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The Influence of Semantic Web on Decision Making of Customers in Tourism Industry

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Abstract

The Internet is already the primary source of tourist destination information for travelers. According to World Tourism Organization, about 95% of Web users use the Internet to gather travel related information and about 93% indicate that they visited tourism Web sites when planning for vacations. The number of people turning to the Internet for vacation and travel planning has increased more than 300% over the past five years. E-tourism is a perfect application area for semantic Web technologies, since information dissemination and exchange are the key backbones of the travel industry. The Semantic Web aims at making the wealth of information available on the Web accessible to more precise search and automated information extraction and processing, based on a machine-readable representation of meaning in the form of ontologies. One common assumption is that the Semantic Web can be made a reality by gradually augmenting existing Web data by ontological annotations. In this paper, we describe electronic word-of-mouth (e-WOM), which has been referred to by various terms such as online communities, feedback systems, peer reputation systems, or consumer generated media. Such systems provide a global platform for customers to share their experiences, and also rate service providers. The primary focus was on the product review systems (PRS). These review systems are less personal but more ubiquitous platforms for e-WOM wherein consumers post reviews about the products/services they have consumed. These reviews are widely accessible to other consumers but are disseminated only when other consumer consult these reviews during the purchasing process. The results illustrate, consumers in the low involvement mode, had carefully analyzed the content of the message to arrive at the decision whether or not to trust the review. In the high involvement mode, they also gave importance to peripheral cues such as the demographic information of the reviewer. This paper shows that the role of social factors, apart from the main review content, can have significant influence on consumers' attitude towards the reviews on the web.

Keyword: Semantic Web, E-Tourism, Web Services, Ontologies, Electronic Word of Mouth (e-WOM), Product Review Systems (PRS).

Introduction

Tourism has become the world's largest industry and its growth shows a consistent year to year increase. The World Tourism Organization predicts that by 2020 tourist arrivals around the world would increase over 200%. Tourism has become a highly competitive business for tourism destination over the world. Competitive advantage is no longer natural, but increasingly driven by science, information technology and innovation.

Travel is a domain in which the Internet has led to a new quality of service and online booking and reservation services have become widely accepted among consumers and business travelers. Furthermore, in recent years, growth rates in online tourism have moved much faster than in the overall world economy, and this trend is not expected to slow down in the near future (The European e-Business Report, 2007). Since travel destinations can be easily checked out in advance, it has become much simpler to choose hotels with a higher degree of precision. Particular hotels on the Web are presented with a variety of visual and factual information and also travelers can seek the true information by the review of the other travelers on hotels in some web sites that their role is to improve the network between people around the globe. There is a variety of services that integrates the information scattered across various sites, federate multiple structured and semi-structured tourism information sources on the web (Haller, Pröll, Retschitzegger, Tjoa and Wagner, 2000), and offer search engines for hotel rooms by providing a list of rooms available for a given period at a particular place. Often these search engines utilize databases and reservation systems to which hotels are connected. Having such an engine that provides integrated information regarding hotel vacancies clearly reduces the search time and costs, which, in turn, means a huge benefit for the end-user. At the same time, the search engine provides more information on hotel, based on customer’s reviews.

In this paper, the primary focus will be on the product review systems (PRS), and more specifically review systems related to tourism service. Product review systems are less personal but more ubiquitous form of electronic word-of-mouth (e-WOM) wherein consumers post reviews about the products/services they have consumed. These reviews are widely accessible to other consumers but are disseminated only when other consumer consult these reviews during the purchasing process.

Semantic Web and e-Tourism

The tourism domain can especially benefit from sophisticated E-Commerce solutions and Semantic Web technology, due to the significant heterogeneity of the market and information sources, and due to the high volume in online transactions (Werthner and Ricci 2004). Semantic Web technology may support more advanced E-

Commerce. Namely the representation of products and services in the form of ontologies will simplify the automated extraction and processing of explicit information and will make implicit information available for the discovery and comparison of offerings.

The Web is supported primarily by HyperText Markup Language (HTML), which is especially useful for displaying graphics and text. HTML is unstructured and descriptive but does not express the meaning contained in the HTML document. For example, when a person wants to search a book about 'Washington' through a search engine, the search result may have millions of records that contain the word 'Washington', whether it may be a name of a person, state, county, city, airport, museum, or something else. Automated web content processing cannot be implemented. The semantic Web has been envisioned as the next revolutionary development in the Internet that will overcome such unstructured problems and allow automated and seamless information processing and exchange over the Internet.Semantic Web can be made a reality by gradually augmenting the existing data (mainly HTML/XHTML) by ontological annotations, derived from the non-machine-readable content.

The development of the Semantic Web is a joint effort of top scientific institutions (MIT, Stanford, ILRT etc.) and global business players (HP, IBM, Nokia etc.), and is led by the World Wide Web Consortium (W3C) whose task is to oversee the major efforts of specifying, developing, and deploying standards and languages with the aim of expressing shared meanings (Quan and Karger, 2004). The World Wide Web Consortium (W3C) suggests, "The goal of the Semantic Web is to develop enabling standards and technologies designed to help machines understand more information on the Web so that they can support richer discovery, data integration, navigation, and automation of tasks" (W3C, 2009).

