Council members do not want digital reading to be exactly the same as reading from paper. It has to bring something new.
- Council members would like to have more support in discovering all the features.
- Council members would like to share more easily.
- Council members like to read in different positions. Especially the couch (laying down/ sitting) is very popular.
- The iPad is less suitable for typing large pieces of text
- Council members would like to experiment with attributes like a stylus or a keyboard.
- The search function is really important and is seen as a big pro of digital reading.

most important features:

- Read (scan)
- Search
- Fast switching between documents, chapters, conclusions, bookmarks
- Share



Lieneke Heuvel is working about fourteen hours a week on council work, she is working often from home, because her two children which are still in primary school. On one hand Lieneke really likes the idea of bringing the documents everywhere and sharing the document with somebody but on the other hand she is irritated by people who are having discussions on Twitter when a debate in the council is going on. Lieneke wants to improve her skills because she does not know how to highlight text.



Stijn Van Brekelenkam's work environment is enviable. He handles with finance data entry at the Rabobank. He does not rely on old computers for all aspects of his work. Also in his free time Stijn is really interested in having the latest gadgets, especially the ones from Apple. He does not refer to paper much on work and also want to appoint this opinion in his work as a councillor. He is spending thirteen hours a week for the council work. Stijn is used to work with new technology and as mentioned above he is really interested in saving paper and prefers reading his documents from an iPad screen over a laptop screen. So he can also share his working time with his wife and kids, Stijn is a 43 year old father of three children and a big advantage in his opinion is that he is able to work by sitting or laying down in the garden and working for the council. He rather likes to see a feature which helps him to switch faster between documents and creating own bookmarks and conclusions.



Bram Vogel is a 61-year old retired teacher and is not really a capable computer user also because of his profession during his working life, so he would describe himself as technologically disabled. Bram considers his work-life to be continued and so he decided to spend ten to twelve hours a week by working in the council. With the beginning of his council work he also get into new technology also the iPad and really like the usability and is impressed about the fast switch-on. Bram is just using the iPad for his council work and checking e-mail because in his free time he does not feel comfortable with the different features and possibilities and also in stressful situations he still prefers paper instead of the iPad.

4. use cases

In the use cases we try to describe the typical usage of people. It should point out how people use the application in different ways. The main focus bears on the most important steps of usage.

user 1

.. opens his NotuBox and types in his user-name and password. After the log-in he ends up on the start-page, where the documents are listed. Unfortunately the document he needs is not current and for this reason not in the list. Therefore the user needs to use the search-field to find the document. The search-function finds the right document for the user and he can open the right pdf.

user 2

.. has already opened the pdf in NotuBox. Now he wants to get an overview of the whole document. Therefore he opens the index-page in the task-bar at the top of the display, in which all pages are viewed minimized. The user does not need to read through chapter 5 and 9, for this reason he marks these chapters and changes the priority from standard to low.

user 3

.. is reading a document and wants highlight some important lines. Therefore he activates the highlight-button in the task-bar and starts to highlight the text by moving with his finger over it. After this he would also like to leave a note. For this reason he activates the annotation-button and starts writing his annotation. He closes the annotation-field and moves the annotation-sign to the point of the page where he wants to find it the next time.

user 4

.. is already at the end of a document and wants to go back to page 15. He activates the page-button and types in the number 15. Arrived on this page the user wants to maximize the curve chart, therefore he clicks on the chart, which is viewed now in a bigger size. Now the user changes the brightness of the display in the task-bar to see the chart in his best way.

user 5

.. is now at the end of the pdf and wants to sum up his document. From there he opens the summary-bar in the task-bar and activates his annotations, the highlight and also the high priorities. Now the user wants to share his document with a colleague and clicks on the e-mail-button which opens his standard e-mail program where the pdf as well as the summary of it are already attached.

user 6

.. is surfing on the web and finds an interesting website. The user bookmarks it and later on he can open it from the NotuBox-App and by doing that the user can utilize all the features the NotuBox-App has to offer.

4.1 common usage:

the user wants to start the NotuBox-Application:

- with tapping on the NotuBox-App the application starts automatically
- at first the user has to type in his user-name and his password
- after a successful login, the user gets on the start page of NotuBox

the user wants to search a PDF-document:

- to find a special document which is not listed on the start-page, the user can type in the name or issue of the document in the search-field
- (if the user knows the date of the document he/she can use the calendar)

the user wants to open a PDF-document:

- to open a document the user must tap on the preferred document in the list
- all actual documents are listed, for older documents the user can change the month in the calendar

dar -or he/she can use the search-field

the user wants to navigate through a document:

- user can swipe from page to page, he/she can push the buttons at the bottom, or the user can push the back- and forward-button in the task-bar to turn to another page
- all features which are necessary for the user are located in the task-bar at the top of the display

the user wants to widen the view of a picture:

- with a simple tap on a picture or graphic, the picture will be open in a bigger size
- with a second tap it will go back to its original size

the user wants to go back to the start-page:

- for returning back to the start-page, the user has to tap on the „home-button“ in the task-bar at the top of the display

the user wants to receive an overview of the document:

- to get an overview of the whole document the user needs to tap on the index-button
- after this all pages will be shown as miniatures
- user is able to see, where he/she created a comment or changed the priority
- user is also able to open a preferred page with a tap on it

the user wants to go to a special page:

- user has to tap on the page-button in the task-bar
- a short bar with numbers from 0-9 will open, user can type in the page-number and
- confirm with „ok“ - page will open

the user wants to create an annotation:

- to create a new annotation the user has to tap on the „annotation-button“ in the task-bar
- a new annotation-field will open as well as the keyboard
- user can start directly typing in his annotation
- after finishing he can close the annotation or delete it
- the sign for an existing annotation can be moved by the user by moving it over the page

the user wants to get an overview of his annotations:

- to see all the annotations the user can open the „annotation-list“ in the task-bar
- user can delete annotations directly in the list, by tapping on the delete-button
- user can change the annotation by tapping on „undo-button“
- user can open an annotation and the page where it is located with a double tap on the annotation

the user wants to highlight words, lines, or paragraphs:

- he/she needs to activate the „highlight-button“ in the task-bar
- finger-movements over the text will highlight these sequences
- (same function for deleting the highlights)

the user wants to zoom-in and -out:

- to get another view of the page the user has to tap on the zoom-in or zoom-out button
- there are 3 different modes available, which are specially created for 3 different work-places

the user wants to give a page a special priority:

- if a user thinks that a page is very important or in the other way not important for the work, he/she can easily change the priority in the task-bar
- a click on the „priority-button“ will open a small bar with 3 options: high, normal and low
- a high priority will mark the page with a red border, a low priority will reduce the transparency of the page

the user wants to change the brightness of the display:

- if a user wants to change the brightness of the display, he/she can tap on the „brightness-button“ in the task-bar which opens a (roll)-ledge
- the moving from the button will change the brightness immediately

the user wants to create a summary of the document:

- after going through a document the user is able to create a summary of his annotations, highlights and high priority-pages
- with a tap on the „summary-button“ in the task-bar, a small bar will open with 3 options to activate
- after activating the options, the program will create a summary, which can be open directly on the start-page (next to the according pdf)

the user wants to share his document with others:

- to share a document the user can directly tap on the e-mail-button in the task-bar
- the standard e-mail program will open, where the document is automatically attached
- the user only needs to fill in the e-mail adress of the receiver and click on send

