A Review on the HCI Modern Design Principles in the domain of Sport Websites

Danish Ul Hassan, M. Ameen Chhajro

Sindh Madressatul Islam University/Computer Science, Karachi, 75800, Pakistan

Email: danishulhassan7@gmail.com, ameen.chhajro@smiu.edu.pk

Abstract: Human-computer interface (HCI) is a multidisciplinary field of study, it more emphasizes on designs of computer expertise. Furthermore, it particularly stresses over the interaction betweenhumans (users) and computers. Human-computer interaction traced at the intersection between thebehavioral economics, social, behavioral sciences, and studies. Moreover, it depends on the computer sciences and information technologies. It is more apprehensive with the appreciative and understanding of how people make use of devices, storages, and systems. It is most fast growing, vast, immense, and furthermost noticeable and visible partof computer sciences and information technology. The exporter of these shared devices is what we callhuman-computer Crossing point. This paper provides a comprehensive literature review on the modern design principles of HCI in the domain of the sports websites.

Keyword: HCI, Design Principles, User Experience, Technology, Interfaces and Sports Websites.

1. INTRODUCTION

Today we are living in the year of 2021 and the timeis very precious in any aspect of the life as well as inthe field of technology, and when we want to use technology in our daily life tasks then the interfaces play a vital role. In this study of paper, we are goingto highlight the design principles in the interfaces ofsports websites (live scoring websites). In Pakistan, we know Cricket is the most popular sports around the country, and the people of Pakistan is very passionate about that. And on daily bases cricket fans visited live scoring cricket websites to get theirself-updated. When we talk about the web design interfaces of sports websites there are so many flawsand mistakes. Chao proposed that, Human-computer interface (HCI) is a multidisciplinary field of study, it more emphasizes on designs of computer expertise. Furthermore, it particularly stresses over the interaction between humans (users) and computers.[1] Bian, Peng presented that, Human- computer interaction traced at the intersectionbetween the behavioral economics, social,behavioral sciences, and studies. Moreover, it depends on the computer sciences and information technologies. It is more apprehensive with the appreciative and understanding of how people makeuse of devices, storages, and systems. It is most fast growing, vast, immense, and furthermost noticeable and visible part of computer sciences and information technology. The exporter of these shareddevices is what we call human-computer Crossing point. [2]

2. LITERATURE REVIEW

Cai, Xinyuan proposed that the Human-computer interface is the study of how human interacts with machines to perform a particular task. It draws the significant support study of the system and the human side. [3] Lian-nan presented that the most heated term 'user interfaces for all' means the simplest design with an easy approach for all users without having the knowledge of that domain, the goal is to create a design that covers all the users of the world irrespective of their knowledge range. [4] Shen presented that, the human-computer interface isa kind of medium in the communication circle, a waywhere the

51

human interacts with the machines using tools and software to perform a particular task. A good and simple user interface design makescommunication easier, more effective, less complexfor the users. [5] Zhang proposed that the HCI design principles play an important role in computer science, according to the authority's research surveyreport, suggests that there is a huge gap of knowledgeon the topic of human design principles. [6] Hamzi presented that The design principles are a way to inculcates technology and creative thinking. We cancreate an attractive layout by diving out into the harmony and the purpose of the website, with simplicity and accessibility in mind. [7] According to the 'Takada' research in Carleton University in Ottawa which claims that the users of the website form the opinion, by just visiting out the website, in 1/20th of a second, this is a worrying number for thebusiness. The design of a business company and sports websites plays a vital role, in growing the business and the values. A good design generally refers to increase in the time users spend on your websites, which directly grows your business.[8] Cuddihy in his research says that the most basic thingin the interaction design principle is accessibility andusability of the human-computer interaction becauseit reflects on the user experience, the more the design is discoverable the more the user performs a task quickly.[9] Xiang research says that Modern devices revolutionized the modern world, multiple devices are used to access the websites, which means different screen sizes, now the responsive factors come in to play, our user interface is designed in a manner that it adapts all the screen sizes which directly enhance the user experience. [10] Safaviproposed that The company's focus on the user interface and user experience as more and more the services and products are being automated, and the machine learning is helping in this matter and the models of machine learning are embedded to our systems. In the modern era the businesses spend lessmoney on the support system, they spend their money on the best research on UX before launchingtheir services or goods, which after then in the futurebecomes a customer experience framework. [11] Kiruthika proposed that The critical thing is the userinterface design's useability and accessibility. The user interface of the website requires discoverabilityand simplicity. And also there are more things that come under the umbrella of user experience in designis security, layouts, images, text, font, speed,responsiveness, etc. All these terms can beconcluded in a single term which is user-friendly design, a company/business can achieve their goals by being the design is user-friendly. [12]

