

Cognitive Search E-Learning Framework

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ABSTRACT

Technological advancements have made increased internet usage around the world in recent times and individuals use internet search engines as primary medium of reference for clarification of concept and knowledge level doubts. Rarely printed books are used for such purposes and its usage is fading out. However technology should help the learner to gain knowledge fully and effectively. Many learning initiatives were emerged with content based learning. Mobile based learning also came in the form of smart phone applications. Even though, these E-Learning/M-Learning systems couldn't meet the learner's preference in using contents, some of the E-Learning systems cater to learning styles of users like VARK. This may help to frame the customized learning system according learner's need. But these systems couldn't adapt to the dynamic behavior of the individual learner. In technical education, the learner should understand each of the concepts related to the domain or particular subject. To satisfy this, we have proposed a framework that performs cognitive approach in e-learning. This helps the learner to get motivated and choose learning preferences and choice of learning materials which is already available in internet. This framework is intended help the learner to gain adequate knowledge about the subject or domain to any level of depth. The learner has sufficient freedom to use this learning framework and expected to achieve the intended learning outcomes effectively. This research study also proposes a unique assessment type of learning with concept mappings. We have proposed some combinations of unsupervised and supervised learning algorithms for the self evaluation at the time of learning.

General Terms

E-Learning, M-Learning, Learning styles, VARK, Supervised learning, unsupervised learning.

Keywords

Meta data, Subject Matter Expert, Electronic Book

1. INTRODUCTION

Learning is a continuous process in every area. Due to the advancement of technology and the availability of the Internet, learning becomes smarter in every decade. Learners prefer self learning and the internet itself provide every contents. Smart mobile phone platforms are rich with learning materials. Learning situation is unpredicted. Now it is more convenient for every student to design a learning framework in an hour. With the rapid development of technology and learning methods has been changed. Tutors play an important role in addition to classroom teaching methods in E-learning, regardless of learner's different learning style. In this paper we discussed the various learning solutions with innovative searching framework.

2. MOTIVATION

In addition to the self learning the registration of online courses are increased. But the completing of the course count is not exactly with the registered numbers. Learners ultimately have different knowledge before starting the online courses [1]. The web searching results couldn't meet the real need of the learner. As a learner his/her preference is change from time to time. Web search results are general and static depends on the searching words. Some semantic & customized search engines may leads to solve the problem. But in that also the search results are repeating and static. [2] If a system design and develop with intelligent methods of searching and content viewing could be more productive.

3. LEARNING PREFERENCES

3.1 Web search engines

Web search engines are the first choice for the generation learners. They retrieve pages from HTML markup, which many web pages that search engines work by storing information. These pages (sometimes also known as a spider) are a web crawler [3] that follows every link on the site that is an automatic web crawler. Questions about the use of web pages, the data are stored in an index database. A query from a user can be a single word. Index as early as possible helps to find information related to the query

3.2 Role of Meta data in web searching

Every web results have its own reason. The Meta data plays the essential role in web searching results. The priority and the ranking also related to the meta data used in the files or pages in web. It is not possible to add metadata to the third party reputed learning contents.

3.3 Keywords the matters

Keywords are the search queries to perform needed results. Moreover, every search results based on the keywords which we searching in query. For example if we search "java" with the intention of computer language the search results will also covers "island Java". Usage of exact keywords are comes only in practicing [4]. Due to semantic and customized searching the pre-knowledge of keyword usage is limited. The domain expert has the knowledge to use of keywords effectively. If a domain expert give the guidelines of keyword usage could be better for exact result.

3.4 Online courses

There are plenty of online technical platforms has been emerged. Coursera,[5] Edx[6] an many dedicated learning portals are using by learners. The successful of the online courses are getting lower even it covers all the topics in the subject or domain. The searching options are available within the course contents. The results of the internal search gives narrow results which is not like web search engines.

3.5 Mobile learning by APPs

Smart phones are the well connected learning platform by its applications. Slowly it replaces the laptops and desktops. The mobile learning platforms [7] are emerged due to the economical behaviors. Millions of android apps, iphone apps, and microsoft mobile apps are dedicated for learning needs. It gives the positive impact on next generation learning technologies.

4. EXISTING WORKS

According to Barb Arth, The report on : The Business Impact of Next-Generation e-Learning 2011,[8] he describes e-learning is typically categorized by Shorter, multi driven, on-

demand, environmental, and mobile learning. In the asynchronous and synchronous learning the learning material only plays main role. At the addition it has to add some motivation which is extra effort for content developer. The learning contents are narrowing based on the content developers learning style.[8] The mobile learning platforms simply cover all the topics which is related to the subject. Some apps provide interactive contents that it gives the feel like one-to-one learning. Even though, it doesn't cover all the aspects about the subject.