Considering tourism domain semantic technologies allow both hotel offers and requirements at a conceptual level to be described by attaching metadata to datasets that refer to parts of ontology. Ontology is an explicit specification of a shared conceptualization (Gruber, 2005) and provides a description of the area of interest, which in our case means hotel characteristics and customer (travel) requirements.

The Semantic Web vision is to extends the current Web with information that provides well-defined meaning, thus enabling computers to return more precise search results, integrate data from different sources, and automate sophisticated tasks (Berners-Lee, Hendler and Lassila, 2001). The objective is to use the Web like a global distributed knowledge store which can be accessed by applications.

The Importance of PRS for Tourism Service

Product review systems have also become an important aspect of travel planning ever since the Internet permeated the tourism industry. Consumers put more trust in the opinions of fellow consumers than in the content provided by product/service providers (Blackshaw and Nazzaro, 2005). Further, product reviews exist in the online space and can be easily accessed, linked and searched. Given that consumers are increasingly relying on search engines to search for information, consumer generated reviews will inevitably change the structure and accessibility of travel information, and subsequently, consumers' perception of various products. Consequently, there has been a proliferation of online platforms wherein consumers can exchange travel related information and experiences.

Tripadvisor.com, Hotels.com and IgoUgo.com are some of the many online platforms that provide this service to consumers. For instance, Tripadvisor.com is currently known to be the largest site for travel reviews with close to two million reviews of hotels, attractions and restaurants around the world and claims to contain "been there, done that" inside information and the best deals for the travel plans (TripAdvisor.com, 2009). Similarly, IgoUgo.com allows consumers to create profiles and travel lists that can be accessed by other consumers looking for information. Such information allows the site users to contact each other for further questions or even to build acquaintances with fellow consumers (IgoUgo.com, 2009). The fundamental driver of the PRS is their support for online social networks. The promoters of these systems expect that consumers will take advantage of one another's experience and similarity in tastes and preferences to narrow down on the right combination of products and services needed for a perfect trip. While this is also true for various other products and services as well, certain characteristics of tourism and travel related products and services makes these review systems even more relevant. Firstly, from the consumers' point of view, tourism products are essentially intangible and experiential in nature which lack the 'try before you buy' feature or 'return in the case of quality being below expectations' (Buhalis, 2003). This implies that the element of risk in buying these services is much higher when compared to regular products, and the appeal of reference group evaluation is even higher during the decision making process. In this regard, consumer generated reviews assume a lot of significance as they provide a more nuanced view of the travel experience, supported by ratings and rich descriptions (narrative, photos, and videos).

Secondly, from the service provider's point of view, the seasonal and perishable nature of these products increases the marketing stress levels (Lewis and Chambers, 2009). Recent evidence suggests that at least 84% of consumers who search for information online have sought information from PRS and based their decision on other

consumers' opinions. Similarly, a study by market research firm ComScore (2007) suggested that at least 40% of consumers have consulted reviews before deciding on whether to book a hotel room or not, and were willing to pay a price premium of more than 20% to hotels that had excellent or 5-star ratings from other consumers. Also, the image of the tourism service providers is being significantly impacted by the content of these PRS. Review systems enable a continued conversation and connection between the customers and sometime provide a true way of differentiation. Therefore, with growing competition in the online travel related markets, properly utilizing consumer generated reviews can go a long way in providing early competitive advantage. In fact, tourism firms are nowadays deploying sophisticated techniques to track and consolidate consumer reviews in PRS since they believe that such information can provide an important insight into the minds of their consumer. For instance, ReviewAnalyst collects information from sites like TripAdvisor, TravelPost, YouTube, Flickr and Google, among others (Hotelmarketing.com, 2009). The tool not only provides reports of information posted to sites, but also tracks trends through an analysis of the comments made by consumers and facilitates a management response. Such evidence emphasizes that the importance of PRS in online commerce cannot be underestimated and will only grow in the near future.

Electronic Word-of-Mouth (e-WOM)

The emergence of the Internet has radically changed our daily lives. The way we search for information, the way we interact with each other, and more importantly, the way we shop are now all different (Foreman, Ghose, and Weisenfeld, 2008). All these changes are very relevant to the word-of-mouth communication prevalent over the Internet (e-WOM). Previously, when customers needed information about a product/service, they turned to marketer generated information (advertisements and brochures), third party certifications (consumer associations and product experts), or interpersonal sources (friends and relatives). However, the e-WOM platforms have subsumed all the above mentioned information sources. These platforms allow consumers to socially interact with one another, exchange product related information, and make an informed purchase decision.

