Final-Term – Semester Assignment

- Subject : Human computer interaction
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HUMAN COMPUTER INTERACTION

Question 1: Consider the chair given below. Your Employees want to use it as a computer chair. Your task is to write any As HCI Specialist, your job is point out any Five issues in the design of this chair.

Answer:

Following are some of the issues of the chair

- **Adjustability-** The chair cannot be adjusted in different angles.
- **Seat height range** - the seat height cannot be adjusted to the height recommended for the worker(s) who will use it.
- **Backrest** - the backrest is not adjustable and will fail to provide support in both backward and frontward direction.
- **Seat surface –** The seat surface is not comfortable.
- **Armrests –** armrests are not provided and cannot support the arms of the user.

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Question 2: What is Paradigm, and what do you mean by paradigm shift?

Answer: Paradigm:-

The collection of beliefs and concepts is what is known as a **paradigm**, which is a set of theories, assumptions, and ideas that contribute to your worldview or create the framework from which you operate every day. For example, you've probably heard the phrase 'the American way of life,' which is a paradigm because it refers to a collection of beliefs and ideas about what it means to be American. For people who find this paradigm very important, it may serve as the foundation of how they view or interact with the world around them. This emphasizes one of the most important purposes of a paradigm, which is that it is comprised of beliefs and ideas that form a framework to approach and engage with other things or people.

What Is a Paradigm Shift?

Something works or is accomplished. A paradigm shift can happen within a wide variety of contexts. They very often happen when new technology is introduced that radically alters the production process of a good or service. For example, the assembly line created a substantial paradigm shift, not only in the auto industry but in all other areas of manufacturing as well.

KEY TAKEAWAYS:

- A paradigm shift is a major change in the concepts and practices of how something works or is accomplished.

- A paradigm shift very often happens when new technology is introduced that radically alters the production process of a good or service.

Understanding Paradigm Shifts:

A paradigm shift can require that entire departments be eliminated or created in some cases, and millions or even billions of dollars of new equipment purchased while the old equipment is sold or recycled. Paradigm shifts have become much more frequent in the past hundred years, as the industrial revolution has transformed many social and industrial processes. This process is likely to become even more commonplace in the future as our rate of technological advancement increases.

Example of a Paradigm Shift:-

For example, the Internet created a paradigm shift in the way business is conducted. Email and scan replaced the fax machine and courier services. Orders for securities can now be placed directly by the client via the Internet and are sometimes executed in seconds.

Before the Internet, a client would have to call their broker who would write out an order ticket for the broker's record, then call the firm's floor broker to execute the trade. Stock quotes are now widely available through multiple sources thanks to modern technology, whereas 100 years ago people needed ticker machines installed in their offices. All of the old-time equipment such as order tickets, fax machines, and ticker machines are now obsolete thanks to the paradigm shift brought on by modern technology.

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Question3: Explain Design Rationale. Write and explain the types of design rationale.

Ans: Design Rationale:-

A design rationale is the explicit listing of decisions made during a design process, and the reasons why those decisions were made.[2] Its primary goal is to support designers by providing a means to record and communicate the argumentation and reasoning behind the design process. It should therefore include:

- The reasons behind a design decision,
- The justification for it,
- The other alternatives considered,
- The tradeoffs evaluated, and
- The argumentation that led to the decision.

Types of Rationale:

Rationale can be classified into several types. These types are not mutually exclusive and some systems may support multiple types of rationales. The following types of rationale are discussed in this document:

- ***Argumentation based*** - the design rationale is primarily used to represent the arguments that define a design [Garcia, 1993]. These arguments consist of issues raised, alternative

responses to these issues, and arguments for and against each alternative.

- ***History-based*** - the rationale consists of the design history – the sequence of events that occurred while performing the design [Garcia, 1993]. This information can be stored in many forms. It could be in the form of entries in a design notebook, an archive of e-mail messages, or other types of documents that capture actions taken over time.

- ***Device-based*** - a model of the device itself is used to both obtain and present rationale [Gruber, 1990]. The explanations of the design would be produced by using the model to simulate the behavior of the device. It would be possible for the user to view the model and ask questions about its design and behavior.

