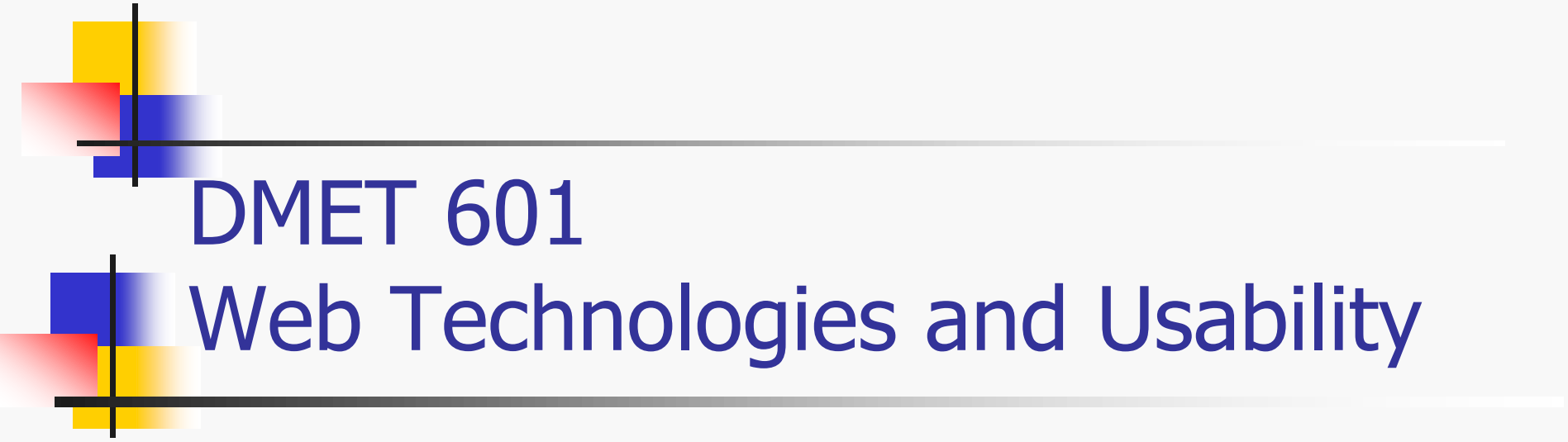

DMET 601
Web Technologies and Usability

Usability Engineering

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Learning Objectives

- In this set of slides, we will have an overview on usability aspects:
  - Usability and why is it important
  - Usability engineering
  - Usability testing
  - Usability steps
  - Usability Engineering Saves Money

What is Usability?

- **Usability** is the measure of the quality of a user's experience when interacting with a product or system — whether a Web site, a software application, mobile technology, or any user-operated device.

- It is a combination of factors:
  - Ease of learning
  - Efficiency of use
  - Memorability
  - Error frequency and severity
  - Subjective satisfaction

Usability is the measure of the quality of a user's experience when interacting with a product or system.

Why is Usability Important?

- Research shows that people cannot find the information they seek on Web sites about 60% of the time.

- This can lead to:
  - wasted time.
  - reduced productivity.
  - increased frustration.
  - loss of repeat visits and money.

Usability Engineering

- **Usability engineering** is a methodical approach to produce a Web site or any user interface.

- Usability engineering involves several methods:
  - gathering requirements
  - developing and testing prototypes
  - evaluating design alternatives
  - analyzing usability problems
  - proposing solutions
  - testing a site (or other interface) with users

Usability Engineering vs. Usability Testing

- **Usability testing** is part of the process of usability engineering.
- In a typical usability test, users perform a variety of tasks with a prototype (or other system) while observers record notes on what each user does and says.
- A prototype may be a paper prototype, or it may be a real working prototype.
- The goal is to uncover any problems that users may encounter so those problems can be fixed.

