CHAPTER 4
RESEARCH METHODOLOGY

4.1 Research Design
Burns & Grove (2003) defines a research design as “a blueprint for conducting a study with
maximum control over factors that may interfere with the validity of the findings”. A research
design is a master plan specifying the methods and procedures for collecting and analyzing the
needed information. Churchill (1979) opined that a research design helps the researchers to
provide a well defined guidance for collecting data for their study.

The basic feature of the research design is as follows; the plan should be specific and should
match to the actual problem, it is a strategy for gathering and analyzing the data for their
hypothesis, time and cost analysis should be made in advance. Thus it should contain a clear
statement of the research problems, the techniques and procedures should be done
systematically, the sampling design should be properly taken into account for processing and
analyzing the data and the methods should be effectively followed to solve the problems.

Research design is broadly classify into three types. They are exploratory, descriptive, casual
relationship research respectively. In this study all the three types of research designs are used in
different stages forming the preparation of the research problem, objectives of the study and by
hypotheses of the study. In this study the exploratory research helps to familiarize with the
research problem or concept to be studied. Descriptive research helps to identify the
characteristics of the population as well as it helps to specify clearly target population taken for
this research. Casual research tries to identify the relationship between the independent and
dependent variables going to be tested in this study.

Both citizens and government employees were studied to understand the impact of e-Governance
in public utility service sector in India. This study undertook a combination of exploratory,
descriptive and causal relationship. Based on the theoretical framework of the study the
questionnaire design framed and then data collection was planned and executed.
4.2 Research Instrument

According to Parahoo (1997), a research instrument is “a tool used to collect data. An instrument is a tool designed to measure knowledge, attitude and skills.” The two approaches are generally followed by most of the researchers, and they are qualitative and quantitative. Burns & Grove (2003) describe a qualitative approach as “a systematic subjective approach used to describe life experiences and situations to give them meaning.” The term qualitative method is referred as nonfigurative approach for collecting data. This approach is used to bring the inner feeling and experiences of a person about the world in which they live. The method used to collect data in qualitative approach is by means of informal, in-depth semi-structured interviews from the participants. The term quantitative method is referred as a systematic process involving the collection of numerical data. Quantitative method helps to identify the relationship between an independent variables and a dependent variable. Qualitative is also refers as inductive approach that means based on the collected information the theory must be developed whereas quantitative approach refers as deductive approach it helps to test the existing theory (Creswell, 2003).

The research instrument used in the present study is questionnaire method. To test the theoretical model for this study, a survey was conducted. Groves & Singer, (2004) defines “survey in quantitative side emphasizes solutions to problems, extraction of principles that have wide applicability, generalization of results and standardization of measurement”. In order to test the theoretical framework, a survey was used in this study to identify the impact of e-Governance in public utility service sector in India.

4.3 Questionnaire Design

A questionnaire was designed to gather the necessary information. Based on the literature review in the field of e-Government adoption studies the questionnaire was developed for both citizens and employees perspective. The questionnaire was created in such way that the respondent can give quick response. The citizens’ questionnaire had three different sections along with a preface. The preface addresses the respondent and provides a brief on the study and the scale has to be used by the researcher. The first section was aimed at collecting general information about the awareness of the e-Governance system, and various e-Government services used by the citizens’. The second section of the questionnaire consisted of statements
aimed at ascertaining and measuring various factors which leads to citizens’ intention to use e-Government system. The third section was aimed at collecting citizens’ demographic data of the respondents.

Employees questionnaire design followed three sections, the first section asks about the general information about the ICT and e-Governance training attend by the employees and second section consisted of statements aimed at ascertaining and measuring various factors which leads to employees’ intention to use e-Government system. The third section was aimed at collecting employees’ demographic data of the respondents.

