1 INTRODUCTION

1.1 GENERAL

E-learning or electronic learning platforms facilitate the delivery of knowledge spectrum to the learning community through information and communication technologies. The transfer of knowledge has to take place from experts to learners, and externalization of the knowledge transfer is significant. In this learning environment, the learners seek subject expertise to clarify their subject queries, and a learner query can be routed to an expert for externalization of expert knowledge provided the learner knows the subject expert or the expertise group. However, new learners who are introduced to e-learning systems are not aware of the expertise group to which the query should be sent, which results in time delays, non-response, inaccurate solutions and loss of knowledge capture. Several models have been proposed to resolve this task, but thus far, these efforts have focused completely on returning the most conversant people as experts on a particular topic to retrieve valuable knowledge.

The existing e-learning systems use instant messages, emails and discussion forums as knowledge transfer medium between knowledge seeker and knowledge provider which are facilitated for externalization. The used communication modes in existing e-learning systems have the provision to store the transferred knowledge but fail to quickly retrieve the required knowledge on demand by the knowledge seeker or knowledge provider. To solve this issue in e-learning environment, the researchers have developed a query management system for transferring knowledge between knowledge seeker and knowledge provider. The query management system has the capability to target experts and quickly retrieve the transferred knowledge on demand by the user or learner. The query routing mechanism is used in the query management system which contains clusters of expert groups on each topic or subject to which the query would be routed. In this approach, the
learners must select the appropriate expert group to clarify their queries accordingly.

The expert from the group must take charge of the assigned query and provide a solution to the query and in turn, the solution will be delivered to the user. This type of query routing mechanism fails if the user is new to the system and unaware of the query process. This may lead the user to receive an irrelevant or unworthy solutions from the expert group because the expert who are handling the query may be inexperienced or lack of knowledge on the raised query topic or the user may have routed the query to the wrong expert group due to human error. To address this problem, it is required to externalize the tacit knowledge of a subject expert. The externalization can be processed by clustering the experts based on their expertization skill set and the query raised by the learners need to be handled by dynamic query handling system that automatically transfers a user query to the best subject expert available in the cluster.

Wang, G.A (2013) has highlighted that existing expert finding techniques often rely on the indicators such as Self-classification and document-based relevance to find one’s area expertise and the level of expertization. Self-Classification basically includes the expert’s expertization or skill sets manually entered by the expert and document-based relevance is evaluated based on relevant document available in the system. Self-Classification requires experts to explicitly state their expertization skill sets in their profiles.

Expert recommendation systems that utilize the expert finding approach include yellowpages.com, guru.com, 88owls.com, and other opt-in directory listings of experts. The manual practices are time-consuming and individual expertise profiles are also not likely to remain updated as each user’s expertise is continuously growing. Most of the automated experts finding techniques rely on document-based relevance to measure the expertise level of an expert to assign a user query. These techniques
assume that the relevance of one’s authored documents to the query is positively related to their expertise level on the query. These perceptions clearly depict that the expert’s expertise levels were measured only with the data available in the system and the existing expert finding approaches cannot be considered for accurate evaluation of expert’s expertization.

Since the existing expert finding techniques do not use the Internet as a potential factor to find the updated information about the expert’s expertization, this thesis finds the expertization level of an expert from the Internet, using the expert’s expertise keywords along with the expert identity data such as expert name, co-authors, email id etc. The expertise keywords and the expert identity data which are given by the experts have to be cross verified with the data available in the Internet to ensure the contribution made by the expert on the given expertise area, the verification has to be made in various resources in the Internet such as websites, blogs and journals etc. But most of the websites and journals require authenticity to access the resources available in their database. These constraints create a barrier to the researchers on utilizing the Internet as an important data source while evaluating an expert’s expertise level.

A new approach has been introduced in this thesis to overcome these constraints which ensures the expertise level of an expert by utilizing the search engines as data retrieving agents to extract the expert’s data available from the Internet and assigns weight according to their contributions made towards the given expertise area. The search engines are used as a data retrieving agents, since they can access Meta data or data of any websites without any authenticity of the accessing website. This action will provide a bulk of results which are linked to the expert contribution towards the expertise keywords.

The results produced by the search engines would contain many junk data. So the entire result of the search engine cannot be considered as a valuable data input to measure expert’s expertise level. Hence it is required
to remove the junk data and extract the records related to the expert and the
given keyword. In addition, these results have to be processed with
constraint parameters to find the exact record of an expert from the extracted
records. The introduced data extraction technique gives a valuable input data
with reasonable accuracy to measure the expertise level of an expert towards
the given expertise keyword and it can be considered as better solution to
extract the updated expertization level of an expert towards the expertise
area. The proposed mechanism considers the experience and qualification of
the expert as a leading factor in expert assessment process and application
of multiple regression analysis to obtain the best subject expert resulted in
the retrieval of data and information with high accuracy levels to ensure the
expertization level of an expert.