

Use of GDSS for Evaluating Web Design Assignments in Web-Based Environment

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With the advent and growing popularity of the Internet and World Wide Web, as well as the improvement in Web site development tools, there is a tremendous movement towards learning through the web. The greatest advantage of using the WWW is the ability to link resources in many different formats (text, images, sound and video), making this a very rich and powerful medium. The Internet have enabled the connection of all components in the teaching process, namely instructors, learners, institutions and learning materials in a unique virtual world. Performance assessment of students in the courses registered is one of the major phases of web based learning environment. Collaborative performance assessment is often the preferred methodology where proper decision making techniques can be applied to decide upon the performance of the students. This paper answers how Group Decision Support System (GDSS) is used in evaluating the students' performance for the subject 'Web Design' in a web-based environment.

Keywords

- GDSS
 - web design
 - web based learning
 - decision making
 - performance assessment
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In the context of web based education, teachers usually evaluate various features like students' performance on tests, exams and assignments [1]. The 'Web Design' course is one of the popular and useful courses registered by students pursuing a degree or diploma or certificate programme in IT related areas. With respect to the course on 'Web Design', assessing the students based on written examinations or quizzes alone can not completely determine the skills learned in that subject. In such a situation, students can be given a set of web design exercises, in which the students will be asked to design web pages or develop web based products involving the concepts of Mark up Languages, Style Sheets, Multimedia concepts etc. Evaluating such completed assignments or finished products needs lot of factors to be considered by the teachers. The assessment should be aimed at identifying and ranking the students' individual skill based on content, style, presentation, navigation abilities, multimedia effects etc available in the submitted assignments. If a single teacher is involved in the assessment process, then assessment may not be accurate. Instead, a collaborative approach consisting of a team of teachers can be formed for the assessment purpose. The team needs to consider the above mentioned factors available in the solution or product for assessment. Especially, when there is a need to rank the products submitted by the students, collaborative performance assessment will be an appropriate approach. In this paper, we propose the use of GDSS to enable the collaborative environment to decide the ranking of several students' submissions.

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Desirable Features for the Web Design

With the growth of Web Technologies, every industry including educational institutions has started using many web applications for development, teaching courses, interaction among the users. In this context, web design forms an integral and essential part of web related activities. Though a web design product may convey all the required features of a client, there are various factors to be considered in bringing out a proper product. Research has proved that the following are the desirable features of web design [2]:

- a. **Aesthetic and Minimal Design**
The web design is expected to be simple and pleasing. Too many levels of information may create disinterest in the topic presented.
- b. **Following the Standards**
Use of standards and general practices are very much stressed. Say, changing the colour of email-ids is not advisable.

- c. **Prevention and Recovery from Errors**
When errors are possible under some circumstances, providing messages or descriptions will help the users to understand what went wrong. Also, providing recovery features will be a better design approach.
- d. **Navigation**
The features like hyper links, basic search form, advanced search form, site map should be properly utilised in the products for navigational purposes.
- e. **Efficiency**
Users should be able to achieve their goals in an efficient manner. In order to maximise efficiency, designers should have included the following in their documents:
 - Definition of proper word hyperlinks; preferably with the title of the page the link leading to.
 - making sure the search results that include a description of the link, in addition to the title of the page.
 - design of site map in a logical manner.
 - providing an alphabetical index which includes as many categories, content areas, departments and keywords as possible.
- f. **Avoid jargons**
Use of simple terminology; Expansion of abbreviations in the very first occurrence.
- g. **Timely Responses to User's Click or Choice**
- h. **Clarity and Readability**
Use of bold headings, subheadings and short paragraphs is very much suggested.

