

Evaluation and proposal of an ergonomic website design case for Oum El-Bouagi university website

تقييم واقتراح تصميم أرغونومي لموقع إلكتروني دراسة لموقع جامعة أم البواقي

Kerbouche Hichem¹, Ababsa Khawla², Aziez Islem³

كربوش هشام¹، عباسسة خولة²، عزيز إسلام³

¹ Oum el-Bouagi university_(Algeria), hichemkerbouche@gmail.com

²ERAPSÉ lab O E B university_(Algeria), khawlaababsa1@gmail.com

³ ERAPSÉ lab O E B university_(Algeria), aziezislem@gmail.com

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Abstract:

Our study aims to reveal the strengths and weaknesses of the University's current website design, in order to provide convenient suggestions to help increase quality. This analytical descriptive study was based on study case, used two tools: the e-questionnaire (850 individuals, consciously selected), and a exploration interview (with 03 website designer), both tools were built based on the website's ergonomic design criteria.

We found some positives for the site, compared to many negatives, this enabled to nominate an appropriate ergonomic recommendation to university website the design.

Keywords: ergonomic website design; website design; university.

JEL Classification Codes : M310

ملخص:

تهدف دراستنا إلى الكشف عن نقاط القوة والضعف في تصميم الموقع الحالي للجامعة ، من أجل تقديم اقتراحات أرغونومية للمساعدة في زيادة الجودة. استندت هذه الدراسة الوصفية التحليلية على دراسة الحالة ، اعتمادا على أداتين: الاستبيان الإلكتروني (850 فردا ، تم اختياره عمدا) ، ومقابلة استطلاعية (مع 03 مختصي تصميم مواقع الويب) ، تم بناء كلتا الأداتين بناء على معايير التصميم الأرغونومي لمواقع الويب. وجدنا بعض الإيجابيات للموقع ، مقارنة بالعديد من السلبيات ، مما مكننا من اقتراح توصيات أرغونومية مناسبة لتصميم موقع الجامعة.

كلمات مفتاحية: أرغونوميا تصميم موقع الكتروني ؛ تصميم موقع ؛ الجامعة .

تصنيفات JEL : M310

Corresponding author: kerbouchehichem, Email: hichemkerbouche@gmail.com .

1. INTRODUCTION

The Internet has become one of the basics of communication and business performance all over the world, and this giant network has become increasingly important, as it has become a gateway to the economy, politics, and social communication of the world's people. It is the destination for millions of users every day, not only for social communication and cultural information, but also for e-commerce, banking, administration, and services, including governments, private institutions, and individuals, and it has become easy for every individual or collective hiss. A free mother organization offers its services through its own websites so that all organizations have become dependent on websites to offer their services .

Among the most prominent institutions that relied on digitization and websites are educational institutions at all levels, foremost among which are universities, which took advantage of this development in the field of technology and have become competing among them to provide the greatest amount of services through websites. It was considered a source of strength and distinguished it from other universities .

This desire to be distinguished and to reach high levels of user satisfaction required the intervention of specialists in ergonomics, where the latter focuses on mental processes (perception, memory, logic...) The user interaction is the human-machine system, and we analyze user interactions with the interface to check whether the interface features are compatible with the user's needs, to make the use of the interfaces as simple as possible, in terms of display tools, and the nature of perception, So that the user focuses on the task they are about to perform and only .

Oum el-Bouagi University is one of the universities that have recently developed its site, and it relies on it for most tasks and provides all the latest information, at the level of all colleges, but there is a clear reluctance to use it by the users to whom the site is directed (Through a research survey), this study evaluated the site based on approved site design criteria, intending to answer the following questions :

What are the pros and cons of website design ?

What suggestions can be made to achieve a good and effective design ?

