Mahjabeen Aydeed “Availability and use of information for managerial decision making of information technology industry in Kerala” Thesis. Department of Library and Information Science, University of Calicut, 2015
This chapter describes the methodological options employed for the study. The detailed explanation of the variables of study that go into the formulation of the basic theoretical framework of study literature was explained. This chapter also includes the research design and the citation style used.
Figure 3: Summary of Research Methodology
4.1. INTRODUCTION

Methodology is a way to systematically solve the research problem. It is the summary of procedures that the researcher had to follow in collecting, organising and presenting data. In order to reach the most reliable conclusion, it is essential to select suitable methods (Best, 1995). The present study is an attempt to understand the availability and use of information for decision making by the managers of IT industry in Kerala. Information is a major source on which qualitative development of the society is based. Unless relevant information is available, the decision maker cannot choose the best course of action in development problems. In the case of industry, access to precise and reliable information at the right time can avoid entire wastage of resources, time, and money. IT industry plays a vital role in the development of other sectors of economy. Hence decision making with the proper use of information in industry especially in IT field promotes the well-being of state as well as country. Therefore it is very essential to identify which type of information is needed for managers for taking different decisions in managerial context within IT industry and whether they are properly utilising information for decision making. In order to utilise information, the availability of information is very essential. The study also tries to find out the barriers faced by them in the proper use of information for decision making.

4.2. VARIABLES USED FOR THE STUDY

A variable is a symbol to which the values are assigned. As the research is mainly based on a theory, all variables must be defined and the methods of conducting the research must be determined. The thorough review of literature helped to derive the variables for the study. Variables selected for this study are classified into two - independent and dependent variables.
4.2.1. INDEPENDENT VARIABLES

The independent or classificatory variables selected regarding the nature of the study based on the literature review are the following.

1. Gender
2. Age
3. Level of management
4. Functional area
5. Experience in managerial position

Although five independent variables are selected as part of the study, only two variables was selected for the analysis of primary data since more heterogeneity is found against these two variables-Level of management and functional area of the managers.

4.2.1.1. Level of Management (Managerial level)

Level of management shows the position of manager in an organisation on the basis of authority. Thus on the basis of authority and responsibility, management can be divided into three types. The first level of management is called Top-level management. Top management consists of managers who work at the highest level of organisational hierarchy and this group consists of least number of managers. Top managers create the organisational goals, overall strategy and make long-range strategic decisions. The second layer of management is called Middle-level management which report to the top management and they serve as the departmental heads of their specialised units. Middle managers are responsible for communicating the decisions made by top levels to lower levels and they supervise the activities of lower levels. The third and final layer of management is called Lower-level management, also known as first-line managers or supervisors. Lower managers supervise the activities of employees and the largest number of
Managers is at the lower level (Vasisht, 2010). Managers are classified based on this level of managerial hierarchy. In this study, the managers of different levels in the IT firms of Kerala are taken into account such as,

- Top level managers
- Middle level managers
- Lower level managers

4.2.1.2. Functional Areas

A business organisation is grouped into different sections and each section will serve as a functional unit as a whole that performs the stated functions which is referred to as a functional area. Each functional area serves a particular purpose in the organisation, which can be separated from the functions of other segments. The main purpose of functional area is to ensure that all important business activities are carried out efficiently to achieve its aims. Organisations have many functional areas of business. In this study only five major functional areas are considered. Managers are classified based on these five main functional areas of work in their firms which is as follows:

4.2.1.2.1. Marketing Management

Marketing is related to the business function of getting consumers and clients to buy the organisations’ products or services. It involves identifying customers’ needs and preferences, along with developing goods and services that will satisfy them. It also involves promoting such products and services within the market place which is integral to the success of a business, with its primary focus on quality, consumer value and customer satisfaction. They focus on ways to properly price, promote, sell, and distribute an organisation’s goods and services. The marketing mix blend these variables together to produce the result it want to achieve in specific target market.
4.2.1.2.2. Human Resource Management

Human resource management refers to the procurement, development, compensation, integration and maintenance of the personnel of an organisation. The functions of this area include planning, staffing, training and development, performance management, labour-management relations and administration. Human resources managers engage in the design of organisational systems to perform these functions and they assist the lower managers in implementing the human resource policies, programmes and practices (Gordon & Gordon, 1995).

