

GATHERING INFORMATION IN ONLINE COMMUNITIES: WHAT IS THE KEY TO SUCCESS?¹

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Abstract

When investigating information sharing activities in online travel communities we found that the benefit of querying topically related online communities as part of the search process may go well beyond the provision of up-to-date or "complete" information. In particular, we argue that one of the main benefits of approaching an online community for information is the resulting *interactive* process that helps the user *clarify* his or her information needs. Conceptualizing this process as mediated interaction rather than traditional information retrieval suggests to investigate further the specific characteristics of such processes and to explore ways to enable, sustain and support them.

Zusammenfassung

Bei der Untersuchung von informationsverbreitenden Aktivitäten in virtuellen Gemeinschaften fanden wir Hinweise darauf, daß für Informationssuchende die Vorteile des Befragens von virtuellen Gemeinschaften weit über den Wert der erhaltenen Information in Bezug auf Aktualität und Vollständigkeit hinausgehen können. Wir zeigen in diesem Artikel, daß einer der Vorteile oftmals initiierte wechselseitige Informationsaustauschprozesse sind, die dazu führen können, daß Informationssuchende ihre Informationsbedürfnisse besser verstehen und auch eher in der Lage sind, diese auszudrücken. Diese Prozesse als *vermittelte Anfragen* aufzufassen legt nahe, die spezifischen

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Eigenheiten dieser Prozesse zu studieren und auch nach Möglichkeiten zu suchen, diese zu initiieren, zu erhalten und zu unterstützen.

1. Introduction

Computer networks have revolutionized the way information is distributed and accessed and have a significant role in transforming society (e.g., [Castells 2001]). Information and communication technologies (ICT) also enabled virtual or online communities. Pioneers of online community development and research Howard Rheingold and Roxanne Hiltz introduced the term 'online community' to connote the intense feelings of camaraderie, empathy and support that they observed among people in the online spaces they studied [Preece and Maloney-Krichmar 2005].

Over the years online communities have been studied extensively (e.g., [Smith and Kollock 1999]). [Preece 2000] discusses ways to establish and sustain online communities. Most relevant to this paper is the observation that online communities are very effective and powerful information sharing habitats (e.g., [Lueg 2001]). Communities of interest [Carotenuto et al 1999] have shown to be places where inquiries by information seekers are usually very welcome.

In this paper we argue that one of the main benefits of approaching an online community for information is the resulting *interactive* process that may help the user *clarify* his or her information needs. We also suggest that such processes are best conceptualized as mediated interaction rather than as querying information systems. We use online tourism communities as example but aim to abstract from interpretations of theme-specific interactions to more general observations regarding the effectiveness of information gathering in online communities.

We proceed as follows. First we introduce online travel communities and the empirical basis of our considerations. Then we discuss a number of information sharing activities we observed and relate them to concepts including *mediation* and *interactivity*. Finally we discuss our findings and outline future work in this area.

2. Online Travel Communities and Data Collection

The role of online communities in enhancing tourism has been largely ignored by research [Schwabe and Prestipino 2005] even though travel and tourism in general are topics that receive a lot of attention in online communities. The latter is of interest to information researchers noticing that information sharing activities in online communities often circumvent and thus affect the way information is distributed in often tightly controlled industries. A number of authors argue that online tourism communities are changing the way travel information is accessed and shared in the travel industry (e.g., [Schwabe and Prestipino 2005]; [Lueg 2006]).

We collected the data used in this paper from a well-established online community, URL www.australien-info.de founded in 1998 (www.australien-info.de/ueberdlp.html). The topics are mostly related to travel in Australia as well as immigration to Australia. Discussions are typically held in German but occasionally postings are written in English. The community features a relatively small number of "regulars". Like in most online communities participation in discussions tends to be irregular. The web site is operated commercially but the online community appears to have remained largely independent.

