

# A holistic redesign of web elements using CATWOE analysis

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**Abstract**—The websites have become an essential elements of every businesses today. The outside world knows about the businesses more through its websites and the social media feedbacks given by the customers. Such webpages needs to be designed more professionally and ethically. This papers addresses the key elements of websites to fulfil the business aspects and wide reach. To analyze and design the webpages, categorization of elements becomes essential. The soft system methodology (SSM) is a methodology used for organizational process design and modelling. In this CATWOE is a tool which helps us to identify the people, processes and a situation required for achieving the goal in terms of business perspectives. The CATWOE is used in this paper to identify and categorize the essential design elements for all website design. The CATWOE is handled with almost care to differentiate the elements for profitable or commercial as well as non-profitable or charitable organizational objectives.

**Keywords**— Essential web elements modelling, CATWOE, Soft Systems Methodology, Design elements, Facilitating elements.

## I. INTRODUCTION

A website is a set of inter-linked webpages written using the mark-up languages like HTML. The websites are hosted on a webserver. The first page of a website is called as homepage which interconnects all other pages. A homepage gives a preface about the entire website. There are different types of websites are available: weblogs, search engines, wiki, social networking. The websites are accessed using a unique web addresses called Uniform Resource Locator (URL). The URL gives accessible location of the website in a hosted webserver. The business who owns the websites need to a buy a hosting space in the webserver by paying money, which is known as domain.

The website builders always use the commercial web authoring tool to make a rapid development of the websites in overnight. In such RAD methodologies no formal approaches or techniques are followed to make a design. The professionals use the standard themes within which some animated tools are embedded and then it will be customized. To make the business people job easier the hosting server company itself provides the templates, where they can edit and upload the relevant contents and images. All these shortcuts leads to non-standardized way of design of websites and at the same time further researchers are also not showing the importance of drawing such guidelines for essential elements for goal specific design of websites. As per the Netcraft report January 2018 Web Server Survey there are 1,805,260,010(over 1.8 billion) websites are available.

## II. LITERATURE REVIEW

In 1989, the first hypertext project was proposed by Tim Berners-Lee, later which was called as WWW globally. Those days, most of the systems were Unix-based and all browsers were command line-mode. There was no chance of multimedia content integration in web. The NCSA Mosaic was a first popular browser, which supported the multimedia content first [1]. Then W3C developed a common protocols for interoperability [2] along with few set standards and client-side programming language JavaScript.

In 1996, Microsoft gave the browser which can support style sheets and tags for creating the webpages [3]. HTML designs were preferred with tables for making multi-columnar pages in a rapid way. CSS was introduced to support the layout for aesthetic presentations. To create a multimedia contents GIF images, flash, action script, gif animations were used to develop the websites more creatively.

In 1998, Netscape browser was very popular and specialized html tags called Netscape extensions were used. To standardize the web contents w3c executed many acid tests for browser compliance. During this time in 2000, Microsoft Internet explorer for Mac was released, it was supporting HTML, CSS and many special image formats like gif, jpeg, png etc. [3].

Website basic design elements such as navigation options, typeface size, typographic layout, element organization, colour schemes, pictures, and graphics (images and icons) may promote either rejection or acceptance, which in turn can be key to attract and retain visitors, and make a sale (Chen & Barnes, 2007;Cyr, Head & Larios, 2010;); Ou & Sia, 2010; Moys, 2014;)

A disorganized layout with ill-placed elements and a multitude of colored text objects can be unappealing and confusing, leading to a negative response (Sonderregger, Sauer & Eichenberger, 2014).

The holistic model was developed using the procedure of conceptual framework analysis as defined by Josef Jabareen (2009). Jabareen (2009) stated that the conceptual framework was a “network, or ‘a plane,’ of interlinked concepts that together provide a comprehensive understanding of a phenomenon or phenomena”.

A number of researchers have investigated the relationship of website design elements and their effect on the user's perceptions of a website's trustworthiness. Such design elements examined included design aesthetics, colour, type font, assurance seals, graphic images and placement and visual cues such as navigation icons, links, etc.

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### III. PROPOSED CLASSIFICATION OF WEB DESIGN ELEMENTS

The following diagram classifies the web design elements into two broad classification.

