

# Electronic Information and Service Accessibility of all Indians

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## ABSTRACT

The improvement of technological innovations has changed the way of information provided by the government departments to the society. The flexibility and cost-effectiveness of cloud SaaS based services has made it the preferred way to give services to citizens. But many online services are not accessible to everyone, particularly people with disabilities. In India, the target of accessible e-government services has not been achieved due to a lack of training among the employees who create the government department's electronic content. Despite the numerous gains associated with the implementation of accessibility standards and providing the training and support needed to increase the accessibility of the electronic content they create. So that the disabled people can also access the government services easily without any barrier help.

## Keywords

ICT, E-Governance, SaaS, Accessibility, Disabilities;

## 1. INTRODUCTION

With the advantage and the proliferation of the cloud computing, the India has seen an incredible surge in the use of technology to deliver government services to its citizens. Numbered are the days of lengthy paper applications and even longer processing times. People no longer wait in queue to be given information – they now go online to find information. Now-a-days over 60% of cloud users interfaced with federal government websites while surfing the cloud SaaS. The successful implementation of such services makes it easier to do business with government agencies, while reducing operating costs, and improving customer service.

Yet the information provided by the nation does not reach the entire people. Unfortunately, just because much of India's electronic information and services are available online does not mean that content is accessible. Many people associate the term accessibility with the Americans with Disabilities Act (ADA) of 1990. The ADA, a broad civil rights law, established standards prohibiting discrimination against individuals with disabilities, specifically targeting equal opportunity employment and equal access to physical environments.

In the broadest sense, accessibility is a feature of a product or environment reflecting its degree of usability. Usability is a measure of how effective that product or environment is at achieving user needs. Consequently, that product or environment can be considered accessible if it can be used by everyone. The discussion of accessibility issues often centers on the needs of individuals with disabilities. For the purposes

of this research, a disability is a condition that partially or entirely, temporarily or permanently, lessens a person's ability to accomplish normal pursuits. Simply put, disability can be viewed as the incompatibility between the people and their environments.

Furthermore, the argument supported by this research is the notion that accessibility benefits everyone, not just those with disabilities. For example, although the redesign of sidewalks to include curb cuts was a special accommodation made for wheelchair access, people pushing strollers or riding bicycles also benefited. "These same types of benefits occur when developing information products with accessibility in mind". A solution, seeded in educational awareness and technical training, is needed to bring the India into compliance with its own laws and guide the nation toward an accessible future.

## 2. LITERATURE REVIEW

Providing equal access to electronic information is the right ethical thing to do. Accessibility benefits everyone, especially individuals living with disabilities. The Web Accessibility Initiative (WAI) advises that as online information and services begin to replace more traditional resource delivery methods, it is imperative to ensure equal access to people with disabilities. The 2007 Disability Status Report identified the percentage of the India's disabled population potentially affected by accessibility issues. According to the report, in 2007, 12.1% of Indians ages 21-64 were living with some form of disability. That percentage jumped to 27.2% for Indians ages 65-74 and soared to 49.3% of Indians over 75 years old [1]. It is important to note those percentages only reflect India's disabled community, and does not account for anyone outside the state trying to access India's e-government online Services. Unless the accessible design and usability of technology is addressed by the nation, persons with disabilities will continue to be isolated and locked out of participation in society on the basis of disability and society will not be enriched by [their] diverse contributions.

Wadell (2005) proposed a social model of disability rather than a medical one, distinguishing between physical and environmental disabilities. For example, a man may be unable to see because he is blind (physical) or because he is in a dark room (environmental). A woman may be unable to hear because she is deaf (physical) or because she is in a noisy restaurant (environmental). Including environmental factors in the definition of disability casts a much wider net for catching potential accessibility problems and reveals an even greater need for awareness education and technical training in this area [9]. The particular relevance to the India, long recognized as a popular retirement destination, is a growing number of

age-related accessibility issues. As noted by the Web Accessibility Initiative, “older users with age-related accessibility needs are an increasingly important customer base for [government agencies], as the percentage of older users is increasing significantly” [1]. Millions of people with disabilities either benefit from accessible information technology or are at a disadvantage when their special needs are not considered. The Indian government can address these needs by fostering an awareness among state employees of the technology accessibility challenges faced by individuals with disabilities and by offering technical training on how to remove virtual barriers to electronic information.

