Week1 Assignments

2.1 (Van Lamsweerde) On page 13 you find figure 1.2 with the "system as-is" and the "system to-be". Given your knowledge of the eTextbook case, make a first version of this figure for your case. [1 h.]

System-as-is: normal text books

Pros:

1. Making notes in margin
2. Can be sold second hand
3. Widely available (e.g. public libraries)
4. Feels more authentic
5. Can be exchanged with other people
6. No device needed to read it

Problems (sorted by relevance):

1. Expensive to print
2. Can run out of stock
3. Hard to carry around (heavy)
4. Book can only be obtained through mail or by buying it in a (physical) store
5. Searching has to be performed via an index (or by hand)
6. Reading requires a source of light
7. Hard to keep in the palm of your hand while reading

Opportunities:

1. Creating cheaper equivalent of print books
2. Making them easier to distribute

System-to-be: eTextbook
Why? (objectives):

eTextbooks should be...

- easily obtainable
- cheaper than the hard-cover equivalent
- readable on any computer, phone or tablet device
- able to contain multimedia or web content
- searchable and contain a dictionary
- able to have notes (in the margin)
- very responsive to user input (navigation)

What? (Services, constraints, assumptions):

Service to...

- read the eTextbook, constraints:
    - responsiveness of the interface
- distribute the eTextbooks, constraints:
    - time to retrieve a eTextbook

Who? (Environment):

- Reader/Student
- Publisher/Writers
- Tablet/eReader
- Digital bookstores (e.g. ibook, amazon kindle)

2.2 On page 17 you find a distinction between descriptive and prescriptive requirements. Provide for each of these categories three examples relevant for your case. [15 min.]

prescriptive requirements:

1. An eTextbook consists of letters
2. If an eTextbook is purchased it is not not purchased
3. An eTextbook can not be published and not published at the same time

descriptive requirements:

1. eTextbooks always remain purchased once bought
2. An eTextbook is searchable by the reader
3. A reader can play a video embedded within the eTextbook

2.3 On page 22 you find a set of statements: SysReq, SofReq, Dom, Asm for the train system. For the eTextbook a system requirement is that all chapters start at the page as given in the table of contents. Provide the set of statements: SysReq, SofReq, Dom, Asm for this requirement. [30 min.]

(Sysreq:) Chapter → the chapter starts at page listed in chapter of contents
(SofReq:) ChapterIndexPage = *x* → ChapterActualPage = x
(Dom:) A book consists of chapters
(Asm:) An eTextbook has a table of content

2.4 On page 24 you find an overview of the quality requirements. Based on this list identify five innovative ideas about requirements for your case. [30 min.]

Performance

- Navigating to chapters or specific pages should be instant (<100ms)
- Ebooks are streamed, once the first page is finished downloading you can start reading
- eBooks should make books 80% cheaper to distribute to customers

Interface

- eBooks should be readable on any computer, tablet or phone
- Clicking on links should navigate to the corresponding page or chapter

2.5 On page 52 you find a list of obstacles to good requirements engineering practice: how do these apply to your case? [30 min.]

It is hard to fit your requirements within the set of guidelines given by the literature, these are only general guidelines and a lot is left for interpretation. I can imagine that a company which is about to develop an eTextbook standard would focus too much on the problems of the system-as-is (normal textbooks), and forgetting to look at the strong points of this system. The current eBook standards definitely had wrong or bad requirements, and the probable cause of this could very well be pressure on tight schedules, short-term costs and catching up on latest technologies.

(Epistemology) Given the proposition: "Currently available eTextbooks are a step back from paper books in how they support learning."

3.1 Chapter 3 is about the Nature of Justification. For each of the approaches to construing justification, provide an example of justification for the aforementioned proposition. [2 h.]

Foundationalism (Internalism)

Belief A:

1. *Currently available eTextbooks are a step back from paper books in how they support learning.*

Beliefs B:

1. *eTextbooks are difficult to navigate*
2. *paper books are easy to navigate*
3. *Books that navigate easy support learning better*

Beliefs C:

1. For a book to support good learning one should be able to quickly lookup words via the index

Belief A is based on belief B1, B2 and B3, B1 and B2 are basic beliefs. Belief B3 is based on the basic belief C1.