4.3.1 Questionnaire and Scale Validation
For measuring the citizens’ intention to use e-Government system as well as employees’ intention to use e-Government system a seven–point Likert’ scale was used. Likert’ Scale is the most widely used approach to scaling responses in survey research. Each item of the questionnaire was measured on a seven–point Likert’ scale with end points of ‘strongly agree’(7) and ‘strongly disagree’(1).

4.3.2 Operationalization of Variables
Based on the theoretical framework the study identified both independent variables and dependent variable for citizens’ and employee perspective. The variables for citizens’ perspective of e-Government system are intention to use, perceived ease of use, web site quality, computer self-efficacy, perceived usefulness, personalization, perceived risk, security, familiarity, local language and computer anxiety. The variables for employees’ perspective of e-Government system are performance expectancy, job fit, facilitating conditions, compatibility and intention to use.

4.3.2.1 Operationalization of Citizens’ Perspective of e-Government Scale
4.3.2.1.1 Operationalization of Intention to Use
The construct intention to use was measured on a seven-point Likert scale with end points of ‘strongly agree’ (7) and ‘strongly disagree’ (1). Intention to use can be defined as how a citizen
is engaged in e-Government services and as well as how they are responding to the services. It is adapted from (Ajzen, 1988; 1991; Taylor & Todd, 1995; Venkatesh & Brown, 2001; Venkatesh et al., 2003) and it is measured by the following items.

i. I intend to use the e-Government services.
ii. It is likely that I will use e-Government services.
iii. I expect to use the e-Government system in future.
iv. I will continue using e-Government websites.
v. In the future, I will consider e-Government websites to be my first choice to do business with government.
vi. In future, I intend to increase my use of e-Government websites.
vii. I will probably use this e-Government service in the future.

4.3.2.1.2 Operationalization of Perceived Ease of Use
The construct perceived ease of use to use was measured on a seven-point Likert scale with end points of ‘strongly agree’ (7) and ‘strongly disagree’ (1). It is adapted from Wangpipatwong et al., (2008) and it is measured by the following items.

i. Getting the information that I want from e-Government websites is easy.
ii. It is easy for me to complete a transaction through an e-Government websites.
iii. The organization and structure of e-Government websites is easy to follow.
iv. The e-Government websites is very easy to use.
v. It is easy to search for information in e-Government websites.
vi. Using e-Government websites enables me to accomplish tasks more quickly.
vii. The information provided by the e-Government websites is clear to me.
viii. The e-Government websites is visually appealing.
ix. The user interface of the e-Government websites has a well organized appearance.
x. It is quick and easy to complete a transaction at the e-Government websites.
xi. The e-Government websites makes it easy to find what I need.
xii. The e-Government websites information is well organized.

4.3.2.1.3 Operationalization of Website Quality
The construct website quality was measured on a seven-point Likert scale with end points of
‘strongly agree’ (7) and ‘strongly disagree’ (1). It is adapted from Loiacono et al. (2002), Yoo & Donthu (2001), Palmer (2002) and it is measured by the following items.

i. The e-Government websites launches and runs right away.

ii. The e-Government websites does not crash.

iii. The e-Government websites is available all the time.

iv. The e-Government websites loads its pages faster.

4.3.2.1.4 Operationalization of Computer Self-Efficacy

The construct computer self-efficacy was measured on a seven-point Likert scale with end points of ‘strongly agree’ (7) and ‘strongly disagree’ (1). It is adapted from Wangpipatwong et al., (2008) and it is measured by the following items.

i. I feel confident while working on computer even if there is no one around to tell me what to do.

ii. Using e-Government websites can cut traveling expense.

iii. Using e-Government websites can lower traveling and queuing time.

4.3.2.1.5 Operationalization of Perceived Usefulness

The construct perceived usefulness was measured on a seven-point Likert scale with end points of ‘strongly agree’ (7) and ‘strongly disagree’ (1). It is adapted from Davis (1989) and it is measured by the following items.

i. Using e-Government websites enables me to do business with the government anytime, not limited to regular business hours.

ii. Most of the e-Government websites are useful for government services.

iii. I feel happy when I use the e-Government websites.

