

Programme Name: \_\_\_\_\_\_\_\_**BCS HONS**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Course Code: \_\_**CSC 2201**\_\_\_\_\_\_\_

Course Name: \_\_\_\_\_\_\_\_**Human Computer Interaction**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Open Book Examination**

Date of Submission: \_\_\_\_\_\_**3/8/2021**\_\_\_\_\_\_\_\_\_\_\_\_

**Submitted By: Submitted To:**

Student Name**: Dipesh Tha Shrestha** Faculty Name**: AKASH DEO**

IUKL ID: **041902900028** Department**: LMS**

Semester**: Third Semester**

Intake**: September 2019**

1. **With the change in hardware design the interface of system also change. Describe this phenomenon with suitable example designing a system you propose showing the different steps of changes in hardware and software interface.**

**Answer**: A hardware interface specifies the plugs, sockets, cables and electrical signals that pass through each line between the CPU and a peripheral device or communications network. Hardware design is instructive to examine the abstractions that have worked for hardware, such as synchronous design.

Changes to the software and hardware are inevitable throughout the life cycle to fix discrepancy reports and improve system testing and maturity. As these changes occur it is imperative that a process is documented for incorporating necessary changes for hardware and software into the computer system architecture with minimal impact to the safe operation. A flow chart shall be developed to document the development process steps to be followed for all potential areas of change, and this process shall tie to established development, test, and regression test processes.

Software in many cases is changed to mask a resultant output or hardware problem instead of actually fixing the true problem. In many hardware related cases, a software fix is the most economical and time effective means of correcting the deficiency, but this must be thoroughly analyzed to ensure a safe solution. The effect that the software change has to safety critical function threads must also be identified and analyzed. Plan to analyze the change for impact to rate changes, system transients, mechanization flow, hardware and interface compatibility, software modules, and other associated effects.

As with the hardware selection process, the hardware change process should utilize mature, reliable components. It is not recommended that state-of-the-art design be pushed. Performance requirements for the system must not be compromised. Once developed, the changed hardware shall be treated as a new development, and as such, fully re-qualified at the system, platform, and software (operating system and application software) levels. The impact of Diminishing Manufacturing Sources (DMS) must also be considered when re-developing the hardware. The process shall also determine the regression testing process for the areas change

With the change in hardware design the interface of system also change and this may be some phenomenon of the change in hardware

* Visual Based: For example, if we change the hardware like monitor visual output of the system will be change.
* Audio Based: The audio based interaction between a computer and a human is another important area of in HCI systems. This area deals with information acquired by different audio signals. If the microphone or speaker of the pc is change its also change the interaction between human and the computer.
* Task environment: The conditions and goals set upon the user. Change in environment also change the interaction.
* Machine environment: The environment that the computer is connected to, e.g. a laptop in a college student’s dorm room. If we don’t create a good environment for the pc it wont responed as we wanted.
* Input flow: The flow of information that begins in the task environment, when the user has some task that requires using their computer.
* Output: The flow of information that originates in the machine environment.

1. **You were asked to conduct a heuristic assessment of its usability by the development manager of a website for online book-buying. The three heuristics described below were explicitly proposed by him.**

**A. "On each page, there should be between five and nine navigation options."**

**B. "A good match between the navigation buttons and the goals of the users should be there."**

**C. "Changing their plans should be easy for users.**

**Questions:**

1. **Did the manager misinterpret the heuristic assessment? Justify your response briefly**

**Answer:** No, The Manager did not misinterpret the heuristic assessment because now a day in every website there is more than 5 navigation option. As for book buying website, there sure will be more navigation. For example, 1 user select then book, he may buy it or may recommend it or put in bookmark and other. So the manager did not misinterpret the heuristic assessment.