| | | | | | |
|---|----------------|----------|-----|----|----------------|
| Nette Unterkunft in Brisbane ?? Neu | Tommy | 19-01-07 | 165 | 5 | 21-01-07 01:05 |
| Frage zur Gulf Air Neu | Flückiger René | 19-01-07 | 188 | 1 | 19-01-07 23:06 |
| Canning Stock Route Neu | Bernd Rombold | 19-01-07 | 136 | 0 | 19-01-07 18:29 |
| Airbus A380 Singapore-Airlines Neu | Andreas Adam | 19-01-07 | 360 | 3 | 21-01-07 10:44 |
| Trainingspartner Melbourne gesucht Neu | Jens76 | 19-01-07 | 154 | 0 | 19-01-07 08:51 |
| Outdoor-Geschäft Neu | P.Mueller | 19-01-07 | 253 | 2 | 19-01-07 15:50 |
| Noch jemand am 9.2. von Frankfurt nach Perth unterwegs? Neu | Petra | 19-01-07 | 133 | 2 | 20-01-07 18:56 |
| Aborigines treffen Neu | Mary | 19-01-07 | 304 | 4 | 21-01-07 04:47 |
| start 22.1.07 Neu | Stefano | 18-01-07 | 192 | 2 | 19-01-07 22:20 |
| Schlangenbissgefahr steigt Neu | Dieter Unger | 18-01-07 | 753 | 8 | 20-01-07 00:06 |
| Solar Saline am Ngaloo Reef geplant... Neu | Dieter Unger | 18-01-07 | 203 | 0 | 18-01-07 09:16 |
| An du Spezialisten Neu | Anne März | 17-01-07 | 590 | 8 | 21-01-07 16:35 |
| Erfahrungen als Krankenschwester in AUS Neu | Desirée | 17-01-07 | 325 | 11 | 21-01-07 23:35 |
| Anrufe mit Handy Neu | Gabriele | 17-01-07 | 377 | 7 | 21-01-07 12:21 |
| Whithaven Beach und Hill-Inlet Lookout Neu | Gabriele | 17-01-07 | 315 | 9 | 21-01-07 17:20 |

The data collection period of 6 weeks in late 2006 (the screenshot above was taken a few months later in January 2007) corresponds to the community's usual expiry rate. "Expire" is a term denoting the process of removing postings after a certain time. Reasons for expiring postings include saving

storage space, reducing information overload and last but not least removing information that is likely to be outdated.

3. How Does the Community Respond to Inquiries?

In order to find out about how the community responds to inquiries we looked at a 6-week window providing 139 inquiries attracting 769 answers and/or follow-up postings. In total the postings attracted 41,207 views suggesting strong interest in the community and its topics. We did not analyze topic-drift [Osborne 1998] in great detail because it seems to be an essential part of the socializing aspect of such communities. The number of distinct contributors is unknown because determining would require a level of access to the community that "regular members" including the authors did not possess.

Discussion threads consist of initial postings (typically questions but also 'informative' postings including news about Australia and personal announcements eg "Back in Germany") plus the above mentioned answers or follow-up postings.

In average questions attracted 5.53 replies. Quite a few inquiries did not attract any responses. 24 of the 139 threads in posted in 2006 attracted at least 10 responses; 3 attracted at least 20 responses. One discussion attracted 50 responses. The active/passive (post/read) in the community ratio is interesting as passive participation or "lurking" is often assumed to be less valuable than active participation. [Nonnecke and Preece 2000] and others [Lueg 2000], however, contest this view.

An established research perspective regarding the informational capacity of online communities is to view them as functionally equivalent to "information systems" (e.g., [Schwabe and Prestipino 2005]). According to this view, travelers query online communities in order to retrieve information. Research questions exploring communities from this perspective include but are not limited to up-to-date-ness of information, coverage, completeness, response time, etc. A major question is how information made available by online communities compares to information provided by professional guidebooks. Findings (e.g., [Prestipino et al 2006]) may have significant impacts on commercial travel guidebooks currently published as books.

We are particularly interested in questions regarding the social and also the cognitive processes that enable information seekers to find the information they are looking for.

One dimension of the problem space is the information retrieval insight that users often are unable to rationalize their information needs in such a way that they can articulate them in computer terminology such as Boolean queries. Research in interactive information retrieval (e.g., [Koenemann and Belkin 1996]) and related IR disciplines therefore considers the human information seeker an integral part of the retrieval process and consequently information retrieval systems as "systems for supporting people's interaction with information." [Belkin 1996, p. 27]. These and similar insights from other disciplines motivated us to explore interactivity and its current or potential role in gathering information from online communities.

