Paper Based Video Prototyping

A study of methods for low fidelity video prototypes in usability testing

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Abstract

In the field of Human Computer Interaction (HCI), low fidelity prototypes are a well-established method with solidly defined advantages and disadvantages. Further development of different methods within this field is constantly evolving, and this paper describes the concept of one of these methods, low fidelity video prototypes. It gives a brief introduction to low fidelity video prototyping methods, advantages and disadvantages. The video prototype is compared to paper prototyping, which lies closest to it in the low-fi family. I explain my methods for developing a paper prototype, a video prototype based on this prototype, the testing of both prototypes, and the results of these tests. Video prototyping is more effective than paper prototyping in certain aspects because the tests themselves demand less people, and less time to walk through the test. It is easy to go through the task in the users own pace. It is a useful method on its own, and can also be effective as a complement to other low-fi prototypes. They are easier to test on larger groups and to share over distance. It is easy to produce, edit and refine video prototypes with modern animating tools.

1. Introduction

A prototype is an original type, form or instance serving as a basis or standard for later stages, it is usually a working but early model of a new product (The Free Dictionary, 2011). The main goal with a prototype is to catch design problems in user interfaces early on, and try out solutions that you are not certain of yet, so that you can develop a product without hitting large problems late in the process that unexpectedly force you to backtrack. Prototyping is an essential tool within HCI design, and the techniques are becoming increasingly numerous and varied. Prototyping are mainly divided into two main categories, low fidelity prototypes and high fidelity prototypes, which are suitable for different situations and have different advantages and disadvantages.

The prototype method needs to be adjusted to several factors such as time and resources available, target group, and what element of the design that needs to be tested. These factors may help you decide if you need a low fidelity or high fidelity prototype, or perhaps something of both. The differences between low-fidelity (low-fi) and high fidelity (high-fi) prototypes are well established, I will therefore not elaborate much on it in this paper. However, it can still be useful to briefly mention their most important strengths. The general agreement is that low-fi prototype’s strongest qualities are the low costs and quick process, and high-fi prototypes have the advantage of being more fully interactive and are closer to the look and feel of the final product, to name a few (Rudd, 1996). “Look” would be the visual impression from the prototype, while “feel” is what it does (Snyder, 2003).

Literature about the advantages and success stories to paper prototyping is plentiful, but few have done studies that compare different prototyping methods to each other. Even though it is easy to prove that paper prototypes may be beneficial to a design project because they are fast and cheap, one still needs to solve its disadvantages. The disadvantages that I in
particular plan to work with are ones such as; test subjects feeling observed (Sefelin, 2003), that it might be too facilitator-driven, and flow limitations (Rudd, 1996). New possibilities lies in trying to find new versions of prototypes, not just by either choosing low-fi or high-fi, it could also be very useful to evolve the methods further by trying to combine the advantages of both, eliminating some of the disadvantages by doing so, and shape it into something entirely new. Studies around these subjects will provide researchers and designers additional and improved tools for HCI design.

One of these new tools could be low-fi video prototyping. The idea of low-fi video prototyping is that you make use of the advantages from low-fi prototyping, more specifically paper prototyping, and transform it into a video. This means creating a user interface in the same rough and sketchy way that one usually uses for paper prototyping, and animating it performing tasks in a logical way that is easy to understand. In other words, it is a simulation of a user going through the interface, instead of making the user interact with the prototype. It would still be a quickly and cheaply assembled prototype that is easy to change and make adjustments to, without users focusing too much on how it looks, just how it feels. However, it will be in digital, animated form, with a natural flow. But is it actually useful? That is what I will try to answer in this paper, and my research question for answering it will be:

**How does a video prototype with a high level of abstraction affect user response?**

This means I will consider positive and/or negative effects, and also how a video prototype should be created. What should it look like? How effective is this form of video prototype compared to the more traditional paper prototype? The comparison is especially important, as I hope to find something that can show certain advantages over traditional prototyping when it is applied to the right design situation. The purpose of this paper is to research and develop new methods/workflows for video prototyping, and the knowledge contribution will be new information and methods for video prototyping in usability testing. It should create information about how useful low-fi video prototypes are compared to other low-fi prototypes, how they are made the most effective, and why they are useful at all.
2. Background

Low-fi prototyping as a usability testing method started to evolve around 1990, but spent a decade or so before becoming fully accepted as a usability testing method (Snyder, 2003). Today it is widely used for interface development. Paper prototyping is not a synonym for low-fi prototyping, but low-fi prototypes are often paper prototypes, and paper prototypes are often low-fi. However, it can be confusing to describe an entire prototype as low-fi even if it is paper, because such a prototype can still include elements that have a high-fi look. Paper prototyping does not quite have an official definition, but in this paper I will use a definition by Carolyn Snyder, from her book “Paper Prototyping – The fast and easy way to design and refine user interfaces”. Snyder states that paper prototypes are a usability testing method where users interact with a paper representation of the interface to perform tasks.