2. Theoretical side:

2.1 Ergonomic

Since the inception of ergonomics following World War II, researchers have tried and are still presenting different definitions of it to determine the scope of its study, and we will present the most important :

History and diversity of ergonomics definition

Man's adaptation to his profession (Bonnardel - 1947)

Adaptation of the machine to man(Faverge, Leplat and Guiguet - 1958)

Ergonomics is the scientific study of the relationship between man and his means, methods, and workplaces. Its objective is to develop, with the help of the various scientific disciplines which make up it, a body of knowledge that, from a perspective of the application, must lead to a better adaptation to the man of the technological means of production, and workplaces and living environments. (SELF - 1969)

Ergonomics can be defined as the adaptation of work to man, more precisely, as the implementation of scientific knowledge relating to man and necessary for designing tools, machines, and devices that can be used with maximum comfort, safety, and efficiency. (SELF - 1970)

The implementation of scientific knowledge relating to man and necessary to design tools, machines, and devices that can be used by the greatest number with the maximum comfort, safety, and efficiency.(SELF - 1988).

Ergonomics is a technology whose object is the arrangement of man-machine systems or, more generally, working conditions, according to criteria whose most important concern is the well-being at work (comfort, satisfaction, health, safety, etc.).Labour Science, or the Whole of Labour Sciences. Jacques LEPLAT (Encyclopedia Universalis 1989)

Ergonomics (or Human Factors) is the scientific discipline that aims at the fundamental understanding of interactions between humans and other components of a system, and the profession that applies theoretical principles, data, and methods to optimize well-being. Being people and the overall performance of systems – Ergonomic practitioners, and ergonomists contribute to the planning, design, and evaluation of tasks, jobs, products,

Organizations, environments, and systems to make them compatible with people's needs, abilities and limitations. IEA (International Ergonomics Association 2000)

A straightforward definition of ergonomics:

Ergonomics is about adapting work to people (not vice versa).

The ergonomics are the appropriate ones. An ergonomic tool is suitable for the operator and his working environment.

In addition, ergonomics also means adapting the product to the intended use by the user. A product or equipment is ergonomic when it is suitable for the user and the environment in which it is used.

Defining Ergonomics from a Practice & Business Perspective:

'Ergonomics is about characterizing the relationship between human beings, whether they are operators, users, customers... and a tool or a product in a context, an environment, a place of life, to design the most appropriate tools and systems for the use that can be made of them A formal definition of ergonomics:

'Ergonomics is the scientific study of the relationship between man and his means, methods, and workplaces. Its objective is to develop, with the help of the various scientific disciplines which make up it, a body of knowledge that, from a perspective of the application, must lead to a better adaptation to the man of the technological means of production, and workplaces and living environments." Fourth International Ergonomics Congress of the Society d' Ergonomic de Langue Francaise (SELF), 1969. Levels of applications of the Ergonomic :

The following are the following :

It is also used to refer to the physical characteristics and specifications of individuals and to apply these data to the design of the seating capacity, control panels, displays, and workstations concerning the work order .

Environmental geometry: It relates to the effects of various physical factors such as lighting, heat, humidity, and vibration noise on the performance of individuals.

Cognitive Human Engineering: It relates to the way individuals think, their concepts, and the information they provide to apply this data in designing programs appropriate to their mental ability (mental, intellectual)

It is based on the design of the work in a way that ensures the right work effort and other characteristics such as the diversification of tasks, and the achievement of self-control ...

It focuses on the interaction of individuals with the overall organizational design of the work system so that individuals use their relationships with colleagues, their functions, equipment, workplaces, and organizations (Assali, 2019, p. 16-17) .

Despite the many levels of their application, the stages of the forced intervention are fixed in all areas as described in the following element.

2.2 Employ ergonomics in website design

web design:

Create a Web site (a set of files placed side by side on one or more Internet servers) that allows the display of the content (content and interactive interface) to the end user in the form of a Web page on request that contains many elements such as text, mailing forms, and bitmaps; All this is arranged by one of the languages used such as CSS, XHTML, HTML, Javascript (Mohammad Abdul Fattah Mahmoud Ramadan,2017,p. 06)

Tomas Apowell defines the design as: "a blueprint for designing the main interfaces and internal pages by controlling text, colors, interactive elements and multimedia, and linking them in a convenient, attractive and easy-to-use way ".

