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Research Collaborator, how do i find thee?

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Research-in-Progress

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Abstract

Expert finding systems assist researchers to automatically find a particular research collaborator. The problem of these systems is that they identify experts based on content of documents linked to the experts (system–centered perspective) and neglect the human interaction perspective, which includes the factors that affect collaborator selection decision in real life. This study examined factors that might affect researchers' decision to collaborate with a particular research collaborator in the university context. Moreover, it investigated how expert finding systems designers can integrate these factors with current expert finding systems in the university context to retrieve the suitable research collaborator. The contribution of this study is the proposed model of collaborator selection criteria which can be integrated with current expert finding systems to improve their effectiveness. The model is based on scientific and technical human capital (STHC) model and social capital theory (SCT).

Keywords: expert finding systems, collaborator selection, social capital, scientific and technical human capital model

Introduction

The expertise of employees is a key value of an organization and the effective sharing of knowledge can result in substantial gains (Balog et al. 2012). In general, an expert is a person who is knowledgeable or who has deep skills in a particular area (Lin et al. 2017). Due to the availability of huge volume of data associated with experts, finding the right expert at the right time is challenging (Neshati et al. 2017; Wang et al. 2017). The problem of expert finding has attracted a lot of attention in the information retrieval community (Neshati et al. 2017). It has been studied in many environments, such as industries (Balog et al. 2009; Li et al. 2011b), bibliographic networks (Hashemi et al. 2013; Neshati et al. 2014; Sateli et al. 2017), question answering communities (Liu et al. 2013; Neshati et al. 2017), online knowledge community (Huang et al. 2017; Wang et al. 2013), social networks (Li et al. 2011a; Silva 2014; Silva et al. 2013; Sun et al. 2015), and universities (Fang et al. 2008; Hofmann et al. 2010; Wang et al. 2017). Universities play an important role in transforming countries to a knowledge based economy (Bamasoud 2014) and have been well considered as a knowledge-based organization (Naeem et al. 2013).

In today's competitive world, university authorities understand that successful development and management of their organizational knowledge base is essential for survival. Ping Liu (2004) highlighted that the knowledge and expertise of a university staff involved in teaching and research in different areas is the main asset that a university holds. Research performance in universities is also considered in national and international ranking criterion (Liu and Cheng 2005). The productivity of research in universities is connected to higher levels of research collaboration (Lewis et al. 2012). However, rapid development of the scholarly researcher community and the huge number of researchers available on the web creates great challenges to collaborator seekers when finding researchers to collaborate with (Silva 2014).

Efficient expert finding techniques can decrease users' information overload by supporting them with personalized and filtered information. Furthermore, providing collaborator seekers with value-added services, such as recommending them a list of potential research collaborators, can help both researchers and universities. Most of the current expert finding systems retrieve information on people as if they are documents (Lin et al. 2017); whereas, people are unlike documents, and they are not directly represented as retrievable elements. The representation of experts based on the strength of the relationships between a topic and an expert, is called representation based on content-based factors (Balog et al. 2012; Sateli et al. 2017; Wang et al. 2017). Content-based factors address the algorithmic aspects of linking people to expertise areas in order to provide technological support for the identification of experts. A challenge in content-based expert finding systems is that the systems need to go beyond document retrieval as they are required to retrieve entities (experts) instead of documents.

An efficient expert finding system should contain expert identification and expert selection. The identification involves identifying the experts and then obtaining them. The selection involves choosing among experts with the required skills and expertise (Hansen and Järvelin 2005). Thus, human interaction perspective is important in the selection phase; it comprises the psychological, social, and organizational aspects of how people select other people as experts. Apart from the degree of expertise extracted from documents, there are other important factors (such as contextual factors) which should be considered for collaborator finding. In this paper, contextual factors refer to the factors that affect how collaborator seekers in the university select research collaborators. Research collaborators are researchers who work together to advance scientific knowledge (Duarte 2017). Selecting the suitable research collaborator is an essential decision in research collaboration in the university. It determines the success of collaboration, as well as researcher's career and reputation.

Stvilia et al. (2017) proposed a model for selecting a research collaborator. They examined the influence of culture, reputation, personality, costs, affiliation and resources on researchers' willingness to collaborate with others. Gao et al (2013) also examined how social network and culture influence the desire of selecting a particular collaborator, but still, there is a lack of research on how researchers in the university select research collaborators, as well as the factors that affect their decisions (Chen and Goh 2019; Iglič et al. 2017; Stvilia et al. 2017). The aim of this paper is to answer the following question: How can a model that recognizes the contextual factors that influence collaborators' selection be developed to facilitate designers when developing an expert finding system for research collaboration in the university?

