

## **CHAPTER 3**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter describes the formulation of a research design and methodology adopted to achieve the stipulated goals for the study. After considering the objectives of the study, the level of digital library development in Malaysia, the research questions, the limitations and the scope, the researcher felt the appropriateness for adopting both the qualitative and quantitative data gathering techniques i.e. the survey method, using the questionnaire as the instrument and supported by qualitative data obtained through structured interviews. A combination of these research design helped provides more data to work with and ultimately a more accurate evaluation (O'Neill, 2006) and according to Hemming (2008) human geographers were also increasingly employing both approaches in their research.

Another reason for adopting both qualitative and quantitative data gathering techniques was that since there had been little documentation on the subject matter, it was therefore important to get to the source of primary information so that each method could complement and substantiate the other and making the findings more concrete. In short, the strengths of qualitative studies should be demonstrated for research that was exploratory or descriptive and that stressed on the importance of context, setting, and participants' frames of reference (Marshall and Rossman, 2006).

The objectives of the study were to identify the extent of readiness of Malaysian libraries in providing digital library operations and services, having embraced library

automation, including problems faced that included both general library problems and digital library related problems and more importantly to solicit the perceived conditions for future growth of digital libraries.

### **3.2 Research Design**

Research design essentially refers to the plan or strategy of shaping the research (Henn, Weinstein and Foard, 2006), that might include the entire process of research from conceptualizing a problem to writing research questions, and on to data collection, analysis, interpretation and report writing (Creswell, 2007). It provided the framework for the collection and analysis of data and subsequently indicated which research methods were appropriate (Walliman, 2006). The most common, useful purposes and main aims of research were exploration, description and rational explanation based on data (Richardson, 2005; Babbie, 2007).

For the purpose of this research, after examining the objectives of the study and realizing the lack of previous study and published literature on digital library development in Malaysia, an exploratory descriptive research design had been chosen, because it would conclusively describe the characteristics and state-of-the-art of the population under study. Exploratory descriptive research would suits best because according to Sekaran (2000) an exploratory study research was performed when a researcher had little knowledge about the situation or had no information on how similar problems or research issues had been solved in the past. It embarks on investigating and finding the real nature of the problem. In addition, solutions and new ideas could surface from this type of research (Richardson, 2005). A descriptive research on the other hand

was a research that described a phenomenon (Salkind, 2000), to document and describe the phenomenon of interest (Marshall and Rossman, 2006), providing a clear answer of who, what, when, where, why, and way (6 Ws) of the research problem and data were typically collected through a questionnaire survey, interviews or observation(s) (Gay and Diehl, 1992).

Prior to the development of questionnaires for both methods, the researcher had explored the library community by doing field works, from February 2002 till end of December 2003, in an attempt to have an overview of library development that had transcended after the *MALMARC* project. During these field works, the researcher had talked, discussed, questioned and seek the librarians' opinions with regards to digital library initiatives as one of the outcome of library automation. The field works had been purely explorative, to see the state of the art of the Malaysian libraries so that the questionnaire would be formulated in accordance with the level of digital library development and that the questionnaires would not be off putting.

### **3.2.1 Qualitative Data: Interviews**

Since this research would be adopting both quantitative and qualitative data gathering techniques, qualitative data would be obtained through structured interviews. Qualitative research methods provide flexibility and questions could be adopted as they went along (Johns, 1998), and had become increasingly important modes of inquiry for the social sciences and applied fields such as education, regional planning, nursing, social work, community development and management (Marshall and Rossman, 2006). More over the interview was an alternative method of collecting data survey (Babbie, 2007)

and were a useful method of obtaining information and opinions from experts during the early stages of your research project (Walliman, 2006). One of the strengths of interviews was their personal nature. If respondents related to the interviewer, they were more likely to be willing to share personal opinion (Wolfer, 2007), yields data in quantity quickly (Marshall and Rossman, 2006) and Glesne (2006) suggested that we might also interview in search of opinions, perceptions and attitudes toward some topic. What was central to in-depth interviews, regardless of how the data was emerging, was that they provided qualitative depth by allowing interviewees to talk about the subject in term of their own frames of reference. In so doing, the method enabled the interviewer to maximize her understanding of the respondent's point of view (Henn, Weinstein and Foard, 2006).