4.2.1.2.3. Finance Management

Finance management is the operational activity of a business that is responsible for managing the flow of funds into and out of the organisation, and they help to determine how company funds can be used most effectively. Without adequate finance, no enterprise can accomplish its objectives. Individual managers in this functional area are responsible for granting and using their company’s credit, investing company funds, safeguarding the company’s assets, keeping track of the company’s financial health, and preparing budgets (Plunkett, Attner & Allen, 2005).

4.2.1.2.4. Operations Management

Operations managers are concerned itself with the function that helps an organisation to manage the various activities related to the creation of a product or service and the conversion of inputs into outputs, so as to provide the desired utilities to the customer while meeting the other organisational objectives of effectiveness, efficiency and adaptability. The Operations managers are responsible for Production, Maintenance, Project and Quality management, Inventory Control etc. (Nirmalya Bagchi, 2010).
4.2.1.2.5. General Management

General or Administrative managers are not associated with any particular management speciality but they ensure the smooth functioning of the business on a day-to-day basis. They are responsible for managing all the functional areas and are commonly belong to the higher level of management.

4.2.2. DEPENDENT VARIABLES

The dependent variables or study variables used for this study are the following.

4.2.2.1. Information Requirements for Decision making of IT industry in Kerala

Organisations are constantly making decisions at every level. Decision making ranges from strategic to managerial and operational decisions. In order to take effective decisions, relevant and up-to-date information is essential for managers. Hence it is essential to understand which type of information is needed for different categories of managers for taking decisions. Rational or result oriented decisions constitutes choosing a course of action from a set of alternatives that involves a number of steps that should be followed in a logical manner to achieve a desired result. Managers need information for carrying out various logical steps of rational decision making.

4.2.2.2. Use of Information for Decision making of IT industry in Kerala

Managerial decision making has a vital role in organisations which is performed through all the functional areas for efficient operation of the particular areas. Proper utilisation of information is very essential for effective decision making. In this study the use of information for decision making in only five major functional areas of management are taken into account. Here the extent of use of information for decision making in the
areas of Operations (Software design and development), Marketing, Human Resource, Finance and General management are studied separately in detail based on the level of management of managers.

In order to assess the extent of use of information in each separate functional area, the important functions of each particular area is taken into account. In the functional area of Marketing, a management approach was selected called ‘Marketing mix’ which provides a framework for the analysis of use of information for Marketing decisions also known as ‘6-P’ approach. Six Ps consist of Product, Price, Place, Promotion, People and Process. In order to study the use of information for decision making in the area of Human resources management, the main functions of this area such as Recruitment and selection, Training, Induction and orientation, Promotion and transfer and Performance evaluation are considered. The use of information for the four major financial decisions such as Investment, Financing, Dividend and Liquidity decisions are studied. Though the functional area of Operations are responsible for product, project, quality and maintenance management etc., the use of information only in the software development is studied, i.e., in the six stages of software development – Requirement analysis, Programme designing, Implementation, Testing, Installation and Delivery, deployment and maintenance are taken into account. In order to understand the utilisation of information for managing the functional areas, the managerial functions of Planning, Organising, Staffing, Directing, Co-ordinating, Reporting and Budgeting are taken into account.

4.2.2.3. Internal Information for Decision making of IT industry in Kerala

Information for managerial decision making basically comes from two types of sources-internal and external sources. An internal source means the information sources inside the organisation. While studying the availability of information for managerial decision making, it is essential to study the
availability from internal sources. The availability of information from the formal and informal internal sources is taken into account. The information support from internal sources measures the extent of information provided by the formal internal sources like Organisational library, Management Information System and other internal sources like Company records, reports and publications and the informal internal sources like Colleagues, Superiors, Subordinates etc.