Traditionally, word-of-mouth behavior (WOM) has always been considered as an important social process that could determine new product diffusion, customer decision making process, satisfaction and loyalty (Srinivasan, Anderson, and Ponnavolu, 2009). WOM is sometimes more effective than traditional marketing tools such as advertising and personal selling. However, WOM is gaining a new significance due to the Internet. More specifically, the Internet has emerged as an important source as well as the outlet for WOM communication. One of the most important features of the Internet as a mass

communication medium is its support for bidirectional communication. It not only enables organizations to reach consumers in a large scale, and at low cost, but, at the same time, allows the consumers to make their product/service experiences known to an organization as well as its wider community of users. E- WOM is growing in importance as organizations recognize its effectiveness in providing personalized information, their affective appeal and persuasiveness. E-WOM platforms are referred to by various terms such as online communities, feedback systems, peer reputation systems, or consumer generated media. Such systems provide a global platform for customers to share their experiences, and also rate service providers. E-WOM systems are burgeoning on the Internet for products such as music and books (Amazon.com), news (Slashdot.org), consumer electronics (shopping.com), tourism and travel (Tripadvisor.com; Hotels.com), and many other products and services. They are an exemplification of 'peer production systems' (Benkler, 2006) through which community of users pool their resources to produce high rated information goods and information embedded goods, sometimes altogether replacing the traditional mechanisms of firms and markets. As with the traditional WOM, numerous studies have shown that these systems have a significant impact on customer decision making process, their satisfaction with goods and services, and the overall value of online economic transactions (Hennig-Thurau et al., 2004).

E- WOM is one of the many external information sources that consumers use during both pre- and post- purchasing process. However, e-WOM, as well as the buying process is fraught with considerable risk and uncertainty, especially for intangible goods such as tourism and travel related services. To alleviate this uncertainty, consumers look for certain social and instrumental cues in the reviews.

PRS and the Problem of Trust

One of the most important issues that need to be understood is the antecedents of consumers trust in the PRS. While it is generally agreed upon that customers extensively use the product reviews in their decision making process, it is still not clear how and why consumers trust these reviews. This becomes even more important given the proliferation of PRS in the e-commerce domain. Two main problems are generally cited in reference to the PRS. Mayzlin (2006) notes that on the firm's side, marketers have incentives to supply promotional chat or reviews in order to influence the consumer's evaluation of their products. They also note that, due to the relative anonymity afforded by the online medium, firms can (and do) disguise their promotions as consumer recommendations. This problem of genuineness is compounded by the fact that consumer interactions in PRS occur in a computer mediated environment. One of the main problems of computer mediated interactions is the lack of social cues. In

traditional face-to-face communication, both sides not only exchange information but also assess each other's motivations through non-verbal cues such as facial expressions, hand movements and other important social mechanisms. Previous reputation of the information source and the contextual cues also play an important role in giving credibility to the information provider. Due to the relatively lesser social cues in online interactions, there is considerable uncertainty at the consumers' end. Further, in the case of PRS, consumers have to deal with two different uncertainties. The first is about inferring the characteristics of the product that is being considered. This task is more difficult in the case of travel and tourism related services that are intangible and difficult to quantify in terms of features and functionalities. Secondly, the consumer has to also deal with the uncertainty regarding the integrity and intentions of the reviewer who is providing the product information.

Product Review Systems and Tourism Websites

The market for tourism and travel related PRS has grown considerably over the past few years. Some of the many firms operating in this domain include TripAdvisor.com, Hotels.com, IgoUgo.com and Travelpost. Each company has its own structure and organization, method of attracting consumer reviews, and ensuring the credibility and quality of these reviews.

Further, these firms have been devising numerous tools to allow consumers to effectively search for the right information and also to make this information trustworthy. Therefore, it is important to understand the basic structure and functioning of some of the popular PRS prior to the discussion on the problems associated with them. Consider TripAdvisor.com, one of the most popular tourism and travel related PRS. According to the official website, TripAdvisor.com is currently a global website for travel information and advice, covering more than 270,000 hotels and attractions in over 30,000 destinations worldwide. It features hotels, attractions, and restaurant reviews written by consumers; a wiki for travel information similar in concept to a travel guidebook; "goLists", where users list what to see or what to do; interactive maps based on the Google Maps engine; and "TripAdvisor Forums", an active traveler message board area.

With more than 25 million reviews and opinions and nearly 30 million unique visitors a month, TripAdvisor is also the largest and most popular online travel advisory site (Tripadvisor.com). The website, like any other online travel website, is modeled in such a way that visitors can narrow down on the destination, and then identify the activities and services available within that destination. For instance, as shown in Figure 1, a hotel in Iran is listed on the website.

Figure 1: A hotel in Iran listing on TripAdvisor website

The listing contains a general description and other relevant details provided by the hotel management. The website also provides an average price tab, the star rating of the hotel, the overall rating for the hotel (average based on ratings provided by each single reviewer) and then the reviews of the consumers who have presumably stayed at this hotel. Each hotel listing is typically associated with more than 100 reviews, and larger hotels (either popular or unpopular) sometimes attract more than 300 reviews. These reviews are spread over multiple web-pages associated with the same hotel listing. The reviews themselves maybe sometimes detailed but more often, they are not. Therefore, the website provides reviewers with the option of rating the hotel on select few attributes such as value for money, service, and sanitation. Further, website visitors can rate each review for its helpfulness (in a yes/no format), and the 'helpfulness' score is displayed alongside each review for the consumers to judge the utility of each review (see Figure 2).

