HUMAN COMPUTER INTERACTION : IT351

ASSIGNMENT 1

15th February, 2018

E-Learning Website

Submitted by,

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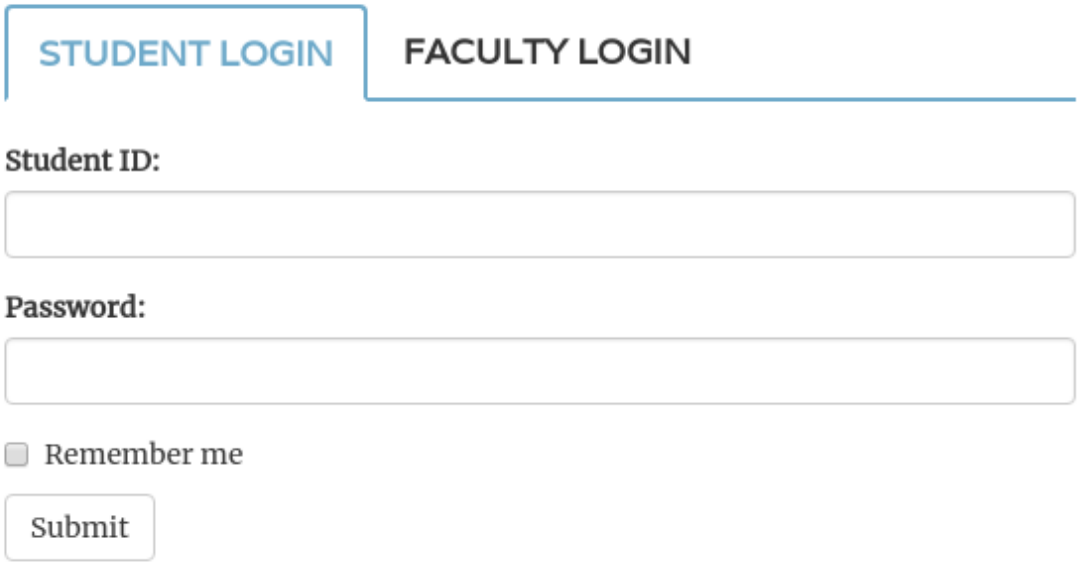
INDEX

Design Rules

Shneiderman's 8 Golden Rules for interface design

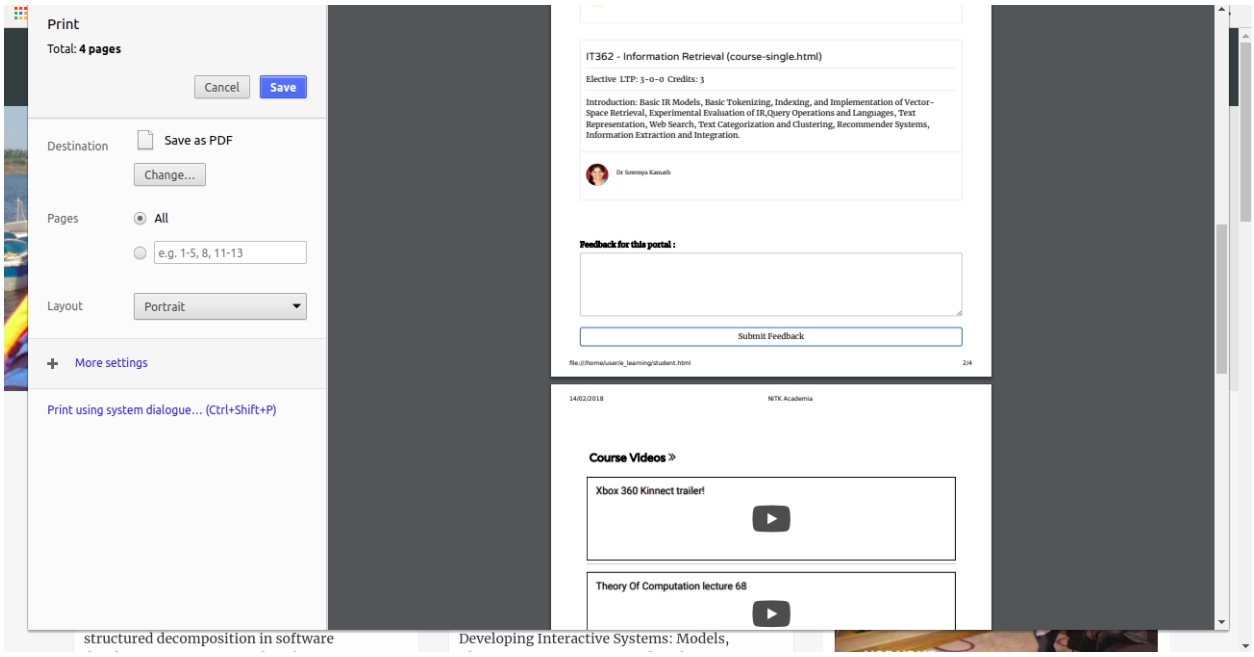
1. Strive for consistency

Consistent sequences of actions are performed in similar situations. When a student logs in, it always leads him to his own portal and not to anyone else's homepage. Such consistency is maintained for faculty login as well.

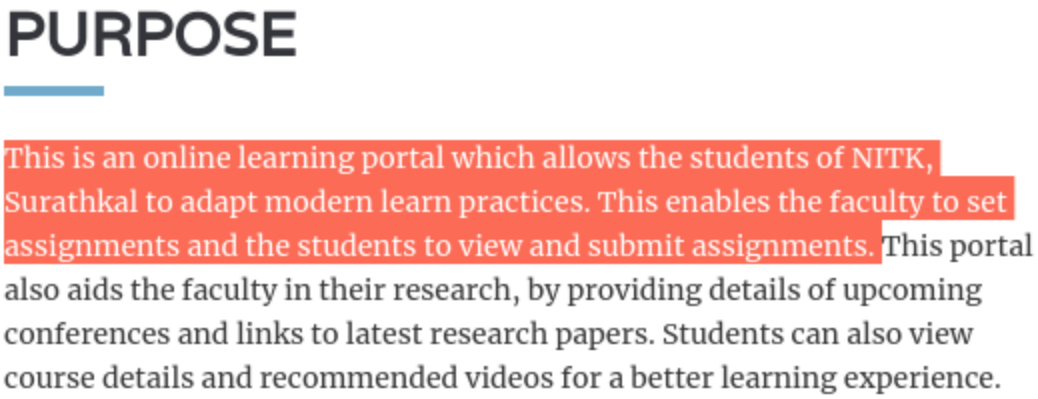


2. Enable frequent users to use shortcuts

Users can use a variety of keyboard shortcuts, such as copy and paste (Ctrl+C and Ctrl+V), and taking screenshots(PrntScr). Shortcuts such as Ctrl+P can be used for printing.



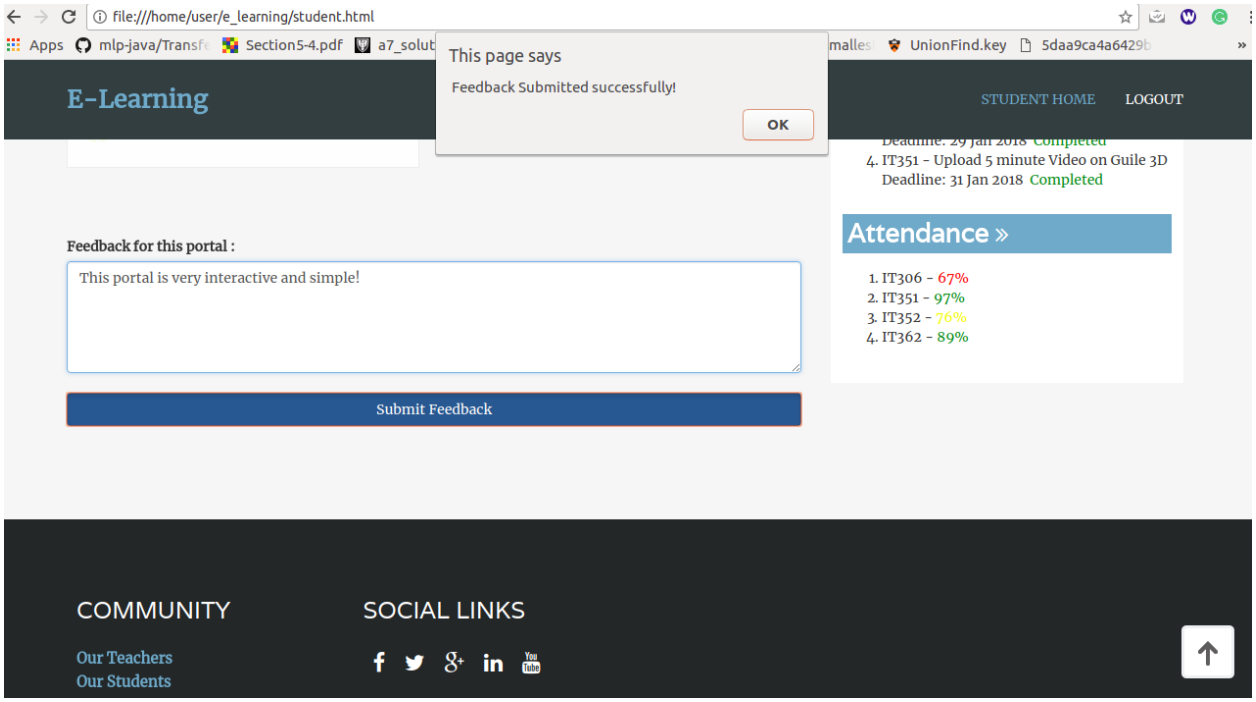
The above is got by using the Ctrl+P shortcut for printing.



