Evaluation of E-Commerce Web-Based Systems

Sahar A. El_Rahman[1,2], Naglaa F. Soliman[2,3]

[1] *Electronics, Computers Systems and Communication, Electrical Department, Faculty of Engineering-Shoubra, Benha University, Cairo, Egypt*
[2] *College of Computer and Information Sciences, Princess Nourah Bint Abdulrahman University, Riyadh, Saudi Arabia*
[3]*Department of Electronics and Electrical Communications, Faculty of Engineering, Zagazig University, Zagazig, Egypt*

Abstract: Web services and Internet are rapid becoming critically important to industry, business and individuals. Where generating online society and trademark is the chief goal of web serving. They recognize that web-based systems able to increase their communications scales where the Internet is able to render big amounts of data within a quick manner to the people. To be successful, web-based systems require the usability is good. Usability is a measurement of how the interface is easy and simple to utilize, for instance, as declared that the E-commerce foremost rule is, if customers are incapable to get products, they can't buy them. Therefore, unused website will direct purchasers to get off them, ensuing in a lack of gross revenue. The involvements in evaluation of web-based systems have been concerned matters in the latest years. E-commerce sites are selected as subjects for this study. Where, many businesses in consumer shops have turned into web services and utilized the recently developed paradigms of business, like as electronic product suppliers, virtual storefront, dealing brokers, auction houses, and online services. Most succeeded websites assure the importance of website evaluation and human computer interaction, however the applications of e-commerce differs crucially. A kind of usability assessment techniques has been produced that can be applied to recognize E-commerce site usability issues. These techniques can be categorized using the identification of usability issues by users, evaluators, or software tools. In this study, Alexa is applied to evaluate E-commerce sites. Also, The evaluation was conducted using a survey method. Six E-commerce sites were inspected. From the findings, the site amazon.com is the most popular site and has good usability. Similarly, The feedback of the analysis show that most organizations apply the functions of marketing distributed reasonably in quality measurements of services.

Keywords: E-commerce, Website Evaluation, E-commerce Website, Usability, Human Computer Interaction, Alexa.

1. INTRODUCTION

In general, the fast progress of information and computer technology and, especially, the internet has considerably varied the business production. It is vastly assumed that the Internet can provide an efficient business tool [1][2][3].

The world wide web (WWW) is an interconnection of computer system networks that supplies data and services to web users. Web Servers are services and information to computer systems provided by other computer systems in this interconnection of networks. Computer systems that request information and services called Web Browsers. The channel of communication between the client (web browser) and server (web host) is established by ISP (Internet Service Provider) that grants admission to the web for both the customer and server. A request/response paradigm used in the client communication with the server. The client, via the channel of communication makes a request to a server and it responds to that request [4].

With respect to the internet publication is no central ruling body. It's exceedingly comfortable, inexpensive and fast to put out along the internet. The quality control system hasn't existed due to the underlying kind of WWW (World Wide Web). It will remain unregulated and unmonitored too. This, subsequently, drops a great duty on the user to be critical and careful in the website evaluation that is you utilize. Since the start of trading Internet tools in the early 1990s, considerable researchers have noticed the power of the internet in the commerce, and supported integrating the world wide web into the business production [2][3][5].

2. BACKGROUND INFORMATION

By concentrating on speed, accuracy, network design, automation and reverse logistics, retailers can implement sales fulfillment strategies that anticipate and exceed consumer needs. Actually, users want to choose most used web services with a better trade-off between quality and

cost. Users can select web services based on Visits Index ranking where they only spend their money on e-commerce with 8 % of their earning [6][7][8].

A) E-commerce

Till now, the website isn't being played as a source of information only, but likewise as media of communications and also, in the media of commercial activities. Web sites that supply channels of the electronic services/goods purchase and sale are called E-commerce websites. It is specified as a single method to supply services. Recently developed competition issue among the organizations is created by the website, i.e. by quality comparison between E-commerce sites of them [9][10][11][12].

B) How to Evaluate a Website

Since the former 1990s, Various approaches in assessing websites have been proposed by the researchers of universities. The widely used techniques involve benchmarking, capacity analysis, case work, experiment, survey, and online evaluation [3]. Although many people evaluate websites (especially trading websites) depending completely on the websites appearance and behavior. Then, we must proceed to evaluate for several quality measures in the scope of accuracy, integrity, security, support and impartiality. Websites evaluation criteria have been offered in several settings in later years. In this scope, researchers strive to decide the principle evaluation factors for e-commerce and services [13].

