

## CHAPTER 2

### Literature Review

#### 2.1 User Experience/UX

User Experience or the term UX can be defined as a set of strategies that are developed and designed to understand the requirements and behaviors of the users of the product/website and then practically implement these strategies to the development of aesthetically pleasing, useful and usable designs for the website (Preston, 2003).

Psychology theory of Gestalt proposes the fact that a human mind is programmed to cope up with visual chaos, which leads to its ability to strive and works hard to make sense out of even the most chaotic scenarios. Also, the fact that a human mind is processed to process an object as a whole rather than processing it into individual parts. It instantly and automatically tries to fill in the missing gaps and seek for ways to avoid uncertainty. These all results in increasing the cognitive load, increasing the chances of a user displeasure, at the users end (Pennington, Chapman, Fry, Deschenes, & McDonald, 2016). This calls for the importance of work in the field of user experience, focused on implementation of basic design principles, that can help in assistance to provide clear visual paths to the end user and which has the capability to direct the flow of the user's attention in the direction we want it to go. Combination of visual and functional attributes of a website serve to provide the highest level of user satisfaction (Lee, 2013).

Researches reveal that user-centered designs turn focus from the point that the 'developer knows the best' towards the fact that 'the user knows the best'. The earlier technique that focused on the developers usually failed because it was hard to envision and identify the uses, needs, and the problems of the end user (Massanari, 2009). User Experience is a continuous process and it is noted that user experience increases gradually and tends to change periodically (Ain, Aslam, Muhammad, Awan, Parvez, Naveed, & Qadri, 2016). An effective site today may not be considered as effective or it may become an average site (or not so interesting) for the user after some time and advancements in technology. Studies on this subject have also revealed that 41% of users

immediately abandon websites that appears outdated to them. (Schiller, 2011) thus leading to the fact that how important user experience is.

UX Enhances Website Effectivity: User experience not only produces a great impact on brand perception and value, but it also has the capability to put a direct impact on sales, particularly on e-commerce websites. Studies have revealed that provision of superior user experience have translated into as much as a 400% increase in sales lead conversion (Schiller, 2011). Today a lot of research is put in developing effective websites because studies reveal that only effective websites can lead to increased user satisfaction (Wilkie, Romance, & Rosendale, 2012) which is very important in the competitive world of today when all organizations are competing and putting emphasis on creating best user experiences that can result in increasing user satisfaction levels from the website.

Key to creating a good user experiences that ultimately translate into successful website is to dynamically adapt the site to meet the needs of the individual users rather than having a strategy to create a one-size-fits-all solution. A study conducted on various award-winning websites showed the fact that before the start of their design process, their proposed experiences were tailored (both the navigation and the intelligence) which means their user experience were designed. Today leading organizations like IBM are making the use of predictive analytics for the purpose of analyzing data or patterns on how users navigate sites and what are the information they are most interested and thus implementing strategies to make that data readily available to them (Schiller, 2011).

## **2.2 What is Website Effectivity**

An effective Website, depending on its purpose, can work as a great Marketing as well as a sales tool by building brand images or personalities. Websites majorly fit into one of the two broad categories that include:

- a. Websites that builds relationships with prospective customers by informing them about the brand or services
- b. Websites featuring products and allowing consumers to purchase online thus serving as direct selling platforms towards the users (Chingching, 2012).

Effectivity of a website is a term that cannot be universal as It is highly dependent on the functioning and purpose of the website therefore different websites are rated differently for their effectivity level. To be true, gauging effectivity is not an exact science as there is no solid way to determine if the website is effective or not. Website success calculation or derivation of an exact ROI figure for the website, an inexact science or procedure, is possible only among two types of websites

1. By calculating sales on an Ecommerce website
2. By comparing and calculating increased employee productivity on intranets (Preston, 2003).

### **2.3 Study on Processes**

User Experience cannot be graded as a measurable task in fact it is said to be developed from a combined set of elements (Deaton, 2003). Similarly, it cannot be achieved or determined by a single process but is perceived as a set of layered processes or a process that consists of set of sequenced activities (Zantjer, & Gonzales, 2015). These processes or activities are said to arise from a set of developed planes that include strategy, structure, skeleton, scope and surface of the development process. Each of these planes mentioned are said to contain elements that are ultimately said to lead to the creation of a greater user experience. Surface plane amongst all the above is of most importance as all the elements gather at the surface plane (interface) to give life to creation of overall user experience (Deaton, 2003).

