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Semester 6<sup>th</sup>

Final Assignment: HUMAN COMPUTER  
INTERACTION

Submitted To: Sir Mr. Shahab Ul Islam

### 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:

The computer chair given in the question having issues which can be problematic for the employees in their department.

- 1: This chair is not adjustable so the employee cannot adjust his position for viewing distance and viewing angle.
- 2: There is no lumbar support for lower back to avoid discomfort.
- 3: There is no adjustable seat height to position yourself for computer.
- 4: This chair has hard surface which is not comfortable for sitting.
- 5: There is no elbow support for to place elbow in 90-degree angle.

### Question 2:

**What is Paradigm, and what do you mean by paradigm shift?**

**Answer: Paradigm:** In science and philosophy, a paradigm (/ˈpærədɑːm/) is a distinct set of concepts or thought patterns, including theories, research methods, postulates, and standards for what constitutes legitimate contributions to a field.

#### **Definition of *paradigm shift***

An important change that happens when the usual way of thinking about or doing something is replaced by a new and different way.

Paradigm shifts tend to appear in response to the accumulation of critical anomalies as well as the proposal of a new theory with the power to encompass both older relevant data and explain relevant anomalies. New paradigms tend to be most dramatic in sciences that appear to be stable and mature, as in [physics](#) at the end of the 19th century. At that time, a statement generally attributed to physicist [Lord Kelvin](#) famously claimed, "There is nothing new to be discovered in physics now. All that remains is more and more precise measurement." Five years later, [Albert Einstein](#) published his paper on [special relativity](#), which challenged the set of rules laid down by [Newtonian mechanics](#), which had been used to describe force and motion for over two hundred years. In this case, the new paradigm reduces the old to a special case in the sense that Newtonian mechanics is still a good model for approximation for speeds that are slow compared to the [speed of light](#). Many philosophers and historians of science, including

Kuhn himself, ultimately accepted a modified version of Kuhn's model, which synthesizes his original view with the gradualist model that preceded it. Kuhn's original model is now generally seen as too limited.

Some examples of contemporary paradigm shifts include:

- In medicine, the transition from "clinical judgment" to **evidence-based medicine**
- In social psychology, the transition from **p-hacking** to replication
- In software engineering, the transition from the Rational Paradigm to the Empirical Paradigm
- In Artificial Intelligence, the transition from classical AI to data-driven AI

### Question3:

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

**Answer: Design Rationale:** A design rationale is an explicit documentation of the reasons behind decisions made when designing a system or artifact. As initially developed by W.R. Kunz and Horst Rittel, design rationale seeks to provide argumentation-based structure to the political, collaborative process of addressing wicked problems.

### Definitions

There are many definitions of Design Rationale:

"Design rationale expresses elements of the reasoning which has been invested behind the design of an artifact" [Shum & Hammond, 1993].

"Design rationale is the reasoning and argument that leads to the final decision of how the design intent is achieved." "Design intent is the 'expected' effect or behavior that the designer intended the design object should achieve to fulfil the required function." [Sim & Duffy, 1994]

"Design rationale means statements of reasoning underlying the design process that explain, derive, and justify design decisions" [Fischer, et. a., 1995]

Design rationale means "information that explains why an artifact is structured the way that it is and has the behavior that it has" [Conklin, Burgess-Yakemovic, 1995].

"Design rationales include not only the reasons behind a design decision but also the justification for it, the other alternatives considered, the tradeoffs evaluated, and the argumentation that led to the decision" [Lee, 1997].

**Explanation:** The information that explains why a computer system is the way it is, including its structural or architectural description and its functional or behavioral description. Relates to an activity of both reflection (doing design rationale) and documentation (creating a design rationale) that occurs throughout the entire life cycle. It is beneficial to have access to the design rationale for several reasons: In an explicit form, a design rationale provides a communication mechanism among

the members of a design team. so that this can help avoid incorrect assumptions later. Accumulated knowledge in the form of design rationales for a set of products can be reused to transfer what has worked in one situation to another situation which has similar needs. The process of deliberation can be assisted by the design rationale technique.

#### Design Rules

Rules a designer can follow in order to increase the usability of the eventual software product. different types of design rules.

#### Principles

#### Standards

#### Guidelines

Abstract principles offer a way of understanding usability.