5. PROPOSED FRAMEWORK

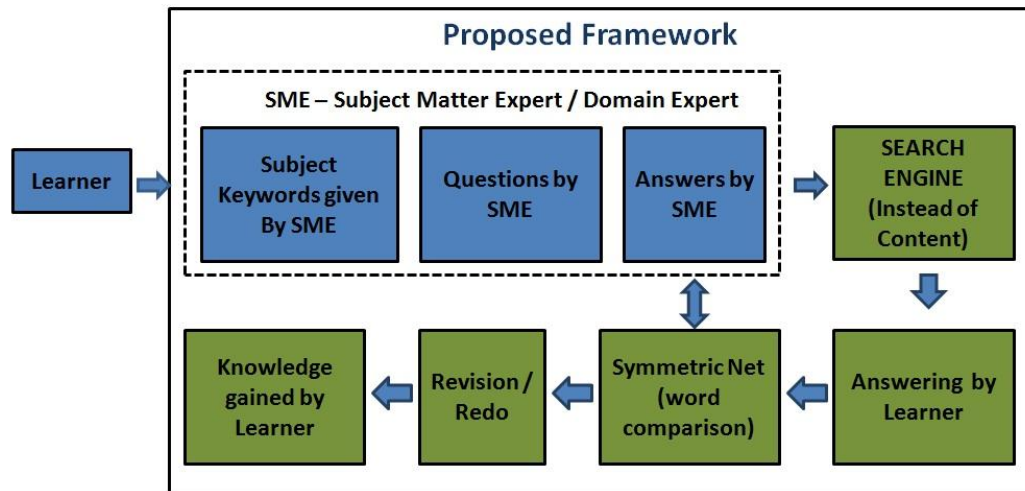


Figure 5.1 Proposed systems

In figure 5.1 denotes the proposed framework for the Cognitive search e-learning framework. Subject Matter Expert plays main role in this framework. Normally SME used to create the learning contents. But in our framework the SME should create the keywords for the searching queries, questionnaires and answers. Learning will happen by the search engine which is also the part of our framework. At some point of view customized search engine also may use.

Learners should not type any keywords in the search engine. Once if he/she selects the topic which is given by the SME search results will appear. Based on the learner's preference the multimedia content can be select. After learning the learner should answer the already prepared questionnaires by SME. This leads to the smart way of learning.

5.1 Cognitive search engine

Cognitive behavior of SME to choose the keyword is recorded to the customized search engine. The framework become smarter because of cognitive behavior of SME is added in the framework.

5.1.1 Learner centralized system

The bigger role in this framework is learner. He/she should answer the questionnaires asked by the SME. If he/she doesn't answer for the questionnaires the learner couldn't jump to the next topic.

5.1.1.1 Meets the Learners dynamic behavior

In the traditional e-learning system behavior of the learners is one of the criteria for making the learning content. But in this CS e-learning framework we are not provide any leaning content. The SME is providing his own knowledge what to learn. The learner have their own choice that how to learn.

5.1.1.2 Expected outcomes

If the system implement in the technical education the learning needs will be fulfill. Finally, every learner becomes SME due to the transform of the knowledge by our framework.

6. IMPLEMENTAION

CS framework, the following steps are involved in learning. Figures from 6.1 to 6.6 are the sample implementation of our CS e-learning framework to learn core java language.

1. Initial stage: selecting the topic
2. Searching: keyword searching already developed by SME
3. Getting search results : by customized keywords
4. Learning: dynamic contents learning
5. Predefined questions generation : given by SME
6. Answering the questions: valuation of learner
7. Verifying by semantic: with SME answers
8. Redo / next: continue learning

The learning time may differ depend on the learner.

