Agility Analysis of Academic Site: Identify Issues of Site by Users

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Abstract

This research work Agility Analysis is based on the usability methods lab usability testing and online usability testing. This testing performed on the academic website of the university and the university websites are a good source of information for all the users. In lab testing, forty participants have participated and for the online usability testing, Pingdom online tool was used. In this online testing results of the Performance grade, Page size, Load time and requests were achieved. Pingdom online tool assigns the grade of the site is B and calculate the percentage 87. The page size of site 1.5 MB is given by the tool. Load time of site was estimated by the tool is 4.09 s and number of request of the site were 37. Manually testing was performed by two groups of students of Information Technology and Economics and participated in the manually testing for the performance of the site for different parameters. Online testing was suggested that the website needs to improve performance by using Gzip to reduce the size of the HyperText Transfer Protocol (HTTP) response. This technique reduces about 70% of the size for better performance.

Key word:

Usability Testing, Online Pingdom Tool, Academic Website, Parameters, Performance of Site.

1. Introduction

Day-by-day increasing advancements in the field of Computers to provide easiness to the users. But in the same way, users may face many issues related to computers. Although throughout the world all organizations are used websites [1-4]. They upload all the related information regarding the company/organization. The majority of the student or job seekers have visited the educational websites [5-7], they search for new updates related to the admissions, job advertisements, exams and much other related information [6]. When they open or use these websites they may face many issues related to website performance. The performance of the websites is checked in different ways, but Web usability and accessibility are the main key factors for the checking of the performance of the websites [3,4,7,8,10].

Usability analysis of the websites is based on the user's experience and also checked different parameters of the websites. The followings are the important principals of usability [8-9].

- ✓ Availability
- ✓ Accessibility
- ✓ Clarity
- ✓ Learnability
- ✓ Credibility
- ✓ Relevancy

A. Selection of Testing Methods

Users' needs lot of information's from the Educational websites such as Display space, Placement, and content of site map, Information search, Link colors, Up-to-date information, Download time, Back button, Open new browser windows, Respond according to users' expectations, Web advertising, Consistent design, Use of color, Organization of information and Navigational aids. For checking all these parameters from one website following usability methods were used and conduct different testing procedures [11-15].

- ✓ Guerilla testing
- ✓ Lab usability testing
- ✓ Unmoderated remote usability testing
- ✓ Contextual inquiry
- ✓ Card sorting
- ✓ Session recording
- ✓ Contextual Task Analysis
- ✓ Heuristic Evaluation
- ✓ Usability Testing
- ✓ Quality Assurance Testing
- ✓ HCI Design Approaches

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This research work of agility analysis is based on the usability methods lab usability testing and online usability testing. This testing performed on the academic website of the Quaid-e-Awam University of Engineering, Science & Technology (QUEST), Nawabshah, Pakistan and the university websites are a good source of information for all the users (students, job seekers, and faculty members) [7,10]. In lab testing, forty participants have participated and for the online usability testing, Pingdom online tool was used [13].

2. Research Methodology

These research works are the comparison of two different methods. Which is depends upon the two methods, one method is based on a performance website on online testing and the second method is based on the manually testing from the students of different departments as shown in Fig. 1.

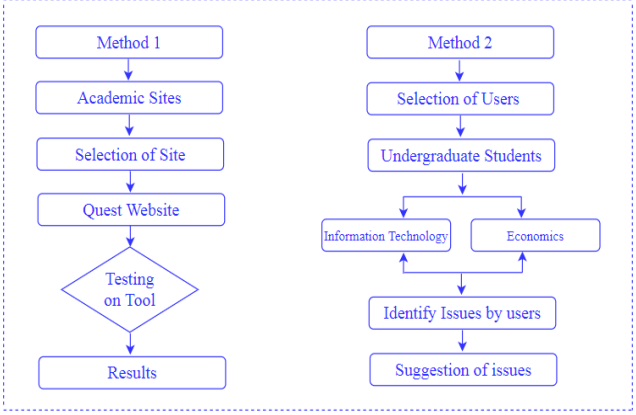

Fig. 1 Research Methodology of Proposed Work

A. First Method

Online testing is the best way to check the speed performance and also check many other parameters of any site. All of these parameters of speed are very important from their use. Many other online testing tools are available on the Internet for online testing, but in this research work, Pingdom is used for the speed performance of the site. Pingdom is a free available online trail/paid version as Shown in Fig. 2.