By reinforcing accessibility standards through the training of employees, India’s government agency websites will also benefit from improved technical performance. According to the Web Accessibility Initiative, the implementation of such standards can reduce e-government site development and maintenance time, reduce demands on bandwidth, enable electronic content on different system configurations, and equip the nation to take advantage of emerging technologies through the re-use of accessible content.

With the continued growth of the mobile technology industry, the interoperability and device-independence of electronic information will become increasingly important [2]. The inability to view an attachment from a Blackberry® or an iPhone® is an accessibility issue that can be addressed through the implementation of technology accessibility standards. Furthermore, accessible electronic information and services increases the “findability of web pages by exposing content to search engines, both internally (within a website) and externally (across the World Wide Web)”[2].

The Web Accessibility Initiative[WAI] suggests there are potential financial gains, direct and indirect savings, associated with the implementation of accessibility standards. The expense of developing online technology accessibility training for state employees is duly justified by the ever increasing demand for e-government services, the increased productivity resulting from the ability to repurpose accessible content, and the reduced maintenance costs. As such, the state’s effort to ensure the accessibility of its electronic

information and services through education and training can yield a positive return on any initial financial investment[2].

### 3. EXISTING SYSTEM

Historically, a gatekeeper model has been employed to monitor the accessibility of the electronic information and services provided on India’s government websites. Although traditionally applied to communications, the model has been incorporated across multiple disciplines. Within the government, the idea of gatekeeping has been adapted to describe the controlled flow of information from the content creators. In this framework, the webmasters function as gatekeepers to audit the accessibility of the information compiled by the government employees prior to posting that information on e-governance websites. As the gatekeepers, the responsibility of the remediating inaccessible content created by state employees falls on webmasters since they are the only group of government employees to receive any formal training in this area.

The problem with the gatekeeper model as a business process to regulate the accessibility of electronic information is two-fold. First, the goal of accessibility is more easily achieved during the creation process, as opposed to remediating that content at a later point in time. Depending on the format, that remediating inaccessible content may take as much as twice as long as creating it accessibly from the start. Thus, remediation is an inefficient way to do business. As such, the employees who create electronic content for the nation must share the responsibility of making it accessible to the webmasters who post it. To that end, the government employees must be properly trained.

Secondly, with thousands of employees creating inaccessible content and only a handful of webmasters remediating it, there is an evitable clog in the flow of information, resulting in a delay in the public availability of that information. Educating the employees about the importance of accessibility issues and training them on how to make the content they create accessible, effectively transfers the information from one person to many other people.

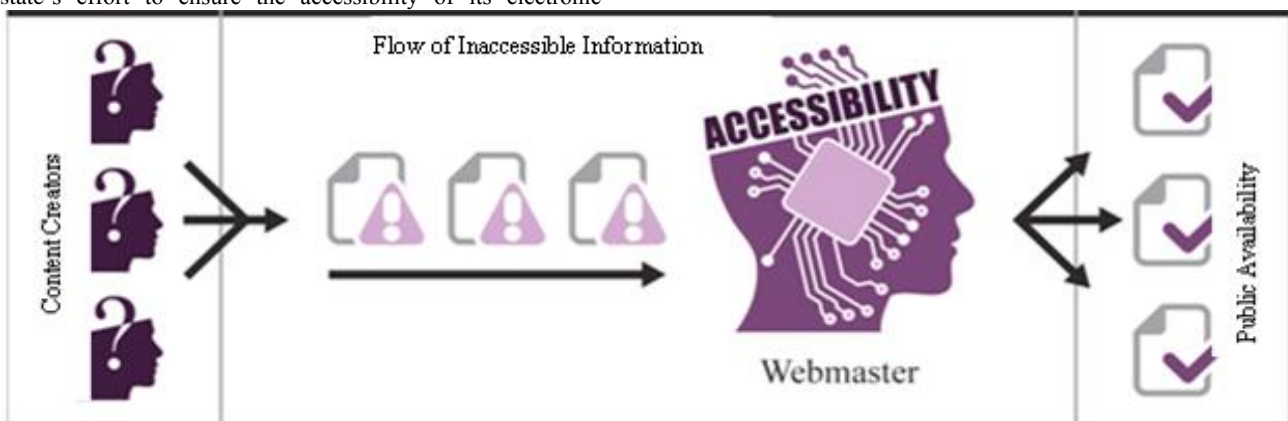


Figure :1 Flow of Inaccessible Information & Electronic Services

### 4. PROPOSED SOLUTION

The implementation of online training for the government employees of India, is the best solution to increase awareness of the concepts and laws surrounding accessibility, as well as provide instruction on techniques for increasing the accessibility of electronic information. Using Bates’

ACTIONS model as a framework for development decisions will yield an efficient and cost-effective curriculum design.

