**Summary**

Chapter 1 of the book gives an overview of what research is, which is in basic terms nothing but search of knowledge. There are mainly 4 objectives of research, to gain familiarity of a particular subject, to get the characteristic of a particular group, to determine the frequency of occurrence and to test a hypothesis. It also gives a brief look on what makes people interested in research. It then gives information about different kinds of research such as Descriptive, Analytical, Applied,Fundamental, Quantitative, Qualitative,Conceptual ,Empirical and other types of research. There are various approaches to conduct research, such as qualitative and quantitative approaches. The chapter also gives data on why research is important and where all are the research applicable such as economics and science. Decision making also results as an outcome of research but not totally depended on it. People in various fields do research such as research students,professionals,philosophers,literary people and intellectuals. There is a difference between research methods and methodology.

Research methods means the techniques used to conduct research whereas research methodology is the way in which we systematically solve a problem. By reading the chapter we can also understand how Scientific and Research are interconnected, such that they are closely related.The scientific methods involves several constraints such as it depends on empirical evidence, utilizes relevant concepts,supports ethical neutrality, results into predictions , required for critical scrutiny and also formulate scientific theories.The scientific method is free from personal opinion. To produce proper results one should know how a research is conducted. This also further helps us in evaluating research. Thus we will be able to judge a particular outcome of a research.The first Step in any research is to formulate a research problem, in which there are two kinds which are closer to the state of nature and which are related to variables. A talk with colleagues is the best way to formulate it. We can also seek information from a guide.He will also evaluate the conceptual and empirical literature. In order to formulate a research topic it has to be done iteratively, each one more specific than the previous one.The next step in research is to conduct an extensive research survey .

Once we formulate we have to write it down, like a brief summary. In a more accurate way we have to write a synopsis.For this particular research one can seek the help of a library. The third step is the development of a working hypothesis, this is done to test the logical and empirical and logical outcomes. It provides a central point for the research. Hypothesis helps a researcher to be specific and to identify his limits and boundaries. Tools which could help this are colleagues and experts on a particular topic, examination of collected data, to collect data on researches conducted related to a particular topic and also to conduct personal investigation. The next step is to create a design on how the research is to be done, a researcher has to have a conceptual framework for his research. This depends on research purposes such as exploration, description , diagnosis and experimentation. We have to make sure that we reduce the bias and increase reliability of the data.

The design work involves collection of information,skills of researcher ,how things are organized, the time available to conduct research and the expense of a research. The next step involves collection of samples, this means to collect a template and sampling. This is followed by collection of actual data via various methods such as observation , personnel interview etc.The following step is the most important part which is the execution of the actual project, the research has to be time constrained and accurate. From the collected data we have to perform analysis, this involves deriving and categorising the data. After this hypothesis testing is done, which involves checking whether the actual fact supports the hypothesis or is it opposite. This is done by various tests such as chi square test, t test, f test etc. After this we have to perform generalization and interpret the data and finally prepare a report of the search concluding our findings. The chapter also gives information about how we identify good research and the scientific community expects certain criterias to be satisfied. We can conclude that good research has to be systematic and logical. It has to be empirical and replicable. The chapter concludes with the various problems encountered by various researchers in India.

Chapter two starts with a general definition of research problem.In conclusion a research problem is the one which a researcher is required to find out the best solution. To select a particular problem we have to identify the topic in such a way that it shouldn't be a topic that is overdone or had extensive research done on it. It shouldn't be a controversial topic. It shouldn't be a small topic and should be very clear. iT should be familiar and feasible. The time and cost involved. We should conduct a preliminary study . We should also understand why we have to define a particular problem, whenever we define a problem correctly it is almost ha;f solved.Then only we will be able to formulate a problem correctly and carry out the research smoothly. There are various ways in which we can define a problem.

First we have to make a statement of the problem in a general way. Then we have to understand the characteristics of the problem such as its origin. A discussion with people related to a particular problem will be better. By use of available literature one can identify related theories of a particular problem. This will help in enhancing ones already acquired knowledge. This is further preceded by developing ideas through discussions, a discussion brings out useful information. This also helps one to focus his attention on specific aspects of the problem. One will be able to identify the tools and techniques used for research. The next step involves rephrasing a research problem.With the help of rephrasing helps in working on a hypothesis. Through the end of the chapter an illustration is provided . In conclusion from this chapter we will know that to conduct research we have to follow a systematic approach and we require specific formulation in realistic terms. By following this approach one will be able to conduct meaningful research and also develop a working hypothesis which in turn solves the problem.

**Research Problem: Offline authentication of payments.**

**How can we improve our payment authentication system to make it faster and safer even in places where the network coverage is low.**