Comparison Between Two Schemes Of Web Site Design

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Abstract

This study is concerned with two design schemes of the web site of Al-Salam Hospital at Mosul city, northern Iraq. Two schemes based on PHP and HTML languages and JavaScript and HTML languages are employed for the design of site(1) and site(2) respectively. The two sites are compared on the basis of loading time and validation of the web site pages. Experiments are assembled to the purpose.

Page loading experiments show relative decrease in measured time on repetition of loading of each selected page and with decrease in speed of internet line (160,64,40 Kbps). Page loading to site(1) is faster than loading to site(2), and the loading time to both sites are significantly correlated (r=0.94), however, loading time to each site are insignificantly correlated (r<0.2) with theoretical loading time.

Calculation of (r) for separate sets of data shows similar factors affecting the time of page loading to both sites.

Image size determines the time of page loading at line speed, of 40 Kbps, where as, at speed of 64 and 160 Kbps, the influence of page size on page loading time is prevailed.

Validation experiments shows that improper filling of name , age and e-mail produce error in site(2) while site(1) accept incorrect filling.

Due to the fact that the designed sites are informational and humanitarian ones, it is expected that name, age and e-mail are properly filled. Therefore, preference of the design scheme of site(1) based on PHP and HTML languages is concluded.

Keywords: Web site design, design schemes comparison, loading time experiments, validity experiment, influential factors of loading   time and validity

introduction

The introduction of Web site in Iraq is relatively delayed for some time, whereas the growing rate of user and designer are thought to go at good pace in short time. The users are more interested in international sites, in spite of government and private sites are made available to the public. Limited school teaching of basic principles of computer and the introduction of computer (software and hardware) departments at different universities may contribute to the adaptation of Web life style in Iraq in the coming years [1].

Concerning Web site designer, limited attention is given by the academic worker where as the bulk of design effort were carried out by non-skilful and unacademics persons who gathered their experience on trial and error basis [1].

The problem most confronted to web site designer, is how to keep transparency of the designed Web site to the end user on one hand, and to be understood by developer on the other hand. The fundamentals of Web site design encompassed subjects such as design philosophy, target browser, screen, page moving convention, page length and scrolling [2, 3]. The discussion of Web site design often gets quickly off track because people comprehension of expression varies dramatically, while everyone has some sense of what Web site design is, nobody seems to be able to define it exactly. The present site design is devoted to help patients encouragement and trust the staff of Al Salam hospital for their health and medical care with complete privacy [1]. Certain components, such as visual design or programming, are generally included in any discussion, but their importance varies from one individual to other, as well as from one site to other [4]. Four primary aspects of Web site design, they are content, technology visuals and economics [5].

The present study deals with the design and development of a dynamic-interactive Web site of informational type which is shallow and with wide tree and optional structure. Two schemes are used for the site design, they are PHP and HTML languages and JavaScript and HTML languages for the design of site(1) and site(2) respectively. Comparison includes loading time and validation of Web site page . Al-Salam hospital is selected as an example for the present work. It is the largest hospital at the left bank of Tigris river in Mosul city, and characterized by its modern building of seven floor, eleven well equipped departments and well trained medical and technical staff [1].

Methodology

On May 2004, the authors made personal contact with Al-Salam hospital to establish scientific relation and to brief the hospital director on the general frame of the intended study. Later on, official inquiry was made to ask the hospital for relevant information and data. Classified data like births and death rates are not available.

The collected text and image information's are arranged in such a way to give the best and meaningful organization. The information design lead to hierarchy type of structure. Navigation aid (pop menus, cascading menus and others) are used to enable the visitor to move freely through out the site. The Icon-based GUI is selected for navigation style. The graphic design (GIF format) is used to assure message communication and to reflect the real aspect of the Web site. Depending on the data in the previous stage of design, a number of primary links are designed and home page is arranged in a wide hierarchy. Total of 21 pages are updated or constructed which cover eleven departments, visitor opinion, patient, administration, research and medical edification, invention and creativity, training courses, conferences and symposiums, publications and journal of medical horizons pages in addition to external and internal search engine.

The two sites are connected to internet through URL (http://members.lycos.co.uk/alsalamhospital, http://members.lycos.co.uk/alsalamhospital2005).
The major goal of the present study is to compare between the two Sites with regards to loading time and validity of Web site pages.

Results and Discussion:
Comparison of loading time and validity are based on experiments assembled for this purpose. Five pages are selected for loading time experiments. Table (1) show the details of the selected pages including page name, page size and image size.

Table (1) details of selected pages for the assembled experiments

Name of pages	Page size(KB)	Images size (KB)
2.HTML	6.08	587.61
15.HTML	11.04	511.14
17.HTML	15.94	393.25
Fateh5.HTML	24.53	50.28
20.HTML	42.33	461.43

The time of page loading to both site are measured using stopwatch of hundredth of a second precision. Time measurement is made for three fold successive loading of each page to both site at each line speed (40,64,160 Kbps) of internet. The whole measurement is repeated three times. Raw data of loading time measurements are shown in table (2).