The total of 38 interviews done was intended to investigate and identify the scenario that Malaysian libraries were going through in embarking on digitization projects having embraced library automation, thus supplementing the quantitative data. The first eleven questions of the structured interviews were quite similar to the questionnaire for the quantitative method, for the purposes of re-affirmation and consolidation and to gauge at some convergence of findings. The last question on the perceived conditions for digital library future growth would be used to form as the basis for recommendations.

Visiting the libraries and observing the on site development had enabled the researcher to see the actual progress that were really taking place at those libraries. It helped the researcher to grasp the overall idea, gained some insights and forming a general idea as to the degree of digital library development that was taking place. It helped to consolidate and getting more definite and stronger information of the research

being done. This understanding of the situation at the grassroots level after visiting some libraries did help the researcher in the final formulation of the questionnaire that would not be too ambitious that respondents would not be able to answer.

Having met, talked and discussed with as many librarians as possible at every opportunity in the early stage of the research, the actual interviews were carried out from the beginning of January till the end of December 2004. The researcher conducted structured interviews by visiting 38 libraries nationwide and the head librarians, all of whom were professional librarians were interviewed. As for the researcher, close association with the pre-determined questions was strictly observed to ensure not so many detours would take place. The respondents were allowed to express freely their own thoughts without any input or help from the researcher to avoid any kinds of bias. The interviews were structured and guided in order to get the best possible answers in tandem with the research objectives.

The respondents were made to realize that some of their verbatim statements would be documented and used in the thesis as and when it would be necessary. They were also given the highest assurance that the information collected would be treated with strictest confidentiality. Ethical procedures such as informed and voluntary consent, confidentiality of information shared, anonymity of interviewees, no harm done to the interviewees and reciprocity were observed. They had also been informed to expect phone calls and e-mail communications from the researcher after the interview sessions for any kind of clarification, explanation and verification of their suggestions, proposals, thoughts, recommendations and statements that would be included in the thesis. Phone

calls were made as a last resort after e-mail communications to those who were late or not responding but strictly not to the extent of harassing the respondents.

On the average, an interview session lasted for about two hours. The sessions were not tape recorded but the researcher preferred to plot directly all the answers on to the answers sheet that had been tabulated according to the interview questions (See Appendix F). All their words, statements, comments, opinions, criticisms, appraisals, wishes and hopes were noted down. The interviews involved a lot of probing and paraphrasing for the purpose of clarity and as part of an attempt to get in depth information. The interviews had resulted in a number of emerging themes and recursive points that these were later grouped, themed, assembled and summarized accordingly. The translations of all their answers were grouped, themed, analyzed, tabulated and later emerged in the forms of supportive elements either in the discussions or recommendations.

As had been mentioned earlier, the interview sessions were smooth sailing. All the respondents had been very cooperative and they were all looking forward to a more dynamic national digital library planning. However during the process of conducting the interviews, there had been last minute cancellations even though the researcher had already arrived at the venue. Some of the interviewees had sudden urgent meeting, or had to take emergency leave or had not come to the office despite prior appointments.

The interview sessions were inclusive of a session with a senior librarian from the Multimedia Development Corporation and were concluded by an interview conducted with the Director of the *PERDANA* Service Division of the National Library of Malaysia, to get some input on the subject matter since library development is directly under its

jurisdiction. The reason for their inclusions was to get some ideas, inputs, feedbacks, opinions, outlook and overviews as they had been directly involved in the initial implementation of the *PERDANA* project. Multimedia Development Corporation was one of the early players and strategic partners directly involved with the National Library of Malaysia in the overall planning of the *PERDANA* project. Meanwhile the Director of *PERDANA* Service Division of the National Library of Malaysia had been and still is the major player of national digital library planning. Being at the helm of national digital library planning, she was assumed to be the best person to talk to about Malaysian digital library development and is in the position to know the actual phenomena. The other reason was to probe deeper into *PERDANA*'s problems and to get some information on National Library of Malaysia's latest digital library planning and also the perceived conditions for digital library future growth.

### **3.2.2 Quantitative Method**

Subsequently for the quantitative method, the self completion questionnaire was used as the instrument for the survey. An advantage of using self completion questionnaire was that they were an entirely standardized measuring instrument because the questions were always phrased exactly in the same way for all respondents (Sapsford, 2007). He was also of the opinion that the biggest advantages of self-completion questionnaires were their cheapness and saving of the researcher's time. Questionnaires were often used in sociological, opinion, psychological and in marketing research (Richardson, 2005).

A total of 354 questionnaires ( $n = 354$ ) were sent by post, enclosed together with self addressed envelope with postages for their return. The sending of the questionnaires began in January 2004 and they were given four months i.e. until April for the returning back of the completed questionnaires. However this seemed to be the most difficult part as the researcher had to send reminders, re-sending and re-emailing of the questionnaires for the second time, including making phone calls as the last resort, until at the end of June 2004. Finally a total of 223 (63%) of the questionnaires were returned. Data input and processing took another two months until end of August 2004.

### **3.3 Population and sampling**

By definition, population is the group to which a researcher would like the results of the study to be generalizable. It could also be set of all cases of interest (Richardson, 2005) and might be virtually any size or might cover almost any geographical area (Gay and Diehl, 1992). Theoretically, researchers could specify an even finer distinction of population called the study population (Wolfer, 2007).

The population for this study, for both the qualitative and quantitative methods, comprised of the libraries that were listed in the *Directory of Libraries in Malaysia, 2002*, published by the National Library of Malaysia. There were 354 libraries ( $N = 354$ ) of all types and questionnaires were sent to the persons in charge, that could be professionals, semi professionals or non- professionals. For the interview sessions, 10% ( $N = 38$ ) of the heads of libraries were interviewed. They must be senior librarians with at least five years experience, head of libraries and of the professional group, representing four library types i.e. academic, special, state and public libraries. They were contacted by e-mail and

telephone for appointments. The researcher physically visited the respondents at their offices for the first time and followed by e-mail and phone calls for clarification whenever deemed necessary. The initial target was to get 50 interviewees in an attempt to have more concrete responses but there had been last minute cancellations due to unforeseen circumstances. There had also been cases when interviews had to be cancelled even when the researcher had already arrived at the place of interviews. A second appointment/visit would then have to be re-arranged as long as still within the time frame i.e. December 2004. Other than these few problems, the interview sessions went smooth because the interviewees were also part of the respondents for the quantitative survey, and thus they were already in the know. In the end, 9 academic libraries, 22 special libraries and 6 public/state libraries and the National Library agreed to be interviewed. The description of the 38 respondents were included in the 10 themes that had emerged from the study.

### **3.3.1 Determination of Sample Size**

A sample was a subset of the population being studied (Richardson, 2005), that included the process of selecting a few (samples) from a bigger group (the sampling population) to become the basis for estimating or predicting a fact, situation or outcome regarding the bigger group (Kumar, 1996). Samples should be as large as possible, in general the larger the sample the more representative and the more generalizable the results of the study were likely to be. Minimum, acceptable sample size for descriptive research would be 10% of population (Gay and Diehl, 1992).

For the purpose of this study, the population sample was drawn from the *Directory of Libraries in Malaysia, 2002* published by the National Library of Malaysia. It listed a total of 1004 libraries of all types, both public and private sectors but excluding school libraries. However, of the total, only 354 libraries (35%) listed were furnished with complete information such as addresses (these were of prime important because the questionnaires would be sent by post), persons in charge, number of staff, registered members, holdings/collections, subject coverage, classification systems used, availability of databases and services. Therefore these 354 libraries (N = 354) were chosen to be the sample population and questionnaires were sent to all of them. This was more than 10% and would therefore represent the population under study. The respondents for the interviews were also derived from the same sampling list, adding an advantage to the researcher because they were already in the know when contacted for appointments.