Fig. 2 Online Pingdom tool

The selection of sites means data set which is used for this research work. Academic sites are resources to use in daily life, which include academic information such as academic activities, books, research articles, faculty information, courses, student attendance, and other information. A variety of academic sites are available online schools, colleges, and universities in different domains such as Medical, Engineering, General and Arts-related. For this research work Website of QUEST was selected. This university is one of the famous universities from the province of Sindh, Pakistan.

B. Second Method

This method is based on manually testing by users, in this test, users were selected from a different domain, one is the Information Technology department and others are from the Department of Economics, Shaheed Benazir Bhutto University, Shaheed Benazirabad, Sindh, Pakistan. Twenty students from is the Information Technology department and the same number of students from the Economics department. Details of students/participants are described in Table 1.

Table 1: Details of Students/Participants in Testing of age 18-25 years

Undergraduate Students of Information Technology, QUEST			
No.	Student Name	Gender	Study Year
1.	Baqir Ali	Male	Final Year
2.	Allah Warayo	Male	
3.	Dua Noor	Female	
4.	Ilham Khan	Female	
5.	Humaira	Female	
6.	Noshad Ali	Male	
7.	M.Muneeb Khan	Male	
8.	Iqra	Female	
9.	Shahzaib	Male	
10.	Zafar Ali	Male	
11.	Mah Saba Maheen	Female	
12.	M.Anwar	Male	
13.	Erum Muneer	Female	
14.	Zainab Iqra Yasrab	Female	
15.	Bilal	Male	
16.	Hassan Zaib	Male	
17.	Adnan Aijaz	Male	

18.	Rooba	Female	
19.	Mishal Malik	Female	
20.	Muhammad Awais	Male	
Undergraduate Students of Economics Shaheed Benazir Bhutto University, Shaheed Benazirabad			
No.	Student Name	Gender	Study Year
1.	Ghullam Akbar	Male	2nd Year
2.	Abdullah		
3.	Aftab Ahmed		
4.	Zeeshan Ali		
5.	Mohsin Raza		
6.	Javed Ali		
7.	Shoaib Hameed		
8.	Ahmed Hussain		
9.	Irfan Ali		
10.	Zakir Hussain		
11.	Jam Salar		
12.	Sachal		
13.	Ghulam Yasin		
14.	Muhammad Hanif		
15.	Naeem-u-Din		
16.	Mohsin Raza		
17.	Rashid Ali		
18.	Imtiaz Hussain		

3 Testing of the Academic website

There are two testing methods were used for this research work. One is an online performance method and the other one is manually testing-based methods. These are further described in detail in the below sections.

A. Performance-Based on Online Testing

Online testing was carried out by the Pingdom online website speed testing software. This testing website of one engineering university (www.quest.edu.pk) was tested and checked the performance as shown in Fig. 3. In this online testing results of the Performance grade, Page size, Load time and requests were achieved. Pingdom online tool assigns the grade of the site is B and calculate the percentage 87. The page size of site 1.5 MB is given by the tool. Load time of site was estimated by the tool is 4.09 s and number of request of the site were 37.

Pingdom online software tested the educational websites in for parts, one is Content size by content type, 2nd is Requests by content type, 3rd is Content size by domain and Requests by domain is the last part as shown in Fig. 4. From the content type maximum size of 867 KB was occupied by the images and the minimum size of 1.4 KB was occupying by the Redirect. In the same way from the content type by domain the maximum size of 828 KB was occupied by the www.quest.edu.pk domain and the minimum size of 6.0 KB was occupying by the yt3.ggpht.com.

