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Nutzergenerierte Reisewarnungen auf Twitter: Eine Explorative Analyse

User-Generated Travel Warnings on Twitter: An Explorative Analysis

Twitter_Travel Risk_Information Source

Zusammenfassung. Viele internationale auswärtige Ämter nutzen die Online-Plattform Twitter mittlerweile als Kanal für Reisewarnungen. Dieser neue Informationskanal erlaubt den Betrieb von Anwendungen, die einem breiten Publikum aktuelle, hochqualitative Reiserisikoinformationen zugänglich machen. Unsere explorative Forschung hat das Ziel, die Rolle der Informationsquelle und Zielgruppe einer solchen Anwendung zu untersuchen. Die Resultate unserer Analyse zeigen keine substantiellen Hinweise darauf, dass nutzergenerierte Inhalte per se ungeeignet als Informationsquelle sind. Zusätzlich zeigt unsere Analyse, dass Vielreisende eine besonders interessante Zielgruppe sind.

Summary. Online platform Twitter, has been recognized by international foreign offices as an outlet for travel warning. This new channel of information allows for the creation of applications that bring current and high quality travel risk information to the mainstream. Our explorative research aims at investigating the role of the information source and target audience of such an application. The results of our analysis show no substantial evidence that user-generated travel risk information would be per se unsuitable as an information source. Further, our analysis revealed that frequent travelers might be of special interest as a target group for the application.

1. Introduction

There is a variety of reasons why travel risk information like travel warnings and guidance of high quality are important. First and foremost, tourists are prone to be under informed about imminent dangers when travelling, as they usually do not have regular access to suitable information outlets and oftentimes do not speak the local language. In case of an emergency, travelers usually do not have sufficient knowledge about local emergency infrastructure preventing them to react appropriately in critical situations. Online applications can provide travel risk information when and where it is necessary and can further help to take appropriate precautions before travelling and prevent dangerous situations in advance by indicating generally risky travel destinations. There are already information systems in place distributing high-quality travel risk information. Corporations pay extensive amounts of money to assist their employees during travels and keep them safe from potential threat on the basis of these sources (see e.g. Aon, Drum Cussac).

With the advent of social networks, micro-blogging and news platforms like Twitter, information generally propagates more freely than before. Not just the amount and frequency of broadcasted information has increased, but also the diversity of directly available information sources has immensely grown (Kwak, Lee, Park and Moon 2010). Lately, Twitter has been recognized by multiple foreign offices and other official sources as an outlet for travel warnings and guidance. The quality and amount of available travel risk information from these sources on Twitter is substantial and enables for the creation of information systems that bring high-quality travel risk information to the average traveler who do not travel under the safeguarding umbrella of a corporation.

The core design artifacts of our research are a travel risk web portal and a mobile application that integrate travel risk related tweets and provides an information system comparable to a corporate travel risk program to consumer markets. The system obtains Twitter feeds from several foreign offices, in order to provide high quality and up to date travel risk information. Tweets, which contain a reference to a country are automatically recognized and presented to the user grouped by country.

Twitter has even more potential for providing travel risk information. At a later stage of development, we want to integrate Tweets which were not generated by official sources, but by unaffiliated users of the platform. Despite the fact that it requires more effort to filter for travel risk relevant content and appropriately integrate it into the information system, this kind of information source holds great potential for broadening the information base and providing more detailed first-hand information (Becker,

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Naaman and Gravano 2011). However, it is unclear how user-generated travel risk information is perceived by the users of the system and how that perception affects their intention to use the system. Perceived information quality is known to be a key driver of system acceptance (Nicolaou and McKnight 2006). We assume that this is also the case in the context of a travel risk information system. Therefore, the first dimension along which we study the perception of the provided information and the resulting consequences for the intention to use the system, is the information source.

The second dimension we want to investigate is the target audience of the application. While there is large potential for companies to strategically position themselves in the travel context by offering such an application, it is unclear which target audience can be reached. Previous research suggests that general perception of travel warnings might strongly vary with travel frequency of the user (Reisinger and Mavondo 2005). More frequent travelers might rely more on their own experiences and are less affected by travel risk information. In this study, we specifically want to investigate the interplay of information source and target audience on an explorative basis, as we expect interesting insights that can guide future artifact development. More specifically, we want to focus on the following research question:

RQ: What is the impact of information source and travel frequency on system acceptance?