Design rules in the form of standards and guidelines provide direction for design, in both general and more concrete terms, in order to enhance the interactive properties of the system. The essential characteristics of good design are often summarized through 'golden rules' or heuristics. Design patterns provide a potentially generative approach to capturing and reusing design knowledge.

### **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.

- **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, et. 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.

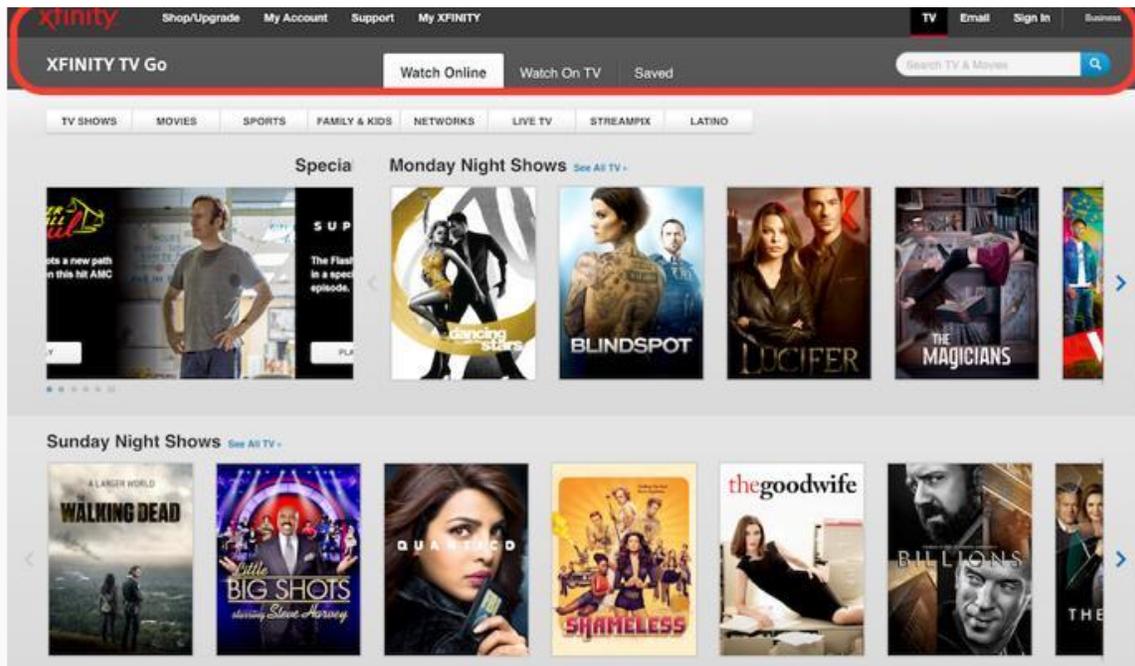
- **Active document-based** - the DR is pre-generated and stored in the system. In these systems, the designer creates the design and the DR system generates the rationale for it based on the system's stored knowledge. For each decision made, the system compares the decision made by the user with the 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:

Bad website:



Author/Copyright holder: Comcast Corporation.  
Copyright terms and licence: Fair Use.

**Explanation:** This is the My Xfinity page of the Xfinity website. All three pages examined above have very different colors, layout, and font-styles in their navigation menu. These differences make it confusing and disorienting for the user as it no longer feels like one website, as if they are three different companies.

**URL:** <https://login.xfinity.com/login>

**Good website:**



The screenshot shows the BBC News website interface. At the top, there is a navigation bar with the BBC logo, a 'Sign in' button, and links for 'Home' and 'Menu'. Below this is a prominent red 'NEWS' banner. Underneath the banner is a secondary navigation menu with links for 'Home', 'Coronavirus', 'Video', 'World', 'Asia', 'UK', 'Business', 'Tech', 'Science', 'Stories', and 'Entertainment & Arts'. The main content area features a breadcrumb trail for 'Coronavirus pandemic' and 'Your Coronavirus Stories'. A large image shows a person in a blue jacket and a light blue surgical mask working with a green gas cylinder and various gauges. Below the image is the headline 'How Peru locked down early but got badly hit' and a sub-headline 'Peru has one of the highest case totals and excess death rates in the world - but why?'. To the right of the main article is a sidebar with a 'BBC' logo and a play button icon, followed by a section titled 'Where are cases still rising?' with a brief description and a '2h | World' timestamp. Further down the sidebar, another 'BBC' logo is visible.