The above text selected and the above mentioned shortcut for copying.

3. Offer informative feedback

There is a provision for both faculty and students to provide feedback about the portal. Once they submit their feedback, they get a response from the portal informing them if their feedback is submitted successfully.

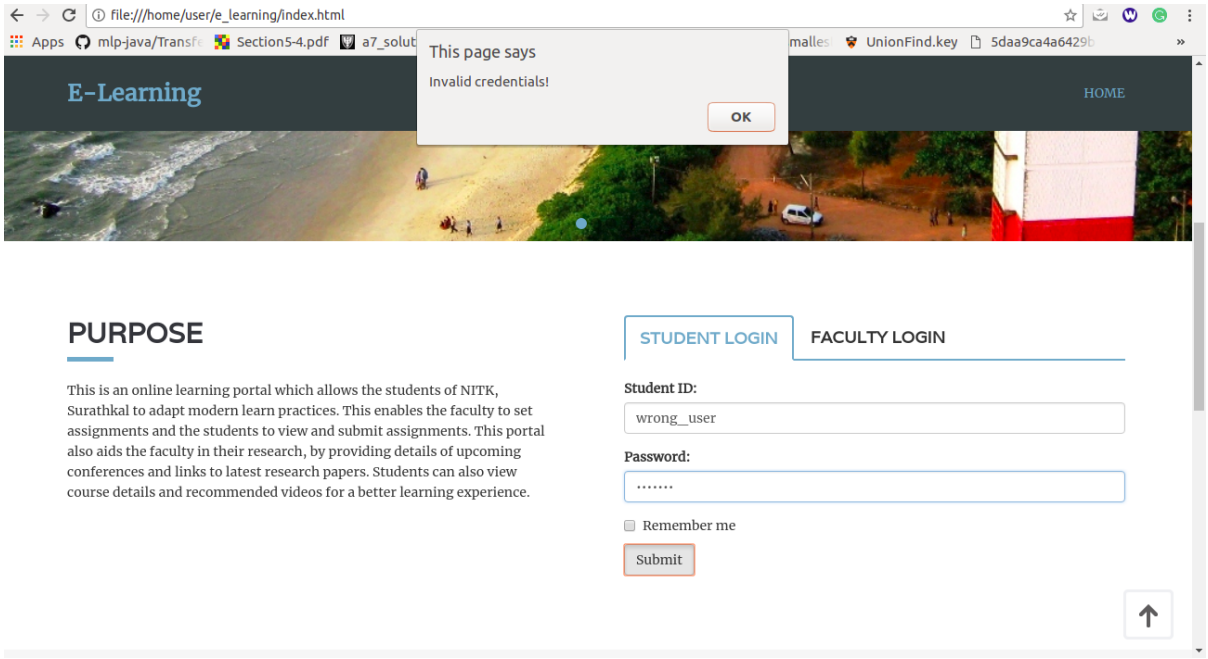


4. Design dialogs to yield closure

Sequences of actions are organized into groups with a beginning, middle, and end. The informative feedback at the completion of a group of actions gives the users 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. The dialog boxes on submitting feedback and on entering invalid login credentials are examples of these.

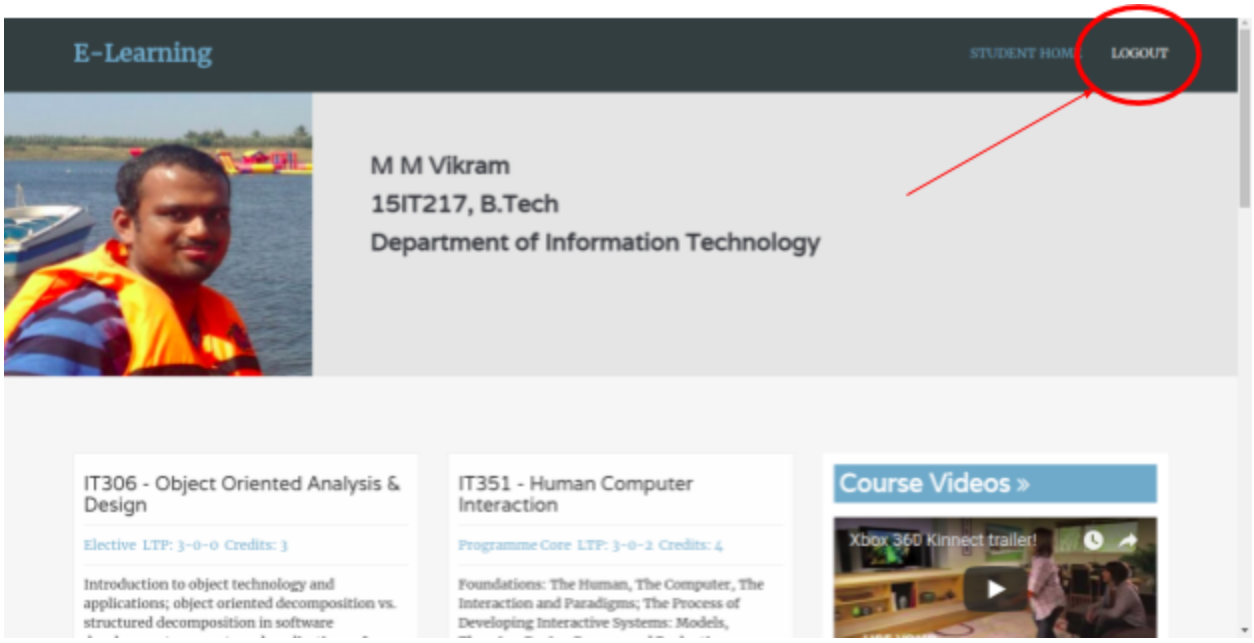
5. Offer error prevention and simple error handling

When logging in, if the wrong credentials are entered, an alert notifies this to the user and ensures that the user cannot proceed further. He will have to enter the correct credentials before he can proceed further.