It can be safely inferred that there is no single characteristic that has the capability to fully encompass experience of the user which leads to the fact that skills and expertise that are required for effective implementation of user experience cannot be combined in a nutshell. In fact, they can be considered as a set of processes and skills that are required to define the job or skill set that will be required by a user experience manager to implement the techniques and produce the best use experience (Zantjer, & Gonzales, 2015).

#### **a. Persona Development**

Personas can be defined as prototypical users with names, interests, faces and preferences. They serve as a standard or conceptual image of the end user and help in the process for making important design decisions (Massanari, 2009). Personas serve as an emotional bridge between website producers/ team member and the end users. They provide a level of familiarity or empathy related to what the user might experience when they will traverse your Web site. A persona is a narrative for describing the flow of someone's schedule, skills, attitudes, environment and goals instead of being a description or list of tasks or duties which were taken as standard for design and development in the earlier years. Personas have the capability to connect the design and development teams to a user who is tangible rather than just being a vague idea or a set of specific requirements (Guenther, 2006).

Personas cannot be defined as real people but are hypothetical archetypes of actual users. Although they are imaginary still they are defined with significant rigor and precision and are used to represent the end user throughout the design process and are very important (Massanari, 2009). Personas help us in recognizing the fact that even within a customer base there will always be various discrete user groups that will have similar needs and goals. Steps on a simple Persona Development include:

- Research: Research and gather data about the users
- Data Analyzing and Findings: Once the information has been gathered, observe repetitive patterns in behaviors and attitudes of the user and cluster data into consistent themes
- Persona Writing: Assign characteristics to the persona such as: a name, some demographic data such as age and educational background and a picture/image to make the persona more real.

A broader insight in order to connect product development with a tangible user can go as far as a precise fictitious name, personality, schedule, occupation and lifestyle etc. (Guenther, 2006).

Persona and User Experience: Personas generally are highly valued in the design process. They can be clearly identified as an important basis of creating a website that will have the ability to provide the users with positive emotions and higher levels of satisfaction resulting in enhancement of user's experience (Massanari, 2009). Personas serve as a solid platform through which different project teams and designers are able to sync their work with user goals and needs. This synchronization with user goals results in enhancement user experience (Guenther, 2006). As a need for a clear format that has the capability to take into account all realities of life and still have

room for future evolution, Personas can be clearly stated as user experience design tools (Idoughi, Seffah, & Kolski, 2012).

Persona and Website Effectivity: Considering Personas from a marketing point of view, personas have proven to be beneficial for both internal and external marketing efforts. They are considered as a source of providing tangible means for kicking off a project thus leading to the success of a website. The idea held by designers and technical people, assuming that they already know their users wants and needs, can lead to website that might work for the users who resemble the development team of the Web site only. Such a site may not address the complete and nonobvious needs of the user (Guenther, 2006) thus giving rise to the fact that personas can help development teams to understand the user and create websites that have higher capacity to match the requirement of the user thus giving rise to success chances or effectivity of the website.

Persona in Information Architecture: Information architecture personals usually do not have direct contact with the users. Value of a persona therefore becomes critical to the design process in this situation as they are said to possess thematic elements which help the architecture practitioners to perceive users in the best possible way (Massanari, 2009) thus proving that persona development is an important process that can help with the process of Information Architecture.

Persona in Visual Design: A persona helps the designers to sync their work with user goals. Aesthetic designs and content of a website can be carefully planned and executed by making decisions after considering the details mentioned in the persona about the user. This leading to success of a visual design (Guenther, 2006).

Persona in Interaction Design: Interaction design personals greatly use personas to perceive user interaction for the design processes as they themselves do not have any direct way to assess the potential user of the website or asses how the user will interact with the website. Thus, proving the fact that use of persona is critical in the interaction design process (Massanari, 2009).

Persona in Usability Engineering: Data-driven personas, serving as a resource for UCD's (user-centered designs), can help to improve the design process and make assessments about usability of the site. Personas are highly helpful for usability designing professionals to make important evaluations (Friesse, 2015).