The Proposed Model and Theoretical Framework

The scientific and technical human capital (STHC) model has emerged as an alternative model for analyzing research capacity. Bozeman et al. (2001) defined STHC as ''the sum of an individual researcher's professional network ties, skills, resources and technical knowledge. It integrates human capital and social capital theories into research evaluation studies. Human capital theory concentrates on skills, reputation, education, training, and experience as investments undertaken by individuals. Generally, human capital refers to an individual's knowledge, information, ideas, skills and personal health. The knowledge, skills, and other specific abilities embodied in individuals are usually crucial (Bozeman and Corley 2004; Corley et al. 2017). Individuals who have more human capital will identify potential opportunities more easily and be more productive in their working positions (Corley et al. 2017). Human capital is important for research collaboration (Iglič et al. 2017), but research

collaboration is about knowledge exchange, a social process that needs individual interactions (Yuan 2009). However, individual relationships are crucial for knowledge exchange. Thus, social capital theory (SCT) can bridge this gap between knowledge exchange and human relationships (Woudstra and van den Hooff 2008; Woudstra et al. 2012; Zimmer and Henry 2017). Social capital is essential for a successful collaboration (Steinmo and Rasmussen 2018). Within the model, the integration of social capital has improved the study and assessment of research collaboration.

Corley et al. (2017) expanded STHC theory by adding cultural experience dimension to social capital and human capital dimensions. Hence, the expanded model of (Corley et al. 2017) can be applied to identify the factors that influence research collaborator selection decision. In the current STHC, social capital consists of network ties. Woudstra et al. (2012) found that relevance and reliability are cognitive and relational dimensions of social capital, respectively. Further, physical accessibility is a structural dimension, cognitive accessibility is a cognitive dimension and relational accessibility is a relational dimension of social capital. Additionally, Nahapiet & Ghoshal (1998) mentioned that trust is a relational dimension of social capital.

Thus, relevance, reliability, physical accessibility, cognitive accessibility, and relational accessibility can be added to the social capital dimension in STHC model of this research. Hence, social capital and individual capital theories may have potential in application to collaborator selection. In this research, the STHC model presented three categories: i) Human capital factors, which are commitment, research experience, complimentary skills, and reputation, ii) Social capital factors, which are trust, network ties, physical accessibility, relational accessibility, relevance, and reliability, and iii) cultural experiences. Table 1 summarizes the operational definitions, hypotheses, and previous related studies for these factors.

Table 1: Factors, operational definitions, hypotheses and previous studies

Factors	Operational definition	Hypotheses	Previous studies
Commitment	It refers to research collaborator's willingness to give his/her time and energy to the research collaboration success	H1: The commitment is expected to affect positively on selecting the research collaborator in university context.	(Shah and Swaminathan 2008),(Dhurkari and Nandakumar 2015)
Research experience	It refers to the experience of research collaborator in research	H2: The research experience of research collaborator is expected to affect positively on selecting the research collaborator in university context.	(Iglič et al. 2017)
Complementary skills	It refers to the extent to which research collaborator has additional knowledge and skills	H3: The complementary skills of a research collaborator are expected to affect positively on selecting the research collaborator in university context.	(Dhurkari and Nandakumar 2015), (Büyüközkan and Güleryüz 2016),
Reputation	It refers to collaborators' position and reputation in the previous research and research communities.	H4a: The reputation of a research collaborator is expected to affect positively on selecting the research collaborator in university context. H4b: The reputation of a research collaborator is expected to affect positively on trust.	(Christiansen and Vendelø 2003) (Muriithi et al. 2013)

Trust	It refers to the extent to which collaborator's seeker and research collaborator can understand each other and have the confidence they will cooperate and share information in a fair and helpful way.	H5: The trust is expected to affect positively on selecting the research collaborator in university context.	(Perrault et al. 2011) (Domingo De Abreu, 2017)(Iglič et al. 2017),(Isabelle and Heslop 2014)
Network ties	It refers to the strength of the relationships, represent the motivation that a collaborator seeker has to exchange resources with that collaborator, and communication frequency among collaborator seeker and collaborator.	H6: The network ties with research collaborator is expected to affect positively on selecting the research collaborator in university context.	(Isabelle and Heslop 2014)
Physical accessibility	It refers to the amount of effort or duration needed to access the research collaborator physically.	H7: The physical accessibility is expected to affect positively on selecting the research collaborator in university context.	(Stvilia et al. 2017), (Arsenyan and Buyukozkan 2012),(Chen and Goh 2019)
Relational accessibility	It refers to feeling comfortable when dealing with research collaborator	H8: The relational accessibility is expected to affect positively on selecting the research collaborator in university context.	(Woudstra and van den Hooff 2008), (Woudstra et al. 2012)
Cognitive accessibility	It refers to understandability and communication with the research collaborator and the processing of the obtained information.	H9: The cognitive accessibility is expected to affect positively on selecting the research collaborator in university context.	(Heringa et al. 2014; Werker et al. 2016), (Perrault et al. 2011)
Relevance	It refers to the match between the knowledge provided by research collaborator and research area for research collaboration task	H10: The relevance of the research collaborator knowledge is expected to affect positively on selecting the research collaborator in university context.	(Sun et al. 2015) (Hertzum 2002; Woudstra and van den Hooff 2008; Woudstra et al. 2012)
Reliability	It refers to research collaborator extensive knowledge about the subject of research area and he/ she is dependable.	H11: The reliability of research collaborator knowledge is expected to affect positively on selecting the research collaborator in university context.	(Paul 2016)
Cultural experience	It refers to the sum of a collaborator's experiences that are gained while interacting with collaborators from diverse cultural backgrounds	H12: The cultural experience of a research collaborator is expected to affect positively on selecting the research collaborator in university context.	(Corley et al. 2017; Solesvik and Westhead 2010)

Human capital factors: Commitment has been studied in collaborator selection for strategic alliance between the firms. Failure to make commitments with collaborators often leads to collaboration failure (Morgan and Hunt 1994). Therefore, commitment is similar to trust in reducing opportunism risk. H1 hypothesizes that in the collaborator selection process, people look for credible resource commitments (Shah and Swaminathan 2008). Iglič et al. (2017) found that the longer researchers participate in research collaboration and gain more research experience, the more knowledge and skills they accumulate, which leads to H2. A high similarity between collaborators' knowledge and resources makes collaboration redundant (Büyüközkan and Güleryüz 2016). Hence, Arsenyan and Buyukozkan (2012) found that complementary is an important criterion for collaborator selection in collaboration between firms; this leads to H3. Christiansen and Vendelø (2003) found that reputation is an important selection criterion in R&D collaboration; this leads to H4a. Additionally, collaborators will use reputation as the foundation to evaluate partner's trustworthiness when selecting a partner. The significance of reputation in collaborative work will diminish, especially when the collaborators have more opportunity to interact with each other (Sayogo et al. 2011). Thus, reputation can play the role of a mediator between trust and collaborator selection; this leads to H4b.

Social capital factors: Büyüközkan and Güleryüz (2016) pointed out that high-performance collaboration is characterized by high trust among collaborators. When collaboration is considered, the role of trust among collaborators is particularly important; this leads to H5. Regarding network ties, Nahapiet and Ghoshal (1998) found that network ties provide access to resources, constitute a valuable source of information benefits, and reduce the amount of time for finding the required information; this leads to H6. Many researchers found that collaborator accessibility has an important role in research collaboration (Heringa et al. 2014; Perrault et al. 2011; Werker et al. 2016). Woudstra et al. (2012) divided accessibility into three dimensions: physical, cognitive and relational accessibility; this leads to H7, H8, and H9. Sun et al. (2015) found that integrating information quality factor with expert finding system for collaborator selection has improved the effectiveness of the systems. Woudstra et al. (2012) divided information quality into two dimensions- relevance and reliability; this leads to H10 and H11.