1. Design elements
2. Facilitating elements.

Under the design elements, the elements that are required for aesthetically pleasing components are identified and listed. Under the facilitating elements the functionally significant components are identified and listed. The component design and coding are quite common to all web authoring tools like FrontPage viewer and Dreamweaver. Each element and its characteristics are briefly explained in this paper. To identify the elements simple CATWOE [4] is used. C stands for customer, A is actors, T refers a transformation process, W is World view, O refers Owners. The CATWOE analysis was defined by Peter Checkland as a part of soft systems methodology. Each elements are identified by keeping these 6 terminologies in mind.

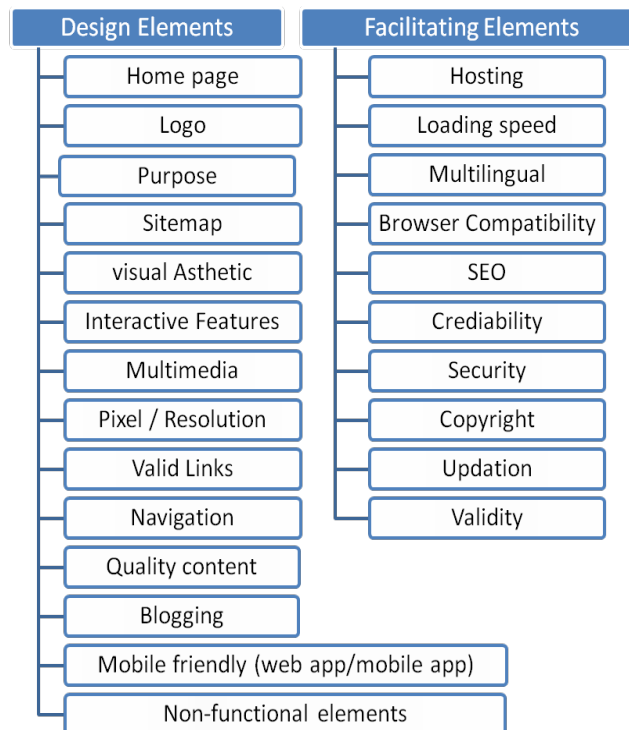


Fig. 1 Redesign elements of web design using CATWOE

#### A. Home page:

The home page is the first landing page of the website for visitors. It should be well designed and organized to catch the attention of the visitor. The start-up page of high-quality website is the virtual entrance door of every organization which has to

answer “Why the website is,” “what it will do,” and “what the visitor can do”. The objective of the homepage is to induce the user to move down further and dig deep into the website. It must hold all valuable elements like Brand Logo, Taglines, Top stories etc., Commercial elements present in home page such as advertisements, pop-ups and flash banners should not disturb the user unnecessarily. Then home page must adapt constant changes in accordance with the flexibility and requirements of visitors.

#### *B. Logo:*

When we design a website, care should be taken, when designing the logo. The logo should be a clear and visible on the left corner of each page and the content inside the logo in a readable manner. Logo colour should be visually attractive.

#### *C. Purpose:*

The website must clearly states its purpose (personal, commercial, educational, government, banking, business, commerce). That is the website designed for the exact about stated domain and the purpose for which the user find information for their need.

#### *D. Site map:*

Site map is the organized model of website content and used to list the pages in website. It is mainly used for three purposes. Primary purpose of having site map is the designers can use this hierarchy for planning the website right from the beginning. In visitors point of view site map can be made for easy visibility of website. Crawler program can use this site map for ranking and navigating the website in search engine.

#### *E. Visual Aesthetics:*

When we design the website it should fascinate that is attack and the user they should have a feeling of as soon as seeing design must be emotionally appeal, making them very much happy and comfortable usage of colours background of the website it should be light colours. Utilizing colours for a single page is restricted to only four different colours.

#### *F. Interactive features and feedback:*

Feedback exist between the user and the website through E-Mail, chat rooms, online community, suggestion form. Suppose the user posting some comments or they may expert some valid information, it is possible only through their way of communication.

#### *G. Multimedia:*

When we design the website keeping in the mind of incorporating multimedia the user should feel more than reading an article from the base, listening audio and more than watching a television that sort of effort should be incorporated in the website. Care should be taken that when focusing a multimedia technology opening of the website and downloading of the website should not get delayed.