**b. Information Architecture**

The general process of Information architecture leads to the designing of information environments along with its management (Deaton, 2003). Information Architecture can be defined best as a dissection of a Project into Manageable Bits and pieces. An Information architects work is somewhat similar to a person solving a complex jigsaw puzzle, involves going through painstaking processes while keeping in focus the big picture, to ensure that the completed image in the end is worth the efforts that have been put in.

A candidate for performing Information architecture must have great eye for detail and good problem-solving skills as these are fundamental for the success of an information architect role or position. An information architect breaks down a large project into manageable chunks and delegates responsibilities and determines the workflow. An example to explain this all was given by Hartley who defines information architecture in the easiest way by considering a scenario in which a company intends to work on a project described as: 'building a system that can plug a monitoring device into the side of a tank to monitor and record the pressure and then e-mail that reading to the concerned to ensure that a truck is sent for disposal dumping.' Now an information architect would work on this problem by first breaking down the process into steps and then clearly determining all the technical requirements for the execution of each step. The information architect would be required to define the job generally and then determine each step of work in this problem such as:

- Requirement of an email processing service which will run on one server and will perform following responsibilities....
- An alert system that will run on 'this' server and will perform following responsibilities.
- A web application that will display the data is going to work like 'this'... and have following responsibilities.... Etc. (Hartley, 2009).

Information Architecture and User Experience of a Website: The roots of Information architecture are found in multiple fields including visual design, information design and engineering psychology which can all be summed up as human factors and are very important factors for designing of human experiences (Deaton, 2003). Therefore, the work of an Information Architect usually involves structuring organization, search and the navigation systems that can lead to shaping up the best user experience.

Information Architecture and Effectivity of Website: IA contributes to website success by answering three findability questions:

- Can users find the web site?
- Can users find their way around your web site?
- Can users find products and content on the web site?

IA helps in findability which is the major problem to which information architecture is the answer. IA is not only about findability but in fact it is essential to designing websites that are useful, accessible, usable, desirable and credible. The role information architecture plays in shaping up a company's brand through a website cannot be ignored (Marcos, 2007).

### c. Interaction Design

Interaction design is concerned with facilitating interactions; interactions with artifacts or interaction between humans through artifacts. The discipline of interaction design is said to be related to behaviors, functions and information. This type of design work can be clearly characterized as a conversation between the designer and the situation. This conversation is generally challenging as it is a very hard process to define the elusive term known as 'interaction' and to understand the proper concept of an interaction design we need to understand that is concerned with the behavior of a user towards the products or services or how that product or that service works (Karlgrén, Ramberg, & Artman, 2016).

The interactions between users and products can be characterized based upon product properties, tasks, user characteristics and other contextual features and users tend to instantly form impressions of a website. Investigation of attitude formation upon interaction with a website is a very important aspect and can help us shape up the interaction of the user with the site thus resulting in the intended behaviors we require and avoidance of user switching to another alternative or competitive website (Jiang, Wang, Tan, & Yu, 2016).

The complex that design interaction plays made it difficult to separate presentation layer from behavioral or interaction layer as interaction is more about behavioral aesthetics. To understand this point let us consider the aesthetics of an iPhone. The aesthetics are not only visible from its visual appearance but are also evident from its touchable interface or by the fact how or

what type of experienced it gives to its users. This leads to the fact that beauty of a design does not exist as a whole in a visual design only. It heavily relies on user interaction and behavior. Giving rise to the existence of a behavioral level of aesthetics, where people perceive aesthetics through their actions/operations or interactions to be exact. (Jiang, Wang, Tan, & Yu, 2016)

Interaction Design and User Experience of a Website: To understand product and user interaction it is important to first examine the relationships between user perceptions of usability/aesthetics and emotional responses. The interactions between the users and a product/website can be characterized based upon product properties, task at hand, user characteristics and other contextual features. These interaction characteristics have a great connection to creation of user experience which is largely connected with human emotions. Emotional reactions, feelings, motor expressions are all parameters that can be used to design interaction (Seo, Lee, & Chung, 2016).

Interaction Design and Effectivity of Website: First impression of a website on a user is of utmost importance. This leads to the fact that Investigation of attitude formation upon the first interaction with a website is crucial as these initial impressions are said to impart larger impacts on attitudes and behavior of the user. If the user's interaction with the website is not impressive this may lead the user to easily switch or another alternative or competitor website thus resulting in non-achievement of website purpose or decrease in website effectivity (Jiang, Wang, Tan, & Yu, 2016).