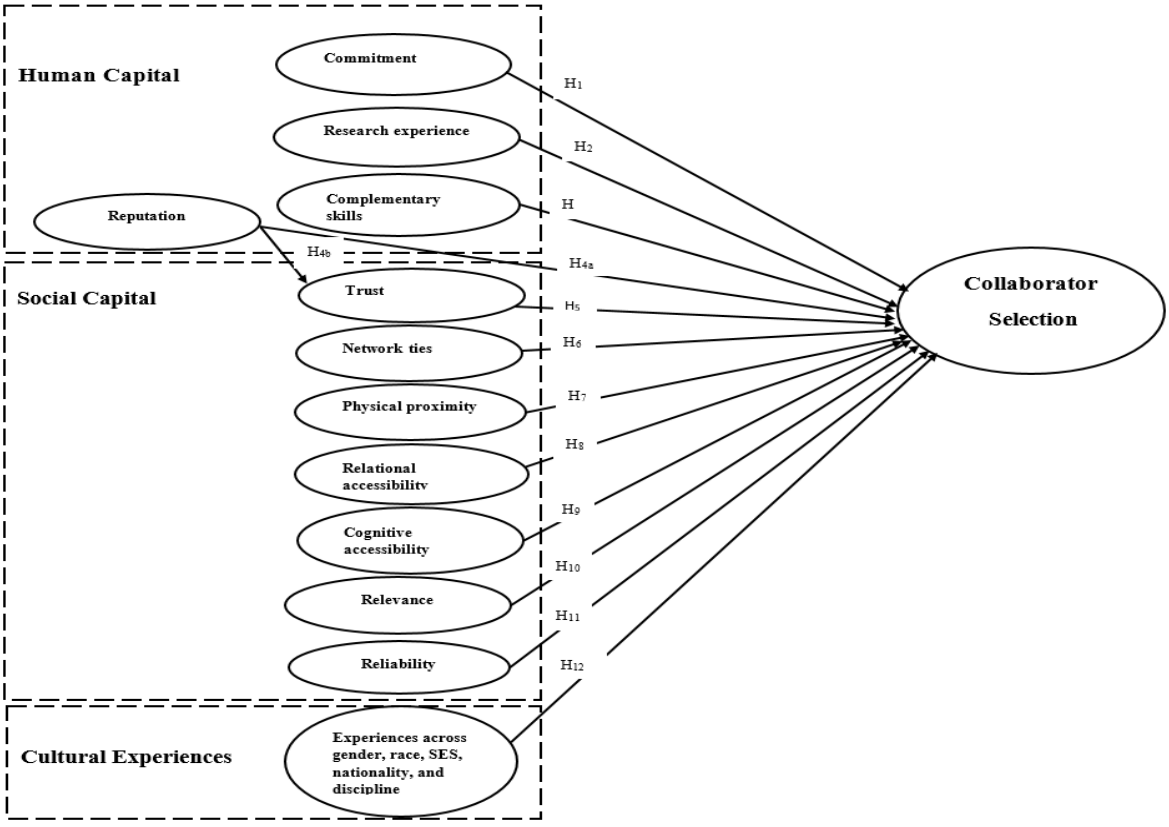

Figure 1: The proposed model

Cultural Experiences factor: Cultural experiences are experiences across gender, race, SES, nationality, and discipline. The cultural dimension of the STHC model is conceptualized as the sum of

an individual scientist's experience. It has five components- race, socio-economic status (SES), gender, nationality, and academic discipline (Corley et al. 2017); this leads to H12.

Figure 1 shows the proposed model for this research.

Research Methodology

Research Approach

As the essential focus of this research is to develop a contextual model for collaborator selection in the university context based on particular theories and to test the related hypotheses, a confirmatory (deductive) approach is selected. This research adopts positivist paradigm with quantitative research approach utilizing survey method. Survey research supports the collection of valuable data which can be used to test a research model and to identify the relationships amongst key factors that influence collaborator selection. Thus, a questionnaire will be designed based on the developed research model. The research instrument includes demographic information about the respondents such as age, gender, education, and research experience. All items of the instrument will be adapted from previous studies and the five-point Likert scale (1= strongly disagree; 5 = strongly agree) will be used. The questionnaire will be distributed among the respondents in two phases. The first phase is to pilot the questionnaire (confirming reliability and validity), while the second phase (main study) is to make decisions on acceptance or rejection of the hypotheses to finalize a contextual model for expert finding systems. Two methods will be used for data collection: (i) online questionnaire will be distributed on R & D email groups and (ii) paper questionnaire will be distributed to researchers overcome the drawbacks of the online survey, which include: data errors, questions complexity issues, technical issues, and limited respondents.