#### **3.4 Data collection method (Secondary and Primary)**

As explained, the study would adopt both quantitative and qualitative data gathering techniques. A survey research method was adopted to address the research questions, using the questionnaire as the main instrument. Survey data was thus obtained through pre-determined questions that were sent to the respondents by the post. For the qualitative data, data collection techniques available to a qualitative researcher fell into three categories (Johns, 1998) but for this research, only the interview method was applied.

The structured interview through a pre-determined questionnaire consisting of 12 questions was used to gather primary information with the heads of libraries (See

Appendices D, E, F and G for details). Field works were conducted from February 2002 – December 2003. What was meant by this was actually meeting, asking, talking and discussing about automation, digitization and digital library initiatives, with as many librarians as possible at any opportunities at the initial stage of the research. The purpose was to help the researcher in understanding the subject of digital library development in a better perspective and also in an attempt to gauge the actual phenomena or changes that were actually happening at their respective libraries having embraced library automation. These would help in the formulation of research questions that would not be too high in content that would be off putting. In this research, qualitative data through interview sessions would supplement the data collected through the questionnaire. Interviews made to all the 38 libraries nationwide but many of whom were in the Klang Valley had enabled the researcher to get first hand information and observing the actual progresses and it helped the researcher to grasp and forming a pre idea as to the degree of digital library development that were taking place.

### **3.5 Questionnaire development.**

The questionnaire was the main research instrument in this study, with the objective to elicit as much related information as possible from the respondents. It would contain enough questions to be able to meet survey objectives but not so many as to be off-putting to respondents. The questions must be long enough to elicit the information that was required but short enough to encourage an optimum response rate (Johns, 1998). The question development process had taken several steps:

- a) Overview of the research situation would take into considerations all the library types, who headed them, systems used, budget, problems faced, collections/holdings, digitization program, subscription of online databases, Information and Communications Technologies infrastructure, future planning and opinions of heads of libraries. All of these were important to satisfy the survey objectives. The field work done earlier helped in the formulation of the questionnaire that was in accordance with the level of digital library development in Malaysia.
- b) The completed questionnaire would then be sent to selected few librarians for the purpose of pre-testing and validity test from the experts. Their suggestions and comments would then be considered to perfect the questionnaire and filling in any loopholes.
- c) Pilot study would follow suit. Forty libraries that were part of the study population would be given the questionnaire, for them to fill up. Efforts would be taken to ensure as many as possible questionnaires sent would be returned.
- d) The data collected would then be processed using the Statistical Package for Social Science software, to ascertain its reliability and validity.

### **3.5.1 Questionnaire design**

Bearing the research objectives in mind and equipped with an extensive literature review, meetings and discussions with the library community were conducted prior to the conceptualization of the possible questionnaire items. This was important because of the different levels of digital library developments between the western countries and

Malaysia. From the preliminary fieldworks, meetings and discussions with as many librarians as possible at any opportunity at the early stage of the research, prior to the formulation of the questionnaires, the researcher decided that certain terms might not be able to be used in the questionnaire such as open access repository, *Dspace*, handle system or multilingual digital library as these were still peculiar to many of the librarians. Many had not heard even the term *Greenstone*.

Discussions were also held with a statistician who had advised that if there were too many missing values from the questionnaire, this would affect the data process and findings. The statistician also noted that if there were too many terms that they did not understand, there was a tendency and possibility that they would not pursue in answering the questionnaire. The researcher was also made to understand from the numerous feedbacks that generally Malaysian libraries would normally first acquire integrated library systems and develop electronic libraries prior to eventually planning for a digital library set up.

Based on the above, a structured questionnaire was developed, covering as many as possible the items that might point to achieving the objectives of the study. Therefore items listed in the questionnaire were based on the level of digital library development in Malaysia, having developed electronic libraries that formed the basis of their preparedness and readiness to move forward and to venture into a much bigger endeavor i.e. digital library environment. The questionnaire consisted of demography, general library problems, and statistics on library holdings, library automation, training, digitization projects, budget and opinions of heads of libraries. These were the main eight

categories of questions that had been asked, covering the aspects that would meet the set objectives.

