
Develop a Guideline of Effective Interface Design for E-Commerce Websites

by

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CERTIFICATION OF APPROVAL

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In partial fulfillment of the required for
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Approved by,

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CERTIFIATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.

VEPA NARMEDOV

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ABSTRACT

Website consists of computer files that are accessible through the Internet; electronically linked together and viewed or retrieved through a browser. Interface of the website is an important element so as to meet user expectation from it. For a CD rental websites, users do expect getting information and completing necessary transactions. To accomplish these guidelines, a standard guideline of interface design is needed to help designer to build a usable website. But, standard guideline for these kinds of websites is not established yet. Therefore, this research will investigate elements from interface guideline that can be used in designing necessary web interface. A guideline for CD rental website would be produced at the end of the research.

A research through four phases methodology which are Problem Statement, Information Gathering, Information Analysis, Guideline Development, Prototype Development and Conclusion as a guide to finish this project. At the end of the research, an interface guideline for CD rental websites would be produced and based on produced guideline prototype would be developed.

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CHAPTER 1

INTRODUCTION

1.1 Background of Study

Electronic commerce or e-commerce covers the range of online business activities for products and services, both business-to-business and business-to-consumer, through the Internet (Anita Rosen).

One of the main purposes of purchasing computers by companies, homes and other individuals is getting internet access. People have access to information from all over the world via internet. In the book of Discovering Computers for Digital World define Internet as a worldwide collection of network that link millions of business, government agencies, educational institutions, organization and individual website [1].

A fundamental truth in business is that sales are only successful if both the buyer and the seller benefit from the transaction. It is the same way with a website, which is both, the provider and the customer or user must benefit or the website fails. Computer companies became aware that if they could somehow improve the physical aspect of the user interface, they would stand a better chance of being a successful in the market place (Jenny Preece, 1994). Therefore, interface is a major function to bring a site to life.

The design of a product's user interface is critical to its user acceptance and success. Without a well-design user interface, even a system with outstanding features will not be successful (Theo Mandel, 1997). Designing an interface for any application is critical because it should be based on the knowledge of the user's experiences and expectations. They have different goals depending on who they are and what they're doing on the application. Therefore the application's interface should be flexible and effective as user wants to perform the task.

Because of the difficulties in designing interfaces, guidelines may help designer to produce a consistent and usable interfaces. Furthermore, design guidelines can help to provide a framework that can guide designers towards making sound decisions (Jenny Preece, 1994). Guidelines are simply rules and interpretations to follow for creating interface elements, their appearance and their behavior (Theo Mandel, 1997).

In this project user will conduct research to produce guidelines for CD Rental websites in particular. Questions like “How does CD Rental websites work?” or “What are the business processes on CD Rental websites?” arise, when we first think about CD Rental websites.

There are several kinds of CD Rental methods adopted by different companies in different countries. However author will give most common business process of CD Rental websites.

Users will need to register with the company through website. Those who are already registered will need to login. There will be form provided online to be completed where it includes all necessary information needed. After completing necessary information user needs to submit the form by clicking submit button. Given information are stored on website database and order is confirmed by company representative. CDs then shipped to given address on given time. Shipping address of customer used for billing.

Sample of the form is provided in APENDIX 5.

1.2 Problem Statement

“While these young business people grew up with video games and computers, they do not usually have the skills to do user interface design. Many Website designers are not professionals but hobbyists who can read a book and master HTML, the web’s basic writing tool” (Theo Mandel, 1997, p403).

Although part of the excitement of the Internet is freedom and creativity seen on the web, following design principles and guidelines will allow user to learn the obvious and necessary look and feel of the interface quickly. They also will focus on essence and experience of the sensory content and design of the information.

One of the guidelines of user interface for web design is to establish user interface consistency. This guideline has been stated by most of the web designer like Nielsen, Heller, Rivers and Lange [2]. Much has been written about the need for consistency in user interface. Much has also been written about difficulty in understanding what consistency is and how to apply effectively. It is a critical element of interface guidelines. Consistency by one criterion can conflict with consistency by another. These guidelines of consistency can even conflict or trade off with other guidelines. Nonetheless, consistency is one of the most significant factors affecting usability (Deborah Hix, H. Rex Hartson, 1993).

Another expert by the name of Jeff Johnson said in the book of GUI Bloopers Don’ts and Do’s for Software Developers and Web Designers that making a consistent of users interfaces is somewhat risky because consistency is a more complex concept than many people think it is. It is difficult to define; many experts have tried without success [3].

1.3 Objectives and Scope of Study

The objectives of the research project are:

1. To carry out research on interface guidelines for web design.
2. To identify elements that can be used in designing web interface for CD rental web sites.
3. To produce a guideline of interface design for CD rental websites system and develop prototype based on guideline produced.

CHAPTER 2

LITERATURE REVIEW

A fundamental reality of application development is that the user interface is the system to users. What users want is for developers to build application that meets their needs and that are easy to use. Too many developers think that they are artistic geniuses – they do not bother to follow user interface design guidelines or invest the effort to make their application usable, instead they mistakenly believe that the important thing is to make the code clever or to use a really interesting color scheme. Constantine (1995) points out that a good user interface allows people who understand the problem domain to work with the application without having to read the manuals or receive training.

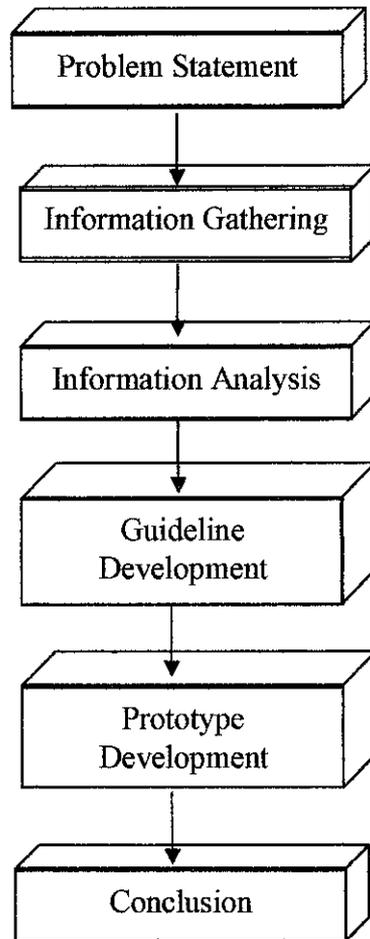
Interface design is important for several reasons. First of all, the more intuitive the user interface the easier it is to use, and the easier it is to use the cheaper it is. The better the user interface the easier it is to train people to use it, reducing your training costs. The better your user interface the less help people will need to use it, reducing your support costs. The better your user interface the more your users will like to use it, increasing their satisfaction with the work you have done.

The point to be made is that the user interface of an application will often make it or break it. Although the functionality that an application provides to users is important, the way in which it provides that functionality is just important. An application that is difficult to use will not be used. It will not matter how technically superior your software is or what functionality it provides, if your users do not like it they simply will not use it. Do not underestimate the value of user interface design [4].

There are increasing number of guidelines, reflecting the increasing numbers of people designing and using computer system. The continuing effort to produce more and better guidelines reflects how difficult it is to design systems from guidelines. Design is easier of tradeoffs, a series of conflicts among good principles, and these concepts are hard to incorporate into guidelines (John Gould, 1998).

CHAPTER 3 METHODOLOGY

3.1 Procedure Identification



The research will be done based on four phases: Problem Statement, Information Gathering, Information Analysis and Conclusion [Figure 3.1]

The first stage is **observation** where the author observes the study on CD rental web sites at the Internet and interface guidelines for the web design. The author identifies the weakness of CD rental web sites and identifies the potential of the subject to proceed to the next step.