Data Collection and Sampling Technique

The population for this research are the academic staff in all five public research universities in Malaysia, namely Universiti Malaya (UM), Universiti Putra Malaysia (UPM), Universiti Kebangsaan Malaysia (UKM), Universiti Teknologi Malaysia (UTM), and Universiti Sains Malaysia (USM). Purposive sampling with non-probability sampling within a quantitative research approach is employed, where elements are chosen with a defined purpose in view. Moreover Daniel (2011) said that "in purposive sampling, scholar purposely chooses the units because they satisfy particular inclusion and exclusion criteria for participation in the study". The target population are the lecturers who have experience in research collaboration and collaborator selection. Partial Least Square (PLS) technique of Structural Equation Modeling (SEM) will be used for data analysis using Smart PLS software v3.

Implications

Currently in this age of technology and innovation, the need for collaboration is increasing due to the huge volume of available information and collaborators seekers need to find the right collaborators in the right time. Expert finding systems play a significant role in identifying collaborators with experience and knowledge. Practically, this research contributes to a more comprehensive understanding of expert finding systems in the university setting by: i) developing a contextual model that helps in providing effective expert finding systems for universities when finding appropriate collaborators automatically. ii) It can help collaborator seekers by providing them a way to find collaborators based on their knowledge and their behavior, such as accessibility and reputation. iii) It can help the collaborators themselves by appreciating their efforts when they collaborate and share their knowledge. This can increase their reputation and network. iv) Identifying the factors that influence the selection of research collaborators in the university context. v) Becoming a starting point for future studies associated with integrating contextual factors with content-based factors based on theoretical frameworks. Theoretically, this research contributes to information systems theories by extending the social capital dimension in STHC model and applying it for collaborator selection.

REFERENCES

Arsenyan, J., and Buyukozkan, G. 2012. "Collaborative Partner Evaluation with Multicriteria Decision Making Techniques," in *Uncertainty Modeling in Knowledge Engineering and Decision Making*. World Scientific, pp. 547-552.

Balog, K., Azzopardi, L., and de Rijke, M. 2009. "A Language Modeling Framework for Expert Finding," *Information Processing & Management* (45:1), pp. 1-19.

Balog, K., Fang, Y., de Rijke, M., Serdyukov, P., and Si, L. 2012. "Expertise Retrieval," *Foundations and Trends® in Information Retrieval* (6:2–3), pp. 127-256.

Bamasoud, D. M. S. 2014. "Influence of Academic Researchers' Absorptive Capacity and Its Antecedents Towards Acceptance of Collaborative Technologies." Universiti Teknologi Malaysia.

Bozeman, B., and Corley, E. 2004. "Scientists' Collaboration Strategies: Implications for Scientific and Technical Human Capital," *Research Policy* (33:4), pp. 599-616.

Büyüközkan, G., and Güleryüz, S. 2016. "A New Integrated Intuitionistic Fuzzy Group Decision Making Approach Product Development Partner Selection," *Computers & Industrial Engineering* (102), pp. 383-395.

Chen, W., and Goh, M. 2019. "Mechanism for Cooperative Partner Selection: Dual-Factor Theory Perspective," *Computers & Industrial Engineering* (128), pp. 254-263.

Christiansen, J., and Vendelø, M. 2003. *The Role of Reputation Building in International R&D Project Collaboration*.

Corley, E. A., Bozeman, B., Zhang, X., and Tsai, C.-C. 2017. "The Expanded Scientific and Technical Human Capital Model: The Addition of a Cultural Dimension," *The Journal of Technology Transfer*).

Daniel, J. 2011. *Sampling Essentials: Practical Guidelines for Making Sampling Choices*. Sage.

Dhurkari, R. K., and Nandakumar, M. K. 2015. "Measures of Complementarity and Compatibility in Strategic Alliances for Innovation: A Review of Literature," *The International Technology Management Review* (5:4), pp. 182-201.

Dongre, A. R., Deshmukh, P. R., Kalaiselvan, G., and Upadhyaya, S. 2010. "Application of Qualitative Methods in Health Research: An Overview," *Online Journal of Health and Allied Sciences* (8:4).

Duarte, K. B. 2017. "Assessing Researcher Quality for Collaborative Purposes,").

Fang, Y., Si, L., and Mathur, A. 2008. "Facfinder: Search for Expertise in Academic Institutions," *Technical Report: SERC-TR-294, Department of Computer Science, Purdue University*).

