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## **1.1 Introductions**

Research methodology is a means of taking decision from the results obtained from the collective, natural or social phenomena. The primary goal of research methodology is to understand immediate, distant and past social problems in order to gain a better measure of control over them. Well designed and tested research techniques are scientifically used for research purposes. Research in general sense can be regarded as a search for knowledge. Research can be carried out in different fields via social, economics, politics, education etc. Research is not a search that yields infallible truths; rather it can be regarded as a search that provides knowledge for solution of problems. The knowledge of research methodology is must for all those who desire to keep themselves abreast of the latest techniques developed in the field of research. Research has become an important aspect of human activity. It is through research that knowledge grows and develops, ultimately leading to the extension of the boundaries of knowledge and scholarship. It is considered that the progress made by our society is due to the result of research.

## **1.2 Research: Meaning and Definition**

Research is a matter of raising a question and then trying to find an answer. In other words, research, means a sort of investigation describing the fact that some problem is being investigated to shed for generalization. Therefore, research is the activity of solving problem which adds knowledge and developing of theory as well as gathering of evidence to test generalization.

Research is composed of two words "re" and "search" which means to search again, or to search for new facts or to modify older ones in any branch of knowledge. The Webster's International Dictionary proposes a very inclusive definition of research as "a careful critical inquiry or examination in seeking facts or principles diligent investigation in order ascertain something"

A careful investigation carried out to understand or re-examine the facts or to search for new facts or to modify older ones in any branch of knowledge. Research is an academic activity. According to Coiffure Woody research comprises defining and

redefining problems, formulating hypothesis, collecting, organizing and evaluating data, making deductions and reaching conclusions; and at last carefully testing the conclusions to determine whether they fit the formulating hypothesis.

The term "research" refers to the systematic method consisting of enunciating the problem, formulating a hypothesis, collecting the facts or data, analyzing the facts and reaching certain conclusions either in the form of solutions towards the conceded problem or in certain generalizations for some theoretical formulation Encyclopedia of social sciences defines research as " the manipulation of things, concepts or symbols for the purpose of generalizing to extend, correct or verify knowledge, whether that knowledge aids in construction of theory or in the practice of an art<sup>2</sup>". This definition throws light on four connotations, as .

1. Manipulation of things
2. Generality
3. Extending knowledge
4. Building up theory or practice

### **1.3 Need for research**

The research deals with the broad range of human behavior which affect by diverse influences like environmental, biological, Library and Information Science, psychology, etc. As such, under these situations it is an arduous task for scientist to innovate or discover a solution to the problem or complexity nature of human beings. In simple word what is the significance of research. The answer to this question explains by itself that new scientific knowledge is like a new born baby, which holds great potential of growth as well as development like new born-child, research gives us pleasure. It also gives us satisfaction of knowing unknown that a scientist is self-justifying goodness of scientific knowledge which may be small or big. So that research in library and Information science has an important role to play in the educational process, creation of new knowledge in L&IS, and solution of problems faced by librarians, documentaries, Information scientists. It is considered that research

programmers will enable the profession to achieve greater academic and professional respectability.

In order to utilize information effectively, national and international information networks are being set up. These require specialized manpower and research programmers. These can help to sharpen existing methods, techniques, tools and also enable designing of new ones. In other words, science is a two-face weapon. It cannot lead but can only serve. It has sharp eyes for methods but blind to ends and values. This means the utility of research needs in the L&IS. Due to increase in the price of documents and scarcity of resources, librarians are faced tremendous problems, in the running of libraries. Research can help to improve services to the users; lead to better utilization of documents, etc.

Research assists to think and act on the scientific base. It is a facts study. It is useful to find out the solutions where various fundamental problems are arrived in Industrial and Business structure. Research is useful to compare social relationships. Research is useful to find out solution on the grounds of social problem. Research is an important guideline to each and every part of the society to develop their social standard with a goodmanner.

#### **1.4 Objective of Research**

The objective of any research is broadly studied under two headings namely (i) Academic and (ii) Utilitarian Manipulation the things, finding new Propositions or concepts resulting to generalizations and discovery of truth. The purpose of research is to discover answers to questions through the application of scientific procedures. The main aim of research is to find out the truth which is hidden and which has not been discovered as yet. The main objectives of research are given below:

- \_ Taste the difference between two variables.
- \_ Find out certain conclusion.
- \_ Draw out an exact nature of individual group or situation.
- \_ To achieve new trends in the phenomenon.

