

# Task Based Effectiveness Evaluation of Educational Institute Websites

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**Abstract**— Websites is considered as a mode of communication by an organization through the virtual environment. To make this communication effective one need to identify the stakeholders and understand their behavior online. In order to achieve this the users were given a series of task scenarios and the analysis was done to gauge the effectiveness of website. The idea is to see whether the given website actually helps the end user to make a better decision for selecting an institute at the time of admission. The task scenarios were designed realistically, i.e., typically how people actually look into the system when they try to select an educational institute. In the current study the effectiveness of website for institute is evaluated on the basis of task success rate and task completion time.

**Keyword:** *Effectiveness, website, task success rate, task completion time.*

## I. INTRODUCTION

Advancements in the field of information and communication technology have eased the process of gaining and exchanging the information. Now any information can be retrieved by just clicking the website of the organization. Websites are considered as a de facto standard for establishing a communication link between an organization and external world i.e., target audience who are the key stake holders with respect to that organization. Today website are not just a source of information it also provides a platform to its users for interaction and performing various tasks. The designing of a website depends on the need of the organization, level of communication required between customer and organization via the website and end users who are using it. According to the services offered websites available on the web can be grouped in different categories, but for any of the website the prime objective of a website designer is to design an user-centric website which is able to attract and satisfy its target audience. The information displayed on the website plays an important role in influencing the visitor's decision making process.

Like other industries today all educational institutes are using website as tool to broadcast their image and branding themselves[1]. The major concern of designers of these websites is to effectively design the website so that their academic offerings and opportunities are projected to the

visitors of website. The target audience of these websites includes entry level students, students extending their education for higher studies, parents and external agencies. The website design and content present on it play a vital role in influencing the visitors opinion. Thus measuring effectiveness of website with user perception will directly reflect the success of website[2][3]. Smith and Clark, (2004) [4] defined measure of effectiveness(MOE) as "A measure of the ability of a system to meet its specified needs (or requirements) from a particular viewpoint. This measure may be quantitative or qualitative and it allows comparable systems to be ranked. These effectiveness measures are defined in the problem-space. Implicit in the meeting of problem requirements is that threshold values must be exceeded."

The task based approach supports the assessment and deriving a conclusion how ongoing operation performs in a given environment. This approach can be suitably used from measuring the effectiveness of a system where different alternatives are judged based on how system performs its function within the given scenario.

The effectiveness of website is judged on what usually stakeholder looks for and what information is present and how they are presented on the website. In order to rank the websites on the effectiveness score in this paper the target audience were given the task. The task performance is analyzed statistically based on level to which task is completed and time taken to complete the task.

## II. BACKGROUND STUDY

Although the website effectiveness reflects the general impression that stake holders have towards the website. However, there is still a need to consolidate method investigation, the objective of the stake holder. Many of them have measured the effectiveness in terms of marketing reflecting the number of results the website bring back to the company including sales, market shares and customer retention. The MOE is widely used in various domains like education[5], health industry[6], information retrieval[7][8], research[9], hotel industry [10] and many more. MOE can be considered as a quantifiable benchmark against which the system concepts and how they are implemented are compared. It helps to identify the best among the alternatives based on the factors that contribute to the system. This quality measure along with others like usability[11], reliability etc. can help to

judge the website. Hornbeak[12] summarized various Measures of effectiveness of website present in the literature are:

- **Binary task completion**

It refers to whether the user is able to complete the task or not. The score '1' is given if user complete the tasks correctly else the score is '0'.

- **Accuracy**

In the process of completing the task of finding the solution it measures the number of errors users make or present in the system.

- **Recall**

It measures how much information visitors can retrieve while using the website interface. This will depend on the content present on the website.

- **Completeness**

It measures the level to which the user is able to complete the task. It is orthogonal to accuracy and proportional to relevant information present on the website.

- **Quality of outcome**

It is a more extensive way to measure the effectiveness as it attempts to measure the outcome of tasks, based on various factors like user and environment. It directly effects the usability of the website.