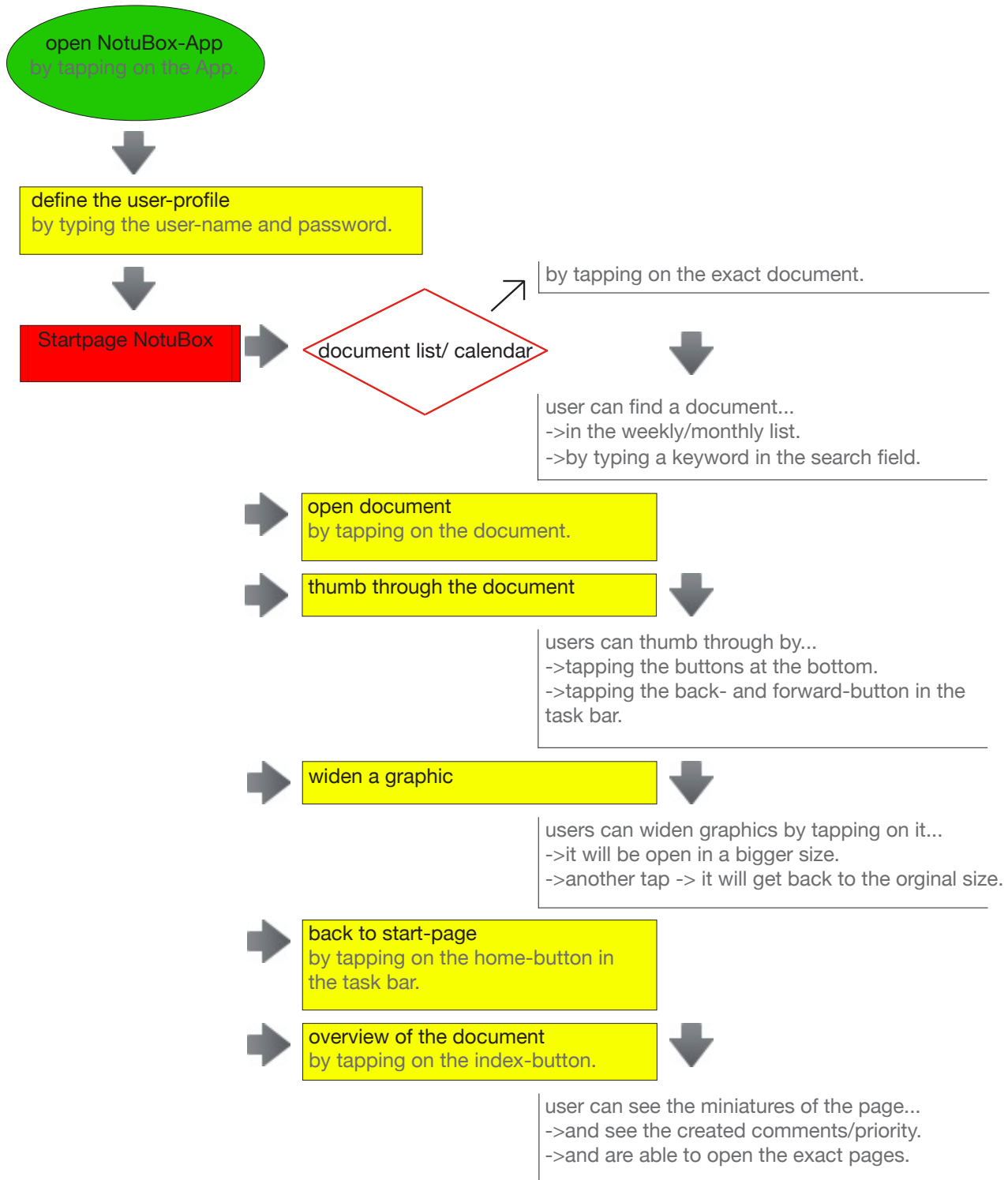
the user wants to open a summary of a PDF-document:

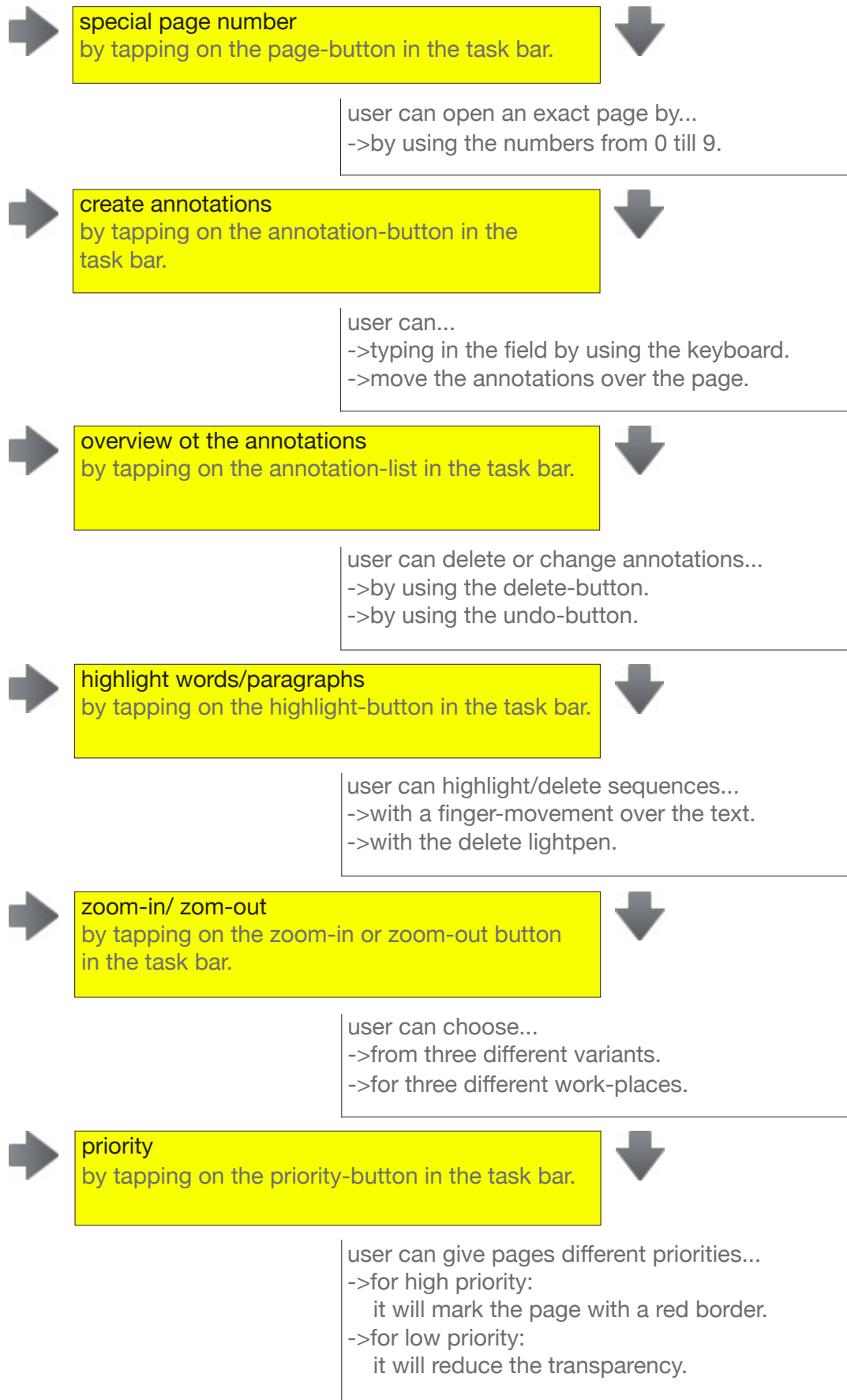
- if a user has already created a summary of a document, he/she can open this summary directly on the start-page with a tap on the sign

