

Quality evaluation of portal sites in health system, as a tool for education and learning

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ABSTRACT

Background: The main objective of creating a portal is to make information service available for users who need them for performance of duties and responsibilities regardless of the sources. This article is attempted to consider the parameters that can evaluate these sites since these criteria can be effective in designing and implementing such portals. On the other hand, portal sites in health systems of every country make it possible for leaders, policy makers, and directors to system education as a tool for new learning technologies. One of the main decisions each manager has to make is precise selection of appropriate portal sites.

Materials and Methods: This is a descriptive and qualitative study. The research sample was 53 computer professional working in the area of computer programming and design. In the first part of the study a questionnaire was send to the participants and in the second part of the study based on their response to the questionnaire the participant was interviewed and the main themes of the studies were formulated. The validity and the reliability of the questionnaire were confirmed. **Results:** The study results were summarized in 10 themes and 50 sub-categories. The main themes included were portal requirements, security, management, and efficiency, user friendliness, built-in applications, portal flexibility, interoperability, and support systems.

Conclusion: Portal sites in any education systems make it possible for health system leaders and policy makers to manage their organization information system efficiently and effectively. One of the major decisions each manager has to make is precise selection of an appropriate portal sites design and development. The themes and sub-categories of this study could help health system managers and policy makers and information technology professionals to make appropriate decisions regarding portal design and development.

Key words: Distance education, educational activities, education, information, portal website

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INTRODUCTION

Increasing development in the field of information technology and its proper infrastructure preparation for rapid transfer of information on the one hand and great dependence of all the social issues and needs on information on the other have led to a new era in social life called “information society.” This dramatic transformation, which is rightly called information revolution has deeply affected human lives and their relations and has made a change from “capital-based” to “knowledge-based” classical development frame-works. It is clear that the infrastructure of this development is training the manpower and the main way of fulfilling this requirement is through appropriate information systems. Portals have an

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increasing role in the delivery of health messages and are inseparable parts of the learning and teaching process and can dramatically improve health in the population and increase health literacy. Nowadays, printing and distributing media are expensive and time-consuming. Therefore, not only students and professionals, but also, people can create educational portals and classify them by type and subject matter and then refer to them, open the file and read the discussions. Therefore, its' importance in preparing cultural-educational infrastructure for training and educating expert and experienced forces becomes more obvious than before.^[1]

PORTALS

Portal is a service or a website that presents a wide set of services and resources such as electronic mail, search engines, and online shopping markets. The first portals, provided online services, but, nowadays, most of these search engines have turned to portals in order to be more attractive and consequently attract more users.^[2]

Portals play an important role in the field of education so that examples of their potential benefits can be mentioned in many countries like Glow in Scotland, Kennisnet in the Netherlands, and National Portal of Education in Kenya. Studies have shown that teachers and professors use computers and technologies as a means of preparation and a supportive tool in the first place^[5,6] rather than an educational tool in the classroom.^[7]

Portals have numerous advantages for their users which include:^[8]

- Improving efficiency to target learning requirements and identify their related solutions
- Having advanced capabilities and design
- Improving investment efficiency in learning.

World Health Organization expresses its goals and definitions for health education as follows:

- Encouraging people for active participation in health measures, either individually or communally, in order to maintain individual's health
- Equipping individuals with the required knowledge and skills and influencing their tendencies in a way that they can solve their own health issues
- Providing essential conditions for improving health services
- Preparing and motivating people to accept and maintain health habits
- Informing people of health and medical services in their countries
- Helping people to be healthy by their own measures and activities in a way that they can be ready to accept the responsibility of their own health and their community.^[9]

As can be understood from the definition of portals, they should be easily used by the simplest Internet users for obtaining their required information and finding their

required services. Hence, the main purpose is to provide the possibility of easy access to everything (information and services), which user needs so as to do his/her duties and responsibilities, regardless of the location of that source.^[12] Studies have shown that user's positive outlook is a vital for every portal and their expectations should be met in line with their positive ideas in the first place.^[13,14]

In this regard, one question arises before implementing an educational portal which is "what are the rating criteria of an educational portal for community health?" That is because arranging and collecting these criteria can greatly help in the design, implementation, rating, and correct selection of administrators and users.

Interviews with informatics experts about the analysis of implementation tools of these websites and their capabilities and also people's requirements helped to extract some parameters as follows.

System requirements

Every web-based software program requires a set of hardware and client and server software. Portal requirements include:

- Programming language: A language by which the portal is implemented
- Data Base Management System: This can be used for implementing the required database management system
- Access permission to code: Portal producer's permission to the content of source codes in order to meet specific needs in future
- Access management: Defining different access levels for different users in the portal in order to change its content.