4.3.2.1.6 Operationalization of Personalization

The construct personalization was measured on a seven-point Likert scale with end points of ‘strongly agree’ (7) and ‘strongly disagree’ (1). It is adapted from Madu & Madu (2002), Lee & Lin (2005), Hongxiu & Reima (2009) and it is measured by the following items.

i. The e-Government websites contains links to other websites that citizens may be interested in (e.g. links to its parent websites, branch websites, or other e-Government
sites).

ii. The e-Government websites provides various options for delivering the service (eg. Email, postal service etc).

iii. The e-Government websites provides different e-Government service options(e.g. Payment methods like credit card, debit card etc)

4.3.2.1.7 Operationalization of Perceived Risk

The construct perceived risk was measured on a seven-point Likert scale with end points of ‘strongly agree’ (7) and ‘strongly disagree’ (1). It is adapted from Pires et al., (2004), Ueltschy et al., (2004) and it is measured by the following items.

i. I feel uneasy about using a new e-Government service.

ii. When transaction errors occur, I worry that I cannot get compensation from banks.

iii. If payment error occurs, it will lead to a lot of inconvenience for me.

iv. I would not feel totally safe providing personal information over the internet.

v. I would not feel secure sending sensitive information across the Internet to use e-Government services.

4.3.2.1.8 Operationalization of Security

The construct security was measured on a seven-point Likert scale with end points of ‘strongly agree’ (7) and ‘strongly disagree’ (1). It is adapted from Alanezi et al., (2010) and it is measured by the following items.

i. I am confident of the security of e-Government websites.

ii. The e-Government websites protects information about my personal detail.

iii. It does not share my personal information with other web sites.

4.3.2.1.9 Operationalization of Familiarity

The construct familiarity was measured on a seven-point Likert scale with end points of ‘strongly agree’ (7) and ‘strongly disagree’ (1). It is adapted from Alsaghier et al., (2009) and it is measured by the following items.

i. I am familiar with the e-Government websites.
ii. I am familiar with conducting online transaction with e-Government websites.

### 4.3.2.1.10 Operationalization of Local Language

The construct local language was measured on a seven-point Likert scale with end points of ‘strongly agree’ (7) and ‘strongly disagree’ (1). It is adapted from Mahadeo (2009) and it is measured by the following items.

- i. I believe that, if e-Government service websites should be in my local language will make it easier to use the systems.
- ii. It is easier for me to understand the e-Government services websites in my local language.

### 4.3.2.1.11 Operationalization of Computer Anxiety

The construct computer anxiety was measured on a seven-point Likert scale with end points of ‘strongly agree’ (7) and ‘strongly disagree’ (1). It is adapted from Compeau & Higgins (1995), Lee et al. (2009) and it is measured by the following items.

- i. Using computer is not comfortable for me.
- ii. I get worried when I think of using computers.
- iii. Computer makes me feel uneasy.

### 4.3.2.2 Operationalization of Employees’ perspective of e-Government Scale

#### 4.3.2.2.1 Operationalization of Intention to Use

The construct intention to use was measured on a seven-point Likert scale with end points of ‘strongly agree’ (7) and ‘strongly disagree’ (1). It is adapted from Venkatesh et al (2003) and it is measured by the following items.

- i. I intend adopting e-Government system in the future.
- ii. I predict using the e-Government system in the future.
- iii. I plan to use e-Government in the future.

#### 4.3.2.2.2 Operationalization of Performance Expectancy

The construct performance expectancy was measured on a seven-point Likert scale with end
points of ‘strongly agree’ (7) and ‘strongly disagree’ (1). It is adapted from Venkatesh et al., (2003) and it is measured by the following items.

i. Using the e-Government system is a new experience for me.

ii. I would find the e-Government system useful in my job.

iii. Using the e-Government system enables me to accomplish tasks more quickly.

iv. I feel assured that the legislation level currently implemented encourage me to adopt e-Government services.