Muller [13] use the Retrospective Pretest Methodology(RPM) to conclude whether the contents are effective enough to change the characteristics of website visitor. Hahn and Kuaffman[14] has measured the effectiveness of e-commerce website by considering the input as the various functionality that user uses and output as the number of items the customer selects at check out. He extended this study to evaluate the efficiency of website. Welch and Pandey[15] has developed a model to identify organizational and environmental factors to determine the effectiveness of the website and how the measures effectiveness contribute towards the service quality. Shum et.al.[16] has included the structure of the website and its navigation properties to measure the effectiveness of website of an organization having large and diverse target audience. For evaluation of effectiveness and efficiency of websites users are given the series of task and based on their evaluation, time taken description of problems the performance of the website can be estimated[17]. As the effectiveness obtained indicates the accuracy and completeness with which user achieve goals, The quality of solution from task based experiment can be chosen as a bench mark for measuring the effectiveness of website.

### III. OBJECTIVE OF THE STUDY

The main objective of the study is to analyze the effectiveness of the website for educational institutions . Task scenarios were designed to mimic the real world and these task scenarios were considered as a tool to measure the effectiveness of website. Thus while designing the task scenario the idea is to look for the information that user try to find when they visit the website. The educational institutes desired to include complete information about their policies, achievements, facilities and resources on their websites.

Different task were designed and given to the user. Depending on the user input the following parameters are measured :

- Task success rate
- Task completion time

These two measures will reflect the quality of information present on the website and how easily this information can be retrieved from the website respectively.

### IV. METHODOLOGY

Steps taken to measure the effectiveness of the educational institute websites are given below:

- Identify the websites(considered as a case study).
- Identify the information that user look on the website.
- Design the task based scenario that will help to gather the data.
- Based on the level of task completed and time taken to complete the task
- Evaluate the overall score of effectiveness .

### V. EXPERIMENTS AND RESULTS

For a typically information centric website which is used for delivering the information to the end user the major task is to navigate the website from the home page to the page that contains the target information. There is no clear step-by step procedure given to the end user for completing the task also the users taken are unfamiliar with the website and there is no said procedure given to them. A user could start from any page within the website and follow any path to reach to the target information. Users are not allowed to use external search engine or any link for performing the task.

Performance based evaluation[18] of six educational institution websites referred as  $U_1..U_6$  was done based on Task success rate and Task completion time to analyze the effectiveness. Each visitor were asked to visit six different website and perform 10 questionnaires which involves fact gathering scenarios.

Out of a selected group of 100 participants total of 30 agreed to take part in performance based evaluation of six educational institutes websites. The participants are selected from variety of backgrounds which includes 20% parents and remaining 80% were students of whom 20% were international students, 20% were the graduate students who will look for the institutions for their post graduate studies and 40% were the students who looks institution for their graduation.

The participants were given 10 tasks to perform. The common information that user look forward are institutional infrastructure like hostel details, in-campus services, services available in the departments, library facilities fee details, placement, accreditation and MOU's, latest news and events, research activities, alumni details, result and contact details. On these information the visitors looks forward to view the complete detail however often the website provides the partial information like if we look about the department details of any institute some may mention the number and name of departments, some may include the details of faculty teaching the courses, other may mention the facilities details also available in the department and it can be a case when there is no details mentioned on the website. Each participant is

required to retrieve information and based on level of information available the participant need to rate the website on 1-5 scale. '5' if 100% information regarding the given task is available on the website,'4' if adequate information is available,'3' if incomplete information is available,'2' inadequate information is available and '1' if no information is available on the website. This grading is directly related to the quality of information present on the website. The hard copy of response from the participants are collected and time taken by the participants to complete the task was recorded. These data were reviewed on the basis of Task success and Task Completion time.

