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Analysis, Design and Implementation
Topic 2:
Paper Prototyping

Scope and Coverage

This lecture will cover:

- An overview of what is meant by **paper prototyping.**
- How to do paper prototyping as a stage of analysis and design
- What you learn from paper prototyping
- Why paper prototyping is a useful technique.

Introduction

- Before we begin to develop a system, we must understand what users want from the system.
  - This is often done as an extensive consultation exercise known as **analysis**.
- This can take many forms.
  - Structured interviews
  - Focus groups
  - Examining existing business needs
  - Evaluating current systems
  - And more

Proactive Analysis

- One of the more useful techniques is proactive analysis.
  - Examining the directions that the analysis could take.
- This involves exploring the **solution space** of a problem with users.
  - What they need, and how it should be emphasised.
- A powerful technique for doing this is called **paper prototyping**.

Paper Prototypes

- Paper Prototypes are used to quickly and easily explore the solution space of a problem.
- It's a **low fidelity** approach.
  - All you need is a piece of paper and a pencil.
- It is a **throwaway** approach.
  - You only invest what effort you are willing to completely abandon.
- It is an **iterative** approach.
  - We do it over and over and over

Low Fidelity

- There is a large gap between a paper prototype and a finished system.
  - The larger the better.
- Low fidelity means 'vague and incomplete'
  - It's not used to show what a system will be.
- It's used to very quickly produce a rough sketch of a system.
  - And to test the broadest possible concepts before they are developed farther.

Throwaway

- The only paper prototype worth keeping, save for documentation purposes, is the last one.
  - The one that represents the prototype everyone can agree upon.
- This encourages people to take risks, be creative, and explore the possibilities more widely.
  - There's no inertia that comes from having put a lot of work into a prototype.
- It's often sketched out directly in front of a user.
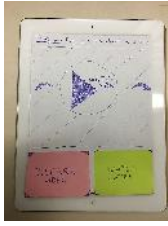
Iterative

- We may go through dozens of paper prototypes in an hour.
  - With direct involvement from users.
- As you explore what they like and what they understand you can edit prototypes accordingly.
  - And throw them away and start again when needed.
- This allows rapid exploration of the roughest contours of the solution space.
  - And finds where you should be focusing efforts.

Paper Prototypes

https://en.wikipedia.org/wiki/Paper_prototyping#/media/File:
Paper_prototype_of_website_user_interface,_2015-04-
16.jpg

https://upload.wikimedia.org/wikipedia/comm
ons/thumb/9/9c/Paper_Prototype_on_iPad.jp
g/768px-Paper_Prototype_on_iPad.jpg

Developing a Paper Prototype

- It's important here to remember you don't need to get this right to begin with.
    - All that's important is that you start.
- Draw the roughest possible shape of how a system might look.
    - As the user would see it.
- Your role in this is to show people an idea of what you think the system should be.
    - And gradually make it what **they** think it should be.

Testing a Paper Prototype

- Drawing the prototype is the easy part, but this is only the first step.
    - The next step is testing it to make sure it works.
- As part of an analysis process you will discover key tasks that need to be done by a system.
    - This will come out as a natural by-product of the system.
- You are looking to see if your paper prototype would permit people to optimally accomplish their goals.

Testing a Paper Prototype

- Usually for this you'll have a list of standard tasks someone would need to accomplish with a system.
    - Upload a file
    - Add a new customer record
    - Handle a help ticket
- Sitting down with the users, you gradually refine your paper prototype until those tasks are permitted in an optimal way.
    - Or at least, in a way that is reasonably effective for everyone.

The Wizard of Oz Simulation

- Since your prototype is just paper, you can't use it by itself.
- Your role in this is partially to draw and reconstruct the system.
- More importantly, your role is to emulate how the finished system will work.
- We do this through what is known as a **wizard of Oz simulation**.
  - You play the part of the computer.

The Wizard of Oz Simulation

- A paper prototype may consist of many separate pages.
  - Each representing a screen or page of the application.
- When a user presses buttons on the prototype, you switch out the screens for what they should be seeing.
  - If there are sounds, you make them.
  - If there's a data store, you are responsible for holding it.
- You are the wizard behind the curtain.

Evaluation

- Your third major role in paper prototyping is observation.
  - You need to watch and listen to how people interact with the prototype.
- If they're finding something difficult, make it easier to do.
- If they're not sure what they should do, act as a help system.
- Work to minimise your need to explain things.

Iteration

- Having gone through a paper prototype evaluation, you redesign the prototype and do it all again.
  - And observe whether you have improved the system.
- Test it with the same users.
  - To make sure you addressed their issues.
- Test it with different users.
  - To make sure your changes are generalizable.
- And once you've done that, do it again.
  - And again. And again.

Why?

- Users know better than we do what they want out of their systems.
  - They will have their own workflows that emerge only as a result of observation.
- Paper prototypes are incredibly cheap to make.
  - You don't even need software to do this well.
- They don't need anyone to code a minimally functional product.
  - Which means it's easier to change the course of the project in line with user expectations.

Low Fidelity Problems

- However, this is not a perfect system.
  - And it needs you to be mindful of the issues.
- Some functionality or behaviour cannot be represented in low fidelity.
  - Sometimes paper prototypes don't capture the flow of real life.
- It's often a very subjective process.
  - A product of interaction between user and prototype team.
- It doesn't necessarily lead to implementable systems.

Collaborative

- Most of all, paper prototypes work only as a **collaborative** process.
  - They're used to explore **what** a user wants, and what your team can deliver.
- They are about the **what**, but crucially they are also about the **why**.
  - Every statement of 'this doesn't work' needs to be answered by a 'why' it doesn't work.
- They are time intensive, but give very high returns on that time for everyone.

Interpreting User Feedback

- It's not necessarily the role of someone doing paper prototypes to say yes to all feedback.
  - It's about interpreting what feedback means.
- 'These buttons are too small'
  - This might mean there is an issue with accessibility or workflow.
- 'There's too much to remember'
  - This might be a problem with workflow.
- Listen and interpret, and try again.

Conclusion

- Paper prototyping is a very powerful tool for analysis.
- And serves to offer a bridge between analysis and design.
- It's a low fidelity, throwaway, and iterative process.
- And requires you to understand what your users mean, rather than necessarily what they say.
- It's very cheap, very easy, and offers great returns on investment.

Terminology

- Paper Prototype
  - A low-fidelity, throw away diagram of how a system should function.
- Wizard of Oz
  - A simulation of a paper prototype with someone playing the role of a computer.
- Solution Space
  - The set of all possible ways a system could be designed.

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Any Questions?