1. **Please elaborate on the three heuristics proposed by the manager above. Your comments should contain the following for each of the suggested heuristics:**
2. **some theoretical rationale for this heuristic (or against it);**

**answer**: Some theoretical rationale for this heuristic is that this website will be easy to used due to easy navigation. Without navigation, websites can appear unstructured and organized. It will be difficult to used website without proper navigation. The navigation bar or tools is a clear indication that your website is filled with knowledge and depth.so its important to have navigation in the website. With proper navigation, People have a clear indication of what is on offer and what they can find and expect from the website. They are also encouraged to explore more, if they are able to clearly see the navigation bars and links. Navigation tools help to break up the website into categories and groups in a logical and understandable group. Navigation is important because your readers don’t want to figure out how your website works. Good navigation can speed up the viewer’s search. Navigation on a website is mainly used so that the visitors have a good idea of what the website is about, without venturing around the whole website. Navigation should be simple to understand, which will generally mean that the viewers will stay longer and will return because it is a pleasure to use. Good navigation will allow visitors to search your site for longer, giving them confidence in where they are and what they can receive from your website. Navigation allows visitors to search with ease. Good navigation can place websites highly on search engines. Navigation is necessary in ensuring that your website is accessible and usable. Good navigation works well with SEO, in that it enables the Search Engine Spiders to properly crawl sites and index them. It will also improve web usability. This means that if the website is not accessible by a link, it will not be found, by search engines.

So, above this are the theoretical rationale for this heuristic.

1. **any additional assessment measures that may be needed to enforce it;**

**Answer:** Advertisement, Social Networks and Mobile friendly should be added in this heuristics. Adding Social Networks like Facebook and Instagram make it easy for your readers to share the content that they like to the social media platform of their choice by adding social share buttons to all of your content. This eliminates the need for them to copy the link to your content and paste it into their social media page. Instead, they can instantly share with just a click of a button. Not only does it make sharing easier for them, it will help increase exposure of your content, thereby bringing in more traffic and potentially more leads. If reaching a mass or targeted audience happens to be your goal, Banner Advertisements are an excellent option. To proceed, you need to shortlist portals and request quotations from them. You also need to gather information from them about the demographics which visit their portals. Based on your objective, you can run a banner advertisement campaign. I would suggest running a 1 day to 7-day campaign to assess the ROI before investing in big campaigns. Other Digital Media Platforms that can be covered are Mobile Marketing, Affiliate Marketing, etc. As a Digital Marketing Consultant, we can help you strategies, execute and control your digital advertising plans as per your budget. Mobile-friendliness is more important than ever — especially because 74% of users are more likely to return to a website with a mobile version. When you optimize your website to be mobile-friendly, it means that every user, no matter what device they’re using, will have the same great experience on your website. This makes your website more trustworthy and helps you increase sales since users shopping on mobile will stay on your site.

So above thing such as social network, mobile friendly and advertisement should be added in this heuristics.

1. the possible effect on device design of such assessment.

Answer: The possible effect on device design of this assessment is it will be easy to used because of clear and understandable navigation.

**Section B**

1. **You have been given responsibility for developing the user interface of a new edition of the web facility of the Nepal government that taxpayers use to make their online income tax returns.**
2. **You suspect that the online tax return is used in a variety of very distinct forms by various taxpayers. How could you investigate this, and how could you communicate to the development team your findings?**

**Answer:** A tax return is a form or forms filed with a tax authority that reports income, expenses, and other pertinent tax information. Tax returns allow taxpayers to calculate their tax liability, schedule tax payments, or request refunds for the overpayment of taxes. We will communicate to the development team by making plans and goals. Converting your research papers or reports into more easily digestible summaries, podcasts, articles and so on, is becoming more widely regarded as an important factor in creating impact.

1. **An analysis of the data logs of the system reveals two surprising activity trends. Some users enter various values repeatedly and then adjust them, seemingly checking out the results. Long delays between entering and piece of data are used in the other trend, with the same users accessing support and documentation pages overlapping with pages of data entry.**
2. **How do you account for any of these pattern?**

**Answer**: you must discover how to recognize patterns within your environment, within information clusters and within problems. Secondly, you must proactively combine the data you have acquired into visual patterns that help you identify critical solutions — leading you to breakthrough thinking, ideas and innovation.

1. **In order to enhance the usability of the system for these two user groups, what usability review procedures would you perform?**

**Answer:** In order to enhance the usability of the system for these two user groups, we should do the following

* Interviews and surveys of end-user requirements

Used to understand what top concerns and unmet needs customers, target users, and organizational stakeholders would like addressed. When you begin to work in a new domain area, it is critical that you start with end-user interviews and surveys in order to gain firsthand knowledge of the major issues and opportunities from users in their own voices. Typically, these surveys involve a fairly large sample—perhaps 30 to 100 participants. Ideally, you begin with a larger survey group and follow up with in-depth interviews of a smaller group of end users and other key stakeholders (e.g., decision makers who will not necessarily use the system). Identification and refinement of the end-user profile occur as part of this work.