C) Usability

Usability is a way to produce development which integrates user feedback through the cycle of development so as to decrease costs and generate the products and applications that meet user demands. It is the learnability and the use easily of human made themes (see Figure 1). Also ,it is considered as testing that the products work completely and well [14][15]. The customers' choice is affected by the usability on the web. For a service or product to be actually forced, it has to engage with human at various levels as indicated in Figure 2 [14][16].

D) Alexa

Alexa is a known software tool to calculate the internet traffic statistics, that gives a flow data range and several indicators showing the quality and credibility of the websites, like as external links, bounce rate, ...and so forth [17][18].

E) E-Commerce and Network Security

The main focus of E-commerce web security are the secure transmission, web server security and some concern with client-side security. If the transmission channel and web server are safe, the client can be greatly assured that the client's security expectations will be encountered. For an acceptable premise of secured online business, the web security is necessary. Where web security is concerned with preventing attacks on websites which are classified as attacks on information and accessibility [4][19][20][21][22][23].
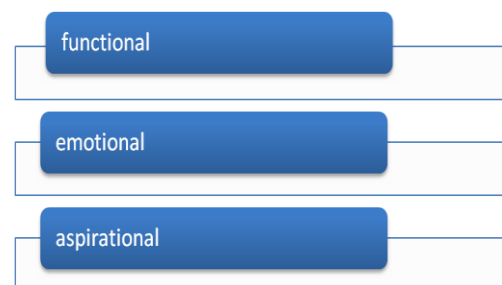

Figure 1. Illustration of Usability Attributes

Figure 2. Illustration of User Engagement Levels

3. METHODOLOGY

The first matter that each establishment will like to distinguish the universe of its existence is out of its electronic website. The best website could support the gathering of the objectives of the owner and the users, the most successful, the website will exist [24]. The higher the usability website has a tendency to catch further links. It has likewise been indicated that SE (Search Engine) creates a big balance of the traffic on the web and the generality of current SE techniques have a tendency to present heavily related websites foremost. In this work, the aims were sought to be settled through.

- Using Alexa it is possible to gauge the volume of the web traffic for a specific site. Also, it gave the situation and circumstances for any website looked in at: to whom it may concern, how regularly, it was

modified, how many other websites indicated to it, and how many screens it encountered.

- Assessing the prototyping and other E-commerce website usability through a questionnaire. A sample of 51 stakeholders (managers, employees, and customers with different nationalities) makes a response to the questionnaire was given to them. Information from the questionnaire was compiled, formed and studied.

- Collecting the information in an efficient way by using a survey that was prepared based on HCI (Human Computer Interaction) conception, an abbreviated version of the feedback is indicated in Figure 3.
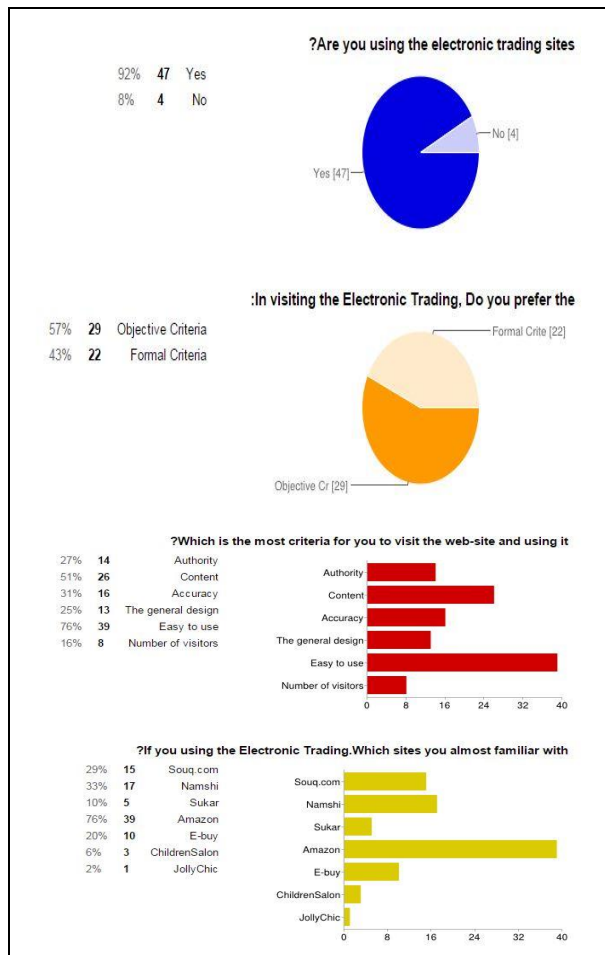

Figure 3. A Summary of Results

4. RESULTS AND DISCUSSION

The web pages usability is evaluated utilizing several paradigms. Academic researchers debate that a lot of recommendations and results of usability need experimental and empirical data. E-commerce websites are selected as matters to this work. A set of experiments

have been proceeded to inspect the design and the usability of the E-commerce websites.