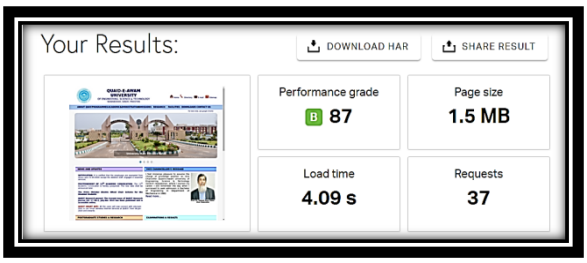

Fig. 3 Performance of the website through Online Pingdom tool

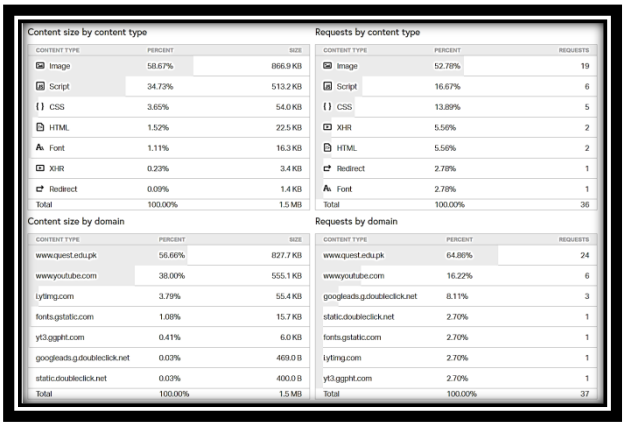

Fig. 4 Detailed Performance of the website

B. Performance-based on Manually Testing

In this testing procedure, all the students of Information Technology and Economics have used their sources during testing and open separately website one by one. This testing was performed at Shaheed Benazir Bhutto University, Shaheed Benazirabad. After opening the educational website of the university they check performance parameters. These parameters are as follows.

(a) Site Colour, Bootstrap
(b) Footer
(c) Quick Links
(d) Text Style
(e) Load Balancer
(f) Old User Interface
(g) Server Down
(h) Speed
(i) Bootstrap
(j) Help Desk
(k) Quick Links
(l) Live message

4. Results and Discussion

A. Results and Discussions of Online Testing Procedure

Online testing was performed on an educational website of QUEST by using an online Pingdom tool. There are four important parameters (Performance grade, Page size, Load time and Requests) for the checking of performance of the website. As the grade mentioned in Table 2, that Grade-D varies from 1-67, Grade-C varies from 68-76, Grade-B varies from 77-90 and the value of Grade-A is 91-100. Pingdom gives Grade-B to the QUEST website ant it means that the website needs to improve performance by using Gzip to reduce the size of the HTTP response. This technique reduces about 70% of the size for better performance.

Table 2. Performance by Grading

Grade	Suggestion	Grade	Suggestion
D-67	Add Expires Headers	B-89	Compress components with gzip
C-72	Make Fewer HTTP requests	B-90	Avoid URL redirects
C-75	Use cookie-free domains	A-100	Avoid empty SRC or HREF

This tool gives results in 14 attributes and these attributes are Load order, Load Time, Response header size, Response body size, Response total size, Status code, Blocked time, Connect time, Domain Name System (DNS) Time, Receive time, Send time, Secure Sockets Layer (SSL) time figure, Wait time and Content time is the last attribute of the result, also these attributes are shown in Figs. 5-18.