4.2.2.3.1. Use of Information Systems for Decision making of IT industry in Kerala

The purpose of an information system is to provide management with the information that is essential for decision making. Management Information System is basically concerned with processing data into information and is then communicated to various departments and functional areas in an organisation for appropriate decision-making. Most of the organisations have Management Information Systems and managers depend on it for taking decisions. Sometimes managers keep a record of collected information with them as Personal Information System (PIS) in order to utilise it at the time of need. The frequency of depending on Management Information System and Personal Information System by the managers and the extent of information obtained from these systems are collected from managers.

4.2.2.3.2. Role of Organisational Libraries in Information Transfer for Decision making of IT industry in Kerala

Libraries have a great role in the transfer of information through its wide variety of resources. The existence of library inside the companies or firms of the IT parks is revealed as part of the study. The extent of
information they obtained from the library resources like project reports, case studies, e-resources etc. for taking managerial decisions is also explored.

4.2.2.4. External Information for Decision making of IT Industry in Kerala

An external source originates outside the boundaries of organisation. Managers have to depend on the various external sources of information if the information from internal sources is inadequate for decision making. The extent of dependence on external formal sources like Text Books or Journals, Trade literature, Information bulletins, Newspapers, Consultants or Experts etc. and external informal sources like Customers, Competitors, Business Associates, Personal advisors etc. for information support by the managers for decision making is also taken into account.

4.2.2.5. Barriers Faced by the Managers of IT industry in Kerala in the Effective Use of Information for Decision making.

Different barriers which are faced by the managers while accessing and proper utilising of internal and external information for decision making want to be revealed as part of the study.

4.3. RESEARCH DESIGN

Research design means the plans and procedures for the research that span the decisions from broad assumptions to detailed methods of data collection and analysis (Creswell, 2009). The overall research question is to study the availability and use of information for managerial decision making by the employees in managerial positions in different IT firms in Kerala.

Methodologically the study falls into descriptive cum explanatory framework. The study is descriptive as it seeks to depict the distribution of managers in different functional areas who have differential levels of
information need and use of information for managerial decision making. The availability of required information from organisational (internal) and external information sources for managerial decision making was also explained. Study proceeds to seek the adequacy and the satisfaction level in respect to the available information through various sources for managerial decision making and is thus explanatory in character.

4.3.1. SAMPLING DESIGN

The sampling design is the method of selecting the items to be observed and it provides the basic plan and methodology for selecting the sample. It constitutes the following.

4.3.1.1. Population

The population of the present study covers the managers of IT industry in Kerala. i.e., the employees in the managerial positions in the IT (Software) firms of the Government owned IT Parks in Kerala. In Kerala, mainly three IT Parks are promoted by the Government-Technopark, Infopark and Cyberpark. Technoparks are in Trivandrum and Kollam, Infoparks in Kochi, Cherthala, Ambalapuzha and Thrissur and Cyberparks are in Kozhikode, Kannur and Kasaragod. Besides these, KINFRA (Kerala Industrial Infrastructure Development Corporation) that promotes industrialisation in the state of Kerala has an IT Park called KINFRA Neo space in Malappuram other than the industrial Parks in Adoor, Pathanamthitta, Koratty, Nellad, Malappuram, Thalassery, Wayanad and Kasaragod.

4.3.1.2. Sample unit

The present study is based on the availability and use of information by the managers of IT firms (Software firms) in Government owned IT Parks in
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Kerala. The three IT parks in Kerala which are covered in this study that constitutes the sample unit are:

1. Technopark, Thiruvananthapuram
2. Infopark, Kochi
3. KINFRA Neo space, Malappuram

4.3.1.3. Sampling Technique

Multi stage sampling technique was used for this study. In the first stage of sampling, the entire state is divided into three geographical regions such as North, Central and Southern regions. Northern region consists of six districts namely, Kasargod, Kannur, Wayanad, Kozhikode, Malappuram and Palakkad. Central region of Kerala covers four districts namely; Thrissur, Ernakulam, Alappuzha and Kottayam while the Southern region covers Idukki, Kollam, Pathanamthitta and Thiruvananthapuram districts. Three districts, Malappuram from Northern region, Ernakulam from Central region and Thiruvananthapuram from Southern region were selected.

In the next stage KINFRA Neospace in Malappuram (North), Infopark in Ernakulam (Central) and Technopark in Trivandrum (South) was selected for the study. Finally in the last stage managers were selected by stratified random sampling technique from the three IT Parks – Infopark, Technopark and KINFRA Neospace to form the sample of the study. Care was taken to ensure that the selected respondents from the companies represented all the three levels of managers, viz. Top, Middle and Lower level managers and belonged to the five main functional areas of business – Marketing, Human resources, Finance, Operations and General management.
4.3.1.4. Sample Size

The ever increasing demand for research has created a need for an efficient method to determine the sample size that must be representative of the population. The population of the managers in IT industry is finite. Hence the sample size was determined by using US National Education Association statistical table as expressed by Krejcie and Morgan (1970). This is a very well accepted method in social sciences to determine the sample size needed to be representative of a given population. In the article “Small Sample Techniques,” the research division of National Education Association has published a formula to determine the sample size which is as follows.

The formula was \( s = X^2 \frac{NP(1-P)}{d^2(N-1)} + X^2 P(1-P) \). Following is the description of the formula:

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

Krejcie and Morgan (1970) pointed that there is no need of calculations by using the above formula. In order to determine the sample size of a given population, only the table has to be considered. According to this table, the sample size of the given population of Technopark (4125), Infopark (1900) and KINFRA Neospace (65) is 351, 320 and 56 IT managers respectively.
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Table 3 shows the total company and managers and the sample size of the selected three IT Parks – Technopark (Trivandrum), Infopark (Kochi) and KINFRA Neospace (Malappuram) in Kerala.

Table 3

Total population of IT Parks

<table>
<thead>
<tr>
<th>IT Parks</th>
<th>Total Company</th>
<th>Total Managers</th>
<th>Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technopark</td>
<td>280</td>
<td>4125</td>
<td>351</td>
</tr>
<tr>
<td>Infopark</td>
<td>118</td>
<td>1900</td>
<td>320</td>
</tr>
<tr>
<td>KINFRA Neospace</td>
<td>24</td>
<td>65</td>
<td>56</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>422</strong></td>
<td><strong>6090</strong></td>
<td><strong>727</strong></td>
</tr>
</tbody>
</table>

After determining the sample size of managers from each IT park based on the Krejcie and Morgan table, 727 questionnaires were distributed to the managers of Technopark (351), Infopark (320) and KINFRA Neospace (56). But only 439 questionnaires duly filled in were returned back which was taken for the final study, thus making a respond rate of 60.39 per cent.

4.3.1.5. Break-Up of the Sample

The break-up of the sample based on different aspects such as IT Park, Gender, Age, Managerial level, Experience in managerial position and functional area of managers are depicted below through tables 4 to 6 and figures 4 to 6.

4.3.1.5.1. IT Park wise distribution of the sample

The distribution of the sample in three different IT Parks in Kerala-Technopark, Infopark and KINFRA Neospace is tabulated in the table no: 4.
Table: 4

Distribution of the sample – IT park wise

<table>
<thead>
<tr>
<th>IT Parks</th>
<th>Sample size</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technopark</td>
<td>211</td>
<td>48.06</td>
</tr>
<tr>
<td>Infopark</td>
<td>181</td>
<td>41.23</td>
</tr>
<tr>
<td>KINFRA Neospace</td>
<td>47</td>
<td>10.71</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>439</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

It is evident from the table 4 that the data for the present study has been derived from a representative sample size of 439 managers of IT firms of three IT Parks in Kerala - Technopark in Trivandrum, Infopark in Kochi and KINFRA Neospace in Malappuram. From the total of 439 managers, a good number of the managers belong to Technopark, 211 (48.06 %) and Infopark, 181 (41.23 %) and only a very few of them are the managers of KINFRA Neospace, 47 (10.71 %).
4.3.1.5.2. Gender wise distribution of the sample

The managers of IT firms are also classified on the basis of gender. Figure 4 shows the pictorial representation of the sample on the basis of gender.

Figure 4 shows that majority of the managers, 296 (67.43%) are males. Only, 143 (32.57%) of the total managers are females. Even though the number of female managers is increasing in all sectors, the managerial positions are still dominated by the male.