5. flowchart

Composition/ Chart

NotuBiz





→ **summary**
by tapping on the summary-button
in the task bar. ↓

user can create a summary of the...
->annotations,
->highlights and
->priority pages.

→ **share document**
by tapping on the e-mail-button in
the task bar. ↓

user can send...
->the automatically attached document to
others.

→ **brightness**
by tapping on the brightness-
button in the task bar. ↓

user can change the brightness...
by moving the roll-ledge which is opened
automatically.

→ **summary of a document**
by tapping on the summary-sign at
the start page. ↓

user can open a summary...
->which is already created from the app.

6. usability

We have conducted desk research and user tests to avoid future usability problems. We have based our findings on a report by Jakob Nielsen, our own usability tests and an article on activity zones for touchscreen tablets.

Nielsen

Nielsen states that the iPad UIs suffer under a triple threat that causes significant user confusion:

- 1) The UI is mostly hidden and the user has to tap somewhere to reveal the UI.
- 2) Different applications require different gestures to navigate.
- 3) Accidental activation. This occurs when users touch things by mistake or make a gesture that unexpectedly initiates a feature.

When you combine these three usability problems, the resulting user experience is frequently one of not knowing what happened or how to replicate a certain action to achieve the same result again. Users also do not know how to revert to the previous state because there is no consistent undo feature like the Web's Back button.

Particularly for page turning, Nielsen suggests to support different gestures. He suggests to use both the tap and swipe because users who have some experience with reading books on the iPhone expect to be able to turn the page by tapping on the side and users who do not have that experience expect to turn the page by using the reason of swiping, which is similar to how people turn pages in physical books.

On the other hand we have discovered through our own usability tests that the combination of tapping and swiping causes disorientation. When a user for instance taps the screen with the intention to get to the navigation menu and he or she taps on the left or the right side of the screen the result will be that the page will turn and the user gets lost.

usability test

As we declared in the introduction we have conducted three usability tests ourselves. What we did is called 'key task testing'. This means we asked the users to do something, then watched how well they did. The applications we have used are GoodReader and Stanza.

tasks:

- Go to a certain page
- Create an annotation
- Highlight a sentence
- Browse back and forth
- Search for a certain word

test persons:

- Jitske Strikwerda, 35 years old, former councillor and working in outpatient services.
- Gijsbert Witteveen, 25 years old, facility manager.
- Bartjan Baarslag, 37 years old, restaurant manager.

test results:

- As mentioned before: disorientation due to the combination of tapping and swiping.
- Test persons were at first not able to locate the navigation menu.
- They felt that the navigation menu disappeared too quickly.
- Some test persons were looking for a 'back' button.
- It took some time before they discovered that the scrollbar could be used for navigating to a

certain page.

- They preferred Stanza over GoodReader because of its simplicity.
- It took some time before they discovered the highlight feature. They thought it was too difficult to handle.
- None of the test persons tapped to browse back and forth. Instead they all swiped.

activity zones for touchscreen tablets

Kicker Studios conducted research on activity zones for touchscreen tablets. They have discovered that some of the best of them have placed controls in ways that best match the ergonomics of our hands. So, it makes sense, when designing mobile touchscreen applications, to pay attention to these activity zones.



Kicker Studios suggests to put the high-use controls in the Easy zones, and controls that are less used and certainly those you do not want accidentally pressed in the reach zones.