3. MODES OF HCI AND DESIGN PRINCIPLES

Through human-computer interface, customers sendcommands to computer, and then the computer shows the upshots to the users after calculating and processing. The input and output modes between humans and computers are several, includes data, figure, image, voice and intelligent interaction.

1. Data interaction:
   Data interaction, the methods of data transmission of humans (user) to communicate with computers.
2. Image interaction:
   Image interaction, the basic idea of image interaction is how to make computersnoticeable and categorize pictures.
3. Intelligent interaction:
   In this type computers can predict what humans want and what they want to do by the help of intelligence, the automatically read the behavior and emotions of the usersand hence meet their necessities.
4. Voice interaction:
   It is an important source of communication between humans and computer. Furthermore, on one hand technology is depend on voice recognition and on the other hand it is relying on audial rate of recurrence.

Some examples of human-computer interaction Human-computer interaction provide smarter ways to use simple things. HCI releases the prospective of complex system and technologies and tools to the users who need them over the time. The computer mouse; previously if you wanted to talk to a computer, you had to enter commands through a keyboard, but now we have mouse to command our system. Text to speech synthesis; breakthroughs in text-to- speech synthesis have permitted people with speech and reading disabilities to relate naturally with the individuals around them. Predictive text: the smaller the phone harder it is to type. Predictive text systems like T9 allowed us to spend less time fumbling and more time interactive.

HCI DESIGN PRINCIPLES

There are so many principles of designs exist but mainly the HCI engineers use the 15 different principles to evaluate a user interface. These different principles of designs were developed by Jackob Nielsen, Don Norman, Lucy Lockwood, and Larry Constantine.

Discoverability

In user interfaces the main primary function must be clearly visible to the user. The user does not need to navigate in depth to accomplish his simple task. There is some confusion in principles of discoverability and simplicity.

Simplicity

The design and interface should be very simple and easy to understand irrespective of the user knowledge, qualification, and experience. The interface should not be cluttered with unwanted stuff which distracts the user to complete his task in a mean time.

Affordances

The web interfaces should use some kind of small images or icon which clearly specifies the functionality of particular thing, so the user should feel confident and easy when he or she is doing particular thing on the interface. The interface should design in a way that guides the user to what to do next.

Mapping

Mapping is used in HCI to explains the relationship between the user interface and the real-world objects. The UI should use the easy language, or we can say the language of common people instead of field-specific language. We should need to use the terms that people already know.

Perceptibility

The user should be recognizing the state of the task or a system. In perceptibility principle we clearly want to know that our user is accomplish their task easily or they are going farther from the actual task. It is really important that the user should not feel helpless when they are accomplishing their tasks.

Consistency

The user interfaces should be using the similar components that works same, so the users of your web do not need to learn the interface again and again.

Flexibility

The interface design should be easy and design in way that will accommodate a wide range of users, irrespective of their expertise level. Allow the users in a way that the user use interface the way want to use. For example, some of the users want to copy from the keyboard shortcut and some of them wants to copy from the right click of the mouse.

Equity

The interface should be useable by the users with the different range of ability or accessibility.

Ease

The interface should be designed in a way that can be used with the little amount of efforts and tiredness. Comfort
The users of different regions, physical sizes, posture, nationality, can use the interface (website) without any hustle and tension.

Tolerance

The interface design in a way that the errors (bugs) that unavoidably occur, should not distract the user to accomplish their main task. The interface should support functionalities like undo and redo, so the user feels more secure when they are using the interface. Structure
The architecture of the interface should be organized, and adopt the standards of layout, and which makes sense to the end user of our website.