4.3.2.2.3 Operationalization of Compatibility
The construct compatibility was measured on a seven-point Likert scale with end points of ‘strongly agree’ (7) and ‘strongly disagree’ (1). It is adapted from Karahanna et al. (2006) and it is measured by the following items.

i. Using the e-Government system is not similar to anything that I’ve done before.

ii. There is no doubt of the high government support towards the e-Government project.

4.3.2.2.4 Operationalization of Job Fit
The construct job fit was measured on a seven-point Likert scale with end points of ‘strongly agree’ (7) and ‘strongly disagree’ (1). It is adapted from Thompson et al., (1991) and it is measured by the following items.

i. Using the e-Government system increases my productivity.

ii. Using the e-Government system does not require significant changes in my existing work routine.

iii. To use the e-Government system, I don’t have to change anything I currently do.

4.3.2.2.5 Operationalization of Facilitating Conditions
The construct facilitating conditions was measured on a seven-point Likert scale with end points of ‘strongly agree’ (7) and ‘strongly disagree’ (1). It is adapted from Venkatesh et al., (2003) and it is measured by the following items.

i. I have the resources necessary to use the online e-Government system.

ii. I have enough Internet experience to use the e-Government services.
iii. The current legal framework ensures risk free and secured e-Government services.

iv. Learning to operate the e-Government system is easy for me.

v. It has made my job more pleasure.

vi. Using the e-Government system is different from using other software I have used in the past.

4.3.3 Questionnaire pre-test

After the questionnaire is designed based on the literature review, the questionnaire is pretested before releasing it to the respondents. Pretesting helps to identify the critical errors occurred in the questionnaire. In this study the pretesting was conducted with the experts in the field of e-Governance as well as worked in the e-Governance projects. Based on the input given by the experts in the field of e-Governance the structure and the wordings in the questionnaire were changed to get appropriate answer from the respondents. The main purpose of pretesting helps the researcher to reduce the ambiguity wording in the questions, to identify the flow of the question and to find the time taken by the respondents to answer the questions.

4.3.4 Pilot Study

A pilot study for a sample size of 148 respondents were collected from the citizens’ of Mumbai as well as 30 respondents were collected from the employees of Mumbai working in different government departments. This was used to test the reliability and validity of the scales used in the study. Some items with lower factor loadings (< .5) and cross loadings were removed after pre-testing. The pre-testing also asserted that there were no issues on comprehensibility of the statements used in designing the questionnaire. It helped in estimating that 10-15 minutes time was taken by the respondents to the answer the questionnaire.

<table>
<thead>
<tr>
<th>Citizens’ e-Governance Constructs</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Ease of use</td>
<td>.924</td>
</tr>
<tr>
<td>Website Quality</td>
<td>.825</td>
</tr>
<tr>
<td>Computer Self-Efficacy</td>
<td>.802</td>
</tr>
</tbody>
</table>
### Citizens’ e-Governance Constructs

<table>
<thead>
<tr>
<th>Construct</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Usefulness</td>
<td>.844</td>
</tr>
<tr>
<td>Personalization</td>
<td>.800</td>
</tr>
<tr>
<td>Perceived Risk</td>
<td>.811</td>
</tr>
<tr>
<td>Security</td>
<td>.815</td>
</tr>
<tr>
<td>Familiarity</td>
<td>.851</td>
</tr>
<tr>
<td>Local Language</td>
<td>.864</td>
</tr>
<tr>
<td>Computer Anxiety</td>
<td>.933</td>
</tr>
<tr>
<td>Intention to Use</td>
<td>.912</td>
</tr>
</tbody>
</table>