7. scenarios



Based on the usability tests and the group discussion we will describe three user problems. We will also describe what we think are the solutions that might solve these problems.

problem 1

users get disoriented due to:

- The combination of tapping and swiping for browsing pages.
- Tapping in the middle to get to the taskbar.
- The taskbar disappears too quickly.

solutions:

- Users are only able to browse by using the swiping gesture.
- The taskbar will always be visible.

problem 2

it is too complicated to highlight text due to:

- The complexity of selecting a certain text.
- Too many other options to choose from.

solution:

- First the user taps the highlight-button. Then the user moves its finger over a certain piece of text he or she wants to highlight.

problem 3

it is too complicated to create an annotation due to:

- The complexity of selecting a certain text.
- Too many other options to choose from.

solution:

- First the user taps the annotation-button. Then the user taps wherever to create an annotation.

8. user Interface

What makes a great user interface is the question we have asked ourselves. To answer this question we read about Human Computer Interaction and discovered that a good UI consists of eight qualities. These are:

1) clarity:

Clear interfaces do not need manuals. Developers can create clarity through language, flow, hierarchy and metaphors.

2) concision:

The interface has to be clear but at the same time you cannot explain too much because this might lead to interface bloat. This means that there is just too much stuff on the screen at the same time.

3) familiarity

Something is familiar when you recall a previous encounter you have had with it. For instance reusing certain icons can contribute to a sense of familiarity.

4) responsiveness

This can mean two things. At first this means that the UI has to be fast and not 'sluggish'. Secondly responsiveness is providing the user with feedback about what is happening and whether the user's input is being successfully processed.

5) consistency

This is important because it allows users to recognize usage patterns.

6) aesthetics

To create an as 'joyful' as possible user experience it is important that the UI looks good.

7) efficiency

The UI should make the user more productive through shortcuts and good design.

8) forgiveness

Users make mistakes so it is very important that it is easy to for instance undo actions and recover deleted files.

9. motives

In this part we explain how we developed the features of the application for NotuBiz.

start page:

The team has thought about a calendar for structuring the documents, because on this way the actual documents are shown up at first and older ones can be found very easily. If a user is not able to find a document there is also a search-field, which he can use. We decided to include this feature after we have done our research, in which we found out, that the users want to have this option.

turn pages:

The team discovered this way of swiping in an application called „Flipboard“ and we all liked it a lot, by reason that it is very similar to turning a page in a real book and we thought that this fits very good in our application.

pictures:

The idea to be able to maximize pictures came up during our research phase. We thought that in these types of documents which councillors normally read, will be a lot of charts and scales ect. and by this reason it would be very helpful to be able to maximize the pictures very easily.

task-bar:

The team decided to create a task-bar which is constantly seeable at the top of the display. On this way the features can be chosen very fast and easily. The user does not have to search for a bar or for a feature in different bars, everything can be found in one bar at the top of his document.

index-page:

We thought that it would be useful for the user, to get an overview of a document before reading it. (how many chapters, pages are there ect.) The idea that the user can change the „priorities“ of pages/chapters came up during the research phase and is derived from sending e-mails with high priority.

page-button:

The team wanted to find a solution where the user can switch very fast between pages, therefore we came up with the idea for the small bar, where the switching is very easily for the user.

annotation-button:

By reason that this feature is one of the most used ones, it must be as easy as possible. The user only has to click one time on the annotation-button.

annotation-list:

This idea came up after we were thinking about how many notes a user will take in a document. With this feature the user can go through his notes very easily and can delete or change them very fast.

highlight-button:

Besides the annotation-feature, this one is one of the most used ones, and therefore it must be available and easy to handle for the user. With our idea, the user only needs to tap one time on the button and can highlight the text like he would do it with a marker on paper.

zoom-button:

In our research we found out that the target group prefers to work on different places, like the office, the normal desk, but also the couch or the sunbed. Therefore we need a feature that the user can fit the layout to his usage.

priority-button:

As already mentioned, this idea came up during the research-phase. We thought that its a nice opportunity for a user, if he wants to bring whole pages or chapters out and also in the other direction, to eclipse parts of a document.

e-mail-button:

In the research we found out, that it is very important for the users to share their documents with others very fast. So we created the idea that the e-mail-feature should be available as fast as possible.

summary-button:

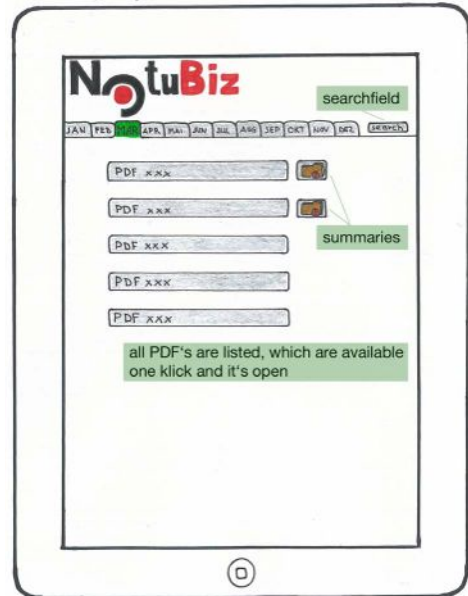
This idea came up during the brainstorming. We thought that it could be very useful for users, if they could get a summary of the most important parts of their documents.

