Part 3 - usability and user experience

Introduction

- The primary aim of the process of design and implementation of an interactive system should be to *maximize the usability* of the system
- It is therefore important for us to understand:
  - The characteristics, methods and tools of a process of design and implementation that can maximize usability
  - The characteristics of usability
  - How to measure and/or evaluate the usability of an interactive system

What is Usability?

The International Standards Organization (ISO 9241-11) identifies three aspects of usability, defining it as "the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use."

The Usability Professionals Association (UPA) definition focuses more on the product development process: "Usability is an approach to product development that incorporates direct user feedback throughout the development cycle in order to reduce costs and create products and tools that meet user need

"**Usability really just means making sure that something works well: that a person of average (or even below average) ability and experience can use the thing—whether it's a website, a fighter jet, or a revolving door—for its intended purpose without getting hopelessly frustrated**." #Steve Krug 'Don't Make me Think

All three of these definitions, as well as other definitions of usability, share some common themes:

- A user is involved.
- That user is doing something.
- That user is doing something with a product, system, or other thing.

Usability

Definitions of Usability:

- A commonly used definition of usability is that given by International Standards Organization (ISO/DIS 9241):
  - Usability refers to "the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use."
- Effectiveness:
  - the accuracy and completeness with which users of the system reach the purposes for which the system has been designed
  - the extent to which the user is able to reach goal while using the system
- Efficiency:
  - the relationship between the effectiveness of the interaction and the allocated or expended resources to achieve the goals
- Satisfaction:
  - the users' comfort with and positive attitudes towards the use of the system

USABILITY METRICS

- Metrics exist in many areas of our lives
- Every industry, activity, and culture has its own set of metrics.
- For example,
  - the auto industry is interested in the horsepower of a car, its gas mileage, and the cost of materials.
  - The computer industry is concerned with processor speed, memory size, and power requirements.
  - At home, we're interested in similar measurements: the bathroom scale (losing or gaining weight), the size of the goat required to feed everyone on Christmas day.
- Usability field is no different. We have a set of metrics specific to our profession: task success, user satisfaction, and errors, among others.

So what is a usability metric?

Usability metrics are based on a reliable system of measurement.

Using the same set of measurements each time something is measured should result in comparable outcomes.
All usability metrics must be

1. Observable (either directly or indirectly): simply noting that a task was completed successfully or noting the time required to complete the task.
2. Quantifiable: All usability metrics also require that the thing being measured represent some aspect of the user experience, presented in a numeric format. For example, a usability metric might reveal that 65 percent of the users are satisfied with using a product, or that 90 percent of the users are able to complete a set of tasks in less than one minute.

What makes a usability metric different from other metrics?

Usability metrics reveal something about the user experience—about the personal experience of the human being using the thing.

- A usability metric reveals something about the interaction between the user and the thing: some aspect of effectiveness (being able to complete a task), efficiency (the amount of effort required to complete the task), or satisfaction (the degree to which the user was happy with his or her experience while performing the task).

Another difference between usability metrics and other metrics is that they measure something about people and their behavior or attitudes. Because people are amazingly diverse and adaptable, designers sometimes encounter challenges in usability metrics.

Emphasis on Usability

- Measures of effectiveness:
  - They are related to the purposes and activities planned for the system and measure the accuracy with which the system supports the user to achieve those purposes.
  - For instance: measure of the outcome of user's interaction, error rates, etc.
  - Example: if the aim is to "type a letter" then possible measures are: the number of misspellings, document formatting features, etc.
  - Example: if the aim is to "search articles on a certain topic" then possible measures are: the number of relevant articles in the result, etc.
- Measures of efficiency:
  - They are linked to the consumption of resources required to attain the purposes.
  - For instance: task completion time, learning time, physical resources expended, etc.
  - Example: if the aim is "to print a report" then possible measures are: number of copies printed in a unit of time, ratio between the total number of copies printed and the number copies printed correctly, etc.
- Measures of satisfaction:
  - They are linked to the users' comfort with and positive attitudes towards the system, or pleasantness of interacting with the system
  - Users' satisfaction can be measured subjectively (e.g. by rating/preference scales, etc) and/or objectively (e.g. , physiological monitoring, etc). [Note the subjective rating scales could be based on effectiveness and efficiency]

- Usability plays a much wider role in our lives than most people realize. It's not just about using a website, a piece of software, or the latest technology. Usability is about setting up a tent, relighting a furnace to heat a home, trying to figure out a tax form, or driving an unfamiliar rental car.
- Usability impacts everyone, every day. It cuts across cultures, age, gender, and economic class.
- Usability takes on an ever-increasing role in our lives as products become more complex. As technologies evolve and mature, they tend to be used by an increasingly diverse set of users.

