Chapter 1: Introduction

1.1 Introduction

In all over the world, the Open and Distance mode of learning is becoming more and more popular day-by-day. The modes of learning are now directing towards this mode which is basically online. In case of modes of learning, there are different concepts which are coming-up. One of such concepts is “Blended Learning” which combines the face-to-face teaching methods and Online Learning methods. This instructional model is proving highly effective for the educational institutions for meeting the challenges of student achievements with limited resources.

Here, in the system, the question database is not a single one; instead a number of heterogeneous/homogeneous databases are integrated to make a common distributed environment. Depending upon the student’s academic history and previous assessment records, this system, EESOA, fetches questions from the question databases intelligently using agent technology and presents to the student for assessment.

1.2 Objective

This thesis undertakes a comprehensive study of agent, which also includes mobile agent, its different design patterns and different agent platforms those exist today. This thesis also covers integration of agent technology with expert system for online assessment. This research is basically an approach for designing and developing an agent based expert system for
online assessment which can assists in authoring and storing various questions of different topics of different subjects, assembling questions for the students intelligently and to assess the student by providing some feedback.

The objectives of the thesis can be summarized as follows:

- Study of Distributed Database Environment.
- Study of Agent Technology and its variance.
- Study of different Design Patterns for Mobile Agent.
- Designing a framework for web-based expert system in distributed environment using agent technology.
- Developing a system to provide fair assessment method for online assessment system.

1.3 Scope of the Thesis

The scope of the thesis is summarized in accordance with stated objectives:

- The study and survey of all the components related to agent-based expert system.
- To build a framework that is able to support agent-based application and allow the assessment system builds on top of this framework.
- To study expert system & agent technology and to design a framework for online assessment.
• This research not only includes the development of mobile agent but also static agent which will be acts as a query component to perform on every local database associated with.

1.4 Problem Statement

In ESOA, this challenge is met with very effective manner. But as we know, the increasing demands for Open and Distance Learning give birth to many Open Universities those provide distance learning courses. Not only that also many existing universities have their own section to provide Open and Distance learning. Since, this age is the age of computer in layman term, so it can be expected that each and every Open and Distance University and Dual Mode University are more-or-less computerized. Assuming also that they, the Universities maintain their students' database as well as also have question database. If it so and anyhow any interconnection can be made between the question databases of different Universities then the size of the question database as a whole will be beyond imagination. But difficulty will be many, i.e., the database management system used by the Universities will not be the all same and also the structure of the question database will differ. So, there is a need for techniques to use the resources from the question databases from various universities and present them to the learner during self-assessment process.

1.5 Thesis Organization

This thesis consists of nine chapters including this introductory one. Overviews of the subsequent eight chapters are described briefly below:
Chapter 2: Literature Review

This chapter contains the literatures related to the thesis. It includes all the conducted literature reviews on the areas which are necessary for or have relevancy to my research work. Here, I have tried to present as much of literatures as possible, those who were gone through.

Chapter 3: Agent Technology & Expert System

This chapter gives a comprehensive review of the literature in agent technology and expert systems;

Chapter 4: Mobile Agent & Distributed Environment

This chapter gives a comprehensive review of the literature in mobile agent technology. This chapter also presents the concept of Distributed Environment in relation with heterogenous Database Management Systems;

Chapter 5: Agent Development Frameworks & JADE

This chapter discusses different Agent Development Frameworks. In this chapter, the Java Agent DEvelopment Framework (JADE) is also discussed in detail as it is the Agent Development Framework I have used in my research work.

Chapter 6: Architecture & System Design of EESOA

This chapter focuses on the Architecture, Framework and System Design of the proposed Agent Based Expert System, EESOA.
Chapter 1: Introduction

- **Chapter 7:** System Development & Implementation of EESOA

This chapter discusses Development and Implementation of the proposed system, the EESOA.

- **Chapter 8:** Testing and Evaluation of EESOA

In this chapter discusses how the developed system, EESOA, is tested and evaluated.

- **Chapter 9:** Conclusion & Future Work

This chapter discusses the merits and demerits of EESOA. Here also the future research works in the extension of EESOA are discussed.

1.6 Publications

The following papers were published during the course of this thesis:

