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Problem Solving Strategies for Enhancing E-Government Websites

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ABSTRACT—

E-government services enable citizens to efficiently access and manage public services and information online. However, it is important to ensure that online transactions and participation are smooth. and achieve high levels of usability and accessibility. This article presents an empirical study that examines the use and accessibility of representative e-government websites. Although e-government has a growing presence in the digital environment, But widespread adoption is often hampered by a lack of public trust due to its novelty and the perceived risk of online interactions. Provide insights into strategies for improvement.

Keywords— E-government, Usabiltiy, Accessibility, Citizen-Centric Approach, Web Design, User Satisfaction ,Website Evaluation

1. Introduction

In the era of digitalization, we cannot perceive e-government websites as more than simple instrument that are used to provide public services and information. These portals are websites created to ease transactions between the government and citizens by minimizing service application time, getting information easily and interact with them.

However, a major part of e-government websites face serious challenges which limit their efficiency and user satisfaction. These platforms frequently suffer from problems including confusing navigation, lack of accessibility and poorly organized content keeps user engagement lower.

Faced with these challenges, this research paper addresses the topic of social problems in exploring and proposing problem-solving strategies to improve e-government Websites. This paper aims at pinpointing the main usability challenges faced by e-government websites and proposing concrete solutions that improve functionality as well along with user satisfaction.

Based on user-centered design and iteration in product development, this paper proposes a complete approach to solving typical problems of e-government platforms.

It is important to solve these usability challenges during the era of digital interaction becoming essential on a daily basis and promoting effective communication between governments with their citizens. This paper aims to address this gap through a small piece of research that is part of the broader effort toward improving websites, in order to make digital more inclusive and citizen-responsive.

I.I Web-Based E-Government Services and Their Benefits

There is still no consensus to what constitutes Web-based e-government services. One can create a working definition from the numerous types of web-based e-government services possible, defined works were Few used in literature.

For example, McClure [1], Golden et al. [2] described electronic government as applying electronic means of providing services to citizens, businesses, and others with an intent for convenient access to government information and services.

Similarly, Momentum Research Group of Cunningham Communication[3] defined "e-government" as "online government services," which refers to any form of interaction by people, business, and organizations with a government body or agency through digital media. It refers to information and services provided by governments through computer-mediated, networked technologies-including websites, mobile applications, and cloud-based services-available in 2024. All of these services are designed to be easy, transparent, and efficient as they will deliver public services to a wide array of users: citizens, businesses, and other government agencies.

There are many benefits in providing the government services from the online channels. These services can greatly enable easy and timely access to government resources while reducing their error-prone handling of data. In addition, web-based e-government services allow government units to enjoy efficiency gains, cost savings, and improvement in customer service. Indeed, the success of many e-commerce initiatives the private sector has undertaken reflected the success of such services, as benefits have become evident through digital solutions that prove beneficial towards customer satisfaction as

well as operational efficiency. However, business success doesn't necessarily have to apply to the government environment. The government cannot upload information and services to the web and then try to reap full benefits from web-based services. Of course, without user-centered design, assessment, and continuous improvement, e-government platforms are liable to become ineffective, underutilized, and irrelevant.

Rating of web-based e-governance service in 2024 would certainly be based on usability, accessibility, and security but needs to scale with integration with emerging technologies like artificial intelligence, blockchain, or data analytics. This is how periodic reviews as well as embracing sophisticated technologies will assist governments ensure that their web service is available, safe, and responsive to everyone's needs.

2. Literature review

There have been only a few studies that have previously attempted to evaluate government electronic services provided over the Internet. These studies generally fall into two groups; one is the lessons learned from evaluating Internet-based e-commerce services in the private sector and the services in the private sector.

These focus on government efforts to provide web services without addressing the attitudes and behaviors of citizens using the system. Try to benefit from advice and experience inmeasuring website performance in e-commerce. The author offers a range of website evaluation strategies including a number of methods like usability testing, user feedback, data usage, and network and Internet performance. This idea may be appropriate in the presence of market concern at the stage of assessing the provision of information and services by governments.

West represents the second way to measure electricity on a government website. These activities often focus on the characteristics of the website in the description. Further, these are case studies conducted over government based applications only neglecting any population traits and its interactions with network features towards the adoption behavior. For example, Eschenfelder et al. Project [4] is the first attempt to explore government website analysis. However, most of the evaluations are not only from the private sector, but also from private sector knowledge.

The semodels also emphasize the perspective of government agencies rather than the perspective of citizens care.

II.I Citizen-centric approach

A citizen-centered approach must help promote the use of e-services is made through a Citizen Portal.

The overarching government-wide perspective is beginning to shift towards a citizen-centric approach which centralises on the individual and delivers through a sole point of entry for all (subset) public services (Sigwejo & Pather ,2016)[5].

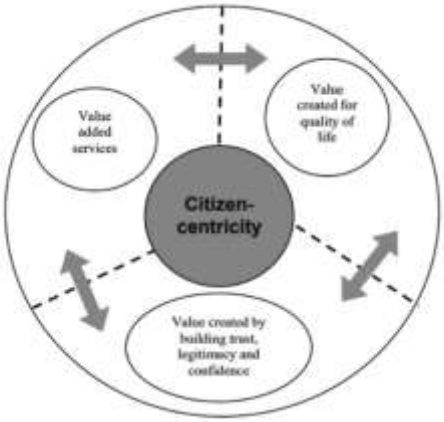


Fig. 1. Creating Value for Citizens (Source: Gupta (2008). Citizen-centric Approach for e-government).

A public approach is to focus on the needs of the public or to create products and services for the public good.

Citizencentered action also implies the creation of public values(Figure 1). When governments provide special services to those in need, they can increase public satisfaction while reducing costs. Today, Citizens want their governments to provide simple and responsive services. The public interest in government electronic services is important to most governments.

According to (Yıldırım and Bostancı ,2021)[7], the latest flow in the creation of electronic government portal is public user preferences. The quality, efficiency, reliability, security and privacy protection of the portal will affect the use of electricity in government services and cause disruptions in users' use of government electricity.

SornIn et al. (2015)[8], The United States, the United Kingdom, Canada, Australia, South Korea, Italy and Singapore are some of the countries where citizens play an important role in the service.

However, e-government system is still in its infancy and there are failures due to lack of participation of stakeholders like remote citizens (Misra, 2009)[9]. A public approach is essential in using egovernment services. Decentralization of citizens is one of the main challenges of e-government (Alomari et al.,

2012)[10]. Use of government services and consumer electronics in government. With the use of electricity in government services, many stakeholders like citizens, technology developers, government employees and legislators are also affected by the government energy services (Osman et al., 2014)[11].

The government's allocation of resources towards establishing portals and offering services is directly linked to the efficiency of government websites in addressing the needs of citizens and government agencies (wang et al, 2005)[ ]. The success of public participation in government electronic services relies on various factors, including human factors and non-human factors. According to a study conducted by nandal and singla (2019), individuals who reject government electronic services tend to be less educated, older, less skilled, and employed in certain industries. Unpaid labor. The success of the government's electronic services relies on the effectiveness of the portal and whether customers prefer using it or find it beneficial.

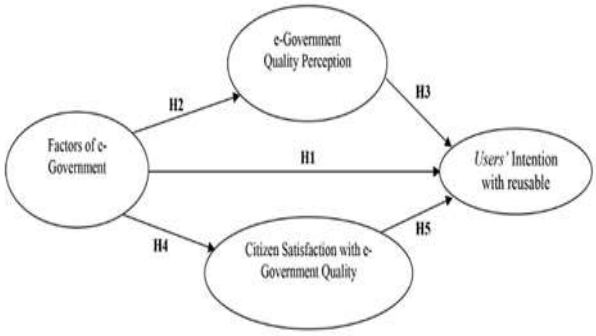


Fig. 2. The Framework of e-government Factors to Users' Intention (Proposed Model).

The era reputation version is also applicable right here for the acceptability of net portals, whether the websites are public or private (Mohammad et al., 2020)[13].

H1: Elements of e-authorities have sturdy substantial influences at the customers' intention.

H2: Factors of e-authorities have robust impacts on the belief closer to e-government service quality.

(QP).

H3: e-government service Quality Perception (QP) significantly influences the users' aim.

H4: elements of e-government have a tremendous impact on residents' delight closer to e-gov

services.

H5: residents' satisfaction with e-gov offerings (CS) without delay influences the customers' purpose.

III. Research Problems and Objectives

With increasing reliance on e-government platforms People often visit these websites to perform various tasks, such as accessing information. Registration for service and form submission. However, these websites do not support problem solving and the information people need remains a challenge. Many e-government websites do not have user-friendly navigation. Easy access to information or effective rate summary process.