Figure 2: A review of Abbasi Hotel - Iran in TripAdvisor.com

The consumers are also provided with tools to filter reviews based on rating valence (positive or negative), relevance to the trip and the date of posting. This gives consumers better control of which reviews to pick and choose from the vast majority of them available for every single service.

Uncertainty Reduction Theory and Trust in PRS

Uncertainty reduction theory (URT) of personal communication was originally proposed to explain the dynamics of human communication. One of the aspects extensively covered by URT and related theories is the communication between perfect strangers i.e., initial individuals who do not have a previous interaction history. The fundamental assumption of URT is that "when strangers meet, their primary concern is of uncertainty reduction or increasing predictability about the behavior of both themselves and others in the interaction". Uncertainty, here, is defined as a cognitive state that fluctuates on a continuum between the kinds of information sought by the individual and the quality of the information actually obtained. Both the parties in the interaction neither have the knowledge of the intentions and internal thoughts nor do they understand the effects of the messages that will be exchanged in the due course of the communication. Therefore, the primary motivation of the individuals is to reduce uncertainty and try to make sense out of the communication context.

In the online PRS, customer reviews are essentially interactions between customers with both social and informational goals. While the interactions between consumers were previously studied in the context of Usenet groups and virtual communities, one of the main differentiating factors with reference to PRS is that the interactions here do not

have a previous history and the expectancy of future interaction is very low or nonexistent.

This gives rise to two types of uncertainty: 1) the uncertainty associated the product or service being considered by the consumer, and 2) the uncertainty regarding the intentions and genuineness of the product review and the reviewer. To reduce such high levels of uncertainty, consumers employ both active and passive strategies of information search. Active strategies involve efforts to evaluate the content of the message itself, and assess the source expertise and bias (Buda and Zhang, 2000). In this process, consumers also search for information from other sources and compare them with the given message. In the case of online reviews, this could mean scanning other reviews of the same product if there are any, or querying through a search engine. Passive strategies include social observation wherein uncertainty is reduced by witnessing behavior of others and drawing conclusions. In online interactions, even though the availability of traditional non-verbal and contextual cues is limited, other cues or proxies for such information are used by the information seeker. As a result, alternate bases for psychological comparison of similarity such as an inclusive mindset or shared group identity might come into play rather than shared characteristics such as socio-economic status. At the same time, technology related factors such as the efficacy of the underlying technology in enabling information search and the institutional context in which the interactions take place further reduce uncertainty, and help build trust in the reviews, and eventually the product.

Conceptual Model

The model for this paper is composed of six key constructs (see Figure 3). Review seekers have both informational and social goals. Therefore, it is hypothesized that both the informational content in the review (ICON) and the social component of the review (IDENTITY) induce consumers' trust in an online review. The social component of the review is a combination of the consumers' perception regarding the socio-demographic characteristics of the reviewer. The induced trust (TRUST) positively influences consumers' behavioral intention (INTENT) to purchase the product. In this context, another concept of interest is the involvement (INVOLVE) of the consumer towards the product in question.

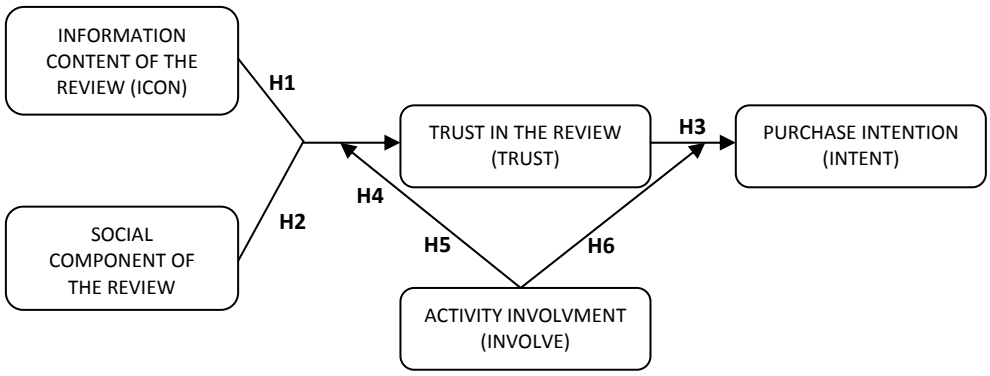

Figure 3: Conceptual Model and Hypotheses

It is hypothesized that involvement has a moderating influence on the relationship between the review characteristics and induced trust as well as the relationship between induced trust and intention to purchase the product (INTENT).

Construct Definitions and Hypothesis Development

The constructs constituting the conceptual model in this paper and their definitions are shown in Table 1.