**Explanation:** Consistency limits the number of ways actions and operations are represented, ensuring that users do not have to learn new representations for each task. Further, establishing design norms like following platform conventions allow users to complete new tasks without having to learn a whole new toolset. In their website, not only is the secondary menu inconsistent almost every time the user clicks into another page, but it is also inconsistent for the primary menu as well.

**URL:** <https://www.bbc.com/news/coronavirus>

## Question 5:

**Write the Shneiderman's 8 Golden Rules.**

### **Answer: Shneiderman's "Eight Golden Rules of Interface Design"**

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 dialogs 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:**

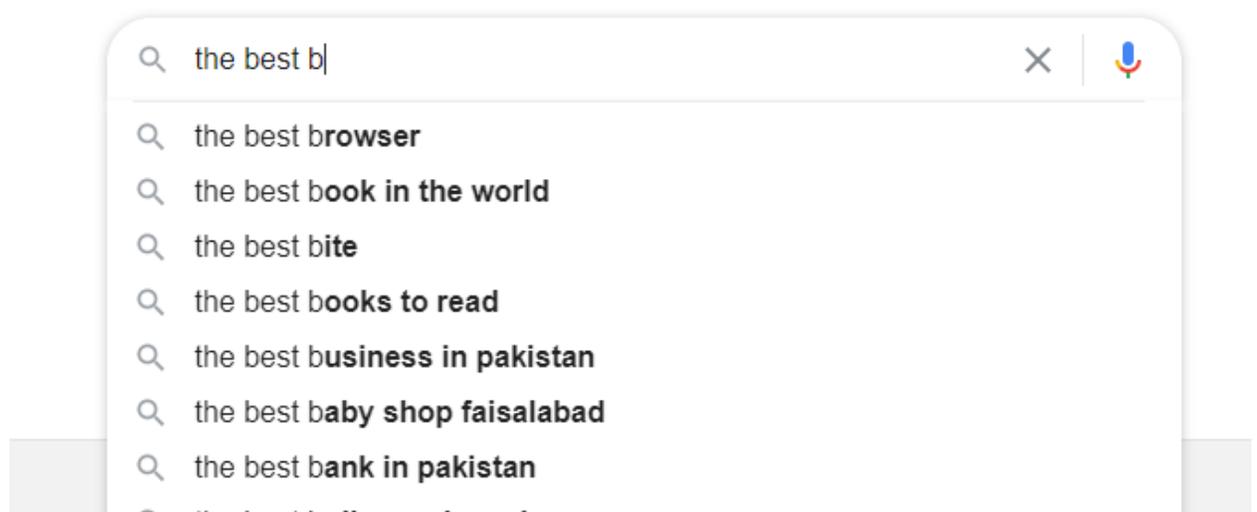
**Answer:**

**Five Usability goals of internet explorer:**

1. **Learnability:** the ease with which new users can begin effective interaction and achieve maximal performance.