The second dimension of the problem space is inspired by ethnographic studies of intermediaries in libraries and other customer support settings. These settings appear to be far removed from online communities but key insights are highly relevant: the work of intermediaries is often "invisible" and therefore difficult to quantify but nevertheless enormously helpful:

"One of the most valuable (and unheralded) services librarians provide is to help clients understand their own needs---a kind of information therapy. Interacting with a reference librarian can be very much like going to a good psychotherapist who, through skillful questioning, gets you to talk about what's really bothering you." [Nardi and O'Day 1999, p. 85].

Summing up we are looking for cues indicating how and to what extent interaction with online communities helps information seekers clarify their information needs and find useful information.

Related work includes [Lueg 2006] describing distinct qualities of community information including mediation, expansion and immediacy. The "mediation" quality denotes that feedback from tourism communities enables users to establish their own, independent perspective on destinations in a way that is not pre-mediated by guidebooks and tourism related media. The "expansion" quality denotes that tourism communities may provide information that is not directly related to their original questions but nevertheless highly relevant. The "immediacy" quality denotes that tourism community may not suffer from the time-space dilemma that guidebook authors usually have to deal with.

Expanding on the information systems view they introduced [Prestipino et al 2007] argue certain features of online communities suggest they may actually

be superior information systems: because online communities provide a “natural language”-interface, they argue, there is no need to transform an information need into a formalized query language, thereby losing details of the information need, or using fixed navigational structures, e.g. indices. The community may also act pro-actively and may provide information the asking person did not think of or deem necessary or failed to formulate in his query. [Lueg 2006] shows that communities members often offer information even though they probably know the information is not exactly what the information seeker asked for. One of the examples provided detailed an online community conversation initiated by a user inquiring about a hotel near Perth airport. A community member knowing Perth and the location of Perth airport interpreted the information seeker's situation, concluded that most likely, the tourist is going to stay in Perth for at least a day anyway and recommended to seek a hotel in downtown Perth rather than near the airport. The observation was that in strict IR terms the information provided was not directly relevant to the information seeker's query as he or she specifically inquired about a hotel at the airport. The argument was that in such situations, the members' understanding of the information seeker's information need overrode the usual relevance criteria.

3.1. Intermediaries

In the previous section we motivated looking for cues indicating how and to what extent interaction with online communities helps users clarify information needs and find information. The metaphor we will use is "intermediary" and argue that the process of identifying the information seeker's state of knowledge by community members engaging in discussions with the information seeker is among the particular strengths of this kind of information gathering. We also argue that the process resembles --at least to some extent-- the interaction between information seekers and (professional) intermediaries in library settings.

In library and information science (LIS) the concept of intermediaries facilitating "mediated interaction" is a powerful information retrieval process that avoids some of the problems of fully automated retrieval systems. Mediated interaction involves an information-seeking user, a skilled human intermediary (typically a librarian) and an information retrieval system. As [Saracevic et al 1997] point out: *"Ever since the advent of user modeling by automatic or semiautomatic means in [information retrieval], or for that matter in [artificial intelligence], nothing has come close to matching the extent, complexity, and success of user modeling as done by skillful*

professional intermediaries in direct contact with the user." User modeling refers to the construction of a (mental) model of the user's information need by the intermediary. This means the interaction and the growing mutual understanding of the information need by both user and intermediary is central to the process.

3.2. Examples of Mediation-Type Processes

In what follows we describe a number of conversations we observed on australien-info.de. The conversations illustrate what we mean by "mediated interaction" in the context of online communities.

The first example is a discussion triggered by an inquiry regarding "Hinterland von Cairns: Mareeba, Chillagoe, Innot Hot Springs etc." (11 answers; initial question posted 3/11/06). The inquiry is about exploring the wider Cairns area ("Hinterland") and the most interesting places in this area. Later on the same day (3/11/06) a community member suggested visiting the rainforest Tablelands. The next day (4/11/06) the original information seeker responded to the suggestion and asked specific questions about climate conditions etc. Additional information provided by other community members lead to further questions by the information seeker.

