

Assignment No 1

Title: Identify specialized users and related facilities for a selected product / system and make necessary suggestions for its improved accessibility design.

Objectives:

1. To identify the users of proposed HCI application.
2. To specify goals and objectives.
3. To list down need of the user for selected product/system.

Theory:

Human–computer interaction (HCI) is the study of how people interact with computers and to what extent computers are or are not developed for successful interaction with human beings. . HCI both observe the ways in which humans interact with computers and design technologies that let humans interact with computers in novel ways.

HCI consists of three parts: the user, the computer itself, and the ways they work together.

User By "user", we may mean an individual user, a group of users working together. An appreciation of the way people's sensory systems (sight, hearing, touch) relay information is vital. Also, different users form different conceptions or mental models about their interactions and have different ways of learning and keeping knowledge and. In addition, cultural and national differences play a part.

Computer When we talk about the computer, we're referring to any technology ranging from desktop computers,

to large scale computer systems. For example, if we were discussing the design of a Website, then the Website itself would be referred to as "the computer". Devices such as mobile phones or VCRs can also be considered to be “computers”.

Interaction, The communication between user and system is called as the interaction. There are obvious differences between humans and machines. In spite of these, HCI attempts to ensure that they both get on with each other and interact successfully. In real systems, the schedule and the budget are important, and it is vital to find a balance between what would be ideal for the users and what is feasible in reality.

Know your users

The start of any interaction design exercise must be the intended user or users. Before you can answer the question “How do you make our user-interfaces better?”, we must first answer the question “for whome?”.

Over time many people are affected directly or indirectly by a system and these people are called stakeholders. Following techniques are used to know user.

Who are they?

The first thing to find out is who your users are. Are they young or old, experienced computer users or novices? You may need to ask this question again as you find out more about the system and its context. This question becomes harder to answer if you are designing generic software, many different users with different purposes and characteristic. However, it is probably better, designer should think of several specific users.

Talk to them

There many ways to talk with user: structured interviews about their job or life, open-ended discussions, or bringing the potential users fully into the design process.

Watch them

Watch what people do as well as hear what they say. This may involve sitting and taking notes of how they spend a day, watching particular activities, using a video camera or tape recorder. It can be done in an informal manner or using developed methods such as ethnography or contextual inquiry.

The observations tell you what they do, they will tell you why.

Use your imagination

If you cannot involve actual users you can at least try to imagine their experiences. One method that

has been quite successful in helping design teams produce user- focused designs is the persona. A persona is a rich picture of an imaginary person who represents your core user group.

Conclusion:

Thus we have studied important parts of HCI and different ways to know users for selected product/system.

Assignment No. 2

Title: Design user persona for the users of selected product / system.

Objectives:

1. To design user persona for the Interactive system.
2. To understand your users' needs.

Theory:

What is a Persona?

Personas are fictional characters, which we create in order to represent the different user types that might use service, product, site, or brand in a similar way. Creating personas will help us to understand users' needs, experiences, behaviors and goals. Persona answers the question "Who do we design for?" It is a powerful tool based on research findings in helping product function creation. It not only represents a specific user but all of them, it can be understood as a typical character of the behavior, attitude, skills and contexts of all potential users.

Why we use Personas?

Numerous research data for product design are quite difficult to handle. Therefore, Persona will be a relatively more realistic and concrete object, although not a real person, it is the most typical image of many real Personas. And it can remind us of the users' needs and help us make a better user experience model because of which real users will feel more comfortable while using product.

The classification of Persona

Personas can be classified into 2 types in general: Marketing Persona and Design Persona.

1. Marketing Personas are typical characters of the customers of a product or a company; they have similarities in buying preference, social relations, mode of consumption and ages. Personas help the company determine how their customers will be;
2. Design Personas refer to the representatives of users of a product or service that have similar points in usage customs, product requirements, preferences and goals. They can describe the needs of potential users and help developers put their focus back on users during the function design, and make products conform to user requirements.

Each persona should include:

Name: Could be realistic, could be taken from an actual customer, or it could be a descriptive handle like "Sally the Thrift-shopper."