Constraints

The interface design in a way that prevents the user from performing by mistakenly or intentionally, we should be aware of the user inputs. A good example of this meeting requirements of passwords which could be done by the developer in the backend of the website. The submit should not be available until the user meets the correct requirements of the password.

Feedback

When the user is doing a task, the interface should give the feedback that your task in progress. A good example of this,

53

when user submits a form, then the interface should acknowledge the user in a way that "Form Submit Successfully". It is better to give feedback to the users to avoid any confusion and by giving feedback to the user it enhances the user experience.

Documentation

The documentation is ignored in most of the interfaces, but it is also the main principle of design. The documentation should be created around the use cases for the tasks that the user wants to accomplish with the system.

4. CASE STUDY

Today we are living in the year of 2020 and the time is very precious in any aspect of the life as well as in technology field, When we want to use technology in our daily life tasks then the interfaces plays a vital role, because in this busy world no person has enough time to spend on understanding the interface. When the developers aiming to develop the interfaces that should keep in mind that they developed an easy and simpler interface so user can easily perform their tasks without wasting their time. For Example, we are specifically discussing about the web-app interfaces. For suppose if a person wants to download a XYZ software on their machine, so simply on the main page he will be found a large button to "Download from here, basically the aim is we don't want that our user have to find the download button on different pages, we need to be careful when we are designing these type of web applications. It's important that the development team needs to think as a consumer (normal user) so that they can developed simple and effective interfaces. Now let's discuss a little bit of effective interfaces, when we talk about the effective interfaces which means we need to take care of the users interest, just carrying out the above XYZ software website, that user wants to download software from your website, your interface is very simple the download button is clearly visible on the main landing page but for instance we are supposing that when the user clicks the download button, then user is redirected to another page of download now again the user needs to found the button of download, that's not so great and it wasting our user time, the ideal effective thing is that if someone wants to download a software simply he visits the website on the main landing page he will saw a big download button, and when the user clicks the download button the downloading starts, you see it is quite simple and effective because the user visits any website or any interface to perform their tasks.

Common mistakes in sports website Interfaces When we talk about the web design interfaces there are so many flaws and mistakes. The common mistakes includes that they filled out their website with irrelevant content (text), the websites are not completely responsive, the information is hidden in somewhere, the websites is loading with animations which takes lots of time to load, poor color scheme in interfaces and so on.

Example

Let's talk about Pakistan No. 1 cricket website "CRICINGIF.com", which is basically a Cricket Fantasy Website and Live scoring Website of any cricket game of the word, specifically Pakistan it covers the domestic, regional and international matches of Pakistan. I'm taking this website example because I visit this website a lot. Although it's Pakistan No. 1 sports website but still in this website interface you will find so many flaws which comes under bad interfaces. Firstly the main goal of this website is to update their users with the live scores, but surprisingly when you visits this website you don't find anything like that, even the navbar have not the option to navigate to the Live Score.

The home-page of Cricingif.

Although the Live Score update is there on the homepage but not on the top of the page, which means userhave to scroll down the page to see the live score, it is not good because user visit website to saw a live score update, and he find no option of live score in the navbar as well as not on the main page, if a new user visit this site to saw a live score and it will not find anything on the main page, there is high chancesthat the user leave your website within few seconds,although the score update is present there but not onthe right place.
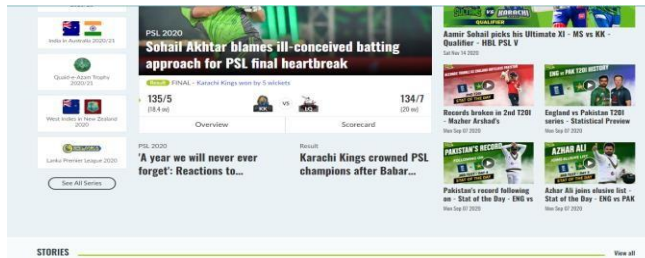
Figure 01: The Live Scoring Data

Basic Problems in Sports WebsitesDiscoverability

There is a discoverability issue in the homepage ofthis website (https://www.cricingif.com/), thepurpose of this website is to facilitate their users byproviding them live scores, but on the website, thelive score section is not on the page, if someonewants to look the score then it needs to scroll a bit. The second problem is the complex interface, thewebsite is filled with lots of images andunnecessary information and the affordance comesinto play because it is quite difficult for new users tonavigate on this website.