Table 1: Definitions of constructs in the conceptual model

Construct	Definition	Abbreviation
Information content in the review	The extent and depth of information provided in the review	ICON
Social component of the review	The reviewer's disclosure of socio-demographic information in the review and the consumers' perceived similarity with the reviewer on these dimensions.	IDENTITY
Decision trust	Consumers' willingness to trust the information by the review and purchase the product/service	TRUST
Purchase intention	Consumers' intention to purchase the product/service	INTENT
Activity involvement	Consumers' involvement in the activity for which the product/service is being reviewed	INVOLVE

Information content in the review

Theories pertaining to uncertainty reduction suggest that in initial interactions, the extent of verbal communication between the communication partners alleviates uncertainty. Further, the length and depth of discussion in the initial stages also reduces uncertainty and enhances the trust between the communicating parties. In the case of online reviews, consumers will rely heavily on the amount of information provided in the review. Word-of-mouth is essentially an information source that consumers use to gain knowledge about a product or service. Therefore, the extent of information available through a word-of-mouth communication episode helps the customers assess the attributes of the product as well as the source of information, and this builds trust in the source.

A product review is an argument made by the reviewer to either encourage or dissuade consumers from buying a particular product or service. The manner in which the reviewer argues for or against the product increases the credibility and trust perceptions. Therefore it is hypothesized in paper that online reviews with better argument quality and analysis (ICON) have a higher trust factor associated with them than brief and general reviews.

H1: *Reviews with higher ICON have a higher positive effect on TRUST than reviews with low ICON.*

Social Component of the Review

In product review systems, while information regarding the product attributes alleviates uncertainty to a certain extent, the social mechanisms also help the consumer decipher the motivations driving the reviewers' effort to provide the review.

Identity claiming is an individual's self-appraisal along a variety of attributes such as physical and cognitive abilities, personal traits and motives, and social roles. In the case of online environments that are generally considered goal directed and lacking in nonverbal cues, individual self-disclosure and selective self-representation may lead to exchanges that are more intimate than regular face-to-face interactions (Tidwell and Walther, 2009).

However, while identity is cognition of self, it is manifested in social environment when the identity claim of an individual is recognized by others and is granted a place in the community of users. Such social identity promotes shared understanding and increases the trust and ease of communication between the involved parties.

When reviewers shared their demographic information such as city name, it spurred identity granting behavior from other customers, and eventually had a positive impact on sales. It is hypothesized in this paper that the reviews with a higher perceived social component (IDENTITY) have a positive impact on the consumers' trust in the review.

H2: *Reviews with high IDENTITY have a higher positive effect on TRUST than reviews with low IDENTITY.*

Trust in the Review: The Mediating Construct

Trust is the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other party will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party.

The concept of trust in the realm of e-commerce has been extensively studied in various fields as diverse as information systems, e-commerce and marketing, to social psychology and strategic behavior. Trust is considered as the central cue in the consumer decision making process since it has a positive impact on the consumer's overall attitude and behavioral intention. In online PRS, the problem is that consumers might not have complete information about the reviewers, actions, thoughts or motives, thereby creating a problem of information asymmetry.

Decision trust denotes an element of dependency on the other person, even when the other person is a completely unknown entity, and this trust contributes, to an extent, towards the final decision of the consumer whether to purchase the product or not. Based on the previous discussion, it is hypothesized in this study that the decision trust induced by an online review (TRUST) acts as a mediating construct between the impact of reviewer characteristics on consumer's intention to purchase the product.

H3: *The higher the TRUST in an online review, higher will be the INTENT.*

Intention to Purchase the Product and Product Involvement

Purchase intention (INTENT) is defined as the probability that the consumer will purchase the product, in this case, the product being reviewed on the PRS. Credible WOM is a strong driver of purchase intentions since it alleviates uncertainty and lowers the perceived risk associated with online product purchase, more so in the case of experiential products such as hotels and tourist activities.

Compared to the regular shopping environment, online commerce provides two additional challenges to the customer. Firstly, they have to interact with a technology medium to complete transactions, and this gives rise to issues such as technology acceptance, usability, human computer interaction and self-efficacy. On the other hand, when we view the e-commerce channel as an information conduit, added constraints such as anonymity, reduced richness and social cues, and abundance of information give rise to the importance role played by consumer trust in driving purchase intentions. Purchase intention in this paper has two dimensions: 1) the willingness to purchase the product, and 2) the willingness to recommend the product to friends and relatives. Attitudinal aspect reflects immediacy of the purchasing episode while the behavioral aspect reflects the consumers' willingness to recommend the product to family and friends (i.e. engage in positive word of mouth).

In high involvement activities, the probability and consequence of risk, both monetary and non-monetary, is higher in comparison to low involvement activities. Therefore, consumers assessing online reviews and taking decisions in a high involvement mode, tend to rely on more cues and require more information than consumers in low involvement mode. Further, highly involved consumers will also ratify the information given in the online review with other informed sources before forming an opinion towards the product.