Citizens often face uncertainty when it comes to taxes. This affects the overall user experience. The gap between the current user experience and desired results is a key issue. In this context, it is important to evaluate how e-government websites can be improved. To better support the tax rate for the purpose and reducing uncertainty in information retrieval is therefore important.

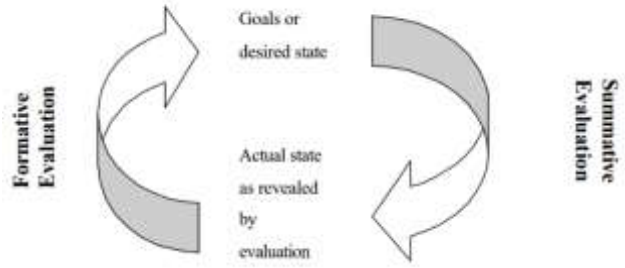
Therefore, the main point of this research is to develop strategies for improving e-government websites to ensure that these websites are user-friendly. Consider the citizen as the center and can facilitate effective problem-solving activities This research aims to answer questions such as:

- How can e-government websites be designed to increase information search efficiency?
- What are the factors of website design? Characteristics of citizens and the complexity of the work influences the success of users of these platforms.
- What strategies can be implemented to improve the overall usability and effectiveness of e-government websites?

IV. Research Methods

Web evaluation is the application of research or evaluation techniques to continuously assess the effectiveness of information on the internet. Evaluation is a crucial aspect of planning work, monitoring workplaces and services, and making necessary adjustments to goals. This is a "formative" evaluation. In contrast, the results of our study indicate that there is a significant difference between the two groups.

"summative" evaluation determines whether the website fulfills goals and user requirements Fig. 3 demonstrates this dual role. On the left side of the diagram, the information gathered during the assessment process offers feedback to the goals and plans. Consistent monitoring is a crucial source of information for an organization's strategic planning. For instance, a review of users' current satisfaction with the website may uncover usability problems with the current page layout or documentation structure. Planners may decide to alter or adjust their objectives based on newly identified problems or the successful completion of previous goals.



On the right side of the diagram, evaluation determines the effectiveness of the program.

Without assessing whether the set goals are being achieved, the overall cost of planning and evaluating is increased.

The device. After assessing the previous evaluation, if the organization had set a goal to enhance site usability, they would employ evaluation to measure the extent to which the site's usability had improved. Both formative and summative evaluation efforts are crucial – although most organizations tend to focus more on summative approaches. However, for assessing and enhancing the quality of services, formative evaluation (designed to enhance, not validate) is crucial.

IV.I A new evaluation model developed with a citizen-centric approach

Generally speaking, citizens' activities on government websites are searching for government-related information or completing certain "actions" such as online registration, online application, logging into a database, downloading forms, handling online complaints, etc. Framing is the process of thinking of it as a solution. When a citizen visits a government website to access e-services, there is always a task to complete; that is, he/she always performs a goal-based task, such as solving problems and/or making a presentation (Wilson et al.) [14]. Until the goal is achieved, there is uncertainty between the population's "current" job and their desired job. Citizens can only achieve their goals by eliminating uncertainty. By definition, information reduces uncertainty; In this sense, accessing Web-based government electronic services can be understood as an informationseeking activity that involves a problem solving process. Since the effectiveness of government websites in supporting public activities is the basis for evaluating online government services, how should they be evaluated and how they help citizens obtain business information?.

IV.II The Evaluation Model

Data mining is an activity in which data users access large amounts of data (e.g. evidence) to solve some data problem. It is essentially the interaction o f two elements: user data, problem data.

P = f (C, T, S, C T, C S, T S, C T S)

Where,

P is a measure of the performance of Web-based information seeking;

C is a vector of citizen's characteristics;

T is a vector of the characteristics of information task;

S is a vector of the characteristics of government Web site.

The effectiveness in this model is essentially seen as an exchange of

user data (i.e. citizens in the current context), public activities tab and documents (e.g. government documents)

to try to complete. context) for information about the work The results or performance are created by two elements:

process and material. The process dimension focuses on how a job is done and the

values dimension looks at the actual results. Examples of process results are the time taken to complete the data operation, the process during the data search or the nodes entered, etc. and enjoy the results.