There are a few expressions from paper prototyping that are useful to know before reading further. During a prototype test, different people have different roles, and the essential roles for paper prototyping are the facilitator, the computer, and the observer(s). A facilitator is the person that guides the user through test, they are there to explain, help the user when he or she gets stuck, and is the communication between the user and the computer. A computer in paper prototyping means the person that manipulates the different parts of the paper prototype to simulate the events in the interface, this person does not communicate with the user anymore than a real computer. Observers simply observe the testing and gather data for further development (Snyder, 2003). And then of course you have the user, which is the test subject.

Video prototyping does not yet exist as an established prototyping method, but there is some literature on the subject of video prototypes. I’ve looked closer on some of it, an article by Laurie Vertelney: Using video to prototype user interfaces. Her article discusses different types of prototypes, and the one I am interested in is what she calls animated prototypes. She describes how to animate drawings with the tools that were available at that time, and this process is very much simpler today than what it was before. This article is from 1989, and because of that some notions no longer apply, but the descriptions of some of the concepts are still relevant for my work. She does for example say that video productions are expensive and time consuming, which is something that has changed a lot since 1989. Today, anyone can buy a somewhat decent camera and even use free editing programs to produce something suitable in a short amount of time. She also states that video is difficult to change and manipulate, which it was, but today it’s easier than ever with digital and non-linear editing. Issues with video misleading people to believe that it is the finished product doesn’t seem that relevant anymore either, unless the user group is elderly/not used to modern technology.

I find these notions interesting, because they can give an implication of how much easier and therefore more useful, video prototyping could be today. One of the disadvantages that Vertelney mentions that still is relevant though is that a video prototype is not interactive. A video prototype can never be interactive in the same way that a paper prototype is, because then it would no longer be a video, but a high-fi prototype instead. Video as a media will always be defined by the fact that users are a passively receiving part, even if new variations that make them more involved are constantly being developed. Still, technology has come so
far since Vertelney touched the subject that we have to consider it an entirely different way today.

There is something worth mentioning concerning the definition of video prototypes. An already established method is slide shows. They are fairly static, and created by using screen shots, and in its most basic variation you simply click to go to the next slide. This could be viewed as interactive as pausing and/or going back or forth in a video. Slide shows can be useful for more large or obvious errors, but limit the feedback from users. A drawback is that if such a slide show is more complexly branched, users can be too caught up in finding the “right” place to click, and are therefore more useful for demos or group reviews (Snyder, 2003). So what is the difference between making a slide show and a video prototype? A video prototype is more constrained than a slide show, it is completely linear, but at the same time it follows a more natural flow, and gives the user a chance to simply observe while going through tasks instead of trying to find the right place to click. It is still possible to investigate how the user understands the prototype. It all depends on how the rest of the test looks like, you do not only have to ask, “What do you think that would do?” as Snyder implies.
3. Study method – prototype testing

-Knowledge about method is not a purpose of its own but rather a tool to achieve the goals in your studies and research (Holme & Solvang, 1996)

To find the answer to my research question I considered how I wanted to do the research. I want to know how video prototypes affect user response, so which method was the most useful to use? There are different methods to choose from, and the two main categories are qualitative and quantitative methods. Quantitative methods process the information into numbers and quantities, which are then analysed statistically. If you want to make general statements around your research selection, or answer questions like “how certain is this connection” or “how large is this phenomenon?” then quantitative methods are useful for the research. Quantitative methods focus on precision, broad information, systematically and structured observations, the representative and average, and distance to the study object.

Qualitative methods circle around the researcher’s interpretation of referential frames, motives and social processes. If the questions you want to answer concerns larger perspectives, thorough understanding, and social processes, or if you want to build theories and create referential frames, then qualitative methods are more useful. Qualitative methods focus on variation, the unique and distinctive, connections and structures, relation to the reality one is researching, research from the inside, and unstructured observations without standardized answers (Holme & Solvang, 1996).

I decided that a qualitative method would be more useful for me since I was not really interested in finding generalisations around video prototypes, but rather go in depth on how it works as a usability testing method. I rather wanted to ask what the users thought about prototype. This paper is also definitely about building theories and asking questions that demand non-standardized answers.

After doing some research on mostly paper prototyping, but also video prototypes, and planning how to do the prototypes I was ready to start producing them. To create the different prototypes for my study I needed a product I could develop them around. I chose the student portal at Umeå University, Cambro1, for several reasons. Firstly, it was more effective than building something from scratch, and it was essential that not much time was spent on the product itself since the focus of the study is prototyping. I chose Cambro specifically because it is a system that I’m familiar with as a student at Umeå University, it has a large target group so it is easy to find test subjects, and it was also easy for me to make a lot of changes to it since the system today is not optimal, but rather very ripe for re-designing.