The reminder of this paper is structured as follows. In the next chapter the theoretical background of our research is outlined. We describe our research design and data collection in section three. The results of our research are presented and analyzed in chapter four. Finally, we discuss our findings in section five.

2. Theoretical Background

Our research question is framed in the context of information source and target audience. Therefore, we want to build upon perceived information quality as a key construct to explain system acceptance. In order to operationalize system acceptance in the context of our work we conducted an intense literature review (keywords "perceived information quality", "system acceptance") on the basis of six scholarly databases (Science Direct, Proquest, EBSCOhost, ACM, Wiley Inter Science, SpringerLink), as they cover the most relevant IS journals, books, as well as conference proceedings.

The identified literature can be categorized into three domains, i.e. tourism, risk management and information systems. All three domains identify trust and risk as essential concepts which play a vital part in the interplay between perceived information quality and intention to use (cf. for example Reisinger and Mavondo 2005, Earle 2004 and McKnight 2002). In their seminal work, Nicolaou and McKnight (Nicolaou and McKnight 2006) ultimately bring these fundamental concepts together in one consistent research model. Hence, we take their work as a foundation for our work.

After examining various PIQ (perceived information quality) -related definitions, Nicolaou and McKnight define PIQ to represent cognitive beliefs about the favorable or unfavorable characteristics of the currency, accuracy, completeness, relevance, and reliability of the information (Nicolaou and McKnight 2006). This definition comprehensively adopts different aspects of PIQ in the literature (cf. for example Lee, Strong, Kahn and Wang 2002 and Wang and Strong 1996).

Building upon the trusting beliefs component of the trust concept typology of McKnight and Chervany, trusting beliefs (TRU) means one believes the other party has beneficial characteristics, and implies favorable perceptions about the other party, i.e. the party is honest (i.e., has integrity and keeps commitments), benevolent (i.e., responsive to the partner's interests, not just its own), and competent (i.e., has the ability to do what the partner needs done) (McKnight and Chervany 2002), (Morgan and Hunt 1994), (Pavlou and Gefen 2004). Nicolaou and McKnight define perceived risk (RSK) as the degree to which one believes uncertainty exists about whether desirable outcomes will occur. This definition includes part of Sitkin and Pablo's broader perceived risk concept, capturing outcome uncertainty, outcome divergence likelihood, and extent of undesirable outcomes (Sitkin and Pablo 1992).

Intention to use (ITU) stems from the theory of reasoned action (TRA) literature (Fishbein and Ajzen 1975), as exemplified by TAM (Technology Acceptance Model) research (e.g. Davis, Bagozzi and Warshaw 1989, Gefen, Karahanna and Straub 2003 and Pavlou 2003).

3. Research Design and Data Collection

We conducted a combined online questionnaire and experimental simulation with German-speaking participants from the university's environment (n = 87). Participants were acquired via a mailing list and asked to imagine soon to be traveling to the fictive country "travel country" for the first time. We chose a fictive country to avoid bias due to prior travel experience. Nevertheless, with the following scenario, which was presented to participants, we aimed to provide a possibly realistic and substantial motivation for the participants' travel intent: "In two weeks, the wedding of your best friend will take place in 'travel country'. You are your best friend's witness at the marriage. On the next page you will be presented with Twitter messages about 'travel country'. Please take a look at the page and answer the upcoming questions." To add more realism to the scenario and provide a somewhat sharper picture of "travel country", participants were informed that their flight to "travel country" would take about 12 hours including waiting and transfer time.

The applied experimental design was a 1 × 2 between subject arrangement. Participants were randomly assigned to either one of the two groups, in which we manipulated the information source of the presented Twitter messages. One group of participants ("official") was presented with tweets from foreign offices (USA, UK, Canada, Switzerland, and Germany), the other group ("unofficial") with tweets from fictive individual Twitter users. Notably, the content of Twitter messages in both groups was identical, i.e. we exchanged author name and

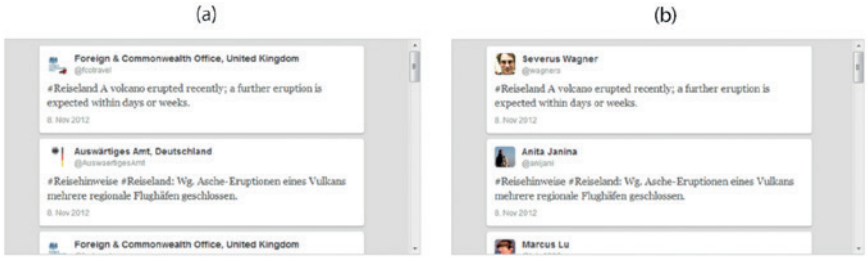

Figure 1: Display of twitter messages for the two experimental groups: official information source (a) and unofficial information source (b).

avatar only. This design guarantees comparability of the two groups. However, it has to be noted that no actual tweets from unofficial sources were presented, which may limit interpretability and generalizability of the results. All presented information originates from actual tweets twittered by foreign offices about Columbia. Exemplary tweets for both groups are shown in figure 1.