Possible individual characteristics of a citizen in this context include gender (Kim) [15], age (Bilal & Kirby; Danielson) [16], [17], previous experience in using the World Wide Web (Danielson; Lanznder et al) [17], [18], domain expertise (Lazonder et al) [18], cognitive styles (Kim) [19], and problem-solving styles (Kim) [15], etc. For information tasks, their uncertainty/predictability (Saracevic & Kantor; Vakkari) [20], [21], the appropriateness of being completed by using Web technology (Mathieson & Keil) [22], how clearly the information task is defined (Saracevie et al) [20], and how urgent it is (Case) [23], can all be factors influencing information seeking performance. Finally, regarding the characteristics of the website, the perceived contribution of web page load corresponds to the understanding of web page visitors, and this can make a difference in human performance in seeking information;

IV.III Advantages of the New Evaluation Model

The advantage of this new evaluation is that it solves two evaluation problems. It is not only combined with the history of the government, but also the characteristics of the population, the characteristics of the work data (including services on the egovernment websites) and the analysis of the websites. For example, the hierarchy and functioning of state institutions determine the citizens authorized to work, their responsibilities, public service procedures and therefore the characteristics of many information works. In addition, state institutions are limited to private institutions when creating websites; they have their own rights in messaging and services; they adopt special methods in web design. All of this can be reflected in the characteristics of the website and can be affected by the characteristics of the government, such as the hierarchy and work of state institutions. Therefore, the evaluation of the new design does not only examine the features of the website but also includes the essential elements of the governmentWhether the government agency provides e-government services well on its website

Equally crucial, it can help identify organizational activities that indicate achievement or failure in web-primarily based authorities digital services; e.g. It facilitates solution why authorities websites create problems of fulfillment or failure in service delivery.

This allows a comprehensive assessment of the services provided by government agencies on their websites; and solutions can be found to improve the situation effectively and efficiently.

V. Research Findings

The current study is based on quantitative methods and is not a sampling method. In this survey, valuable information was collected from the Indian public for the first time using online surveys collected between May and July 2021. Potential respondents were sent to the site to complete the survey on various websites such as Kev Search Gateway and Facebook. (Paliwalet al., 2022; Singh et al., 2022)[24]. The survey was divided into three sections.

The first section includes questions on personal information. The second part of the survey addresses the ways citizens access egovernment portals and various factors that prevent citizens from accessing the portals. The third part of the survey is to measure the difference between citizens' perception of the service quality of the government electronic portal and the public's satisfaction with the government electronic portal and the willingness of customers to use it. The services needed for public participation are related to the question

According to the Likert scale from 1 to 5; 1 indicates no agreement and 5 indicates agreement.

Main aspects of eGovernment portals, perception of portal service quality, public and user satisfaction opinions are based on previous studies by Loiacono et al. (2000), Yoo and Donthu (2001), Agrawal et al. (2007)[25], Fan and Yang (2015) and indicators were further modified and used in research.

V.I Data Analysis and results

Table 1 includes demographic information of participants using different e-government media sites and describes the characteristics of participants such as age, gender, marital status, education level, occupation and use of information on e-government portals. .

The information in Table 2 shows that the government's electronic website used a sample of research participants. Most of the responses were captured and processed by SPSS software and according to 56-9% of the participants in the sample, the education portal was the most used electronic government portal. Others were 47.9%, 25.2%, 52.5%, 26.0%, 51.0%, 14.6%, 34.9%, 58.0%, 35.5%, 49.8%, 11.1%, 4.0% and 19.7% healthy. Portals related to passport, business, culture, sports, airline services, transportation services, hotel/travel services, postal services, communication services communication, municipal services, legal services and other government services are frequently used.

6.1. Factor of quality service of e-government web portals

The statistical data shows the descriptive statistics (mean and standard deviation) of the respondents to various questions regarding the support of government electronic portals, electronic services in government QP, CS and user objectives(UI). Cronbach’s alpha is by far the most reliable (Kumar et al., 2022)[26]. Among the 6 factors analyzed, system stability (SS) was found to have the highest mean (3.9144) and standard deviation (SD) = 0.60848

and the reliability (α) of this factor was 0.756. This is followed by Interview Service (IS) with mean (3.8122) and SD = 0.66547 and the reliability (α) of this factor was 0.764. The average score of the Information Accuracy and Relevance (ICA) status is 3.7995, SD =0.69936, which gives a reliability of 0.792.Theaverage value of factors such as suitability and value (AB)

is 3.5613, SD = 0.77437, the reliability of this situation is

0.745. The average value of Information Accuracy and Completeness (IAC) is 3.6183, SD =0.68686, the reliability of this situation is 0.794. The average score of System Security and User Privacy (SUP) is 3.6183, SD = 0.68686, and the reliability of the values is

0.734. The average value of the Perceived Perception (QP) of state energy services is 3.7322

, SD = 0.76749, and the reliability of the structure is 0.835Content generation regarding public satisfaction with government electronic services (CS) is 3.6236, SD = 0.79568, and the reliability score of this item is 0.778. The mean score of the user interface (UI) was 3.7680,

SD =0.54365, and the reliability of the design was 0.769.