I restructured it from each course part having its own tab, to choosing between four course categories instead; Completed, Ongoing, Coming, and Not Completed, as well as doing some more minor tweaks. Each category contains a list over the separate course part that matches the status in the category name. When entering the home page for a specific course part a

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1 Cambro (https://www.cambro.umu.se/portal) is a portal for the students at Umeå University where they can log in to find information about different course parts, such as assignments, resources, and announcements.
new menu appears (containing assignments, resources, forum, and so on). It is the same menu on every course part, but the content is specific to the course. So a step chain to for example finding an assignment would be: Home> courses> completed> course part E> Assignments> assignment 1. It would be just as many steps to find an assignment on a current course part. Unless you click one of the direct links I added on the “Home” page, the variation would be the course category and the assignment content.

![Image](image_url)

**Figure 1. The homepage to Course Part E (for a closer look, see Appendix A)**

I decided that the testing should not span over too much time, as that would make the project less effective and by doing so it would lose its advantage over high-fi prototyping which is more costly and time demanding (Rudd, 1996). The testing was completed in a day, and each test took between 25-30 minutes. The tests were designed so that the first three of test subjects tested the paper prototype first, then the video prototype, while the three other test subjects did it in reverse order. This was done so that all the test subjects could give feedback on both prototypes.

The target group for the product is very broad; it is every student at Umeå University. I chose to pick 6 classmates for the tests, 4 men and 2 women, ranging from age 21 to 25 (they will go as M1, M2, M3, M4, W1 and W2 from here on in this paper.) They are hardly representative for the entire student body, but still a completely adequate sample since they all fall inside the criteria for the target group, and in a qualitative study they don’t have to be fully representative for the entire group.

It is usually argued against using people you know/colleagues in the same field as you for user testing. They are not “real users” and can give biased feedback, or feedback you are not interested in, and therefore making an awkward situation by not heeding it (Snyder, 2003). However, I have several reasons for choosing the group of people I did. First of all, I made use of the modest resources I had available, and the easiest choice was to pick people I already am in contact with. A more important reason though, is that all of them are familiar with Cambro as it is today, they are all eligible users of the product, and it is realistic for them to do the tasks I designed.
I also see it as an advantage that they know me, some of them really well, because that makes the atmosphere much more relaxed for both them and me. This is fortunate because it makes it easier for them to be honest about the test, it puts less pressure on them as testers, and less pressure on me who have never done this type of study before and therefore am bound to make some mistakes, large or small. The tests were mostly designed as user tests, but given the competence my users had, they could also give me valuable “expert” feedback. I also told them to be honest with me, and none of them seem to have a problem with that. I would say it’s easier for me to detect how genuine their reaction is because I know them. Of course this is something that worked for my study specifically, and not necessarily something that will work for anyone else, it really depends on the situation.

I did perhaps make some untraditional choices considering the documentation as well. I made the test subjects write down their answers themselves, because instead of having them waiting for me to take notes, it becomes an integral part of the test. It made the flow of the tests easier. It also gave them opportunity to think through their answers and explain with their own words. I made a choice to videotape the tests because two of the reasons Snyder deems as plausible, “not enough observers” and “just in case”. Since I am a one-person team I don’t have enough observers, I had to be both computer and facilitator, and observer on top of that would not be optimal. I also had use of seeing what the test subjects were doing, instead of just listening to sound recording of them. The scenario for the test subjects was that they, as students at Umeå University, needed to log into re-designed Cambro to see to some study related tasks.

The tasks concerned both finished and ongoing courses, and were three in total. The first one was to gather information about grades on a finished course. The second was to check the schedule for an ongoing course, and the third was to check an assignment for that same course.

I made each test subject answer a few questions about their previous use of Cambro before starting to test either the paper prototype or the video prototype. After completing each task by writing down the relevant information the discovered, I asked them to describe the steps they took to reach each piece of information. The point was not to make them remember everything, but to see if they followed the same logic as the interface I created. After showing them the second prototype I asked them if they wanted to add some information or steps. The final part of the test was 5 questions they had to answer:

1. Now that you’ve seen both prototypes, which one do you find it easier to understand? Please motivate your answer.
2. Was there anything you found hard to understand?
3. Are there any changes you would have made to the paper prototype?
4. Are there any changes you would have made to the video prototype?
5. If you had to teach new students at the university about Cambro by using one of the two prototypes, which one would you choose? Why?

During the tests I decided to tell them that 3 and 4 also could consider the design itself, but the point of the questions was to get their opinion as designers. The test as a whole was developed as a qualitative test, with semi-structured questions, and room for the subjects to talk freely during the test.
3.2 Materials – Paper bits and video clips

To start creating my paper prototype I went through Cambro and develop a plan for the changes I wanted to make. The focus was mostly on feel but also a little on look. I created a web page hierarchy, and then started creating rough wireframes. After some sketching I refined it in a web application² made for creating sketchy wireframes, while still being more organized than my first versions. I recommend these types of applications it for prototype developers who do not feel too confident about their skills in sketching or handwriting.