4.3.1.5.3. Age wise distribution of sample

Age may be a crucial factor in decision making. The sample managers have been classified into four categories viz., Below 30, 31-40, 41-50, and Above 50 based on their age. Table 5 gives information about the distribution of managers on the basis of age.
### Table: 5
**Distribution of the sample – Age wise**

<table>
<thead>
<tr>
<th>Age (in years)</th>
<th>Sample size</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 30</td>
<td>188</td>
<td>42.82</td>
</tr>
<tr>
<td>31 – 40</td>
<td>207</td>
<td>47.15</td>
</tr>
<tr>
<td>41 – 50</td>
<td>34</td>
<td>7.75</td>
</tr>
<tr>
<td>Above 50</td>
<td>10</td>
<td>2.28</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>439</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

It is clear from the table 5 that a good number of the managers are in the age group of between 31- 40 (47.15 %) and below 30 (42.82%). Only 7.75 per cent of managers fall under the age of between 41 - 50 and only a very few (2.28 %) of the managers belong to the age group of above 50.

### 4.3.1.5.4. Managerial level wise distribution of sample

Managers were classified on the basis of their level of management in their respective firms. Managers of different levels have to take different types of decisions and as a result the utilisation of information for decision making also may alter. The diagrammatic representation of the details relating to managerial level of sample managers is furnished in the figure 5.
Figure 5 indicates the distribution of the sample according to their managerial level. The sample constitute 439 managers from different IT Parks in which maximum respondents, i.e., about half of them, 204 managers (46.47 %) belong to the Lower level and a good number of them, 161 managers are Middle level (36.67 %). It is understood from the figure 5 that only a few of them, 74 managers (16.86 %) belong to the Top level of management. In most organisations, the number of managers at each level is in such a way that the hierarchy resembles a pyramid, with many more lower managers, fewer Middle managers, and the fewest managers at the Top level and as such the same pattern of distribution can be seen in the figure 5.

4.3.1.5.5. Experience wise distribution of sample

The managers were asked about their total experience as a manager in different firms. The distribution of managers on the basis of experience in managerial position is depicted in figure 6.
Figure 6: Distribution of sample – Experience wise

The analysis portrayed in figure 6 shows that about half of the managers, 215 (48.98%) managers have an experience of 5–10 years. Below 5 years is observed for a good number of the managers, i.e., 144 managers (32.80 %) and only a few 80 managers (18.22 %) have more than 10 years’ experience in managerial position.

4.3.1.5.6 Functional area wise distribution of sample

Although the managers belong to different managerial hierarchy, their decision making and information needs are also based on their main functional area of work. The details pertaining to functional area of managers are furnished in the table 6.

Table 6
Distribution of sample – Functional area wise

<table>
<thead>
<tr>
<th>Functional areas</th>
<th>Sample size</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marketing</td>
<td>67</td>
<td>15.26</td>
</tr>
<tr>
<td>Human resource</td>
<td>75</td>
<td>17.09</td>
</tr>
<tr>
<td>Finance</td>
<td>43</td>
<td>9.79</td>
</tr>
<tr>
<td>Operations</td>
<td>203</td>
<td>46.24</td>
</tr>
<tr>
<td>General management</td>
<td>51</td>
<td>11.62</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>439</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>
From the table 6 it is clearly observed that about half of managers (46.24%) belong to the area of Operations (software design and development). After Operations, then come the Human resource managers (17.09%), Marketing (15.26%) and General managers (11.62%). Only a very few of them (9.79%) are Finance managers. The majority of the managers belong to the functional area of Operations with different designations like Project manager, Product manager, Software engineer, Team lead, Technical lead etc.

4.3.2. OBSERVATION DESIGN

Observation design deals with the conditions under which the observations are to be made i.e., the different methods of data collection. Data collection is the most important and crucial aspect of any research which provides answers to the questions under the study. For data collection, the researcher has used both primary and secondary sources of data. This study is based on mainly two types of data – Primary data and Secondary data.