Alexa utilized to assess E-commerce sites usability. As a preliminary step, Using software tools like Alexa to issue an easy, cheap, and quick indicator of prospect usability problems on E-commerce websites and their screens. By applying the planned procedures could support to cut back both valuation and time expenses. The usability of some known E-commerce websites (Amazon[1], Ebay[2], Souq[3], Jollychic[4], Sa.Namshi[5], and Sukar[6]) were evaluated together using Alexa, the results and the statistics are indicated in Figure 4, Figure 5, Figure 6, Figure 7, Figure 8, Figure 9 and Table 1.
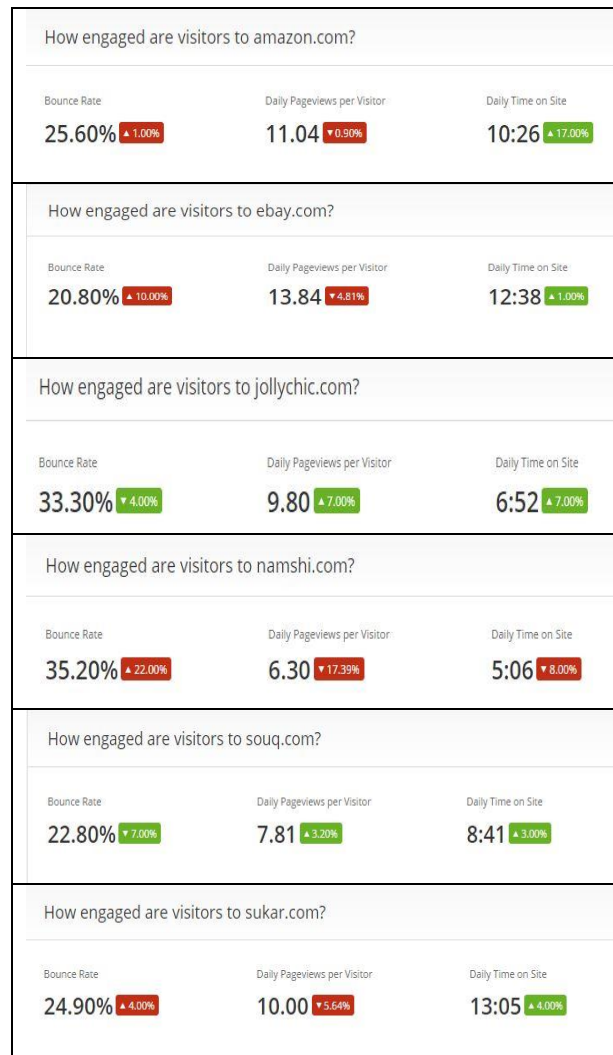

Figure 4. Results of Q1: How Engaged Are Visitors to the E-Commerce Websites?