Snyder warns against getting too caught up in customizing choices about colours and fonts and so on, especially since you usually change the prototype later anyway. This is a very relevant argument, and I did try to avoid too much tweaking, but I was only going to make one prototype and do one batch of tests due to the nature of this study, so I still spent some extra time refining it. Another reason for why I refined the prototype was to make it easy for users to understand text and distinguish different parts of the web page, but also to have the prototype in digital form so it could easily be transformed to a video prototype. It took me about a day and a half because I had to get used to the application, a reasonable amount of time considering the result.

Wireframes are not necessarily paper prototypes unless they contain realistic content and are printed out and tested as a paper prototype (Snyder, 2003). I would argue that this is precisely what I did. I did use nonsense words in the areas that were not directly important for the tasks I designed, but the rest was made to be a realistic representation of the web page, even if it was only on a functional level.

![Cambro](image)

Figure 2. The homepage of the prototype (for a closer look, see Appendix A)

² I used a free web demo of an application called Balsamiq (Balsamiq, 2011), and there are many more tools available on the Internet for those who are interested.
I considered several ways to do the video prototype:

- Showing a person who knows the paper prototype using it. This is informational, but lacks context unless you explain it.
- Showing a person who does not know the paper prototype using it, a potential user. This can become a little too much meta-context for the user to relate.
- Showing a person who knows the prototype using a fantasy user interface, which is based on scanned/filmed paper prototype, because his will create a more convincing scenario. Will demand slightly more time to edit the movie.

I decided instead to draw a simple screen and insert the prototype inside it, and animating a mouse clicking through the tasks. A person in front of this screen would just be in the way, and I felt that even if the context was very basic, it was still sufficient for the users to relate to. I could have just showed the website prototype without any screen around it as a context since the video was already inside a real computer screen, but then they would perhaps misinterpret everything on the real screen as a part of the prototype. I split the three tasks up into three video clips since pauses between was most likely needed anyway. I also told the test subjects that they could pause and go back whenever they wanted.

I split the three tasks into three video clips since there would be pauses there naturally. I told the test subjects that they could pause or go back whenever they wanted during a task. While playing the clips, I also gave some general information about the events (“the mouse clicks on next week in the calendar, but there’s no information there, so we have to find it somewhere else”).

![Screenshot from the video prototype](image)

*Figure 3. Screenshot from the video prototype (for a closer look, see Appendix A)*
4. Results

I have added all the answers the test subjects wrote down in Appendix B in their original form (in Swedish). Below is a summary of those answers and the information I gathered from the video recordings.

Every test subject had used Cambro during the current year. All of them except W2 answered that they are fairly used to using Cambro, she was also the only one that found it more difficult to use. The remaining five were in general agreement that Cambro is fairly easy to use, but most of them thought the website structure could be better. M1, M2 and W1 saw the video prototype first, while W2, M3 and M4 saw the paper prototype first. Note that W2 was very tired at the time, but bravely did her best anyway. This may have affected her results slightly, especially the part when they were supposed to remember the steps, but she didn’t differ remarkably from the others.

4.2 Tasks

The video prototypes did understandably always follow the same steps, but during the paper prototypes the steps varied a little, especially for the three people that did not see the videos first. I varied it myself as well, since the original plan was to always go back to “My Workspace” before starting the next task, but I stayed on the current page a couple of times due to impulse and mistake. This did not affect the results much though, since everyone got to see all the different paths after been through both prototypes.

Everyone managed to find the relevant information on task 1. M1 and M4 had to go back some steps to find everything after some small wrong turns. Both of them needed some more time than the others to get into the concept of them writing down everything, M4 even more so than M1. M2 was the only one who got some of it in the wrong order (this happened on the two other tasks as well), and did not add any steps since he was the first test subject, and I was not sure about that part yet. W2 only remembered the course category step the first time, but added all steps except one afterwards. The other four only missed one or two steps; the step that most added the second time was the choice of which course category they had to take.

The results to task 2 was much the same as task 1, the test subjects misses only a couple of steps and added almost all afterwards, and seemed to follow the same logic as I intended for the menus. The ones that had already seen the video prototype seemed to have it easier to find the way when doing the task on the paper prototype, which was not unexpected due to recognition factors. There was one route that most seemed to miss, perhaps that part was not distinct enough. Some of the test subjects did mention that they thought certain parts should have been easier to notice.

There was not much trouble for the test subjects to find the information in task 3 either. Since they had already visited the course part in task 2 it was easier for the majority to find the same way back. I tried to hint to the direct links on the home page to some of them, all test subjects understood after a while that you could always reach all the course parts in the “Courses” menu so several took that route, which was perfectly fine too of course.
4.3 Interviews -

**Question 1: Now that you’ve seen both prototypes, which one do you find it easier to understand? Please motivate your answer.**

W1, M1 and M3 answered that they preferred the paper because of the interactivity. The remaining three test subjects answered video because it was easy to pause and go back with, and easier to understand the layout without being distracted by different paper bits.