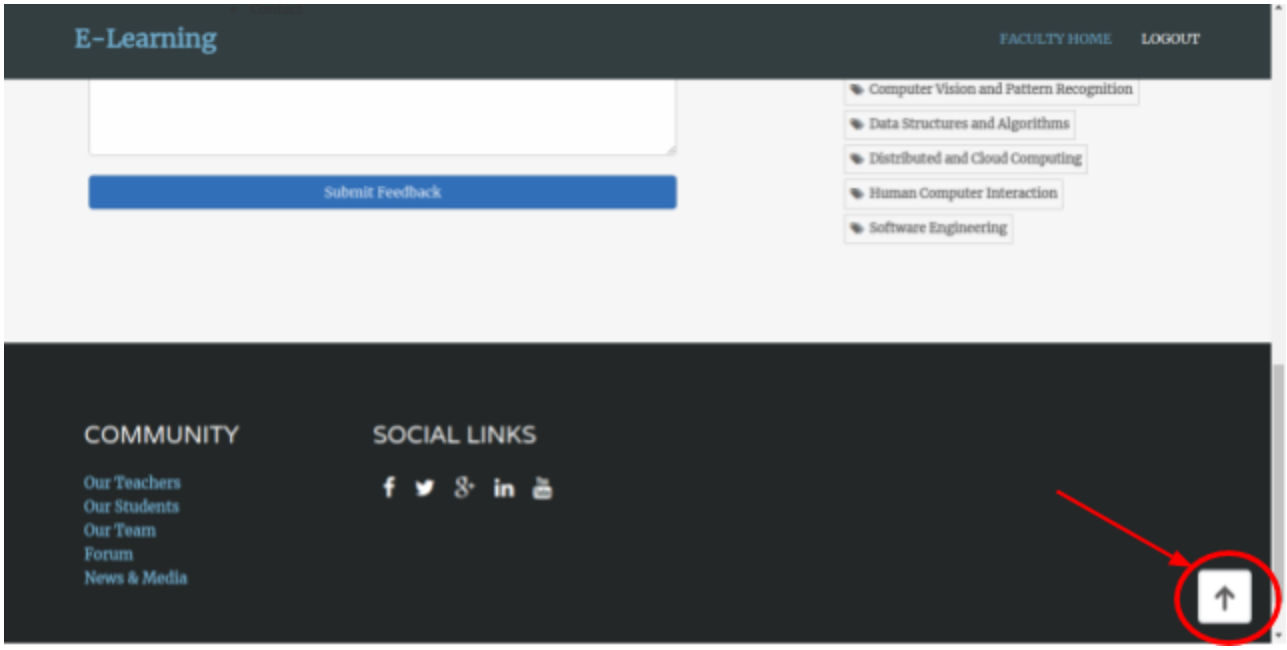


6. Permit easy reversal of actions

The website allows easy navigation from the student portal or the faculty portal to the home page. This can be done by simply pressing the logout button.



As seen above, the logout button will lead to the home page.
There is also an arrow at the bottom of the page, which when clicked will slide to the top of the page.

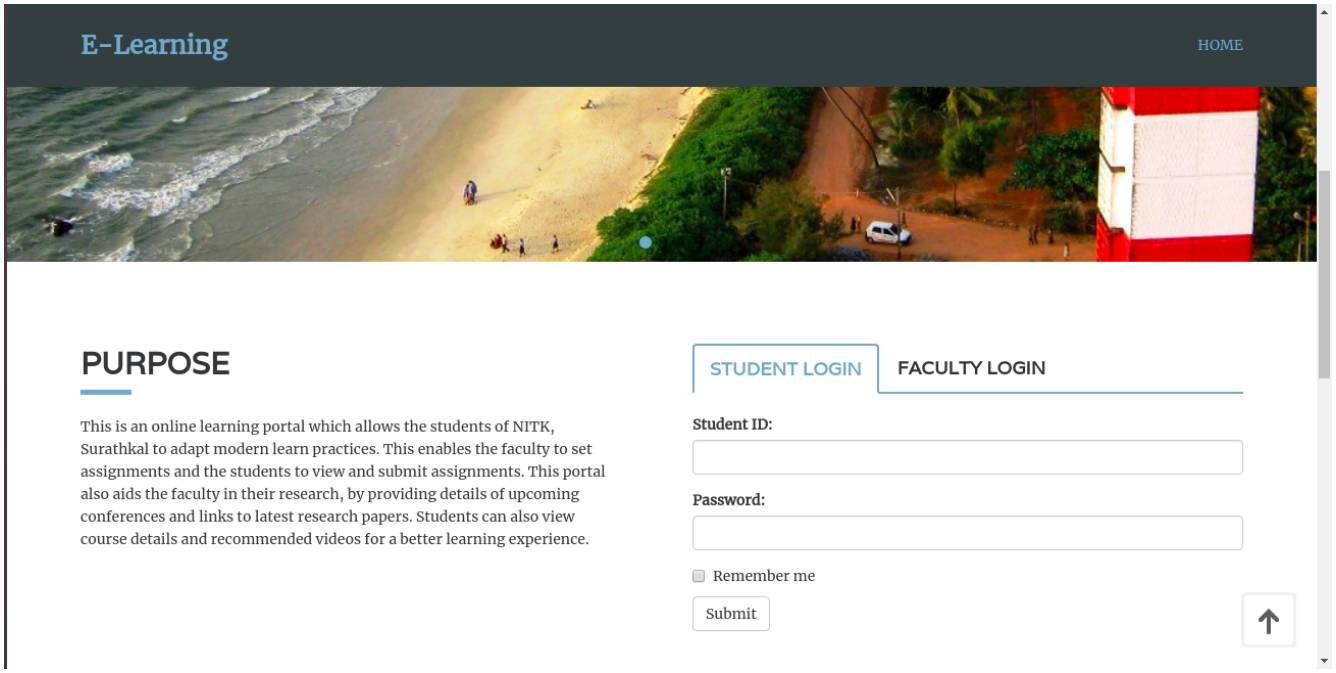


7. Support internal locus of control

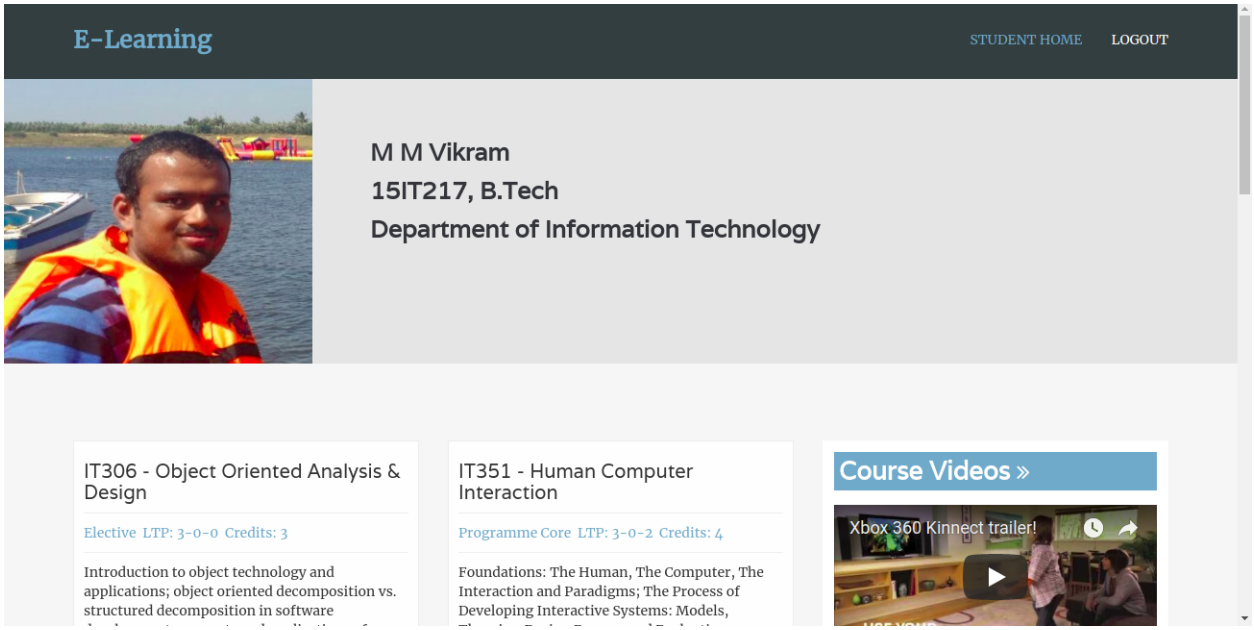
The users (faculty and user) are in the control of system and system responds to the respective actions of the user. Different actions by the user such as logging in, viewing video, marking attendance etc have different responses from the system.The system is designed to make users the initiators of actions rather than the responders.