Thus research looks at people's needs for information and literature of all kinds, and is concerned with some problems.

### **1.5 Characteristics of Research**

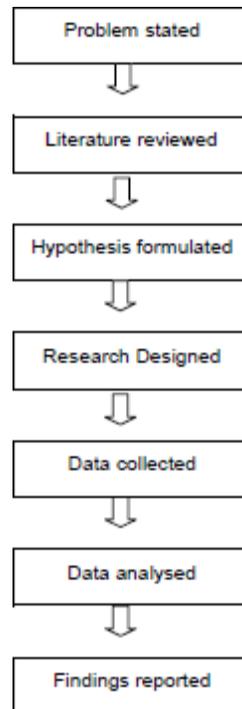
Research is a systematic activity to achieve the truth. Research includes the procedure of collecting data, analyzing the data and finding the conclusion or truth. The main characteristics of research are given below:

- 1 Research is directed toward the solution of a problem and discovers relationship between variables.
- 2 Development of generalizations, principles, or theories that will be helpful in predicting future occurrence.
- 3 Research demands accurate observation and description.
- 4 It involves gathering new data from primary or firsthand sources or using existing data for a new purpose.
- 5 It is carefully designed procedures that apply rigorous analysis.
- 6 It is objective and logical applying every possible test to validate the procedures employed.
- 7 Research is characterized by patient and unhurried activity.
- 8 Research is an honest, exhaustive, intelligent searching for facts and their meaning.
- 9 Research means a systematic frequentative and intensive study of the collected data. 10 A critical and exhaustive investigations or experimentation having as its aim the revision of accepted conclusions in the light of newly discovered facts.

### **1.6 Research Process**

The research process consists of a number of closely related activities which overlap continuously rather than follow of strictly prescribed sequence. So it is interdependent activities that the first step of a research project largely determines the nature of the last. If subsequent procedures have not been taken into account in the

early stages, serious difficulties may arise and prevent the completion of a study. Frequently these difficulties cannot be remedied at the time when they become apparent, because they are rooted in the earlier procedures. They can be avoided only by keeping in mind, at each step of the research process, the requirements of subsequent steps. Research process consists of series of actions or steps necessary to effectively carry out research. The chart given below illustrates a research process.



Research Process

### 1.7 Classification of Research

Dr. S.R Ranganathan has tried to classify research into six stages as given below:

1. Observation research: A solo research developed through minute observation and facts taken there as results.
2. Empirical research: Here the empirical findings of observations at various places are generalized and as the results are generalized facts.
3. Pragmatic research: The tested results of observation and empirical method are further proven as applicable results.
4. Fundamental research: After all above three levels, we produce fundamental law by



verifying in of old theory, and established of a new one. It is of two types: (a) for fundamental research where the researchers are whole and oriented fundamental research where in a group of workers is engaged to carry out that work.

A Pure research: The results of the "fundamental research is applied to solve a specific problem. It is of two types. Pure- It is not biased to any subject. Ex: Pure mathematics. (b) Applied- It is directed towards solution of a problem. Ex: Animal husbandry. Developmental Research: Every research at the last stage is a developmental research which leads to extension of knowledge .

## **1.8 Types of Research**

Research can be studies under **two** divisions, First, according to the methods and second, according to the purpose.

### **1.8.1 Type of research by method**

The study of method is called methodology. A method is a path of achieving or approaching to a problem. The path involves certain steps.

These steps are to occur in an order of occurrences, All sciences are methodological (or based on methods).Every methodology is pointed towards solutions of human problems; existing or to exist in future. A research methodology involves the following kinds of research methods.

#### **1.8.1.1 Historical Research**

This explores the use of histories as method and the ways in which this research can contribute to new understandings about the experiential relationships between libraries and users. The critical examination of past event or happenings order to know truth and later on, to generalization is known as historical research. History is key subject for study of different subjects. It is worth to mention the famous English Dramatist George Bernard Shaw view that "the past is not behind the group. It is within the group". This means a proper study of past provide key to the present.

Historical research is carried out by an individual and may not always carry hypothesis. The reasoning is inductive. By historical research, previous efforts on the topic convey the depth of knowledge and filling up of effort to the present state of

knowledge on the subject Therefore, this method of research is important to methodology. It studies people and their problems but not the period. The style of reporting the result is mostly narrative. One can create a sense of continuity and a consciousness of unity among people by doing research under this method. In this method data are drawn from observations and experiences of others. For this the documents provide primary sources of information.