"The video prototype gave a simpler understanding for the layout and interaction. In the paper prototype I focused more on the menu than the choices that existed right there on the page."

– M4

**Question 2: Was there anything you found hard to understand?**

Nobody answered that they found anything very difficult to understand, M3 and W2 thought it was all right once you got used to it. W2 also said that she thought the paper prototype took longer time to understand (that could be due to it taking longer time to walk through).

"It was unfamiliar because it was a new interface, but not difficult.” – M3

**Question 3: Are there any changes you would have made to the paper prototype?**

Two thought it needed no changes, two wanted more choices/tasks, and two wanted some parts of the menus/links to be more noticeable between the rest of the design since they had some trouble finding them.

"The paper prototype is well designed but it takes longer time to understand. Don’t see any larger changes that needs to be done” – W2

**Question 4: Are there any changes you would have made to the video prototype?**

M1, M3, W2 and M4 answered no. W1 wanted to slow down one of the clips that she meant moved too fast. M2 would rather have an interactive high-fi prototype even if he liked the video prototype.

"Prolong the end of clip 1, didn’t follow.”- W1

**Question 5: If you had to teach new students at the university about Cambro by using one of the two prototypes, which one would you choose? Why?**

W1 answered paper on q.1, but she thought it would be more effective to use video on q.5 since it demanded shorter time and could be showed to more people at once. M1 wanted to use the paper prototype, with the videos as an intro. W2, M2 and M4 answered video. M2 said he thought he thought both were good, but that he still would have preferred the video even if he saw the paper prototype first, because he meant that the video was easier to instinctively understand since it showed the step, instead of making him figure them out. W2 commented on this as well, she found it less confusing to let the video prototype show her the
steps. She also thought it was an advantage that it was so easy to pause or go back if one missed something.

"The lazy side of me would like to use to the video prototype." – W1
"The video prototype, less paper to get lost in." – M2
"The paper prototype, but with the video prototype as an intro" – M1
"The paper prototype because it is more interactive and not as strictly controlled as the video, so the students are more free to explore by themselves." – M3

M3, M4 and W2 all thought that the redesigned prototype was better than the current design on Cambro. M2 did not make any particular comparison, but said that he thought my design was good. M1 was not sure if he remembered the current design too well, but he said that he at least found my design easy. W2 did not comment on this. After finishing the tests I realized that there were some elements to the design the test subjects had not used, like the back and forward browser buttons on the top of the page. Still, it was there to create context, and you can never anticipate exactly how much of the prototype that will be used in a certain way. The general impression was that the test subjects did not have much trouble understanding either of the prototypes.
5. Discussion

After finishing the test, I had several things I thought I should have done differently. I had the same tasks in both prototypes to not have too many variables, but actually it would have been better to have tasks that could have been similar, but still demanding different information. By doing so I could have avoided the slightly redundancy of going through the same tasks again. Then they would not have to add any steps after run-through number two, but could have written down different steps altogether instead. That part of the test should have been slightly altered. I also could have told them that they could add steps that they thought logical instead of just making them remembering the original steps. With that I could have found elements that they wanted to add or remove from the website.

I also should have written down the tasks differently, with the information that they needed to find in bullet points, because some seemed to have to read through the run-on text several time to make sure they knew of everything they had to find. I also had to remind some of them that they had missed some parts. I also should have pushed them more to actually think out loud while acting and writing down their answer, there were a few moments where I would just wait for them to finish writing in silence. One other point I should have made clearer was the fact that they were completely free to pause and go back in the clips, W1 said that she thought the first clip was too fast for her, and I had stated once that she could pause, W2 was the only one who actively made a choice to pause.

So what can we learn from the results? Before I did the tests, I theorized around several reasons for why video prototypes can be useful:

- More flow, but still keeping the versatility and abstractness from paper prototyping
- User feels less awkward and observed
- Less unnecessary work with walking users through the prototype
- Much easier to share, possible to do tests over distance
- A new way to test low-fi prototypes on users
- Changes can easily be made by editing the video/adding new material

Vertelney also discussed some advantages:

- Although I am focusing on low-fi video prototypes, it could just as well been made into a refined high-fi prototype
- It is a powerful visualisation tool that can generate feedback early in the design process
- It makes it easy to produce many design alternatives quickly
- It is useful for simulating interfaces for technologies that does not yet exist.

After testing I thought it could be interesting to see which of these that actually matched up with what I saw and what the users thought. The users seemed to appreciate the flow even if it was a little fast for some of them. The versatility and abstractness from paper prototyping was definitely integrated successfully in the video prototype, seeing as they both were based on the same material. The point of users feeling less awkward and observed is harder to answer, since the atmosphere was more relaxed anyway than what it would have been with test subjects who are strangers. It definitely was less work with walking the users through the video prototype, I didn’t have to shuffle any paper bits with the video, just hit the pause button or go back a little with the media player. It was easier for me at least, since I could not
mess the video up in the same way one can do with paper prototypes (and I did make small mistakes here and there, due to my inexperience). This is an advantage for facilitators that still need more experience.

