Chapter 4
RESEARCH METHODOLOGY

Research methodology consists of various procedural steps such as identification of research method, tools for data collection and selecting techniques for processing and analyzing the data collected.

To operationalise the study survey method was found to be most suitable. As per the objectives the study was divided into two parts each having separate set of objectives namely – IR Development and Management and Users of institutions having institutional repositories. Two separate surveys were conducted to obtain data.

The data collection tool applied for the study was web questionnaire, which was created with the help of software provided by surveymonkey.com. This questionnaire was made available online to respondents for filling in data.

When the potential respondents have web access web-based surveys are an excellent survey method. These potential respondents are invited to participate in completing a web-based questionnaire and their responses are submitted electronically by means of the Internet.

Among the many advantages, Web-based surveys bring rapid return of data, higher response rate, reduced effort in data handling, and potentially lower study costs. For both surveys population was spread over vast geographical area. Also in the user study full addresses were not available for sending questionnaire. Therefore this method was found to be effective in saving time and cost.

The detail procedure for data collection were as follows:

4.1 Developing two separate questionnaires
   4.1.1 Questionnaire related to IR Development and Management
   4.1.2 Questionnaire related to Users of institutions having IR
4.2 Identifying survey software for designing survey questionnaire
4.3 Designing / setting up web survey questionnaire in chosen survey software provided by website
4.4 Pre-testing of both the web questionnaires for the checking of its functionality by the researcher
4.5 Pilot Study
   4.5.1 IR Development and Management
   4.5.2 Users of institutions having IR
4.6 Changes incorporated in questionnaire after pilot study
   4.6.1 IR Development and Management
   4.6.2 Users of institutions having IR
4.7 Data collection
   4.7.1 IR Development and Management
   4.7.2 Users of institutions having IR
4.8 Data analysis
   4.8.1 IR Development and Management
   4.8.2 Users of institutions having IR

4.1 Developing two separate questionnaires

The data gathering instrument was web questionnaire which was created with the help of software provided by surveymonkey.com. The questionnaire was made available online to web administrators of identified institutional repositories.

Steps involved in developing two separate questionnaires as follows:

4.1.1 IR Development and Management (Questionnaire No. 1)

Researcher conducted thorough search and review of literature related to the present topic under study. An examination of underlying theories, methods and conclusions of related studies helped in better understanding of the research process.

Amongst available literature related to institutional repositories one workbook of Barton and Waters (2004) contains detailed guidelines on the developing of Institutional Repository. This workbook was found to be extremely useful for
developing questionnaire for organising groups, formulating questions and their sequence.

Two important research studies, one by Bailey et al. (2006) and another by Publisher and Library/Learning Solutions (PALS) (2004) covered almost all issues concerning questionnaire such as management issues, software and hardware etc. The study done by Markey, Rieh, Jean, Kim, and Yakel (2007) titled “Census of Institutional Repositories in the United States: MIRACLE Project Research Findings” investigated the implementation of IRs in academic institutions to identify models and best practices for the administration, technical infrastructure, and access to digital collections. These research studies were used as a guideline for developing the questionnaire.

Westrienen and Lynch (2005) in their article entitled “Academic Institutional Repositories: Deployment Status in 13 Nations as of Mid-2005” attempted to estimate the comparative international data about institutional repository deployment in 13 nations.

Two surveys were conducted by Shearer (2004, 2005) to determine the status of the Institutional repositories at CARL member libraries in order to allow implementers to provide feedback about repositories at widely differing stages of implementation and containing a wide range of content types.

Amongst the very few research studies conducted about institutional repositories concerning India, one study was by Fernandez (2006) who discussed barriers to setting up institutional repositories as well as commonalities and differences with the western world. The intention of this paper was to create an awareness of emerging institutional repositories in India in the context of recent developments with regard to open access.

Hunter and Day (2005) in their paper titled “Institutional repositories, aggregator services and collection development” recommended the best practice for repositories to support metadata harvesting. Probets and Jenkins (2006) in their study “Documentation for Institutional Repositories” compared and contrasted the best practice and the documentation of seven academic institutional repositories. The case
study by Foster, Gibbons, Bell, and Lindahl, (n.d.) described University of Rochester repository project, original policies, the way those policies impeded and discussed the disruption of those policies and the benefits in user uptake that resulted.