Preliminary **information gathering** involves getting information about details of interface guideline for web from the library research and the Internet. These two information gathering processes could give the research with more precise information. The information gathered from observation and preliminary information gathering stages are used to generate the problem statement for the research project.

The second phase of the research project is to do an information gathering process. The researcher has to investigate and identify in depth of each elements of the interface guideline. The study has to focus more on the consistency of the interface design. The researcher chose to do a library and Internet research in order to complete this information – gathering process.

In the **information analysis** phase, the information gathered are technically analyzed to see if the problem statement that generated have been supported. The author has to analyze all the information gathered which is collection of interface guideline. The guideline has to be studied further as to use for the CD rental web sites.

In the **Guideline Development** stage guideline elements are derived from information analysis stage. Set of elements are identified according their citations based on studies on information analysis stage.

Simple web application developed in **Prototype Development** stage based on the guidelines developed.

Conclusion is the process of arriving at the end of research methodology phase by interpreting the meaning of the information analysis result. The end result from the

finding information will be stated. The author will produce a guideline for interface design for CD rental web sites and will develop prototype application according to produced guideline of the research conducted.

3.2 Tools required

3.2.1 Hardware Requirements

Suggested minimum requirement for development of CD rental web site will be:

- Platform – based application, which is Windows 2000
- 600MHz speed processor
- 128MB RAM
- 10.2 GB Hard Disk
- 40X CD-ROM
- 8MB of VGA for supporting the image located on the prototype

3.2.2 Software Requirements

There are several applications to develop this prototype, but the author chose software stated below:

- Dream Weaver 6.0
- Adobe Photoshop 6.0
- Cascading Style Sheets (CSS)
- Apache Web Server

Apache Web Server, maintained by the Apache Software Foundations, is currently the most popular Web server because of its stability, efficiency and portability. It is an open source product that runs on UNIX, Linux and Windows platforms.

Apache Web Server was chosen as server for project prototype due to the features and functionalities that it provides.

- PHP Requesting Document

PHP Hypertext Preprocessor or PHP is server - side scripting languages.

Server - side scripting uses information sent by clients, information stored on the server, information stored in the server's memory and information from the Internet to dynamically create Web pages.

PHP Hypertext Preprocessor is an open – source technology that is supported by a large community of users and developers. PHP is platform independent; implementations exist for all major UNIX, Linux and Windows operating systems.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Information Gathering

4.1.1 Questionnaire

Before proceeding with the technical research, questionnaire technique was chosen for having discrete answer to the problem of study. Questionnaires are an efficient data collection mechanism when researcher knows exactly what is required and how to measure the variable [8]. The questionnaires are sent directly to the respondent. Respondent is the important role for this process because the study requires precise answer from the right group of the people or population.

Population is a group of people that research conducted on in order to investigate. Member of the population for this research are people who always surf the Internet, to get information about products, software, services of companies, tutorial and others. Some elements of the population are selected as subset of the population and perform as sample. It is impossible to collect data or test every element of population. Investigating a sample's characteristics would be enough to generalize the population's characteristics.

“Studying a sample rather than the entire population is more reliable result for this research because fatigued is reduced and resulting fewer errors in collecting data.” (Uma Sekaran, 200).

Choosing the right sample is important because the result of characteristic analysis of the sample would very much reflect the population characteristic. Sample for this research is UTP students who always use the Internet. To do the sampling, simple random sampling is chosen as to sample the population because every student at UTP has equal chance of being selected as subject. The sample size is 50, which consist of UTP students.

4.1.2 Guidelines

Guidelines can take a variety of forms and may be obtained from several sources like journal articles, general handbooks and etc. They are not specific to a single organization but could be applied across broad area of user interaction design. It helps developer to build more consistent and usable interfaces. Guidelines are not meant to stifle interface design guidelines [2]. But it offers flexible guideline and to help establish design goals and decision.

Guidelines require a deeper and more expert knowledge than many user interaction designers have. Hix and Hartson also said that guidelines are sometimes empirically derived or validated; often, they simply educated opinion based on experience [9]. It generates more suggestions for how to produce a good interface compared to standards, which are enforceable in user interface. Jenny Preece suggested in the book of Human Computer Interaction that the best kinds of guidelines are general principle [10].The reason behind of this statement is limitation used of the guidelines. When the guidelines are in general form, developer is able to design freely base on the general guidelines.

Based on these two sources, several guidelines were studied to proceed with this research. The guidelines are taken from sources like books and reliable websites. Collection of guidelines will be analyzed and summarized in order to produce common elements of interface guidelines. Refer to APPENDIX 1, which contains a set of guidelines for interface design.

4.2 Information Analysis

4.2.1 Questionnaire analysis

The questionnaires are sent to respondents via e-mail. Total number of respondents is 50. All of them are from higher institutions, which have more than 3 years of computer experience. The analyses based on respondents' rating to the web sites are as follows:

Web site 1 <http://www.kelkoo.co.uk>

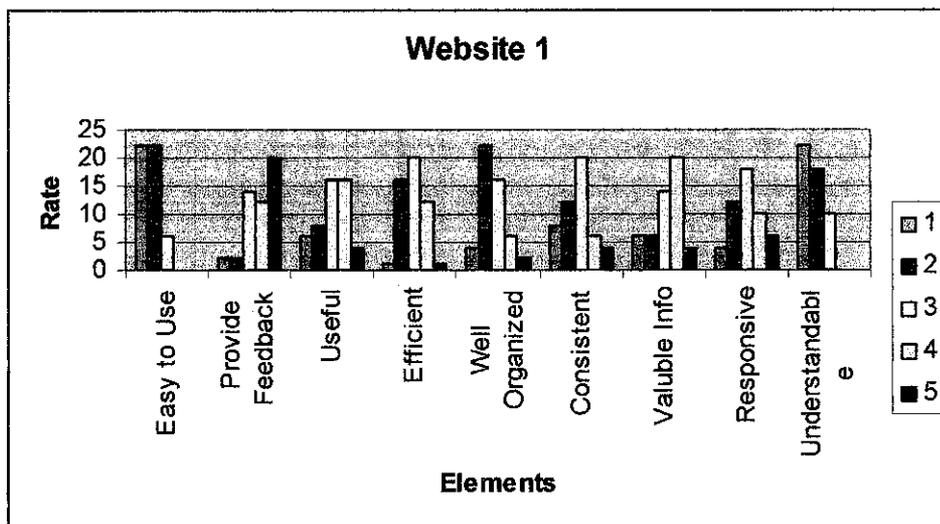


Figure 4.2.1 Result of the questionnaire for website 1

Web site 2 <http://www.canadaflix.com/>

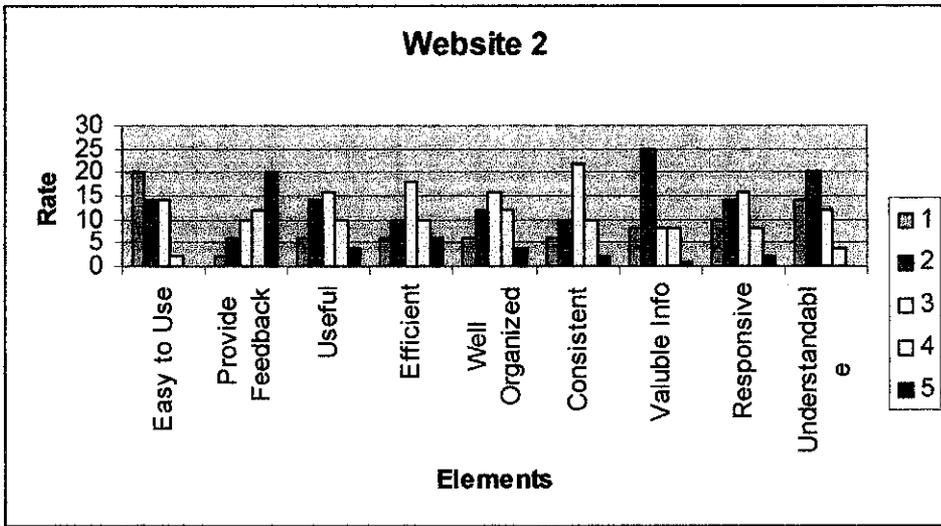


Figure 4.2.2 Result of the questionnaire for website 2

Website 3 <http://www.godesigo.com>

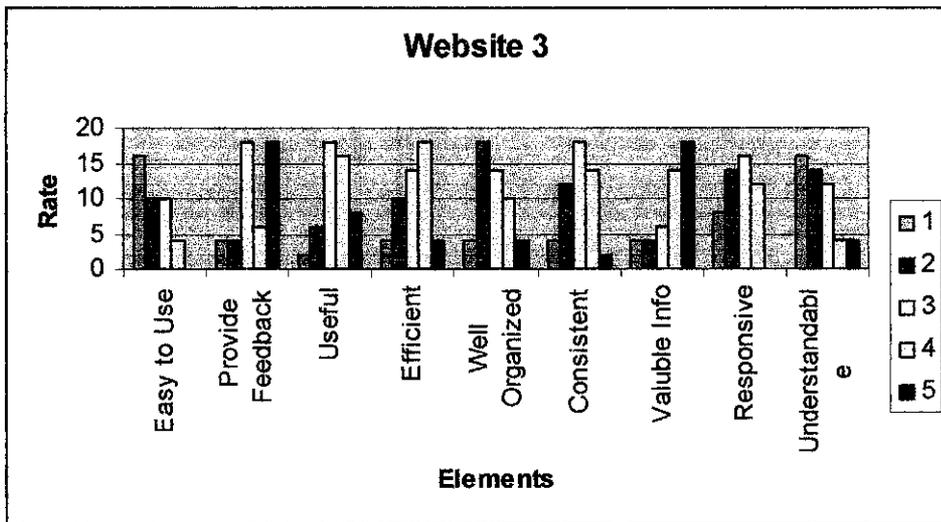


Figure 4.2.3 Result of the questionnaire for website 3

Web site 4 <http://www.screenselect.co.uk>

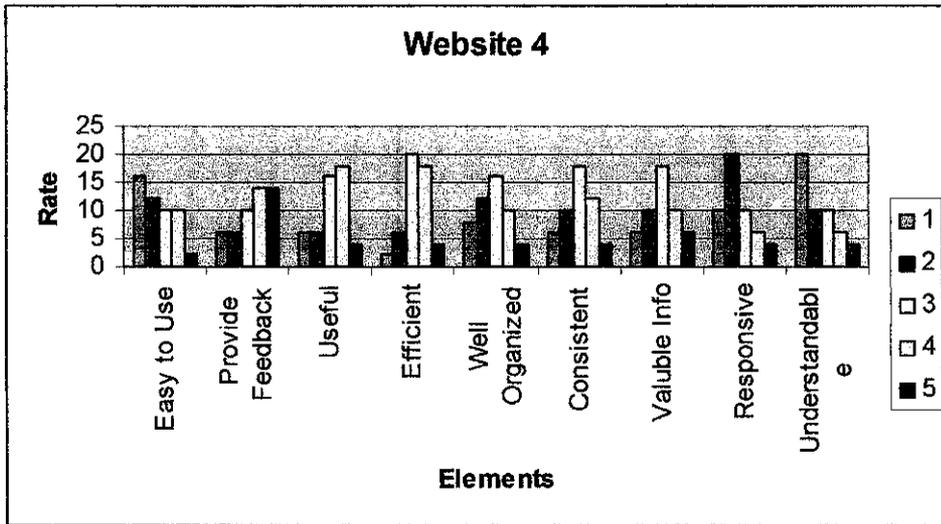


Figure 4.2.4 Result of the questionnaire for website 4

Web site 5 <http://www.screenselect.co.uk/visitor/home.html>

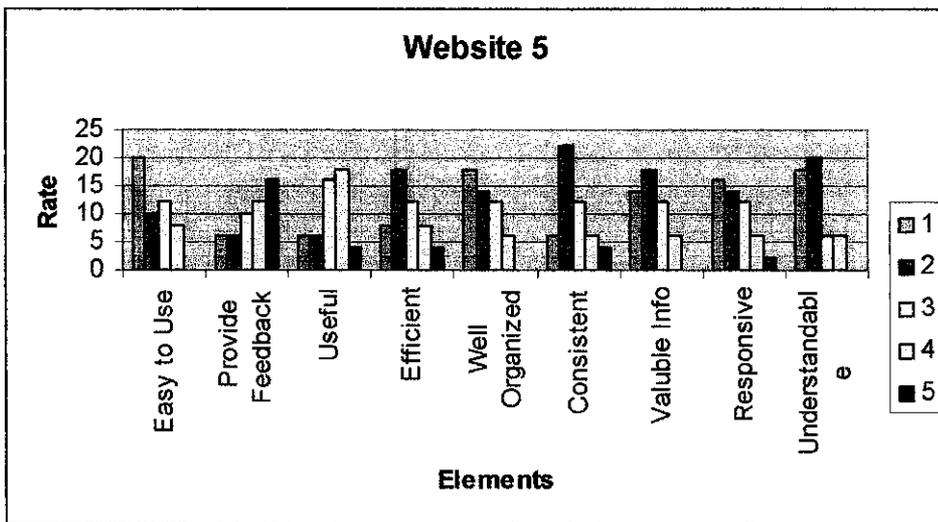


Figure 4.2.5 Result of the questionnaire for website 5

Ratings of all five web sites together

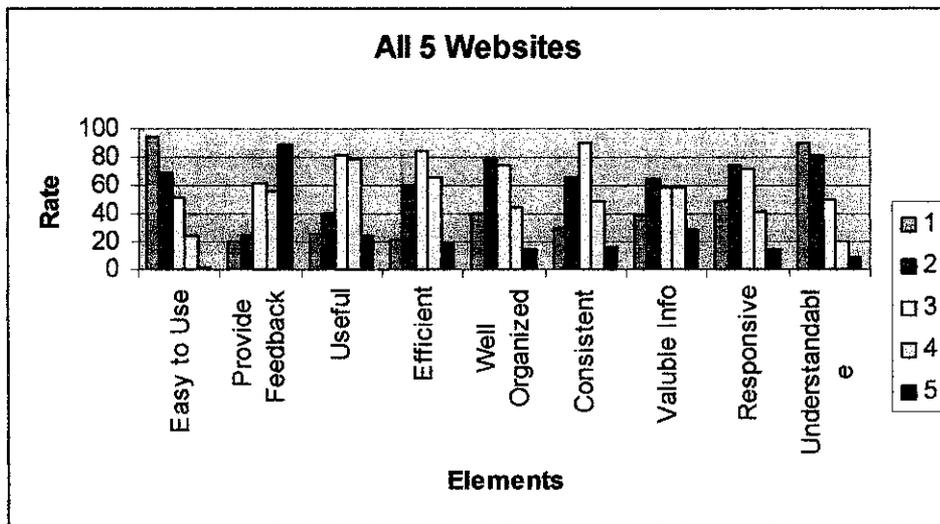


Figure 4.2.6 Result for all five websites

When websites are analyzed, main topics of interest are elements of interface design of a website. Colors, fonts, font style, font size, buttons, placement of buttons, layout, information, the way information provided, images, suitability of images, loading time, inclusion of useful links and etc. are the aspects respondent asked to assess. Short operational definitions are given in order to facilitate assessing respondents.

