HUMAN COMPUTER INTERACTION
ASSIGNMENT 1

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SUBMISSION DATE:

17th February 2018

DESIGN RULES

Norman's Seven Principles

1. Use both knowledge in the world and knowledge in the head

Systems should provide the necessary knowledge within the environment and their operation should be transparent to support the user in building an appropriate mental model of what is going on.

The site has lot of general features like Login, sign up and Message (Feedback) sending. The site is specific in terms of the targeted audience i.e students and the course content. This is how it uses knowledge in the world and that in the head.

2. Simplify the structure of tasks

One is to provide mental aids to help the user keep track of stages in a more complex task. Another is to use technology to provide the user with more information about the task and better feedback. A third approach is to automate the task or part of it, as long as this does not detract from the user's experience.

Once the student signs up, it is automatically updated in the database. This simplifies the task of the admin user to keep a track of all students. Also, the material for all subjects are available for students.

3. Make things visible

The interface should make clear what the system can do and how this is achieved, and should enable the user to see clearly the effect of their actions on the system.

There are buttons and menus for respective targeted actions. Graphical User Interface (GUI) has been developed for easy interaction.

4. Get the mappings right

User intentions should map clearly onto system controls. User actions should map clearly onto system events. So it should be clear what does what and by how much. Controls, sliders and dials should reflect the task –so a small movement has a small effect and a large movement a large effect.

All the buttons and actions are clearly stated. For example, to sign up for the site, there is a button which says "Sign Up". Everything is self-explanatory. Mapping done from the real world to the website is correct and easy to understand.

5. **Exploit the power of constraints**

Exploit the power of constraints, both natural and artificial. Constraints are things in the world that make it impossible to do anything but the correct action in the correct way.

The login requires the user to enter the password twice and hence ensures that both are validated as actual and same passwords.

6. **Design for error**

To err is human, so anticipate the errors the user could make and design recovery into the system.

It displays an error message saying incorrect password when the user enters the wrong password. It also offers the user an ability to undo the error by asking the user to try logging in again.

7. **When all else fails, standardize**

If there are no natural mappings, then arbitrary mappings should be standardized so that users only have to learn them once.

Even the interface might change but the basic functionality remains unchanged and easy to understand. Login, Signup etc- everything is standardized.

Shneiderman's Eight Golden Rules of Interface Design

1**. Strive for consistency** in action sequences, layout, terminology, command use and so on.

The site involves standard interface that ensures users are able to apply knowledge from one click of button to another, without the need to learn new representations for same actions. The site utilizes use of familiar icons, colours and menu hierarchy.

2. **Enable frequent users to use shortcuts**

Enable frequent users to use shortcuts such as abbreviations, special key sequences and macros, to perform regular, familiar actions more quickly.

The user can utilize the shortcuts like Ctrl-Z for undo, Ctrl-C for copying etc. User becomes more experienced, they operate the interface more quickly and effortlessly.

3. Offer informative feedback

Feedback is provided for every user action, at a level appropriate to the magnitude of the action.

Proper understandable error messages are displayed when errors are occurred. Human-readable and meaningful messages are displayed instead of error-codes. For example, if the user enters the wrong password while trying to login, it displays an error message which tells the user that the wrong password is entered. The user understands this and tries to correct it.

4. Design dialogs to yield closure

This is done so that the user knows when they have completed a task.

In this software, when the user enters some message which has to be sent to the admin, the software displays a "Success" message to show that his message has been sent.

5. Offer error prevention and simple error handling

This is done so that, ideally, users are prevented from making mistakes and, if they do, they are offered clear and informative instructions to enable them to recover.

Certain text fields have been flagged, so even if the users forget to feed the input, the web page won't load further. In case of unavoidable errors like entering of wrong passwords, the user is guided by intuitive instruction to enter the password again and proceed.

6. Permit easy reversal of actions

This is done in order to relieve anxiety and encourage exploration, since the user knows that he can always return to the previous state.

It allows the user for reversal of actions. The user is relieved as the reversal of errors is possible whenever the user realizes. This can be done by sending a message in the "Contact us" section.

7. Support internal locus of control

This is done so that the user is in control of the system, which responds to his actions.

The interface allows the users to be the initiators of the action. The user has the freedom to choose the courses whose material he wants to view. He need not view all materials together.

8. Reduce short-term memory load

This is done by keeping displays simple, consolidating multiple page displays and providing time for learning action sequences.

It chooses recognition over recall. For example: In order to navigate from details on one course to another, the user is providing the menu bar that displays the name of the courses offered and undertaken by the user. The interface is simple and easily understandable.

Nielsen's Rules

1. **Visibility of System Status**

The system should always keep users informed about what is going on, through appropriate feedback within reasonable time.

