Methodology

Following is the methodology for the proposed research work to design an EMS system based on principles of Data warehousing and Data mining:

- Population

  The population comprises of Middle & Higher level employees working in Maharashtra governments.

- Sample Size

  The sample set comprises of department of Maharashtra Government; the study will be based on departments in state. The sample will be subdivided as class III employees, class II employees, class I officers & secretariat. Total sample size will be more than 300 & not more than 700 government employees.

- Sample technique

  The middle level employees of the government are divided into different strategy groups based on their designation; therefore the sampling technique used for this research is Non Probability Stratified Random Sampling.

- Sources and Methods of Data Collections

  The primary data will be collected through structured questionnaire and by interviewing the employees of the government. Secondary will be collected from various books, application handbooks, journals, periodicals, magazines and websites etc.
Role of Research in Decision Making

Decision-making is the process of selecting the best alternative from the available set of alternatives. Management is chiefly concerned with decision-making and its implementation. These decisions should be based on appropriate studies, evaluations and observations. Research provides us with knowledge and skills needed to solve the problems and to meet the challenges of a fast paced decision-making environment.

Data Collection – The relevant data for the research will gathered from following sources:

- Books
- Research Papers
- Corporate white papers
- Corporate case studies

Data Analysis – Following steps will be followed for analysing the collected data:

- Various types of Data Warehousing and Data mining techniques will be analysed based for following attributes:
  - Type of Application
  - Type of data
  - Data Volume
  - Resources available
  - Performance requirement of the application
• Processing required on data
  
  o Based on the above research, the EMS system will be designed which will be able to get the examination result data from various Universities and produce analytical environment to answer the critical queries required for planning by Central Education Department of India.

1. Organization of the Thesis

The thesis is organized as follows:

- **Chapter 1:** In this chapter, a historical perspective of Database systems and Information Systems, the milestones of the research work carried out in this area. We also discuss the need of data warehousing, data mining and KDD environment in Indian universities and introduce the common terms, concepts used in the thesis.

- **Chapter 2:** This chapter highlights the requirements of data warehouse and the structure required in our academic setup.

- **Chapter 3:** In this chapter we discuss the need of KDD and data mining for academic analysis and the process of KDD. Further, we introduce new five rules for setting up reliable Data Mining environment, KDD process in detail and discuss the relevance of human interaction in various stages KDD.

- **Chapter 4:** Here, after providing the basic introduction to Data Mining we discuss the various methods & techniques used for data mining. Further, we discuss the basics of Predictive Data mining and the way we used discovery-driven and verification driven data mining in Examination Management System.
• **Chapter 5:** In this chapter, we describe the design and development of a Data mining tool Examination Management System for education department. We also describe new algorithm for computing deviation in data. Further discussions are made on the security aspects, software volume, data volume and generality of Examination Management System as well as scalability and performance of the system.

• **Chapter 6:** In this chapter we describe the typical queries that are obtained from Examination Management System and discuss the impact of such analysis.

• **Chapter 7:** This chapter provides the experiences in the use of Examination Management System, difficulties faced while updating data and applications of Examination Management System.