[1] www.amazon.com
[2] www. ebay.com
[3] www.saudi.souq.com
[4] www.jollychic.com
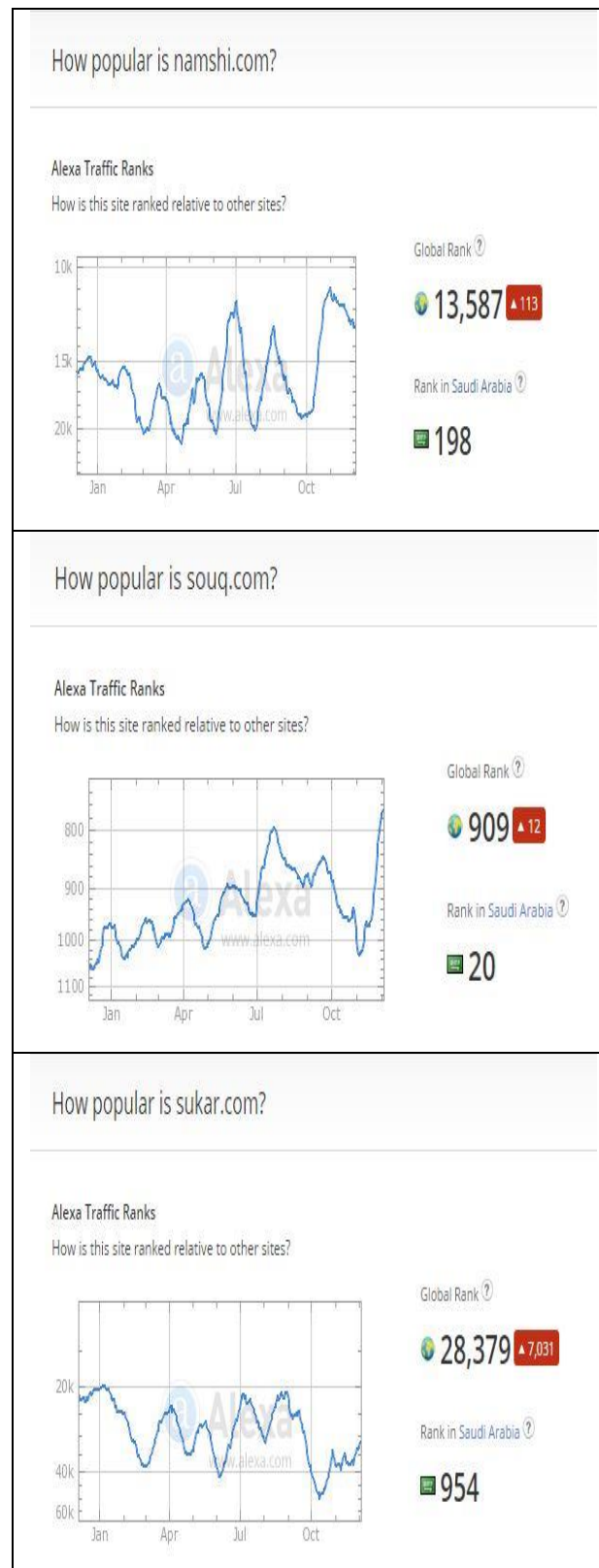[5] www.namshi.com
[6] www.sukar.com

Figure 5. Results of Q2: How popular is the e-commerce websites?

TABLE I. SUMMARY OF ALEXA REPORTS

	www.saudi.souq.com	www.jollychic.com	www.namshi.com	www.sukar.com	www. ebay.com
Overall (The overall score for this website?)	7.2	7.1	7.4	6.9	8.1
Accessibility (How accessible the website is to mobile and disabled users?)	6.1	6.3	7.8	7.8	7.4
Experience (How satisfying the website is likely to be for users?)	8.7	7.8	7.0	7.6	8.8
Marketing (How well marketed and popular the website is?)	8.5	7.6	6.6	7.7	9.0
Technology (How well designed and built the website is?)	5.9	5.5	6.7	6.1	6.8
Code quality	0.4	1.4	2.1	1.7	1.7
Local presence	1.4	1.4	2.5	2.5	5

5. CONCLUSION

Aside from being qualified to distinguish among the fiction and fact, it is significant to be capable of appraising the security, accuracy, currency, usability and data content to specific use. Utilizing data resources with imperfect quality or worse still - quoting misinformation – will put down the work quality. However E-Commerce website evaluation has permanently been high importance, such tone is especially significant when utilizing details established on the Trading.