4.3.2.1. Collection of Primary data

Primary data was collected from the managers of IT firms in Kerala, i.e. the IT firms of Technopark, Infopark and KINFRA Neospace that contribute to the population of the study. This data was required to know the information requirements, level of use of information for decision making, the information support from internal sources, the dependence on external sources, and the barriers faced by the managers in effective use of information for managerial decision making. The primary data were collected by means of a structured comprehensive questionnaire which was developed based on the literature review on the relevant topics. The data obtained from the questionnaires was clarified and supported by informal interviews. As part of data collection the permission from the Government authorities was obtained.
to get the entry into the respective IT Parks. Then the permission of the CEOs of most of the companies was sought. After that the questionnaires were handed over to the HR managers to circulate among other managers in most cases. Certain questionnaires were also filled up by the managers from the cafeteria of IT Parks and on the way outside to IT Parks.

4.3.2.2. Collection of Secondary data

Secondary data represents a very powerful tool for the researcher as the entire research work is structured on the basis of this data. Secondary data was collected to understand the important IT Parks in Kerala, the nature of firms in these Parks, demographic characteristics of the managers of IT firms, different functional areas of IT firms and to understand the different information sources used by the managers and the names of IT professional associations and agencies which provide information support to IT managers. Secondary data was collected from print sources such as Books, Journals, Research books, Official diaries and Directories, Newsletters, Company broachers and e-resources like e-journals, e-books, the websites of the companies etc. E-databases like Emerald, Jstor, Taylor and Francis were mainly used to get research articles and reports. Secondary data were also obtained from the websites of Technopark, Infopark and KINFRA.

4.3.2.3. Tools for Data Collection

The study is based on a structured questionnaire as the tool for data collection. In this study a “Questionnaire on information utilisation for decision making” was developed based on the objectives of the study after a thorough review of literature. The questionnaire was constructed with the assistance of IT professionals and experts in the field of Library and Information science, Management and Statistics. Literatures in the field were consulted for giving the questionnaire a final shape. To get background idea
for constructing the tool informal interviews were also conducted with the managers and professionals of IT field. The detailed description of the tool is given below:

4.3.2.3.1. **Questionnaire on Information Utilisation for Decision making.**

The final version of the questionnaire on information utilisation for decision making is a combination of Likert scale and closed ended questions. The questionnaire consists of eight sub sections which are the following.

4.3.2.3.1.1. **Personal Details of the Respondents**

Five questions are enclosed in this section to collect the personal details of IT managers that constitute gender, age group, and experience in managerial position, level of managerial post, and functional area of work.

4.3.2.3.1.2. **Information Requirements for Decision making**

This section contains three questions which are included in order to understand the information requirements of the managers in their aspect of work, to identify the perception of managers as essential factor for decision making and to identify the types of information needed for the managers. In this section the question to understand the extent of different types of information requirements for decision making is evaluated on a three point Likert scale – To a great extent, To a moderate extent and To a lesser extent.

4.3.2.3.1.3. **Use of Information for Decision making**

Section 3 deals with the extent of use of information by the IT managers based on their functional areas of management. This section contains seven questions in which the respondents have to mention the extent of use of information for decision making in different functional areas separately. The first and second question in this section is a general closed
ended question intended for all the managers to know the average time spend for collecting information in a week and to know the information use in the stages of decision making.

All the remaining five questions are based on a three point Likert scale like, To a great extent, To a moderate extent and To a lesser extent, which is for assessing the extent of use of information for managerial decision making. The first four of the remaining five questions are not meant for all the managers, but it is designed particularly for the managers of specific functional areas. Each of these four questions is separately meant for Marketing, Human resource, Finance and Operations (software development) managers respectively. General managers administers all the functional areas and hence they must respond to all the questions in this section. The last question in this section is meant for all the managers as it is based on the use of information for the managerial functions.

