Person to person trust factors in word of mouth recommendation

Conference or Workshop Item

Person to Person Trust Factors in Word of Mouth Recommendation

Tom Heath, Enrico Motta
Knowledge Media Institute
The Open University, Walton Hall
Milton Keynes, MK7 6AA, UK
t.heath@open.ac.uk, e.motta@open.ac.uk

Marian Petre
Computing Department
The Open University, Walton Hall
Milton Keynes, MK7 6AA, UK
m.petre@open.ac.uk

ABSTRACT
Online recommender systems and review sites do not currently reflect how people seek information using social networks of people they know. Developing systems that overcome this limitation requires studies of how people choose sources for recommendations and assess their trustworthiness. This paper presents the findings of such a study and discusses their implications for search and recommender applications.

Author Keywords
Trust, recommender systems, known person recommendation, word of mouth, social networks

ACM Classification Keywords
H.1.1 [Models and Principles] Systems and Information Theory---Value of information; H.3.3 [Information Storage and Retrieval] Information Search and Retrieval---Information filtering; H.5.3 [Information Interfaces and Presentation (e.g., HCI)] Group and Organisation Interfaces---Collaborative computing

INTRODUCTION

Whilst finding information is one of the most common online activities [5], current search applications are inadequate where the user is unsure exactly what they are looking for, or has too many options. In these circumstances, recommender systems and review sites can help the user identify potentially relevant items and assess their suitability through rudimentary support for word of mouth recommendation [11]. However, they do not take account of how people seek information and recommendations from their social networks of known individuals or how they make trust decisions about these sources. In general, recommender systems suggest items by matching the content of an item to a profile of the user (content-based recommendation), or by correlating a profile of the user (or items selected by them) with others in the system (collaborative filtering) [8, 10]. Review sites are populated by users who have an opinion about an item listed thereon, and may consist of textual reviews and/or star ratings.

However, the trustworthiness of recommendations or reviews can be hard to ascertain, with recommendation algorithms seen as "black boxes" [7] and reviews provided by largely unknown individuals. This contrasts with findings from sociology and management sciences that social networks are commonly used as a source of information [4], and that people decide whom to ask for information based on what they know of the person and how they value their knowledge and skills [3, 9].

The long-term goal of our research is to develop systems that better reflect the mechanisms people use when seeking and evaluating the trustworthiness of recommendations from known sources. We call this process Known Person Recommendation (KPR). To achieve this goal we must understand these mechanisms in more detail. Therefore we have carried out an empirical study examining from whom people seek recommendations in different scenarios, and factors that underlie decisions about the trustworthiness of this information. The findings and implications of this study are presented in the remainder of this paper.

METHOD

Data Collection

Four hypothetical scenarios were put to each of twelve participants (staff and students at The Open University, of varied age, sex, and nationality) in semi-structured interviews. The scenarios were varied on the modality of the task (either *locating* or *exploring*, as defined in [6]) and how critical it was perceived to be. They were designed to closely represent everyday situations, (e.g. locating a hotel in Madrid, exploring treatments for back pain). This contrasts to the study of similar issues specifically in a workplace setting [9]. The study was mindful of possible effects of domain (e.g. tourism, healthcare) and locality of task, but these were not systematically varied. For each scenario participants were asked 1) from whom they would

seek a recommendation, 2) if there was anyone they would not ask, and 3) to explain their reasons for these decisions. Participants were also asked to describe any analogous recommendation-seeking scenarios from their own experiences. Audio recordings were made and transcribed to form the basis for the analysis.

Analysis

Following the methodology described in [12], inductive analysis of the transcripts was carried out to identify themes in respondents' decision-making. Factors that determined from whom respondents would seek recommendations were identified from each transcript, aggregated into a master list, and then grouped into themes and sub-themes to produce the factors described below.

RESULTS

Five factors were identified that influenced the choice of source and their perceived trustworthiness (Table 1). Whilst individuals did vary in the strategies they reported, some general trends were apparent.

Trust Factor	Definition
Expertise	The source has relevant expertise, which may be formally validated through qualifications or acquired over time (35*)
Experience	The source has experience of solving similar scenarios, but without extensive expertise (41*)
Impartiality	The source does not have vested interests in a particular resolution to the scenario (9*)
Affinity	The source has characteristics in common with the recommendation seeker such as shared tastes, standards, viewpoints, interests, or expectations (24*)
Track Record	The source has previously provided successful recommendations to the recommendation seeker (3*)
* the number of times respondents cited a factor as influencing the choice of source, summed across 4 scenarios in each of 12 interviews (giving a maximum of 48)	

Table 1. Person to Person Trust Factors

Effects of Criticality, Subjectivity, and Task Modality

Overall, *expertise* and *experience* most frequently influenced choice of source. However, the nature of the task determined the precise factors most attended to. In tasks perceived as highly critical (e.g. the back pain scenario), emphasis was placed on externally validated *expertise*. In low-criticality tasks respondents were less selective and more willing to filter information from less trusted sources later if necessary. Where tasks were perceived to have an objectively correct solution, respondents also widely cited *expertise* or *experience* of the recommender as influencing their choice. However, where suitable solutions were more subjective (such as in the holiday activities scenario), respondents emphasised the *affinity* factor. Effects of task modality were not readily apparent in the data. This may indicate that sources are chosen in the same way irrespective of modality. However, it is also possible that variation in criticality of task and subjectivity of solution masked any such effects in this study.

