

From Information Behaviour of Independent Travellers to Requirements for Information Systems

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Abstract

The complexity and dynamic nature of travelling offers many opportunities for technological support. But printed guidebooks remain the typical companion, despite many weaknesses. Therefore, interviews with independent travellers were conducted. Results indicate the need to support dynamic changes of trip data and communication in networks as an important source of information for travellers. While knowledge created by planning trips and collected during travel is typically only accessible to close friends after returning, virtual communities offer the possibility to immediately share information and provide tailoring through a powerful social interface. But their technological support typically lacks structure and personalization. The paper concludes by proposing requirements for a tool for individual trip planning based on collaboratively created information and personal information spaces.

Keywords: Information needs, virtual communities, trip diary

1 Introduction

Travellers face complex information needs, ranging from destination choices and itinerary planning to information needs arising spontaneously during travel and being determined by unpredictable circumstances. This is even more pronounced on self-organized individual tours of independent travellers (e.g. Backpackers), where itinerary and activities are completely free to be chosen. The objects of the information need may be thousands of miles away, involving an unknown language, environment and culture. Information needs of travellers are characterized by highly dynamic and individual factors, e.g. perceived attractive sites, weather conditions, prices, transportation, accommodation, appointments.

Guidebooks, still the most popular travel-specific information product, cannot serve needs of this complexity. They may contain outdated information due to time-consuming production and distribution processes. A few episodes collected by the author during a recent (October 2004) visit to Brazil illustrate the problem of outdated information products (the guidebook used was the Rough Guide to Brazil (Cleary, 2003)): When looking for the recommended Hostel Dois Continentes in São

Luís, it turns out to have ceased existence 2 years before and the premises had been turned into an expensive hotel; Arriving at Fortaleza Airport, he looked in vain for the direct bus to the beach areas described in the guidebook. According to the tourism information officer at the airport, this connection had not been served for almost three years.

A guidebook's reader does not know how information was gathered and selected, and which assumptions underlie the recommendations. Trip itineraries, hotels etc. might be perceived to differ strongly from the description given because the traveller's preferences do not match the ones of the person giving the recommendation. It lies in the eye of the beholder what the terms "beautiful" or "difficult" mean. As an example, a traveller interviewed by the author recalled that after having been travelling through New Zealand for two months with a guidebook, he realized that sights described therein as "picturesque" always turned out to be boring. Clearly, his preferences differed from the one of the guidebook's authors, but because the guidebook is written in a neutral way (it caters to a large audience), the traveller could only realize this after longer usage. In personal communication this can be quickly clarified: one can ask a question to clarify or find out what a description means and what the preferences of the person are. One interviewee told that she considers the background of the person giving her advice, e.g. she asks if the person experienced the country personally.

Guidebooks, due to their very popularity, may invoke an adverse effect on their recommended venues, as these are literally swamped by travellers, deteriorating the attracting features (remoteness, prices, service quality). The business model for printed guidebooks is only profitable with update cycles of several years, too long to reflect such changes. Electronic communication and collaboration and the availability of mobile devices enable the creation of new information systems which may overcome these weaknesses, but little is known about the help independent travellers require.

2 Background and related work

We distinguish three phases to describe the process of travelling: preparation before a trip, travelling, and post-travel activities. Before going on a trip, a traveller decides where to go and what to do. In the preparation phase she is typically at home, has excellent access to information sources (e.g. books, internet, travel agencies) and a working knowledge of how to access them and acts in a known environment speaking her language. But information is dispersed through various media, and the traveller needs to retrieve and integrate it with little support by technology. She may for example write her plans on a piece of paper, memorize it or annotate a guidebook. These solutions create isolated collections of information, which are difficult to

change or share. Thus it is also difficult to get support from other people on these plans, as they must be physically available to them. She also may not be aware of her real information needs, e.g. she may forget to check for national holidays or recommended health precautions. During her trip, ad-hoc information needs arise, e.g. about transportation or accommodation. But access to information sources may be more difficult, as the traveller may not speak the language of the country, communication media may not be available and also time is much more valuable. Access is much more dependent on language proficiency and often restricted to persons in the immediate vicinity. So far, there is little specific support of this phase through information technology. Mobile phone networks, internet access points (internet cafes) and location data (GPS) are often available, but again all the burden of retrieving and organizing information is on the user. Travellers are naturally mobile users and may profit from the ability of using location data for information retrieval. Technology could help meeting locals or other travellers spontaneously based on shared interests, e.g. to do a tour requiring a minimum number of participants.