Photo: It always helps to put a face to a name. Stock photos are fine, but avoid photos of celebrities, co-workers or other familiar faces that may come with built-in connotations and assumptions. The idea is create a new, original identity.

Personal quote/motto: Just like a photo, this helps flesh out the persona to make them seem more real.

Bio: Give a little backstory to make the person relatable. What was their childhood like? Why did they choose their current job? How do they spend their free time? These tiny details could influence strategic choices down the road.

Demographics: Age, sex, income, location—whatever attributes are relevant to your industry. Job title is particularly important, considering its business and financial implications.

Personality Traits: People with low attention spans want faster site designs. Cautious people are most likely to comparison shop. Personality traits are one of the most useful features of personas, so choose these with care.

Motivations: Like personality traits, this helps you get inside the customer's head and understand how they think. For example, would a customer be more likely to buy a product that improves their career or their personal life? It depends on which motivates them more.

Goals and frustrations: The scope of these is in direct relation to your needs. A lifestyle company would keep to general life and career goals, while a tech company could hone in on more specific goals like tasks they hope to accomplish with their software.

Preferred brands and influencers: You can tell a lot about a person based on which brands they like and what kind of people influence their decisions. You can also look at those brands' marketing strategies to see if their tactics might apply to you as well.

Characteristics of a good Persona

1. Sufficiently reflect the data and conclusions of investigations;
2. Show the current state of the interviewees instead of their expectation of the future;
3. Be more realistic than idealistic;
4. Propose a challenge to the group (but it is not impossible);
5. Help the group understand the users better.

Conclusion:

Thus we have designed user personas for users of selected system/product.

Assignment No. 3

Title: Conduct the contextual inquiry for the selected product / system.

Objectives:

1. To conduct the contextual inquiry for the Interactive system.
2. To understand your users' needs.
3. To list down need of the user for selected product/system.
4. To observe how users interact with systems.

Theory:

What is contextual inquiry?

Contextual inquiry is reminiscent of anthropological research, and relies heavily on participant observation. For this reason, it's a highly qualitative methodology that does not require a big sample. Its premise is to discover flaws that stem from bad design.

As people grow accustomed to usability issues and find ways of working around them, they slowly forget they even existed in the first place! This is when contextual inquiry can be especially helpful. Through direct observation, it allows researchers to look beyond theory and focus on what is actually done in practice. That way you can identify which designs or workflow strategies are problematic, and what heuristic solutions more experienced users have implemented to work around them. These observations can provide valuable insight toward addressing many issues. For example, if a senior employee has their own unique checklist that makes their work easier, there may be an opportunity to incorporate that same checklist into the design of the existing workflow, improving the overall experience—as well as productivity—of everyone.

When it comes to what you inquire, context is key: it's in the name! Take note of your and your user's surroundings and every tool (e.g. paper and pencils), techniques (e.g. affinity diagrams, moderated testing), or technologies (e.g. cloud storage, collaborative writing) relating to the overall workflow and objective. The goal is to better understand how everything interacts and influences the tasks and workflow.

The four principles of contextual inquiry are:

1. Focus - Plan for the inquiry, based on a clear understanding of your purpose.
2. Context - Go to the customer's workplace and watch them do their own work.
3. Partnership - Talk to customers about their work and engage them in uncovering unarticulated aspects of work.
4. Interpretation - Develop a shared understanding with the customer about the aspects of work that matter.

Here are some simple steps to conducting contextual inquiry yourself:

1. Identify your key research questions: Make sure they relate to the overall task or workflow, but keep them broad, keeping in mind their underlying objectives and anticipated outcomes.
2. Find a participant: The ideal participant is someone especially familiar or proficient with the tool or platform being tested so you can observe any heuristic shortcuts they may have developed.
3. Play your role: You and the participant will adopt roles traditionally known as “master and apprentice” (think super user and newbie), with the researcher as the apprentice and the participant as the master. As the newbie, you'll be asking the super user questions relating to what they do, how they do it, and why.
4. Identify shortcuts or heuristics participants use: Note any instances where the participant does something interesting, unexpected, or confusing, be it for you or them.
5. Review your notes and reflect on your observations: Try to understand the function of each of the tasks and see if any can be simplified, or even eliminated altogether.