Easy to use

When website assessed whether it is easy to use or hard to use user might look aspects like: appropriate background since it makes reading difficult or easy, presentation of information on the page, having necessary buttons or icons where required and etc.

Provide Feedback

Usage of visual cues that is either textual or graphical like changing on the color, appearance or sound. It shows result of their actions and gives idea that by clicking there user will move to different page.

Useful

Usefulness of website should answer questions like “Can you find what you want?”, “Does those information provided helpful?”, “Is that practical website?” and etc.

Efficient

When efficiency of the website is evaluated questions like “Does it take much time to do necessary tasks?” or “Does the information given straight forward?” need to be answered.

Well Organized

Presentation of information and layout is evaluated in these criteria. Placement of icons, buttons, usage of the space on interface, space left empty, neatness of the design are some criteria users need to evaluate.

Consistent

Icons, buttons, background color are main criteria to be evaluated in this part. Questions like “Does placement of icons and buttons are constant in each and every page of the website?” or “Do they have same color for every page as a background?” need to be answered.

Valuable Information

“Do they provide necessary information users will need?” is the main question users need to answer when assessing this criterion.

Responsive

“Do the named buttons and icons give you what that button and icon supposed to give?” or “Does it take much time to load images and information?”

Understandable

Level of language, clearness of message, and appropriate names given to buttons are the main criteria to be evaluated at this question.

Easy to use

As last table summarizes web sites are easy to use. 94 out of 250 rated those 1 and 68 rated 2 which shows ease of use of those websites.

Provide Feedback

88 out of 250 rated this criterion as 5 which show web sites mostly do not have feedbacks.

Useful

82 rated this criterion as 3 which is middle of scaling and subject to improvement.

Efficient

Efficiency of the web sites same as useful criterion. Majority of respondents rated 3 out of five which shows room for improvement.

Well organized

Web sites are quite well organized according survey. 78 out of 250 rated those at 2 and 74 at 3. It can be improved based on ratings respondents given where rating 1 is 40 and rating 4 is 44. With little attention on organization of web sites number 1 rating might be increased at the expense of number 4 rating.

Consistent

Majority rated consistency level of web sites 3 which is 90 out of 250. Nearest rating to 3 is rating 2 where 68 respondents out of 250 chosen it.

Valuable information

There is no remarkable difference in the amount of ratings by respondents which shows a lot effort need to be spent to improve on information provided on those web sites.

Responsive

74 and 72 respondent out of 250 agreed on ratings 2 and 3 respectively. Only 14 respondents given number 5 rating.

Understandable

According to respondents web sites are easy to understand. 90 respondents gave number 1 rating and 82 gave number 2 rating.

4.2.2 Guideline analysis

Developing a detailed guideline of interface require a great deal of effort and expertise. To produce a really effective guideline, it may be necessary to enlist expertise from a professional HCI expert. Due to this reason, interface guidelines that have been developed by HCI experts were reviewed and compared with each other. Total number of interface guidelines is 8. In order to list out most common elements of interface guidelines, the number of citation for every element is counted. The result is shown as below:

Guideline Elements	Number of Citation
Consistency	7
Feedback	7
Minimize user's memory load	6
User Control	5
Recognize Diversity	4
Reversal Action	4
Metaphors	3
Simplicity	3

Table 4.1: Total number of citations for interface elements

From the result, most common interface elements stated by HCI expertise in interface guideline were listed as follows:

- 1.0 Consistency
- 2.0 Feedback
- 3.0 Short term memory load
- 4.0 User control
- 5.0 Recognize diversity
- 6.0 Reversal action
- 7.0 Metaphors
- 8.0 Simplicity

4.3 Interface Guidelines for CD Rental Websites

4.3.1 Consistency

Consistency relates to the likeness in behavior arising from similar situations or similar task objectives. The user relies on a consistent interface. Consistent interface means that a system behaves in ways users expect. Users can transfer the knowledge they gained in some previous experience to the current situation and enhance their current performance base on their prior experience. Many criteria of web design should be consistent. The criteria are:

1.1 Consistent on color

Color selection is a very important element in web design because colors have an effect on users before they begin to read the content of the web site. Thus, it is very important to consider the target audience, the psychology of color, and the corporate image that wish to project for the interface of web design. When color is used correctly, it can add impact and clarity to the message and highlight important points.

Color must function successfully on several levels simultaneously. First, on a technical level, the colors must be as accurate as the existing technology will allow and heeding the rules of optics. Second, once a set of colors has caught and held the visitor's attention they must succeed in conveying appropriate information. Third, colors must function competently as the primary structural element in the store's design, which is the web page layout. In this capacity, color must create appropriate spatial and navigational effects on the page and the site as a whole. Fourth, as the primary aesthetic tool, colors must create a sense of visual harmony, thus sustaining and enhancing the users' interest in exploring the web site.

1.1.1 Use color to direct the eye to the most important areas on the page. The web designer must identify what ideal and normal sequences might entail: what the viewer should see first, where the eye should move next, and how much time the

viewer's attention should be held by each area. Use high value, high saturation colors to draw attention.

- 1.1.2 Keep colors to minimum; which are three - to seven colors. "Signal detection" theory means that the brain is able to understand and organize information when a minimum of colors and shapes exists within the visual field. Too many colors and shapes make it impossible to focus and find anything.
- 1.1.3 Use color harmony principles to create a pleasant visual experience. In other words, all the colors of the components like the navigation system, banners, buttons, and text as well as the images of the merchandise (if they exist), must all work well together. Some common attribute must unify them.
- 1.1.4 Use familiar, consistent color with appropriate pages.
- 1.1.5 Use the same color for grouping related element.

1.2 Consistent on layout

A consistent layout aids users' navigation and synthesizes the elements within the page of the web site. It also establishes unity across several pages. It should be immediately obvious to users that they are at the same site whether they are on the "Homepage" page or "About the Company" page. Consistency increases ease of use, reinforces a sense of structure and decreases learning time associated with navigating the site.

1.2.1 Establish level of importance.

Establish a high-to-low level of importance for each category and carry out this approach throughout the entire Web site. Important categories should appear higher on the page so users can locate them quickly.

1.2.2 Be consistent

Place company logos, recurring text, buttons and graphics in a consistent position on all pages. Users, particularly those older than 65, tend to learn and remember locations of information, functions, and controls.

1.2.3 Reduce unused space

Reduce the amount of unused space on pages used for scanning and searching. On pages that are primarily links or categories, like a home page, the greater the density, the faster the scanning. “Density” is defined as the percent of the screen filled with categories and text. Density has no impact on user accuracy or preference. On content/text pages, using some white space to separate paragraphs and ideas is important. As a rule, use less white space than you would on paper.

1.2.4 Put important information on top of page

Put important items at the top, “above the fold” (in the first screenful of information), to ease scanning. Experienced users usually scan a Web page menu or a list from top to bottom. Users generally look at the top center of a page first, then look left, then right, and finally begin systematically moving down the total page. All critical content and navigation options should be at the top of the page. Particularly on navigation pages, all major choices should be visible without scrolling. Users may conclude that what they see on the visible portion of the page is not of interest, and not bother scrolling down to see the rest of the page.

1.3 Consistent on font

Words are the most common system of communication. They deliver the most widely understood meaning to the greatest number of people accurately and in detail. Therefore, they are important elements of menus, navigation system and content. Text is very important to facilitate reading. The exact appearance of text in HTML is not entirely

predictable.

Consistent of font's typeface is not sufficiently across systems because it is not so confident to ensure that user will see a specific typeface. In most cases, we can only consistently distinguish among serif, san serif and typewriter typeface.