Demography had 10 variables. They were: (1) library type; (2) designation of head of library; (3) grade of head of library; (4) highest academic qualification of head of library; (5) total number of years of working experience of head of library; (6) staff; (7) provision of e-mail address; (8) perception about hybrid, digital or hybrid library type; (9) intention of becoming full fledged digital library; (10) number of years library been established. This section acts as background information.

General library problems had 19 variables. They were: (1) lack of professional staff; (2) lack of IT personnel; (3) lack of support staff; (4) lack of IT training; (5) lack of leadership; (6) lack of management support; (7) lack of suitable integrated library system; (8) lack of local vendor support; (10) lack of IT facility; (11) lack of ICT infrastructure; (12) lack of collaboration; (13) lack of demand for library services; (14) lack of budget; (15) lack of library space; (16) lack of digital library initiatives; (17) under utilization of library resources; (18) renewal subscription of online databases; (19) attitude. This sections acts as a platform to see what kinds of problems the libraries were facing and whether they were ready in certain aspects to migrate to a new library type.

Statistics on library holdings had 10 variables. They were: (1) monographs; (2) journals and periodicals; (3) cassette tapes; (4) video tapes; (5) films; (6) photographs; (7) maps; (8) posters; (9) microfiche; (10) CD-ROM. This section aims to see what constituted their major holdings in view of the influx of digital resources.

Library automation had 8 variables. They were: (1) the year of installation of integrated library system; (2) first system used; (3) current system used; (4) online library

operations and services; (5) IT facilities; (6) total number of PCs held; (7) subscription to databases; (8) technical support. This section is important to gauge their readiness in moving forward towards digital library development having at least done some form of library automation and turning their libraries electronically.

Training had 15 variables. They were: (1) introduction to computers; (2) Internet and WWW; (3) application software; (4) web design and homepage development; (5); online searching skills (6) online indexing & abstracting; (7) programming & programming languages; (8) PC maintenance; (9) Data Base Management System; (10) information systems development; (11) telecommunication & networking; (12) operating systems; (13) content management; (14) trainers; (15) length of training. This section is important to gauge their preparedness and readiness in moving forward towards digital library development that is supposed to be technologically dependent with the necessary skills and know how.

Digitization projects had 11 main variables that included one open ended question on their future planning. They were: (1) digitization project; (2) items digitized; (3) digitization method; (4) common storage devices; (5) public or private domain; (6) budget; (7) contents of web site; (8) digitization related problems; (9) digitization project with PNM; (10) development of in-house databases; (11) future planning. This section wishes to solicit the extent that they had progressed in relation to digital library development.

Budget had 5 variables. They were: (1) allocation for monographs; (2) allocation for AVM; (3) allocation for print journals; (4) allocation for e-journals; (5) allocation for

online databases. This section wishes to see the portion of budget spent on library holdings specifically online resources.

Opinions of heads of libraries had 11 variables. They were: (1) Digital library development; (2) user's readiness; (3) domination by digital format; (4) collection development policy; (5) blueprint; (6) PERDANA Project; (7) hybrid library type; (8) books vs. online services; (9) Information Professionals; (10) IT literate; (11) extinction of traditional libraries. This section wishes to solicit the librarians' opinions on some important aspects related to digital library development in view of the progresses that had been taking place.

### **3.5.2 Contents of the questionnaire**

The questionnaire, 12 pages long, was divided into eight sections. It included Likert scale measurement, close-ended questions and 1 open-ended question. It was designed in such a way that only straightforward, concise, brief and short answers were required. Upon trial, the questionnaire could be answered within 20 - 25 minutes. Data for analysis would result from measurement of one or more variables that had been included in the questionnaire. The eight sections were:

**Part A** was labeled 'Demographics' and listed variables consisting of general information on personnel, total number of staff (professional, support and IT personnel), provision of e-mail address, perception on library type and the intention of becoming fully digital.

**Part B** was labeled ‘ General Problems’ and listed nineteenth possible related problems that a library could be facing such as staffing, library systems, ICT facility, budget, collaboration, resources and attitude.