### **1.8.1.2 Descriptive Research**

It is one of the fundamental methods of research methodology. This research is often referred to as questionnaire or opinion study. It may serve as a reconnaissance phase of an investigation in a new area in which the purpose is to identify factors which are most promising for experimental investigation. This method is (1) used as a check on laboratory findings in real life and (2) used as a tool in identifying norms of standards with which to present conditions for planning future. It describes and interprets what it is with reference to conditions or relationships that exists, opinions that are held, processes that are going on, effect that are evident, or trends that are developing, it is known as non-experimental research, deals with relationship between variables. It is helpful in behavioral subjects and sciences, humanities.

### **3.8.1.3 Ex-post-: facto Research**

In this type of research, the researcher has no control over the independent variable: more than this, randomization is not possible, which means he takes things as they are and try to extricate them.

Descriptive vs. Analytical:

Descriptive research includes surveys and fact-finding enquires of different kinds. The major purpose of descriptive research is description of the state of affairs as it exists at present. In social science and business research quite often use the term Ex post-facto research for descriptive research studies. The main characteristic of this method is that the researcher has no control over the variables; he can only report what was happened or what is happening. Most ex post-facto research projects are used for

descriptive studies in which the researcher seeks to measure such items as, the methods of research utilized in descriptive research are survey methods of all kinds, including comparative and correlation methods. In analytical research, on the other hand, the researcher has to use facts or information already available, and analyze these to make a critical evaluation of the material.

#### **1.8.1.4 Experimental Research**

Experimental research is considered to be the prototype of the scientific method. It involves procedure for gaining knowledge by collecting new or fresh observations under controlled conditions. Further it reveals the causal relation and interactions. Hence, it calls for precision and accurate observation, careful observation and immediate correct recording of the data and to be closely attended to. In experimental research the independent variable as well as dependent variable are involved where the former can be manipulated as an experimental variable in order to see the effect on the latter.

The experimental research is again divided (a) Laboratory experiment and (b) field experiment.

The field experiment aims at the dual purpose of bringing about social change and combining to basis social research. This is possible when the experiment is practically-oriented. The most common features of the field experiment research are practically-oriented.

This method of research suffers with two problems viz. (a) the investigator though has power of manipulation, is faced in identifying and selecting independent variables and (b) the problem of randomization. The researcher is guided more by negativism than optimism. (c) Lack of precision in the sense. The dependent variables sometimes are lacking sensitive to pick up the behavior of independent variables. However the field experiment has three excellent features. They are: (a) the variables in the field experiment, usually have a strong effect compared to laboratory experiment.

In other words the more realistic the research situation. The stronger the variables, (b) the interaction of groups have studied fruitfully in the field experiment mid

(c) In testing of theory as well as of solution to practical problems; the field experiment is well fitted.

#### **1.8.1.5 Field study**

This method distinguishes the field experiment study with respect to the design of the research. The field experiment has purposes:

(a) Discovers significant variables in the field,

(b) discovers variables relations, and

(c) lays a ground work for testing hypothesis.

The field study is strong in realism, theory-orientation, and heuristic quality. Its most weakness is It ex-post-facto character. Another weaknesses are methodological issues like lack of precision in the measurement of variables

### **1.8.2 Types of research by purpose**

Research may be motivated by the desire to know or understand for the sake of knowing called 'pure' or 'basic' research or by the desire to know In order to use this knowledge for practical concerns called 'applied' research

#### **1.8.2.1 Pure research**

Developing scientific theories or basic principles are called 'pure' or 'basic' or 'fundamental' research. Pure scientist desires to see for increasing knowledge in the field of enquiry. To him, the challenge of not knowing is paramount. Technology advance is the corresponding forward in the development of theories as well as principles from pure research. Pure research

(a) helps in developing general principles,

(b) helps in to find out the central factors in practical problems,

(c) becomes a standard procedure for researcher to find out an answer to the problem.