Usability Steps

1. Getting started — planning the Web site
2. Collecting data from users
3. Developing prototypes
4. Collecting, writing, or revising content
5. Conducting usability tests
6. Continuing to assess the site after it is up

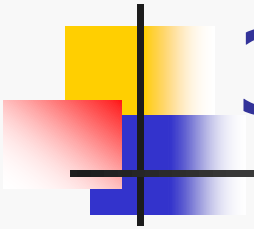
1. Getting Started – Planning the Web Site

- Understand:
  - why you are developing your site.
  - who should come to your site.
  - when and why those people might come.
- Objectives can be established when answering these questions.
- Think about usability objectives. Generally, a site must be:
  - easy to learn
  - efficient to use
  - easy to remember on subsequent visits
  - satisfying, with a minimum number of errors as users go through the site
- You may emphasize different objectives for different audiences and situations.

2. Collecting Data from Users

- Because the design is to be based on user needs, data must be collected about those needs and how well an existing Web site (if there is one) is meeting those needs.

- There are a variety of ways to collect that data, including:
  - feedback forms
  - system metrics (log data on an existing site)
  - usability testing of the existing site



3. Developing Prototypes

- Useful results can be obtained by building a prototype site, with a minimum of text content and no graphics, for a first round of usability testing.
- The prototype can then be used to elicit user comments and observe the prototype's ability to lead the users through the tasks they need to perform.
- It can be built on paper or with simple HTML.

4. Collecting, Writing or Revising Contents

- Based on what users need, you must put content into the site.
- Think about how useful and understandable the information you have.
- Most people want to quickly scan information and read only small sections.
- If the information you have is in long paragraphs, consider revising it..
  - Break it into small chunks with many headings.
  - Cut out unnecessary words.
  - Use lists and tables so people can find information quickly.

6. Continuing to Assess the Site after it is Up

- It is necessary to assess the performance by:
  - Analyzing reports, usage logs, and other data sources for the site.
  - Continuing to gather user feedback on usability.

5. Conducting Usability Tests

- The goal of usability testing is to ascertain what will help users accomplish their tasks and what may impede them.

- We want to focus on:
  - Conducting and using usability tests
    - What Is usability testing?
    - Testing goals
    - Types of questions to ask
    - Iterative testing works best
  - What are the steps in usability testing?
  - Promoting the site

What is Usability Testing?

- Usability testing encompasses a range of methods for identifying how users actually interact with a prototype or a complete site.
- In a typical approach, users — one at a time or two working together — use the Web site to perform tasks, while one or more people watch, listen, and take notes.

Testing Goals

- The goal of usability testing is to find out what is and is not working well on the site. In a usability test, you usually want to answer questions like these:
  - Do users complete a task successfully?
  - If so, how fast do they do each task?
  - Is that fast enough to satisfy them?
  - What paths do they take in trying?
  - Do those paths seem efficient enough to them?
  - Where do they stumble?— What problems do they have?— Where do they get confused?
  - What words or paths are they looking for that are not now on the site?

Types of Questions to Ask

- You might also have more specific questions that are related to your site. For example:
  - Do users realize, without being told, whose site they are working with — just from looking at the home page?
  - Do users click through pages or do they use Search?
  - What words do they try in Search?
  - What do they choose from the Search results?
  - How do they react to the download time for specific pages?
  - If they abandon a shopping cart before buying, when do they stop and why?

Iterative Testing Works Best

- Usability testing is an iterative process that involves testing the site and then using the test results to change the site to better meet users' needs.
- The best process is to try out a prototype with a few users, fix it, and test it again.

What to Call it: Testing? Evaluation? Try Out?

- In the usability community, this technique is called "usability testing." For users, however, "testing" often has negative connotations. We don't want users to think that we are testing them. They are helping us test the site. If something goes wrong, we fix the site — we don't (and can't) fix the users.
- It helps if you make sure you always think of the testing that way. Think "how well is the site allowing the users to meet their goals" rather than "how well do the users do on the site."
- But it may help even more if you change the word "testing" even in your own mind. Some usability specialists like "usability evaluation" — even though it is a longer word than "testing" — because it is softer.
- An even better choice might be "try out." We are asking users to come "try out" or "test drive" a draft version of the site.

Steps in Usability Testing

- Perform the following steps:

1. Plan scope, issues, participants, location, budget.
2. Develop scenarios.
3. Recruit test participants.
4. Conduct usability testing.
5. Make good use of the test results.