On the point of “much easier to share” I want to repeat the quote from W1: “Video takes less time and can be shown for a larger group” (this is why it was “the lazy side” of her that wanted to use the video). This I believe to very astute, since it would be easier to show a video to several people, than it would be to show a paper prototype, and when time is of the essence, this can be a huge advantage. And since video prototypes are digital media, it obviously would be easier to share over a distance, perhaps in combination with a telephone/webcam interview.

Video prototyping would be a slightly different way to test low-fi prototypes, although it’s hard to say if that automatically makes it a good thing. Perhaps it would be useful for teams who feel the need to renew their routines somewhat, or don’t have resources for other solutions. The most important of those resources would be time, as already mentioned. It also demands less people, since the role of the computer becomes redundant, it would be enough with a facilitator and observers.

I spent only a couple of days producing the material for both prototypes, and transforming the paper prototype into a video prototype took approximately a day and a half. I would therefore argue that it is indeed easy to make changes to the prototype, almost as quickly as it is with the most primitive paper prototypes, because the video prototype is still low-fi in nature. A high-fi prototype would take longer time to produce the raw material, but the editing would probably not take much longer than with a low-fi video prototype, unless you want to include some really advanced animating. A mouse clicking around on a web site is a very simple, yet very effective way to demonstrate a task.

Are low-fi video prototypes a powerful visualisation tool? Did it generate feedback? The answers are yes, and yes. M4 commented on this, he meant that the video was a closer representation of the website. I would argue that this is because the fact that it is digital, and therefore almost a hybrid of low-fi and high-fi, it looks more like a real web page because it is on a screen. The look becomes stronger, but most importantly it enhances a realistic context for the user. To return back to the idea of a high-fi video prototype, the enhanced context would be even more strengthened by a high-fi look.

Would it be easy to produce many design alternatives quickly? Yes, it already is with paper prototypes, but with video it is easier to show certain aspects, by the help of animating, even if it is just a storyboard; the flow becomes more convincing if it is animated instead of static. It could take slightly longer time than with paper, depending on the tools you use. I found the rapid wireframing tools to be very useful, and a bit more time effective than drawing on paper and the scan it. The last point I included from Vertelney’s work was that video prototyping could simulate interfaces for technologies that do not yet exist. This point is even more valid now in 2011, where animating video is easier and includes more complex possibilities than ever.

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3 I managed even without that, but that is because of the solution of video recording, which can be applied in any kind of prototype testing with too few observers, as Snyder mentioned.
M1 suggested using the video as an intro, which I find very interesting. Even if I have compared paper prototyping to video prototyping, I never did intend to implicate that it should replace paper prototyping altogether, its success rate is too strong for that, but I do believe it could rather be a tool that could complement paper prototyping.

I would argue that the situations where it would be most useful by itself is where you want shorter, less complex tests to just work out general problems. The largest disadvantage to video prototyping, which several test subjects pointed out, is that it is not as interactive as a paper prototype. This is an advantage that paper prototyping will always have and video prototyping wont. Even so, I still got feedback on the prototype that would be useful if I were to develop it further into an actual website. I would, for example, perhaps have to reconsider the category system in the dropdown menu to make it even more obvious in some way. I also confirmed several design elements that seemed to be successful compared to the current version of Cambro. This means that the video prototype fulfilled the usual goal in usability testing, to generate feedback on design issues.
6. Conclusion

The research question of this paper is: “How do video prototypes with a high level of abstraction affect user response?” So what is the answer, and what is my contribution to the existing knowledge in the low-fi prototyping field? I would argue video prototyping keeps the advantages from traditional low-fi prototyping while adding a more natural flow, and generates desirable feedback, therefore affecting user response in a useful way.

The largest drawback, as mentioned, is the low level of interactivity, although it still is interactive in some way. The challenge lies in designing the tasks in such a way that the users interact in an effective way, and I believe the method I used for this was fairly successful and is a valid example of how a video prototype can look like.

In terms of time and people available, video prototyping is more effective than paper prototyping because the tests themselves demand less people (no human computer, only a real one), and less time to walk through the test. Pausing and rewinding makes it easy to go through the task in the users own pace.

To summarize the advantages discussed earlier, video prototyping is useful on its own, and can also be effective as a complement to other low-fi prototypes. They are easier to test on larger groups and to share over distance because of their digital nature, than doing so with a paper prototype. They create a more believable context for the users. It is easy to produce, edit and refine video prototypes with modern animator tools. These points I believe answers the question if low-fi video prototypes are useful or not.