Coherentism (Internalism)

- eTextbooks can not be bought second hand
- Second hand books are always cheaper than any digital or non digital retailer book
- To better support learning books should be as cheap as possible

Reliabilism (Externalism)

For example the belief can be based on the testimony of some expert in the field of learning from textbooks, as published in some paper based on empirical research.

3.2 Chapter 4 is about the extent of human knowledge. What can we know about above proposition? [45 min.]

It is easier to answer this question with what we not know about it, for example we don't know the origin of this proposition and the reasoning behind it or if it has any at all. We can only know what we belief about the proposition, with our own reasoning.

4.1 (Cognitive psychology) This article provides a model of our understanding of human cognition. In this assignment you are asked to use the concepts (attention, memory, perception, language, metacognition) to describe how you are using your textbook. [1 h.]

Attention is central to reading textbooks, the focus of the mind should be on the letters and words in the book and other input should be filtered out (e.g. sound or other thoughts). Attention is also central in keeping track of message the author is trying to communicate, the reader should keep track of more important pieces of information as compared to less important or additional information.

Procedural memory is used to actually read the letters and words in the book, this is action that is activated on the subconscious level (but very much an important part of reading). To visualise certain pieces of information presented by the author one needs their semantic memory, also used to associate new information with old information already stored in the semantic memory. And finally learned concepts from the book are stored in the semantic memory, for later retrieval (e.g. to be associated with newly read information).

Your (physical) perception of the world is of influence on how you perceive the information in the book. If for example some smell is described in a book, it very much depends on your physical perception of this smell how your non-physical perception of this smell is.

Language defines how well you can understand a certain text, this depends if you understand the vocabulary used by the author.

The cognition of cognition (i.e. metacognition) helps you to set certain goals before reading a text, how fast do you expect to read it how well will you understand it. But it is also needed to keep focus while reading a text and evaluating after reading how much worse or better you did than your expectations.

4.2 You could say that a good textbook builds upon a general idea about what the reader already knows, the attention span of a reader and so on. However you will find that individuals vary a lot. You will also find that your reading performance will vary quite a lot over the day(s). Describe,

using the concepts named in the article, how an interactive eTextbook can observe you and adapt to your condition. And how an interactive eTextbook can improve your learning. [2 h.]

First off the eTextbook should somehow determine some of the involved factors from the reader. Probably a good option is tracking the eyes with a camera and determining how fast the eyes are going over the words, and maybe detect some more metrics from the size of iris. The tricky part is to use this information to assist the reader, maybe the book could detect when the readers mind wanders of and instruct the reader to relax for a second and listen while the eTextbook rereads the last paragraph for him/her. And instruct the reader to clear its mind. Another use is to switch pages automatically once the reader has finished reading the page. Or detecting when a reader stops at a certain word and automatically pull the definition of that word and an explanation of the word in this context.

Also the eTextbook can have knowledge of what the reader already knows or what material he/she read already, this could be used to shorten certain sections or elaborate if needed.

4.3 Explore for one of the topics listed from page 8, choose one you expect to be valuable (the topics are clickable). Describe your findings. [30 min.]

Time perception is a part of perception that is all about the subjective experience of time. This is of importance for reading, because experiencing time as ‘fast’ can be of influence on how much attention a reader has. For instance if you are reading a very thrilling chapter of a fiction book your subjective experience of time can be very fast, and you will read the chapter without distraction. However if your subjective experience of time is very slow when reading a textbook, you will get distracted very easily.

There is research in this area that makes it possible to measure the subjectively experienced time, by performing certain measurements on brain cells.

Research has also be conducted in the area of meditation “they noticed that mindfulness meditation would alter time perception”[1] which in its turn “improves attention, working memory capacity, and reading comprehension.”[1]

5.1 (Experiential learning) How could eTextbooks facilitate experiential learning? [30 min.]

Experiential learning consists of four phases[2]:

1. Concrete experience
2. Observation
3. Forming abstract concepts
4. Testing in new situations

The extra amount of interactivity that can be delivered through an eTextbook will help creating an experiential learning experience. A reader could maybe be coupled to other students also reading the book but having lesser understanding and help them understand the book better. This way a student can have a concrete experience and test it's newly obtained knowledge in a new situation.

[1] http://en.wikipedia.org/wiki/Time_perception

[2] David A. Kolb on experiential learning