Thus, various areas were identified on the basis of knowledge gained through reading of available literature as well as various studies conducted in the area of institutional repositories. The questionnaire was developed which had number of items to gather information about the wide range of practices involved in developing and managing an institutional repository. The questions were aggregated into seven groups to obtain data according to the set of objectives as indicated below:

a) Timeline
b) Exploratory activities
c) Anticipated benefits
d) Management
e) Contributors
f) IR System / Software
g) Number, types and rate of growth of digital documents
h) Inhibiting factors

The sequence and grouping of the questions was based on the above groups mentioned e.g. questions related to management were grouped together whereas those related to the software were grouped together etc.

A questionnaire of 30 questions was developed (Appendix III) as data gathering instrument. Depending on the requirements few of them were open ended and few were closed ended. Where feasible statements were graded on a Likert type scale.

Instructions for filling the answers were given to the questions in brackets wherever necessary i.e. “Choose only one”, or “Choose all that apply”.

a) Timeline
The intention of the first two questions was to know how much time was required for planning and pilot testing and the date when IR become operational i.e available to authorized users for submission and searching of digital content. These questions
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were kept open ended so that respondents could directly fill data in the text box. These questions Q. 1 and Q. 2 were taken from the study done by Markey et al. (2007) with little modification in the instruction of second questions. In their study the instruction was given to type number of months taken to implement a repository. Researcher realized in the pilot study that it is much easier to calculate if it is asked to write month and year of implementation of IR.

b) Exploratory activities
The next issue included in the questionnaire was related to the exploratory activities in terms of influencing institution's decision about implementing an IR. This question Q. 3 was expected to reveal various exploratory activities that institution exercised before implementation of IR. This question was taken from the study done by Markey et al. (2007) with little addition and deletion of options stated in their study.

c) Anticipated benefits
Question no. 4 was related to anticipated benefits of institutional repositories applicable to the institution. This question was taken from the study done by Markey et al. (2007) with little addition and deletion of options stated in their study.

d) Management
Subsequent set of questions were framed to trace the issues of the management. The four aspects of management were traced such as people involved in IR implementation programme, fund source and its allocation, status of the policies and responsibility of the institutional repositories intellectual property rights.

Questions related to people involved in IR implementation programme and fund source and its allocation were taken from the study done by Markey et al. (2007). In case of status of policies, the studies done by Foster, Gibbons, Bell, and Lindahl, (n.d.), Probets and Jenkins (2006) were considered. Questions related to IRs promotion and assessment were taken from the studies done Shearer (2004, 2005) and Markey et al. (2007).
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Table No. 4.1: Concepts related to management

<table>
<thead>
<tr>
<th>Concepts related to management</th>
<th>Question numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>People involved in IR implementation programme</td>
<td>5, 6, 7</td>
</tr>
<tr>
<td>Fund source and its allocation</td>
<td>8,9</td>
</tr>
<tr>
<td>Responsibility of the IR's intellectual property rights</td>
<td>23</td>
</tr>
<tr>
<td>Status of the policies</td>
<td>24</td>
</tr>
<tr>
<td>Promotion and advocacy activities</td>
<td>26</td>
</tr>
<tr>
<td>Assessment of IR</td>
<td>27</td>
</tr>
</tbody>
</table>

e) Contributors

The next issue included in the questionnaire was related to the contributors to the IR. Q. 11 and Q. 12 would address who were considered to be authorized contributors and major contributors to institution's IR. These questions were taken from the study done by Markey et al. (2007) with little modification in the options provided to the questions.

f) IR System / Software

The questions in this section dealt with name of the software, various technical issues, interoperability standards, file formats, preservation strategy, and migration to new IR system in future etc. This information, besides giving facts would also give adequate information about the technical issues related to the IR software.

For the framing of question related to the interoperability standards, research studies conducted by Bailey et al. (2006); Publisher and Library/Learning Solutions (2004) and Hunter and Day (2005) were useful. In case of question related to preservation strategy, workbook of Barton and Waters (2004) was referred. For rest of the questions Markey et al. (2007) study was found to be useful in framing of question.
Table No. 4.2: Concepts related to IR System / Software