If this project were to continue it would be beneficial to make a third test with the adjustments I mentioned in the discussion. The third test would be useful to further research the effectiveness in general, and if the feedback generates a better version of the prototype, but also to see more about how easy/difficult it is to make changes, since easy changes are one of video prototyping’s greatest strengths. Further on it could be useful to create tests that were in larger scale, with more test subjects to get some quantitative data. The next step to fully establish the prototype method would perhaps be to involve it in an actual project development and further study how it affects the entire design process from start to finished product.
References

Holme, I., Solvang, B. Forskningsmetodik – Om kvalitativa och kvantitativa metoder. TANO A.S., 1996.


Vertelney, L. Using Video To Prototype User Interfaces. *SIGCHI Bulletin* October 1989, Volume 21, Number 2, 57-61

Web


Appendix A – Screen shots from prototype material
Appendix B – Raw materials from interviews

M1
Är du van vid att använda Cambro?
- Ja
När använde du Cambro sist?
- 2 mnd
Tycker du Cambro är lätt eller svårt att använda?
- Lätt

Tasks
   - Course part E VG, Individual assign. 2 G

   - Ja

   - Trycker på download 30 maj 2011 17.00

Describe steps:
1. Courses> course part E> individual assignment
1.2 Courses> Completed> course part E> Assignments> invid ass.
2. Schemat(kalenderen) på förste sidan> Courses > scheman (schedule)> download
3. Första sidan course part A> ass.1

Questions
   - pappersprototypen, for att man fysiskt fikk ta seg gjennom tasks
2. Var det någonting du tyckte var svårt att förstå?
   - nei
3. Har du några ändringar du vill göra på pappersprototypen? Varför?
   - nej, men längre/mera oppgåver.
4. Har du några ändringar du vill göra på videoprototypen? Varför?
   - nei
5. Om du skulle varit tvungen att visa och lära nya studenter om Cambro med hjälp utav en av de två prototyperna, vilken prototyp skulle du då använt? Varför?
- Pappersprototypen, men med videoprototypen som intro.

**W1**

Är du van vid att använda Cambro?
- använt det några ggr per termin. Men hittat det jag letar efter.

När använde du Cambro sist?
- lite over en månad

Tycker du Cambro är lätt eller svårt att använda?
- Ganska lett när man klickat ut där ett par ggr. Rätt ok.

**Tasks**

   - VG, G, no comments
   - Downloadede schemat och fick veta att jag hade föreläsning
   - Download instruktioner, 30 may 2011 17.00

**Describe steps:**

1. Menu>completed courses>course part E> invidual assignments
2. Menu>courses>completed courses>course part E>assignments>invidual assignment 2
3. Kollar på schemat (kalender)> bläddrar till v.21> inget inskrivet>course part A>download
4. Ongoing courses> course part A> assignment>looked at date> download instructions

**Questions**

   - Paper, för där var det ”interaktivt”, jag fick välja väg
2. Var det något som du tyckte var svårt att förstå?
   - Nej
3. Har du några ändringar du vill göra på pappersprototypen? Varför?
   - Mer val
4. Har du några ändringar du vill göra på videoprototypen? Varför?
   - Förlanga slutet på klipp 1, hängde inte med
5. Om du skulle vara tvungen att visa och lära nya studenter om Cambro med hjälp utav en av de två prototyperna, vilken typot skulle du då använt? Varför?
   - Video tar mindre tid och kan visa för större grupp
M2
Är du van vid att använda Cambro?
- ja
När använde du Cambro sist?
- HT2010
Tycker du Cambro är lätt eller svårt att använda?
- Ganska lätt. Man hittar på sidan men forumen och inlämnings”grejen” är dåligt konstruerade.

Tasks
   - VG på part E, men G på inviduella 2.
   - Jag downloader schemat, åh så bra, föreläsning på fredan
   - Kl 17 30 maj, instruktionerna finns på plats

Describe steps:
1. tryckte på assignments> course part E> individual assignment 2, läser kommentarer der (fanns ingen)
2. schemat till höger, trycker på next week, syns inget på fredag men finns en länk till course part A trycker på den, finner schema> downlad
3. trycker på assignments>course part A>instructions

Questions
   - videoprototypen. Förstod bra med Iselins hjälp och muspekaren, tydligt interface. (videoprototypen)<WINNER
   Pappersprototypen var dock också lätt att förstå.
2. Var det någonting du tyckte var svårt att förstå?
   - Möjligtvis steget (completed> assignments)
3. Har du några ändringar du vill göra på pappersprototypen? Varför?
   - n/a
4. Har du några ändringar du vill göra på videoprototypen? Varför?
   - hellre en interaktiv prototyp vid datorn (när mus/tangentbord finns)
5. Om du skulle varit tvungen att visa och lära nya studenter om Cambro med hjälp utav en av de två prototyperna, vilken prototyp skulle du då använt? Varför?
- Videoprototypen, mindre papper att förvirra sig i.