Security

Security and other standard authentication and security methods are very important factors for rating. For instance, capability of connection and synchronization with active directory of the portal in the case of hackers' attack and sending warning messages for the administrator of portal website can have a great role in maintaining information (due to some reasons, a few parts of the portal might not operate as expected and users might face some errors).

Administrator

It is natural that the administrator of the portal needs some statistical tools to make proper decisions. The core of training systems and electric learning is its management system. Portal management systems have been designed for the distribution, follow-up, reporting, managing educational content and student achievement. The main goal of an educational system is implementing educational needs. The management system must be smart to prepare lessons software according to the learner's taste. Management capabilities in the portal include:

1. Ability to evaluate and assess
2. Curriculum management

3. Guide the learner in the learning
4. Educator management
5. Back-up capability
6. Appropriate security capabilities
7. Ease of installation
8. The distribution function
9. Learner's management
10. Reporting
11. Integration with existing systems
12. Sharing information with these systems
13. Personalized ease
14. Ability to schedule events.

Performance

- Caching: Saving pages while visiting them and possibility of re-visiting them after disconnection
- Database replication: Ability of making back-up from databases to be used as a substitution in the case of any problem
- Load balancing: Possibility of traffic control and data distribution in different paths for loading webpages
- Static content export: Possibility of converting web pages to other file formats for saving or sending
- Cost: Costs of design and implementation of portal selection and purchase.

User friendliness

Unfriendliness means taking into account the user in various areas. Being multilingual portal, sending e-mail, updating a department, board, forum, news, maps, relevant portals, sub-sites, and Internet search, personalization by the user, personalization by the portal are among examples of user friendliness. The user must have a feeling of satisfaction, not a sense of isolation or alienation while entering the portal.

Built-in applications

In order to get a better result in informing and creating a proper transaction with users, a set of control management system (CMS) are required for showing the content in a more integrative way; moreover, data entry also does not require an expert.

Flexibility

Flexibility in transaction with other databases and programming languages is among other important factors in rating a portal, which is located in this group. Furthermore, the portal will have the potential to be used depending on the learners' needs.

Business

This section is about the possibility of connecting to the desired credit card or possibility of sale and using electronic shops of portals. Portals must provide other needs of users, as well. Since, the portal sites must also provide additional user needs, they also act as the electronic interface among employees, suppliers, manufacturers, and customers. Unique feature of portals enables linking software on different servers. Hence, portals are known as an e-commerce cyberspace source.

Interoperability

A set of operations occur internally in the portal system (such as filing...). This set, which will be eventually shared with other portals and software belong to this group. A (Sco) is the smallest and lowest level of components with the availability of runtime environment as well as e-learning and teaching management system. The portal is to receive and share information. In better words, the portal organizes and displays information in different sites and databases.^[10]

Support

In every software system, user manual, online instruction and user, management, and development training are among the most important tools, which have the highest values. This support is important since all the users of the portal are not professional users. The portal should provide the possibility that even the least experienced users can make use of the information and services provided.

In this paper, there was an attempt to present rating criteria of educational portals for community health.

LITERATURE REVIEW

After doing research about the rating criteria of educational portals, the author decided to mention some parameters used for the selection of portals.

| Content and menu management | Web-based form-making management |
|--|--------------------------------------|
| Capability management website | Output management PHP, HTML, Asp |
| Website optimization management | Internet radio management |
| Powerful text editor | Management of system |
| Website additional languages management | User management |
| Advertisement management | Virtual shop management |
| Management of services and goods | Management of news and newsletters |
| Really simple syndication feed management | Chat or forum management |
| Image gallery management | Links management |
| Virtual library management | Dictionary management |
| Survey management | Moving messages management |
| Calendar management | Website titles management |
| Website capability management | Cascading style sheet management |
| Organizational chart management | Personnel introduction management |
| Website characteristics management | Database management |
| Website counter management | Viewer supervision management |
| Management of visiting statistics for each section | Magazines management |
| Standards and certificates management | Management of companies and partners |

MATERIALS AND METHODS

This descriptive survey was conducted on 53 faculty members and information technology experts who had experience in the field of web-based programming. In order to do the research, purposeful sampling method was used.

Information collection for this study was performed by searching the Internet websites, interviewing relevant experts and preparing five-level Likert scale questionnaires based on the standards of software engineering and the Internet and author's own experiences. Formal and content validity of the formulated questionnaire was based on the interviews with a number of informatics experts. To ensure the reliability of the questionnaire; it was first implemented on 20 participants from that population (pilot study) and achieved Cronbach's Alpha co-efficient of 0.78.

Finally, all the data obtained from the final questionnaire were analyzed using SPSS software. In this study, *t*-test was used because this test is used to investigate effectiveness (low and high) of the variables, the effects of which have been previously approved.