- ***Process-based*** -- the DR capture is integrated into the design process itself which guides the format of the rationale. In Ganeshan, etc. al. [1994], the design description is modified only by changes to and refinements of the design objectives, thus capturing the rationale as part of the design process.

- ***Active document-based*** - the DR is pre-generated and stored in the system. In these systems, the designer creates the design and the DR system generates the rationale for it based on the

system's stored knowledge. For each decision made, the system compares the decision made by the user with the decision that it would have made based in its knowledge. If the actions of the user conflict with the system recommendations, they are given the option of changing their decision or modifying some of the criteria.

Question 4: Find the web pages that illustrate the principle of consistency. You must provide on good and one bad example of consistency. You must provide the screen shot of web pages along with URL and the written explanation justifying your good and bad example in your answer. To provide the relevant examples browse the internet.

Answer :

Good web page that illustrates the principle of consistency.

The “keep it simple”-principle (KIS) should be the primary goal of site design. Users are rarely on a site to enjoy the design; furthermore, in most cases they are looking for the information *despite* the design. Strive for simplicity instead of complexity.

From the visitors' point of view, the best site design is a pure text, without any advertisements or further content blocks matching exactly the query visitors used or the content they've been looking for. This is one of the reasons why a user-friendly print-version of web pages is essential for good user experience.
www.finch.com

Finch clearly presents the information about the site and gives visitors a choice of options without overcrowding them with unnecessary content.

Bad web page that illustrates the principle of consistency

Why is Arngren a poorly designed website?

1) The biggest problem is that the site doesn't use a grid.

2) Unbelievable navigational structure.

3) Poor typography makes it unreadable.

4) Random use of colors.

www.arngren.net

A grid can make everything clean and organized on your website. It keeps all your elements in their proper places and helps you to determine their size, the size, and space of the text, etc. With a grid, you can create a consistent, well-designed interface.

A good web design example of using the grid in web design - everything is organized.

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Question 5: Write the Shneiderman’s 8 Golden Rules.

Answer:

Shneiderman's "Eight Golden Rules of Interface Design"

These rules were obtained from the text designing the User Interface by Ben Shneiderman. Shneiderman proposed this collection of principles that are derived heuristically from experience and applicable in most interactive systems after being properly refined, extended, and interpreted.

To improve the usability of an application it is important to have a well-designed interface. Shneiderman's "Eight Golden Rules of Interface Design" are a guide to good interaction design.

1 Strive for consistency.
Consistent sequences of actions should be required in similar situations; identical terminology should be used in prompts, menus, and help screens; and consistent commands should be employed throughout.

2 Enable frequent users to use shortcuts.
As the frequency of use increases, so do the user's desires to reduce the number of interactions and to increase the pace of interaction. Abbreviations, function keys, hidden commands, and macro facilities are very helpful to an expert user.

3 Offer informative feedback.
For every operator action, there should be some system feedback. For frequent and minor actions, the response can be modest, while for infrequent and major actions, the response should be more substantial.

4 Design dialog to yield closure.
Sequences of actions should be organized into groups with a beginning, middle, and end. The informative feedback at the completion of a group of actions gives the operators the satisfaction of accomplishment, a sense of relief, the signal to drop contingency plans and options from their minds, and an indication that the way is clear to prepare for the next group of actions.

5 Offer simple error handling.
As much as possible, design the system so the user cannot make a serious error. If an error is made, the system should be able to detect the error and offer simple, comprehensible mechanisms for handling the error.

6 Permit easy reversal of actions.
This feature relieves anxiety, since the user knows that errors can be undone; it thus encourages exploration of unfamiliar options. The units of reversibility may be a single action, a data entry, or a complete group of actions.

7 Support internal locus of control.
Experienced operators strongly desire the sense that they are in charge

of the system and that the system responds to their actions. Design the system to make users the initiators of actions rather than the responders.

8 Reduce short-term memory load.
The limitation of human information processing in short-term memory requires that displays be kept simple, multiple page displays be consolidated, window-motion frequency be reduced, and sufficient training time be allotted for codes, mnemonics, and sequences of actions.

Question 6: You are familiar with internet explorer. Explain any five usability goals in terms of internet explorer. Justify each goal with example.