In this software, when the admin is creating a new course or uploading a pdf or a video for any of the courses, he can see the percentage of upload complete at each moment. Depending on internet speed, this load time varies for many users. There is no way for the user to know if he needs to wait or continue to the next page. This principle states that the user should know what's going on inside the system.

2. **Match between System and Real World**

The system should speak the users' language, with words, phrases and concepts familiar to the user, rather than system-oriented terms. Follow real-world conventions, making information appear in a natural and logical order.

The software uses the English language which is the most spoken and used language universally. Also, it does not use technical terms but uses everyday language which is easily understood by the user. For example, "Sign In", "Sign Up", "Start Course" and so on.

3**. User Control and Freedom**

Users often choose system functions by mistake and will need a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue. Support undo and redo.

The user has the freedom to choose whatever course he wants to, hence the courses he is not interested in, he need not opt for. Also, if the user enrolls for a course by mistake, he can ask the Admin to remove him from the course. Also, there is no specified time limit for any course. The user can complete it according to his pace.

4. **Consistency and standards**

Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions.

In the software, the same language has been used throughout the site. Also, the layout of the pages is consistent and similar.

5. Error prevention

Even better than good error messages is a careful design which prevents a problem from occurring in the first place. Either eliminate error-prone conditions or check for them and present users with a confirmation option before they commit to the action.

The users are not permitted to use a password less than 8 characters of length.

6. Recognition rather than recall

Minimize the user's memory load by making objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate.

The instructions, buttons and various options are present in a standard form, the user need not remember various symbols and instructions.

7. Flexibility and efficiency of use

Accelerators unseen by the novice user may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users. Allow users to tailor frequent actions.

Once a user logs in he can opt to save his password and username, for faster access in the future.

8. Aesthetic and minimalist design

Dialogues should not contain information which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility.

The software contains only the minimalistic design required to use the website. It does not contain unnecessary complicated features for decorative purposes.

9. Help users recognize, diagnose, and recover from errors

Error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution.

While trying to login if user enters a wrong password, the system detects it and doesn't allow the user to login. The user is then prompted to re-enter the password.

10. Help and documentation

Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. Any such information should be easy to search, focused on the user's task, list concrete steps to be carried out, and not be too large.

The documentation for the tools used is easily available and provided online.

UNIVERSAL DESIGN

Principle one is equitable use

The design is useful to people with a range of abilities and appealing to all. No user is excluded or stigmatized. Wherever possible, access should be the same for all; where identical use is not possible, equivalent use should be supported. Where appropriate, security, privacy and safety provision should be available to all.

Every user has a respective user id and password. The user has the choice to select only the courses that he is interested in.

Principle two is flexibility in use

The design allows for a range of ability and preference, through choice of methods of use and adaptivity to the user's pace, precision and custom.

It provides the users to access the website on mobile as well as on computer.

Principle three is the simplicity

The system be simple and intuitive to use, regardless of the knowledge, experience, language or level of concentration of the user. The design needs to support the user's expectations and accommodate different language and literacy skills. It should not be unnecessarily complex and should be organized to facilitate access to the most important areas. It should provide prompting and feedback as far as possible.

It avoids unnecessary complexity by building easy GUI, it is consistent with user's intuition and expectations. It provides effective prompting and feedback.

Principle four is perceptible information

The design should provide effective communication of information regardless of the environmental conditions or the user's abilities. Redundancy of presentation is important: information should be represented in different forms or modes (e.g. graphic, verbal, text, touch). Essential information should be emphasized and differentiated clearly from the peripheral content. Presentation should support the range of devices and techniques used to access information by people with different sensory abilities.

The essential information like errors pop up and appear in red color that help the user to recognise that he needs to correct and reverse his actions.

Principle five is tolerance for error

Minimizing the impact and damage caused by mistakes or unintended behavior. Potentially dangerous situations should be removed or made hard to reach. Potential hazards should be shielded by warnings. Systems should fail safe from the user's perspective and users should be supported in tasks that require concentration.

An undo feature by standardising the usage on Ctrl-Z allows the user to correct mistakes without penalty. Also the user can drop the course by mailing the admin that he is not interested in continuing it.

Principle six is low physical effort

Systems should be designed to be comfortable to use, minimizing physical effort and fatigue. The physical design of the system should allow the user to maintain a natural posture with reasonable operating effort. Repetitive or sustained actions should be avoided.

Everything is available online so the user does not need to go to the classroom and sit. He can cover the topics that he had missed in classes.

Principle seven requires size and space for approach and use

The placement of the system should be such that it can be reached and used by any user regardless of body size, posture or mobility. Important elements should be on the line of sight for both
seated and standing users. All physical components should be comfortably reachable by seated or standing users. Systems should allow for variation in hand size and provide enough room for assistive devices to be used.