**Part C** was labeled ‘Statistics on Collection’ and consisted of ten collection types and the total number of volumes held.

**Part D** was labeled ‘Automation’, consisted of questions about library automation, systems used, online operations and services, Internet facility and subscriptions to local and foreign databases.

**Part E** was labeled ‘Training’ consisted of the kinds of training that library staff have been sent in anticipation of digital library development. Thirteen types of training were listed comprising both technical aspects like programming and PC maintenance and information science related trainings.

**Part F** was labeled ‘Digitization Projects’ consisting the most in terms of the number of variables. Embedded within eleven main questions were the itemized variables that related specifically to digital library initiatives. Question number two as an example seeks to solicit what were the collection types that have been digitized. Could it be monographs, journal, circulars, press cuttings, photo collection, patents, thesis, and maps. Question eight on the other hand seeks to identify the problems that they faced in the process to becoming digital library or what was the stumbling block in initiating digital library initiatives. This part ended with one open-ended question related to their digital library future planning.

**Part G** was labeled ‘Annual Budget’ consisting of questions on budget allocation for monographs, Audio Visual Materials, print and e-journals and online databases, hoping

to see if there was an increase, decrease or static in terms of expenditure on print and online materials.

**Part H** was labeled ‘Opinion’ asking the head librarians of their personal opinion on digital library development, users’ readiness in responding to online services, domination by digital format and changes in their collection development policy. The last part was seeking their general opinions related to blueprint, *PERDANA* Project, hybrid library, the demise of books, information professionals and the extinction of traditional libraries.

Having completed and fully developed, the questionnaire need to be tested for its focus on subject content, reliability, face and content validity, brevity and clarity. A pre-test was done and the questionnaire was given to a selected group of practicing librarians and academicians/lecturers.

### **3.5.3 Pre-test**

It would be good to pre-test the questionnaire on a small number of people before you use it on its earnest (Walliman, 2006). Therefore for the purpose of pre-test, the questionnaires were sent to 2 groups of people – 4 practicing librarians (Universiti Teknologi MARA Library, Malaysia Productivity Center Library, Malaysian Industrial Development Authority Library and *Akademi Seni Kebangsaan* Library) and 6 academicians/lecturers from the Faculty of Information Management, Universiti Teknologi MARA, three of whom were with doctoral degree. They were encouraged to state their comments and criticisms with respect to the length of the questionnaire, the words used, sentence structure and any ambiguous statements or confusing questions and clarity of the information science terms used.

Discussions were also held with Assoc. Prof. Dr. Rasimah Ariffin, a statistician who is an expert in quantitative survey from the Faculty of Information Technology and Quantitative Science, Universiti Teknologi MARA. The questionnaire had been modified accordingly upon receiving feedbacks and comments from these people. Their relevant comments had been taken into considerations. Some new elements were added while those not related were changed and deleted. Suggestions on technical aspects like size and type of server, computer configurations and operating systems had been excluded because it had been stated crystal clear under the scope of study that technical specifications were not included.

#### **3.5.4 Validity test**

A new set of questionnaire had resulted after the pre-test sessions. To ensure that the measures developed in the instrument were relevant and appropriate, the instruments were tested for its validity and reliability. Validity refers to the extent to which an empirical measure adequately reflects the real meaning of the concept under consideration (Babbie, 2007). This was supported by Henn, Weinstein and Foard (2006) who said the most critical was whether or not the results from a quantitative research study accurately reflect the phenomenon under investigation. It was characteristic of a measure or protocol that assesses what it actually claims to measure (Devlin, 2006). Validity, which could be face validity (determining whether the measure seems to make logical sense as an indicator of a concept) or content validity (a test for whether the measure covers the full range, or all of the dimensions, of a concept's meaning), has been

a mechanism to re-confirm whether whatever that was supposed to measure, had actually been addressed.

