IJCSE International Journal of Computer Sciences and Engineering Open Access
Review Paper Vol.-7, Issue-2, Feb 2019 E-ISSN: 2347-2693

A Conceptual Framework of Expert Finding System for Academic Events and Committess

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DOI: https://doi.org/10.26438/ijcse/v7i2.281283 | Available online at: www.ijcseonline.org

Accepted: 09/Feb/2019, Published: 28/Feb/2019

***Abstract*—** In academic institutes or universities, there is always a need to find experts in different subjects. The experts are required as resource persons for various workshop, seminars, and conferences. There is always need of experts for working on various research committees. There are various online research groups available on World Wide Web. Many researchers from various domains relate to each other via these online research groups. This paper describes a conceptual framework which finds experts from online research groups for various academic events and committees.

Keywords—Expert Finding System, Academic event, Research committee, Online research group, ResearchGate, Google Scholar

I. INTRODUCTION

Various academic institutes and universities are providing higher education to the youth in different disciplines. These educational programme conducts different academic events to propagate knowledge amongst students and teachers. Experts from various disciplines are required to work as resource persons in such academic events. Several research and academic committees are also formed in universities and academic institutes to make important decisions. Experts are identified from various disciplines to make appointments to work on such committees. Normally, these experts are selected by the suggestions of authorities working in universities. These suggestions can be enriched by online expert finding system. There are various online research groups available on World Wide Web. Many researchers from various domains relate to each other via these online research groups. In this paper, the conceptual framework is proposed to implement expert finding system for academic events and committees. Section II gives detailed literature study. In section III, the working of conceptual framework is explained in detail. Implementation of the system is described in section IV. Conclusion and future work are presented in section IV.

II. LIETRATURE STUDY

Peyman Rostami and Mahmood Neshati in 2019 defined the problem of agile team formation which is one of the important requirements of software companies. They proposed T-shaped expert with the use of efficient model XEBM and RDM [1]. In the proposed work by Gharebagh et. al. in 2018, profile diversity of users is estimated. They have made use of Community Questions Answering (CQA) websites [2]. A survey on use of Community Question Answering in expert recommendations is presented by Wang et. al. in 2018 [3]. Kundu Dipankar and Deba Prasad Mandalin 2018 formulated a hybrid expertise retrieval system in community question answering services using text based and network-based segment [4]. The semantic representation of the dynamic user is studied by Shangsong Liang et. al. in 2018 which is helpful to effectively measure the similarities between users [5]. In open source environment finding a proper project assignment is difficult for developers due to vast number of choices. Liu Chao et. al. in 2018, performed an experiment which will provide recommendations to developer onboarding for GitHub projects [6]. Silvello Gianmaria et. al. in 2017 explored a survey on different expert finding techniques. Various expertise retrieval algorithms like generative probabilistic models, voting models, network-based models, along with model component extensions are explained [7]. Liang Shangsong, and Maarten de Rijke in 2016 introduced an expert group finding task with the help of language models such as GQD, GDQ, DGQ, QDG, and QGD [8].

Literature study shows that expert finding is an important task in several areas. Such a system can be helpful in the academic institutes or universities.

III. CONCEPTUAL FRAMEWORK

Figure 1 describes the conceptual framework for the expert finding system.

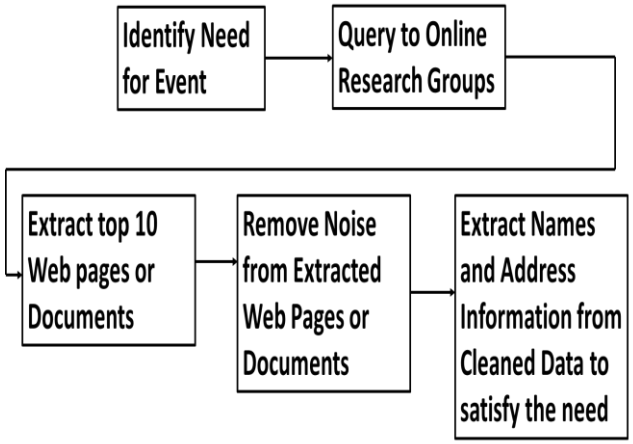

Figure 1. Conceptual Framework for Expert Finding System

A. Identify need for event or research committee

Higher education is given in various streams such as arts, science, and commerce related subjects. The organization of conferences, workshops, seminars, development programmes, etc. is done to enhance the skills. Committees of experts are formed to evaluate and to make decisions about academic and research related activities. To design an online expert finding system, it is needed to identify what is the exact purpose to find the expert [1]. This task will include understanding about exact area in which the individuals needful are expert. This correct identification will help to prepare correct query.