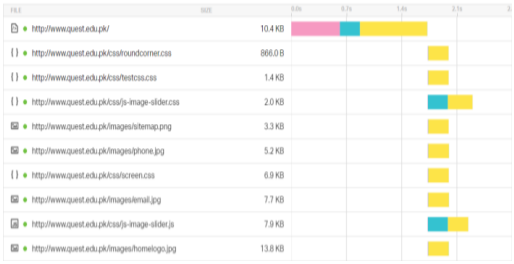

Fig. 5 Load order

Fig. 6 Load Time

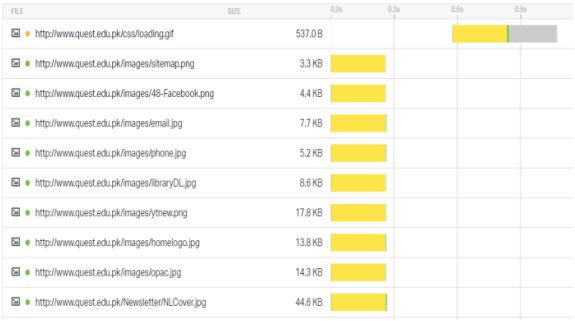

Fig. 7 Response header size

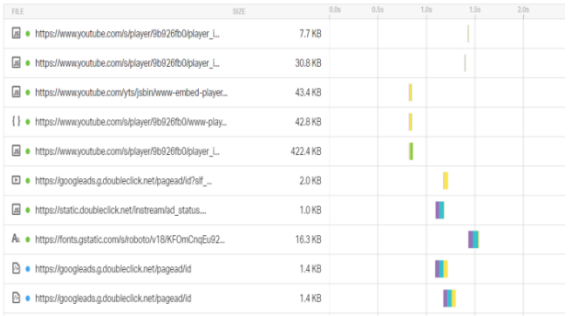

Fig. 8 Response to body size

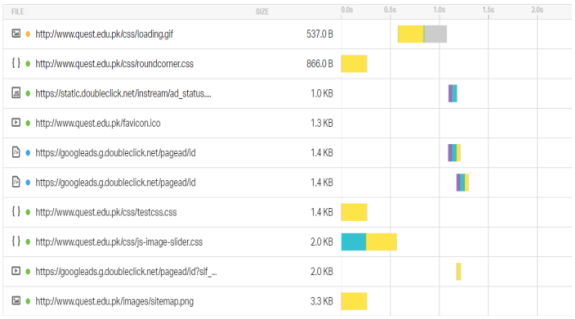

Fig. 9 Response total size

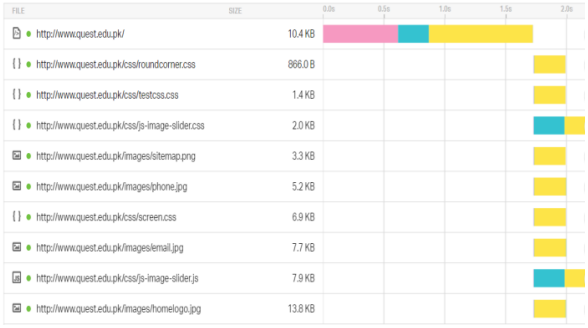

Fig. 10 Status code

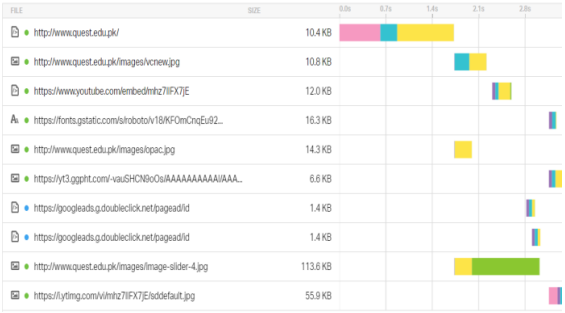

Fig.11 Blocked time

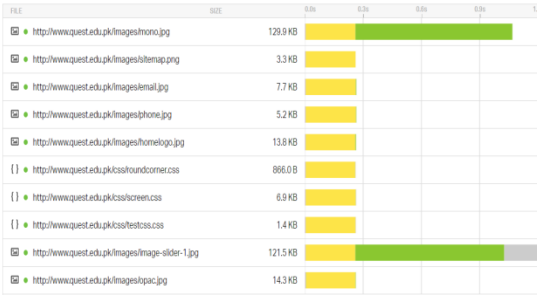

Fig. 12 Connect time

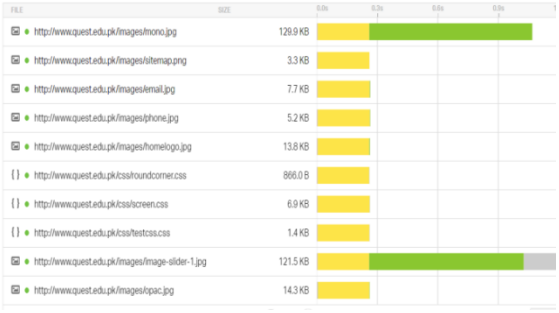

Fig. 13 DNS Time

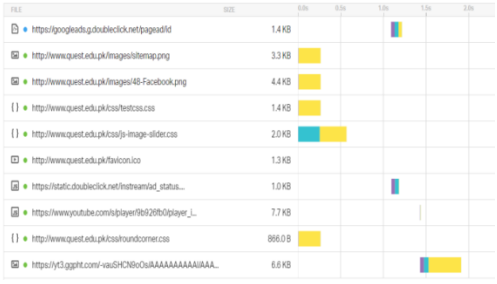

Fig., 14 Receive time

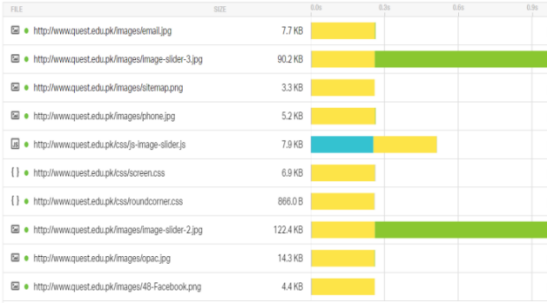

Fig. 15 Send time

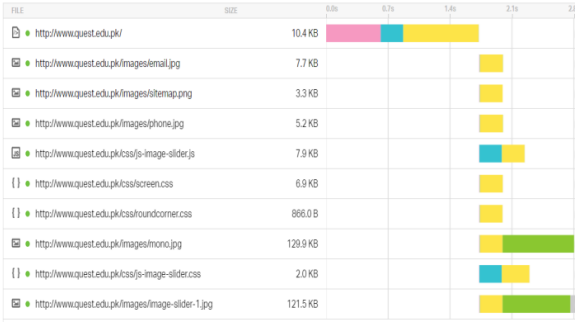

Fig. 16 SSL time

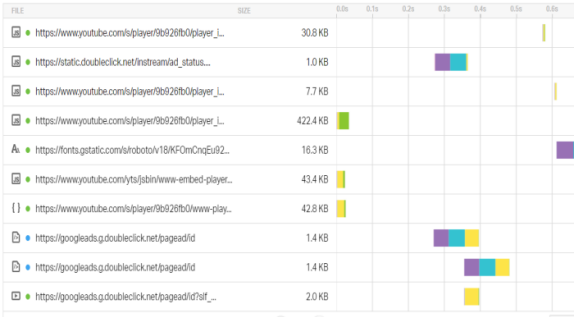

Fig. 17 Wait time

Fig. 18 Content time

B. Results and Discussions of Manually Testing Procedure

This manually testing was performed by two groups of students of Information Technology and Economics for the performance of the site of the parameters of Site Colour, Bootstrap, Footer, Quick Links, Text Style, Load Balancer, Old User Interface, Server Down, Speed, Bootstrap, Help Desk, Quick Links and Live message. The majority of the users have faced issues and they are not satisfied with the selected website for testing. Mostly they faced Load time, Quick search/links, speed, size of website and color of the website as described in Table 3. Also, users give their value able suggestions for the performance parameters of the website.

The users had an enormous impact on the design process of the website and they gave views about design on the official website of educational universality that it must be changed and give attractive design for users. This was the indefinable process of identifying uses from sites by using different browsers and devices. Also, they gave many suggestions regarding website related features. The developer also has a big step to redesign the site according to user wish who used multiple times a day.

Table 3: Identify Issues and Suggestions by Participants/Students/Users

No.	Parameters	Issues	Suggestion
1.	Site Colour	Not Satisfied	Background and Font color should be Changed
2.	Bootstrap		Not applied on Quest official website
3.	Footer		Should be added for information
4.	Quick Links		Should be added in the official website