#### **1.8.2.2 Applied research**

In applied research, the problem is identified and the results are accepted to be applicable in the improvement of the practice or solution to a problem producing material gains. Like pure research, applied research also contributes to the



development in the following manner

- It can contribute new fact
- It can put theory to test
- It may aid in conceptual classification
- It may integrate theory of previous study

### **1.8.2.3 Action research**

In this type of research, the researcher appears as a participant rather observer; and therefore is actively and even emotionally involved in the results and their application. It is a special type of research in the sense, testing of application in accordance with a certain set of situation and modified according to the local prevailing conditions as well. Another feature is that it adapts itself to the changes that have taken place in the particular community. Thus, action research is similar to applied research but differs from the action process. Action research is depended upon the feed-back of information supplied.

### **3.8.2.4 Evaluation research**

Evaluation research aims at evaluating programme that have been implemented or actions that have taken in order to get an objective. Evaluation means some sort of measurement of the end-product and impact of an effort in the light of the stated goals for which the programmed undertaken. There are so many programmes in which economic gains are not visible, the evaluation of which calls for special techniques. There are three types of evaluations.

Concurrent evaluation means continuous process and part takes the nature of an inspection and social audit. This evaluation stimulates a sort of guidance and counseling to the policy-maker with feed-back. Periodic evaluation means a distinctive phase or stage completion on which the evaluation takes place. Terminal evaluation means evaluation is done after the completion of the programme or project. One should be of very clear with the objectives of the programme or project in evaluation of it.

### **1.8.2.5 Inter-disciplinary research**

Information has now become inter-disciplinary in nature. The old division of knowledge into separate disciplines has virtually broken down. Each discipline is now interacting with other disciplines and in the Process. New interdisciplinary information is generated. Shear stated that "today there are unmistakable indications that all higher education is moving away from vertical toward a horizontal dimension that transcends traditional disciplinary boundaries to seek a universal function common to all curricula." Heinz Heckhausen identified the following six types of interdisciplinary among subjects:

1. Indiscriminate Inter: All "encyclopedic endeavors" end up with "curricular mix-ups." Librarianship is a typical example of an encyclopedic endeavor.

2. Pseudo-Interdisciplinary: Disciplines using the same analytical tools are at times considered to produce interdisciplinary fields. This association represents phase relation among disciplines. The so-called Interdisciplinary expected on the basics of analytical tools being common is pseudo-interdisciplinary because there is no integration between the tool discipline and the host disciplines.

3. Auxiliary interdisciplinary: This type of Interdisciplinary results from cross-disciplinary by Use of methods, one discipline being constantly dependent upon the method of another auxiliary discipline.

4. Composite interdisciplinary: Here diverse disciplines are brought together as problem-solving techniques. The respective material fields do not overlap, yet present a composition. In Ranganathan's terminology these are described as "Clustered" subjects.

5. Supplementary interdisciplinary: This type of Interdisciplinary exists between disciplines in the same material field. Their respective subject matters partially overlap. Communications is an example of this type of interdisciplinary. Ranganathan called these subjects as "Compound" subject

6. Unifying interdisciplinary: When two or more disciplines move towards their unification at the theoretical integration level, a unifying inter disciplinarily results. These are the "Fused" Subjects. Interdisciplinary research is a common feature of today; rather, it is the need of the day. Inter-disciplinary research brings out a number of new disciplines by way of lamination. Loose-assemble e.g. agglomeration and fusion.

## **1.9 Research Design**

The formidable problem that follows the task of defining the research problem is the preparation of the design of the research project, popularly known as the "research design". Decisions regarding what, where, when, how much, by what means concerning an inquiry or a research study constitute a research design. "A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure." In fact, the research design is the conceptual structure within which research is conducted; it constitutes the blueprint for the collection, measurement and analysis of data. As such the design includes an outline of what the researcher will do from writing the hypothesis and its operational implications to the final analysis of data. More explicitly, the design decisions happen to be in respect of:

- \_ What is the study about?
- \_ Why is the study being made?
- \_ Where will the study be carried out?
- \_ What type of data is required?
- \_ Where can the required data are found?
- \_ What periods of time will the study include?
- \_ What will be the sample design?
- \_ What techniques of data collection will be used?
- \_ How will the data be analyzed?
- \_ In what style will the report be prepared?

### **1.9.1 Definitions**

Miller has defined "Research Design" as "the planned sequence of the entire process involved in conducting a research study." Johoda, Deutsch and Cook have defined it as "a research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure".

In a simple language, research design is "the plan, structure and strategy of



investigation conceived so as to obtain answers to research questions and control variance".