E-commerce continues to develop in importance as a sales channel, and customer expectations have been higher. Hence, business organizations want to measure and enhance their E-commerce sites in a manner in order to increase their successfulness. The website evaluation is essentially beneficial for leaders of business organizations that may be concerned with recognizing usability issues on their websites and making the design better to fit the stakeholders' demands. The website evaluation, that specifically determines the efficiency and effectiveness of these sites. It subsequently supports business organizations to find the usability procedures that best meet their needs. It is anticipated that the website evaluation will support e-commerce organization in making the suitable decision concerning that usability procedures to use and how to use it to update the usability of their websites partially or totally, that might support growing their profit. Considering the core services proportion, content rich sites achieve enjoyment fairly high ranking in Alexa.
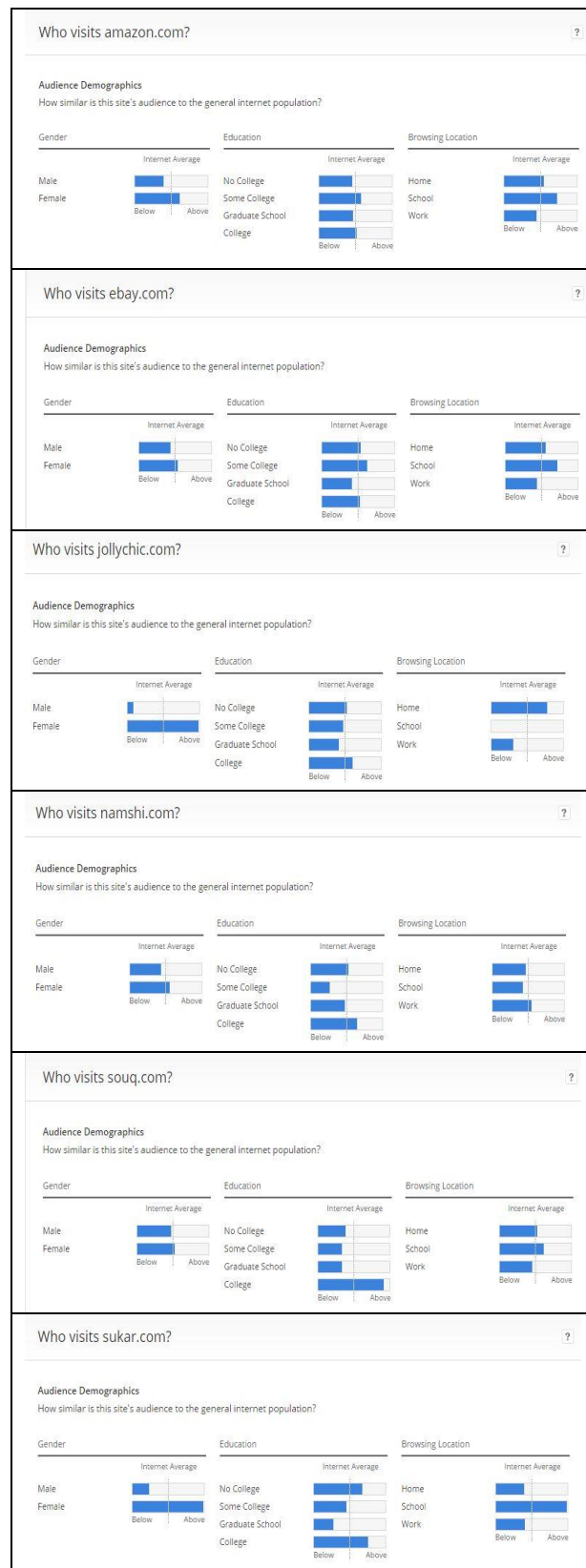