V.II Finding the Cracks in E-Government Websites:

A Usability Analysis

Some of the problems point towards advertisements, links, search functions, font size, and performance problems apart from many usability problems hampering the user experience of developing an e-government website. These sites are supposed to make easy access to information and services, quite contrary because different design problems bar users of all ages.

Blind ads and banners: Ads or ad-like images clutter web pages and disrupt the user experience. Distract or cause confusion when visiting external sites. These distractions can cause users to ignore important information. which is a phenomenon called "Banner Invisibility" has reduced use of e-government site ads. Those advertisements may have a negative impact on the user experience. Makes navigating web pages more difficult.

Unclear and duplicate links: Navigating government sites can be complicated due to the inadequate design of two links. Many web pages use cryptic or obscure links (such as abbreviations or jargon), directing users to unfamiliar destinations. and reduce reading comprehension But most government homepages contain redundant links such as "Home," "Text Only," and "Research" buttons, causing the page to overload. and cause confusion to the user. This not only reduces readability; But it also makes navigation easier.

Ineffective Search Design: A simple and efficient search function is a basic feature of any site. But many e-government sites do not support this format. More than 60% of two sites offer a search link or button. which are often placed in strange ways In the middle or bottom of the page Instead it offers a clear search box at the top. This makes it more difficult for users to find information quickly. This adds unnecessary complications.

Mouse over technology: Using hover technology Menu items appear only when the cursor is hovered over them. This may present significant usability challenges. Precise mouse movements are required to access these menus. This can create barriers for many adults. Especially those with high intuition.

Font size and readability: Many government sites do not accommodate visually impaired users by using small font sizes. This is especially true for peripheral links like “Help,” “Privacy Policy,” or “Contact Me.” When important information is displayed in fonts smaller than 12 pt, they are rarely necessary. It affects usability for adults with aging vision. Unfortunately, 84% of the two evaluated sites displayed important links and web objects in smaller font sizes.

Slow Download Speed: Website performance is a major issue. Especially for users with slower internet connections. Many e-government websites exceed the recommended download limit of 10 seconds. In a study of 84 default government web pages, the average download time was 20 seconds, and nearly 25% of two sites took more than 30 seconds to load. Some sites, such as the Aging Administration page, lag as long as 71 seconds, having a serious impact on experience for those with slower internet speeds.

These shortcomings in the design and functionality of two e-government websites highlight areas where significant improvements are needed to improve the user experience for all adults. By solving these problems These websites can therefore best serve the desired purpose. That is, to provide accessible and efficient services to all citizens.

6. Conclusion & Future Work

This research highlights the critical usability challenges faced by e-government websites, which often fail to meet the expectations of users in terms of accessibility, efficiency, and overall user experience. The study underlines the importance of a citizen-centric approach, where the primary focus is on the needs and preferences of the users – in this case, citizens. Many e-government platforms suffer from issues such as poorly structured navigation, lack of clarity in information presentation, slow website performance, and an overall lack of accessibility for various demographics, including elderly users or those with disabilities.

These design and functionality shortcomings continue not only to reduce the effectiveness of e-government websites but also to reduce public confidence in online government services, an important determinant of wider adoption. Governments can easily improve the usability and functionality of their digital

platforms by addressing these through thoughtful, user-centered improvements in design: better navigation, improved information architecture, reduced time to load, and clearer communication result in higher citizen engagement and satisfaction.

Continuous assessment and adjustment are also vital for e-government services. Regular evaluation on usability, performance, and feedback from the users provide various means to ensure that these applications remain responsive to the changing needs of the citizens. The challenges can help, therefore, catapult e-government websites as effective mediums for public service delivery, hence improving digital governance through inclusiveness and effectiveness.

Moving forward, there is considerable scope for this research to be further expanded into a comprehensive evaluation model showing the principles of user-centered design and technological innovations. Future studies should be aimed at developing frameworks which take account of incorporating real-time citizen feedback, usability testing, and performance metrics to continue improving the experience of users on the e-government platforms.

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