* Focus groups

Used to understand and identify at a high level area in which there are customer, target user, and other stakeholder concerns and unmet needs. Focus groups can augment surveys. An independent facilitator guides group discussions with samples of end users and probes issues in the domain area in greater depth than surveys are generally able to do. If resources are available, you might use focus groups before you conduct individual interviews.

* Field studies of end-user work context

Used to understand and observe how current technology and business practices are being employed by users to accomplish their goals today. Find out what’s working and what’s not. Depending on your resources, expertise, and time available, you might conduct limited field studies to complement and validate the information gained from the preceding methods, or you might use a large sample of field studies to gain all of your information and forego the preceding steps.

* Task analysis

Used to understand the core and infrequent tasks that users need or would like to complete to accomplish their goals. These tasks will be identified during interviews, focus groups, and field studies of end-user work context. The experts gathering the information will probe to gain the context and relative importance of the items in the set of tasks. Also, end users will provide information to help set the usability objectives of the system (see the description of deliverables later in this section).

1. **As a result, what changes could be encountered by each class?**

**Answer**: Smooth Communication, Team work can be encountered by each class. A teamwork environment promotes an atmosphere that fosters friendship and loyalty. These close-knit relationships motivate employees in parallel and align them to work harder, cooperate and be supportive of one another. Individuals possess diverse talents, weaknesses, communication skills, strengths, and habits. Therefore, when a teamwork environment is not encouraged this can pose many challenges towards achieving the overall goals and objectives. This creates an environment where employees become focused on promoting their own achievements and competing against their fellow colleagues. Ultimately, this can lead to an unhealthy and inefficient working environment. When teamwork is working the whole team would be motivated and working toward the same goal in harmony. Communication of every staff is good in this class after the change.

1. **After the project has started, it is agreed that two more groups of users should also be served by the new design: those who do not want to make a tax return electronically, but just need to find out what paper documents to submit, and tax office workers who need to use the system to check the tax returns of people when the taxpayer receives a telephone enquiry. When customizing the user interface for these types of users, what usability review techniques could you use, and what changes could they experience as a result?**

**Answer:** “Usability” refers to the ease of access and/or use of a product or website. It’s a sub-discipline of user experience design. Although user experience design (UX Design) and usability were once used interchangeably, we must now understand that usability provides an important contribution to UX; however, it’s not the whole of the experience. We can accurately measure usability.

Interface elements include but are not limited to:

* Input Controls: buttons, text fields, checkboxes, radio buttons, dropdown lists, list boxes, toggles, date field
* Navigational Components: breadcrumb, slider, search field, pagination, slider, tags, icons
* Informational Components: tooltips, icons, progress bar, notifications, message boxes, modal windows
* Containers: accordion

A design is not usable or unusable per se; its features, together with the user, what the user wants to do with it, and the user’s environment in performing tasks, determine its level of usability. A usable interface has three main outcomes:

It should be easy for the user to become familiar with and competent in using the user interface on the first contact with the website. If we take a travel agent’s website that a designer has made well, the user should be able to move through the sequence of actions to book a ticket quickly.It should be easy for users to achieve their objective through using the website. If a user has the goal of booking a flight, a good design will guide him/her through the easiest process to purchase that ticket.It should be easy to recall the user interface and how to use it on subsequent visits. So, a good design on the travel agent’s site means the user should learn from the first time and book a second ticket just as easily.

This isn’t the only set of requirements for usability. For example, a usable interface will be relatively error-free when used.

We can measure usability throughout the development process, from wireframes to prototypes to the final deliverable. Testing can be done with paper and pencil but also remotely when we have higher-fidelity prototypes.