Figure 02: The Data Hidden Issue

Mapping
And when we look at the language is used on the website is not easy or we can say it's not for the common people. Because they use terms that can beonly understood by cricket fans. The pie-chart represents the user satisfaction level when they visit these websites.
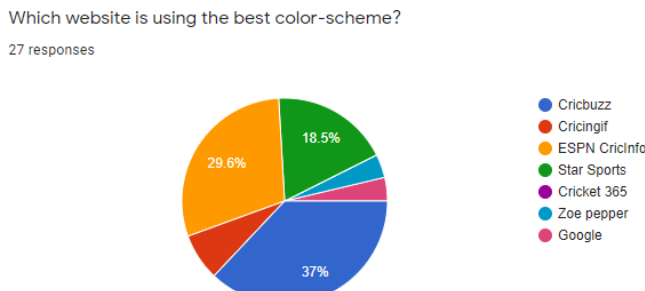

Figure 03: The Survey Pie

Perceptibility

When the user visits the website to look out for the updates or live scores, then the user will see a lot ofunnecessary information (images, news, videos) which deviates him to perform the actual task.

Equity and Ease

As we mentioned, the design is not that easy to understand for new users, so there is no ease for newusers to navigate on them, and the language is used not so easy for common people.

Figure 04: Live Score Visibility

Solutions to Design Principles Problems

Discoverability

The score should be updated on the front (head) ofthe home page instead of the middle of the body.

Simplicity

They need to use icons or small images in the navigation bar so the user can easily navigate on thewebsite, and everything should be mentioned on thepage.

Affordance

For simplicity purposes, they need to use icons so theuser knows easily where he is going, and the navigation should be easier for users.

Mapping

The website design needs simple language, or we cansay the language the common people understand. So,the more users can use this site.

The pie-chart represents the user satisfaction level when they visit these websites.
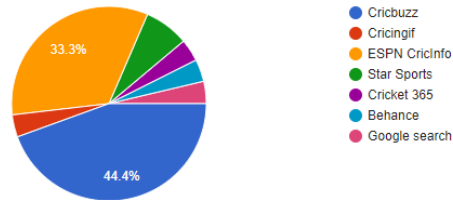
Figure 05: Survey Expression

Perceptibility

The users should know what he is doing on thewebsite, they do not feel helpless like if they are creating or registering on the website so they will some kind of acknowledgment msg or pop like you are successfully registered.
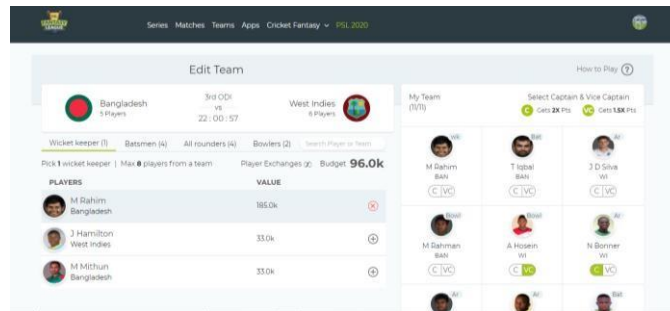

Figure 06: Dull User Experience

5. RESULTS - Survey Comparison

Table 1 represents a comparison based on survey, which websites is standing tall in terms of modem Human-computer interaction principles.