The ACTIONS model assesses the design of new e-learning models, such as asynchronous online training, through the detailed consideration of the access, costs, teaching,

interaction, organization, novelty and speed [3]. Deeson highlights that by examining these specific areas, the most appropriate technology or media resources can be matched to specific training objectives.

When developing a new training model, the importance of the flexibility of the technology chosen to deliver the curriculum. "The appropriateness of online learning will depend very much on the [group] being targeted"[4]. Since all government employees of India, who create electronic content have direct or indirect access to computers and the cloud SaaS, an online format for the proposed accessibility training is an appropriate choice. The flexibility of this delivery method will allow the training at a central location on the web. Every government employee with access to the cloud SaaS would have access to the training. Bates notes, "Easy access to computers, accessible, reliable and cheap internet service, and low cost telecommunications are all important requirements for the successful implementation of e-learning"[3]. As such, the proposed online training module could be modified given any changes in the learner, task, or context variables.

Materials can be distributed more cheaply and easily; it is easier to ensure that all users have the most recent version of the materials; learners can access the materials at their convenience; accessibility is facilitated for people with disabilities; and dangerous, expensive, or unique environments can be simulated to improve access. Given the current economic reality, the response to any training or continuing education need must be cost-effective[5]. By providing the proposed accessibility training online, the nation can eliminate both the costs associated with contracting an instructor and the costs associated with traveling to a central training location. The Indians will not incur the additional costs of purchasing computer equipment or acquiring bandwidth resources since the technology infrastructure for online learning is already in place. The online training also reduces the amount of time employees are taken away from other job-related responsibilities.

In order to satisfy the objectives for the proposed training, the government employees will be required to synthesize general knowledge of accessibility concepts and laws with the application of technical skill in the creation of electronic content. Online instruction will take the form of an asynchronous computer-based training module, where a teacher need not be present and learning materials are always available to students for reference or review. A student-centered approach offers learners "more control with course pacing, sequencing and styles" [5].

Since the government employees of India are with adults and older, it is important to consider characteristics specific to older learners in the development of the proposed online training module. Since adult learners are autonomous, practical, and relevancy-oriented, the proposed technology accessibility training will be self-paced, organized into clearly defined objectives, and be applicable to an employee's daily work [6].

Cognitive teaching strategies emphasizing attitude, memory, thinking and reflection will be used to introduce state employees to accessibility laws and concepts, whereas Objectivist methodologies, including step-by step demonstrations and tutorials, will be used to teach techniques for increasing the accessibility of electronic content [7].

According to Bates notes, "Students need to be aware of the epistemological requirements of a subject and ensure their understandings are consistent with the rules for validating knowledge in the subject area" [3]. The foundation of the curriculum will be based on accessibility standards established by the World Wide Web Consortium's Web Accessibility Initiative. Their recommendations will guide the content development of the proposed online training module designed to teach government employee techniques for increasing the accessibility of electronic content.

One of the leading benefits of providing the proposed technology accessibility training online is that employees will be trained in the same environment in which they will ultimately be required to demonstrate the mastery of their newly acquired skills. The transfer of learning can be difficult for users of multimedia, computer based instruction, citing that limited interaction, "such as typing and moving the mouse, tend to impede transfer when compared to classroom and on-the-job instruction" [7]. However, in the case of the proposed technology accessibility training, computer-based instruction and practice will undoubtedly increase the transfer of learning as the skills state employees will be required to master are also computer-based. As such, the techniques demonstrated in the technology accessibility training can be immediately applied on-the-job.

Government employees in India, already using the computers and various software applications in the creation of electronic content as a part of their daily job-related tasks. Such experience will help facilitate interaction with these familiar technologies and promote usability in the proposed accessibility training.