8. Reduce short-term memory load

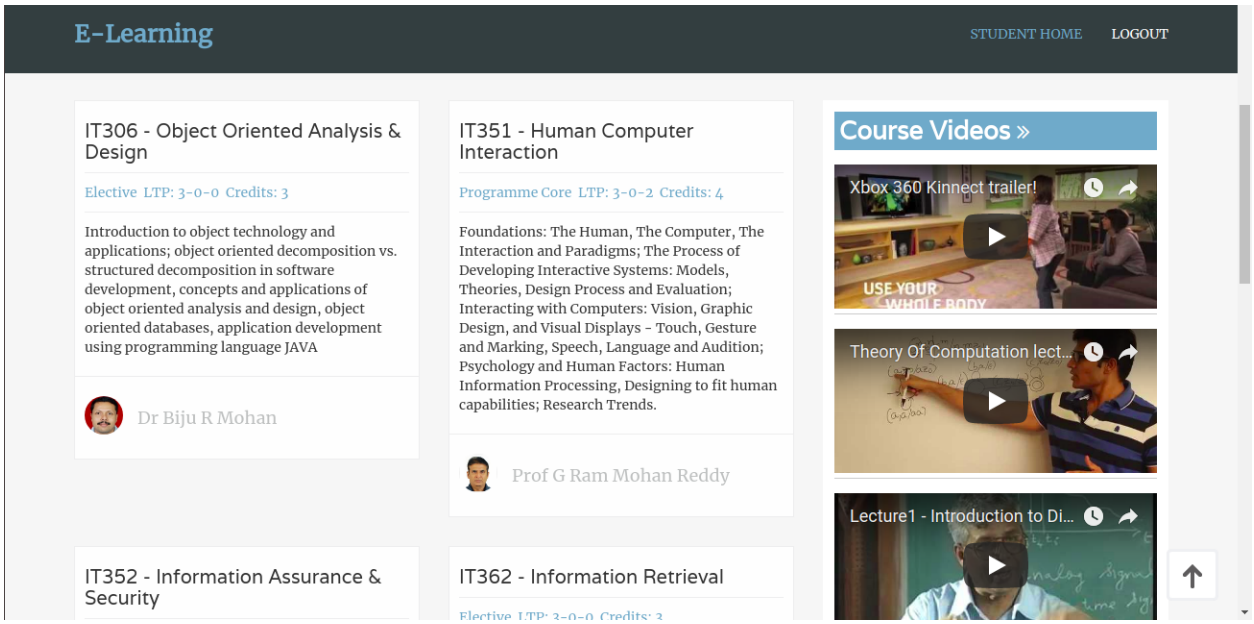
This is be done by keeping display simple and consolidating multiple displays. In student page, details of the courses taken, assignments to be submitted, attendance status and course lectures and materials and feedback provision have all been combined into a single view for the student. While the faculty page consolidates display of time-table for the faculty, setting assignments, marking attendance, details about upcoming conferences and links to the latest research papers along with the feedback provision in a single view. The homepage consolidates the login views for both faculty and students along with other details about the institution and the portal.

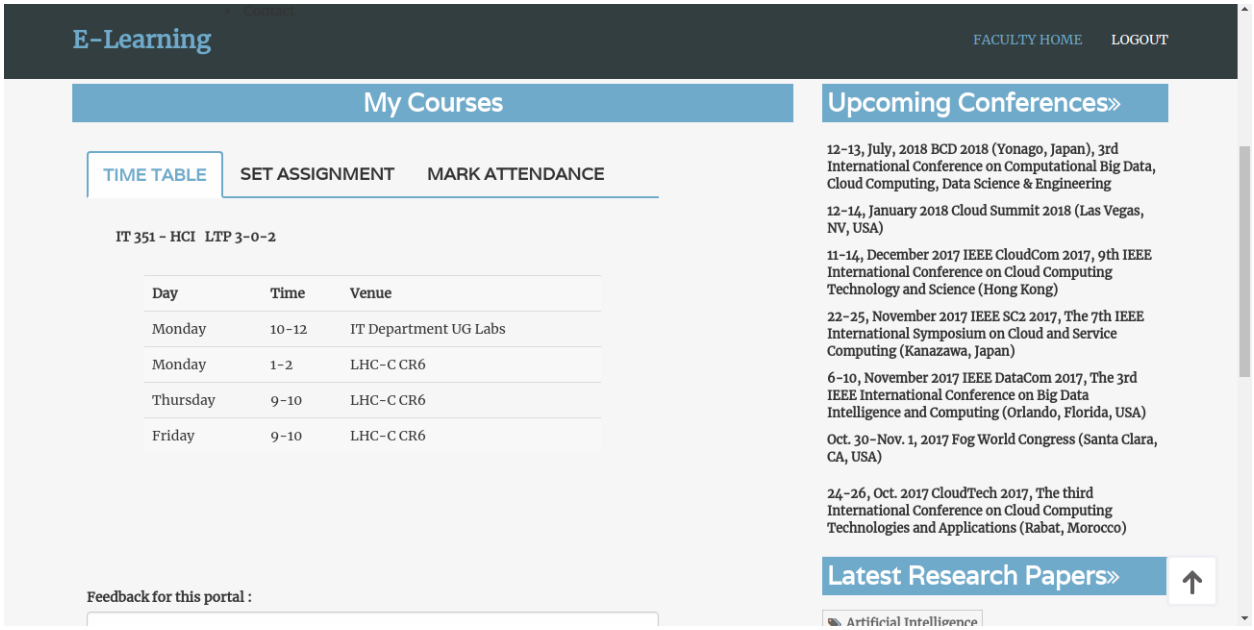


Home page with display of both student and faculty login

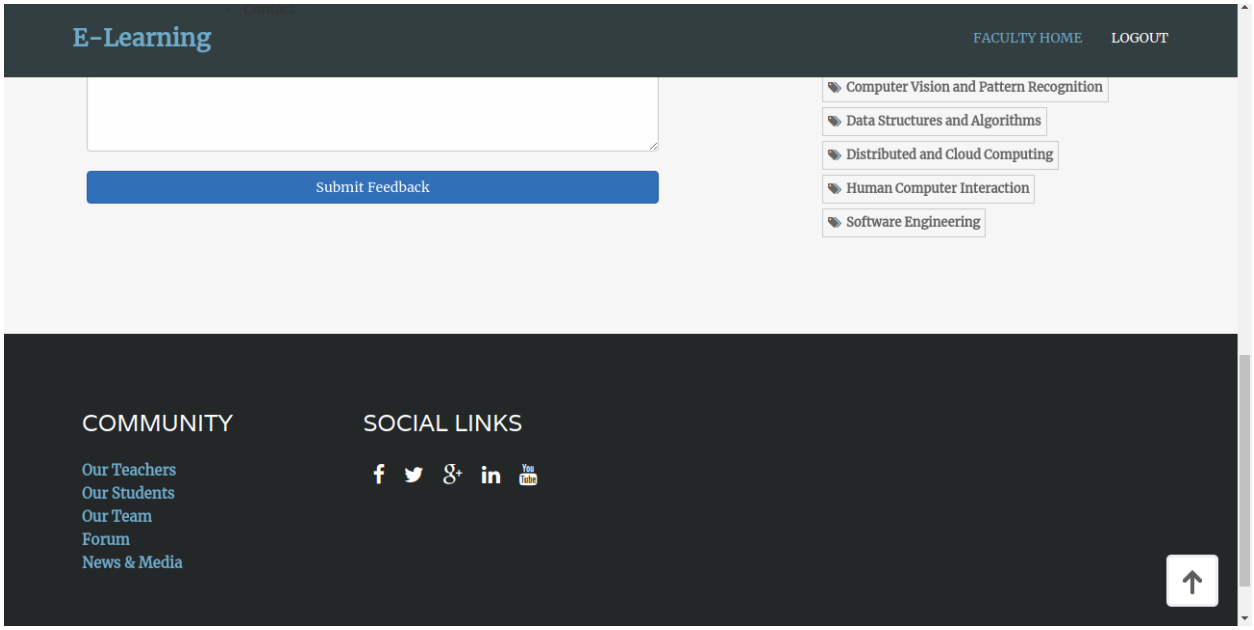


STUDENT PORTAL - Multiple displays consolidated in a single view





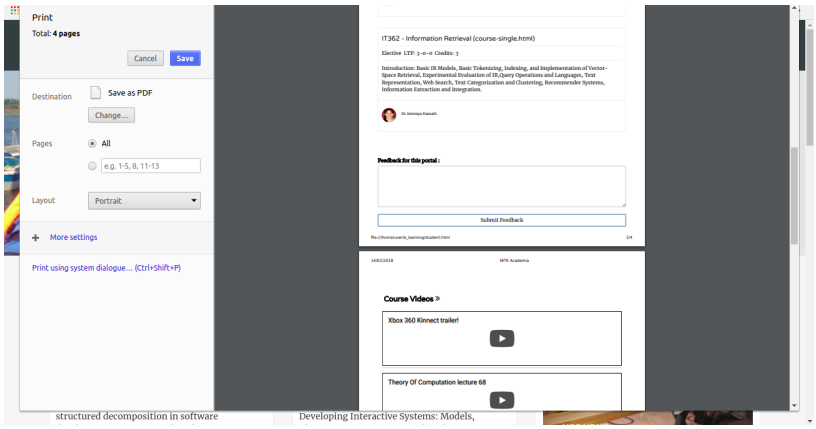
Faculty Portal - Multiple displays consolidated in a single view



Norman's 7 Principles

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

It states that people learn better when the information needed to complete a task is readily available to them. Text has been kept to a minimum and the language used is clear and concise. Alerts and prompts will help guide users through the system. Keyboard shortcuts and manual controls improve performance for expert users. This E-learning website has been developed using both developer's knowledge and referring existing E-learning websites. This website has improved upon the drawbacks of popular existing E-learning websites like coursera and edX along with NITK IRIS.