Table 1: Websites and Design Principles

Websites	Design Principles				
	Simplicity	Discoverability	Mapping	Affordance	Perceptibility
Cricbuzz	*Yes*	*No*	No	Yes	*Yes*
Cricingif	*Yes*	*No*	No	No	*No*
ESPN Cricinfo	*Yes*	*Yes*	No	No	*Yes*

Star Sports	*No*	*Yes*	No	Yes	*Yes*
Cricke t 365	No	*No*	No	Yes	*Yes*
Ten sports	*Np*	*Yes*	Yes	No	*Yes*
ICC	*No*	*Yes*	Yes	Yes	*Yes*
Behan ce	No	*Yes*	Yes	No	*Yes*
CricF ever	Yes	*No*	No	No	*Yes*
The RealP CB	No	*Yes*	Yes	No	*No*
Live Cricke t	Yes	*No*	Yes	No	*No*
Howz at	*No*	*Yes*	Yes	No	*Yes*

6. CONCLUSION

Interactive designs, it is a mutual communication among humans and computers that contains several progressions: joint recognition, mutual understanding, mutual transmission, and feedback of information. The goal is to provide products easily available to users. The most appropriate sort of understanding must be calculated, recognizing tasks of human-computer interaction, calculating subsidiary level, and predicting and evaluating density of interfaces. The workload for human should be as less as possible in human-computer interface design. The more effort machine can do, enhanced the design is. It has more focus on increasing the capability of machines and giving full compensation to humans. The consistency and reliability principle will help users to learn system very fast and decrease the burden of wisdom and learning and minimizes the possibility of in correction or wrong operation. It can prevent users from incorrect handling effectually.

REFERENCE

[1] Chao, Gong. "Human-computer interaction: process and principles of human-computer interfacedesign." In *2009 International Conference on Computer and Automation Engineering*, pp. 230-233. IEEE, 2009.

[2]. Bian, Peng, Yi Jin, and Nairen Zhang. "Research on human-computer interaction design for distance education websites." In *2010 5th International Conference on Computer Science & Education*, pp. 716-719. IEEE, 2010.

[3]. Cai, Xinyuan. "Principles of human-computer interaction in game design." In *2009 Second International Symposium on Computational Intelligence and Design*, vol. 2, pp. 92-95. IEEE, 2009.

[4]. Lian-nan, Lin, Li Yu-long, and Cai Jia-xun. "Theresearch of design of human-computer interaction curriculum." In *2015 10th International Conferenceon Computer Science & Education (ICCSE)*, pp.761-765. IEEE, 2015.

[5]. Shen, Wei, and Xiaolei Zhou. "Research on the human-computer interaction mode designed for elderly users." In *2015 4th International Conferenceon Computer Science and Network Technology (ICCSNT)*, vol. 1, pp. 374-377. IEEE, 2015.

[6]. Zhang, Ye, Xiaoguang Huang, and Hongfei Wang. "Computer-Human Interaction: ThePrinciples of User Interface in Chinese Website Design." In *2009 International Conference on Multimedia Information Networking and Security*, vol. 2, pp. 46-49. IEEE, 2009.

[7]. Hamzi, Morteza, and Abdolreza Hajmoosaei. "Web interface design for academic institutions."In *2014 IEEE Conference on e-Learning, e- Management and e-Services (IC3e)*, pp. 7-11. IEEE,2014.

[8]. Takada, Haruhiko, and Incheon Paik. "Design ofgeneral user interface for automatic Web servicecomposition." In *2008 Japan-China Joint Workshopon Frontier of Computer Science and Technology*, pp. 75-78. IEEE, 2008.

[9]. Cuddihy, Elisabeth, and Jan H. Spyridakis. "From web designer to researcher: Using experimentpatterns to research web design decisions." In *2012 IEEE International Professional Communication Conference*, pp. 1-10. IEEE, 2012.

[10]. Xiang, Xiaorong, and Gregory Madey. "A semantic web services enabled web portal architecture." In *Proceedings. IEEE International Conference on Web Services, 2004.*, pp. 834-835. IEEE, 2004.

[11]. Safavi, Roshanak. "Interface design issues to enhance usability of e-commerce websites and systems." In *2009 International Conference onComputer Technology and Development*, vol. 1, pp. 277-281. IEEE, 2009.

[12]. Kiruthika, Jay, Souheil Khaddaj, Darrel Greenhill, and Jarek Francik. "User Experience design in web applications." In *2016 IEEE Intl Conference on Computational Science and Engineering (CSE) and IEEE Intl Conference on Embedded and Ubiquitous Computing (EUC) and 15th Intl Symposium on Distributed Computing and Applications for Business Engineering (DCABES)*, pp. 642-646. IEEE, 201.