Domain of Task and Nature of Relationship

Respondents chose sources with *expertise* or *experience* appropriate to the domain of the task (e.g. a doctor in the back pain scenario). However, variation across domains in use of the trust factors is attributable to factors such as the criticality of the task, not to differences in strategy specific to particular domains. Close family and friends were often cited as sources. Whilst trust factors such as affinity and track record likely contribute to this finding, it is also probable that respondents cited these sources for practical reasons; they are easily accessible, and the seeker can better assess their suitability to give recommendations in a particular domain. The precise nature of the relationship between respondent and the source they chose did not appear of great importance. Practical factors such as the source being a gatekeeper to others (as a family doctor may be), and the social acceptability of asking someone were also mentioned.

DISCUSSION

Previous research has shown that quality and accessibility affect the choice of source in information seeking [3, 9]. This study refines those results by a) identifying factors that underlie trust decisions about a source, b) demonstrating the impact of criticality and subjectivity of task on the use of these factors, and c) examining everyday, rather than workplace, scenarios.

Whilst the role of factors such as expertise has previously been documented in organisational settings [9], identification of the affinity factor in this study poses the question of its greater significance in these scenarios. Affinity may be crucial where subjective recommendations are sought rather than simply factual information, a conclusion consistent with the findings of [2] regarding taste domains. Furthermore, outside the formal roles and structures of the workplace there may be greater potential

for personal discretion in selection of sources, increasing the use of affinity relative to other trust factors.

Implications for Online Search and Recommendation

This study emphasises the source-centricity of recommendation seeking, where sources are chosen by perceived trustworthiness and the demands of the task. Current recommender systems and review sites are item-centric and do not support complex trust decisions about sources. It is our view that overcoming this limitation requires KPR systems that allow the trust factors identified here to be taken into account. Furthermore, we believe that use of these trust factors can be automated, with trust relationships being inferred from evidence and used to support online tasks. This requires systems able to integrate data from different sources and reason with it, a task for which the semantic web [1] is ideally suited. To investigate this area further we intend to build a prototype system supporting KPR. The system will focus on enabling locating and exploring tasks in the domain of tourism, using semantic web technologies to facilitate collection and integration of social network data, recommendations, and evidence to support the trust factors. Further investigation will be needed as to what evidence is appropriate for each trust factor, and how this might be captured.

Issues of interaction must also be attended to. It is not clear whether the complexity of options (e.g. criticality and subjectivity) should be exposed to the user, or confined to algorithms running behind the scenes. This may be dependent on how transparent the decision making process can be made to the user, as this may affect acceptance of the system [7]. Furthermore, despite possible similarities in source selection criteria in locating and exploring tasks, the nature of results required is likely to be distinct and consequently may need to be presented differently. However, this area requires further investigation.

ACKNOWLEDGMENTS

This research was partially supported by the Advanced Knowledge Technologies (AKT) project. AKT is an Interdisciplinary Research Collaboration (IRC), which is sponsored by the UK Engineering and Physical Sciences Research Council under grant number GR/N15764/01. The AKT IRC comprises the Universities of Aberdeen, Edinburgh, Sheffield, Southampton and the Open University.

REFERENCES

1. Berners-Lee, T., Hendler, J., Lassila, O. The Semantic Web. Scientific American 284, 5 (2001) 34-43.
2. Bonhard, P., Sasse, M. A. "I thought it was terrible and everyone else loved it" - A New Perspective for Effective Recommender System Design. In *Proc. HCI2005* (2005) 251-261.
3. Borgatti, S. P., Cross, R. A Relational View of Information Seeking and Learning in Social Networks. Management Science 49, 4 (2003) 432-445.
4. Granovetter, M. S. The Strength of Weak Ties. The American Journal of Sociology 78, 6 (1973) 1360-1380.
5. Haythornthwaite, C. The Internet in Everyday Life. American Behavioral Scientist 45, 3 (2001) 363-382.
6. Heath, T., Dzbor, M., Motta, E. Supporting User Tasks and Context: Challenges for Semantic Web Research. In *Proc. UserSWeb2005* (2005).
7. Herlocker, J. L., Konstan, J. A., Riedl, J. Explaining Collaborative Filtering Recommendations. In *Proc. CSCW2000* (2000) 241-250.
8. Linden, G., Smith, B., York, J. Amazon.com Recommendations: Item-to-Item Collaborative Filtering. IEEE Data Engineering Bulletin (2003) 76-80.
9. O'Reilly, C. A. Variations in Decision Makers' Use of Information Sources: The Impact of Quality and Accessibility of Information. The Academy of Management Journal 25, 4 (1982) 756-771.
10. Resnick, P., Varian, H. R. Recommender Systems. Communications of the ACM 40, 3 (1997) 56-58.
11. Shardanand, U., Maes, P. Social Information Filtering: Algorithms for Automating "Word of Mouth". In *Proc. CHI1995* (1995).
12. Smith, J. A. Semi-Structured Interviewing and Qualitative Analysis. In J. A. Smith, R. Harre, and L. Van Langenhove, (eds.): Rethinking Methods in Psychology. Sage (1995) 9-26.