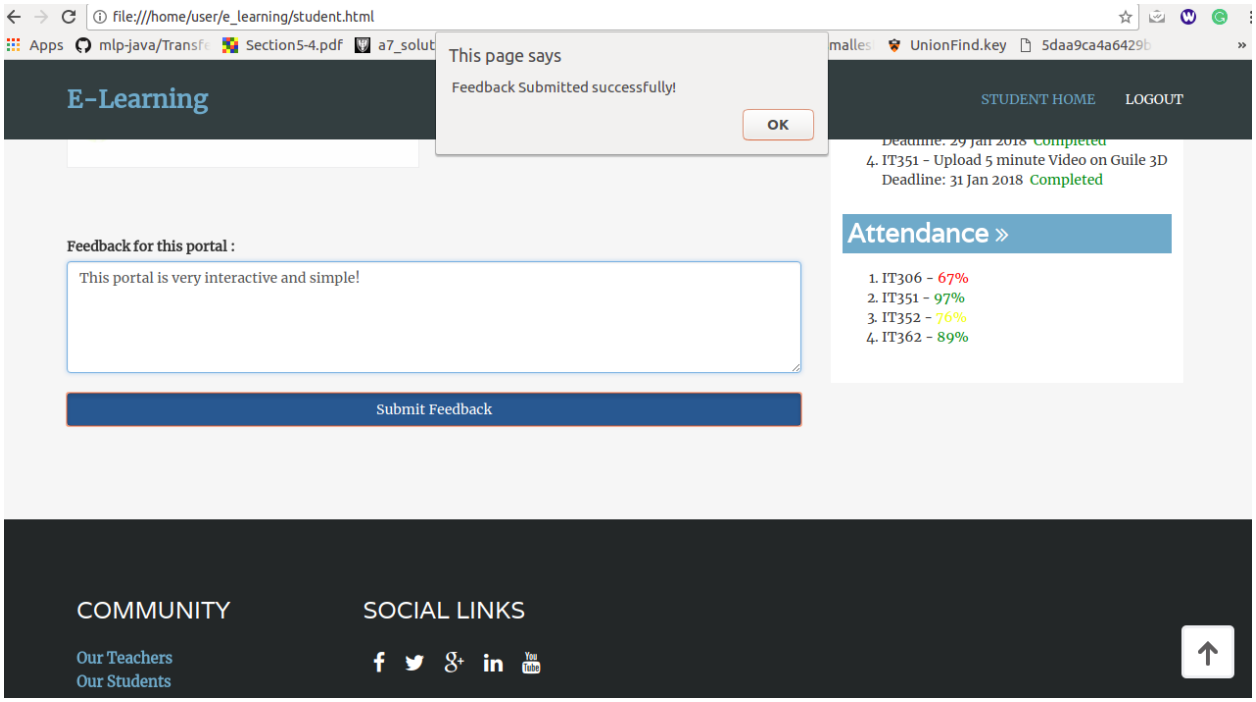
Using keyboard shortcut to print

2. Simplify the structure of tasks.

All functionalities are simple to perform for the user, there are no complex tasks for both student and faculty. The amount of irrelevant information in the website has been reduced.

3. Make things visible: bridge the gulfs of Execution and Evaluation.

All functionalities are easily visible to the users and hence can be easily executed and evaluated by the user. For example, all student functionalities like courses taken, assignments to be submitted, attendance status, feedback system and course lectures and materials are visible to the student in the student home page. The same applies to faculty home page also. The user know how the task is executed and should be able to evaluate the outcome. Feedback is critical to this principle, always give good feedback to the user about the state of the system and make the outcomes of their actions as obvious as possible.



4. Get the mappings right.

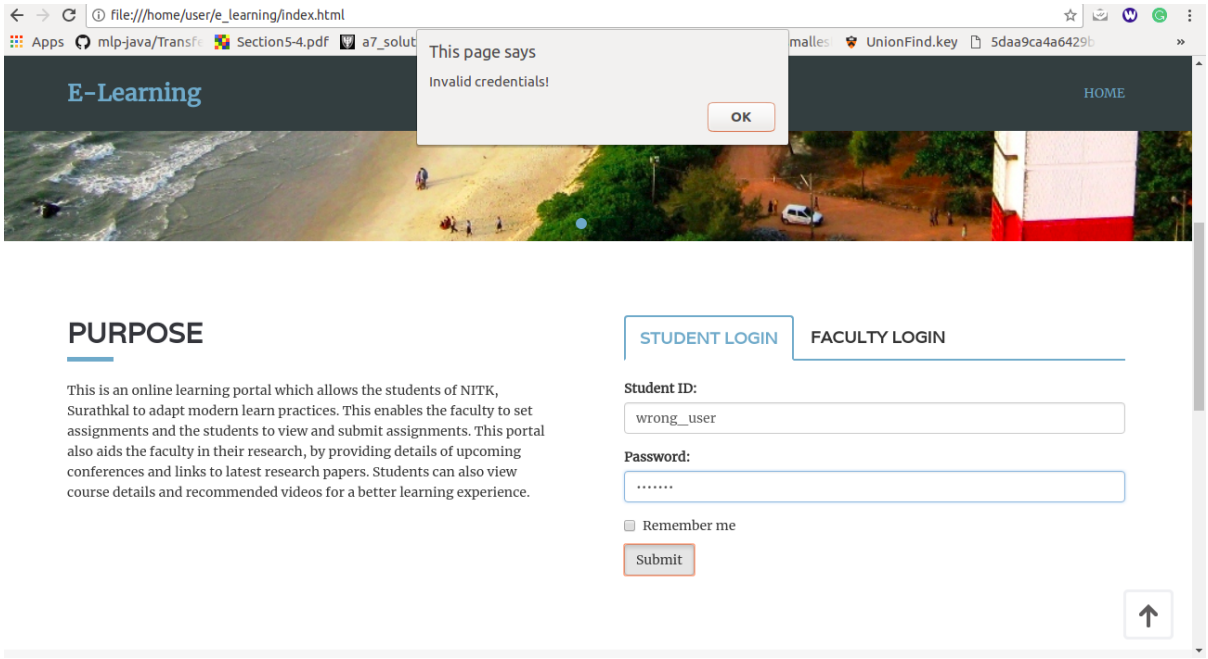
Mapping is the relationship between a control, whatever it effects and the resulting action of the control. The mappings from the student and faculty to their functionalities are clear. The functionalities of faculty include viewing time-table for the faculty, setting assignments, marking attendance, feedback system, details about upcoming conferences and latest research papers and for student include viewing courses taken, assignments to be submitted, attendance status, feedback system and course lectures and materials.

5. Exploit the power of constraints, both natural and artificial.

Constraints prevent errors from occurring by taking the control out of the hands of users. The constraints of the system have been exploited to the fullest.
Constraints include : The website is restricted to only students and faculty and their functionalities have been given a lot of importance in the design of the system. Also all faculty IDs and student IDs are unique for each user.

6. Design for error.

The design is robust and can handle errors easily. For example, while login if we give wrong credentials an error message pops up on screen and the user will be prompted to enter correct credentials.



