CHAPTER 3

DATA METHODOLOGY

3.1 Types of Organization:

These are the organization where collected the data to evaluate the performance of semantic web services for multiple disabilities.

- National Institute of Empowerment of People with Multiple Disabilities, Chennai
- Madurai Multi-Specialty Rehabilitation Centre and Hospital, Madurai
- Dr. MGR Educational and Research Institute University, Chennai
- Aakash Special School, Madurai
- Preethi Special School, Madurai

3.2 Types of Disabilities taken for study:

Paciello (2000), stated that to make your Website more accessible when administrators, designers, and engineers understand the user characteristics of the disabled. If you are not a person with a disability — For example, loss of vision, hearing, or mobility — then likely you’re not familiar with their needs as Web surfers. In the development of any interface, the first rule of thumb is “know thy user.”

The distinguished type of disability communities are

- Blind/Visually Blind Disabilities
  a. Low vision
  b. Color Blindness
  c. Blindness
- Deaf/Hard of Hearing
- Speech & Learning Disabilities
Physical Disabilities/ Motor Impairment
Cognitive / Neurological Disabilities
Multiple Disabilities

3.2.1 Blind or Visually Disabled People

Paciello (2000), described that of all the disability communities concerned by the inaccessibility of the Web, people with visual disabilities probably rank first. This is primarily due to the graphical nature of the Web’s client-server interface.

Visual disabilities vary in category including low vision, color blindness, and total blindness. The following sections contain a description of each (Paciello 2000).

3.2.1.1 Low Vision

On the Web and when using computers, many people with low vision use specialized monitors or software that increases the size of text or images large enough for the individual to see. Web sites that use absolute font sizes make it difficult for the low vision user to make this adjustment using his or her computer Paciello (2000).

Additionally, some low vision users have difficulty making out certain font styles. Italic text, for example, may be difficult for a low vision user to read without assistive software Paciello (2000). (However, in all honesty, italic text is difficult for individuals with good vision to read. This is often due to inadequate screen resolution or poor font quality).

3.2.1.2 Color Blindness

Web accessibility issues for individuals who are color blind often involve color combinations that are not properly coordinated or do not provide high contrast. Images without alternative text are also an inconvenience, particularly when the individual is not able to discern what the image is due to the nature of his or her blindness (Paciello 2000).
3.2.1.3 Blindness

Web accessibility for people who are blind is a considerable challenge based on the obvious fact that the Web is a visual interface. Images without associated text, frames, tables, forms, and interactive content are just a few of the problems that perplex these users (Paciello 2000).

3.2.2 Deaf or Hard of Hearing People

Up front, it’s very important that so-called “able-bodied” people understand some important distinctions regarding those who are typically classified as “people with disabilities.” For example, this section purposely differentiates between people who are deaf and people who are hard of hearing. This is a crucial distinction. Generally speaking, the deaf do not consider themselves hard of hearing. Their hearing is not impaired; it simply does not exist (Paciello 2000).

Quite obviously, then, a person who is hard of hearing is one who has lost a degree of his or her ability to hear. These individuals may need an amplifying device in order to have functional hearing (Paciello 2000).

It is also important to know that people who are deaf do not consider themselves disabled” or “functionally limited. “Web accessibility for people who are blind is a considerable challenge based on the obvious fact that the Web is a visual interface. Images without associated text, frames, tables, forms, and interactive content are just a few of the problems that perplex these users (Paciello 2000).

The fact that the deaf culture is included in the category of people with disabilities is primarily based on the increasing prevalence of Web multimedia content that includes dialogue and sound but does not include captioning (Paciello 2000).

Additionally, with the growing popularity of speech recognition interfaces, people within the deaf culture who have limited speech capacity (or none at all) run the risk of being shut out of next-generation computing interfaces all together (Paciello 2000).
3.2.3 Speech Disabilities People

Individuals who have speech limitations or speech disabilities collectively include a population of people who have weakened speaking ability or a complete loss of their ability to speak (Paciello 2000).

You may not consider the population of people with limited speaking ability to be that significant. In fact, there are a variety of disabilities and conditions that include limited speech functionality as a secondary aspect of the disability (Paciello 2000).

3.2.4 Physical Disabilities and Motor Impairments People

For people with physical disabilities or motor impairments, accessibility issues can take on a wide range of challenges. Some people have use of their hands while others do not. Some have the ability to use mouth sticks and head pointers while others rely on infrared devices (Paciello 2000).

Physical impairments are wide and varied. They include conditions such as muscle weakness, paralysis, joint discomfort, and spinal injuries, or disease processes such as arthritis and muscular dystrophy (Paciello 2000).

Functional limitations as a result of Repetitive Strain Injury (RSI) have increased dramatically over the years. Ironically, one of the key reasons for this increase is directly related to use of personal computers. This led to a growth in the use of emerging technologies such as speech recognition (Paciello 2000).

The growing popularity of Web appliances and devices such as WebTV and Web kiosks, if not properly designed and tested, will present numerous challenges for the physically challenged user (Paciello 2000).
3.2.5 Cognitive or Neurological Disabilities People

Cognitive and neurological disabilities may seem a little more difficult to address. However, as with outwardly apparent physical disabilities, the improvements made to your Web authoring techniques will serve more than the disabilities community (Paciello 2000).

Individuals with dyslexia, dyscalculia, and auditory perception difficulties benefit from information being presented in short, discrete units. Easily digestible chunks of data make the important points in your content stand out as well (Paciello 2000).

Some neurological conditions can result in users being sensitive to excessive flashing in animations or blinking that occurs within certain ranges of frequencies. Seizure disorders have been known to be triggered by such events. Any time that the eye is distracted from the real content of the page, your meaning may be lost (Paciello 2000).