A subsequent item-based questionnaire allowed us to measure participants' perceived information quality (PIQ), perceived risk (RSK), trusting beliefs (TRU) and intention to use the system (INT) in both experimental groups. Furthermore, participants were asked how often they travel long distance (1, rarely – 6, often). The scale assessing PIQ was adapted from Nicolaou and McKnight (Nicolaou and McKnight 2006) to the context at hand while preserving the underlying theoretical considerations of the scale (different information quality dimensions). TRU, RSK and ITU also stem from Nicolaou and McKnight. Again, the scales were adapted with the intent to maintain the underlying rationales. Only the original TRU scale cannot be tuned well to the nature of our work. Our experimental setup is limited in that it does not allow assessing the benevolence of the solution provider. Hence, TRU only reflects honesty and competence as major aspects of trust. Summing up, Table 1 shows the item measures underlying our work with corresponding descriptive information.

19 % of the participants were between 18 and 24 years old, 65 % were between 25 and 34 years old, 2 % were between 35 and 54 years old and 2 % were older than 55. 12 % of the participants did not report their age. Of all participants, 57 % were female, 30 % were male and 13 % did not report their gender.

4. Analysis and Results

Our research is of explorative nature. Therefore, we do not aim to validate the constructs on the basis of a comprehensive research model but run an item-based analysis. To analyze our results we conducted a two-way analysis of vari-

Item	1–7 Scale (Strongly disagree … Strongly agree)	Mean	Standard deviation
Perceived information quality (PIQ)			
PIQ 1	Information is current enough	5.22	1.41
PIQ 2	Information is accurate enough	3.84	1.52
PIQ 3	Information ist relevant enough	4.70	1.51
PIQ 4	Sufficient amount of information available	3.28	1.40
PIQ 5	Information has appropriate level of detail	3.06	1.64
PIQ 6	Information can be relied upon	4.08	1.68
Trusting Beliefs (TRU)			
TRU 1	Website is sincere	4.52	1.46
TRU 2	Website competent	4.11	1.63
Risk (RSK)			
RSK 1	Risk of making wrong decidion (very low … very high)	3.90	1.47
RSK 2	Website use (potential for loss … potential for gain)	4.75	1.12
Intention to use (ITU)			
ITU 1	Would use again	4.55	1.58
ITU 2	I would recommend use	4.60	1.71

Table 1: Construct and item measures

ance (Anova) to analyze the impact on information source and travel frequency on intention to use the system.

Information source (official/ unofficial) might influence the perception of the presented travel risk information, but that effect might differ across groups of frequent and non-frequent travelers. A two-way Anova tested the perceived information quality, trusting beliefs, perceived risk and intention to use of travel warnings either being presented as originating from official or unofficial sources among respondents who classified themselves as frequent or non-frequent travelers. The means of all items are illustrated in table 2. Anova test results are presented in table 3. In the following, all significant effects are described.

	Frequent traveler		Non-frequent traveler	
	Official	User	Official	User
PIQ 1	5.48	5.34	4.64	4.75
PIQ 2	4.24	3.82	3.18	3.50
PIQ 3	4.97	4.71	4.27	4.42
PIQ 4	3.90	3.09	3.00	2.58
PIQ 5	3.96	2.91	1.91	2.42
PIQ 6	4.66	3.54	4.64	3.73
TRU 1	5.00	4.03	4.73	4.58
TRU 2	4.34	3.74	4.45	4.33
RSK 1	3.48	4.03	4.00	4.42
RSK 2	4.59	4.83	5.00	4.67
ITU 1	4.69	4.51	4.82	4.00
ITU 2	4.86	4.71	4.36	3.83

Table 2: Means for two way Anova (information source and travel frequency)