While touring, the user learns a lot about the country and this information and experiences may be of high interest to other travellers. But it is burdensome to share information with other people, especially with persons outside one's personal network. After the trip, travellers want to share experiences and keep their memories using artefacts like pictures, notes etc. She may externalize her experiences for herself and for others to see, e.g. by creating a personal diary. But some episodes and experiences may already be forgotten and the extra effort required is considerable.

Research projects related to supporting travellers with information mostly address Human-Computer-Interaction issues and route plotting. The goals of Tellmaris, an EU-funded project, are "to evaluate the usability of 3D maps provided on mobile computers for access to tourist information, and to explore how such maps can help tourists to make better decisions when travelling and planning their holiday" (Laakso, Gjesdal & Sulebak, 2003). CRUMPET (Poslad et al., 2001) provides location based services, e.g. showing directions to reach a location, but adds group features like analyzing preferences of a group's members and then proposing a nearby restaurant. Cheverst et al. (2000) developed GUIDE, a context-aware electronic guide using preferences to give recommendations, but concluded that "designers need to be careful when deciding to preempt the information requirements of users based on current context. For example, when we restricted the information available to visitors, such that they could only access information on the attractions at their current location, some visitors became frustrated because they could not query the system on things visible in the distance."

These systems mediate impersonal information in a more convenient way, i.e. using a mobile device and filtering information according to a user's location and a small set of specified preferences. The proposed solution is an interaction between a human user and an information product. These information products are consumed autonomously and obviously cannot provide intellectually tailored information matching the individual information need, preferences and situation of the user. Instead the user has to specify his information need using some query mechanism, which is then used for automatic retrieval. No query mechanism achieves the expressiveness and fine distinctions of human language. Most users lack the ability to use even simple query languages or retrieval tools (Jansen et al., 2000).

The approaches do not take into consideration that travellers are consumers and at the same time producers of information. Travellers value experience of others: Freyer (Freyer, 2001) found that more than 38,1% of travellers use experience of friends in the preparation phase. Case (Case 2002, p.289) concludes in his survey on human information seeking research: "Empirical research tells us that many people use formal sources rarely, relying instead on informal sources such as friends and family [...] Formal systems will never be able to satisfy most information needs".

Watson et al. (Watson et al., 2003) discuss opportunities for information support for travellers, but do not provide empirical data supporting their position. While usage of a specific technology, such as web search engines (e.g. Mitsche, 2005) or recommendation systems (e.g. Jeng and Fesenmaier, 2002) has been studied, there is a lack of empirical investigation about how well current information products are suited, although no improvement is possible without such studies. Current web based systems use generic communication tools developed for other goals than trip planning (Prestipino, 2005). Following the contextual design (Beyer and Holtzblatt, 1998) approach to systems design, the first goal is to understand how users act in real life and what problems they encounter and how they go about solving those problems rather than to analyse how users would use a given system.

The following chapter presents the methodology used to collect interview data from travellers while the results are discussed in Chapter four. Chapter five presents requirements for an information system for independent travellers derived from the interview results. Chapter five concludes by giving a brief outlook.