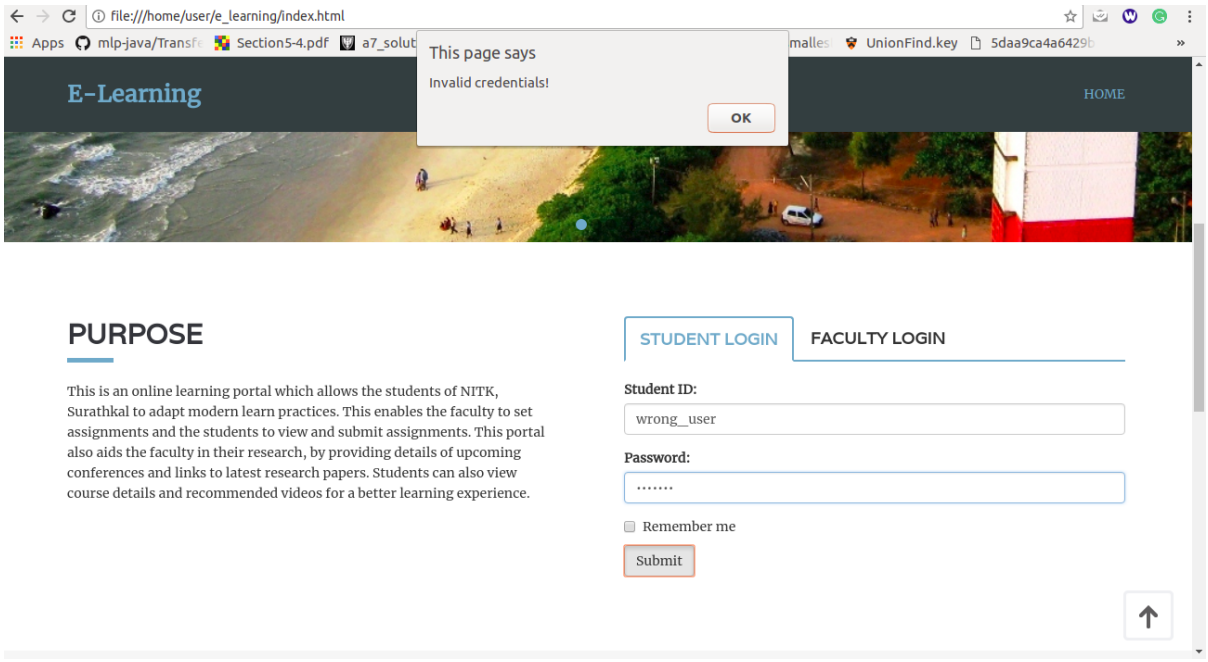
7. When all else fails, standardize.

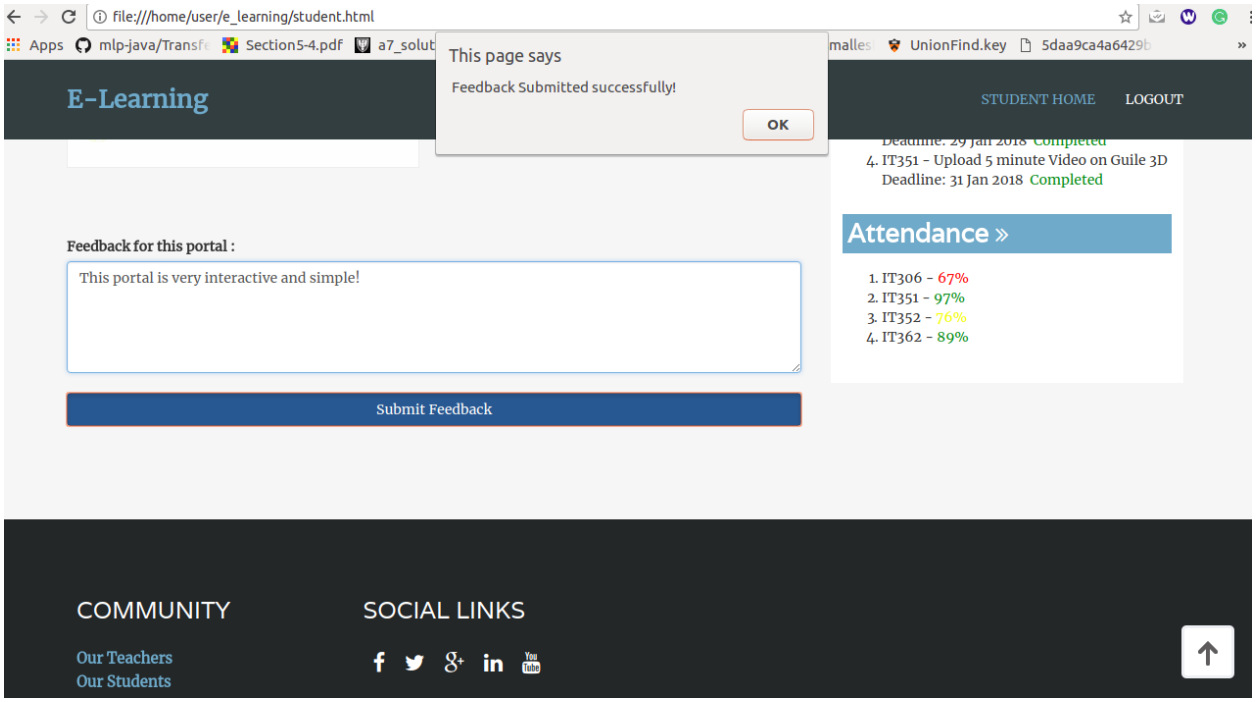
Sequences of actions are performed in similar situations and these sequences are standardized across the design of the website. For example, when a student logs in, he/she is lead to his/her own student page and not anyone else's page. Similar standards are maintained for faculty as well.

Nielsen’s 10 Heuristics

1. Visibility of system status

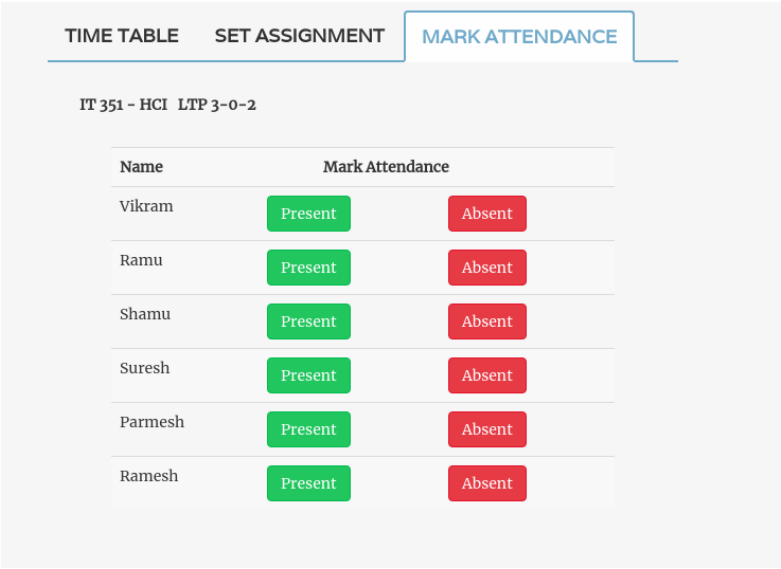
The system should keeps users informed about what is going on, through appropriate feedback within reasonable time. Feedback is provided when a form such as the feedback form is submitted or when the credentials are wrong.





2. Match between system and the real world

The system speaks the users' language, with words, phrases and concepts familiar to the user, rather than system-oriented terms. It follows real-world conventions, making information appear in a natural and logical order. A suitable example of this is the attendance functionality of the faculty user - marking of attendance is similar to what the faculty would in real-world, go through a list of names in the register and mark present or absent.