In this research, an in-depth study of the extent of digital library development done through the literature review, coupled with the field work that had gauged the level of digital library development in Malaysia, had helped in the fine tuning of the questionnaire development. The extensive discussions held with the various quarters of the professionals, both practicing librarians and academicians helped ensure adequate content validity to the level of Malaysian digital library development. The questionnaires were sent to selected experts in the area to check on the validity of the instrument. They were expected to finalize the validity of the instrument for face and content validity as and to finally evaluate the appropriateness of the issues covered, again based on the level of Malaysian digital library development.

The experts selected were the CIO from the Multimedia Development Corporation, Putrajaya; Chief Librarian of the International Islamic University; two professors from the Faculty of Information Management, Universiti Teknologi MARA and Head of Digital Library Unit from the National Library of Malaysia. These people were chosen due to the vast experience and knowledge in this particular field and who had actually saw, witnessed and participated in the development of Malaysian libraries long from the *MALMARC* era. The researcher strongly felt that these information professionals and themselves librarians would be able to give an insight, comments, ideas and suggestions, and they were able to judge the relevancy of the topic being researched. The inputs received from these experts were extremely important in the process of finalizing the questionnaire before sending them for the next stage i.e. pilot test.

### **3.5.5 Pilot study and Reliability test**

A pilot study was conducted in July 2003 by distributing the questionnaire to 40 libraries of all types within the Klang Valley, specifically Kuala Lumpur, Serdang and Putrajaya. Seventeen completed questionnaire were returned. As the objective of the pilot study was to ensure that respondents understood the instructions, the questions being asked, the terminologies used, no misleading questions, clarity was observed and that the instruments used were reliable to the subject being studied, the returned questionnaires were looked at thoroughly for more corrective inputs.

All input in the forms of comments, suggestions, ideas, proposals, corrections and views were taken into consideration to improve, improvise and upgrade the level of reliability of the instrument. To ensure that the measures and variables developed as the instruments in the questionnaire were appropriate, the instrument was tested for its reliability. Prior to the actual data gathering exercise, reliability test was done on the data collected from the pilot study. The outcome of this exercise was a new set of questionnaire that would be used for the actual survey, conducted in January 2004.

### **3.5.6 Empirical survey**

The survey instrument used in this research was a questionnaire which had been developed, corrected and verified prior to the actual sending to the respondents. Using a direct mail survey method, a self-administered questionnaires were mailed to a total population of 354 (N = 354) libraries nation wide. This was probably the most common forms of survey research social scientists used (Wolfer, 2007). The study population was

taken from *Directory of Libraries in Malaysia*, 2002 published by the National Library Malaysia.

A cover letter accompanied the questionnaire explaining the purpose of the study and to act as a proof that the researcher was indeed a registered student doing research in this particular area, and was mailed in January 2004. Posted together were stamped self addressed envelopes for the returning of the completed questionnaires. They were given until 30 April 2004 to return the completed questionnaires. All letters were addressed to the Head of Libraries and reminders were sent after one month and phone calls were made after six weeks to those who did not respond. There were some libraries who claimed that the questionnaire did not reach them. In cases like this, the questionnaires were re-sent and they were given another 2-3 weeks to reply.

The researcher felt that this was a very challenging task – trying to get back as many as possible the sent questionnaires. Even though the response was a little slow but what really important was to get them back, to make the research more representative. Researchers took a lot of pains to encourage participants to complete and return the surveys and almost all researchers doing mailed surveys sent follow-up mailings (Wolfer, 2007). After follow ups through e-mail communications and phone calls (if necessary), finally the researcher called it off and stopped collecting the data on 30<sup>th</sup> June 2004.

The total response rate or return rate for this study was 63 % or 223 responses, considered high. If a high response rate was achieved, there was less chance of significant response bias than with a low rate (Babbie, 2007). He added that a review of published social research literature suggests that a response rate of 50% was considered adequate for analysis and reporting. A response of 60% was good; a response of 70% was very

good. The researcher attributed this high percentage to the fact that majority of the respondents were colleagues as the researcher herself was a former practicing librarian for twenty years. Finally data collected were coded and processed in early September 2004.