<table>
<thead>
<tr>
<th>Concepts relate to IR System / Software</th>
<th>Question numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>IR software package</td>
<td>13</td>
</tr>
<tr>
<td>Interoperability standards</td>
<td>15</td>
</tr>
<tr>
<td>Technical issues related to the IR software</td>
<td>16</td>
</tr>
<tr>
<td>File formats</td>
<td>20</td>
</tr>
<tr>
<td>Long term preservation strategy</td>
<td>21</td>
</tr>
<tr>
<td>Migration to new IR system</td>
<td>22</td>
</tr>
</tbody>
</table>

g) Number, types and rate of growth of digital documents
The next statements Q. 18 and Q. 19 queried about how many and which types of digital documents were published in the IR respectively. This question was taken from the study done by Markey et al. (2007). Researcher added few more options in addition to the options given in Markey’s study. There was no question framed to know the rate of growth of digital documents of IR. Researcher planned to record the number of digital documents of each repository by visiting website on every first day of the month during the year 2007 and 2008 to analyze the growth of IRs of all 14 institutions under study.

h) Inhibiting factors
The next statement Q. 28 queried about the factors that inhibit the ability to set up a successful IR. This question was taken from the study done by Markey et al. (2007).

The last item Q. 30 included in the questionnaire, queried about the general description of the institution, that is the name, URL and subject coverage of the institution. Also designation of the respondent in order to identify the respondent.

4.1.2 Users of institutions having IR (Questionnaire No. 2)
The second web questionnaire was developed to gather the knowledge, practice and opinions about the IR among the users and potential users of the institutions having institutional repositories. These questions were grouped under three categories as follows:
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a) Experience of users
b) Contribution to IR
c) Opinion of users about IR

There were numerous studies done on authors / researchers in case of open access journals / open access archives and so on but there are very few studies done particularly on users of institutional repositories in other countries. No study had been done in India on users of institutional repositories, as it is a recent phenomenon.

Among the few studies, one significant study was done by Pelizzari, 2004 titled “Academic Authors and Open Archives: A Survey in the Social Science Field”. This study discussed the following issues: authors’ general attitudes towards electronic publications, use or non-use of IR, attitudes towards copyright and reasons of contributing and non-contribution of documents to IR. This study along with IRI-Scotland Academic Author Survey (2006) was found to be extremely useful for developing questionnaire, formulating questions and forming groups.

Two significant studies were done by Swan and Brown during 2004 and 2005. The first study titled “Authors and open access publishing” (2004) dealt with authors who had published their work in open access journals visa vis compared and contrasted with authors who had not done so. The second study was about “Open access self-archiving: An author study” (2005) was carried out to determine the current state of play with respect to authors’ self-archiving behaviour. The survey also briefly explored author experiences and opinions on publishing in open access journals.

A questionnaire of 13 questions was developed (Appendix IV) as data gathering instrument. It was divided in two parts. In the first part respondents were asked about their background such as subject, job title and institution name (Q. 1) and age group (Q. 2). The second part consisted of questions related to their experience, contribution, opinion about IR (Q. 3 – Q. 13).

a) Experience of users
IRI-Scotland Academic Author Survey (2006) helped researcher to frame questions related to the experience of researchers about institutional repository. In this section
Q. 3 and Q. 4 would reveal about what was their experience about IR and how they came to know about IR of their institution respectively.

**Table No. 4.3: Experience of users**

<table>
<thead>
<tr>
<th>Experience of users</th>
<th>Question numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Institutional Repository / Digital repository service</td>
<td>3</td>
</tr>
<tr>
<td>Ways of knowing about IR / Digital repository</td>
<td>4</td>
</tr>
</tbody>
</table>

**b) Contribution to IR**

Kim (2006) in his survey titled “Motivating and Impeding Factors Affecting Faculty Contribution to Institutional Repositories”, discussed the problems surrounding faculty contribution to Institutional Repositories (IRs) and proposed a theoretical model for studying the diverse factors surrounding this issue. This study along with the study done by Pickton (2005) was very useful for framing questions related to the issues of contribution.

In this group Q. 5 explored whether the users had contributed documents to any of the repositories such as their own institutional, subject, departmental repository etc or not. Q. 6 and Q. 7 investigated reasons for contributing or not contributing documents to IR respectively. Q. 8 looked at the types of documents users would like to contribute to the IR. IRI-Scotland Academic Author Survey (2006) facilitated researcher to outline question no.12 which investigated the likely reasons to contribute to IR if they have to contribute in future.