Answer: **Five usability factors that make products usable:**

1. **Effectiveness**
2. **Efficiency**
3. **Engagement**

4. **Error Tolerance**
5. **Ease of Learning**

Effectiveness

Effectiveness is about the high degree of accuracy under which users can complete their goals. The product has to be able to support the user while performing tasks.

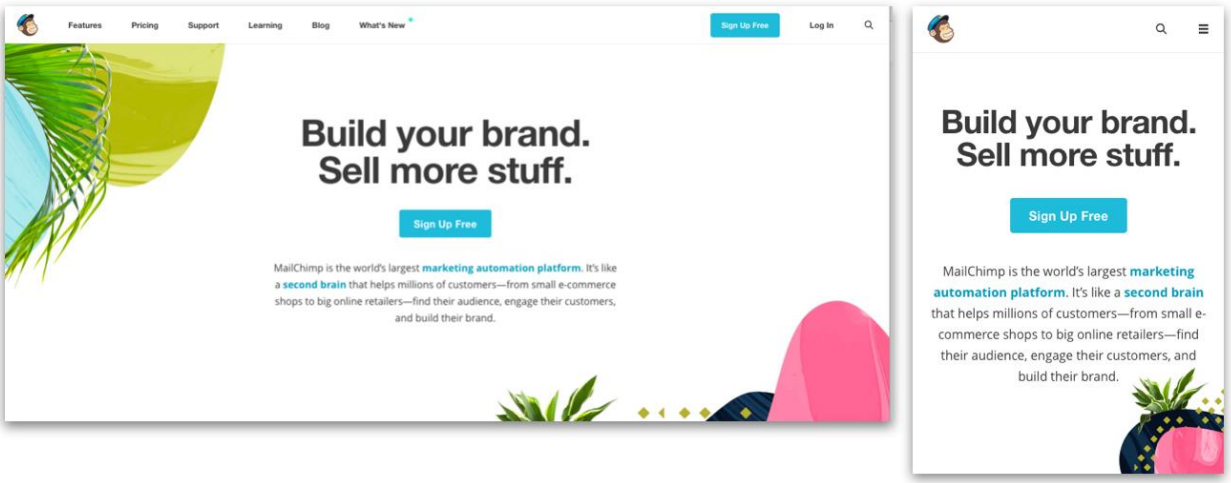
For example, validating each field of a form accordingly (the postal code field has to be 5 characters long and only contain numbers) and be informative while doing it so, this can reduce data entry errors and help the user finish the task correctly.

Efficiency

Efficiency must not be mistaken for effectiveness as they are quite different and our goal is aiming to have both of them. Effectiveness, as we covered above, is about the accuracy of the user to complete a task, while **efficiency** is how fast can the user finish the task. It's all about speed!

Take **for example** MailChimp's web and mobile page shown below, as they follow the same structure and the content also remains the same; but the main menu on the mobile site is no longer displayed as a

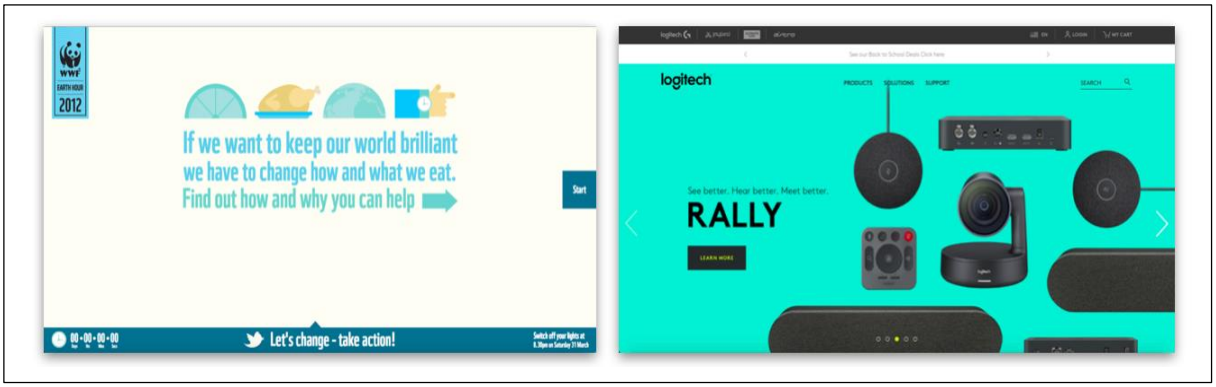
Horizontal navigation but as a hamburger menu containing the same sections. The layout changed to a more simplified version of the desktop site and the shortcuts were only maintained for the sign-up option and the search.