### **3.6 Research General Guidelines.**

Below were the general guidelines that the researcher had observed in the whole process:

- a) Numerous discussions with the supervisor for the confirmation of the research topic.
- b) Numerous discussions with the supervisor for the confirmation of the research questions for both quantitative and qualitative methods.
- c) Literature review of the related materials from all sources in the fields of library and information science, library automation and digital library development were carried out. The extensive readings helped to consolidate researcher's understanding and in getting an overview of the state of the art in terms of general digital library development, issues and problems faced, local and abroad. At this stage, the researcher realized that while there had been so much literature on digital library initiatives and developments in other countries, specifically in the United States, United Kingdom, Australia, European Union countries, India, China, Korea and New Zealand, but similar developments were not much happening in Malaysia. There had been a gap so much so that the literature review could not be geared too much towards Malaysian digital library developments and

the facets of digital library initiatives could not be reflected extensively in the research questions, for fear of discouragement in answering the questionnaire on the part of the respondents. Foreign digital library initiatives were widespread and characterized by numerous digital library researches, digital library projects at national, regional and international levels, digitization efforts, accessibility and resource sharing were the main goal, availability of financial support and digital library collaborations and cooperation's were both abundance and very prominent.

- d) A set of structured questionnaire was developed (bearing in mind the degree/level of digital library initiatives of the Malaysian libraries gathered during the initial literature review and field works) covering main aspects that were related to digital library initiatives and digitization works as an outcome of library automation.
- e) The draft of the questionnaire was pre-tested on a few colleagues to test its face validity. The librarians were also asked for their opinions on the subject matter and suggestion noted.
- f) Modifications and re-adjustments were made on some of the contents and wordings used in the questionnaire.
- g) The final version of the questionnaire was sent to two experts in Library and Information Science from the Faculty of Information Management, UiTM for their professional advice and content validity.
- h) Final approval of the questionnaire was obtained from the supervisor.
- i) The questionnaire was sent for pilot study to 40 libraries.

- j) The questionnaire was again modified after getting some feedback from the respondents.
- k) Once approved by the supervisor after the modifications, the questionnaires were finally sent for the actual study to 354 libraries.
- l) The data from the questionnaire were received, coded, keyed-in and analyzed to answer the research questions.
- m) A total of 38 interview sessions were held using a pre-determined set of questionnaire to supplement the data collected through the quantitative method.  
(See Appendices D, E and F for details)

### **3.7 Data analysis**

Thematic principle had been applied in the process of qualitative data analysis. The collected information had to be sieved, sorted, grouped and assembled in accordance with the question numbers that acted as the coding system in order to solicit the emerging issues/points and to establish certain patterns in all the answers. The summarization of the collected information was done mainly based on typology and quasi statistics i.e. classified, grouped, themed or patterned and the number of times or frequencies a subject/topic was mentioned in the interview process.

In the process of report writing and for the purpose to increase the credibility of qualitative data, the process of member checking was done vigorously. Follow up phone calls and e-mail communications were made to the interviewees, both to clarify and verify their statements and to validate whatever that they had said. Respondents' validation was important to improve accuracy, validity and transferability of the

information from the interview transcript. More often the process of validation was concerned with ensuring that their comments or thought had been correctly described and interpreted. Descriptive and interpretative validities took most of the time as there had been many recursive points that might be similar in nature but said by various respondents.

Data analysis for the questionnaire was done by using the common statistical software SPSS (Statistical Package for Social Science). All questions would be individually analyzed, taking into considerations all the available factors and supported with descriptive and inferential analysis.

### **3.8 Summary**

This chapter had been organized to include introduction, research design, population and determination of sample size, data collection method, questionnaire development, interviews, research general guidelines, data analysis and summary. Elaboration and explanation of the issues related to research methodology had been highlighted that included the choices of research methodology and data collection methods. The researcher's experience throughout the data gathering process was also mentioned.

Details of the analysis from both qualitative and quantitative method, results and inferences were presented in Chapter 4 and Chapter 5. Based on what had been discussed, suggested, raised, argued, agreed and proposed, the researcher tried her level best to translate all these findings in the form of recommendations that were presented in Chapter 6.