1.3.1 Use suitable size

Use at least a 10-point font to achieve the best possible reading performance. Research has shown that fonts smaller than 10-point elicited slower performance from users. For people over 65, it may be better to use at least 12 or 14 point. A rule of thumb is for a size 3 character on the users screen to equal a printed 12 point character of the same font.

1.3.2 Use familiar font

Use either a familiar and formal serif or sans serif font to achieve the best possible reading speed. Do not mix serif and sans serif- fonts within the text, because it may decrease reading speed. Research shows no reliable differences in reading speed or user preferences between 10-point Times Roman, Georgia serif fonts, Helvetica, or Verdana sans serif fonts. The mixing of serif and san serif font decreases reading speed.

1.4 Consistent on menu or icon

1.4.1 Keep the icon consistent

Use the same icon on all pages if possible. Important icon should be included at every page like home, previous, next, help and contact.

1.4.2 Provide a text link along with the icon

A text link can be read by screen readers for the visually impaired. Furthermore, it

is the best way to enable user understand on the icon's action.

1.4.3 Use a meaningful icon

If the users are domain expert, they will know what an icon might do. Thus, it is better to design the icon that can unambiguously be mapped to the correct concept.

4.3.2 Feedback

Effective feedback is a part of the interaction that has significant psychological impact on the user. Via good feedback, users can gauge the effects of their actions. Research also suggests that improving the feedback of software, in addition to increasing users satisfaction, actually improves the productivity of its users (Brady, 1986). Jeff Johnson said in his book that responsiveness is important issue on the web because it is completely user driven. In a technical reason, the huge difference in the time it takes to execute operations that can be performed entirely on the client side versus operation that require communicating with a web server. This difference places strong constraint on the design of web server. (Jeff Johnson, 2000)

When users perform some action, they want to know what happened. For example, when users click on the icon, it lets the user know that the icon would bring user to the next page by changing the icon's color. Below are the techniques and methods that support this element of interface guidelines.

2.1 Timely feedback. Acknowledge users input immediately by designing the user interface to distinguish between acknowledging users' actions and acting on them.

2.2 Use visual cues that are either textual or graphical like changing on the color,

appearance or sound. It shows users the effect of their actions.

- 2.3 Provide semantic feedback confirming that the intended choice was right or the task that user wished to perform.

4.3.3 Short – term memory load

Human's short-term memory or working memory acts as 'scratch pad' for temporary recall of information. It is used to store information which is only required fleetingly. Short-term memory also has a limited capacity [7]. The average person can remember is normally measured as the famous seven plus or minus two chunks (Miller, 1956) [9]. A chunk is basic unit information to be remembered. Due these limitation of human memory interaction design of user interface should limit the number of items that user has to deal at a particular moment.

- 3.1 Avoid from having a long menu scrolling off the top of the screen where a users can no longer see them and certainly won't remember them.
- 3.2 Design short linear sequences of actions by the users rather than deep involved task and sub task hierarchies.
- 3.3 Let users recognize rather than having to recall. That allows users to make selection from a displayed list as recognition instead of having to remember a specific character that must be typed in to accomplish a task.
- 3.4 Don't require users to remember information between two different pages on web site

4.3.4 User control

It is important to make users feel in charge at all the times rather than feeling as if the computer is in charge [9]. Izak Benbasat and J. Jiang have studied on interface design that allows customers' "virtual control" of web products and investigates the effect of this virtual control on customers' overall perception of product quality [14]. Users should have the impression if the web site is prepared to respond whenever user is ready to issue a command.

- 4.1 Make users know where they are in task and that information is automatically carried through from each step to the next.
- 4.2 Allow users to use either the keyboard or mouse as to provide flexibility to the users.
- 4.3 Display descriptive message and text for helping the user
- 4.4 Provide users to navigate easily through the interface by having meaningful path and exit. Make them comfortable by providing some context of where they are, where they have been and where they can go next.

4.3.5 Recognize Diversity

CD Rental web site would be accessed by many people, who cause wide diversity of users, users preference settings, hardware and software platform, browser and network speeds. It is impossible to create an optimal design for everyone. But developer could decide how well the site will work to each segment of the target population [13]. Target user for these web sites is adult and teenager.

- 5.1 Design for the individual differences like experience level and disabilities.

- 5.1.1 Addresses the differences in users by including both menu or icon or full descriptive menus choices. It is useful for novice users
- 5.1.2. Develop a screen layout to accommodate each type users' desire like novices needing extensive help and expert wanting to get where they want to go as quick as possible.
- 5.1.3 Avoid using color to make meaningful distinction between items because of the color blindness especially red or green.
- 5.2 Design for differences in user preference setting.
 - 5.2.1 Use standard font face, which is available at all platform like Times New Roman.
 - 5.2.2 Don't misuse of images because users with slow connection speeds will often avoid loading images.
 - 5.2.3 Provide button for user to skip from running other plug-ins like Flash, QuickTime or RealAudio. Some user may not install the software in their system.
- 5.3 Design for international differences. Users' hardware and software configurations vary widely. Hardware and software configurations need to be carefully sampled and tested. The web site has to be tested at all platform and browser as to need it work well.

4.3.6 Reversal action

Reversibility applies to actions for navigating through the system. Allowing users to return to previous levels or screen is a way to make this kind of action easily reversible.

Users should be able to return to at least the previous page they come from. This allows users to reverse undesirable accidental actions they may make. Such mechanism that allows users easily to reverse their action will encourage exploration of the web site. Under this condition, when they are not fearful of getting trapped or of taking potentially destructive action by accident, users will explore many more features of a web site.

6.1 Provide important link for every page.

It is better to design for freedom of movement and flexible navigation that supports many different ways of moving through a site. Therefore, users are able to reverse their previous action from their current page.

6.2 Allow users to go to previous pages.

Provide a link that allows user to go to the previous page. Having previous link that goes to the previous screen in the same page would be better for the user.

4.3.7 Metaphors

It is cognitive directness that involves minimizing mental transformation that users must make. Minimization of mental transformation by users can be accomplished by the use of appropriate mnemonics or memory aids. This mechanism has been successful in introducing computer novices to relatively foreign interaction techniques. Tremendous commercial successes in computing have arisen directly from a judicious choice of metaphor [7].

7.1 Use verbal metaphor

It is useful for graphic design in the web site and helps user to understand the interface. Knowledge about a familiar domain in terms of elements and their relationship to each other is mapped on to elements and their relationship in the web site design. Elements include arrow and email. The relations between the element include back arrow can go to the previous page and email is to contact

the company. By drawing on the prior knowledge users can develop an understanding of the new domain more readily.

7.2 Design for user to feel apart of the interface

In spite of using graphic for designing the metaphor, sound and animation is useful to create a real world domain. Make it a simple sound and animation for recognizing the users and understanding mechanism of the metaphor.

4.3.8 Simplicity

Developing a simple web site would make user comfortable to get information, navigate or explore the web site and visit the web site again.

8.1 Keep task short and simple

Include only necessary elements to the user's task it can be done by breaking the complex task into simpler task and breaking long sequences into separate step. Use objects that are familiar to the user like icon, list box and menu.

8.2 Present the entire interface element in the simplest way.

8.3 Use a simple language and direct. It is easy for users to understand

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

People tend to go shopping to places where they are treated well, where everything is neatly arranged, easy to find, and with lot of choices. If those criteria what they were looking are provided then they prefer to come to that place again.

In this century where value of time increasing constantly especially in corporate world time management is becoming one of the most important issues. With the emergence of e-business time to spend to travel to shopping malls and shops can be saved. People do their shopping online and get their purchase shipped to their address. Now, place of friendly sales assistant taken by comprehensive and neatly designed website. Website that entities put up on the net plays vital role in getting customer for them, more customers they get higher possibility to survive in this competitive world. That is why websites designed with all required information are becoming vital each and every day passed.