3.3 Types of test done for collected data in SPSS 16.0

1. Descriptive Statistics – Frequency, Percentage, Mean, Standard Deviation
2. Reliability - Cronbach’s Alpha Test
3. Intraclass Correlation – F Test
4. Significance value – Chi-Square Test
5. Skewed Data - Kolmogrov-Simirnaov Test
6. Multivariate Analysis - Krusal-Walli's Test
7. Bivariate Analysis - Mann-Whitney U Test
8. Relationship between the variables - Spearman's rank correlation

The collected data were analyzed with SPSS 16.0. To describe about the data, descriptive statistics, frequency analysis, percentage analysis, mean and S.D was used. The reliability of the collected data was verified with Cronbach's Alpha. The Kolmogrov-Simirnaov test for normality shows the data was skewed data. So to find the significant difference between the bivariate samples in Independent groups (Male & Female) Mann-Whitney U test was used. In the multivariate analysis the Krusal-Walli's test was used. To assess the relationship between the variables Spearman's rank correlation was used. To find
the significance in categorical data Chi-Square test was used. In all the above statistical tools the probability value $P= .05$ is considered as significant level.

### 3.4 Types of tool used for evaluation

1. Achecker Tool – To check the accessibility of a website using WCAG2.0
2. SPSS 16.0 Tool – To check the collected data for analysis
3. Keel Tool – To extract the knowledge using K-Means clustering

A couple of studies have investigated the perceptual experience of accessibility of Web developers (Lazar et al. 2004) (http://www.enabledweb.org/publicresults/survey results/) regarding people from different contexts and contexts. Two other fields have seen in the perceptual experience of accessibility by Brazilian developers (Tangarife and Mont’alvao 2006) (Ferreira et al. 2007), particularly people from a governmental organization world other fields have seen in the perceptual experience of accessibility by Brazilian developers (Tangarife and Mont’alvao 2006) (Ferreira et al. 2007), particularly people from governmental organizations. Nonetheless, the studies did not regard a significant and varied scope of the masses. Also, the works were not planned aimed at enabling further statistical analysis. In this report, we suggested a study to investigate the accessibility awareness of people involved in Web development projects in Tamil Nadu. The main goal of this work was to examine basic issues related to accessibility in software development, and how developers and other people tackle accessibility for e-learning.

This study for analysis of various website accessibility by comparison of principles of guidelines with or without visual icons to easily access the website for disabilities by using AChecker tool. This tool was based on the principles of the WCAG 2.0 guidelines predictable, understandable, operable and robust with priority, Level A, Level AA, and Level AAA. 20 websites have been analyzed for accessibility in Achecker tool and report has been generated like known problems, likely problems, potential problems, HTML validation and CSS validation are discussed in the next chapter.

Web sites need to be accessible to all users, including those with disabilities. Given all of the resources available for making web sites accessible, it is unclear why they remain
so inaccessible. Our goal is to learn more about why sites are not accessible. For the person that has the greatest influence on current-existing websites is the webmaster, the researchers decided to start the investigation with webmasters. The researchers created a survey to learn more about webmasters and their approaches and knowledge on the topic of web accessibility.

The same data were evaluated with stakeholders like people with able/disabled has been accessed the site. Age 18 to more than 60 and sex both male and female, 200 participants who were taken to access the website is 30minutes. The questionnaire had 21 questions: 9 questions linked to demographic data, 12 close-ended questions. The questions set was split into two sections: the first with general questions, and the second with questions linked with 3 point Likert scale why developers consider or not accessibility in projects. In the demographic questions, subjects were required to be sufficient about the situation, gender, age, and field of work, training and social occasion in their organization. In the close-ended questions set were included questions regarding: knowledge on HTML and CSS, awareness about how people with disabilities use the Web, knowledge about assistive technologies, knowledge about the accessibility law, practice techniques for accessibility evaluation, opinion about the actual consideration of availability in the projects they take part in, and reasons for selecting or not accessibility in development projects. The collected data were analyzed with SPSS 16.0 version. To describe about the data, descriptive statistics, frequency analysis, percentage analysis, mean and S.D was used. The reliability of the collected data was verified with Cranbach's Alpha. To find the significance in categorical data Chi-Square test was used. In all the above statistical tools the probability value P=.05 is considered as significant level.

The results of that survey are discussed in this report. In addition, we have created a model, called the Semantic Web Accessible Platform Model, which describes the various ways that accessibility flaws enter a web site. Our goal with this research is to increase the knowledge about why web sites are not accessible, so that we can make the web a more accessible place.
To find out the performance of disabilities with the help of SOA for disabled schools for integrated educational information system by the questionnaire it was analyzed. 500 participants who were taking part in this evaluation. People with abilities/disabilities has been accessed the site, age 18 to more than 60, sex both male and female. Based on accessing the website some questions were asked to participants with 5 point Likert scale. The collected data were analyzed with SPSS 16.0. To describe about the data, descriptive statistics, frequency analysis, percentage analysis, mean and S.D was used. The reliability of the collected data was verified with Cronbach's Alpha. The Kolmogrov-Simirnaov test for normality shows the data was skewed data. So to find the significant difference between the bivariate samples in Independent groups (Male & Female) Mann-Whitney U test was used. In the multivariate analysis the Krusal-Walli's test was used. To assess the relationship between the variables Spearman's rank correlation was used. To find the significance in categorical data Chi-Square test was used. In all the above statistical tools the probability value P= .05 is considered as significant level.

KEEL software tool has been used to find out the knowledge extraction by using our proposed model, by using clustering techniques, it has been discussed in the next chapter.