Research Methodology

1. Work Plan

The steps taken by me as the preparatory work for my research project as follows

1. Prepared the Thesis Layout for my Ph.D. project titled “Handling of Security Threats for Distributed Database” by consulting the supervisor.
2. Complete the work plan for my Ph.D. project that will be complete in the guidance of Supervisor.

3. Complete the Introductory study of all the aspects related to my research project and also doing the practical work.
4. Detailed study of research papers published and thesis of various scholars concerned about my research topic.
5. Find out the work which is yet to be done related to my topic with the help of national and international conferences, in which senior scholars/lecturers/ Professors narrated about their study, which is very useful to my research project.
6. Prepare the protocols of my research topic with the help of my Supervisor and research committee.
7. Doing the study and analyze the papers published previously in various Universities, Institutes and Organizations.
8. Attends the various National and International conferences organized by different Universities, Institutes and Organizations.
9. Prepared a research paper titled “MECHANISM FOR BUILDING THE SECURE DATABASE” for the international conference organized by IMT Faridabad, Haryana, India.
10. Complete the 10 days course work is organized and held by the principal investigators of the PhD program. It takes place once a year and is compulsory for all first-year students. It is an effective introduction into the various fields offered in this program. It should bring all students to an equal level and give them the necessary theoretical background for a good project start. It covers all the important aspects of the Research Methodology.
12. Evaluation Phase.
13. Changes to the core.
14. Writing the thesis.
2. Hypothesis

PhD is a unique degree in that it is not focused on acquiring more knowledge. A Masters essentially provides more knowledge or more in-depth knowledge in a subject. But doing a PhD is oriented around research. Due to the focus and importance of research in PhD, it is often believed that creating new knowledge is the main goal of PhD. Though creating new knowledge is part of the PhD training, the main objective of doing PhD degree is to become a competent researcher who can conduct independent research in my area. If I go by the premise that the purpose of a PhD program is to produce competent researcher, then the research done during PhD is primarily for contributing towards this goal and the nature and sophistication of the research output is less important. What is important is to learn to properly formulate a problem and apply suitable techniques to produce results that further the state of understanding about that problem. The Hypothesis follows for the research work:

- Management of distributed data with different levels of transparency.
- Increase reliability and availability.
- Easier expansion.
- Reflects organizational structure — database fragments are located in the departments they relate to.
- Local autonomy — a department can control the data about them (as they are the ones familiar with it.)
- Protection of valuable data — if there were ever a catastrophic event such as a fire, all of the data would not be in one place, but distributed in multiple locations.
- Improved performance — data is located near the site of greatest demand, and the database systems themselves are parallelized, allowing load on the databases to be balanced among servers. (A high load on one module of the database won't affect other modules of the database in a distributed database.)
- Economics — it costs less to create a network of smaller computers with the power of a single large computer.
- Modularity — systems can be modified, added and removed from the distributed database without affecting other modules (systems).
- Reliable transactions - Due to replication of database.
- Hardware, Operating System, Network, Fragmentation, DBMS, Replication and Location Independence.
- Continuous operation.
- Distributed Query processing.
- Distributed Transaction management.

3. Methodology
Research methods can be broadly classified as follows:

1. Descriptive vs., Analytical
2. Applied vs. Fundamental
3. Quantitative vs. Qualitative
4. Conceptual vs. Empirical

**Descriptive vs. Analytical**

Descriptive research includes surveys and fact-finding enquiries of different kinds. The major purpose of descriptive research is description of the state of affairs, as it exists present. The main characteristic of this method is researcher has no control over the variables; he can only report what has happened and what is happening. Most ex post facto research projects are used for descriptive studies in which the research seeks to measure such items as frequency of shopping, preferences of people, or similar data. Ex post facto studies also include attempts by researcher to discover causes even when they cannot control the variables. The methods of research utilized in descriptive research are survey methods of all kinds, including comparative and relational method. In analytical research, the researcher has to use facts or information already available and analyze these to make a critical evaluation of the material.

**Applied vs. Fundamental**

Research can either be applied research or fundamental research. Applied research aims at finding a solution for an immediate problem facing a society or a business organization. Whereas fundamental research is mainly concerned with generalizations and with the formulation of a theory. Research concerning some phenomenon or relating to pure mathematics are examples of fundamental research. Similarly, research studies concerning human behavior carried on with view to make generalizations about human behavior are examples of fundamental research, but research aimed at certain conclusions facing a concrete social or business problem is an example of applied problem.

**Quantitative vs. Qualitative**

Quantitative research is based on the measurement of quantity or amount. It is applicable to phenomena that can be expressed in terms of quantity. Qualitative research is concerned with qualitative phenomenon. For example when we are interesting in investigating the reasons for human behavior.

**Conceptual vs. Empirical**

Conceptual research is that related to some abstract idea or theory. It is generally used by philosopher and thinkers to develop new concepts or to reinterpret existing ones. On the other hand the empirical research relies on experience or observation alone, often without regard for system and theory. We can also call it as experimental type of research. In such a research it is
necessary to get at facts firsthand, at their source and activity to go about doing certain things to stimulate the production of desired information. Empirical research is appropriate when proof is sought that certain variables affect other variables in some way.

The choice of a basic framework for a study is made in the light of the problem that is specified. Whenever the researcher sets out to study a situation as it currently exists, the framework of the study is “descriptive”. Descriptive research, in addition to describing, interprets present conditions. Included with the study of conditions is study of relationships, present practices, attitudes and trends that seem to be developing. Conclusions for descriptive studies are based on results of data analysis which interpret by comparisons, contrast and causal-effect relationship.

Since the present study is one related to describing conditions as they exist, the descriptive approach has been selected.