### Employees’ e-Governance Constructs

<table>
<thead>
<tr>
<th>Construct</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance Expectancy</td>
<td>.734</td>
</tr>
<tr>
<td>Compatibility</td>
<td>.787</td>
</tr>
<tr>
<td>Job Fit</td>
<td>.700</td>
</tr>
<tr>
<td>Facilitating Conditions</td>
<td>.838</td>
</tr>
<tr>
<td>Intention to Use</td>
<td>.961</td>
</tr>
</tbody>
</table>

#### 4.4 Sampling Method

Neuman, W.L. (2007) defines, “Sampling is a process of selecting samples from a group or population to become the foundation for estimating and predicting the outcome of the population as well as to detect the unknown piece of information”. Sampling is used because it is very difficult to study the entire population. Sample refers to subset of a larger population. It is important to ensure that the chosen sample should be a fair representation of the underlying population. The sample selection is a basic process which generally goes through five steps; defining the target population, choosing the sampling frame, selecting the sampling method, determining the sample size, and implementing the sampling plan (Hair et al, 2005).

The target population helps to specify the complete groups of sample relevant for the research study. The target population for this study citizens’ of various states in India as well as government employees who are working in the public utility services in India is considered. Sampling frame also refers as working population, which is used to draw sample from the list of
elements. The sampling frame drawn for this research study citizens from 27 states in India, the employee sample frame consists of employees who are working in public service sector like income tax, telecom department, electricity department, land & registration department etc.

Sampling is basically divided into two types, they are probability or random sampling, non-probability or non-random sampling. According to Zikmund (2003) probability sampling is defined as “a sampling technique in which every member of the population has to be know, nonzero probability of selection”. Non-probability sampling defined as “a sampling techniques in which units of the sample are selected on the basis of personal judgment or convenience”. Probability sampling refers to selecting samples by using randomization mechanism whereas non-probability sampling is based on the convenience of the researchers. Probability Sampling is further divided into five types; they are simple random, systematic, stratified, cluster and multistage sampling. Non-probability sampling is divided into four types they are convenience, judgment, snowball and quota sampling.

After sampling frame the researcher has to choose one sampling method i.e. either probability sampling or non-probability sampling for collecting the appropriate data for their study. The appropriate sampling should be chosen based on the most common criteria which are accuracy requirements, resources available, time constraints, knowledge availability, and analytical requirements. For this study the researcher has used convenience sampling for collecting the responses for the study. Convenience sampling is referred to as sample selected based on the convenience of the researcher. The convenience sampling is used in this study because the researcher has not having the population list to be studied. The advantage of this sampling method is relative less cost and time, very easy to carry out with few rules in data collection.

**4.4.1 Sampling Size and Justification**

After sampling method is concluded next part is the researcher has to finalize the sample size for the study. Sample size is defined as the number of observations used for calculating estimates of a given population. Great care has to taken before finalizing the sample size for a given research study. A total of 1000 sample is considered for this study out which 750 responses for citizens’ scale and 250 responses for employee e-Government scale. For justification of sample size for
this study first considered the rule given by Hair et al (2005) in deciding sample size by the number of variable in the questionnaire multiply by 10 (i.e. 1 : 10 ratio ). This is the minimum requirement fixed for an adequate sample size. In this research study the citizen questionnaire has 47 variables (47:10 ratio), hence 470 sample sizes is enough to do the analysis. In same way the employee questionnaire has 18 variables (18: 10 ratio), hence 180 sample sizes is adequate enough to do the analysis. Total sample size required for the entire study is 470 plus 180 totaling 650 sample size. Comfrey and Lee (1992) suggest that sample size of: 50 – very poor; 100 – poor; 200 – fair; 300 – good; 500 – very good; 1000 or more – excellent. They recommend the researchers to get 500 or more observations sample sizes whenever possible.