Consequently, involvement should have a moderating effect on the relationship between review characteristics and attitude towards the review as well as between this attitude and behavioral intention. Therefore, in paper, it is hypothesized as follows:

H4: *The positive effect of ICON on TRUST will be greater for subjects with high INVOLVE than for subjects with low INVOLVE.*

H5: *The positive effect of IDENTITY on TRUST will be greater for subjects in high INVOLVE than for subjects in low INVOLVE.*

H6: *The positive effect of TRUST on INTENT will be greater for subjects in high INVOLVE than for subjects in low INVOLVE.*

Data analysis and Discussion

This section discusses the methodological issues and data analysis pertinent to testing of the hypotheses proposed in this paper.

At the primary test for the purpose of elicit subjects' views regarding various high and low involvement, 20 persons were randomly selected to participate in a group discussion. The discussion and subsequent analysis helped identify certain variables that formed the basis for manipulating the involvement levels of the trips. Based on this knowledge, some trip scenarios were created and tested for levels of involvement. The goal of this phase was to identify two trips/activities, one for high involvement and the other for low involvement. These two trips also served as the manipulation basis for the covariate 'INVOLVE' in the final data collection instrument. In the other phase, hotel reviews were created for each of the two trips so that the two independent factors, 'ICON' and 'IDENTITY' were manipulated as high and low. In the next phase, these survey instruments were tested for scale validity and manipulation checks. The validated instrument was evaluated by 128 persons. In the first stage, they were provided a talking point about the excitement of travelling around the country and the world. In the ensuing lively discussion, they raised various issues regarding their traveling interests and motivations. During this discussion, they were encouraged to delve upon following questions were raised during the session:

a. Name one destination/location that you always wanted to visit but could not due to various constraints.

b. Name one person (and your relationship to this person) who would be the most ideal partner on trip to your most dreamed about location

c. What are the other types of trips that don't really excite you but you have to go due to pressure from others?

d. If you were to plan for these trips, what would be the first activity that you would undertake?

Subsequently, at the end of the session, each person was asked to briefly write about at least two trips, one that they considered exciting (HIGH INVOLVE) and the other not so much (LOW INVOLVE). (See Table 2)

Table 2: Trip variables identified through group discussions

Variable	High Involve	Low Involve
Destination/Location	International	Domestic
Companion(s)	Significant other /Friends	Parents
Length of Stay	More than a week	Less than a week
Purpose	Leisure/Pleasure	Business

An implicit feature of a review is the word count. Previous studies have shown that this variable forms an important basis of differentiation between trustworthy and

untrustworthy reviews and shows a strong correlation with the number of helpful votes obtained by a review (Pavlou and Dimoka, 2006). To obtain this information, about 50 randomly selected reviews of hotels are tested for word count using word processing software. The word count analysis revealed that for hotel reviews, the average word count was 382.5 (SD=229.45) with the lowest at 170 words and highest at 856. However, using more than 800 words in a review was not feasible since those review extended beyond a single page. Given that each subject had to assess four reviews at the same time, a decision was taken to incorporate only 486 words for the high ICON review and 200 words for the low ICON reviews.

IDENTITY Manipulation: The social component of the review was manipulated using reviewer's personal information such as photo, real name/screen name, place of origin, and a short statement regarding the lifestyle and tastes.

The most important of information people generally use to assess the identity of a source, included individual identification (the 'who' question), shared identification (demographics and lifestyle), geographical location (the 'where from' question), and photos (what does he/she look like question). Real name of the source, for instance, was found to be much more reliable identity information than nick name or screen name in online communities (even though the real name provided can itself be false in many cases). The general attributes of the reviewer were extracted from randomly selected reviews. The analysis of these reviews revealed that majority of the reviewers used a screen name and very few either listed either their first name or full name.

The final data was collected in the month of August, 2009. The subjects were people and travelers in Iran, Esfahan. For this matter first we explained the objectives of the study to each person.

First it was declared that the study was to understand opinions of various online intermediaries such as TripAdvisor.com, and was asked to provide their honest opinion of the reviews presented in the survey instrument. The data were examined for the presence of univariate or multivariate outliers. Univariate outliers were detected in the ICON and IDENTITY measures. Each outlier was reassigned a value one unit larger than the upper-bound limit of the 95% confidence interval for the variable.

The characteristics of the respondents are presented in Table 3. To ensure the reliability of the measures, a series of the validity and reliability tests were conducted prior to the final analysis.

To test the hypotheses, four hotel reviews were created based on two levels for each of the three main constructs. These four reviews were evaluated by 128 people. The main objective of this study design was to test which combinations of the main effects (manipulated in the form of reviews) contributed the maximum to the consumer's trust and purchase intentions.

Table 3: Characteristics of the respondents

Gender	Male	42%
	Female	58%
Education	High School or less	35%
	2 Years College	17%
	4 Years College	29%
	Masters PhD Degree	19%
Age	18-23	54%
	24-27	14%
	28-32	19%
	32 and Above	13%

Linear mixed model analysis (a variant of general linear models with within-subject repeated measures) was performed to test the mean differences in the trust scores, as well as the main effects and their interactions. Linear mixed model analysis (LMM) handles data where observations are not independent. In terms of data format, LMM requires one row per person per measurement. Thus if each person is measured four times for four treatments, there are four data rows for person 1, then four rows for person 2, etc. Each data row contains an identification key for each person, the treatment variable. In this paper, four reviews and the effects that are being modeled (ICON, IDENTITY, TRUST and INTENT).