### **1.9.2 Importance**

A research plan prescribes the boundaries of research activities and enables the researcher to channel his energies in the right work. With clear research objectives in view, the researcher can proceed systematically towards his achievement. Thus, the design also enables the researcher, to anticipate potential problems of data gathering, operationalization of concepts, measurement, etc. It helps the researcher to organize his ideas in a form. It provides an opportunity to the critic to evaluate the projected study.

### **1.9.3 Need**

Research design is needed because it facilitates the smooth sailing of the various research operations, thereby making research as efficient as possible yielding maximal information with minimal expenditure of effort, time and money. Just as for better, economical and attractive construction of a house, researcher need a blueprint (or what is commonly called the map of the house) well thought out and prepared by an expert architect, similarly researcher need a research design or a plan in advance of data collection and analysis for his/her research project. Research design stands for advance planning of the methods to be adopted for collecting the relevant data and the techniques to be used in their analysis, keeping in view the objective of the research and the availability of staff, time and money.

Preparation of the research design should be done with great care as any error in it may upset the entire project. Research design, in fact, has a great bearing on the reliability of the results arrived at end as such constitutes the firm foundation of the entire edifice of the research work.

### **1.9.4 Parts of a Research Design**

Keeping in view the above stated design decisions; one may split the overall research design into the following parts:

a. The sampling design which deals with the method of selecting items to be observed

for/the given study;

- b.* The observational design which relates to the conditions under which the observations are to be made;
- c.* The statistical design which concerns with the question of how many items are to be observed and how the information and data gathered are to be analyzed; and
- d.* The operational design which deals with the techniques by which the procedures specified in the sampling, statistical and observational designs can be carried out.

### **1.9.5 Types of Research Design**

Usually, four types of research designs are identified:

#### **1.9.5.1 Exploratory Research Design**

Exploratory studies are usually more appropriate in library and Information science. An exploratory study is a systematic and scientific approach, which enables a social scientist to determine whether not an idea, which appears to be promising is so in reality or not. Sometimes, it may be the only way to check the idea for this purpose. An exploratory study can provide ideas and hypotheses, which may not occur to him otherwise. Thus, this can be helpful in formulating precisely a research problem or hypothesis. The purpose of exploratory studies is to achieve new insights into a phenomenon. The major emphasis in those studies is the discovery of new insights or ideas. The reason for aiming at new insights or ideas is to formulate a more precise problem or to develop hypotheses for further definite research.

#### **1.9.5.2 Design of Descriptive Studies**

Descriptive studies aim at portraying accurately the characteristics of a particular group or situation. One may undertake a descriptive study about the works in a factory, their age distribution, their community-wise distribution, their educational level, the state of their physical health and so on and so forth. Also one may study the conditions of work in a factory health, safety and welfare. One may undertake to describe the organization of an industrial establishment or of a trade union congress. A descriptive study may be concerned with the attitudes or views of a people towards anything, e.g., attitudes towards presidential form of Government, rights to strike, capital punishment,

prohibition, college autonomy etc. A descriptive study in networking subject involves formulating the objectives of the study, defining the population and selecting a sample, designing the methods of data collection, and analysis of the data and results.

### **1.9.5.3 Design of Diagnostic Studies**

Diagnostic refers to scientific differentiation among various conditions or phenomena for the purpose of accurately classifying these conditions. In its broadest sense, diagnostic corresponds to the fact-finding aspect of clinical practice. Its objectives include screening and classification, personality description, prediction of outcome and attainment of insight by the client.

In library and Information science a diagnostic study is geared to the solution of a specific problem by the discovery of the relevant variables that are associated with it in varying degrees. The design in such studies must be rigid and not flexible and must focus attention on the following:

- \_ Formulating the objective of the study (what the study is about and why is it being made?)
- \_ Designing the methods of data collection (what techniques of gathering data will be adopted?)
- \_ Selecting the sample (how much sample will be needed?)
- \_ Collecting the data (where can the required data be found and with, what time period should the data be related?) Processing and analyzing the data.

### **1.9.5.4 Design of Experimental Studies**

The term 'experiment' is frequently linked with library and Information science. The investigator of the experimental method is able to observe and measure the effect of manipulation of the independent variable on the dependent variable in a situation in which the operation of other relevant factors is held to a minimum. Experimental studies are most suitable for testing the causal hypothesis. A hypothesis of causal relationship asserts that a particular characteristic or occurrence is one of the factors that determine another characteristic or occurrence. The purpose of experimental

studies in library and information science is to test a hypothesis of causal relationship between variable

### **1.10 Research Problem of the Study**

Today it is virtually not possible for any library however big and rich, to acquire all the publications. That is required for a comprehensive coverage of all subject fields or to keep up with the rapid rising flow of new publication. No library as such can claim to be self sufficient in meeting all the information needs of its clientele. Therefore the sharing and networking of libraries have become the necessity of the day.