B. Query to online research groups (ResearchGate, Google Scholar) as per the need

Learning the exact need to academic institute or university, next step will give a query to online search engine. The query is formed to reflect exact need including correct area and proper purpose of expert.

C. Extract top 10 web pages or documents from the results

Searching may result in thousands of web pages or documents. Results are arranged according to most relevant similarity index. The expert finding system will consider only top 10 web pages or documents. This will give most relevant results as per the query.

D. Remove noise from web pages or web documents

These resultant web pages or web documents consists of lot of noise. The noise includes stop words, unrelated images, etc. In this step, the noise is removed from selected top 10 web pages or web documents. This will help to extract the required information easily.

E. Extract names and address information from cleaned data

After removal of noise from the web pages or web documents, cleaned data containing information about expert is available to the expert finding system. With the use of cleaned data, information about the expert matching with the identified need in the first step is performed. This will give information about the expert which will be useful to enrich the knowledge used to decide expert in manual way.

IV. WAY TO IMPLEMENTATION

The conceptual framework described in section III can be implemented using the following algorithm.

Expert_Finding_System module perform important task of querying to Google Search Engine using APIs, extract top 10 web pages/web documents from result, clean the data with the help of stop keywords list. The module then calls Expert_Finding_Process module. This module performs the main task of calculating similarity between need keywords and cleaned data. This module will give output as suggested expert list.

Algorithm for **Expert_Finding_System ( )**

BEGIN

Need ← Identify correct area and purpose of the expert

NeedKeywords ← Represent the need in terms of keywords

SearchEngine_Result ← Pass the query to the Google Search engine using Google APIs

Top10_Results ← Extract Top 10 Web pages / Web documents

Cleaned_Data ← Remove noise from selected Top 10 Web pages / Web documents with the use of stop words keyword list

Suggested_Expert_List ← Call module Expert_Finding_Process (NeedKeywords, Cleaned_Data)

Return Suggested_Expert_List
END

Algorithm for **Expert_Finding_Process ( )**

Expert_Finding_Process (NeedKeywords, Cleaned_Data)

BEGIN

NeedKeywords_Vector ← Represent NeedKeywords as vector of keywords

Cleaned_Data_Vector ← Represent Cleaned_Data as vector of keywords

Suggested_Expert_List ← Calculate_Similarity (NeedKeywords_Vector, Cleaned_Data_Vector)

Return Suggested_Expert_List

END

The performance of the proposed expert finding system depends on the correctness of keyword content in the vectors NeedKeywords and Cleaned_Data. Vector NeedKeywords contains the need of academic institute or university. Extracting name and address information along with their research interests is the important task. Google APIs returns results as per the query (NeedKeywords) assigned. Top10 web pages or web documents from ResearchGate and Google Scholar are taken into consideration for further processing. ResearchGate and Google Scholar provide profiles of the researchers as per the query. Expert finding system access these profiles to find research interests of individuals and insert the keywords into the vectors Cleaned_Data. These vectors created for individual are matched with NeedKeywords. The closest vector will give finally the experts to satisfy the need of academic institute or university.

V. CONCLUSION AND FUTURE SCOPE

Experts plays important role in organization of various events and committees in different academic institutes and universities. The panel of experts is designed manually by the suggestions of authorities working in universities. These suggestions can be enriched by online expert finding system. This online expert finding system will make use of online research groups ResearchGate and Google Scholar. These research networks connect many researchers to each other. The proposed expert finding system will effectively generate the list of experts appropriate for the need. The performance of the system depends on correct identification of the experts need and correct retrieval of keywords from online research groups. The system can be further improved by weighting the keywords in the vectors created.

ACKNOWLEDGMENT

The authors are thankful to the University Grants Commission, New Delhi for supporting this research under the Special Assistance Programme (SAP) at the level of DRS-II (No: F.4-7/2018/DRS-II (SAP-II).

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