### Task Success

Task assigned were graded in range of '5'- '1' i.e from 'success' to 'failure' on the basis whether the participants are able to retrieve complete information to inability in finding the information correctly. Task failure will happen if requisite information is not present on the website(lack of informativeness), if information is present but visitor is unable to retrieve the desired information(lack of ease of use) or user somehow fills the wrong input. Rates for task success is calculated by taking the average of these grades . For six website task success rates are evaluated as shown in Fig.[1]:

- The website of institute  $U_1$  has highest success rate, the participants were able to complete all tasks except for Task T2 and T10 where participants rated it as 50% and 45% respectively.
- For Institute  $U_2$ , overall task success rate is 56.22% as most of the tasks the participants are able to perform partially.
- For Institute  $U_3$ , the website has lowest success rate . Except for T1 task either incomplete or inadequate information is available on the website.
- For task T10 in institute  $U_4$  inadequate information is available and for Task T1 complete information is available on the website.
- For Institute  $U_5$ , except for Task T1 and T3 incomplete or partial information is available on the website.
- For Institute  $U_6$ , overall task success rate is 71%

### Task Completion Time

Task completion time depends upon how fast the user is able to retrieve the information. Retrieval time will be less for the sites having less response time and easy navigation i.e. visitor is able to find the information very quickly and easily. Time data for completing the task is analyzed for all six websites and the average completion time w.r.t. each task is evaluated as shown in Fig.[2].

- For institute  $U_1$  for all tasks the time of completing the task is less than or equal to 30 s
- For institute  $U_2$  the time of completing all the tasks lie between 20s to 80s.
- For institute  $U_3$  the time to complete all tasks lie between 10s to 80s,lowest time taken by Task 9 i.e 10 s.
- For institute  $U_4$  the average time take taken to complete all the task is 28.5s lowest being 10s and highest time taken to complete that task being 50s.
- For institute  $U_5$  the highest time taken to complete the task T7 is 85 s and the overall average time to complete all the tasks is 57.3s.
- For institute  $U_6$  overall task completion time is 31s.

The overall average task completion time was observed to be lowest in  $U_1$ (21s) and the highest in  $U_5$ (57.3s).Lowest the task completion time higher is effectiveness for that website(the task completion rate for  $U_1$  is calculated as  $100-21=79$ ).

The overall score for all the six institutes were calculated averaging the scores obtained from the task and calculating the percentage of each score with Institute  $U_1$ (84),  $U_2$ (55),  $U_3$ (47),  $U_4$ (75),  $U_5$ (52) and  $U_6$ (70) as shown in Table[1]. The overall score of website  $U_1$  is highest among all six websites and lowest is  $U_3$ (Fig.[3]).

**TABLE 1 Overall Score of different Website**

Website	Task Completion Rate(%)	Average Task Success rate(%)	Overall Score
$U_1$	79	89.22	84.11
$U_2$	54.7	56.22	55.46
$U_3$	52.5	40.76	46.63
$U_4$	71.5	77.9	74.7
$U_5$	42.7	61.26	51.98
$U_6$	69	70.42	69.71

## VI. CONCLUSION

The result and analysis of the collected data on the basis of task success rate and time completion rate, overall task performance by the end users indicates that institute  $U_1$  is most effective and lowest being  $U_3$ . Higher effectiveness indicates that the user is quickly able to retrieve the most looked on information completely and accurately. Thus effectiveness depends upon completeness and accuracy of information present on the website also how easily user can find it while navigating the website. The current study can be validated using After Scenario Questionnaire(ASQ) where feedback from the user on the usage of website can be surveyed and analyzed statistically.