Gao, G., Hinds, P., and Zhao, C. 2013. "Closure Vs. Structural Holes: How Social Network Information and Culture Affect Choice of Collaborators," in: *Proceedings of the 2013 conference on Computer supported cooperative work*. San Antonio, Texas, USA: ACM, pp. 5-18.

Hansen, P., and Järvelin, K. 2005. "Collaborative Information Retrieval in an Information-Intensive Domain," *Information Processing & Management* (41:5), pp. 1101-1119.

Hashemi, S. H., Neshati, M., and Beigy, H. 2013. "Expertise Retrieval in Bibliographic Network: A Topic Dominance Learning Approach," *Proceedings of the 22nd ACM international conference on Conference on information & knowledge management*: ACM, pp. 1117-1126.

Heringa, P. W., Horlings, E., van der Zouwen, M., van den Besselaar, P., and van Vierssen, W. 2014. "How Do Dimensions of Proximity Relate to the Outcomes of Collaboration? A Survey of Knowledge-Intensive Networks in the Dutch Water Sector," *Economics of Innovation and New Technology* (23:7), pp. 689-716.

Hertzum, M. 2002. "The Importance of Trust in Software Engineers' Assessment and Choice of Information Sources," *Information and Organization* (12:1), pp. 1-18.

Hofmann, K., Balog, K., Bogers, T., and De Rijke, M. 2010. "Contextual Factors for Finding Similar Experts," *Journal of the Association for Information Science and Technology* (61:5), pp. 994-1014.

Huang, C., Yao, L., Wang, X., Benatallah, B., and Sheng, Q. Z. 2017. "Expert as a Service: Software Expert Recommendation Via Knowledge Domain Embeddings in Stack Overflow," *Web Services (ICWS), 2017 IEEE International Conference on*: IEEE, pp. 317-324.

Iglič, H., Doreian, P., Kronegger, L., and Ferligoj, A. 2017. "With Whom Do Researchers Collaborate and Why?," *Scientometrics* (112:1), pp. 153-174.

Isabelle, D. A., and Heslop, L. A. 2014. "The Role of Social Capital in International Scientific Collaborations: Evidence from a Multi-Country Survey," *International Journal of Technology and Globalisation* (7:4), pp. 259-287.

Lewis, J. M., Ross, S., and Holden, T. 2012. "The How and Why of Academic Collaboration: Disciplinary Differences and Policy Implications," *Higher Education* (64:5), pp. 693-708.

Li, C.-T., Shan, M.-K., and Lin, S.-D. 2011a. "Context-Based People Search in Labeled Social Networks," *Proceedings of the 20th ACM international conference on Information and knowledge management*: ACM, pp. 1607-1612.

Li, M., Liu, L., and Li, C.-B. 2011b. "An Approach to Expert Recommendation Based on Fuzzy Linguistic Method and Fuzzy Text Classification," *Expert Systems with Applications* (38:7), pp. 8586-8596.