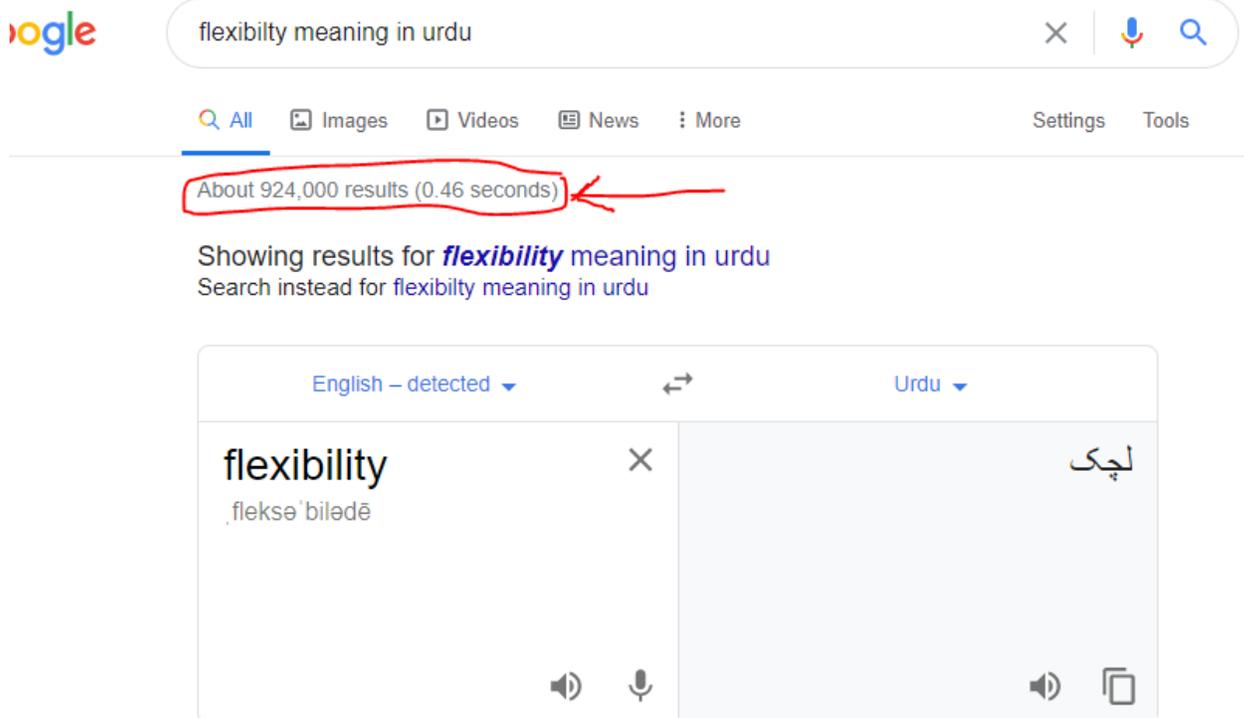
**Example:** if a search a thing in internet explorer and my quarries are then internet learn the quarries and give the predication quarries so it is very easy for the user to search a things without any problem.

**Figure is below:**



2. **Flexibility:** the multiplicity of ways the internet give information to user in Millions of result in milli seconds.

Example:



## Usability and accessibility

Internet Explorer makes use of the accessibility framework provided in Windows. Internet Explorer is also a user interface for FTP, with operations similar to that of Windows Explorer. [Pop-up blocking](#) and [tabbed browsing](#) were added respectively in Internet Explorer 6 and Internet Explorer 7. Tabbed browsing can also be added to older versions by installing [MSN Search Toolbar](#) or [Yahoo Toolbar](#).

## 3.Cache

Internet Explorer caches visited content in the [Temporary Internet Files](#) folder to allow quicker access (or offline access) to previously visited pages. The content is indexed in a database file, known as [Index.dat](#). Multiple Index.dat files exist which index different content—visited content, [web feeds](#), visited [URLs](#), cookies, etc.

Prior to IE7, clearing the cache used to clear the index but the files themselves were not reliably removed, posing a potential security and privacy risk. In IE7 and later, when the cache is cleared, the cache files are more reliably removed, and the index.dat file is overwritten with null bytes.

Caching has been improved in IE9.

## Credibility:

Web search engines apply a variety of ranking signals to achieve user satisfaction, i.e., results pages that provide the best-possible results to the user. While these ranking signals implicitly consider credibility (e.g., by measuring popularity), explicit measures of credibility are not applied. In this chapter, credibility in Web search engines is discussed in a broad context: credibility as a measure for including documents in a search engine's index, credibility as a ranking signal, credibility in the context of universal search results, and the possibility of using credibility as an explicit measure for ranking purposes. It is found that while search engines—at least to a certain extent—show credible results to their users, there is no fully integrated credibility framework for Web search engines.

**Error Tolerance**—It supports a range of user actions and only shows an error in genuine erroneous situations. You achieve this by finding out the number, type and severity of common errors users make, as well as how easily users can recover from those errors.

**Example-** The server rarely gives any errors and only after the user types anything wrong and gives suggestions to the user so that he/she can continue their work.

## Compatible:

It is highly compatible with all versions of the most popular OS, [Microsoft Windows](#) and it exists in Windows by default.

**Security:** Internet Explorer uses a zone-based [security](#) framework that groups sites based on certain conditions, including whether it is an Internet- or intranet-based site as well as a user-editable whitelist. Security restrictions are applied per zone; all the sites in a zone are subject to the restrictions.

Internet Explorer 6 SP2 onwards uses the *Attachment Execution Service* of Microsoft Windows to mark executable files downloaded from the Internet as being potentially unsafe. Accessing files marked as such will prompt the user to make an explicit trust decision to execute the file, as executables originating from the Internet can be potentially unsafe. This helps in preventing accidental installation of malware.