3 Methodology and data collection

Information behaviour encompasses information seeking and unintentional information acquisition as well as activities such as sharing, storing or transforming

information. Considering Wilson's (Wilson, 2000) global model we are specifically interested in the sources and strategies used in the phase of "Information seeking behaviour" and the habits of the "Information Processing and Use". This research strives for a deeper understanding of independent travellers' information behaviour in order to generate requirements for future systems. Therefore, explorative semi-structured interviews were chosen as appropriate method, allowing travellers to describe unrestricted. The questions for this cross-sectional study concerned all three phases of travelling. From a previous brainstorming session with five neutral (paid) subjects, literature review, analysis of guidebooks and discussion boards the following assumptions were formulated: travellers have information needs and use information sources to fulfil those needs; they need a way of taking information along, e.g. memorizing, using a guidebook or taking notes. While touring, they have to deal with ad-hoc information needs. They collect information which they may share or organize after their trip. This outcome was then used as the basis for formulating the questions used in the interviews:

- What information needs do independent travellers have? This question was used to get subjects started and help them remember their trips for subsequent questions
- Which information sources do they use?
- Do they prepare a stable plan of their trip or does the tour evolve dynamically based on events and new information?
- How do they take information along?
- What ad-hoc information needs are most prominent?
- How do they solve ad-hoc information needs?
- Do they share experiences after a trip?
- How do they deal with their memories and souvenirs? Are there any problems?

All questions in the exact phrasing can be found in the annex. We conducted one-to-one interviews lasting approximately an hour with seventeen unpaid persons between 20 and 30 years, eight males and nine females. It was assumed that this age group includes a major share of independent travellers. All participants were highly educated (college education or higher). The nationality of participants was mostly German and Swiss. Interviewees were recruited through different channels:

- An announcement on a web page mainly visited by residents of the Zurich area,
- A mailing list addressing Swiss students planning to spend a part of their study abroad or already having been abroad,
- Contacting a random sample of members of a large online community about travelling

We deliberately chose these channels to recruit travellers with at least basic

knowledge of internet and computer usage, as the goal was developing requirements for a tool supporting users with at least basic internet knowledge, extending their possibility beyond generic tools like Blogs. The focus was not on designing a tool for computer-illiterate users. Analyzing this group would also allow detecting patterns of innovative information behaviour using IT, e.g. electronic maps.

In three cases, a personal interview was not possible, and subjects were interviewed over the phone. Subjects were first asked about their travel experience to make sure they had already been on self-organized trips. The interviewer posed each question and the subjects would answer freely. The interviewees were instructed to answer the questions based on what they had done in the past, not to theorize what they might do in the future. The interviewer would take notes, which were also shown to the subjects in order to avoid misunderstandings. When the subject had finished his answer, the interviewer would specifically ask for certain standardized arguments that had not already been touched. This was done in order to avoid important points just being forgotten, as subjects could talk freely about their experiences in the course of the interview. E.g. when asking for information sources, the standardized sources friends, guidebooks, internet, literature, contact to locals, discussion boards. Thus the subjects could still bring up their personal, possibly new arguments. The standardized arguments were deduced from a pre-test of the interview with 25 persons. It is obvious that the sample is not representative for the totality of independent travellers. This is acceptable as our goal is not to generate general assertions about information behaviour but to formulate requirements based on user needs and experiences.

4 Results

4.1 Information Sources used in the preparation phase

When asked about the information sources typically used when preparing a trip, sixteen of seventeen interviewees replied they ask friends, often declaring it their most important source (see table 1). Eleven subjects use internet search engines, while the guidebook is surprisingly seldom used for preparation.

Table 1. Which information sources do you use when preparing a trip? (Multiple options possible)

Asking friends	16
Use a Guidebook	2
Search the internet	11
Use other literature	5

Contact locals	6
Ask in discussion boards	2
Travel agency	3

One subject described an innovative way of planning using the only recently available detailed satellite images provided for free by Google Earth (<http://earth.google.com/>): he scans the images to identify interesting landscapes. Another subject's main preparation activity consisted in getting contacts to locals (using internet communities) he would then call and meet.

Result 1: Personal networks are the most frequently used information source when preparing a trip

4.2 Stability of travel plans

Fifteen of seventeen subjects change their route often while travelling (cf. table 2). Often they just have a vague idea of the itinerary when departing. The most prominent factors influencing route changes were: meeting people on the trip and spending time with them at one place or travelling with them, and how attractive a place was considered once there. Several subjects said they purposely intend to meet and travel with other (unknown) people.

Table 2. Do you change your itinerary often while travelling?