Same goes to CD Rental websites. People might not be able to go and look for best places to rent CDs. Internet will be the place to look for such information, and website play important role to get customer who is undecided where to rent from.

Appropriate design of website will increase their number of customers, thus increasing their business. In order to get website designed well, guidelines can play vital role in designing process. Author produced guideline with set of most important elements for website design

A well - crafted Website can enhance corporate image and provide tangible benefits both to the organization and to its readership. Certainly there are plenty of technical considerations that go into the design and development of an Effective Corporate Website [5].

A research was conducted on certain identified CD Rental websites. Based on the result at the Information Analysis stage, web design guidelines was developed on this particular topic. Guideline is really useful to improve the web site interfaces because it covers lots of aspects such as simplicity, consistency, feedback, users' control and metaphor.

Due to the time constraint, the research conducted did not cover all the topics related to interface guideline and yet prototype developed based on findings of research topic is not fully functional. Concentration was be given on interface part of prototype rather than full functionality of the application developed [15].

5.2 Recommendation

Detailed research can be done on topics involve in interface guideline. Application to be developed can be enhanced based on extended research on this topic and functionality can be improved as well.

The guideline requires testing phase because it was not implemented at this phase due to the time constraint. Researches have studied how designers use the guidelines to design interfaces. According to the Theo Mandel, only 71 percent of the participant's designs were compliant with the design guidelines. Most of the differences were due to the influences from designer's experiences with nonstandard interface design for compliance. When given an interface to evaluate, designers find only an average of 4 out of 12 deviations in the design. Therefore, this guideline needs to be tested as to define the usability of the guideline.

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APPENDIX 1

1. Eight Golden Rules of Interface Design from Shneiderman's Principles of Human Computer Interaction

Strive for consistency	<ul style="list-style-type: none"> • Consistent sequences of actions should be required in similar situation • Identical terminology should be used in prompts, menus and help screen • Consistent color, layout, capitalization, fonts and so on should employed throughout
Enable frequent users to use shortcuts	<ul style="list-style-type: none"> • To increase the pace of interaction use abbreviations, special keys, hidden commands and macros
Offer informative feedback	<ul style="list-style-type: none"> • For every user action, the system should respond in some way (in web design, this can be accomplished by DHTML; for example a button will make a clicking sound or change color when clicked to show the user something has happened)
Design dialogue to yield closure	<ul style="list-style-type: none"> • Sequences of actions should be organized into groups with a beginning, middle and end. The informative feedback at the completion of a group of actions shows the user their activity has completed successfully
Offer error prevention and simple error handling	<ul style="list-style-type: none"> • Design the form so that users cannot make a serious error; for example, prefer menu selection to form fill in and do not allow alphabetic characters in numeric entry fields • If users make an error, instructions should be written to detect the error and offer simple, constructive and specific instructions for recovery • Segment long form and send sections separately so that the user that multiple sections are coming up
Support internal locus of control	Experienced users want to be in charge. Surprising system actions, tedious sequences of data entries, inability to produce the action desired all build anxiety and satisfaction.
Reduce short term memory load	<ul style="list-style-type: none"> • A famous study suggests that humans can store only 7 (plus or minus 2) pieces of information in their short

	term memory. You can reduce short term memory load by designing screens where options are clearly visible or using pull down menus and icons
--	--

2. interface web design from Bonnie Skaalid (Bonnie Skaalid, 1999)

Recognize diversity	<ul style="list-style-type: none"> • Make your main navigation area fast loading for repeat users • Provide a text index for quick access to all pages of the site • Ensure your pages are readable in many formats, to accommodate users who are blind or deaf, users with old versions of browsers, lynx users, users on slow modem or those with graphics turned off
Strive for consistency	<ul style="list-style-type: none"> • Consistent in menus, help screens, color, layout, capitalization, fonts and sequences of actions
Offer informative feedback	<ul style="list-style-type: none"> • Rollover buttons, sounds when clicked
Build in error prevention in online forms	n/a
Give users control as much as possible	n/a
Reduce short - term memory load by providing menus, buttons or icons	<ul style="list-style-type: none"> • If use icons, make sure have a section which explains what they mean • Make things obvious by using constraints – grayed out items in menus for options not available in that page
Make use of web conventions	<ul style="list-style-type: none"> • For example underlined links, color change in links for visited pages and common terminology
Provide conceptual model or site using a site map or an index	n/a

3. Summary of Apple interface Guidelines [11]

Metaphors from the real	<ul style="list-style-type: none"> • Use concrete metaphors and make them plan, so that users have a set of expectations to apply to computer environment
World	<p>Users have a set of expectations to apply to computer environment</p> <ul style="list-style-type: none"> • Whenever appropriate, use audio and visual effects that support metaphors
Direct manipulation	<ul style="list-style-type: none"> • Users want to feel that they are in charge of the computer's activities
See and point (not remember and type)	<ul style="list-style-type: none"> • Users select actions from alternatives presented on the screen. The general form of user action is noun then verb • Users rely on recognition, not recall, they should not have to remember anything the computer already knows. Most programmers have no trouble working with a command line interface that requires memorization and Boolean logic. The average user is not programmer.
Consistency	<ul style="list-style-type: none"> • Effective applications are both consistent within themselves and consistent with one another.
WYSIWYG	<ul style="list-style-type: none"> • There should be no secrets from the user, no abstract commands that only promise future results. • There should be no significant difference between what the user sees on the screen and what eventually gets printed.
User control	<ul style="list-style-type: none"> • The user, not the computer, initiates and controls all the actions
Feedback and dialog	<ul style="list-style-type: none"> • Keep the user informed. Provide immediate feedback. • User activities should be simple at any moment, though they may be complex taken together.
Forgiveness	<ul style="list-style-type: none"> • Users make mistakes; forgive them. The users actions generally reversible – let user know any that are not.
Perceived stability	<ul style="list-style-type: none"> • Users feel comfortable in a computer environment that remains understandable and familiar rather than changing randomly
Aesthetic integrity	<ul style="list-style-type: none"> • Visually confusing or unattractive displays detract from the effectiveness of HCI. Different “things” look different on the screen. Users should be able to control the superficial appearance of their computer workplaces to display their own style and individuality. Messes are acceptable only if the user makes them – applications aren't allowed this freedom.

4. Ergonomics Guidelines For User – Interface Design [12]

<p>Consistency ("Principle of least astonishment")</p>	<ul style="list-style-type: none"> • Certain aspects of an interface should behave in consistent ways at all times for all screens. • Terminology should be consistent between screens. • Icons should be consistent between screens. • Colors should be consistent between screens of similar function.
<p>Simplicity</p>	<ul style="list-style-type: none"> • Break complex tasks into simpler tasks • Break long sequences into separate steps • Keep tasks easy by using icons, words etc. • Use icons/objects that are familiar to the user.
<p>Human memory limitations</p>	<ul style="list-style-type: none"> • Organize information into a small number of "chunks" • Try to create short linear sequences of tasks • Don't flash important information onto screen for brief time periods • Organize data fields to match user expectations, or to organize user input (e.g. Autoformatting phone numbers) • Provide cues/navigation aids for the user to know where they are in the software or at what stage they are in an operation • Provide reminders, or warnings as appropriate • Provide ongoing feedback on what is and/or just has happened • Let users recognize rather than recall information • Minimize working memory loads by limiting the length of sequences and quantity of information – avoid icon mania
<p>Cognitive directness</p>	<ul style="list-style-type: none"> • Minimize mental transformations of information (e.g. Using 'control+shift+esc+8' to indent a paragraph) • Use meaningful icons/letters • Use appropriate visual cues, such as direction arrows • Use 'real-world' metaphors whenever possible (e.g. Desktop metaphor, folder metaphor, trash can metaphor etc.)
<p>Feedback</p>	<ul style="list-style-type: none"> • Provide informative feedback at the appropriate points • Provide appropriate articulatory feedback – feedback that confirms the physical operation you just did (e.g. Type 'help' and 'help' appear on the screen). This includes all forms of feedback, such as auditory feedback (e.g. System beeps, mouse click, key clicks etc.) • Provide appropriate semantic feedback – feedback that