W2

Är du van vid att använda Cambro?
- nej
När använde du Cambro sist?
- minns ej
Tycker du Cambro är lätt eller svårt att använda?
- ganska svårt

Tasks

   - VG No comments G
   - Download
   - Download 30 maj

Describe steps:
1. Completed>betyg
   - courses>completed>assignment>individual assignment
2. Ongoing>course part A>download
3. Ongoing>assignments>assignment 1>download
   - ongoing>course A>assignments>assignment 1>download

Questions
   - Videoprototypen. Enklare. Kan spela tillbaka snabbt o enkelt
2. Var det någonting du tyckte var svårt att förstå?
   - svårt i början men man lär sig snabbt om man är en van dataanvändare. Men för en ovan person kan det bli lite svårare att förstå upplägget.
3. Har du några ändringar du vill göra på pappersprototypen? Varför?
   - Pappersprototypen är bra designat men det tar längre tid att förstå. Ser inga större ändringar som behövs
4. Har du några ändringar du vill göra på videoprototypen? Varför?
- Viduturrol var enkel att förstå men det beror nog lite på att jag är van att titta på läromedel film.

5. Om du skulle varit tvungen att visa och lära nya studenter om Cambro med hjälp utav en av de två prototyperna, vilken prototyp skulle du då använt? Varför?
- Definitivt videotuturiol men lite långsammare flow med text o pauser där man klickar.

M3

Är du van vid att använda Cambro?
- Ja

När använder du Cambro sist?
- Hela HT10

Tycker du Cambro är lätt eller svårt att använda?
- Lätt men inte jättesmidigt

Tasks
- Betyg VG, G på individual assignment 2, inga kommentarer.

- Jag fick ner schemat

- Jag fick ner instruktionerna och ser när den skal lämnas inn

Describe steps:
1. Tryckte på course>completed>course part E>individual assignment 2
1.2 Tryckte på course>completed>course part E>assignments>individual assignment 2
2. Tryckte på course>ongoing>course part A>download schedule. Jag vet att jag även kan göra det på det sätt jag gjorde i task 3.
3. Tryckte direkt på course A i högre hörnet (under current courses)> assignments> assignment1.

Questions
- Jag tycker att pappersprototypen var enklast att förstå för man fick själv gå igenom den i sin egna takt och jag lär mig lättare med tekniken ”learning by doing”.
2. Var det någonting du tyckte var svårt att förstå?
   - *Det var ovant för det var ett nytt gränssnitt, men inte svårt*

3. Har du några ändringar du vill göra på pappersprototypen? Varför?

4. Har du några ändringar du vill göra på videoprototypen? Varför?
   - *Menyerna på Course sidorna högst upp var lite svåra att se i början för dom smälte in för väl i designen.*

5. Om du skulle varit tvungen att visa och lära nya studenter om Cambro med hjälp utav en av de två prototyperna, vilken prototyp skulle du då använt? Varför?
   - *Pappersprototypen för den är mer interaktiv och inte lika styrd som videon, så att studenterna själva är mer fria att utforska.*

Övrigt: *Jag gillar att det finns flera olika vägar att gå för att komma till t.ex. en och samma kurssida.*

**M4**

Är du van vid att använda Cambro?
   - *ja*

När använde du Cambro sist?
   - *vet ej, hT10 kanske*

Tycker du Cambro är lätt eller svårt att använda?
   - *Det är relativt lättanvänt, men aningen svår navigerat och dumt strukurerat*

**Tasks**

   - *VG på kursen, G på uppgiften, ingen kommentarer*

   - *Download schema*

   - *det står inlämningsdatum, laddar ner instruktioner*

**Describe steps:**

1. *my workspace>courses >course part E>Assignments>Individual assignment >my workspace> courses*
   1.2 *my workspace>courses>completed> course partE> Assignments> Individual assignment*

2. *my workspace> courses>course part A> download schedule*

2.2 *my workspace> courses>ongoing>course part A> download schedule*

3. *my workspace> courses>course part A>assignments> assignment 1*
Questions

   - Videoprototypen gav enklare förståelse för layoten och interaktion. I pappersprototypen låg mer fokus på menyn än alla val som fanns direkt på sidan.

2. Var det någonting du tyckte var svårt att förstå?
   - nej

3. Har du några ändringar du vill göra på pappersprototypen? Varför?
   - göra valen direkt på sidan mer uppenbara, man lägger mer fokus på den bläddringsbara menyn.

4. Har du några ändringar du vill göra på videoprototypen? Varför?
   - nej

5. Om du skulle vara tvungen att visa och lära nya studenter om Cambro med hjälp utav en av de två prototyperna, vilken prototyp skulle du då använda? Varför?
   - videoprototypen, den var aningen mer lättförståd och kändes mer representativ gentemot websidan.

Övrigt: mer lättnavigerad enn den nuvarande cambrosidan.