There was a significant main effect of travel frequency on the perception of the currency of the presented information (PIQ 1), $F(1,83) = 4.47$, $p < .05$. Specifically, frequent travelers perceived the information to be more current than non-frequent travelers. Furthermore, there was a significant main effect of travel frequency on the perception of the sufficiency of the amount of available information (PIQ 4), $F(1,83) = 4.61$, $p < .05$. Specifically, frequent travelers perceived the amount of available information to be more sufficient than non-frequent travelers. In addition, there was a significant main effect of travel frequency on the perception of the appropriate level of information detail (PIQ 5), $F(1,81) = 12.12$, $p < .01$. Frequent travelers perceived the level of detail to be more appropriate than non-frequent travelers. However, there was also a significant interaction effect between travel frequency of the participants and the information source of the presented travel risk information (PIQ 5), $F(1,81) = 4.54$, $p < .05$. Taking the

	Information source			Travel frequency			Interaction		
	df	F	Prob > F	df	F	Prob > F	df	F	Prob > F
PIQ 1	1	0.000	0.969	1	4.470	0.037	1	0.140	0.710
PIQ 2	1	0.020	0.892	1	3.560	0.063	1	1.010	0.318
PIQ 3	1	0.020	0.885	1	1.790	0.184	1	0.290	0.594
PIQ 4	1	3.550	0.063	1	4.610	0.035	1	0.370	0.547
PIQ 5	1	0.550	0.459	1	12.120	0.001	1	4.540	0.036
PIQ 6	1	6.340	0.014	1	0.040	0.837	1	0.060	0.801
TRU 1	1	2.590	0.111	1	0.170	0.685	1	1.430	0.236
TRU 2	1	0.830	0.365	1	0.780	0.381	1	0.370	0.547
RSK 1	1	1.830	0.180	1	1.620	0.207	1	0.030	0.856
RSK 2	1	0.030	0.870	1	0.210	0.650	1	1.090	0.300
ITU 1	1	1.600	0.210	1	0.240	0.625	1	0.670	0.416
ITU 2	1	0.670	0.416	1	2.760	0.100	1	0.210	0.646

Table 3: Anova results for information source and travel frequency

means as a basis (cf. Figure 2), this indicates that the perceived level of detail of the information was quite similar for frequent and non-frequent travelers if they were presented travel risk information from an unofficial information source, however it was significantly different if they were confronted with the same information from an official information source. Finally, there was a significant main effect of information source on the perception of the reliability of information (PIQ 6), $F(1,82) = 6.34$, $p < .05$. Specifically, information originating from an official information source was perceived as being more reliable.

5. Discussion and Conclusion

The primary objective of our study was to investigate the implications of using Twitter as a source for travel warnings in information systems. We found that both the information source and characteristic traits of the target audience play an important role for several aspects of perceived information quality and the resulting consequences for the intention to use the system.

There were no direct significant effects of information source and travel frequency on system acceptance (RQ). That is, neither our experimental manipulation of the information source of being either official or unofficial nor the respondents' trait of being either frequent or non-frequent travelers had a significant influence on the respondent's intention to use the system. However, we found significant effects of both travel frequency and information source on several aspects of perceived information quality which might lead to an indirect influence on intention to use. Surprisingly, frequent travelers perceived the currency of the provided information as higher than non-frequent travelers. This is indeed unexpected, because there is no direct, intuitive connection between a respondent's frequency of traveling and her perception of how sufficient the currency of the presented travel risk information is. Also, the sufficiency of the amount of the presented information was perceived higher by frequent-travelers than by non-frequent travelers. The reason for that might be that frequent travelers require less information than non-frequent due to their higher travel experience. Interestingly, the level of detail of the presented information was rated higher by frequent travelers than non-frequent travelers, but only if the presented information was denoted to originate from an official information source. This means that frequent and non-frequent travelers perceive the same information only differently, if the information source is official. Not surprisingly, the empirical evidence shows that information denoted as originating from an official information source was perceived as being more reliable.

As we specifically wanted to investigate the interplay of information source and target audience to guide future artifact development, our findings bear some interesting insights. First, as could be expected, allegedly official information was perceived as more reliable and made the overall system appear more sincere. However, our empirical data shows no significant effects for many items like accuracy, relevancy or even competence when manipulating the information source to be either official or unofficial. Hence, we found no extensive evidence that user-generated travel risk information would be per se unsuitable as an information source for a travel risk application. Indeed this type of information might complement official information sources with the potential of providing latest first-hand information. Second, our data suggests that our proposed travel risk application might be best positioned in the target audience of frequent travelers as all significant effects we found point into that direction.

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2