FINDINGS

According to Table 1, the maximum frequency of 49.95% belonged to those with Bachelor's Degree and 41.50% and 9.43% belonged to the participants with Master's Degree and Ph.D. in computer, respectively.

Considering the results obtained from Table 2, the maximum frequency of people's experience was between 10 years and 16 years.

Table 1: Distribution of educational level of respondents

| Statistical indicators of education | Frequency | Percent |
|-------------------------------------|-----------|---------|
| BA | 26 | 49.05 |
| MA | 22 | 41.50 |
| Ph.D. in computer | 5 | 9.43 |
| Total 53 | 53 | 100 |

Table 2: Frequency distribution of the number of activities respondents

| Statistical indicators of work experience (year) | Frequency | Percent |
|--|-----------|---------|
| 3-5 | 10 | 18.86 |
| 5-9 | 12 | 22.64 |
| 10-14 | 20 | 37.73 |
| 15 | 11 | 20.75 |
| 53 | 53 | 100 |

Table 3: T-test to check the system requirements

| Test value: 3 | | | |
|---------------------|---------|-------|----|
| The mean difference | Mean | Sig | df |
| 0.13056 | 3.13056 | 0.017 | 52 |

T-test was done for all the criteria. The following Table 3 shows the result of *t*-test for "system requirements." Since the value of observed *t* was significant at $P \leq 0.5$ level, hypothesis one was accepted. In other words, this criterion had significant importance in rating portals of health education. Similar to the previous example, the effectiveness of other parameters was also investigated separately.

According to the data obtained from experts and their analysis, the parameters and factors which were 70% more effective than other parameters were as follows:

1. System requirements,
2. Security,
3. Management,
4. Performance,
5. User friendliness,
6. Built-in applications,
7. Flexibility,
8. Business,
9. Interoperability, and
10. Support.

The results showed the importance of effective parameters of rating criteria for portals of health education all over the society, which included:

- a. In the section of system's requirements, content production of a health education portal had the highest importance
- b. In security section, defining different levels of accessibility for hierarchical changes of the educational portal and also the possibility of identifying and recognizing the people who make changes in the portal showed the highest importance
- c. In management section, defining schedules for displaying portal content, statistical possibility for appropriate decision making about management of portal and costs of selection and purchase had the highest importance
- d. In performance section, caching the pages while visiting, the possibility of revisiting after disconnection, possibility of converting webpage format to other file formats for saving or sending had the highest importance
- e. In user friendliness section, the possibility of editing with appropriate options for typing and printing in the portal and also the possibility of multilingual change for the webpages in portals of community health had the highest importance
- f. In built-in applications section, chat and question and answer for the users of the portal and e-mail services in education portal of community health had the highest importance
- g. In support section, user manual in the portal, online user guide in the portal, having source code in the portal's maintenance period, the possibility of training users, management and control in the portal and, finally, website map had the highest importance in the educational portal of community health.

DISCUSSION AND INTERPRETATION

Results of previous studies about the effective parameters in quality and costs of software production demonstrated that one of the effective factors in the selection of automation software in a system is having the source code. These factors play a determining role in system independence in terms of software maintenance and support to such an extent that completing future needs, correcting present problems and errors and also adapting the software with the up-to-date technology requirement having the source code.^[18] However, this article demonstrated that this criterion is not much important for portals and (CMS) are usually used for the current support; thus, lack of source code is not considered a main disadvantage or defect.

The second point is that the results of this study showed that activities related to the generation and maintenance of the portal systems are spreading in a way that even non-experts in the field of computer can change and modify website content where previous studies showed that the presence of an expert in the field of computer is essential for modifying the software.^[19]

The third point is that the results obtained in this study demonstrated that user manual of the portal was significantly important whereas previous studies indicated that user manual is not much important and the documents related to programming lines are inevitable issues.^[19]

It can be concluded that educational portals have valuable economic and social advantages such as reducing costs, accessing information through different systems, accelerating activities, sharing information, better decision-making, connecting people to information and expertise, increasing users' performance and so on; thus, they can be very effective in meeting the users' needs. Accordingly, their design and implementation are inevitable.

CONCLUSION

This paper intended to familiarize managers with the selection of a portal for health systems, medical centers and research centers and specifying it stating criteria and

parameters since this can be very effective in improving the qualities of portals in order to present more effective services; therefore, the designers can proceed in designing these sites in a more efficient manner. In order to create an educational portal and changing that into a very important factor with high potentials in public education infrastructure, it is recommended to do research to develop a comprehensive strategy-driven (as opposed to teacher-oriented). Educational portals creation is a necessity not a choice. Theoretical material can be placed on the portal. Furthermore, research centers, including centers for diabetes, cardiovascular disease, infertility, etc., can use this method to expand the research result among people.

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