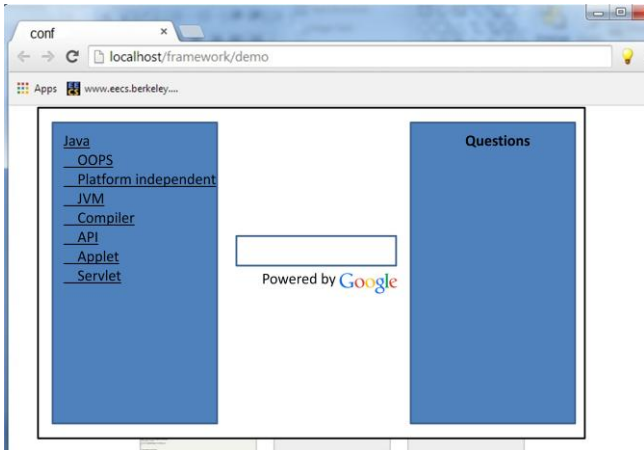


Figure 6.1 Initial stage

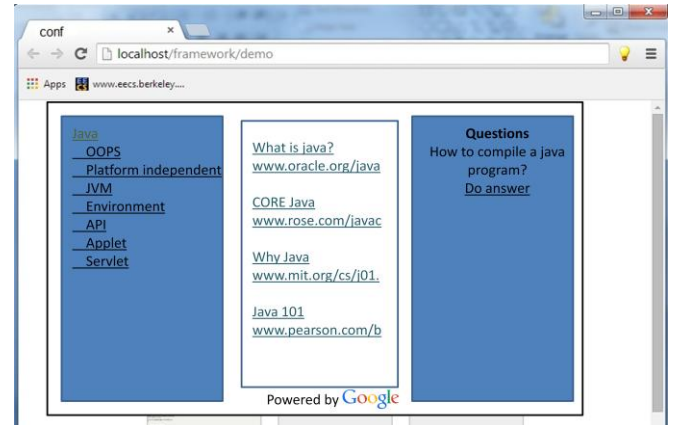


Figure 6.5 Predefined questionnaires by SME

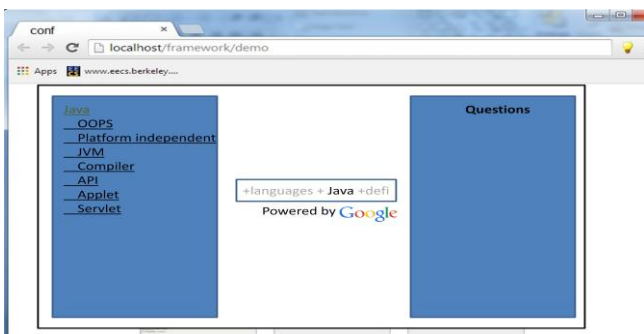


Figure 6.2 Topic selection

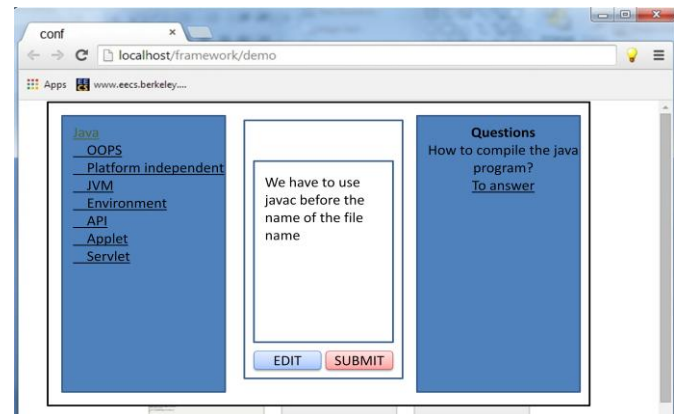


Figure 6.6 answering the questionnaires by learner

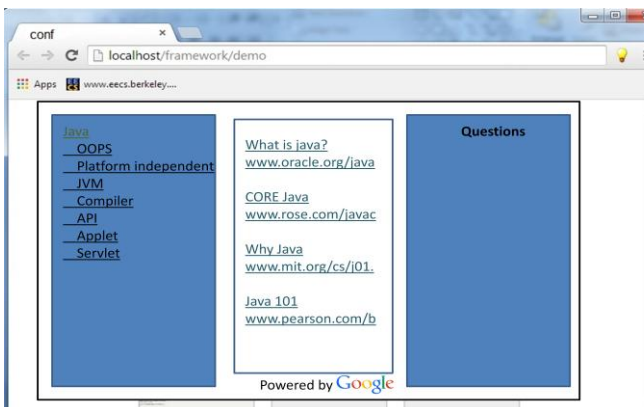


Figure 6.3 Getting search results

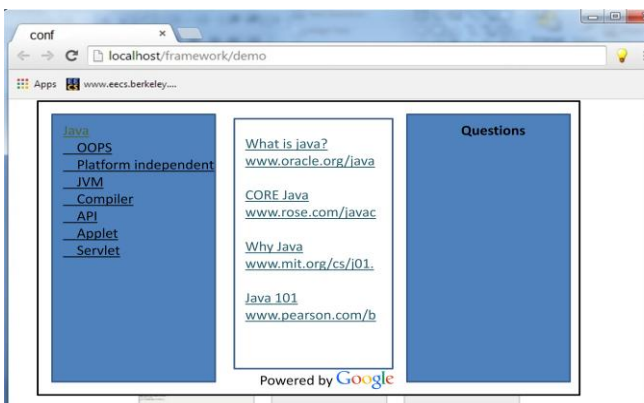


Figure 6.4 Learning by search results

7. CONCLUSION

Considering the dynamic behavior of the learner this framework is designed. SME's time and efforts are stored in the form of keywords and questionnaires. The advancement of the technology leads the dynamic learning habits. Our CS e-learning framework is an attempt for learner centralized learning. The maximum efficiency can reach only by the efforts of the SME for making keywords and questionnaires. The learner will have enough knowledge of the domain or subject with their freedom to learn. The disadvantages of the system over the period the keywords has to add or change because of web learning contents are generated dramatically.

8. FUTURE WORKS

If the framework to be implement in smart phone platforms that could be better reach to the learners. The role of the SME replace by the machine learning is one of the biggest advancement for this CS e-learning framework.

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