	<p>confirms the intention of the action (e.g. highlighting an item being chosen from a list)</p> <ul style="list-style-type: none"> • Provide appropriate status indicators to show the user the progress with a lengthy operation (e.g. The copy bar when copying files, an hour glass icon when a process is being executed etc.)
System messages	<ul style="list-style-type: none"> • Provide user-centered wording in messages (e.g. “there was a problem in copying file to your disk” rather than “execution error 159”) • Avoid ambiguous messages (e.g. Hit ‘any’ key to continue – there is no ‘any’ key and there is no need to hit a key, reword to say ‘press the return key to continue’) • Avoid using threatening or alarming messages (e.g. Fatal error, run aborted, kill job, catastrophic error) • Use specific, constructive words in error messages (e.g. Avoid general messages such as ‘invalid entry’ and use specific such as ‘please enter your name’) • Make the system ‘take the blame’ for errors (e.g. “illegal command” versus “unrecognized command”)
Anthropomorphization	<ul style="list-style-type: none"> • Don’t anthropomorphize (i.e. Don’t attribute human characteristics to objects) – avoid the “have a nice day” messages from your computer
Modality	<ul style="list-style-type: none"> • Use modes cautiously – a mode is an interface state where what the user does has different actions than in other states (e.g. changing the shape of the cursor can indicate whether the user is in an editing mode or a browsing mode) • Minimize preemptive modes, especially irreversible preemptive modes – a preemptive mode is one where the user must complete one task before proceeding to the next. In a preemptive mode other software functions are inaccessible (e.g. File save dialog boxes) • Make user actions easily reversible – use ‘undo’ commands, but use these sparingly • Allow escape routes from operations
Display issues	<ul style="list-style-type: none"> • Use attention grabbing techniques cautiously (e.g. Avoid overusing ‘blinks’ on web pages, flashing messages, ‘you have mail’, bold colors etc.) • Don’t use more than 4 different font sizes per screen • Use serif or sans serif fonts appropriately as the visual task situation demands • Do not use all uppercase letters – use uppercase/lowercase mix • Do not overuse audio and video

	<ul style="list-style-type: none"> • Use colors appropriately and make use of expectations (e.g. do not have an ok button colored red! Use green for ok, yellow for 'caution', and red for 'danger' or 'stop') • Do not use more more than 4 different colors on a screen • Do not use blue for text (hard to read), blue is good background color • Do not put red text on a blue background • Use high contrast color combinations • Use color consistently • Use only 2 levels of intensity on a single screen • Use underline, bold, inverse video or other markets sparingly • On text screens do not use more than 3 fonts on a single screen
Individual differences	<ul style="list-style-type: none"> • Accommodate individual differences in user experience (from the novice to the computer literature)

5. Ten web guidelines by Darren Gergle [13]

See point (not remember and type)	<ul style="list-style-type: none"> • Users select actions from alternatives presented on the screen. The general form of user action is noun then verb • Users rely on recognition, not recall; they should not have to remember anything the computer already knows. Most programmers have no trouble working with a command line interface that requires memorization and Boolean logic. The average user is not a programmer
Navigation	<ul style="list-style-type: none"> • How clear the organization of the web site • Can user find their way from place to place?
Speed	<ul style="list-style-type: none"> • Slow download time is one biggest complaints of user online • Minimize page size and processing time • Use text unless graphics are necessary
Appropriateness to task	<ul style="list-style-type: none"> • What are the user tasks and does the site reflect the structure? • Make sure user know where they are in a task
Visual Design	<ul style="list-style-type: none"> • Does your design have simplicity, consistency and focus? • Is it attractive and uncluttered?

Compatibility	<ul style="list-style-type: none"> • Does the site work wide range of users and computers? • Does it work well across the wide range of individual differences?
Simplicity	<ul style="list-style-type: none"> • Is every presented in the simples, most straightforward way? • Is the language simple and direct? • Are icons helpful or obscure?
Error handling	<ul style="list-style-type: none"> • Does the system prevent the users from entering inappropriateness values? • Is error recovery quick and efficient, guiding the user through the problem resolution as easily as possible?
Respect for the user	<ul style="list-style-type: none"> • Are you putting the user's security or privacy at risk? • Are you misleading them, wasting their time or tapping them into a path they don't want to be on?
Consistency and contrast	<ul style="list-style-type: none"> • Similar thing should be similar. • Different thing should be obviously different • Does the site have internal consistency within the page and between the pages? • Does it have consistency style and message?

6. 10 web design guidelines Jakob Neilson (1993) [13]

Simple and natural dialogue	<ul style="list-style-type: none"> • Keep task short and simple • Follow a principle of minimalism, including only elements necessary to the user's task
Speak the user's language	<ul style="list-style-type: none"> • Use terminology familiar to the use, not to your organization • Avoid jargon the user would not know
Minimize the user's memory load	<ul style="list-style-type: none"> • Don't require users to remember information, especially between two different pages on your site and certainly not between two different visits to your site • Show them options and let them recognize the relevant information and choose
Feedback	<ul style="list-style-type: none"> • How the systems respond to users' actions? • How is the state of the system reflected on screen? • When users click, is his response quick?

Clearly marked exist	<ul style="list-style-type: none"> • Provide ways users to back out of mistakes they make. • Don't create orphan pages with no links back to the home page • Allow operation to be cancelled or undone
Shortcuts	<ul style="list-style-type: none"> • Make thing fast • Minimize the number of steps users need to go through • Let expert users to perform frequent task more easily
Good error message	<ul style="list-style-type: none"> • Help user recognize, diagnose, and recover from error. • Provide clear error message that explain how the user can correct a problem
Prevent errors	<ul style="list-style-type: none"> • Help user avoid making errors altogether • Provide clear instructions to avoid errors of misunderstanding
Help and documentation	<ul style="list-style-type: none"> • Provide help information, frequently ask questions and tips. • Give instructions.
Consistency	<ul style="list-style-type: none"> • Remain consistent within your pages between pages and with web standards and conventions.