Engagement

Engagement happens when the user finds your product enjoyable and satisfactory to use. Yes, aesthetics and great UI elements start to have relevance here, but they're not the only factors implicated in creating a gratifying product that users like to interact with.

Here are 2 examples of engaging websites, that show not only great visual elements, but also play with interactive elements, they have a clear navigation, and they communicate their message crystal-clear.



Error Tolerance

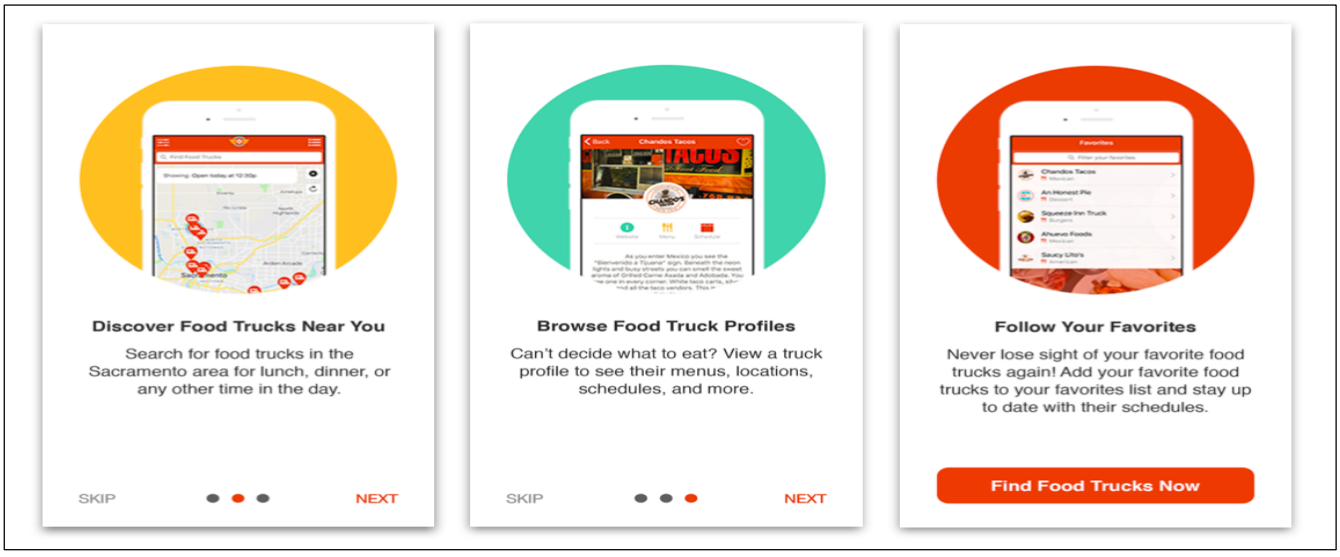
Being tolerant to error means to make everything in our power to design a product in which is easy to achieve tasks and without letting the users get confused and do the wrong thing, for example:

1. Making all the navigation elements clear and visible so the users can know where they're at and where to go next.
2. The right language comes into play again: communicate everything in a simple language.
3. The actions performed have to be consistent throughout the product to reduce the probability of mistakes.
4. Limit the options to only correct choices.
5. And *always* provide feedback, as in the image below.

Ease of Learning

When a product requires the users to remember a lot of information or learn to do several things in order to be able to use it, it's really hard for them to stick and engage with the product regularly. On the contrary, if we have a product that lets the user learn to use it easily, the interaction will come as something natural the next time they use it.

For example, the app to find food trucks around town, Diamond Plate shows in just a few screens the whole concept of the product and its features, letting the user create a mental model of the app before even using it. As a result, when it's time to interact with it, the users can easily navigate and make the best use of the app by reaching their goals.



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