Another example of this type of discussion was triggered by an inquiry about "Route von Alice nach Broome" (posted 24/11/06). The context provided by the information seeker was the intention to travel, in a rental Apollo 4WD [4 wheel drive] Adventure camper van, to Broome from Alice Springs. The specific question was whether the 4WD is suitable for traveling the Gumbarrel Hyw (sic) in June or whether it would be better to travel the presumably less interesting Gread Central Road (sic). A community member advised that traveling the route in the 4WD mentioned may be problematic. Moreover he suggested that Apollo's rental conditions may actually exclude traveling this and a number of other 'rough' outback routes. The community member also suggested that the Great Central Route may not be as boring as assumed and suggested to consider traveling the Tananmi Road (another outback track). The inquirer responded that he considered the alternative route and explained why he decided against it and thanked for the Adventure Camper advise.

Other inquiries however did not trigger such interactive processes which leads to the question if there are specific aspects that can be used to characterize successful inquiries. One of the difficulties is defining "success" as receiving

feedback from the community depends to some significant extent on the very availability of knowledgeable community members. This means e.g. that regardless of the specific characteristics of an inquiry, community response may be poor during holiday periods in either Germany or Australia (expats answering questions).

What we found is that inquiries to online communities that clearly specify the information sought may be answered in a direct manner and won't trigger an interactive process either.

An example of such an inquiry and the community response is "Bilderladen in ASP" (posted 19/11/06) asking for name and/or address of a specific gallery in Alice Springs. The information sought was provided by the community within 2 days:

Beitrag am Forum:

Fenster schließen

Bilderladen in ASP

Autor(in): Micha [REDACTED]
Datum: 19-11-06 11:56

Hi,
ich war vor 6 Wochen in einer Bildergalerie, wo sehr schöne Photographien in Form von grossen Bildern ausgestellt und verkauft wurden. Der Laden liegt in einer kleinen Seitenstrasse der Todd Mall. Wenn man Richtung Norden läuft, ging es mal rechts ab, vor oder nach Red Ochre Grill. Wer kann mir Namen oder Adresse sagen? Vielen Dank an alle Alice- Kenner.
Cu Micha

 Auf diesen Beitrag antworten

Re: Bilderladen in ASP

Autor(in): Robert [REDACTED]
Datum: 21-11-06 09:19

Hallo Micha,
Du meinst den Laden von Steve Strike. So weit ich weiss, nennt er sein Unternehmen "Outback Photographics". Du wirst seine Webpage aber sicher über seinen Namen finden. Er bietet dort einige Motive auch Online zum Verkauf an!

Gruß

Rob

 Auf diesen Beitrag antworten

Re: Re: Bilderladen in ASP

Autor(in): Micha [REDACTED]
Datum: 21-11-06 12:53

Hi Rob
vielen Dank, liegst voll richtig mit Deinem Hinweis. Man kann sich einfach auf die AUS Spezialisten im Forum verlassen.

Another example of this type of process is "Bundaberg Rum" (posted 22/11/06). The information seeker inquired about opportunities to buy Bundaberg Rum (an Australian specialty often enjoyed by tourists and sought after once they returned home) in Switzerland and received respective advice within approx. an hour. Another one and a half hours later the inquirer thanked for the information.

Another example is "Digitalkamera im Auto aufladen" (posted 23/11/06) about recharging a digital camera while traveling Australia in a car. Within 13 minutes (sic) the inquiry was answered comprehensively. 16 minutes later the inquirer thanked for the information.

Similarly, "Einfuhr von Schokolade" (posted 22/11/06) asking about bringing German chocolate and Gummibaerchen (a kind of jelly beans) into Australia was answered within 24h.

"Camper für 3" posted 19/11/06 inquiring about a "Hitop Camper" camper van and if it is sufficiently roomy for 3 people was answered within 24h as well.

However, inquiries that appear to be seriously under-specified don't seem to attract a lot of responses either. Inquiries such as "I am about to travel from Sydney to Cairns. What should I consider?" are typical examples of this type of inquiry. A possible explanation is that respective information seekers are perceived as not making an effort to ask more precise questions.

4. DISCUSSION AND FUTURE RESEARCH

The main contribution of this paper is that we have provided qualitative analyzes suggesting that some of the most effective information gathering processes in online communities may be best described as "mediated interaction" [Saracevic et al 1997] or "mediated problem solving" rather than just "querying information systems". This insight is significant as it suggests a distinct type of support for information seekers. The question is not so much how conversations can be "marked up" for efficient retrieval in the information systems sense. Rather, the question is what kind of graphical and/or textual representations can be used to initiate and sustain mediated interaction in online communities? What kind of reward schemes can be introduced?