4.3.2.3.1.4. Internal Information for Decision making

This section contains four questions which was asked to mention the extent of information support they obtained from internal sources i.e., the sources inside the organisation. The extent of use of formal and informal information sources internal to the organisation to support decisions is obtained through two questions. The last two questions in this section are intended to understand the existence of library in the IT firms and to understand the extent of information support provided by the library resources for decision making. In this section the third question is a dichotomous (Yes/No) question and the remaining three questions are of a three-point Likert scale of – To a great extent, To a moderate extent and To a lesser extent.
4.3.2.3.1.4.1. Use of Information System for Decision making

Four questions are included in this section to understand the use of information systems by the managers for decision making. The first question of this section is a dichotomous question to know whether managers keep a record of collected information in proper order for taking decisions. The dependence on Personal Information Systems and Management Information System by the managers in decision making are obtained through second and third questions which is evaluated using a three point Likert scale – Always, Sometimes and Never. The last question is to measure the extent of information provided by the information system of their company which is measured on a three point Likert scale – To a great extent, To a moderate extent and To a lesser extent.

4.3.2.3.1.5. External Information for Decision making

In this section two questions on a three point Likert scale – To a great extent, To a moderate extent and To a lesser extent are included to find out the dependence on formal and informal external sources of information.

4.3.2.3.1.6. Online Information to Support Decision making

Managers’ dependence on the online sources for information support and the extent of information provided by the online sources and the dependence on internet tools, internet based electronic resources and social media are evaluated through five questions provided in this section. The first question of this section is to assess the frequency of depending on online sources and it is expressed on a three point Likert scale, i.e., Always, Sometimes and Never. The remaining four questions are expressed on a three point Likert scale – To a great extent, To a moderate extent and To a lesser extent to understand the extent of dependence on the various online tools.
Chapter 4

Methodology

General three questions are asked to the respondents to understand the availability of required information, adequacy and satisfaction in the available information. The availability of required information for decision making is asked on a three point Likert scale – Always, Sometimes and Never and the adequacy of the available information is asked on a three point Likert scale – Adequate, Moderately adequate, and Inadequate. The satisfaction of the managers with the available information is measured on a three point Likert scale – Highly satisfied, Moderate Satisfied and Not Satisfied.

4.3.2.3.1.7. Barriers in Effective Use of Information for Decision making

The last part of the questionnaire deals with a single question to understand the various barriers in the use of internal and external information sources. The barriers are measured on a five point Likert scale – Very high, High, Moderate, Low and Very low.

Informal interviews were also conducted with different type of managers of the software firms. There was no formal interview schedule designed for the study as most of the questions were included in the questionnaires. Questions were asked to know about their decision making pattern, the information sources, and the barriers faced by them in information use for decision making. The information provided through interview was to provide clarification to the information obtained from questionnaires.

4.3.2.4. Data Scoring and Grading

Likert scale was used to interpret some of the items in the questionnaire. Some of the questions covered in the questionnaire are qualitative in nature. In order to quantify the information, a three and five dimensional scaling technique is followed keeping neutrality in the middle. The three point Likert scales are rated by using a grading table where the
score ranging between 1 and 3 and the interpretations are shown in the table 7.

Table: 7

Three-point Likert Scale

<table>
<thead>
<tr>
<th>Scale</th>
<th>Range</th>
<th>Interpretations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1 – 1.66</td>
<td>To a Lesser extent</td>
</tr>
<tr>
<td>2</td>
<td>1.67 – 2.32</td>
<td>To a Moderate extent</td>
</tr>
<tr>
<td>3</td>
<td>2.33 – 3</td>
<td>To a Greater extent</td>
</tr>
</tbody>
</table>

Scoring pattern of information requirements, the extent of use of information for decision making, the internal and external information support for decision making, the availability and adequacy of information and satisfaction level are rated by using a grading pattern on the basis of mean value on a three point scale. The range of the values of these three point scale is depicted in detail in table 7. The five point Likert scale is rated by using a grading table where the score ranging between 1 and 5 is shown in the table 8.