The subject identification number and involvement mode were specified as the between-subject factor, the review number as the within-subject repeated measure, and the two constructs, ICON and IDENTITY as the main effects. The results from this analysis are as presented in Table 4. The table shows the main and interaction effects of the two independent variables as well the moderator involvement on the dependent variable (the rows in bold indicate those predictors that showed significant effects). It should be noted that in the analysis, the HIGH level of each construct was specified as the reference category, and therefore, the estimates in the table correspond to the LOW level of the main factors.

Table 4: Tests of Fixed Effects for TRUST

	Estimate	Std. Error	Numerator df	F	Sig.
ICON	-0.14	0.14	1.00	28.43	0.00
IDENTITY	-0.19	0.14	1.00	84.37	0.00
ICON*IDENTITY	-0.32	0.19	1.00	6.47	0.01
INVOLVE	0.02	0.13	1.00	1.43	0.30
ICON * INVOLVE	-0.02	0.13	1.00	0.02	0.70
IDENTITY * INVOLVE	-0.25	0.15	1.00	5.84	0.05

The main effect of ICON on TRUST was found to be highly significant ($p<0.01$; F value=28.43) indicating that the subjects' trust was significantly higher for reviews that have higher information content than those with higher information content. This

supports the hypothesis H1 that reviews with detailed analysis have higher positive effect on trust than reviews that are general.

The main effect of IDENTITY was found highly significant ($p<0.01$; F value=84.37). This implies that the trust factor is higher for reviews for which there is perceived identity. This supports hypothesis H2 which states that reviews with higher perceived IDENTITY have higher trust factor than reviews with lower perceived identity. However, this effect should be interpreted in the context of the interaction term ICON * IDENTITY that was found be significant ($p=0.01$; $F=6.47$). It shows that there is a significant interaction between the information content and the social identity. Therefore, reviews that have a combination of high ICON and IDENTITY have significantly higher trust scores compared to reviews with low ICON and IDENTITY.

The moderating influence of the activity involvement was not supported by the data. For instance, the interaction effect ICON * INVOLVE was found to be not significant ($p>0.05$; $F=0.02$). The interaction terms IDENTITY * INVOLVE ($p>0.05$; $F=5.84$) was found to be marginally significant ($p=0.05$; $F=5.84$). These set of results support the hypothesis H4 but do not support H5. The analysis was also applied to test the effect of the main manipulations.

As the estimates in the Table 5 indicate, the review format (manipulated based on the two independent factors) explains significant differences in the mean trust score (the rows in bold indicate those predictors that showed significant effects). At the same time, there was no significant difference in the trust scores between the two involvement modes (i.e., interaction effect of review and involvement mode).

Table 5: Summary table for the analysis of variance tests

Source	Numerator df	F	Sig.
REVIEW	3	28.45	0.00
INVMODE	1	0.72	0.35
REVIEW * INVMODE	3	1.08	0.35

The estimated marginal means are shown in Table 6.

Table 6: Estimated marginal mean trust scores in two involvement conditions

Involvement mode	Reviewer	Mean	Std. Error	Lower Bound	Upper Bound
High	Hotel 01	6.137	.124	5.365	6.320
	Hotel 02	4.073	.121	3.726	4.371
	Hotel 03	5.107	.106	4.848	5.362
	Hotel 04	4.639	.132	4.379	4.423
Low	Hotel 01	6.105	.126	5.795	6.373
	Hotel 02	4.261	.138	3.957	4.532
	Hotel 03	4.946	.115	4.634	5.358
	Hotel 04	4.842	.142	4.571	5.105

Table 6 reveals that, consistent with the results of the mixed models, Hotel 01 with high ICON and IDENTITY was associated with the highest trust scores in both the involvement conditions, and Hotel 04 with low ICON and IDENTITY showed the lowest trust scores. This analysis was further extended through a post hoc analysis based on Scheffe's test of multiple comparisons. This test is considered more conservative and robust for pair-wise comparisons of means, as it requires larger differences between means for significance than some other methods such as Bonferroni correction and Tukey-HSD test. Sheffe's test (see Table 7) revealed the following:

a) Hotel 01 (with high ICON and IDENTITY) was associated with significantly higher trust scores in both high and low involvement modes than Hotel 03, Hotel 04 and Hotel 02,

b) Hotel 04 (with high ICON and IDENTITY) had significantly higher mean score than Hotel 02,

c) Hotel 03 (with low ICON and high IDENTITY) had significantly higher trust score than Hotel 02,

d) There is no significant difference in mean trust scores of Hotel 03 and Hotel 04.