Most sites supporting the sharing of travel experiences allow posting textual descriptions of routes; some allow posting of pictures, etc but we are not aware of any work looking into the specific requirements of supporting the very "problem solving" that our research suggests to be a core activity of such sites.

When evaluating the information behavior of online communities it is difficult to derive quantitative results as community participation may vary significantly over time for reasons unrelated to the nature of the original inquiries.

We are proceeding in several directions. We are analyzing further data regarding the characteristics of mediated interaction in online communities. Second, we are reviewing the online communities and knowledge management literature to distill recommendations for incentives schemes applicable to interaction support. Third, we are reviewing existing travel community sites as to what means of support they offer (and why they are offered).

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6. References

- Belkin, N. (1996). Intelligent Information Retrieval: Whose Intelligence? *Proc. Fifth International Symposium for Information Science*, 1996, pp. 25-31, Universitätsverlag Konstanz.
- Castells, M. (2001). *The Internet galaxy. Reflections on the Internet, Business and Society*. Oxford University Press, Oxford, UK.
- Carotenuto, L., Etienne, W., Fontaine, M., Friedman, J., Newberg, H., Muller, M., Simpson, M., Slusher, J., and Stevenson, K. (1999). CommunitySpace: Toward Flexible Support for Voluntary Knowledge Communities. *Proc. Workshop "Changing Places"*, London, UK.
- Koenemann, J., and Belkin, N. (1996). A Case for Interaction: A Study of Interactive Information Retrieval Behavior and Effectiveness. *Proc. Human Factors in Computing Systems*. Vancouver BC, Canada, pp. 205–212. ACM Press.

- Lueg, C. (2000). Where is the Action in Virtual Communities of Practice? *Workshop "Communication and Cooperation in Knowledge Communities" at the German Computer-Supported Cooperative Work Conference*, Munich, Germany.
- Lueg, C. (2001). Information Dissemination in Virtual Communities as Challenge to Real World Companies. *Proc. First IFIP Conference on E-Commerce, E-Business, and E-Government (I3E 2001)* Zurich, Switzerland, pp. 261-270. ISBN 0-7923-7529-7.
- Lueg, C. (2006). Mediation, Expansion and Immediacy: How Online Communities Revolutionize Information Access in the Tourism Sector. *Proc. 14th European Conference on Information Systems*, Göteborg, Sweden, paper No 418.
- Nardi, B. A. and O'Day, V. L. (1999). *Information Ecologies*. MIT Press, Cambridge MA, USA.
- Nonnecke, B. and Preece, J. (2000). Lurker Demographics: Counting the Silent. *Proc. Annual ACM SIGCHI Conference on Human Factors in Computing Systems*, The Hague, The Netherlands. 2000. pp. 73-80. ACM Press.
- Osborne, L. (1998). Topic Development in USENET Newsgroups. *Journal of the American Society for Information Science*. Volume 49, Issue 11, pp. 1010-1016. Wiley.
- Preece, J. (2000). *Online Communities: Designing Usability and Supporting Sociability*, John Wiley & Sons, Chichester.
- Preece, J., and Maloney-Krichmar, D. (2005). Online Communities: Design, Theory, and Practice. *Journal of Computer-Mediated Communication*, 10(4).
- Prestipino, M., Aschoff, F. and Schwabe, G. (2006). What's the Use of Guidebooks in the Age of Collaborative Media? Empirical Evaluation of Free and Commercial Travel Information. *Proc. 19th Bled Conference*.
- Prestipino, M., Aschoff, F. and Schwabe, G. (2007). How up-to-date are Online Tourism Communities? Empirical Evaluation of Commercial and Information Quality. *Proc. HICSS 2007*.
- Saracevic, T., Spink, A., and Wu, M.-M. (1997). Users and Intermediaries in Information Retrieval: What are They Talking About? *Proc. User Modeling*, pp. 43-54.
- Schwabe, G., Prestipino, M. (2005). How Tourism Communities can Change Travel Information Quality. *Proc. 13th European Conference on Information Systems*.
- Smith, M.A. and Kollock, P., eds (1999). *Communities in Cyberspace*. Routledge, London.