**Table No. 4.4: Contribution to IR**

<table>
<thead>
<tr>
<th>Contribution to IR</th>
<th>Question numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contributed to own IR or not</td>
<td>5</td>
</tr>
<tr>
<td>Reasons for contribution</td>
<td>6</td>
</tr>
<tr>
<td>Reasons for not contribution</td>
<td>7</td>
</tr>
<tr>
<td>Types of documents would you like to contribute to IR</td>
<td>8</td>
</tr>
<tr>
<td>Likely reasons to contribute to IR if they have to contribute in future</td>
<td>12</td>
</tr>
</tbody>
</table>
c) Opinion of users about IR

Q. 9, Q. 10 and Q. 13 queried type of quality control mechanism they expect, type of access they would like for their ideal IR and opinion regarding management of IR respectively. Q.11 tried to elicit opinion of respondents about who should own the copyright of documents after submitting to IR.

From the survey done by Pelizzari, 2004 titled “Academic Authors and Open Archives: A Survey in the Social Science Field”, researcher realized the importance of copyright and quality control measures in context of open access which inspired her to frame questions related to these issues.

Table No. 4.5: Opinion of users about IR

<table>
<thead>
<tr>
<th>Opinion of users about IR</th>
<th>Question numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality control mechanisms</td>
<td>9</td>
</tr>
<tr>
<td>Type of access</td>
<td>10</td>
</tr>
<tr>
<td>Copyright</td>
<td>11</td>
</tr>
<tr>
<td>Management of the IR</td>
<td>13</td>
</tr>
</tbody>
</table>

Pickton (2005) in her Master's dissertation investigated the potential role for research students in a new institutional repository at Loughborough University as well as carried out survey of managers of existing institutional repositories. This study gave a thought to the researcher for framing question no. 13 related to management of IR.

At the starting of the questionnaire brief definition of IR was given to make the concept of IR clear to the respondents. Instructions were given in brackets wherever necessary for filling the questionnaire i.e. “Choose only one”, or “Choose all that apply”. Questionnaire was kept short and simple. The design was user-friendly for ease of use.

Thus after developing both questionnaires, the questionnaires were shown to some senior librarians for their comments on content and approach. All the submissions, suggestions and criticisms thus obtained were noted, and necessary modifications were made in the questionnaire.
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4.2 Identifying survey software for designing survey questionnaire

The researcher searched in Google in order to find out about survey software / website for Designing / Creation of web survey questionnaire.

There are number of survey software available on the web viz. SurveyMonkey, Zoomerang™, Infopoll, Questionpro, Apian Software, SurveyGold, SuperSurvey, InSite, CustomerSat, EZSurvey and others.

To find out the best option the researcher signed up for free trials of different online survey software such as SurveyMonkey, Zoomerang™, Infopoll, SurveyGold etc.

The free trials helped the researcher to develop the ability and understanding of designing web survey. The researcher did a small survey during free trial that helped her to develop the understanding and ability to design the survey.

Based on pricing information, flexibility, and functionality related to designing, data collection and analysis, researcher narrowed down the list. Eventually, the researcher decided to use SurveyMonkey because it was more straightforward, relatively cheap, flexible and offered more advanced features than others.

4.3 Designing / setting up web survey questionnaire in chosen survey software provided by website

Researcher took professional subscription of SurveyMonkey.com, which enabled her to launch online survey with unlimited number of questions. It also enabled researcher to use SurveyMonkey’s advanced features, which are described below:

- No Limits
- Create Skip Logic (Conditional Logic)
- Require Answers
- Randomize Answer Choices
- Add a Logo
- Create Custom Themes
- Generate Popup Invitations
Keeping in mind high-quality data collection researcher designed questionnaire with the help of Audio Visual guided tutorial of surveymonkey.com.

Researcher used different types of questions such as single choice, multiple choice, matrix etc. as well as tried out with different themes to have best look and feel of the questionnaire. In this way two separate questionnaires were created.

**4.4 Pre-testing of the web questionnaires for the checking of its functionality by the researcher**

After creating final web survey questionnaires regarding IR implementation as well as users of institutions having IR, researcher created dummy web survey questionnaires to check the functionality of the buttons of each question in the questionnaire for example: A few questions were single choice so that only one button should operate at a time, a few were multiple choice where all the buttons should operate if necessary.

Both the dummy questionnaires were filled up by the researcher from many terminals to check the functionality of URL generated by website for questionnaire.

After finalizing the design of the survey questionnaire consultation was held with seniors and professional colleagues for reviews.