Figure 6. Results of Q3: Who Visits the E-Commerce Websites?
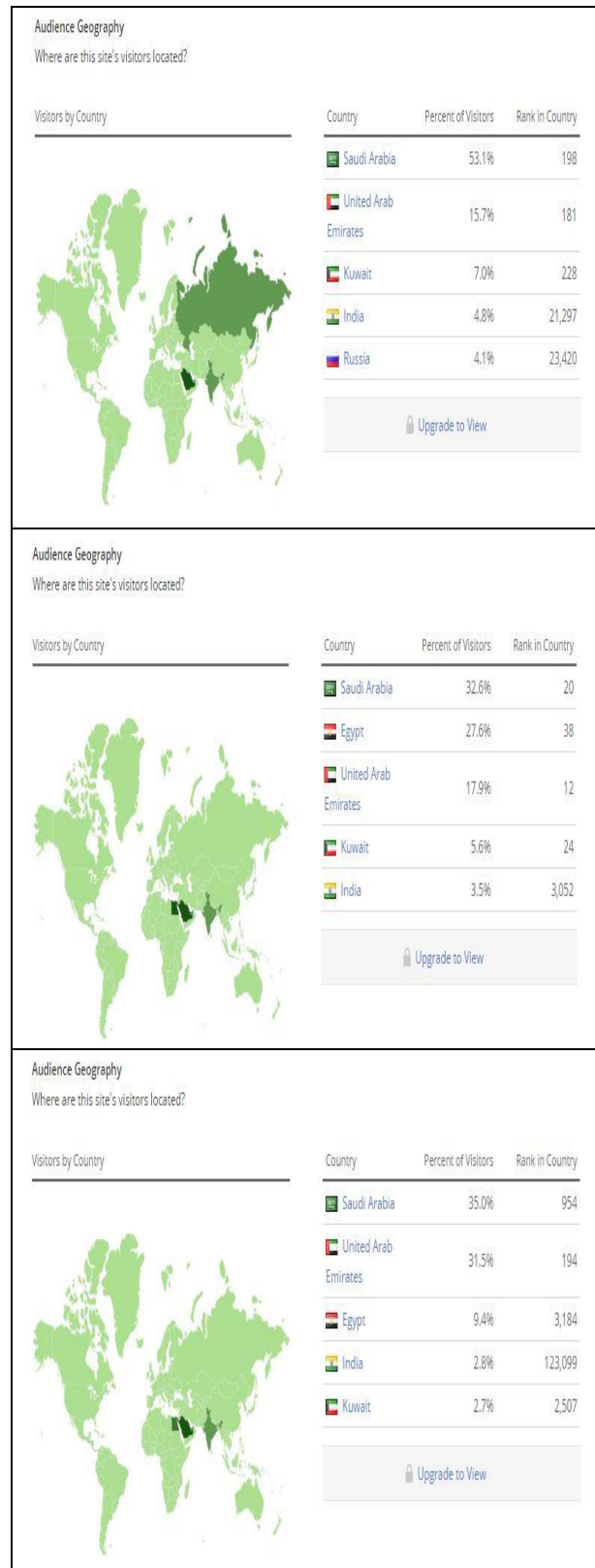
Figure 7. Results of Q4: Where Are the Sites Visitors Located to the E-Commerce Websites?
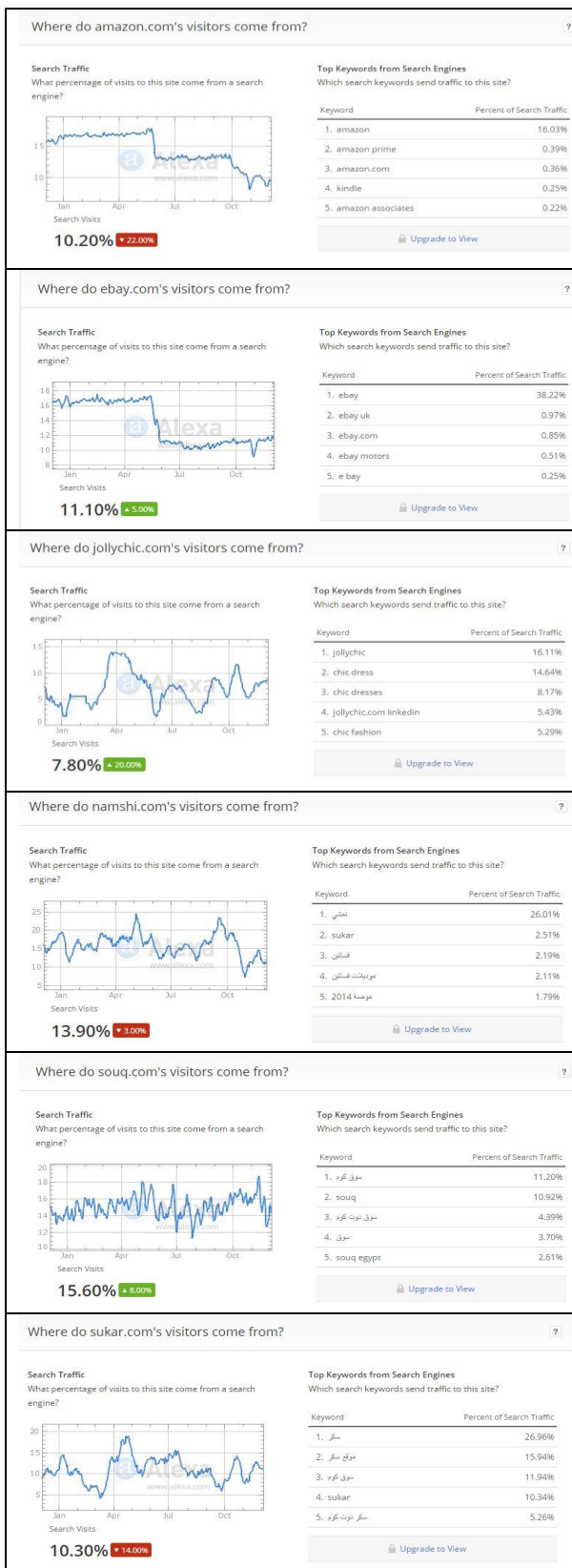
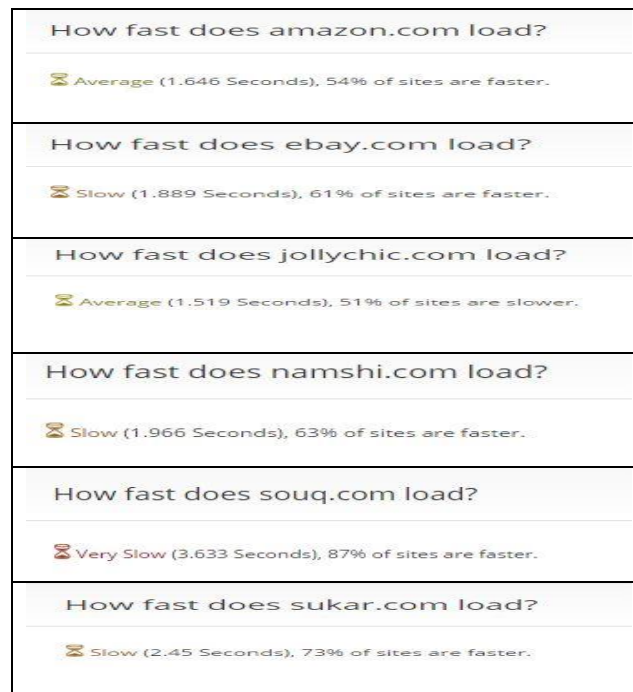Figure 8.   Results of Q5: Where Do the E-Commerce Website Visitors Come from?