11. visualizations

In this step we show up our ideas of the features, which we want to develop for the application of NotuBiz.

start page:

- > Logo of Notubiz (or Notubox), callendar with actual month
- > all PDF's are listed, which are available at the moment (+summaries)
- > one tap and it is open
- > searchfield



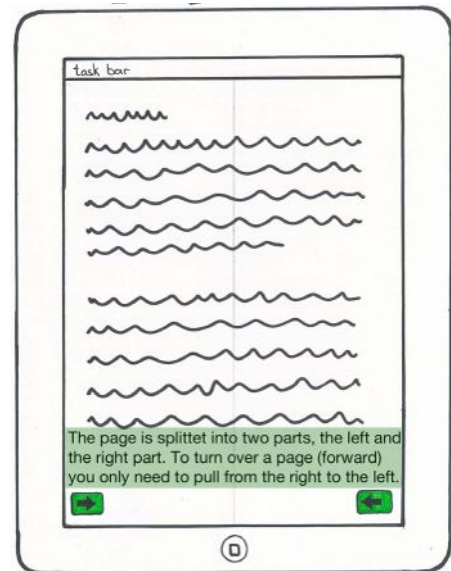
general functions:

turn pages

On the tablet you can always see one page. The page is split into two parts, the left and the right part. To turn over a page (forward) you only need to pull (on the right part of the page) from the right to the left.

Same to go backwards on the left part of the page.

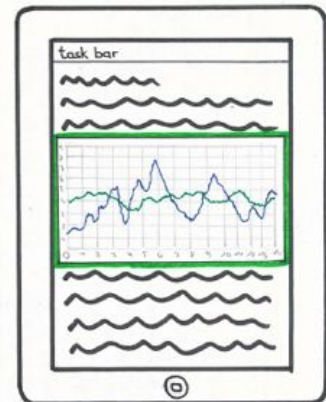
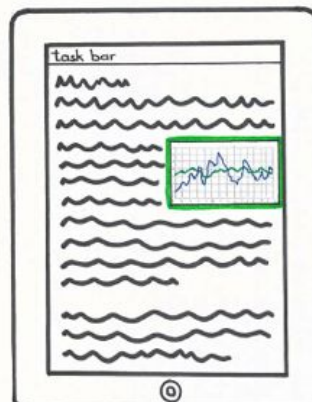
(for help we need little arrows for showing the direction)



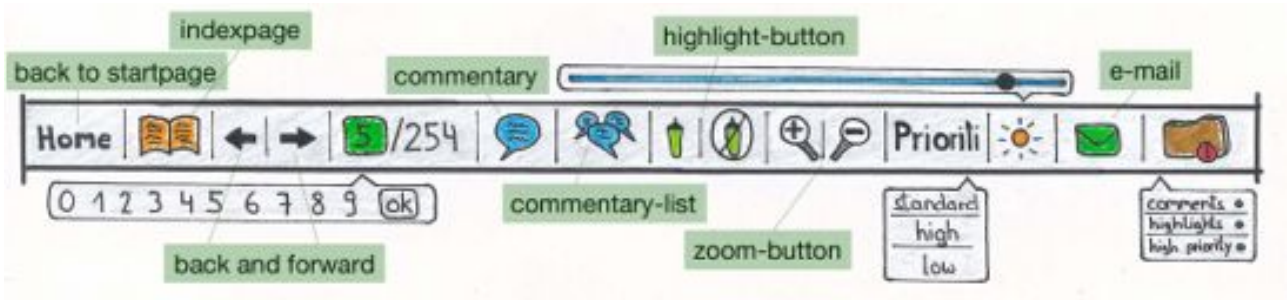
pictures

when you tap on a picture it will get bigger

with the second tap it will get back into its original size



task bar:



choice of ends

back- and forward-arrow, current sitepage (manuel) of x-pages
 other option: scrollbar like in goodReader