Things to consider before trying contextual inquiry:

1. Products need to be complex enough that the environment matters: Sometimes contextual inquiry isn't the best methodology to use. For example, workflows done on single channels or simple interfaces, as is usually the case with apps and websites, aren't ideal candidates for contextual inquiry. Digital platforms tend to be lacking in contextual information and interaction, with most interactions occurring independently of the environment.

Contextual inquiry adopts a more holistic perspective in the way it seeks to find meaning in and across a variety of different settings, and more often than not, research done on websites or apps just don't offer enough to work with.

2. Products need to have a base of power users: Another important aspect of contextual inquiry is timing. Because you're observing participants using fully functioning software or systems, you need a completed product. That means contextual inquiry comes at the end of the testing cycle, after prototyping and implementation. You need a system or design that has seen extensive use and actually has super users.

3. Do plenty of usability testing first: You should conduct usability research—lots of it!—before you're ready for contextual inquiry. Testing early and often will not only help you identify usability and user experience issues, it will also help guide your objectives and questions once you're ready for contextual inquiry.

Conclusion: Thus we have studied the contextual inquiry and different steps to conduct the contextual inquiry for the selected product / system.

Assignment No. 4

Title: Design an interface prototype for the selected product / system.

Objectives:

1. To develop prototype of interface design system.
2. To involve the users in testing design ideas and get their feedback.
3. To test the effectiveness of interface design.

Theory:

What is Prototyping?

In the initial design phase, the proposed design undergoes frequent changes, it is not advisable to even feasible to carry out evaluation with real users. An alternative way to collect feedback on proposed design is to develop and evaluate prototypes.

The main purpose of prototyping is to involve the users in testing design ideas and get their feedback in the early stage of development, thus to reduce the time and cost. It provides an efficient and effective way to refine and optimize interfaces through discussion, exploration, testing and iterative revision.

Why Use it?

1. Saves money - "Finding and fixing a software problem after delivery is 100 times more expensive than finding and fixing it during the requirements and early design phases."
2. Brings the design to life
3. Clarifies requirements
4. Supports user involvement and feedback
 1. As observers of demonstrations, and/or
 2. Through hands-on testing, and/or
 3. In extended field trials (beta testing)and/or
 4. As co-designers
5. Identifies problems early - can be used to explore usability issues
6. Improves communication
7. Supports exploration of imagined use – the prototype does not have to be able to do everything that the finished product does

Different types of Prototyping:

Prototyping can be divided into three groups

1. Low-fidelity prototyping,
2. Medium-fidelity prototyping and
3. High-fidelity prototyping

Low-fidelity prototyping:

Low-fidelity prototypes are quickly constructed to depict concepts, design alternatives, and screen layouts, rather than to model the user interaction with a system. Low-fidelity prototypes provide limited or no functionality. They are intended to demonstrate the general look and the feel of the interface, but not the detail how the application operates.

• Sketches

Sketching techniques, a kind of visual brainstorming, can be useful for exploring all kinds of design ideas. After producing initial sketches the best ideas can be further developed by constructing cardboard representations of the design

• Storyboard

Storyboard is a graphical depiction of the outward appearance of the intended system without accompanying system functionality. Storyboard provides snapshots of the interface at particular points in the interaction so that the users can determine quickly if the design is heading in the right direction.

- PICTIVE

PICTIVE stands for Plastic Interface for Collaborative Technology Initiatives through Video Exploration. It was developed at Bell Communications Research (Bellcore) in 1990 within the context of participatory design.

PICTIVE insures that users have early exposure to the target implementation technology. The PICTIVE technique provides a fine-grained, dynamic paper and pencil concretization mock-up of what the system will eventually look like and how it will behave. The components are literally made of colored plastic.

Medium-fidelity prototyping:

Medium-fidelity prototypes simulate or animate some but not all features of the intended system.

There are three approaches to limit prototype functionality.

- Horizontal prototyping

Horizontal prototyping reduces the level of functionality so that the result is a surface layer that includes the entire user interface to a full-featured system without underlying functionality.