**a. Visual Design**

Visual design can be defined as the attention-grabbing aesthetic as well as visual quality of a Web page. Elements of a visual design are said to be dealing with balance, aesthetics, uniformity and emotional appeal of the overall graphical look and are said to be the most effective attributes of a website. Visual design can be defined into two sub-dimensions:

a. Graphic Design: Graphic design usually refers to the look and feel of a website or the features that usually determine the first impressions of a visitor/consumer. Including elements such as the use and size of images, display of colors, use of animation, the size and number of characters and symbols. Research suggests that well-designed graphics have the tendency to improve the overall online shopping experience of a consumer.

- b. Structure Design: Structure design' that is said to be the other dimension of visual design involves the overall organization and accessibility of the displayed information on website. This Structure design includes the organization of the different pages into an understandable and desirable whole and is also known as the website architecture (Karimov, Brengman, & Van Hove, 2011).

To understand visual design, we first need to understand what the design principals says, how design principles relate and how often designers use these design principles, especially in the era or user-centered designs. When we get into the details we come to know that none of the questions that make us understand the design principals or visual design can be summed up to form some basic rules or get some straightforward answers. This is the reason why authors around the world refer to these principles but can hardly define them as a set of rules and what they mean. It is for this reason designers, depending upon the situation they encounter, employ different design principles with different levels of consistency giving rise to no particular set of visual design rules or techniques. In fact, the rule is to "break the rules" and to bring attention and interest to a design wherever required. Kimball defines that as the design principles can't be quantified they can only be:

- Generalizable (applied to many situations)
- Heuristic (help in decisions and determine the path of action)
- Grounded (should be more than simple preference and should be based on organized experience through practice or research)
- Meaningful (should help designers to communicate ideas in an effective ways)
- Contingent (its application should be dependent on local conditions) (Kimball, 2013).

Determinants of a Website Aesthetics:

Unity: A website design consists of multiple interrelated components, it becomes necessary that these components are integrated in a way that result in making complete visual sense. Unity can be regarded as an aspect of a visual display, referring to congruity among elements of a design in such a way that they look as if though they belong together. Website unity is subject to visual characteristics of a website such as: visual balance of website structure, consistency of the color scheming and the layout of images and text.

Complexity: Complexity can be determined by various design elements such as:

- number of elements on a web interface

- variety of presentation formats
- different layers of navigation structure

A website perceived to be too complex, results in difficult processing of information and cues resulting in uncertainty. Whereas a very simple Website (or zero complexity) may result in boredom. Both extremes of feeling 'comfort' and 'boredom' effect aesthetic perceptions of the website.

Intensity: intensity of an artwork enables it to escape "aesthetic blandness," and thus fosters the perception of aesthetics. Intensity attracts user's attention and enhances the salience of information that is presented resulting in facilitating users' appreciation of beauty and cultivates the sense of pleasure whereas a very low or high intensity in a design may result in the in less attractiveness to visual stimuli resulting in less aesthetic preference toward the stimuli.

Novelty: Novelty of a website design is the quality of being new or unusual or different from anything that has already been created before. Novelty of a design provides a chance for people to have varying experiences thus making a website more interesting as compared to others and influencing a viewer's aesthetic preference (Jiang, Wang, Tan, & Yu, 2016)

Visual Design and User Experience of a Website: Gestalt Theory explains how humans behave or respond to visual chaos and explains how the mind constantly strives to make sense out of even visual chaos leading to increase in cognitive load and feeling of displeasure that ultimately leads to the feelings of dissatisfaction (Pennington, Chapman, Fry, Deschenes, & McDonald, 2016). This theory leads to the importance of visual design in creating user experience. And also stresses on the fact based on reports that the beauty of a website is crucial for creating the best online experience for the users (Jiang, Wang, Tan, & Yu, 2016).

Also, the fact that Visual design is the first thing the user comes in interaction with leads to the importance that the visual design must be attention-grabbing (to keep the user on to the website to later on carry out the desired actions required from the user). Visual design must balance emotional appeal, aesthetics, and uniformity of the overall graphical look to keep the user interested and to create a pleasant initial experience. Research suggests that well-designed graphics have the tendency to improve the overall online shopping experience of a consumer. (Karimov, Brengman, & Van Hove, 2011).