brightness-button

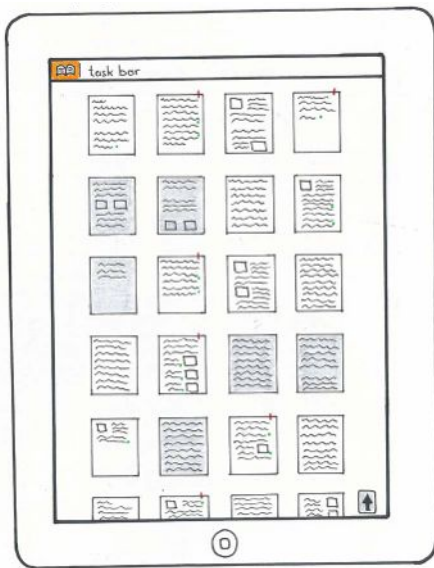
bar for changing the brightness of the display (goodReader)

e-mail-button

one tap to open the standard mail-programm
 (PDF is already attached)

summary-button

highlights, priorities, notes or all

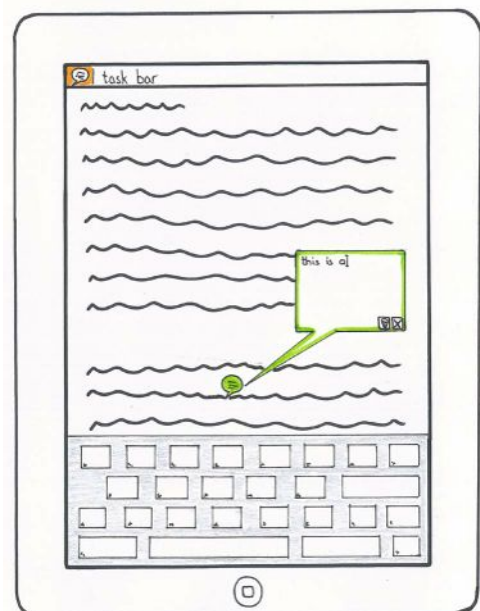


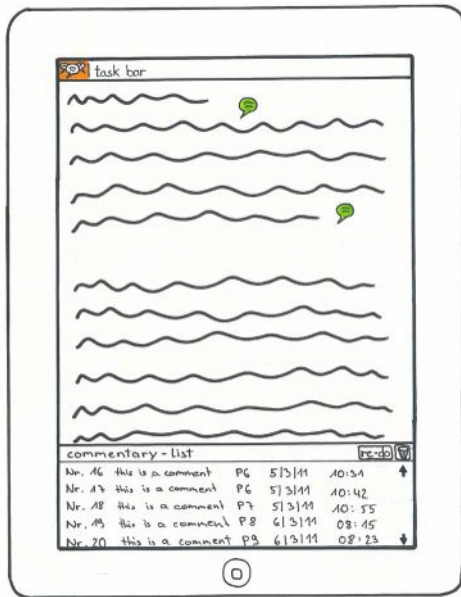
index page

every page is listed (miniature), 4x5 pages (scroll down)
 annotations and priority status of pages is marked
 one tap or pulling over some pages will mark them
 double tap -> page will open

annotation-button

one tap -> new annotation opens (can be moved)
 minimize-button for closing it, delete-button for deleting
 the little sign for the annotation is in color and always
 visible with a tap on the sign it opens again





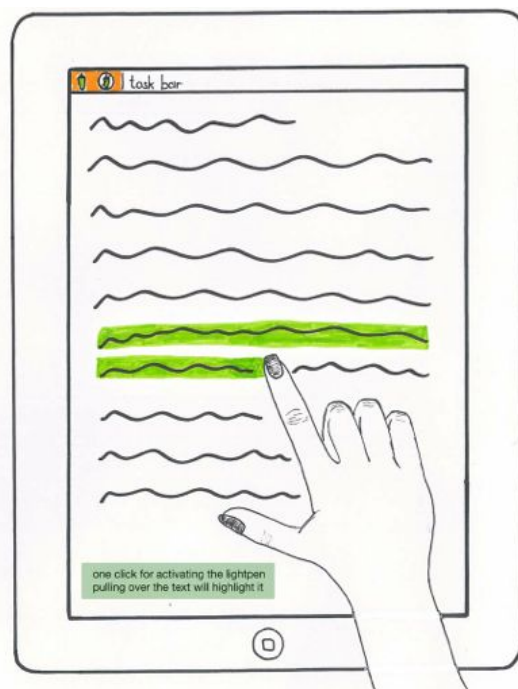
annotation-list
 all annotations are listed (max. 5, scroll down)
 date, time and page
 can be deleted or prepared directly in the list
 one tap or pulling over more annotations will mark them
 double tap -> page and annotation will open

highlight-button

one tap for activating the lightpen
 swiping over the text will highlight it
 page swiping disables when the highlight-button
 is activated