WHY DOES USABILITY MATTER?

Usability can sometimes mean the difference between life and death.

Examples: health industry is not immune to poor usability. These issues abound in medical devices, procedures and even diagnostic tools. An instruction that's misunderstood or misread can easily result in property damage, personal injury, or even death.

Saving lives is, of course, not the only motivation for good usability. Championing usability in a business setting is often geared toward increasing revenues and/or decreasing costs.

- Companies have lost money because of poor usability of a new product

Usability can have a huge impact on providing access to goods and services for different user populations, such as older adults, people with disabilities, or people with language or literacy challenges

How Does *Bad Design* Affect a Business?

- **Damages your *credibility*:** If you are a serious business, but your website is crowded with animation, stock photography, and other virtual clutter, you are not sending a professional message.
- **Make you look out of touch:** A website you do not update frequently does more than hurt your SEO (Search Engine Optimization). A dated website tells your customers you are behind the technological times, or worse that you do not care enough to keep updated.
- **Costs you customers:** Every time a customer navigates away in frustration – because of broken links, complex forms, or too much *navigation* – it is unlikely you will see them again. If your competitor offers the same services in an intuitive website design, your loss is their gain.

Usability Goals

- Effective to use
- Efficient to use
- Safe to use
- Have good utility
- Easy to learn
- Easy to remember how to use

Effectiveness

- Most general goal
- Concerned with whether the system is doing what it generally says it will do
- Question: is the system doing what it is supposed to do?
- E.g., word processor, E-commerce system, Educational software

Efficiency

- Considers how much time it will take users to perform their tasks
- Generally the more steps it takes to carry out a task, the less efficient a system is
- Question: is the user saving time/being productive with the system?
- Criteria: time to complete a task; # of operations to complete a task

E.g., Voice mail Amazon e-commerce

Safety

- Does the system
  - prevent making serious/unrecoverable errors
  - provide means of recovering from errors

    undo options, confirmation dialogs
  - protect users from dangerous and undesirable conditions

- Question: does it prevent users from making/recovering from serious errors? does it jeopardize the well-being of the user or others?

- Criteria: number of errors/time to recover from errors

  Eg: Systems in chemical plants, Transferring files, Drawing tools

Utility

- Sufficient functionality to accommodate range of users tasks
- Will the system provide sufficient fluidity to cover tasks as performed
- Question: does it provide sufficient functionality for users to carry out tasks as naturally as possible?
- Criteria: availability of core tasks
  e.g. Accounting packages Drawing tools

Learnability

- How easy is the system to learn
- Important if system will be adopted by the user
  - particularly if used infrequently
- Need to identify how much time users are willing to spend to learn the system
- Question: can primary (core) and secondary tasks be learned quickly and easily?
- Criteria: time to learn a task, errors made in learning a task E.g., iPhone? Android phone? Game?

Memorability

- Once learned, how easy is the system to remember
  - Particularly important if system will be used infrequently
  - Can users remember with the aids of appropriately designs icons, command groupings, etc.
- Question: will users remember all the steps to carrying out a task?
- Criteria: errors made in carrying out a task after system is learned

E.g. an interface to a digital camera

Advantages of Usability

- Allows you to focus on user needs and organization
  - More focused during system development and therefore reduced development time
  - Decrease of training required
- Increases productivity
  - Reduction of user errors
- Improve the quality of products
  - Increased profile of competitive products
  - Decrease time and cost of maintenance
- Improve quality of life
  - Reduced stress and increased satisfaction of the user
  - Improved working environment
- Allows compliance e.g. with ISO standards, European directives on displays