Steps in Usability Testing

1. Plan scope, issues, participants, location, budget

- What are you going to test?
- What concerns do you have about the site that you want to test?
- Which users should participate in the test?
- Where will you conduct the test? In a fixed laboratory? In a conference room or other space with a portable lab? In a conference room or other space but without any recording equipment? Remotely?
- What is your budget for testing?

Steps in Usability Testing

2. Develop scenarios

- Select relevant tasks for users to try.
- Prepare, try out, and refine scenarios for those tasks.

3. Recruit test participants

- Recruit users who accurately represent your current or potential users.

Steps in Usability Testing

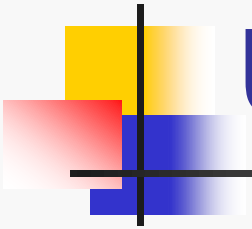
4. Conduct usability testing

- Have a trained facilitator interact with the user.
- Have trained observers watch, listen, and take notes.
- Make sure participants know that they are helping by trying out the Web site; the site is being tested, not them.
- Get participants to think aloud as they work.
- Let participants express their reactions.
- Listen! Do not lead. Be sure to stay neutral in your words and body language. Be careful not to ask leading questions that may skew the participants' responses.
- Take detailed, useful notes concentrating on observations of behavior rather than inferences.

Steps in Usability Testing

5. Make good use of the test results

- Compile the data from all participants.
- List the problems that participants had.
- Sort the problems by priority and frequency of the problem.
- Develop solutions. Get expert advice if the solutions are not obvious.
- Fix the problems.
- Test the revised version to ensure you made the right design decisions.



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Usability Engineering Saves Money

- You can use usability testing to show that the benefits of usability engineering outweigh the costs.
- Conduct the following steps:
  - Do a usability test on an early version of the Web site (or other product) — this could be the old site or one done without involvement of usability specialists.
    - Use actual users doing relevant tasks.
    - Measure time to complete tasks.
  - Identify and fix problems
  - Do a usability test on the new version of the site.
    - Have users who match the demographics of the first set of users do the same tasks you used in the first test.
    - Measure time to complete the same tasks.

Usability Engineering Saves Money (cont.)

- Calculate the improvement in average time to complete each task.
- Multiply the time saved by the number of people who are likely to do that task in a given time period (say, each day).
  - If users are likely to do a task several times a day, you can also multiply by that number.
  - If you have noted the time saved in seconds or minutes, convert it to hours because you will want to work in hours in the next step.
- Identify the average hourly salary of the users who do that task.
- Convert time to money by multiplying time saved (in hours) by users' salary (per hour).

Usability Engineering Saves Money (cont.)

- Find the one-year savings by multiplying your previous figure by the number of days in the year that users are likely to do the task.
  - If this is a work task, use the number of days in the organization's working year.
  - You now have the total annual savings of your usability changes — all due to time saved by fixing the product so users can do tasks more quickly.
- Compare the amount saved to the cost of usability activities.

An Example

- Suppose that a department in your company, consisting of 50 employees, uses a certain Web site to perform a series of 3 tasks every hour. The average durations consumed by an employee to perform the tasks are
  - 1st task: 3 minutes and 20 seconds (i.e., 3:20).
  - 2nd task: 4 minutes and 17 seconds (i.e., 4:17).
  - 3rd task: 5 minutes and 9 seconds (i.e., 5:09).
- After performing usability testing and improving the Website, the durations consumed decreased to 2:17, 2:59 and 3:44 for the first, second and third tasks respectively.
- The hourly rate for each of these employees is 10.00 LE. Consider that there are only 260 working days annually and each working day is 8 hours.
- How much money will be saved after performing the usability testing?

An Example

3:20→2:17, 4:17→2:59 and 5:09→3:44

Hourly saved time in seconds for one employee = 63 + 78 + 85 = 226 seconds
Hourly saved time in seconds for 50 employees = 226*50 = 11300 seconds
Daily saved time in seconds for 50 employees = 11300* 8 = 90400 seconds = 25.11 hours
Daily saved time converted to money = 25.11*10= LE 251.11
Yearly savings = 251.11*260 = LE 65288.89

Summary

- Usability aspects:
  - Usability and why is it important
  - Usability engineering
  - Usability testing
  - Usability steps
  - Usability Engineering Saves Money