It’s important to analyze the users’ performance and concerns with a web design as early as possible. From there, we can apply a set of guidelines with a grain of salt; because they tend to be general, we need to adapt them to our specific area. Guidelines show a product’s features proven to improve usability. We can fine-tune design revisions according to these guidelines, as long as we look at all the dimensions. Sometimes, it might just involve tweaking a menu layout; or, it might involve looking much higher

**2.**

**a. Compare the costs and benefits of the quantitative techniques**.

Answer: Quantitative techniques involves information that deals with quantities and numbers. That is different from the qualitative approach, which is known for observation and description. You can measure quantitative results, but you cannot do so for the qualitative work. It is used widely in psychology, sociology, and marketing as a way to provide evidence that a hypothesis is correct. Instead of relying on instinct or opinion, this method of research seeks out facts before suggesting an outcome. That is why the research gets closely affiliated with the scientific method.

the costs and benefits of the quantitative techniques are:

* Basis for scientific analysis– With the increase in complexities of modern business it is not possible to rely on the unscientific decisions based on the intuitions. This provides the scientific methods for tackling various problems for modern business.
* Tools for scientific analysis– Quantitative techniques provide the managers with a variety of tools from mathematics, statistics, economics and operational research. These tools help the manager to provide a more precise description and solution of the problem. The solutions obtained by using quantitative techniques are often free from the bias of the manager or the owner of the business.
* Solution for various business problems. Quantitative techniques provide solutions to almost every area of a business. These can be used in production, marketing, inventory, finance and other areas to find answers to various question like (a) how the resources should be used in production so that profits are maximized. (b) How should the production be matched to demand so as to minimize the cost of inventory?
* Optimum allocation of resources- An allocation of resources is said to be optional if either a given level of output is being produced at minimum cost or maximum output is being produced at a given cost. A quantitative technique enables a manager to optimally allocate the resources of a business or industry.
* Selection of an optimal strategy– Using quantitative techniques it is possible to determine the optimal strategy of a business or firm that is facing competition from its rivals. The techniques for determining the optimal strategy is dependent upon game theory.
* Optimal deployment of resources-  Using quantitative technique It is possible to find out the earliest and latest time for successful completion of project and this is called program evaluation and review technique.
* Facilitate the process of decision making- quantitative techniques provide a method of decision making in the face of uncertainty. These techniques are based upon decision theory.

b. **Compare the costs and benefits of the qualitative techniques**

Answer: Qualitative techniques is the process of collecting, analyzing, and interpreting non-numerical data, such as language. Qualitative research can be used to understand how an individual subjectively perceives and gives meaning to their social realit. Qualitative techniques is multimethod in focus, involving an interpretive, naturalistic approach to its subject matter. This means that qualitative researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them.

the costs and benefits of the qualitative techniques are:

* Flexibility

The data collection and analysis process can be adapted as new ideas or patterns emerge. They are not rigidly decided beforehand.

* Natural settings

Data collection occurs in real-world contexts or in naturalistic ways.

* Meaningful insights

Detailed descriptions of people’s experiences, feelings and perceptions can be used in designing, testing or improving systems or products.

* Generation of new ideas

Open-ended responses mean that researchers can uncover novel problems or opportunities that they wouldn’t have thought of otherwise.

1. **If restricted to a single one of these techniques when designing a new online banking system, which would you choose and why**?

Answer: I will use quantitative techniques while designing a new online banking system. Quantitative techniques provide the managers with a variety of tools from mathematics, statistics, economics and operational research. These tools help the manager to provide a more precise description and solution of the problem. The solutions obtained by using quantitative techniques are often free from the bias of the manager or the owner of the business. Quantitative techniques provide solutions to almost every area of a business. These can be used in production, marketing, inventory, finance and other areas to find answers to various question. Using quantitative techniques, it is possible to determine the optimal strategy of a business or firm that is facing competition from its rivals. The techniques for determining the optimal strategy is dependent upon game theory. Using quantitative technique, It is possible to find out the earliest and latest time for successful completion of project and this is called program evaluation and review technique. As we know, Quantitative technique is the process of collecting and analyzing numerical data. It can be used to find patterns and averages, make predictions, test causal relationships, and generalize results to wider populations.

So, I will use quantitative techniques while designing a new online banking system because Quantitative techniques provide the managers with a variety of tools from mathematics, statistics, economics and operational research. These tools help the manager to provide a more precise description and solution of the problem.