Yes	15
No	1
Don't know	1

Result 2: Independent travellers mostly have no detailed outline of their trip, their itinerary varies.

4.3 How do travellers take information along?

A central question for the design of an information system is what users can do with the retrieved information. Thus we asked how travellers take information along (cf. table 3)

Table 3. How do you take personal information along? (Multiple answers possible)

Paper	10
Annotate guidebook	5
Digital medium	1
Memorize	5
Personalized maps	1

The need for flexibility and integration of many sources leads to the frequent usage of paper. A disadvantage of personal notes, annotated guidebooks and memorized information is that this information may never be used again by others. Digital portable media (PDAs, mobile phones) are only used by one person.

Result 3: Independent travellers prefer a low-effort, high-flexibility approach for taking information along.

4.4 Which information sources were used when faced with ad-hoc information needs?

During the trip, information gathering is very different than in the preparation phase (see introduction), as the traveller has to deal with a foreign environment: access to information sources may be much more cumbersome, complicated or even impossible. On the other hand, he is able to draw on the first-hand experience of locals and other travellers. Almost all subjects talk to other persons on the street or in the accommodation (cf. table 4).

Table 4. Which information sources do you use while travelling? (Multiple answers possible)

Ask locals & other travellers	16
Use a guidebook	2
Search the Internet	12
Tourist information	5
Bookstore	6
E-Mail	2
Travel agency	3

Many interviewees said they would deliberately seek out youth hostels because there they can easily meet other travellers with similar preferences and valuable experience to draw on. One subject would almost entirely rely on searching the internet, looking for access as soon as arriving to a new city. The subject looking for contacts to locals in the preparation phase (see above) would mainly use his cellular phone to call his local contacts or friends at home. Again, the guidebook was mentioned seldom.

Result 4: While touring, direct communication is the most important way of acquiring information. The Internet is an accepted and frequently used information source.

4.5 Is experience shared after a trip?

All interviewees share their experience with friends and relatives, typically by showing pictures and story-telling. Besides, they also act as experts for people in their personal network, i.e. friends and friends of friends can obtain information when going to a location known to them. Only one of the interviewees shared his experiences with a general audience (through his web page). This indicates that experiences of many travellers are only available in social networks and never make it into a guidebook or web page. Information quality for travellers could substantially be increased if these experiences could be untied from close personal networks and made available to a larger audience.

Result 5: Travellers share their experience with friends and acquaintances, but hardly with other people. Valuable information never gets disseminated.

When asked about what problems they had in the post-trip phase, eight subjects stated they wished to keep more memories from forgetting, especially to reminisce and share emotions. Sharing the moments of a trip with travel companions is also seen as valuable distributed memory. One subject explained: “when travelling alone or just with short time travel companions you never meet again, you are likely to forget all the small beautiful episodes, you can not talk to another person and reminisce together and say “do you remember that night out, with that silly person...”. Another subject said she had once travelled with a person taking a lot of pictures of often very ordinary things, and that obtaining those pictures turned out to be an important help to remember feelings and episodes.

Result 6: Independent travellers are often unable to share experiences of their trips with other people and access memories of people they meet or travelled with.

5 Requirements and design propositions for travellers' information support

We propose the following requirements for a support system for independent travellers (table five summarizes the findings from the interviews and requirements):

The system must allow for cooperation, e.g. through the possibility to pose questions and allowing users to comment, add or edit the on information provided by another user. As personal networks are an important source, the system must support and also extend those networks by allowing a larger audience to collaborate. Virtual Communities (Rheingold, 1993) fulfil these requirements, although they provide mainly communication support. On the internet numerous large and long-lived communities about travelling exist, so obviously those communities serve a need and create some benefit for their users. As an example, Thorn Tree¹, the online discussion space of guidebook publisher Lonely Planet, receives around 5000 written contributions per day. There is evidence that communities may serve as effective information systems for travellers (Prestipino 2004; Prestipino & Schwabe, 2005). Virtual communities extend a traveller's personal network to possibly thousands of people. The community provides a "natural language" interface to their knowledge allowing for refinement and clarification of the real information need (cf. Belkin, 1982). Community members may point to existing information or tailor information, matching the actual information need, and proactively give information the inquirer did not ask for. Virtual communities constitute an transparent information market where experts pick questions they are able and motivated to answer. We propose to use these communities as information sources for an information system. The system shall allow travellers to plan a trip and make data available beyond personal networks.