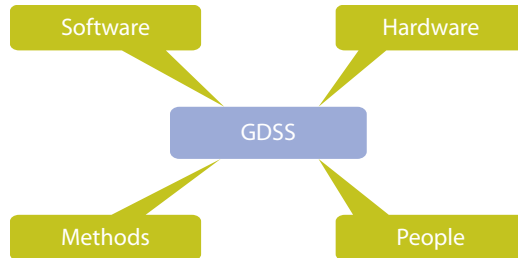
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Group Decision Support System (GDSS)

At its broadest definition, a Decision Support System (DSS) is any methodology that is helpful to a decision maker to resolve issue of trade-offs through the synthesis of information. DSS assists in decision making by combining data, sophisticated analytical models and tools, and user-friendly software into a single system that can support semistructured and unstructured decision making. For a collaborative environment, an extension of DSS, namely Group Decision Support System (GDSS), is a very powerful methodology, useful for groups to interact and distribute information to solve problem or take decision [3]. In general, GDSS has software, hardware, methodology and people as major components (see Figure 1). Here, Hardware refers to the primary entities like audio-visual systems, computers, networking systems, transmission media and the environmental entities like room,

tables, chairs etc. Software tools include lot of entities like electronic questionnaire, brainstorming tools, voting tools, group dictionaries etc. People refer to users of the collaborative system [3].

Figure 1 Major Components of GDSS

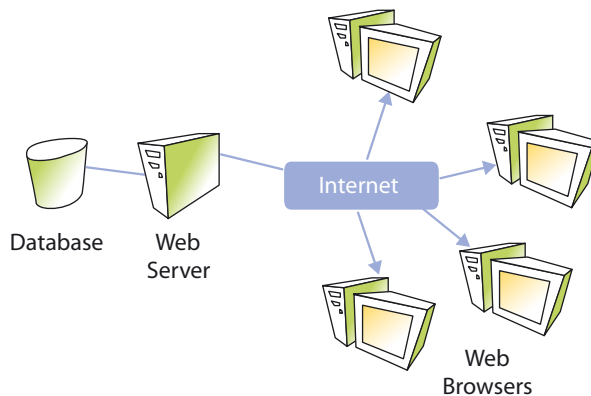


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Web-Based Model for Assessment

The framework for Web-based model for assessment has the following major components (see Figure 2) [3]. The Web Browser acts as an interface between the user (who may be the system administrator or a collaborative team member) and the rest of the system. The Internet links various elements of the environment. The Web Server hosts the pages, scripts, programs and serves them using HTTP, a protocol designed to send files to web browsers and other protocols. The Database system stores various students' web design products for assessment.

Figure 2 Web-Based Model



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Collaborative Team

There are three categories of users in the collaborative team namely System Administrator, Participants and Mediator. The System Administrator creates new models and can add or delete participants to/from a particular decision group. Participants refer to group members who access the system at the same time to contribute their decisions. Mediator is a participant who deals with the co-ordination and controlling feature of the overall decision process.

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Decision Model

Once the completed assignments or web products have come to the System Administrator, he/she will need to initiate the assessment process. The process involves two major steps namely:

Step 1: System Administrator defines the control structure and the process.

Step 2: Mediator facilitates participants to group and synchronise results, identify individual differences as well as common interests to create several alternatives.

The above steps 1 and 2 use Analytical Hierarchy Process (AHP) which assist the collaborative team and/or an administrator handle their decision making process in a systematic way [4]. Within the system, a hierarchy can be defined with alternatives.

The evaluation of the hierarchy criteria and the alternatives is carried through pair-wise comparisons. In each pair-wise comparison, the decision maker has to evaluate the intensity of relative importance of the two alternatives with respect to the objective. This is done by locating the relative importance of two alternatives as concerns the fulfilment of the objective on a scale from 1 to 9 called Saaty's scale [6, 7]. Here, 1 corresponds to the case in which two alternatives contribute in the same way to the objective, 9 to the case in which one of the two is extremely more important than the other. Geometric Mean is used to sum up the overall group preferences of each group member. To get the final decision, the eigenvector method can be used [3, 5].

Web Based Education has the ability to link resources in many different formats providing a very rich and powerful medium for learners. Students' performance evaluation forms a major phase of web based education. The performance evaluation methods adopted vary from subject to subject. A subject like 'Web Design' requires a different performance evaluation method because the process needs multiple criteria to be taken into consideration for evaluation. However, the use of GDSS in a web-based environment is suggested for the complete evaluation of the web design products. The use of GDSS may be thought of as a performance evaluation method for similar subjects.

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