The site is available on the computer and hence can be accessed by everyone anywhere anytime. The site can be accessed via phone too.

COMMUNICATION AND COLLABORATIVE MODEL

These are the ways in which the admin communicates with the user.

Face to Face Communication:

Transfer effects and personal space:

Live-video stream and In-person communication have video conference. A problem occurs when cameras are positioned in different places relative to the monitors, or if the monitors are different sizes. Ideally, both the users ought to be able to adjust the zoom on their camera and vice versa.

Eye contact and gaze:

The professor and the student should maintain proper eye contact during live-video stream and In-person communication. Turn-taking is the process by which the roles of speaker and listener are exchanged.

Text-based Communication:

The text-based communication in groupware systems is acts as a speech substitute, and, thus, there are some problems adapting between the two media.

Discrete – directed message as in email. There is no explicit connection between different messages, except in so far as the text of the message refers to a previous one.

Communication using e-mails:

When the user registers for the course, he receives a mail acknowledging the registration.

If the user wishes to drop the course or give feedback, then he/she can send a mail concerning the same to the admin whose contact details are provided on the website.

Often you cannot know when you send a message what the email culture of the recipient is. It varies between organizations and even between groups and individuals within an organization. The medium itself gives few clues. Many people do not even realize that there are such cultural differences.

The pace of the conversation is the rate of such a sequence of connected messages and replies. Clearly, as the pace of a conversation reduces, there is a tendency for the granularity to increase

More interesting in a cooperative work setting are two coping strategies which increase the chunk size of messages in order to reduce the number of interactions required to complete a task. These strategies are frequently seen in both text-based conferences and in letter writing.

MODELLING RICH INTERACTION

We operate within an ecology of people, physical artefacts and electronic systems, and this rich ecology has recently become more complex as electronic devices invade the workplace and our day to day lives. We need methods to deal with these rich interactions.

1. Status–event analysis is a semi-formal, easy to apply technique that
• classifies phenomena as event or status
• embodies naïve psychology
• highlights feedback problems in interfaces.

2. Aspects of rich environments can be incorporated into methods such as task analysis
• other people
• information requirements
• triggers for tasks
• modelling artefacts
• placeholders in task sequences

3. New sensor-based systems do not require explicit interaction, this means
• new cognitive and interaction models
• new design methods
• new system architectures

1. Status – Event Analysis
Note that the word 'status' is chosen rather than 'state', as the term will be used to refer to any phenomenon with a persistent value. The distinction between status and event is between being and doing. Status–event analysis makes use of fairly naïve psychological knowledge, to predict how particular interface features affect the user.

In this software the status is the different courses available which are static and the event is registering for these courses. Also, when a user hovers over a button, the button gets highlighted which indicates what the user is pointing towards. This is based on Naïve Psychology, i.e, the user can see what he has chosen.

2. Rich Contexts
Formalized methods such as task analysis adopt a systemized, view of the workplace – people working to achieve well-defined goals following regular procedures.

This includes trigger analysis, collaboration, information, artifacts and placeholders. This software has inbuilt triggers. As soon as there is a new sign up, the details of the new user are immediately updated in the database and the user is logged in. Also, if the user enters the wrong credentials for login, immediately a trigger is activated and a message is displayed to the user and the user is prompted to login again. Another trigger is activated when the user registers for a course. The enrollment is updated in the courses database automatically.

HYPERTEXT, MULTIMEDIA and WWW

1. Rich Content by Video:

In a media dominated world, there are strong arguments for using video or audio material as part of hypertext systems whether for education, entertainment or reference. Both audio and video material are expensive and time consuming to produce, but increasingly even home-PC systems include video and audio editing as standard. Rich content has been implemented in the website by including videos for better learning and understanding. Every course has used videos to improve the learning experience.

2. Education and E-learning

Hypertext and hypermedia are used extensively in educational settings, as they allow varied subjects to be related to each other in numerous ways so that the learner can investigate the links between different areas. In contrast to computer-aided learning (CAL) packages, hypermedia allows a student-controlled learning process. The system includes text, videos, photos and so on. The website created uses links to go to different pages with various information. You can navigate and explore the different options easily.

3. Lost in Hyperspace

Although the non-linear structure of hypertext is very powerful, it can also be confusing. It is easy to lose track of where you are, a problem that has been called 'lost in hyperspace'. There are two elements to this feeling of 'lostness'. This problem is solved by providing user friendly interface and the users are given better ways of understanding as to where they are through navigation by hypertext.

4. *Static Web Content*

A static website contains web pages with fixed contents. Each page displays the same information to any user. This website is a static website because each user should be able to view the same courses.

5. Using Graphics

This website uses graphics like images, videos, icons etc. which improves the user experience.