Technology Accessibility removes barriers to learning by providing information in usable formats. By providing the proposed online technology accessibility training in a mixed media format, the widest possible audience of learners will be reached. Gardner (1999) observes: "We are not all the same; we do not all have the same kinds of minds. ... and education works most effectively if these differences are taken into account rather than denied or ignored"[8]. A rich combination of graphics and videos will be used alongside the presentation of key concepts and terminology in a written format. Additionally, step-by-step tutorials will be used to demonstrate or model techniques for increasing the accessibility of electronic content. Bartley and Golek note (2004) "The challenge is to transform a simple printed lesson transmitted via computer technology into an exciting online classroom with powerful interactive features for the learner" [5].

Integration of the Proposed Solution into the Current Paradigm With the technological infrastructure required to offer online training already in place, the India e-government can move quickly and cost-effectively toward the development and implementation of an online training module designed to provide the employees with the information and techniques necessary to increase the accessibility of the nation's electronic content. Such training can be incorporated in the nation's new employee orientation program and as a part of each agency's continued educational or professional development.

By providing such instruction, webmasters no longer need to act as the gatekeepers between electronic content and its availability to the public. The need for time-consuming

remediation will dissipate as government employees begin to apply the knowledge gained in the proposed technology accessibility training on the job. As a result, the webmasters and employees become equal contributors in the creation of accessible electronic content, sharing the responsibility of

ensuring the accessibility of that content, and, in the process, providing more inclusive, timely and relevant information to the citizens of India.

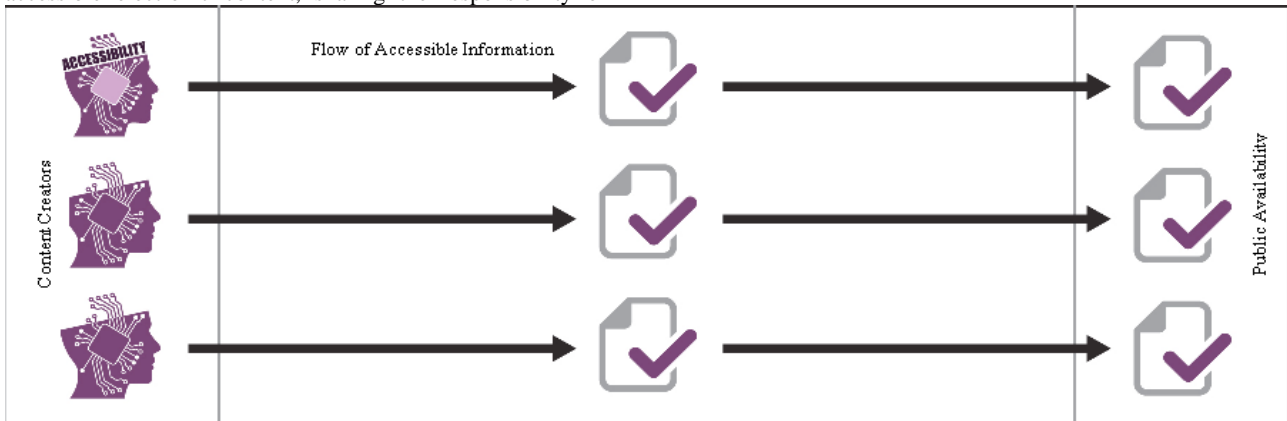


Figure 2: Flow of Accessible Information and Electronic Services

## 5. CONCLUSION

The development and implementation of online technology accessibility training for government employees is the first step in offering better, more inclusive electronic information and services to all Indians. Accessibility starts at the level of creation, which is why the people who generate the content need to be trained on how to make it accessible. There are countless advantages to the application of accessibility standards in the delivery of e-government services. Through the education of its employees, meet its social responsibility to ensure equal access to electronic content for people with disabilities. As a result, the nation may also take advantage of the technical gains associated with accessible electronic content and capitalize on identifying financial savings. The global application of technology accessibility education is limitless. By definition, electronic information that is accessible can be obtained by anyone or anything, anywhere. While the online technology accessibility training proposed by this research is intended for Indian government employees, the concepts and techniques taught in the training can be applied across multiple disciplines. Specifically as the topic relates to education, there are a vast number of accessibility considerations of which every curriculum designer, instructional designer, and teacher should be aware. Usability is at the heart of all accessibility issues and, ultimately, if the design of a lesson or training is not usable, then it is not effective.

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