Figure 9.   Results of Q6: How Fast Dose The E-Commerce Websites Load?

REFERENCES

[1] Ali H. Al-Badi, Ali O. Al Majeeni, Pam J. Mayhew and Abdullah S. Al-Rashdi, "Improving Website Ranking through Search Engine Optimization", Journal of Internet and e-business Studies, IBIMA Publishing, Vol. 2011, pp. 1-11, 2011.

[2] Rob Lawa, Shanshan Qi a, Dimitrios Buhalis, "Progress in tourism management: A review of website evaluation in tourism research", Journal of Tourism Management, © 2009 Elsevier Ltd. All rights reserved, Vol. 31, pp. 297–313, 2010.

[3] Wen-Chih Chiou, Chin-Chao Lin and Chyuan Perng, "A strategic website evaluation of online travel agencies", Journal of Tourism Management, © 2010 Elsevier Ltd. All rights reserved, Vol. 32, pp 1463-1473, 2011.

[4] R. J. Boncella, "Web Security for E-Commerce", Communications of AIS (Association of Information Systems), Volume 4, Article 11, 2000.

[5] Feng-Jyh Lin, Kunhuang Huarng, Yi-Min Chen and Shu-Ming Lin, "Quality Evaluation of Web Services", Proceedings of the IEEE International Conference on E-Commerce Technology for Dynamic E-Business (CEC-East'04).

[6] Gang Wang and Kunming Nie, " A Framework of VI-based Ranking and Recommendation of Web Services", 6th international Conference on Internet Technology and Secured Transactions, ©2011 IEEE, United Arab Emirates, pp. 478-483.

[7] Souheil Badran, "What Merchants Need to Know About Cross-Border eCommerce ", © 2008 First Data Corporation. All rights reserved.

[8] Hsieh, Hui-Ching, Yen-Chiu Chen, and He-Chih Lin. "More precise: Stores recommendation under O2O commerce." International Journal of Computing and Digital Systems 3.2 (2014): 91-99.

[9] Farah Shafira Effendi and Ika Alfina, "Quality Evaluation of Airline's E-Commerce Website, A Case Study of AirAsia and Lion Air Websites", ICACSIS 2014, © 2014 IEEE, pp. 125-128.

[10] Chen-Yuan Chen, Bih-Yaw Shih1, Zih-Siang Chen and Tsung-Hao Chen, "The exploration of internet marketing strategy by search engine optimization: A critical review and comparison", African Journal of Business Management Vol. 5(12), pp. 4644-4649, 18 June, 2011. ©2011 Academic Journals Review. Available online at http://www.academicjournals.org/AJBM

[11] John Lowe and Atif Ali Khan I,"E-commerce Fulfillment Execution Essentials", © Cognizant 20-20 Insights, March2013.

[12] Ajantha Herath , Yousif Al-Bastaki and Suvineetha Herath, "Task based Interdisciplinary E-Commerce Course with UML Sequence Diagrams, Algorithm Transformations and Spatial Circuits to Boost Learning Information Security Concepts", International Journal of Computing and Digital Systems , Vol. 2, No. 2, pp. 79-87, 2013.