- Vertical prototyping

Vertical prototyping cuts down on the number of features, so that the result is a narrow system that includes in-depth functionality, but only for a few selected features.

- Scenario

Scenario reduces both the number of features and the level of functionality. a user can use a specific set of computer facilities to achieve a specific outcome under specified circumstances. Scenarios can be easy and cheap to build.

Hi fidelity prototyping:

High-fidelity prototypes are fully interactive, simulating much of the functionality in the final product. Users can operate on the prototype, or even perform some real tasks with it. High-fidelity prototypes are not as quick and easy to create as low-fidelity prototypes, but they faithfully represent the interface to be implemented in the product.

Conclusion:

Thus we have designed an interface prototype for selected system/product.

Assignment No.5

Title: Evaluate an interface using usability evaluation technique.

Objectives:

1. To evaluate an interface using usability evaluation technique.
2. To test the effectiveness of interface design using usability evaluation technique.

Theory:

What is Usability?

Usability refers to the quality of a user's experience when interacting with products or systems, including websites, software, devices, or applications. Usability is about effectiveness, efficiency and the overall satisfaction of the user.

It is important to realize that usability is not a single, one-dimensional property of a product, system, or user interface.

‘Usability’ is a combination of factors including:

- Intuitive design: a nearly effortless understanding of the architecture and navigation of the site
- Ease of learning: how fast a user who has never seen the user interface before can accomplish basic tasks
- Efficiency of use: How fast an experienced user can accomplish tasks
- Memorability: after visiting the site, if a user can remember enough to use it effectively in future visits

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Error frequency and severity: how often users make errors while using the system, how serious the errors are, and how users recover from the errors

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Subjective satisfaction: If the user likes using the system

What are the Evaluation Methods and When Should I Implement Them?

The key to developing highly usable sites is employing user-centered design. The expression, “test early and often”, is particularly appropriate when it comes to usability testing. As part of UCD you can and should test as early as possible in the process and the variety of methods available allow you to assist in the development of content, Information architecture, visual design, interaction design and general user satisfaction.

Opportunities for testing include:

- Baseline usability testing on an existing site
- Focus groups, surveys or interviews to establish user goals
- Card Sort testing to assist with IA development
- Wireframe testing to evaluate navigation
- First click testing to make sure your users go down the right path
- Usability testing to gauge the user interaction end-to-end and
- Satisfaction surveys to see how the site fares in the real world.

Any one or a combination of these tests will radically improve the usability of your site, system or application.

Working with Data from Testing:

Usability evaluations can capture two types of data: qualitative data and quantitative data. Quantitative data notes what actually happened. Qualitative data describes what participants thought or said.

Once you have gathered your data, use it to:

1. Evaluate the usability of your website
2. Recommend improvements
3. Implement the recommendations

4. Re-test the site to measure the effectiveness of your changes.

Usability Evaluation Methods:

The purpose of evaluation can be to improve the usability of the product as part of design/development (formative evaluation), or to assess the extent to which usability objectives have been achieved (summative evaluation).

1. Usability Inspection Method:

This section describes methods that can be used by experienced practitioners to assess usability issues. While these methods do not involve users directly, they can provide some useful insights. However, the goal is to use them to supplement, not replace, direct user involvement in testing designs and systems. The ISO standard for user-centered design (ISO, 2009) defines five key activities in the project, as Figure given below shows, starting with the requirement to plan for user-centered design and usability, and then proceeding through an iterative cycle of activities including evaluation (ISO, 2010).

2. Usability Testing with Users:

Usability testing involves observing users while they perform tasks with a hardware or software system. The product may be a paper sketch, a wireframe, a storyboard, a display mock-up, a product in development, a working prototype, or a completed product. Usability testing can also be conducted on competitive products to understand their strengths and weaknesses. A usability test can be a formative evaluation, which is conducted early in the design process to find problems improve the product, or summative evaluation, conducted to validate the design against specific goals.

Conclusion: Thus we have studied different usability evaluation methods and hoe to evaluate an interface using usability evaluation technique.