Another method of justification is given in Krejcie & Morgan (1970) in the article “Small Sample Techniques,” the research division of the National Education Association has published a formula for determining sample size. The formula for calculating sample size is

\[ s = X^2 NP (1-P) \div (N-1) + X^2 P (1-P) \]

\( s \) = required sample size.
\( X^2 \) = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841).
\( N \) = the population size.
\( P \) = the population proportion (assumed to be .50 since this would provide the maximum sample size)
\( d \) = the degree of accuracy expressed as a proportion (.05)

The authors also provided a table for determining the sample size from a given population and they specify that no calculation is required to use the given TABLE 4.2 and it can be applicable for any defined population.
TABLE 4.2 DETERMINE SAMPLE SIZE FROM A GIVEN POPULATION
(SOURCE: KREJCIE & MORGAN (1970))

<table>
<thead>
<tr>
<th>N</th>
<th>S</th>
<th>N</th>
<th>S</th>
<th>N</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>10</td>
<td>220</td>
<td>140</td>
<td>1200</td>
<td>291</td>
</tr>
<tr>
<td>15</td>
<td>14</td>
<td>230</td>
<td>144</td>
<td>1300</td>
<td>297</td>
</tr>
<tr>
<td>20</td>
<td>19</td>
<td>240</td>
<td>148</td>
<td>1400</td>
<td>302</td>
</tr>
<tr>
<td>25</td>
<td>24</td>
<td>250</td>
<td>152</td>
<td>1500</td>
<td>306</td>
</tr>
<tr>
<td>30</td>
<td>28</td>
<td>260</td>
<td>155</td>
<td>1600</td>
<td>310</td>
</tr>
<tr>
<td>35</td>
<td>32</td>
<td>270</td>
<td>159</td>
<td>1700</td>
<td>313</td>
</tr>
<tr>
<td>40</td>
<td>36</td>
<td>280</td>
<td>162</td>
<td>1800</td>
<td>317</td>
</tr>
<tr>
<td>45</td>
<td>40</td>
<td>290</td>
<td>165</td>
<td>1900</td>
<td>320</td>
</tr>
<tr>
<td>50</td>
<td>44</td>
<td>300</td>
<td>169</td>
<td>2000</td>
<td>322</td>
</tr>
<tr>
<td>55</td>
<td>48</td>
<td>320</td>
<td>175</td>
<td>2200</td>
<td>327</td>
</tr>
<tr>
<td>60</td>
<td>52</td>
<td>340</td>
<td>181</td>
<td>2400</td>
<td>331</td>
</tr>
<tr>
<td>65</td>
<td>56</td>
<td>360</td>
<td>188</td>
<td>2600</td>
<td>335</td>
</tr>
<tr>
<td>70</td>
<td>59</td>
<td>380</td>
<td>191</td>
<td>2800</td>
<td>338</td>
</tr>
<tr>
<td>75</td>
<td>63</td>
<td>400</td>
<td>196</td>
<td>3000</td>
<td>341</td>
</tr>
<tr>
<td>80</td>
<td>66</td>
<td>420</td>
<td>201</td>
<td>3200</td>
<td>346</td>
</tr>
<tr>
<td>85</td>
<td>70</td>
<td>440</td>
<td>205</td>
<td>3400</td>
<td>351</td>
</tr>
<tr>
<td>90</td>
<td>73</td>
<td>460</td>
<td>210</td>
<td>3600</td>
<td>354</td>
</tr>
<tr>
<td>95</td>
<td>76</td>
<td>480</td>
<td>214</td>
<td>3800</td>
<td>357</td>
</tr>
<tr>
<td>100</td>
<td>80</td>
<td>500</td>
<td>217</td>
<td>4000</td>
<td>361</td>
</tr>
<tr>
<td>105</td>
<td>83</td>
<td>520</td>
<td>226</td>
<td>4200</td>
<td>364</td>
</tr>
<tr>
<td>110</td>
<td>86</td>
<td>550</td>
<td>234</td>
<td>4400</td>
<td>367</td>
</tr>
<tr>
<td>115</td>
<td>89</td>
<td>580</td>
<td>242</td>
<td>4600</td>
<td>368</td>
</tr>
<tr>
<td>120</td>
<td>92</td>
<td>600</td>
<td>250</td>
<td>4800</td>
<td>370</td>
</tr>
<tr>
<td>125</td>
<td>95</td>
<td>620</td>
<td>258</td>
<td>5000</td>
<td>373</td>
</tr>
<tr>
<td>130</td>
<td>97</td>
<td>650</td>
<td>266</td>
<td>5200</td>
<td>375</td>
</tr>
<tr>
<td>135</td>
<td>100</td>
<td>680</td>
<td>274</td>
<td>5400</td>
<td>377</td>
</tr>
<tr>
<td>140</td>
<td>103</td>
<td>700</td>
<td>284</td>
<td>5600</td>
<td>379</td>
</tr>
<tr>
<td>145</td>
<td>106</td>
<td>720</td>
<td>292</td>
<td>5800</td>
<td>380</td>
</tr>
<tr>
<td>150</td>
<td>109</td>
<td>740</td>
<td>299</td>
<td>6000</td>
<td>381</td>
</tr>
<tr>
<td>155</td>
<td>112</td>
<td>760</td>
<td>308</td>
<td>6200</td>
<td>382</td>
</tr>
<tr>
<td>160</td>
<td>115</td>
<td>780</td>
<td>315</td>
<td>6400</td>
<td>384</td>
</tr>
</tbody>
</table>