[13] Wen-Hsien Tsai, Wen-Chin Chou and Chien-Wen Lai, "An effective evaluation model and improvement analysis for national park websites: A case study of Taiwan", Journal of Tourism Management, ©2010 Elsevier Ltd. All rights reserved, Vol. 31, pp 936–952, 2010.

[14] Layla Hasan, Anne Morris, Steve Probets, (2013) "E‐commerce websites for developing countries ‐ a usability evaluation framework", Online Information Review, Vol. 37, No. 2, pp.231‐251.

[15] Saad Subair, "Assessing the Usability of Institutions Web Pages", International Journal of Internet and Distributed Systems, 2014, 2, pp. 15-21.

[16] Nagpal, Renuka, et al. "FAHP approach to rank educational websites on usability." Int J Com Dig Syst 4.4 (2015): 251-260.

[17] Xiaoqiang Li, Yun Mi, Yingwei Jin, Heng Qi and Zhiyang Li, "A Novel System for Evaluating Website Using Link Analysis ", ©2012 IEEE, 11th International Conference on Trust, Security and Privacy in Computing and Communications

[18] Alexa, http://www.alexa.com/

[19] Drew, G. Using SET for Secure Electronic Commerce, Prentice-Hall, Upper Saddle River, NJ, 1999.

[20] Garfinkel, S. and Spafford, G. Web Security & Commerce, O'Reilly and Associates, Cambridge, MA, 1997.

[21] Rubin, A., Geer, D., and Ranum, M., Web Security Sourcebook, Wiley, New York, NY, 1997.

[22] Mark S. Ackerman and Donald T. Davis, Jr. , "Privacy and Security Issues in E-Commerce", Chapter 39, New Economy Handbook, Copyright 2003, Elsevier Science (USA).

[23] Aly M. Elsemary, Abdullah A. AlAnoor, Ahmad A. Alshammari, and Abdulaziz E. Aljohani," Secure Hybrid Payment System in KSA", International Journal of Computing and Digital Systems, Vol. 5, No.1, pp. 59-71, 2016.

[24] Ahmad Bakeri Abu Bakar, "Evaluating the Accessibility and Visibility of Quran Websites", ©2010 IEEE, Information Technology (ITSim), 2010 International Symposium in, Kuala Lumpur, Vol.1, pp. 1-4.

Sahar Abd El_Rahman was born in Cairo, Egypt, B.Sc. Electronics & Communication Branch, Electrical Engineering Department, Faculty of Engineering- Shoubra, Benha University (previously Branch from Zagazig University) – Cairo, Egypt in May 1997. She had the first rank over all graduates in all academic evaluations. M.Sc. in an AI Technique Applied to Machine Aided Translation, Electronic Engineering, Electrical Engineering Department, Faculty of Engineering- Shoubra, Benha University – Cairo, Egypt, May2003. Ph.D. in Reconstruction of High-Resolution Image from a Set of Low-Resolution Images, Electronic Engineering, Electrical Engineering Department, Faculty of Engineering- Shoubra, Benha University – Cairo, Egypt in Jan2008.

She is Assistant Professor from 2008 till now at Electronics & communication, and Computer Systems Branch, Electrical Engineering Department, Faculty of Engineering-Shoubra, Benha University, Cairo, Egypt. She was a Lecture in the same location since 2003 and an Instructor in the same location in 1998.

Dr. Sahar has published many papers in national and international journals and conferences. Her research interests include Computer Vision, Image Processing, Signal Processing, Information Security, Human Computer Interaction, E-Health, Big Data and Cloud Computing. She immersed herself in conducting research in the chosen area of specialization, guiding Ph.D. and M.Sc. students and teaching at undergraduate and postgraduate level.

Dr. Sahar is a member of IACSIT (International Association of Computer Science and Information Technology) since 2013. A member of Internet Society (ISOC) since 2015, a member of IAENG (International Association of Engineers) since 2011, and a member of the Egyptian Engineers' Syndicate since 1997.

Naglaa F. Soliman received the B.Sc., M.Sc., and Ph.D. degrees from the faculty of Engineering, Zagazig University, Egypt in 1999, 2004, and 2011, respectively. She is currently a lecturer at the Department of Electronics and Communications Engineering, Faculty of Engineering, Zagazig University. Her areas of interest are digital communications, signal processing, image processing, and coding.