7. User Interface guidelines for web design [2]

Determine user demographic and experience	<ul style="list-style-type: none"> • New visitors to your web page? • Previous visitors returning to your web page? • Any previous web experience?
Define user task	<ul style="list-style-type: none"> • Find information • Learn about the product • Order a product • Track an order • Give feedback
Help user investigate and search	<ul style="list-style-type: none"> • Offer clear and intuitive organization of site information • Offer an understandable and obvious visual navigation scheme (button, text, image map) • Provide navigation aids on every pages(make it possible for users to jump right to any page from a web search engine) • Let user know where a navigation link will take them • Labeled all linked graphics

	<ul style="list-style-type: none"> • Use standard text link colors and highlighting
<p>Help user perform task quickly</p>	<ul style="list-style-type: none"> • Reduce search time • Reduce time to load pages and image • Reduce scrolling within a page • Limit number of choices at a level • Group important choices together
<p>Establish user interface</p>	<ul style="list-style-type: none"> • Use consistent heading and terminology • Be consistent in your navigation scheme • Establish a page layout grid and follow it on all pages

APPENDIX 2

This questionnaire is designed to gather information about user interface of CD Rental web sites in order to produce guideline

I. Please browse through the websites and mark them by **highlighting** the number.

1. http://www.kelkoo.co.uk/b/a/c_150401_music.html?kpartnerid=8902247&popups=no

Easy to use	1	2	3	4	5	Hard to use
Have feedback	1	2	3	4	5	No feedback
Useful	1	2	3	4	5	Waste of time
Efficient	1	2	3	4	5	Tedious
Well organized	1	2	3	4	5	Haphazard
Consistent	1	2	3	4	5	Not consistent
Valuable Information	1	2	3	4	5	No information
Responsive	1	2	3	4	5	Slow
Understandable	1	2	3	4	5	Hard to understand

2. <http://www.canadaflix.com/>

Easy to use	1	2	3	4	5	Hard to use
Have feedback	1	2	3	4	5	No feedback
Useful	1	2	3	4	5	Waste of time
Efficient	1	2	3	4	5	Tedious
Well organized	1	2	3	4	5	Haphazard
Consistent	1	2	3	4	5	Not consistent
Valuable Information	1	2	3	4	5	No information
Responsive	1	2	3	4	5	Slow
Understandable	1	2	3	4	5	Hard to understand

3. <http://www.godesigo.com/>

Easy to use	1	2	3	4	5	Hard to use
Have feedback	1	2	3	4	5	No feedback
Useful	1	2	3	4	5	Waste of time
Efficient	1	2	3	4	5	Tedious
Well organized	1	2	3	4	5	Haphazard
Consistent	1	2	3	4	5	Not consistent
Valuable Information	1	2	3	4	5	No information
Responsive	1	2	3	4	5	Slow
Understandable	1	2	3	4	5	Hard to understand

4. http://www.screenselect.co.uk/visitor/preview_titles.html

Easy to use	1	2	3	4	5	Hard to use
Have feedback	1	2	3	4	5	No feedback
Useful	1	2	3	4	5	Waste of time
Efficient	1	2	3	4	5	Tedious
Well organized	1	2	3	4	5	Haphazard
Consistent	1	2	3	4	5	Not consistent
Valuable Information	1	2	3	4	5	No information
Responsive	1	2	3	4	5	Slow
Understandable	1	2	3	4	5	Hard to understand

5. http://www.screenselect.co.uk/visitor/home.html?refer=afstandard120x120&promotion_code=AFUT

Easy to use	1	2	3	4	5	Hard to use
Have feedback	1	2	3	4	5	No feedback
Useful	1	2	3	4	5	Waste of time
Efficient	1	2	3	4	5	Tedious
Well organized	1	2	3	4	5	Haphazard
Consistent	1	2	3	4	5	Not consistent
Valuable Information	1	2	3	4	5	No information
Responsive	1	2	3	4	5	Slow
Understandable	1	2	3	4	5	Hard to understand

II. What are the remarkable differences between identified websites that you have noticed?

Thank you in Advance
Vepa Narmedov

APPENDIX 3

1. http://www.kelkoo.co.uk/b/a/c_150401_music.html?kpartnerid=8902247&popups=no

kelkoo
MUSIC

Search all of kelkoo Search within "Music"

37. Album: Dedicated
Artist: Lemar
[more](#)

38. Album: Youth and young manhood
Artist: Kings Of Leon
[more](#)

39. Album: Best Christmas Album In The World... Ever, The
Artist: Various Artists
[more](#)

40. Album: Absolution
Artist: Muse (3)
[more](#)

41. Album: Maximum Sheryl Crow
Artist: Crow, Sheryl
[more](#)

42. Album: Rock Show, The
Artist: Blink 182
[more](#)

43. Album: In Time
Artist: RFI
[more](#)

44. Album: Introduction
Artist: Renewation
[more](#)

45. Album: Shut Up
Artist: Black Eyed Peas
[more](#)

46. Album: Dutty rock
Artist: Paul Sean
[more](#)

47. Album: Time
Artist: JourneX (1)
[more](#)

48. Album: MH
Artist: Houston, Marques
[more](#)

49. Album: Friday's child
Artist: Young, Will
[more](#)

50. Album: Unearthed
Artist: Cash, Johnny
[more](#)

[1 2] Next >>

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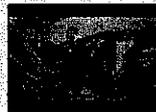


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APPENDIX 4

Web site 1 <http://www.kelkoo.co.uk>

RATING						
	1	2	3	4	5	
Easy to use	22	22	6	0	0	Hard to use
Provide Feedback	2	2	14	12	20	No feedback
Useful	6	8	16	16	4	Waste of time
Efficient	1	16	20	12	1	Tedious
Well organized	4	22	16	6	2	Haphazard
Consistent	8	12	20	6	4	Inconsistent
Valuable information	6	6	14	20	4	No information
Responsive	4	12	18	10	6	Slow
Understandable	22	18	10	0	0	Hard to understand

Web site 2 <http://www.canadaflix.com/>

RATING						
	1	2	3	4	5	
Easy to use	20	14	14	2		Hard to use
Provide Feedback	2	6	10	12	20	No feedback
Useful	6	14	16	10	4	Waste of time
Efficient	6	10	18	10	6	Tedious
Well organized	6	12	16	12	4	Haphazard
Consistent	6	10	22	10	2	Inconsistent
Valuable information	8	26	8	8		No information

Responsive	10	14	16	8	2	Slow
Understandable	14	20	12	4		Hard to understand

Website 3 <http://www.godesigo.com/>

RATING						
	1	2	3	4	5	
Easy to use	16	10	10	4	0	Hard to use
Provide Feedback	4	4	18	6	18	No feedback
Useful	2	6	18	16	8	Waste of time
Efficient	4	10	14	18	4	Tedious
Well organized	4	18	14	10	4	Haphazard
Consistent	4	12	18	14	2	Inconsistent
Valuable information	4	4	6	14	18	No information
Responsive	8	14	16	12		Slow
Understandable	16	14	12	4	4	Hard to understand

Web site 4 <http://www.screenselect.co.uk>

RATING						
	1	2	3	4	5	
Easy to use	16	12	10	10	2	Hard to use
Provide Feedback	6	6	10	14	14	No feedback
Useful	6	6	16	18	4	Waste of time
Efficient	2	6	20	18	4	Tedious
Well organized	8	12	16	10	4	Haphazard

Consistent	6	10	18	12	4	Inconsistent
Valuable information	6	10	18	10	6	No information
Responsive	10	20	10	6	4	Slow
Understandable	20	10	10	6	4	Hard to understand

Web site 5 <http://www.screenselect.co.uk/visitor/home.html>

RATING						
	1	2	3	4	5	
Easy to use	20	10	12	8		Hard to use
Provide Feedback	6	6	10	12	16	No feedback
Useful	6	6	16	18	4	Waste of time
Efficient	8	18	12	8	4	Tedious
Well organized	18	14	12	6		Haphazard
Consistent	6	22	12	6	4	Inconsistent
Valuable information	14	18	12	6		No information
Responsive	16	14	12	6	2	Slow
Understandable	18	20	6	6		Hard to understand

Ratings of all five web sites together

RATING						
	1	2	3	4	5	
Easy to use	94	68	52	24	2	Hard to use
Provide Feedback	20	24	62	56	88	No feedback
Useful	26	40	82	78	24	Waste of time

Efficient	21	60	84	66	19	Tedious
Well organized	40	78	74	44	14	Haphazard
Consistent	30	66	90	48	16	Inconsistent
Valuable information	38	64	58	58	28	No information
Responsive	48	74	72	42	14	Slow
Understandable	90	82	50	20	8	Hard to understand

APPENDIX 5

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