**4.5 Pilot Study**

**4.5.1 IR Development and Management**

Pilot study is mainly done to check for proper wording, proper answer sets, and conceptual clarity.

The draft questionnaire was first tested with a small group of respondents. Three institutional repositories were selected for the pilot study. These included one
academic institutional repository namely IIM-Kozhikode and two research institutional repositories namely NCL-Pune and NIO-Goa. These institutional repositories between them covered the fields of pure sciences, applied sciences, economics and business management.

The web administrators of these institutional repositories were requested to point out if the questions and instructions were clear, and if any more questions needed to be included or to be reframed.

4.5.2 Users of institutions having IR
The draft questionnaire was first tested on a small group of respondents. The 20 users of four institutional repositories were selected for the pilot study. These included one academic institutional repository and three research institutional repositories. These institutional repositories between them covered the fields of pure sciences, applied sciences, economics and business management.

The users of institutional repositories were requested to point out if any of the questions and instructions were not clear, and if any more questions needed to be included or to be reframed.

4.6 Changes incorporated in questionnaire after pilot study

4.6.1 IR Development and Management
Out of the three web administrator to whom the URL of the questionnaire was sent by e-mail for the pilot study, two responses were obtained within two weeks. In case of third institutional repository the response was not received in one month from the first e-mail sent requesting to fill in data. The researcher had telephonic inquiry and realized that the web administrator was out of station and was not available for the response. After knowing this researcher had telephonic discussion with the head of the implementation programme regarding the questionnaire.

One respondent had one suggestion in case of question no. 6 (Appendix III) that there was no committee or committee chair appointed for IR implementation programme. After learning this researcher added ‘No committee or committee chair has been appointed’ as one option in the answer.
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Another respondent had one suggestion in case of question no. 11 (Appendix III) that the computer service staff are also authorised contributor to their institutional repository. So after knowing this researcher added ‘computer service staff’ as one more option in the answer. Personal discussions were held with all three respondents.

After this the questionnaire was finalized. A covering letter in the form of e-mail was prepared, and was sent to all respondents with the URL of the web survey.

4.6.2 Users of institutions having IR

Out of 20 respondents whom this researcher had contacted via e-mail containing the URL of the web survey questionnaire for the pilot study, eleven responses were obtained within two weeks. First and the second reminder was sent after the second and fourth week respectively of the first e-mail. One response was obtained after first reminder and another after the second reminder. Third and the final reminder was sent after six weeks of the first e-mail mentioning URL of web questionnaire. However no response was received. Total 13 responses was received making response rate 65%.

Personal discussion through phone was held with some of these respondents. There was one suggestion by one respondent that in case of question no. 8 he would like to contribute power point presentations prepared for class to his institutional repository. After realizing the validity of the point raised by the respondent, researcher added one more option to the answer set. The remaining 12 respondents did not give any suggestions.

After this the questionnaires were finalized, a covering letter in form of e-mail (Appendix I & II) was prepared, and sent to all respondents with URL of web survey.

4.7 Data collection

4.7.1 IR Development and Management:

In total 16 institutional repositories were identified for the study. Researcher sent e-mail mentioning URL of the web survey questionnaire no. 1 (Appendix III) to the web administrator of every institutional repository and requested the respondent to fill data in the web questionnaire. After this seven responses were obtained.
The first reminder was sent out after the one month of the first e-mail containing URL of the web survey questionnaire had been sent. Five responses were received after the first reminder was sent. Two responses were received when the second reminder was sent after two months of the first e-mail containing URL of the web survey questionnaire. Third and the last reminder was sent out after three months of the first e-mail containing URL of the web survey. No response was received after third reminder was sent.

Total 14 responses out of 16 were received making total response rate of 87.5% over the period of four months.

4.7.2 Users of institutions having IR

Researcher first located the e-mail ids of users from the institutions web sites. Then stratified sampling was carried out, the categories being of students (10), researcher scholars (10), teachers / scientists (10) and technical officers (5). Thus 35 users were selected from each institution making total of 490 users. In case of students category two e-mail ids from the alphabetical list of each department i.e 10 users were sent the e-mails requesting to fill data in the web questionnaire. The same pattern was followed for research scholars, teachers / scientists and technical officer’s category users. In case of failure of e-mail delivery, e-mail was sent to the next e-mail id in the alphabetical list requesting to fill data in the web questionnaire.