Lin, S., Hong, W., Wang, D., and Li, T. 2017. "A Survey on Expert Finding Techniques," *Journal of Intelligent Information Systems*), pp. 1-25.
Liu, D.-R., Chen, Y.-H., Kao, W.-C., and Wang, H.-W. 2013. "Integrating Expert Profile, Reputation and Link Analysis for Expert Finding in Question-Answering Websites," *Information processing & management* (49:1), pp. 312-329.
Liu, N. C., and Cheng, Y. 2005. "The Academic Ranking of World Universities," *Higher education in Europe* (30:2), pp. 127-136.
Morgan, R. M., and Hunt, S. D. 1994. "The Commitment-Trust Theory of Relationship Marketing," *Journal of marketing* (58:3), pp. 20-38.
Muriithi, P., Horner, D., and Pemberton, L. 2013. "Understanding Factors Influencing the Effect of Scientific Collaboration on Productivity in a Developing Country: Kenya," *Proceedings of the Association for Information Science and Technology* (50:1), pp. 1-10.
Naeem, M., Khan, M. B., and Afzal, M. T. 2013. "Expert Discovery: A Web Mining Approach," *Journal of AI and Data Mining* (1:1), pp. 35-47.
Nahapiet, J., and Ghoshal, S. 1998. "Social Capital, Intellectual Capital, and the Organizational Advantage," *Academy of management review* (23:2), pp. 242-266.
Neshati, M., Beigy, H., and Hiemstra, D. 2014. "Expert Group Formation Using Facility Location Analysis," *Information Processing & Management* (50:2), pp. 361-383.
Neshati, M., Fallahnejad, Z., and Beigy, H. 2017. "On Dynamicity of Expert Finding in Community Question Answering," *Information Processing & Management* (53:5), pp. 1026-1042.
Paul, S. A. 2016. "Find an Expert: Designing Expert Selection Interfaces for Formal Help-Giving," *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*: ACM, pp. 3038-3048.
Perrault, E., McClelland, R., Austin, C., and Sieppert, J. 2011. "Working Together in Collaborations: Successful Process Factors for Community Collaboration," *Administration in Social Work* (35:3), pp. 282-298.
Ping Liu, P. D. 2004. "Using Semantic Web Technologies to Improve Expertise Matching within Academia.," *Proceedings of I-KNOW* '04 Graz, Austria.
Sateli, B., Löffler, F., König-Ries, B., and Witte, R. 2017. "Scholarlens: Extracting Competences from Research Publications for the Automatic Generation of Semantic User Profiles," *PeerJ Computer Science* (3), p. e121.
Sayogo, D. S., Nam, T., and Zhang, J. 2011. "The Role of Trust and Ict Proficiency in Structuring the Cross-Boundary Digital Government Research," Berlin, Heidelberg: Springer Berlin Heidelberg, pp. 67-74.
Shah, R. H., and Swaminathan, V. 2008. "Factors Influencing Partner Selection in Strategic Alliances: The Moderating Role of Alliance Context," *Strategic Management Journal* (29:5), pp. 471-494.
Silva, A. T. P. 2014. "A Research Analytics Framework for Expert Recommendation in Research Social Networks." City University of Hong Kong.
Silva, T., Guo, Z., Ma, J., Jiang, H., and Chen, H. 2013. "A Social Network-Empowered Research Analytics Framework for Project Selection," *Decision Support Systems* (55:4), pp. 957-968.
Solesvik, M. Z., and Westhead, P. 2010. "Partner Selection for Strategic Alliances: Case Study Insights from the Maritime Industry," *Industrial Management & Data Systems* (110:6), pp. 841-860.
Stvilia, B., Hinnant, C. C., Wu, S., Worrall, A., Lee, D. J., Burnett, K., Burnett, G., Kazmer, M. M., and Marty, P. F. 2017. "Toward Collaborator Selection and Determination of Data Ownership and Publication Authorship in Research Collaborations," *Library & Information Science Research* (39:2), pp. 85-97.
Sun, J., Xu, W., Ma, J., and Sun, J. 2015. "Leverage Raf to Find Domain Experts on Research Social Network Services: A Big Data Analytics Methodology with Mapreduce Framework," *International Journal of Production Economics* (165), pp. 185-193.
Wang, G. A., Jiao, J., Abrahams, A. S., Fan, W., and Zhang, Z. 2013. "Expertrank: A Topic-Aware Expert Finding Algorithm for Online Knowledge Communities," *Decision Support Systems* (54:3), pp. 1442-1451.
Wang, Q., Ma, J., Liao, X., and Du, W. 2017. "A Context-Aware Researcher Recommendation System for University-Industry Collaboration R&D Projects," *Decision Support Systems* (103:Supplement C), pp.46-57.
Werker, C., Ooms, W., and Caniëls, M. C. J. 2016. "Personal and Related Kinds of Proximity Driving Collaborations: A Multi-Case Study of Dutch Nanotechnology Researchers," *SpringerPlus* (5:1), p. 1751.
Woudstra, L., and van den Hooff, B. 2008. "Inside the Source Selection Process: Selection Criteria for Human Information Sources," *Information Processing & Management* (44:3), pp. 1267-1278.
Woudstra, L., van den Hooff, B., and Schouten, A. P. 2012. "Dimensions of Quality and Accessibility: Selection of Human Information Sources from a Social Capital Perspective," *Information Processing & Management* (48:4), pp. 618-630.
Yuan, Y. C. 2009. "Social Capital and the Development of Group Transactive Memory Systems,", Saarbrucken, Germany, VDM Verlaag Dr. Mu lier.
Zimmer, J. C., and Henry, R. M. 2017. "The Role of Social Capital in Selecting Interpersonal Information Sources," *Journal of the Association for Information Science and Technology* (68:1), pp. 5-21.