3. User control and freedom

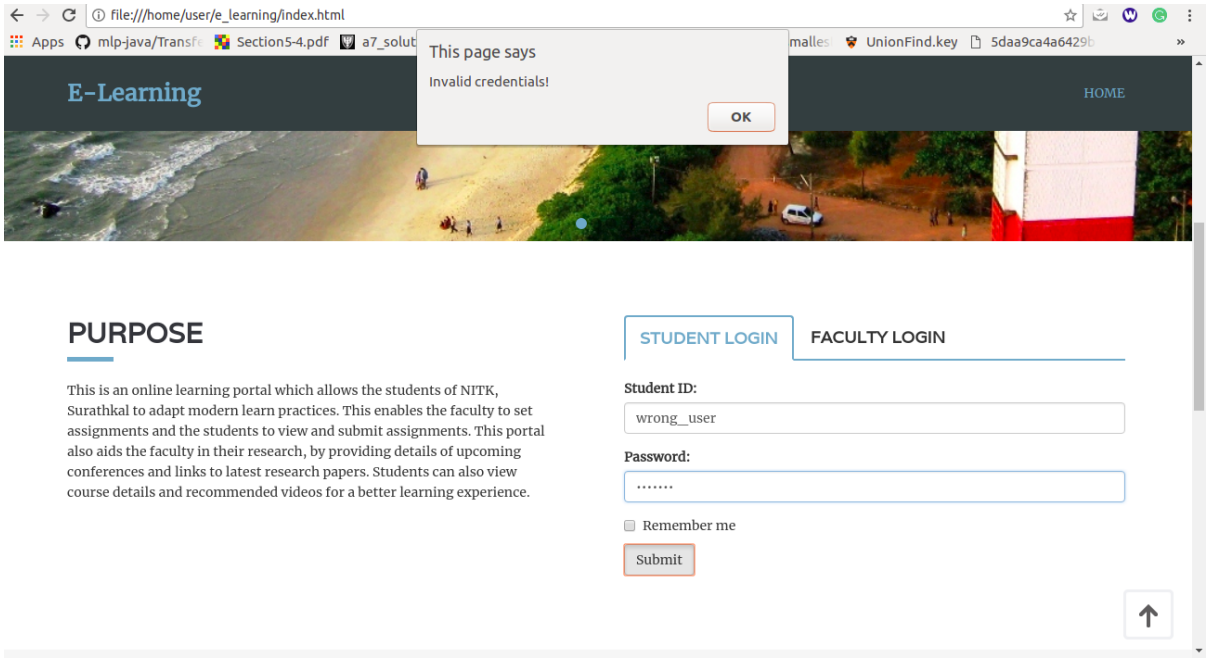
The users choose system functions by mistake and has a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue. Supports undo and redo. Standard shortcuts which are Ctrl+Z and Ctrl+Y are applicable here for the text fields. Also, if an instructor posts a wrong assignment, he will be allowed to delete it and upload a new assignment.

4. Consistency and standards

The users do not have to wonder whether different words, situations, or actions mean the same thing. All the use cases and functionalities are very distinct which does not lead to any such confusion.

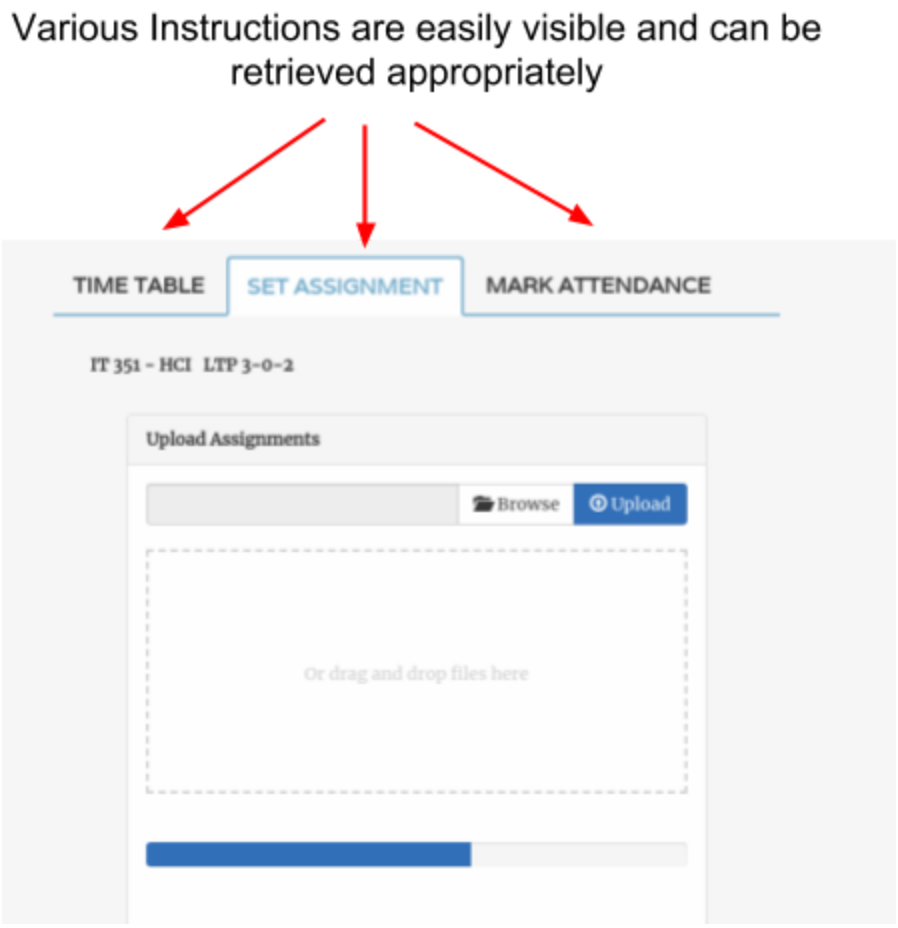
5. Error prevention

When logging in, if the wrong credentials are entered, an alert notificies this to the user and ensures that the user cannot proceed further. He will have to enter the correct credentials before he can proceed further.



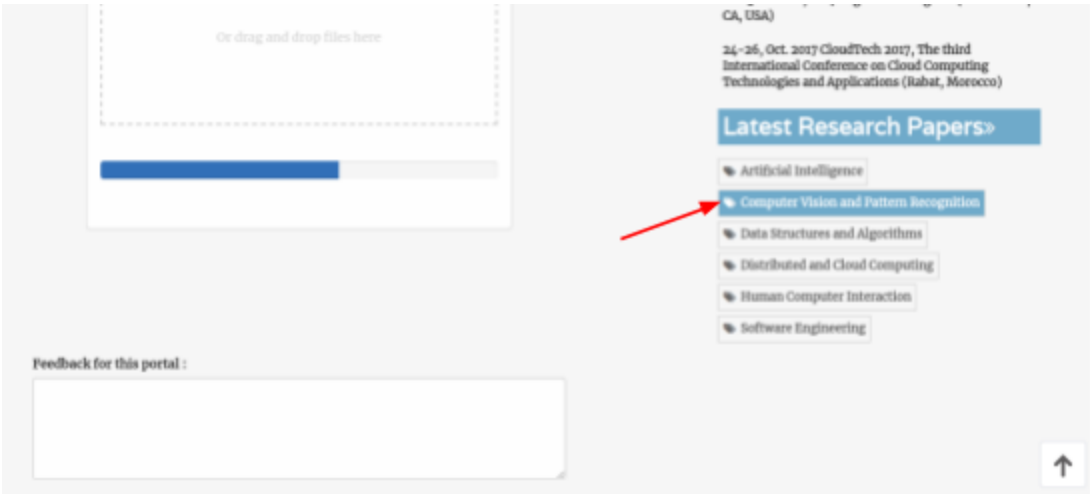
6. Recognition rather than recall

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

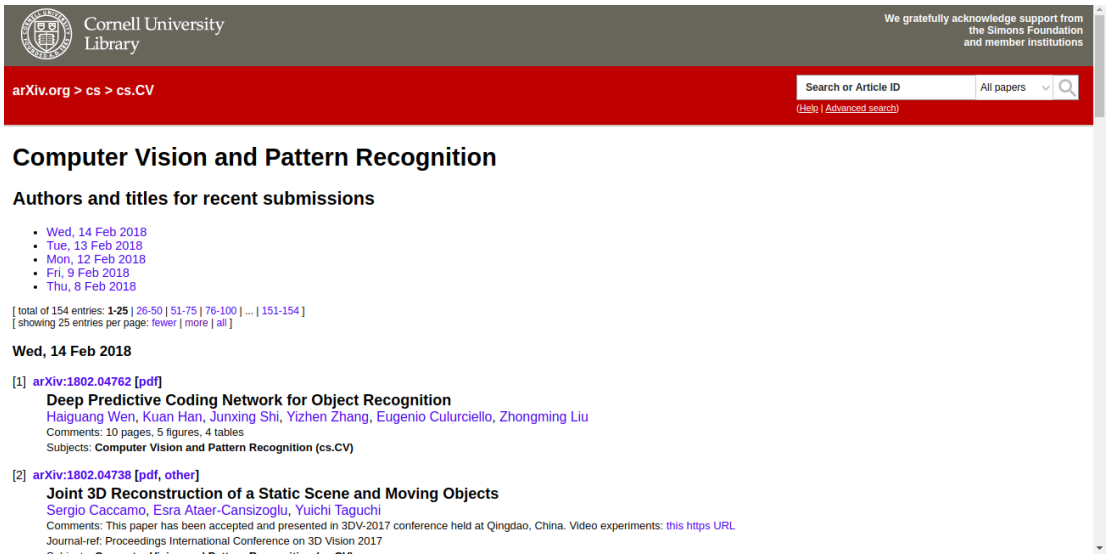


7. Flexibility and efficiency of use

Expert users can directly go to the latest research papers by clicking on the their areas of interest. This use case is provided only to the faculty users.