Table: 8

Five-point Likert Scale

<table>
<thead>
<tr>
<th>Scale</th>
<th>Range</th>
<th>Interpretations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1 – 1.79</td>
<td>Very low</td>
</tr>
<tr>
<td>2</td>
<td>1.80 – 2.59</td>
<td>Low</td>
</tr>
<tr>
<td>3</td>
<td>2.60 – 3.39</td>
<td>Moderate</td>
</tr>
<tr>
<td>4</td>
<td>3.40 – 4.19</td>
<td>High</td>
</tr>
<tr>
<td>5</td>
<td>4.20 – 5.00</td>
<td>Very High</td>
</tr>
</tbody>
</table>
Table 8 describes the range and interpretations of five-point Likert scale of the barriers faced by the managers in effective use of information for managerial decision making which is rated based on mean values in which the score ranges between 1 and 5.

4.3.3. STATISTICAL DESIGN

Statistical tools play an important role in research. Statistics helps the researcher in designing the research, analysing its data and in drawing conclusions. Statistical design deals with the question of how many items are to be observed and how the information and data gathered are to be analysed.

4.3.3.1. Tools of Data Analysis

The data analysis tools such as Ms Excel and SPSS were used to analyse the primary data gathered from the managers of IT industry. Data is collected, segregated and then consolidated with Microsoft Excel. Then simple analysis in terms of percentage for both the categories was also calculated with Microsoft Excel. SPSS is used for further analysis with the help of tests such as Chi-Square, ANOVA and Scheffe. Coding is first made in Excel and then this data is imported from Excel to SPSS. After importing the data, variables were declared first in SPSS. The analysed data are presented through tables and graphs supported by interpretations. The implications are also provided along with the tables. The graphs used are pie diagram and bar charts. The data is presented and analysed into two ways such as Managerial level and Functional area wise.

4.3.4. OPERATIONAL DESIGN

Operational design is the techniques by which the procedures specified in the sampling, observational and statistical designs can be carried out.
4.3.4.1 Statistical Techniques Used for the Study

Statistical Package for Social Sciences, Version 16 was used to summarise the primary data and to do required statistical analysis. The following statistical techniques and tools were used for analysing the data as per the objectives of the study stated earlier.

- Simple Percentage method – To concise the whole data.
- Arithmetic mean – To identify the average level of information use, the information obtained from internal sources and the dependence on external sources and the barriers in the effective use of information for decision making.
- Standard Deviation – To measure the degree of variation or dispersion from the average.
- Weighted Average Mean – An average of quantities to which have been attached a series of weights in order to make proper allowance for their relative importance (Kendall & Buckland, 1971). To find out the aspect of work in which information is most required for the managers, rank was to be provided to three options. Rank 1 is given to the least required; rank 2 to the next required and rank 3 to the most required. For finding out a mean rank for each options a weighted mean of the ranks were computed, where weight is the number of individuals associated with that particular rank. Data ranks with larger weights contribute more to the weighted mean and ranks with smaller weights contribute less to the weighted mean.
- Chi-square test – Here it is done to check the significance of association of selected variables.
- ANOVA – Analysis of variance is a method of splitting the total variation of data into constituent parts, which measures different sources of variations (Srivastava & Rego, 2010). Here this test is done
to test the significance of variation between the selected variables based on independent variables.

- Scheffe test – It is a conservative method used for testing the significance of one or more comparisons of mean values arising in analysis of variance where the comparisons get selected by inspection as being of interest (Encyclopaedic Dictionary of Statistics, 1989). In this study it is done to understand the categories between which there exists a significant variation in the barriers faced by the managers in the effective use of information for decision making.

4.4. CITATION STYLE USED

References and Bibliography are prepared according to the American Psychological Association (APA) edition 6 which is widely accepted in the Social sciences and other fields, such as Education, Management etc. The APA citation format requires parenthetical citations within the text rather than endnotes or footnotes. Citations in the text provide brief information, usually the name of the author and the date of publication, to lead the reader to the source of information in the alphabetical reference list at the end of the paper. All citations must be in hanging indent format with the first line flush to the left margin and all other lines indented (American Psychological Association, 2010).

4.5. CONCLUSION

In this chapter the research design of the present study have been deployed in detail. The variables used for the study, sampling, tools of data collection and the pilot study done were explained. The data collected from the managers of different functional areas and the three levels of management of IT industry on the availability and use of information for managerial decision making are analysed using appropriate techniques for description and inference. The details of the statistical data analysis are presented in the next chapter.
REFERENCES