Helmi Mohsib states that the design is: "the process of placing structural elements harmoniously so that each structural element supports the other, taking into account the accepted principles of the design, which are: Unity, contrast, equilibrium, and motion, as the design places each structural element in its proper place according to the psychological and physiological theories of visual communication" (Nada Al-Saadi, 2020, p.:30)

Before being detailed in the concepts of the website, we will briefly refer to the difference between the web platform and the site because of the many confusion between them .

Platform and Location :

The platform is a web portal that is concerned with providing interactive services that vary according to the nature and activity of this platform, as well as the information it is provided through .

The website is only interested in providing information in one or more areas, and it rarely provides interactive services .

There are some differences in which an electronic tool can be described as a platform, a portal, or a site, the most important of which are the following :

All platforms and portals should provide interactive services as well as information, and the lack of services and service applications makes them out of the portal space, while the site may only offer information and may offer a few interactive services. In both cases, it retains the status of the website, but in the case of the sites, it can change its theme and logo at any time if it so wishes without any link to any other party. .

However, many websites overlook the idea that the domain name is the same as the site name, and this is evident in many Arabic sites .

The e-platform requires an integrated network of engineers and specialists in computing and programming to be ready, follow up, and always communicate with its visitors in a way that achieves the intended purpose for which the platform was launched. While the site requires only a limited number of programs, only one site manager can be met.(Asmaa Nuri, Mohamed Abboud, 2021, p.:01,04)

Definition of websites :

"A website is a set of interconnected pages that contain certain texts, images, videos, audio files, and other files so that this site is located or hosted on a specific server in one of the hosting companies so that it can be accessed via the internet from any site in the world(Mohamed Abdel Fattah, 2017, P. 06) "the Website is a set of interconnected pages that contain certain texts, images, videos, audio files, and other files so that this site is located or hosted on a specific server in one of the hosting companies so that it can be accessed via the internet from any site in the world" (Mohamed Abdel Fattah, 2017, P. 06) " This is a file so that this site is located or hosted on a particular server

at a hosting company so that it can be accessed on the Internet from any site in the world (Mohamed Abdel Fattah, 2017,p. 06)

This is how we can publish information directly to another party through the Internet, and communicate with millions of people who use the web and the Internet, and the site is placed on a Serveurs server and its contents are accessed by the browser. (Ben Daho,2013,p.76)

Website types :

Static web sites :

The content is fairly fixed as determined by the owner of the site from the very beginning of its publication, and it changes only by the developer of this site until it changes these content or formats.(Majdi, Adel, 2017,p.:36)

Dynamic web sites:

Pages also enter data into the database from the user who is the site's most frequently used user (Yousef, p.10) .

Another classification believes that websites are diverse sponsors and that any person or organization can build the site that they deem appropriate to support their work or person, based on which the following types can be distinguished :

Personal sites: Private sites these sites take the character of the person speaking at the time of their page and are sometimes informal where they are not supported by an organization or organization .

This site includes all commercial and promotional sites that promote a commodity, and also includes educational, media, and other sites that may contain URLs of some scientific research, resources, and pain that serves a particular subject .

A portal site is a large site that includes search engines and indexes for topics and companies, as well as some institutional guidance, and offers many media and advertising services ,

news sites and press sources: (news and journalistic sites):

They are sites of news, newspapers, and electronic magazines .This is a web page that is about an issue or a point of view, such as anti-drug or anti-smoking and is usually the responsibility of government organizations and organizations .

Graphical criteria for evaluating websites :

Website specification according to ISO definition :

This is how quickly the user can first browse the site, understand it, and understand it .

Usage efficiency: How quickly the beneficiary who has been browsing the site several times in performing basic tasks

Remember: How much you can remember the beneficiary who has already been on the site .