Note.—N is population size.  
S is sample size.

4.4.2 Data Collection and Responses Rate

Data collection can be defined as collecting raw data and converts them into useful information. Data collection can be classified into primary and secondary data. Primary data is a data collected newly from the origin whereas secondary data uses the primary data by the researchers for their research. Primary data is collected by any one of the standard methods of research, which are surveys, filed studies, experiments, system studies, etc. Great care needs to be taken to ensure that the data collections are relevant, accurate, current and unbiased (Kotler & Armstrong, 2010).

The present study employed quantitative techniques by using of survey questionnaire method for data collection. For citizens’ perspective, the questionnaire was distributed to the respondents through the researcher personal conduct as well as by email conduct. Researcher’s personal
contact the data related to employees is collected from certain government department like railways, land and revenue, income tax, telephone department and electricity department. Questionnaire survey allows the researcher to easily examine the relationship between the constructs (Saunders et al. 2007).

The survey questionnaire was distributed among a total of 750 respondents to citizens. From a total of 550 responses were collected, 498 were usable responses obtained and used for all the analysis. The total responses rate in this research was (66.4%) which is considered as good response rate (Babbie, 1990). The survey questionnaire was distributed among a total of 250 respondents to government employees’. From the total of 110 responses were obtained with response rate of 44.0%.

4.5 Statistical Analysis Techniques

Suitable statistical analysis tools were used to analyze the data. Appropriate univariate, bivariate and multivariate analyses were used depending upon the nature of variables and objective of the study.

4.5.1 Reliability Test

Reliability is defined as a variable or set of variables is consistency in what it is intended to measure. For both citizens’ perspective of e-Government system scale and employees’ perspective of e-Government system scale, reliability test is conducted using Cronbach alpha.

4.5.2 Validity Test

Validity is referred as “the ability on a scale or measuring instrument to measure what it is intended to measure” (Zikmund, 2003). In order to evaluate the validity of a scale three different approaches are used, that are face validity or content validity, criterion validity and construct validity. Face validity or content validity is used to establish the identity of whether the proposed is accurately measuring what it is intended to measure. Construct validity helps to identify the validity of the proposed construct along with the actual measurement. For this study content validity and construct validity is used.
4.5.3 Univariate Analysis

Univariate analysis refers to the analysis with one single variable. The demographic profile, frequency of citizens’ e-Government usage, frequency list of services used by the citizens, frequency of ICT facilities and e-Governance preparedness by the respondents were identified by using univariate analysis.