#### *H. Resolution:*

To develop a user responsive web page, client side or front end technologies are performing major role to make the web sessions and environment more interactive. Today's internet technologies has a fast rate of development and upgraded with latest modern devices to access internet, therefore the Websites are viewed through different devices like Mobile phones, Smart glasses, Wrist watches, Tablet computers, Desktop computers, Smart TV, E-book readers, etc., The web designers are committed to guarantee best user friendly experience for users with all sort of accessing devices based on orientation (portrait or landscape) and screen resolution when they are surfing a website. The website should be built based on flexible layout model and pixel rate that adapt all screen sizes of multiple devices with different dimension and resolutions.

#### *I. Navigation / Valid links:*

Does the website provide valid and worthy links that is actually user want to go to the home page, moving to top suppose the user in the third and fourth sub stages of website and they wanted to move back to the original home page, By single click they can go to the home page within a single click, there should not be any dead links.

#### *J. Hosting:*

Web hosting is the process of providing storage space on the server to an organization or an individual by the hosting company in order to get the worldwide accessibility of their website. It is suggested to choose and register with familiar, easy-to-use and effective domain name (web address) with the right extensions according to the nature of business to publish website on to the internet. The hosting company for the website must be carefully chosen to keep the site uptime 24/7 without any interruption, best service level agreement, Nominal service charge, Site traffic management, Speed, ability to adapt latest technologies etc., to run the business smoothly. Cloud based web hosting service is very popular which could kill downtime and also provides pay as you go service.

#### *K. Loading speed:*

The main purpose of designing the website is to make the visitor to stay and acquire the required information. A normal visitor patience level is 5 to 8 seconds only, but the content may be in different forms as text, document, pdf, audio, video, etc.,

when it takes a long time to load our website the visitor losing his interest level and skipping our website. So we should keep all the things in our mind based on this we have to design the website.

*L. Multilingual:*

The usage of website is within the country or international, we have to think about the website information must be available in different languages to meet the needs of all customers throughout of their country.

*M. Browser compatibility:*

When we are designing the website care should be taken for multi browser compatibility. The user wants to load our website they will be using different browser at that time they should not find any difficulty to load our website.

*N. SEO:*

Search engine optimization is the practice of designing website in a way to improve the visibility of website by customer. This is the good marketing strategy for companies to index their websites in top of some popular search engine pages like Google, Yahoo, Bing etc., Search engines use some complex algorithms to pull most frequently visited websites based on keyword to the top of the page. Companies should use appropriate website name, headings, content and meta description to improve the quality of webpage by using precise SEO tools and technique to attract more customers.

*O. Credibility:*

The level of user confidence of websites information is clearly identified by providing organization physical address, specifications of site managers, giving information about the copyright it will automatically increase the credibility of our website.

*P. Security:*

The website security should not be compromised, it is mandatory to take some strong measures to avoid the disaster of hacking. The web address can be highly secured by using HTTPS through secure sockets certificate which confirms that the information is encrypted back and forth while transferring between browser and server. It is also evident that the website can be prevented from malware or hackers by installing and timely updating of firewalls or any other security software plug-ins. The security software could be either installed or managed by the website developer or by hosting company itself.

*Q. Copyright:*

The Website is the valuable asset for any business and it should be protected just like other property. Copyright is the process of recording authorship to protect original work. An organization or individual can get a copyright for their website which covers only some elements in website content which includes text, images, graphics, photographs, audio and video. Copyright registration is the record of ownership through which it is possible to sue someone in case of any violation or infringement.

*R. Quality content:*

Well-formulated and informative content is the first and foremost design factors in creating a quality web contents. Quality means the purposeful and optimized details that targeted users are able to read, perceive, understand and then share to public. Google like search engine algorithms measure the quality in terms relevance and reward with high ranks. Thereby semantic operations are done among the details [5].

*S. Blogging:*

A blog is a small piece of official information about the web page written by the owner or writer view shared.

*T. Mobile friendly (web app/mobile app):*

The web pages are accessed by more on mobile devices. Designing your websites to be mobile friendly ensures that your pages perform well on all devices.

*U. Non-functional elements:*

The Non-functional elements such as Usability, accessibility, conventionality and user centricity [6,7].

#### IV. CONCLUSIONS AND FUTURE WORK

Building a professional web page is an integration of key qualities in art, science, architecture, engineering, management and humanity studies. The sculpture of a web page must incorporate the essential elements of each of the aforementioned field. The web design authoring tools need to incorporate more artistic elements to make the web design as an inter-disciplinary approachable concept of "abstract art". The abstract art is in three forms: minimalism, cubism and precisionism. These perspectives can be incorporated in the future work.

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