Repeat Error: Is it intended to make a frequent error when using the site

The objective and satisfaction of the beneficiary: Or to what extent the site is preferred to be used, The criteria for the World Summit Award (WSA) include

Content quality and comprehensiveness in depth and authenticity Easy to use, navigate and navigate work Use of added values such as interaction and multimedia. The attraction of design, the use of sound and visual effects, and the professional quality (technology) are the strategic importance of the site and its role in the development of the information society worldwide.(Sumayya Thinou,2017,p.:35)

There are other criteria for a group of researchers, the most important of which are :

Ben Schneiderman's criteria for evaluating the user interface:

Learning time - fast man-machine execution - error rate and ease of recovery - keep learning over time - satisfy personal user

The seven rules of kutaz:

-Consistency - seeking shortening - reducing cognitive load - putting control in the hands of the user - flexibility of use - organizing dialog - predicting errors

Dominique Scapin and Cristian Bastien Evaluation criteria: In practice, we separate the sub-criteria set as follows :

Guidance: It is a set of guidelines and guidance to facilitate the use of the system, learn it, and Through Invitation, Grouping, and the distinction between items. It is a matter of fact that we are not in a state of the world .

The orientation is readable: For easier reading and a better understanding of what is displayed on the screen, such as using dark text on a light background makes content easier to read .

Workload: Reducing the psychological and mental burden of location perception through techniques such: Brevity/conciseness / minimal actions/information density.

explicit control: Where indicates the degree of user control over the processing performed by the system ‘It is embodied through explicit actions ‘user control

Adaptable: Adaptability to the means available to users to customize the interface to consider: Preferences, abilities/skills, habits, the context of use, and how each of the recommendations works ,It is embodied through flexibility, Taking into account the user's experience.

Error management: aimed at avoiding or reducing user errors and enabling them to be corrected,

Three sub-criteria have to be taken into account: protection against errors message quality error correct.

Homogénéité-Cohérence: Makes learning faster because what is learned in one place also applies else where (generalization), displays navigation systems continuously on all pages of the site, provides a link to the main page of the application on all pages

Significance of codes and names: speak the user language, and select the appropriate words and symbols used in the site .

Compatibility: The ability of the program to integrate into the real activity of the users in which it is used (physical, psychological, demographic, experience, competence, expectations, needs,..)

(khaoulabenmoussa et al ,2019 ,p :858)

Accessibility: The ability to access the site, and to make it available to all types of users ,

Usability of its sub-criteria: The convenient quality of interactive systems, enabling users to use the site to achieve specific goals, effectively, efficiently, and content .

Emotional design and its norms: Their component in generating themes that focus on themes, creating sites that generate the right emotions for a positive user experience

Interactive persuasion: A conscious effort to influence the ideas or actions of the Forum, which is characterized by the fact that even to modify the position or behavior, it must remain hidden in some cases to the user .

3. Field side of study

3.1 methodology

During our topic, we considered using the descriptive, analytical method, based on the case study of Oum el-Bouagi University site to evaluate it.

Study Sample: The main objective of our study is to evaluate Oum el-Bouagi University's website according to the criteria of ergonomic web design, so the sample is intended, and the research community is the individuals who are users of the university site, where the emphasis is placed on the quality of the university's user (professor, administrative officer or student). An electronic questionnaire was distributed and the number of replies was estimated at 850 and were categorized as follows:

Table (1) Structure of the Statistical Research Society

Percentage	Number	User attribute
18,80%	160	Professor
16,50%	140	Administrative Officer
64,70%	550	University student
100%	850	Sum

Data collection tools: In this study, we used the electronic questionnaire, directed to the users of the website to:

- Determining the basics of ergonomically designing for the university site.
- Set good site design criteria.
- Access to as many users as possible.

Design: Experts have been enlisted to design the questionnaire, a way in which the topic is put to the experts, attention to their views and modifications, scrutiny every time, and return the tool to experts until final validation.

After presenting the form to the sample experts (professors and researchers in the field of ergonomics, designers of websites that have been amended and modified repeatedly and repeated and returned to the experts every time their observations are taken into account and amended until they reach full agreement.