Visual Design and Effectivity of Website: Website's visual design has become increasingly important as it encourages prospective consumers to seek information as well as positively effects the purchase intention of a user as today almost 60% of the overall consumers search for information about products or services online. (Chingching, 2012). Web designers today perceive the fact that the elements of a visual design tend to be the most effective attributes of a website (especially a B2C websites). The look and feel or the visual design of a website is said to be a great in building up the first impressions (Karimov, Brengman, &Van Hove, 2011). And studies on this subject of first impression have revealed that 41% of users immediately abandon websites if the visual design or outlook of the website appears outdated to them (Schiller, 2011).

Well-designed graphics possess the tendency to hook the users to the website that is the reason that visual attractiveness is said to be positively associated with quality perceptions. Users usually associate visual appeal of a website with trustworthiness on the retailer thus making visual design as one of the most important among all element leading to the effectivity of a website. Researches also demonstrates that well designed graphics, optimal text display and the appeal of interface to the users in general improves the online shopping experiences of consumers (Karimov, Brengman, &Van Hove, 2011).

An aesthetically pleasing e-commerce website is generally more liked and valued by consumers, leading to more sales and ROI. Studies suggest that the visual appeal of an e-commerce website greatly affects how a consumer's shops and leads into a trend or urge for impulsive buying online (Jiang, Wang, Tan, &Yu, 2016).

e. **Usability Engineering**

A key aspect of a website is its usability. Usability can be defined as the ability of the target audience of the website to carry out tasks in the most safe, efficient, effective or in the most joyfully manner. The International Standards Organization ISO has defined usability as the "extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use" (Bias, Moon, & Hoffman, 2015). Usability can also be defined as a measurement of a products adoption level by the user with contentment, competence and worth (Ain, Aslam, Muhammad, Awan, Parvez, Naveed, & Qadri, 2016).

Usability of a product of website can also be described as the ease with which users can understand how a product or website works and performs. Ease whereas refers to the determination of whether a websites design can enable humans to accomplish the desired tasks effectively with efficiency and satisfaction. This is one of the reasons why website usability researchers often use representative samples of end-users to observe them in actual work environments and then collect data for web usability assessment.

Usability studies are used to determine the experiences of the end-users while they interact with a website, in order to identify the important factors that help us in taking website design decisions (Wilkie, Romance, & Rosendale, 2012). Website usability can be measured by the adaptive level of its users, satisfaction, learnability and screen reading level. Usability is a very important feature as irrelevant images/textures on the websites lead to cognitive burden which can ultimately lead to negative emotions and user disturbance. (Ain, Aslam, Muhammad, Awan, Parvez, Naveed, & Qadri, 2016). Usability studies to determine the experiences of the end-users while they interact with the website. These studies include the consideration of true emotional value of the experience. The emotional value of an experience defined as -worthy goal of a design, takes into consideration the type of emotions a user experiences and leads to the importance of understanding about why that person feels in that certain way to yield even more valuable information for the website designers (Wilkie, Romance, & Rosendale, 2012).

Usability Engineering and User Experience of a Website: Usability of a website determines whether the design of a websites enables users to accomplish the desired tasks, expected from the user, effectively, efficiently and while attaining satisfaction giving rise to a great user experience. Usability studies, determining the experiences of the end-users while they interact with a website, leads to the identification of important factors that can help with website design decisions to enhance the overall user experience (Wilkie, Romance, & Rosendale, 2012).Usability Engineering Improves Effectivity of Website: Deriving an exact ROI figure for web site usability is an inexact science but the fact is that usability engineering weighs highly when it comes to planning a return on investment for ecommerce websites. A study conveyed on 42 web projects that were redesigned for usability showed a:

- 100 % improvement in sales conversion
- 150% improvement in traffic visitor counts

- 161% increase in user performance or productivity along
- 202% improvement in the use of specific features (Preston, 2003).

Usability of a website evolves majorly around human factors, thus helping in validation of effectiveness of the interface and improvements in the ability to carry out their desired tasks with the website (Bias, Moon, & Hoffman, 2015).