4.5.4 Bivariate Analysis

Bivariate analysis involves two variables to analyze the data, to establish the relationship between two variables. In this research study, independent t-test and one-way ANOVA are tested for the null hypotheses $H_{10}$ to $H_{140}$.

4.5.4.1 Independent t-test

The independent t-test is used to compare means for two groups of cases. The proposed null hypothesis $H_{110}$ is tested using t-test. The null hypothesis states that:

$H_{110}$: There is no significant difference between genders in predicting the overall intention to use the e-Government system.

4.5.4.2 One-way ANOVA (Analysis of variance)

ANOVA is used to analyses mean differences between two or more groups. ANOVA compares the validity among groups with the variability within groups (Krishnaswamy et al. 2009). The hypotheses from $H_{120}$ to $H_{140}$ are tested using one-way ANOVA. The proposed null hypotheses are:

$H_{120}$: There is no significant difference across different age categories of citizens’ in predicting the overall intention to use the e-Government system.

$H_{130}$: There is no significant difference in income category of citizens’ in predicting the overall intention to use the e-Government system.

$H_{140}$: There is no significant difference in education category of citizens’ in predicting the overall intention to use the e-Government system.
4.5.4.3 Bivariate Linear Regression

Regression is a technique for measuring the linear association between a dependent and an independent variable. Bivariate linear regression is a measure of linear association that investigates straight-line relationships of the type $Y = \alpha + \beta X$, where $Y$ is the dependent variable, $X$ is the independent variable, $\alpha$ and $\beta$ are two constants to be estimated (Zikmund, 2003). In this study hypotheses from $H_{10}$ to $H_{10}$ is tested using bivariate linear regression.

4.5.5 Multivariate Analysis

Multivariate analyses are used when there are more than one independent variables or dependent variables. In this research study, multivariate analysis such as multiple regression and factor analysis were used.

4.5.5.1 Multiple Regression Analysis

Multiple regression is an extension of linear regression. Multiple regression analysis is used to predict one variable from the combination of several variables. In addition, it is used to identify which variables are better predictors than others. It is used to judge the model is fit or not. This study tests the theoretical model of citizen’s perspective of the e-Government system based on multiple regression.

In this study the null hypotheses from $H_{150}$ to $H_{180}$ of the employees’ perspective of e-Government system is tested using multiple regression. The null hypotheses from $H_{150}$ to $H_{180}$ states that:

$H_{150}$: Performance Expectancy of e-Government services has no significant influence on intention to use the e-Government system.

$H_{160}$: Compability of e-Government services has no significant influence on intention to use the e-Government system.

$H_{170}$: Job fit of e-Government services has no significant influence on intention to use the e-Government system.
H180: Facilitating Conditions of e-Government services has no significant influence on intention to use the e-Government system.

4.5.5.2 Factor Analysis
Factor analysis is the most often tool used in multivariate techniques in research studies. Factor analysis is used to analyzing the structure of the interrelationships (correlations) among a large number of variables by defining a set of common underlying dimensions known as factors (Hair et al. 2005). It is used to reduce the number of factors from a large number of factors of measured variables. The factors are normally latent constructs, and the researcher need to distinguish between independent and dependent variables to conduct factor analysis (Zikmund, 2003). Factor analysis was conducted to evaluate the consistency, stability of the model. Principal component analysis with varimax rotation was used to evaluate and identify the component factors.

4.6 Ethical Consideration
Ethical aspects regarding the confidentiality, privacy, and consent of data were seriously considered during the research process. During the data collection process, the respondents were briefed about the objectives of the study, and ensured data were not been used for any other purpose than the academic research objectives. While collecting data from the respondents, they were informed about the academic objective of the research study. The participants were well informed by the researcher about how much time it would need to fill the form. To ensure the confidentiality and privacy of the respondents, only aggregate results were used. No respondents were forced to answer any question in which they were not comfortable. Respondents’ personal information such as name, address, and contact information were not used in the study.