5.	Text Style		Should be changed heading text is different from description text.
6.	Load Balancer		When users are increased, the site should down so balance the load of the site.
7.	Old User Interface		Redesign the Interface of the site and compare the site with different countries' sites.
8.	Server Down		During admission time server was down so trying to reduce the bulk of information on the main page and increase the strength of the server
9.	Speed		A download of the results page was slow, try to enhance the speed of downloading
10.	Help Desk		Provided help desk online
11.	Quick Links		New visitors have problems finding the link, what they want; Site must provide the quick link of related links for easiness of old and new users.
12.	Live message		Live message chat with the admin

5. Conclusion

Agility analysis of the academic website was done by two methods (online testing and manually testing), but from the analysis of online testing that the website has 1.5 MB size, having load time was 4.09 seconds and the performance grade was assigned by the Pingdom was Grade-B. Online testing was suggested that the website needs to improve performance by using Gzip to reduce the size of the HTTP response. This technique reduces about 70% of the size for better performance. By using this technique also reduces the size of the website, load time of the website and improve the performance grade. Manually testing was carried out by participants/users/students of two different platforms. They also faced the problems of lad time, speed, the color of the website and the size of the website. They suggest that Background and Font color should be changed, should be changed heading text is different from description text When users are increased, the site should be down to balance a load of site, during admission time server was down so trying to reduce the bulk of information on the main page and increase the strength of server, Download of results page was slow, try to enhance the speed of downloading.

6. Future Work

Future work of the study is to improve the performance of the website, decrease load time and size of the page. Also, this study increases the quality of the website and the preference of the users.

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