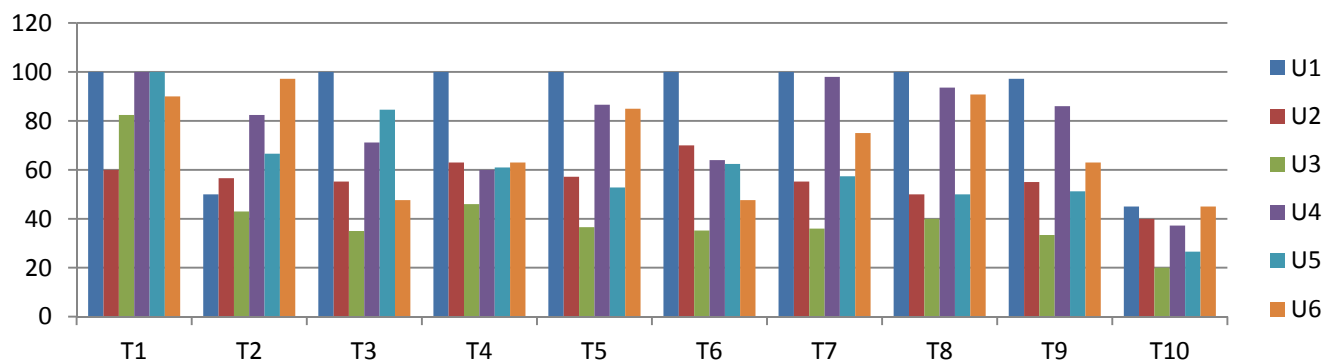


Fig. 1 Average Task Success Rates across six websites

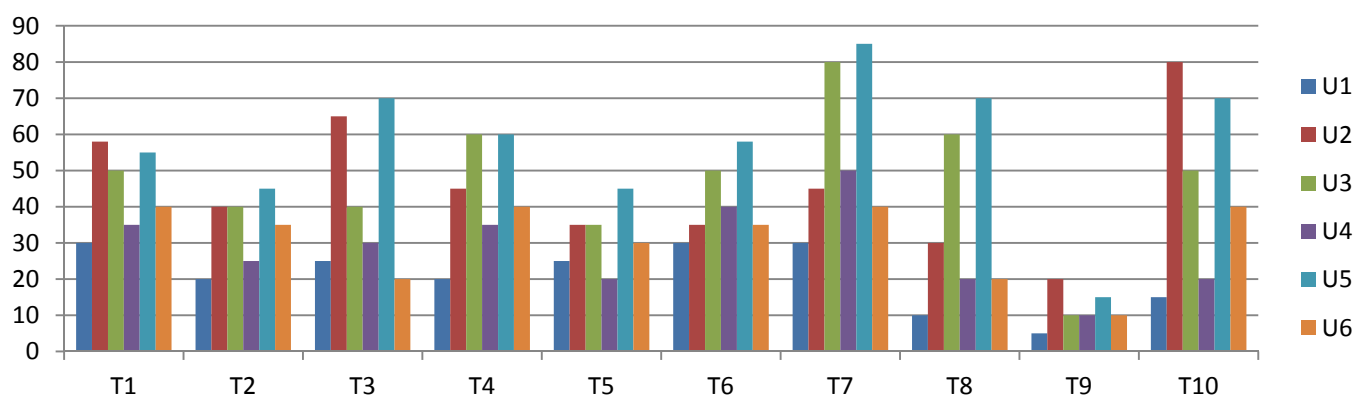


Fig. 2 task Completion rate for six websites

## Total Score

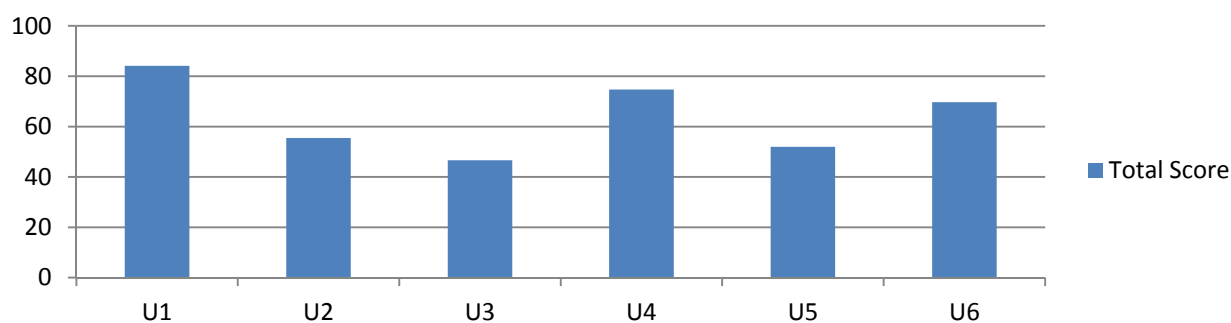


Fig. 3 Overall task based score of six websites

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