Sixty-eight responses were received after two weeks of the first e-mail mentioning URL of the web survey questionnaire was sent to the respondents. First reminder was sent after the two weeks. After this 96 responses were received. The second reminder was sent after the four weeks of first e-mail mentioning URL of the web survey questionnaire was sent. After the second reminder 27 responses were obtained. Third reminder was sent after six weeks. The researcher received only one response. Fourth and final reminder was sent after the eight weeks of first e-mail mentioning URL of the web survey questionnaire was sent. The researcher received no response.

Out of the 490 respondents to whom URL of the questionnaire were e-mailed only 192 respondents responded to the web questionnaire, making a total response rate of 39%. However, of these seven responses were invalid because five students had submitted their PhD’s (one from IGIDR, one from IITB, two from IISc, one from
IITD) and two post graduate students had completed their post graduation and were no longer associated with institutions. Therefore, only 185 responses could be used for analysis making total response rate of 38%.

### 4.8 Data Analysis

#### 4.8.1 IR Development and Management

The survey data was grouped according to different categories of questions representing the different issues of the institutional repository.

Descriptive statistical techniques were applied to the responses. This consisted of methods and procedures for summarizing, simplifying, reducing and presenting raw data, to communicate the essence of the data to another (Busha & Harter, 1980).

The data collected in the survey was analysed using frequency distribution that included mainly percentages which were reported in form of tables and graphical charts. In few cases central tendency was measured by using mean commonly called as average.

All 30 questions were categorised in Table No. 4.6.

**Table No. 4.6: Types of questions in questionnaire no.1**

<table>
<thead>
<tr>
<th>Types of questions</th>
<th>Question numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple Choice</td>
<td>4, 6, 7, 8, 9, 11, 12, 15, 19, 20, 21, 23, 24, 26, 27</td>
</tr>
<tr>
<td>Single Choice</td>
<td>5, 13</td>
</tr>
<tr>
<td>Open ended questions: Respondents were requested to type the required information</td>
<td>1, 2, 18, 22, 30</td>
</tr>
<tr>
<td>Likert type scale / Matrix of choices (Only one answer per row)</td>
<td>3, 16, 28</td>
</tr>
<tr>
<td>Text Box provided for those respondents who opted for ‘Others’ in the preceding question</td>
<td>10, 14, 17, 25, 29</td>
</tr>
</tbody>
</table>
Three questions i.e. question no. 3, 16, and 28 of questionnaire no. 1 had options which were graded on a Likert type scale of VERY IMPORTANT / VERY ADEQUATE / VERY LIKELY 4 to DON’T KNOW / NON APPLICABLE 0.

(Very Important / Very Adequate / Very Likely = 4; Important / Adequate / Likely = 3; Somewhat Important / Somewhat Adequate / Somewhat Likely = 2; Least Important / Least Adequate / Least Likely = 1; Don’t know / Non applicable= 0)

4.8.2 Users of institutions having IR

Similarly, data analysis techniques used for the IR development and management survey were used for the survey of users of institutions having IRs.

The data collected in the survey was analysed using frequency distribution that included mainly percentages which was reported in form of table and graphical charts. In few cases central tendency was measured by using mean commonly called as average.

All 13 questions were categorised in Table No. 4.7.

Table No. 4.7: Types of questions in questionnaire no.2

<table>
<thead>
<tr>
<th>Types of questions</th>
<th>Question numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple options</td>
<td>3, 4, 6, 7, 8,</td>
</tr>
<tr>
<td>Single option</td>
<td>2, 5, 9, 10, 11, 13</td>
</tr>
<tr>
<td>Open ended questions: Respondents were requested to type the required information</td>
<td>1</td>
</tr>
<tr>
<td>Likert type scale / Matrix of choices (Only one answer per row)</td>
<td>12</td>
</tr>
</tbody>
</table>

In case of question no. 12, which had options that were graded on a Likert type scale of VERY LIKELY 4 to NO OPINION 0. (Very Likely = 4; Likely =3; Somewhat Likely = 2; Least Likely = 1; No Opinion= 0)

Subject, Institution and Job Title were used as a variable for data analysis.
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After following all required steps such as developing and designing web questionnaire, pilot testing, and then actual data collection, data was collected and analysed. The next chapter analyses the answers to the questionnaire no. 1 i.e. IR Development and Management.
REFERENCES


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