Clicking on the above link leads to the following page.

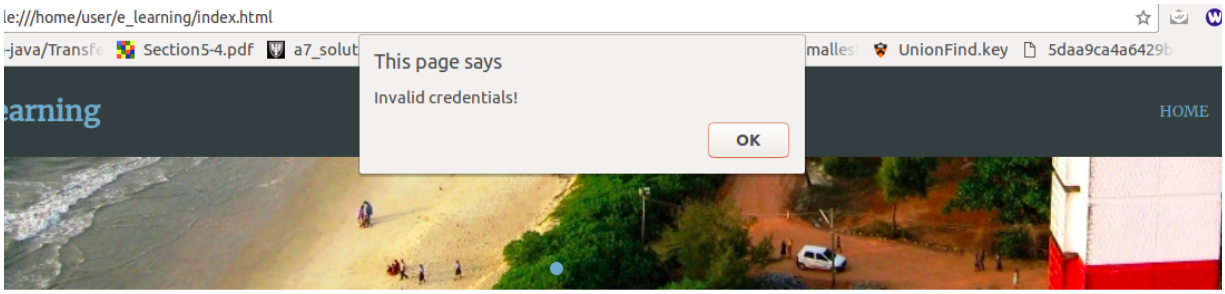


8. Aesthetic and minimalist design

All the dialogues contain only the information which is relevant. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility. Throughout all the pages, this has been followed and all the pages are kept simple.

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

Error messages expressed in plain language, precisely indicate the problem, and constructively suggest a solution.



10. Help and documentation

The readme file provided with this document serves this purpose.

Universal Design Principles (Chapter 7)

7 Principles of Universal Design:

1. Equitable Use

The design is useful and marketable to people with diverse abilities.

- All students have same login procedure. All teachers have same login procedure.
- Design is made appealing for both teachers and students.
- None of the teachers/students are segregated

2. Flexibility in Use

The design accommodates a wide range of individual preferences and abilities.

- This website can be accessed on any media device which suits the user

3. Simple and Intuitive Use

Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.

- The design of this website avoids unnecessary complexity
- The website is consistent with user expectation and intuition
- This website accommodates a wide range of literacy and language skills.
- This website also provides opportunity for users to give feedback.

4. Perceptible Information

The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.

- This website maximises legibility of essential information (e.g courses for student, marking attendance, timetable for teacher)

- This website provides compatibility over various devices
- This website also provides adequate contrast between essential information and its surroundings.

5. Tolerance for Error

The design minimizes hazards and the adverse consequences of accidental or unintended actions.

- Teachers/students are alerted on wrong login
- This website arranges elements to minimize hazards for example, research paper links can be malicious and they are in small font on the side of the page while safe functionality like mark attendance, timetable are at the centre in bigger font.

6. Low Physical Effort

The design can be used efficiently and comfortably and with a minimum of fatigue.

- This website provides arrow marks to scroll up and links to scroll up the page easily thus reducing physical effort.
- Also, due to its compatibility in different media devices, the website can be accessed by reducing physical effort.
- This website also allows the users to maintain a neutral body position while accessing it.

7. Size and Space for Approach and Use

Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

- This website provides a clear line of sight to important elements for any seated or standing user.
- This website makes reach to all components comfortable for any seated or standing user.

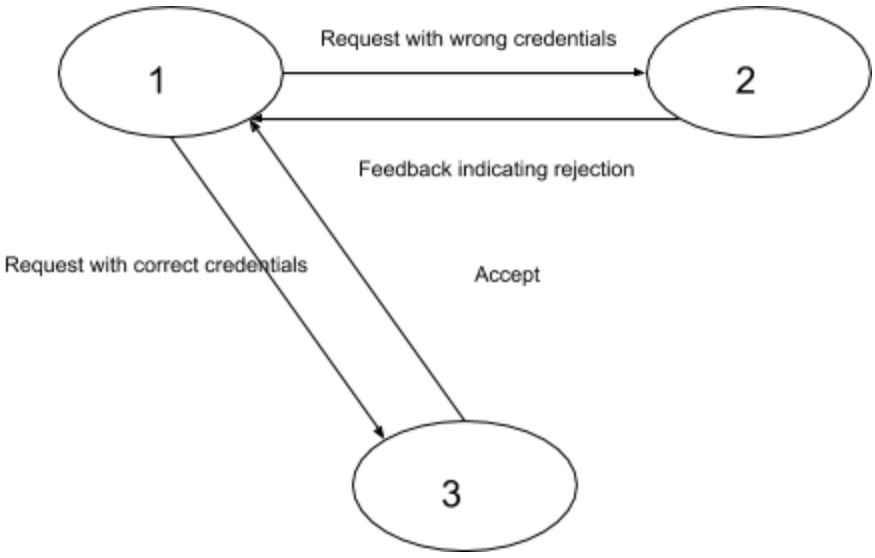
Communication and Collaboration Model(Chapter14)

Text based communication

The interaction between the system and the user for activities such as feedback, error response or other standard interactions is largely in the form of text. This delivers the message in an very objective manner and there is no provision for expressing emotions or body language.

Conversation for Action (CFA)

The diagram below explains the conversation between the user and system during the login activity. The user first requests the system with his credentials. If his credentials are wrong, the system identifies this and conveys the same to the user. If his credentials are right, the system conveys the accept message to the user.



CFA for login activity

Circles represent ‘states’ in the conversation Arcs represent utterances (speech acts)

Modelling Rich Content (Chapter 18)

Status - Event Analysis:

The word ‘event’ is self evident. While events happen at a particular time, status refers to a phenomenon which have some continuity. That is anything which for a period of time can be sampled or observed. Examples of events in a system include keypress(input), beep(output), interrupt(internal) and time(external). Similarly examples of statuses are mouse position(input), display(output), document state(internal) and temperature (external).

Examples of status

Examples of status - event pairs which occur in our website are pressing of the sign in button(event) and the displaying of the associated page as the change in status of the system. This is an example of showing how events provoke the change of status of the system. Similarly, the pressing of the play button on the video present in the student page causes the video to be played. This is another example of a status-event pair. In a similar manner, the pressing of the upload buttons on the upload pdf, assignment section causes a prompt asking for the pdf, assignment which needs to be uploaded.

Hypertext, Multimedia and WWW (Chapter 21)

Hypertext is a text which contains links to other texts. The term was invented by Ted Nelson around 1965. Hypertext is therefore usually non-linear. HyperMedia is not constrained to be text-based. It can include other media, e.g., graphics, images, and especially the continuous media - sound and video. Apparently, Ted Nelson was also the first to use this term.

The World Wide Web (WWW) is the best example of hypermedia applications.

This assignment use hypermedia like videos to facilitate learning and help students understand the subject and the course.This makes the e-learning experience more effective and enjoyable.

With the advent of HTML5, many new tags like audio, video, svg tags have been added, which provide the functionality of embedding videos and audios in HTML.

Text

The website uses many generic styles and fonts like serif, sans, fixed, bold, italic. Cascading style sheets (CSS) are used for fine control. Text positioning is easy, either left, right justified or centred.

Icons

Icons on the web are just small images. They are either used for bullets, decoration or to link to other pages. In this website icons for social networking sites like facebook, twitter, google+ and linkedin in addition to youtube.

Animation

Animation has been used wisely in the index page to make the page feel more dynamic. A few transitions have been added to images.