Table 7: Scheffe's test for multiple comparisons of the review format

(I) Reviewer	(J) Reviewer	Mean Difference (I-J)	Std. Error	Sig.
Hotel 01	Hotel 02	1.034*	.132	.000
	Hotel 03	.392*	.079	.000
	Hotel 04	.458*	.105	.000
Hotel 02	Hotel 01	-1.034*	.132	.000
	Hotel 03	-.646*	.083	.000
	Hotel 04	-.586*	.118	.000
Hotel 03	Hotel 01	-.392*	.079	.000
	Hotel 02	.646*	.083	.000
	Hotel 04	.042	.100	.652
Hotel 04	Hotel 01	-.458*	.105	.000
	Hotel 02	.586*	.118	.000
	Hotel 03	-.042	.100	.652

The next step of the analysis was to test the main effect of trust on the intention to book the hotel. The results are shown in Table 8. The estimated marginal means of the INTENT are shown in Table 9. The analysis revealed that TRUST has a significant effect on INTENT. There was no significant difference between high and low involvement modes. Another important assumption in this study was the mediation effect of TRUST. The LMM model was specified with the three main effects and the INTENT as the dependent variable. None of the main and interaction effects were found significant. This analysis supports hypothesis H3 that trust mediates the impact of

reviews on intention to book the hotel, but hypotheses H4, H5 and H6 are not supported.

Table 8: Main effect of TRUST on INTENT

Source	Numerator df	F	Sig.
TRUST	25	5.47	0.00
INVOLVE	1	0.06	0.75
TRUST * INVOLVE	23	1.32	0.36

Table 9: Estimated Marginal Means of INTENT in the two involvement modes

INVOLVE	REVIEW	Mean INTENT	Std. Error	Lower Bound	Upper Bound
High	Hotel 01	2.534	.121	2.293	2.739
	Hotel 02	2.687	.125	2.352	2.925
	Hotel 03	2.506	.102	2.210	2.792
	Hotel 04	2.184	.113	1.937	2.349
Low	Hotel 01	2.485	.135	2.032	2.743
	Hotel 02	2.138	.127	1.834	2.384
	Hotel 03	2.523	.139	2.289	2.698
	Hotel 04	1.974	.112	1.637	2.273

Conclusion

One of the main contributions of this study was to understand the role of semantic web, which can have significant influence on consumers' attitude towards the on line reviews. This paper hypothesized, and validated that social identity can come into picture when consumers are evaluating online reviews. For instance, results show how identity information is essential to establish para-social presence in online review systems.

It was hypothesized that the information content in a review (ICON), and the social component of the review (IDENTITY) have a positive effect on consumer's trust (TRUST) in the review, and this trust in turn has a positive effect on the consumer's intent to purchase a product or service (INTENT). Further, it was also hypothesized that the extent of involvement (INVOLVE) moderates the above mentioned relationships.

To test the hypotheses, the study adopted a quasi-experimental design, based on it, two levels for each of factors, four reviews similar to those found in sites such as tripadvisor.com were created. The data was analyzed using linear mixed models. The results showed that both the main effects, information content of the review, and the consumers' perceived social identity with the reviewer contribute to an increased trust in the reviews. The study data did not support the hypothesis that involvement of the activity moderates the above mentioned relationships. Within this, information content was found to be playing an important role in both the involvement modes whereas the social component explained more variance in the trust in the high involvement mode

than low involvement mode. It shows that, as in face-to-face communication, computer mediated communication also requires a social component to reassure consumers and build trust in them. Further, the results also emphasize the important influence that product reviews have on consumers' intention to purchase products and services. Interestingly, the results show that for tourism and travel related products that are generally characterized by intangibility and ambiguity, consumers tended to trust reviews that are provided by other consumers whom the consumers perceive to be similar in socio-demographic characteristics, as well as tastes and preferences. This affect is more evident in high involvement activities as compared to low involvement activities.

Analysis revealed a significant difference in the trust scores associated with the four reviews. The review of Hotel 01 (with high ICON and IDENTITY) was considered more trustworthy than all other reviews. Interestingly, there was no difference in trust scores between Hotel 03 (high IDENTITY and low ICON) and Hotel 04 (low IDENTITY and high ICON). The main effects of ICON and IDENTITY were found highly significant in the analysis. These results lend credence to the fact that consumers form impressions of others even with relatively limited non-verbal and physical cues available via computer mediated communication.

Interestingly, the interaction term IDENTITY*INVOLVE was also found to be significant. This result was further supported by the structural modeling which indicated that in the high involvement mode, IDENTITY explained significant amount of variance in the dependent variable TRUST whereas ICON assumed more importance in low involvement mode.

Semantic web is essentially social interaction platforms, it is important to apply the aforementioned concepts and understand how online reviews also require certain social components apart from their pure utilitarian value.

This paper shows that consumers use the content of the review to achieve certain social and utilitarian goals. Tourism and travel related products and activities high involvement products and do not have the try before you buy feature. Therefore, traveler reviews become a more salient form of information source for the tourists before they make any decision, thus semantic web has an important role in trip planning process.

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