highlight-delete-button

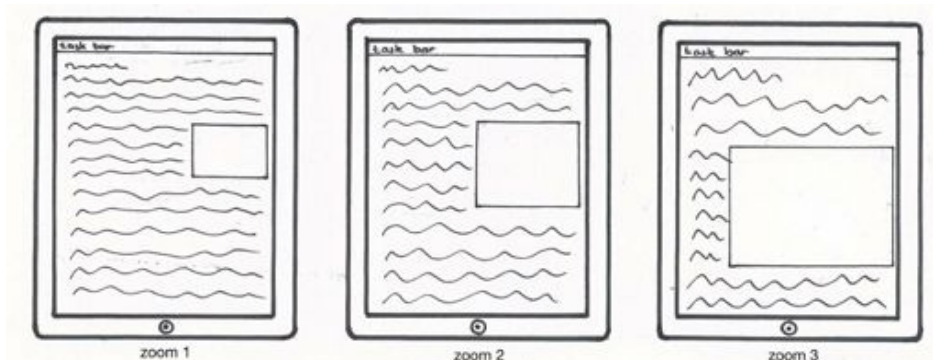
same way



zoom-button

one for maximizing and one for minimalizing
 maybe a zoom-field (xxx%)

- 3 different types
- bed, breakfast, work (different fontsize)

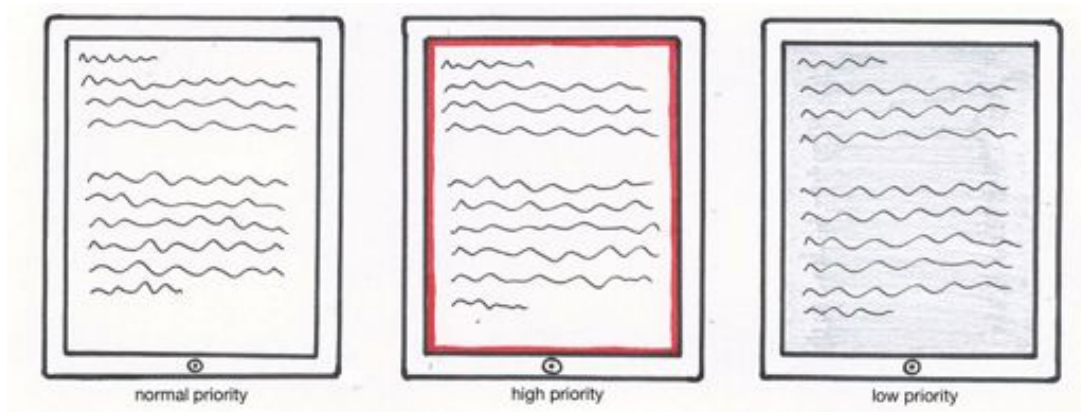


site-priority

normal = standard

high = red border or/and a mark on the right top of the page

low = transparency



12. closing words

We need some technical insights to adjust the concept. Therefore we have a meeting with the technicians of Docwolves based on that we will develop the final concept.

problems we should think about:

There are still existing user problems, of which we must think about and find possible solutions.

problem 1:

Council members still prefer paper in stressful situations (like a debate) because they want to be 100% sure they've got the right information in front of them.

Possible solutions:

- Easy way to create a cheatsheet with all the information that is necessary.
- Easy way to go through all the bookmarks.

problem 2:

Besides the documents the secretary sends them, they also need to search the web when investigating a certain topic.

Possible solutions:

- when the user finds other reading material that it needs to include, maybe we have to include a way that it is easy to add this to NotuBox so this reading material can also be highlighted and annotated
- Integrate Google in NotuBox

problem 3:

Council members would love to have more support in discovering all the features.

Possible solution:

- Add a clear screencast(tutorial video)

problem 4:

Council members would love to share more easily. So we have to think of a way to integrate this.

Possible solution:

- add a share feature

problem 5:

Council members would love to see what's new when a new version of a document is uploaded by the secretary. They also want to keep the annotations they've already made when an new versions of a document is uploaded.

Possible solution: ?

problem 6:

The search function is really important and is seen as a big pro of digital reading.

Possible solution: ?

problem 7:

Council members don't actually read everything but more or less scan the documents the secretary sends them. They need to switch a lot between conclusions, chapters, bookmarks and documents.

Possible solution: ?

13. sources

<http://www.kickerstudio.com/blog/2011/01/activity-zones-for-touchscreen-tablets-and-phones/>

<http://www.nngroup.com/reports/mobile/ipad/ipad-usability.pdf>

Human Computer Interaction: Hogeschool van Amsterdam, Propedeuse 2010/11