Table (2) Raw data of loading time measurements

A) 40 Kbps

Name of Page	Page size	HTML + PHP			HTML + JavaScript		
		1	2	3	1	2	3
2.html	6.08 KB	130.31	128.62	94.48	100.31	102.00	97.09
15.html	11.04 KB	76.68	56.81	37.37	82.18	62.65	40.56
17.html	15.94 KB	75.93	48.96	41.38	73.31	55.18	38.34
Fateh5.html	24.53 KB	26.56	6.68	6.50	29.28	7.02	6.34
20.html	42.33 KB	64.50	30.65	22.78	73.34	27.40	29.93

Name of Page	Page size	HTML + PHP			HTML + JavaScript		
		1	2	3	1	2	3
2.html	6.08 KB	101.09	70.59	73.65	93.59	81.09	76.31
15.html	11.04 KB	67.71	34.37	29.50	87.78	56.90	60.53
17.html	15.94 KB	35.65	29.93	25.71	49.71	34.75	33.46
Fateh5.html	24.53 KB	35.28	20.62	6.56	26.03	9.25	7.93
20.html	42.33 KB	56.31	24.75	31.37	63.93	32.87	27.34

Name of Page	Page size	HTML + PHP			HTML + JavaScript		
		1	2	3	1	2	3
2.html	6.08 KB	71.53	69.09	61	100.96	93.09	83.93
15.html	11.04 KB	81.59	50.78	28.68	86.71	62.93	61.28
17.html	15.94 KB	52.06	44.81	24.90	59.93	42.31	23.62
Fateh5.html	24.53 KB	38.25	17.50	6.75	36	20.15	7.78
20.html	42.33 KB	59.71	25.75	29.40	73.78	42.93	18.96

Note: underline Numbers was used in calculation of average time.

Table (2) continue …

B) 64 Kbps

Name of Page	Page size	HTML + PHP			HTML + JavaScript		
		1	**2**	**3**	**1**	**2**	**3**
2.html	6.08 KB	23.37	3.43	4.09	13.15	4.87	5.84
15.html	11.04 KB	15.81	6.18	3.90	33.09	7.93	4.71
17.html	15.94 KB	13.84	5.37	3.75	8.43	5.62	4.68
Fateh5.html	24.53 KB	8.40	5.81	3.71	8.75	5.78	4.90
20.html	42.33 KB	12.68	6.53	5.34	14.56	9	7.43

Name of Page	Page size	HTML + PHP			HTML + JavaScript		
		1	2	3	1	2	3
2.html	6.08 KB	9.22	4.90	3.93	6.40	4.09	3.96
15.html	11.04 KB	4.78	3.68	3.50	3.96	3.59	3.75
17.html	15.94 KB	4.90	3.59	4.09	5.71	4.25	4
Fateh5.html	24.53 KB	6.60	4.50	4.43	5.37	4.81	4.68
20.html	42.33 KB	7.59	6.59	3.96	6.96	6.28	5.71

Name of Page	Page size	HTML + PHP			HTML + JavaScript		
		1	2	3	1	2	3
2.html	6.08 KB	3.50	4.12	4.18	2.28	4.25	4
15.html	11.04 KB	3.09	4.09	3.21	4.81	3.85	3.50
17.html	15.94 KB	8.68	3.59	3.75	5.03	4	4.18
Fateh5.html	24.53 KB	10.40	5.25	3.78	16.50	5.09	6.28
20.html	42.33 KB	13.90	8.62	6.81	8.87	7.28	6.87

Note: underline Numbers was used in calculation of average time.

Table (2) continue …

C) 160 Kbps

Name of Page	Page size	HTML + PHP			HTML + JavaScript		
		1	2	3	1	2	3
2.html	6.08 KB	6.90	2.40	1.56	7.15	2.65	2.60
15.html	11.04 KB	6.46	3.50	2.37	8.87	1.78	3.56
17.html	15.94 KB	6.96	1.50	1.12	10.06	4.15	5
Fateh5.html	24.53 KB	8.37	1.87	1.84	7.34	2.65	1.62
20.html	42.33 KB	8.21	3.78	2.12	13.34	3.93	2.81

Name of Page	Page size	HTML + PHP			HTML + JavaScript		
		1	2	3	1	2	3
2.html	6.08 KB	5.46	2	1.46	6.43	4.31	4.15
15.html	11.04 KB	6.62	2.03	1.43	6.81	4.06	2.96
17.html	15.94 KB	5.06	2.12	1.68	6.18	3.56	2.53
Fateh5.html	24.53 KB	3.34	2.96	2.53	5.21	4.31	2.28
20.html	42.33 KB	7.50	5.06	4.90	12.03	5.65	5.09

Name of Page	Page size	HTML + PHP			HTML + JavaScript		
		1	2	3	1	2	3
2.html	6.08 KB	2.40	1.21	1.18	7.25	2.12	1.53
15.html	11.04 KB	2.56	1.65	1.06	5.68	1.50	1.40
17.html	15.94 KB	2.40	1.21	1.93	9.87	1.37	1.34
Fateh5.html	24.53 KB	4.46	4.15	0.71	7.46	1.65	1.50
20.html	42.33 KB	10.90	2.43	2.06	9.84	2.90	2.59

Note: underline Numbers was used in calculation of average time.