The system must provide users with a personal information space: Personalization refers to the user being able to create a personal information space. A forum does not offer good personalization features: it is not possible to edit, annotate or rearrange the information. Also, it would be socially awkward to start a thread meant for personal use, and the user would have little control about the thread in terms of altering information or structure. He would also have no possibility to restrict other users of posting into this thread which might or might not be welcome. It also refers to the possibilities of using available resources for ones personal situation, e.g. linking to information objects offered by the system.

¹ <http://thorntree.lonelyplanet.com/>

The personal information space should allow for easy integration of information sources, e.g. copying content from discussions, other users' personal spaces and the shared knowledge base or bookmarking contacts or external sources. Integrated content should still be connected to the original source, i.e. if a user copied or bookmarked a wiki page or discussion he should be notified if that information changes. The system should provide travel-specific information structure and functionality, such as the ability to define a route and add information to certain points on a route. Personal trip plans in turn become a source for other users and thus enhance the available knowledge base. It is also much easier for other users to comment or answer information needs of a traveller if they get the complete information about his trip instead of just a question

The system should support reminiscing and documentation of past trips: a user should not need to create his documentation from scratch after he used the tool. The tool should allow to arrange trips in certain structures (trip plans, time, place) and to integrate pictures and additional descriptions. It should be possible to publish these trip descriptions.

Users must be able to retrieve public information from other users' personal information spaces using navigation structures or key-word retrieval. Trip plans of other travellers may be an excellent information source, providing much more information than single discussions in forums. The system must provide search facilities and structure by which a user can navigate to desired information (e.g. by location).

The system must connect the personal information space to a larger community information space, such that the user can pose questions and browse structures information created by a community. Virtual Communities typically use web based discussion spaces. Information is created, structured and archived in discussion trees. This feature makes it easy to participate in ongoing discussions but does not allow for structure. While electronic retrieval may support full-text search for a certain piece of information, a well-designed structure is much more suitable for a systematic knowledge acquisition. A well-designed book has little redundancy; the content is described in a way that later pieces of knowledge build on prior pieces; and the content is structured in a way that is didactically and aesthetically appealing. Typical guidebooks have to find a compromise to support search for specific information and to give an overview over the general information. They address both information needs in different book sections.

In discussion spaces, valuable information may never be written because it was not asked and the potential writer thus did not find a location to share his knowledge. Several threads might deal with the same topic, fragmenting information. Threads themselves lack structure, as they mimic a discussion transcript, i.e. it is often required to read the whole thread. Because of the different granularity of information in thread topics and individual posts and the lack of structure on both levels it is difficult to find or maintain information. Outdated information can only be corrected by adding another post, thereby increasing the problem of structure. Lists do not convey hierarchical relations between threads. We therefore propose a tightly interlinked combination of a discussion space with a collaborative knowledge base. Users may search the knowledge base, ask questions or collaborate on the knowledge base. Unsolicited information and the outcome of discussions can then be added to the shared material as homogenous texts, such that it can be corrected and updated easily.

The concept of open collaboration using shared material has recently received much attention, especially Wikis, and its most prominent example Wikipedia. A Wiki is a set of web pages offered as shared material: anyone is allowed to create or edit a page. The success of Wikipedia shows that, given an increasing amount of people connected to the internet and easy-to-use collaboration software, professional authors are not necessary to create information products, nor are commercial editors and publishers. But while stand-alone wikis may well provide free guidebooks, we argue those guidebooks will share some of the disadvantages of printed guidebooks: they do not provide individualized information, and do not support personalization.

The system must support flexible planning and fast rearrangement of the information space: As the trip often is not outlined beforehand or may change during the trip, the system must allow a user to change his route definition effortlessly and without losing previously entered information. As paper is the most frequently used way of taking information along, it should always be possible to print the information collected.

