

## **CHAPTER 3**

### **PROBLEM STATEMENT**

This work consists of two web based systems. They are Generic E-Learning system and Semantic Search Engine system. The main objective of this thesis is to develop the Generic E-Learning frame work and semantic search engine. The objectives of the problem statement are defined as follows.

#### **3.1 E-LEARNING FRAMEWORK USING LAYERED APPROACH**

The proposed work is to develop domain and content independent E-Learning framework for all environments. The proposed E-Learning framework is constructed using layered approach. The proposed layers are presentation layer, service layer, specification layer and resource layer. Each layer consists of different process components such as standard interface, content management system, delivery specification component, evaluation management component, user data repository, content repository etc. The proposed system is called generic framework because the learning content irrespective of domain can be created using this learning framework. This work aims to provide E-Learning delivery infrastructure. It also provides knowledge about implementation of E-Learning and management. Using the proposed E-Learning system, the multi way knowledge is gained through video, audio, picture and animations. It emphasizes on evaluation schemes. The maintenance is easy and the deployment is fast. It is a service and component based framework. The solution to this problem statement is addressed in Chapter 4.

### **3.1.1 Objectives of E-Learning Framework**

The objective of this E-Learning framework is not to replace the existing learning practice but to nurture the existing teaching and learning process. In other words, it is a move to take the current learning practice to the next level with help of advanced technologies. The main aim of this framework is to deploy the E-Learning system rapidly with less effort and at the same time not compromising the quality of learning practice. This framework ensures the extensibility, portability, compatibility and adoptability. This research work aims to minimize technological reworking using a well-defined interaction framework. This work is a fair attempt to provide perfect domain independent framework for E-Learning environments. The outcome of this work will be the analysis model enriched with existing E-Learning standards. Analysis model is based on newly proposed E-Learning architecture. Moreover, it includes the guidelines to deploy this framework. The solution to this problem is addressed in Chapter 4.

### **3.1.2 Motivation towards This Work**

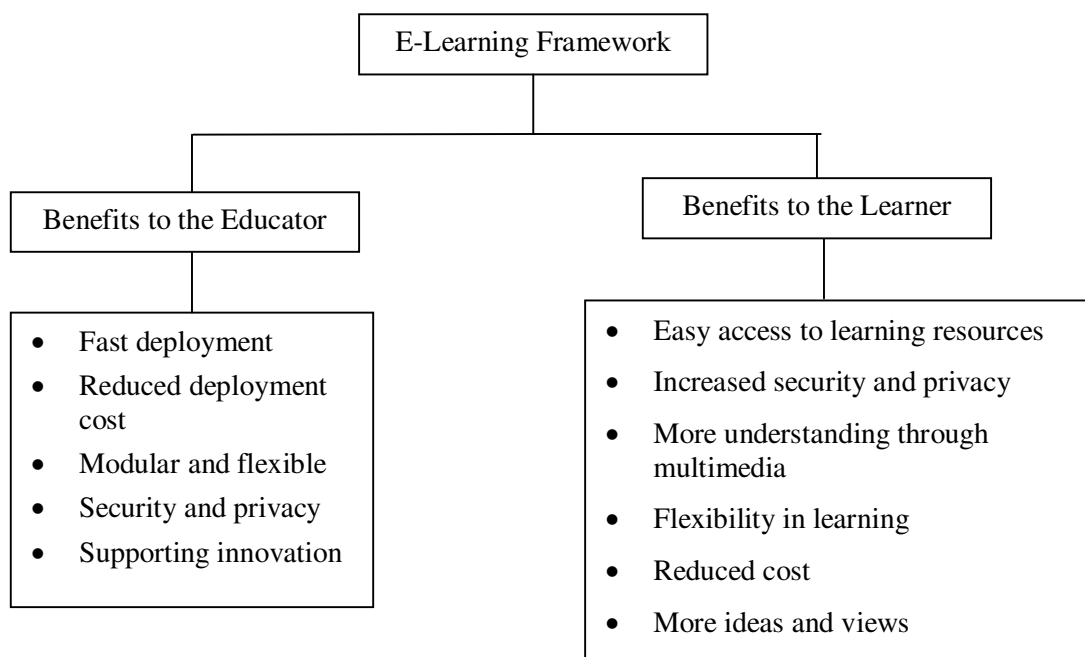
There are a number of trends impacting the increased use of E-Learning. Educational institutions have found the capacity of existing classrooms limited and the cost of building new ones is sometimes prohibitive. In addition, today's learners, especially younger ones, expect to use computers in their learning, while adults have begun to heavily use the Internet for just-in-time learning. But still the web engineering area has not grown like image processing, networking, pattern recognition, etc. The following reasons may be the cause for such backlog

- Existing Standards are immature.
- There is no adequate coordinated effort to bring the web engineering to the fore like other research areas.
- Little attention than actual demand.
- Changing requirements and more diversity of various learning domains.
- Depends on growth of multimedia and networking technologies.
- Mindset of people.

Hence, there is a vast chance for new researchers to confront more challenges and to take part in the web engineering area.

### 3.1.3 Benefits of the Proposed Work

The proposed work will enable remote learning. It is cost effective and makes use of expert knowledge. It will also reduce human intervention and improve the quality of education. Since the components are reusable, maintenance cost is very low. Specific benefits are given in the figure below.



**Figure 3.1 Benefits of E-Learning Framework**

### **3.1.4 Necessity of E-Learning Framework**

This E-Learning framework is a roadmap for decision-makers at every level of the education spectrum to adopt a framework which provides for a stable, flexible, scalable, and proven E-Learning delivery infrastructure and the knowledge necessary to implement and manage such a system. The framework addresses the reality of heterogeneous hardware and software environments found in all educational institutions, many of which are not replaceable, but still vitally important to the institution to continue using. Most importantly, the framework provides a means for decision-makers to ensure the satisfaction of many different types of users in the campus community by providing an easy and reliable Internet-based method to create and access learning. This focus on the learner, not the technology, is the key to any successful E-Learning implementation.

## **3.2 SEARCH ENGINE USING SEMANTIC CONCEPTS**

The second part of the thesis is the development of a search engine using semantic concepts. In recent years, people are in thirst of getting information from the internet. Search engines are used to fulfill the need of them. Even though the conventional search engines are used to retrieve the information, the people will get irrelevant information also for their query. Semantic search engine is used to retrieve the relevant information.

### **3.2.1 Objectives of Semantic Search Engine**

The main aim of development of semantic search engine is the improvement of learning process through the web. The main objective of this work is to enhance the search engine using semantic web concepts. The proposed work is a fair attempt to develop the semantic search engine using domain knowledge. It is aimed to retrieve the information in a well-defined

meaning, highly specific and machine understandable. The proposed work also filters the irrelevant documents. The comparative analysis is being carried out to ensure the effectiveness of the proposed approach. The solution to this problem is addressed in Chapters 5 and 6.

### **3.3 CONCLUSION**

This chapter describes the objective of this research and significance of the thesis work. Also, it depicts the motivation towards this research work. The next chapter describes the methodologies for the development of Generic E-Learning Framework.