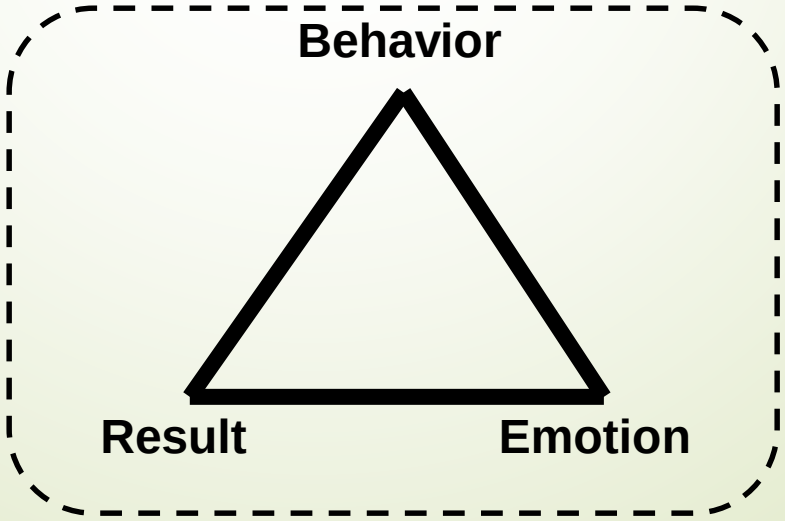
Activity

How long should it take to learn to use the following products? How long does it actually take?
How memorable are they?

i. Buying an iPhone from jumia
ii. Using an authoring tool create a simple social application
iii. Setting up a wireless router

User Experience Goals

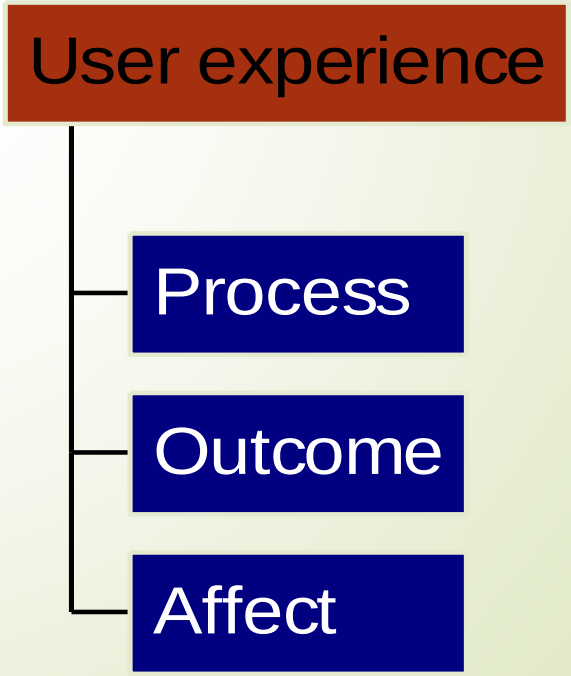
- *User Experience* (UX) is the overall experience of a person using a product such as a website or computer application to accomplish a task and refers to a person's emotions and attitudes about using the product especially in terms of how easy or pleasing it is to use
- User experience = behavior + result + emotion



User Experience

- Users' experience is contextually determined by their needs, their tasks, their history and their location
- Understanding this and knowing how to evaluate experience, is the primary purpose of this class

- What user does
- What user attains
- How user feels



Some experience goals include:

- Motivating: did not feel like giving up
- Satisfying: productive
- Enjoyable: no frustrations were encountered
- Aesthetically pleasing: subjective
- Fun: excited about using it again
- Supportive of creativity: drawing tools
- Entertaining: games
- Rewarding: sense of productivity
- Helpful: clueless but still made it through
- Emotionally fulfilling: evokes emotions/ online chatting

User Experience Design

- User Experience Design (UX, UXD, UED or XD) is the process of enhancing user satisfaction with a product by improving the usability, accessibility, and pleasure provided in the interaction with the product

Biggest User Complaints

- Poor content
- Slow loading
- Poor aesthetics
- Unclear menu options
  - Menus with example sub-items much preferred and lead to more efficient use
- Too much clicking and "forced" navigation
- No site map
- Poor search facilities

Usability vs. Experience Goals

- Usability goals could take primary importance but not always
- User experience goals are not easily measured
- Have to balance the tradeoffs between user experience and usability goals
- Be selective about which goals to pursue for designing a system or parts of a system