The system should connect the user with other users, e.g. by showing users nearby or with similar trip plans. Thus, ad-hoc communication and coordination is possible, e.g. a person who is in the same city may be willing to join a traveller or may have expert knowledge on this city. The system should support communication between users. This may be the ability to send asynchronous messages but also the provision of chat facilities and Voice-over IP telephony.

Table 5. Overview of interview results and requirements

Interview result	Requirement for system design
Personal networks are the most frequently used information source when preparing a trip.	1. The system must allow for cooperation, such that friends may comment, add or edit the personal information space of a user.
Independent travellers mostly have no detailed outline of their trip, their itinerary varies. A trip planning system must support modifications.	2. The system must support flexible planning and fast rearrangement of the information space. 3. The system must provide users with a personal information space
Independent travellers prefer a low-effort, high-flexibility approach for taking information along. Internet is an accepted and frequently used information source.	4. Access to the information must be low-effort: as internet cafes are now widely available, the system should be based on internet standards, and not require a special software or device. 5. It must be possible to print out information.
While touring, direct communication is the most important way of acquiring information.	6. The system should connect the user with other users, e.g. by showing users nearby or with similar information needs 7. The system should support communication between users.
Travellers share their experience with friends and acquaintances, but hardly with other people. Valuable information never gets disseminated. Independent travellers are often unable to share experiences of their trips with other people and access memories of people they meet or travelled with.	8. Easy dissemination and sharing of experience and information beyond personal networks: a system shall allow travellers to plan a trip and make data available to others. 9. The system must connect the personal information space to a larger community information space, such that the user can pose questions and browse shared information created by a community. 10. Users must be able to retrieve public information from other users' personal information spaces using navigation structures or key-word retrieval. 11. The system should support reminiscing and documentation of past trips.

6 Conclusion and Outlook

This paper presented work in progress on how to improve information support for independent travellers. More empirical data needs to be collected, e.g. from field observations of real travellers, and from a larger sample. We are currently prototyping and evaluating a travel information system based upon the requirements and design propositions described in this paper. The evaluation results will contribute to a better understanding of the domain, leading to new requirements, in a cycle that is typical for user-centred systems development. The implications on the tourism industry could not be discussed in this paper, but are not to be underestimated: tourism industry may suddenly face fierce competition from virtual community providers offering more and more additional services to a loyal base of users. Virtual communities may prove disruptive to the whole B2C tourism sector, as companies harnessing community technology may attract and lock in customers. Also, the business model for guidebook publishers may not work anymore in the future.

7 Acknowledgments

For helpful comments and discussions I am grateful to Gerhard Schwabe and Andreas Löber from the University of Zurich.

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Annex: Question used in the interviews (in German)

Warum gehst du hauptsächlich ins Ausland?

Wie viele Wochen verbringst du durchschnittlich im Ausland pro Jahr? (Ohne Geschäftsreisen!)

Wie lange hat deine bis jetzt längste Reise gedauert? (Ohne Geschäftsreisen!)

Was für Fragen stellen sich dir, wenn du dich auf deine Reise vorbereitest?

Wenn du eine Reise planst, wie bereitest du dich darauf vor?

Änderst du deine Reisepläne oft, wenn du unterwegs bist?

Weshalb?

Welche Informationen haben dir unterwegs gefehlt?

Wie gehst du vor, um an diese Informationen zu gelangen?

Wie hast du die Informationen aufbereitet um anschliessend mitzuführen?

Wie lernst du unterwegs Leute kennen?

Wie hältst du Kontakt mit Freunden/Familie/Bekanntschaften unterwegs?

Lässt du andere von deinen Reiseerfahrungen profitieren?

Falls ja, wie?

Wie bewahrst du Dinge, die dich an deinen Urlaub erinnern auf?

Gab es dabei irgendwelche Probleme? Was ist nicht gut daran?

Was würdest du dir wünschen, um weniger von deinen Reiseerinnerungen zu vergessen?

Was sind Kriterien für deine Hotelwahl?

Hattest du schon Probleme mit Reiseführern?