Considering the needs, purposes and importance of network and the difficulties faced by the university libraries in Iraq have compelled the present researcher to select the topic “Network of University Libraries in Iraq”.

However the objectives of Network of university libraries have been achieved as well as it has stated its problems, lacunas and ways to overcome. The term problem is derived from the Greek word "proballei" which means anything thrown forward; a question proposed for solution; a matter stated for examination. R.S. Woodworth defines problem as "a situation for which we have no ready and successful response by instinct or by previously acquired habit." In brief in library and Information science problem, means the state of situation one could not find a solution. Thus, the necessity is the mother of innovation. In other words, without a problem, research cannot proceed because there is nothing to proceed from and proceed toward. In research process, the first and foremost step happens to be that of selecting and properly

defining a research problem?

A researcher must find the problem and formulate it. To define a problem correctly, a researcher must know: what are the problem?

There is lack of networks among university libraries in Iraq, so the problem is

determined that the university libraries are not enough to satisfy the users need. In addition to the repetition occurs in all procedures. Functions by the library on each unit lead to the waste of efforts and financial resources and materials

## **1.11 Hypothesis**

A hypothesis is a piece of theory; it is a theoretical statement. It tells us where to look for if we want to find some particular sort of experience. Hypothesis is "a human devise for anticipating the events that are about to happen to use". A hypothesis has the general form: "If this happens, then one will (with some probability) find himself observing that. An equivalent form is: "Suppose I were to do this: what would case? Would that perhaps occur?" The important thing about this mode of expression is that it is tentative and exploratory. The chief idea is not to "prove" that an idea is "true", but to open oneself to new possibilities and contingencies.

### **1.11.1 Definitions**

Goode and Hatt say, "Hypothesis is a shrewd guess... that is formulated and provisionally adopted to explain observed facts, or conditions, and to guide in further investigations".

In the words of George Lundberg, "A hypothesis is a tentative generalization, the validity of which remains to be tested. In its most elementary stage the hypothesis may be any hunch, guess, imaginative idea, which becomes the basis for action or investigation".

According to Webster "A hypothesis is a proposition, condition or principle which is assumed, perhaps without belief in order to draw out its logical consequences and by this method to test its accord with facts which are known or may be determined". Goode and Hatt have defined it as "a proposition which can be put to test to determine validity". In very simple terms Kerlinger states "A hypothesis is a conjectural statement of relation between two or more variables. Hypotheses are always in declarative sentence form, and they relate either generally or specifically variables to variables".

### **1.11.2 Need and Purpose**

Cohen and Nagel's statement that "we cannot take a single step forward in any

inquiry without a hypothesis may well be an accurate statement of the value of hypotheses in scientific investigation, generally but it does not do justice to an important role of scientific research, which is the "formulation of hypotheses".

### **1.11.3 Hypothesis of the Study**

A hypothesis than could be defined as" an expectation about events based on generalizations of the assumed relationship between two variables. The hypothesis is meant to provide the researcher with an opportunity in advance of the actual data collection, to predict the results of the study. These predictions of the results are called the hypothesis of the study. From above, we find that a hypothesis is a shred guess or inference or (ii) a tentative generalization or (iii) an expectation about events or (iv) prediction of the results of the study. A hypothesis is a tentative generalization about the relation between two or more variables. Which can be observed empirically a hypothesis is never proved, it is merely sustained or supported or rejected. In case it fails to meet the test of validity, then it has to be either modified or rejected.