3.2 Presentation and discussion of results

View Results by axes

Verdict	percentage		axes
	No	yes	
Unavailable by 2/9	78.2%	21.8 %	accessibility
Unavailable by 3/23	91.88 %	8.12%	usability
Totally unavailable	100%	0%	emotional design
Totally unavailable	100%	0%	interactive coax

Discussion of data

From the results shown in the table we can consider that: As for the accessibility standard: most of the features of the sub-criteria, the accessibility standard, are not available on our site, as only two of the 11 features were achieved, and a weak percentage indicates that the majority of the sample finds it difficult to access the site and the information contained therein. As for the usability criterion, it was available in only 3 properties out of 26 properties, for the usability criterion, which is a very small percentage, which means that most of the respondents find it difficult to use the site. Emotional design standard: all the characteristics of the emotional design standard are not available on the site, that is, this aspect was not taken into account during the design of the site, which left a negative impression on users .

Emotional design standard: all the characteristics of the emotional design standard are not available on the site, that is, this aspect was not taken into account during the design of the site, which left a negative impression on users. The interactive persuasion criterion: it is also not achieved in the design of our site, as it did not have any feature according to the sample's

opinion. It seems that the designers of the site were based on previous models, and they were not modified, perhaps because there were no permissions, or because they focused on updating the information periodically, at the expense of the design itself .

Recommendations and suggestions:

Based on the results of our study, we present a set of recommendations that we propose to improve the quality of the site under study, which we hope that the specialists responsible for the site at our university will take into account while making changes to the site, and we summarize them in the following points:

- ✓ Relieve the main page of non-essential icons.
- ✓ Support the site with icons and services for communication and interaction on the site between users.
- ✓ Rearrange the content of the sub-pages according to their importance for the user.
- ✓ Change the colors of the site and rely on eye-friendly tones, commensurate with visual perception (it is preferable to rely on the color circle, which includes all the colors used by designers and there are many ways to choose colors)
- ✓ Re-prioritization of necessary and then secondary data.
- ✓ Strengthening practical links that cover the needs of the user.
- ✓ Designing the access to the site according to the quality of the user: three icons at the top (student, professor, employee) to facilitate the process of accessing the services provided by the site for each user according to his class.
- ✓ Providing the possibility of conducting all administrative or pedagogical transactions through the site.
- ✓ Work on the technical side of the site: speed and proper interaction with users.
- ✓ Taking into account the principle of shape and background in the design, especially in writing symbols on icons so that they are clear
- ✓ The choice of symbols and abbreviations agreed on their meaning by the majority of users.
- ✓ Grouping elements are similar in purpose and actions.

- ✓ Allow the user to use favorites, especially with the addition of a user-type icon.
- ✓ Collection of advertisements offers of employment, scholarships, and the like on Spider pages.
- ✓ Switching large images with buttons that enlarge while the mouse hovers over them.
- ✓ Making technical adjustments, using add-ons, such as supporting applications for phones, and reading icons for the blind...
- ✓ Add a button or icon for the blind voice service.
- ✓ Using modern design templates
- ✓ Focus on modifying and renewing the site, which creates confidence in the user and feels its importance.
- ✓ Adopting the same design for the websites of the colleges, to ensure the principle of easy identification (familiarity) with the addition of simple distinctions for each college.
- ✓ Confirmation of the entry and Exit feature, and FEED back suggestions
- ✓ Work on creating consistency in the presentation of pages of colors and shapes.

4. CONCLUSION

The aim of our study is to evaluate the site, to extract the negatives and pros, and then propose amendments so that it is easier for users to deal with the site with high efficiency (speed, simplicity, maximum benefit) by accessing the services provided by the site, and to do their tasks more easily, and this by strengthening the strengths and correcting the weaknesses, otherwise, the user will only feel the heaviness and lack of understanding of the content, which leads him to aversion from the site.

However, the process of evaluating websites, especially those related to university institutions, has some complications and difficulties. This is due to the lack of professionalism and importance given to design .With scientific criteria that guarantee the social characteristics of users, and the global image on the one hand.

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