Page loading is actually a lot like ordering a take-out restaurant deliver food at home door [6]. The impact of traffic and delivery rout should be considered. If the roads are congested with traffic, then it will take longer for dinner to arrive relative to clear roads, more over, major and direct roads are faster in delivery than small and indirect routes respectively. Instant variation in conditions of routing pathway may account for the fluctuation in measured time of successive page loading to both sites of the present study.

Examination of data displayed by table (2) reveals general trend of decrease in time measurement of successive page loading to both sites at each speed of internet line. This remark holds true for 93% of the obtained data. Less pronounced trend is also observed on repetition of set measurement.

The whole remarks can be explain by the following:

Since all selected pages of the present site contain images then caching has a major impact on time measurement of successive page and repeated page set loading [6].

The Web browser saves copies of images locally in a cache folder. By keeping the most recent loaded image on hard, the Web browser eliminate the need to repeat the image that appear more than one time within one site. This leads to decrease in loading time of present site pages [6].

The raw data of table (2) show wide range of variation. Closer values are underlined and included in the calculation of average value shown in table (3).

Table (3) Average Measurements of Loading Time (second)

A) 40 Kbps

Name of page	PHP + HTML	JavaScript +HTML	Theoretical Loading Time
2.HTML	90.63	91.84	1.21
15.HTML	42.87	60.88	2.20
17.HTML	40.48	43.89	3.18
Fateh5.HTML	10.74	12.19	4.90
20.HTML	27.44	29.91	8.46

B) 64 Kbps

Name of page	PHP + HTML	JavaScript +HTML	Theoretical Loading Time
2.HTML	4.11	4.47	0.76
15.HTML	4.06	4.58	1.38
17.HTML	4.14	4.46	1.99
Fateh5.HTML	4.58	5.33	3.06
20.HTML	6.92	7.21	5.28

C) 160 Kbps

Name of page	PHP + HTML	JavaScript +HTML	Theoretical Loading Time
2.HTML	1.64	2.9	0.3
15.HTML	2.14	2.54	0.55
17.HTML	1.59	3	0.79
Fateh5.HTML	1.92	2.83	1.22
20.HTML	3.39	3.83	2.11

The average loading time of site page decrease with increase of internet line speed. This reflects the well known fact of the dependence of page loading time on connection speed. Page loading to site (1) is always faster than the loading of the same page to site (2) as shown in table (2). The previous observation underline the efficiency of PHP relative to ASP language in page design of Web site [7]. Almost the same factors affecting page loading to both sites as concluded from the observed significant values of correlation coefficient (r=+0.94) between loading times to both sites.

The factor affecting differently on loading time is the scheme language used for the design of both sites and to some extent, routing pathway [7,8]. Insignificant correlation is noticed (r<0.2) between image and page size with loading time to both sites at all speeds of internet line. This is rather strange observation. However, calculation of correlation coefficients based on separated set of data (table 3) lead to the suggestion that image size determine the loading times (r>0.78) to both sites at 40 Kbps speed of internet line, where as at speed of 64 and 160 Kbps, the page size influence the loading time (r>0.88) to both sites. Validation experiments are based on two pages namely the patient page (5.HTML) and visitor opinion page (6.HTML). Both pages ask for name, age and e-mail. The experiments shows that improper filling of the forementioned information in both pages produce error in site(2)(Fig. a, b and c) where as, site(1) accept the incorrect fillings[9].

Fig. (a) Output of incorrect name filling to site 2

Fig.(b) Output of incorrect age filling to site 2

Fig.(c) Output of incorrect e-mail filling to site 2

Since Al-Salam Hospital site is of information and humanitarian type, then, proper information filling is expected. Therefore, it is concluded that site(1) is better and faster than site(2) i.e.

Design site based on PHP and HTML language scheme is preferred.

Conclusion

Many factors determine the time of page loading to Al-Salam Hospital Web site. They are: language scheme, internet line speed, routing pathway, page and image sizes. Cache folder play major role in time measurement of repeated page loading. Fluctuation in loading time reflects instance conditions of page routing pathway. Considering the shorter loading time and the informational and humanitarian feature of the site, therefore, the designed site based on PHP and HTML scheme is preferred.

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