### **1.12 Data Collection Technique**

Choosing an appropriate data collection technique or set of techniques is the most important activity when developing a broad research plan, and may also be the most difficult. It is here that the recursive nature of qualitative research becomes most apparent. According to Marshall and Rossman ,research problems and research questions can be divided into four types: exploratory, explanatory, descriptive and predictive. Each of these types in turn is most suitable for investigation by two or more data collection techniques

Research Problems	Research Question	Data Collection Techniques
<p><b>Exploratory</b></p> <p>To investigate little-understood phenomena, to identify important variables</p>	<p>What is happening in this programmed? What are the salient themes, patterns, categories in participants measuring structures? How are these patterns linked with one another?</p>	<p>Participant observation In-depth Interviewing</p>
<p><b>Explanatory</b></p> <p>To explain the forces causing the phenomenon in question to identify plausible causal networks shaping the phenomenon</p>	<p>What events, beliefs, attitudes, policies are shaping this phenomenon? How do these forces in tract to result in the phenomenon?</p>	<p>Participant observation In-depth Interviewing. Survey questionnaire Document analysis</p>
<p><b>Descriptive</b></p> <p>To document the phenomenon of interest</p>	<p>What are the salient behaviors, events, beliefs, attitudes structures processes occurring in this phenomenon</p>	<p>Participant observation In-depth In Interviewing Document analysis. Unobtrusive measures. Survey questionnaire</p>
<p><b>Predictive</b></p> <p>To predict the overall outcomes of the phenomenon to forecast the events and behaviors resulting from the phenomenon</p>	<p>What will occur as it of this phenomenon? Who will be affected? In what way?</p>	<p>Survey questionnaire. Kinetics polemics. Content analysis</p>

The data collection Technique is the sum of the means and tools to be adopted by the researcher to obtain the information needed to understand the problem and solve/the most important tools used in this study.

1 Documentary source: It can be divided into three types

- Primary sources of information, which includes documents, reports, research and academic communications and conferences and other events. These sources contain information or data about the history of university libraries in Iraq.

- Secondary sources of information, which relies on primary sources materials, including books and the preliminary study references and others, talking about the history of library networks and the most important test of global, regional and local elections in this area.

- Sources of information of the third degree, and those sources that guide researchers to primary and secondary sources including indexes, abstracts, bibliographies and university libraries guide-books.

2 Electronic sources : They all acquaintance from the traditional sources of information- paper and paper stored electronically on magnetic media or laser committees paperless and also stored electronically if production of exporters or diffusion (authors and publishers) in the files of databases and information banks did available to the beneficiaries through direct contact or persons in the library or information center such as database, CD-ROM, multimedia in different types Which was used in this study to determine the relevance in the university libraries in Iraq.

3 The questionnaires and queries: It is a group of words or sentences, which represents one of a room or gives life to members of a particular research cascade. The queries are always ask for something, or the fact or personal knowledge or experience of the members for the search is not available in public or apparent as is the case with previous polls and questionnaires and often come these queries in the form of questions and sequenced. In this study, the questionnaire in twoparts:

First: the questionnaire sent to the directors of university libraries contain a number of questions about the library in terms of activity, functions, sections, staff and the services they provide to beneficiaries and their views on the building of a network of information.

Second: the questionnaire sent to a sample of graduate students the services provided by libraries, to know their views on the network.

4 Personal interviews: It usually means oral directly or telephone for the collection of data an individual question about information not available in books or other sources. Interview technique was used in this study. Interview was taken of some officials and university librarians to obtain some information for research.

5 Observation: The tools or models usually written by the researcher often use in evolutionary studies and pilot, respectively, then watch descriptive view the census and registration of specific types of behavioral tool in any form or as soon as available data of interest to the researcher. Researcher used in a note the reality of university libraries in Iraq in order to assess the possibility of linking the library network

6 Reading and analyzed study: using these tools in historical studies and descriptive often, as there are documents and written and visual records, which recognize the validity of the data. It is the purpose of analysis to reach the internal and external validity of the document and inventory data of interest to the problem studied in the search. Library records, budget and its statistics have been used to access information of each library included in the study.

7 Modern technological means: the means are Internet, Database, films, videos and audio recordings have been used to serve as sources of data for the study.

### **1.13 Research Methodology**

The research methodology has been followed in this study for achieving the objectives of the study are as under:

\_ The researcher carried out the literature survey to acquire history & development of higher education and its libraries as well as recent trends pertaining to the area of study.

\_ The researcher discussed with library & information professional, as well as the computer experts regarding technological application in libraries.

\_ To collect primary data researcher prepared the questionnaire & circulated to all

the university libraries covered in the study.

\_ The researcher visited university libraries in Iraq for observation, interview & to collect questionnaire.

References:

1. <https://shodhganga.inflibnet.ac.in/bitstream/10603/97412/5/chapter%203.pdf>.
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