The recommendation process: An approach based source localization in social networks

Tarek Abdellatif

Academic Member ECGI
European Corporate Governance Institute
Consultant Expert in Marketing Strategy
A.2.W.M Vanves (France)
E-mail: tarlatif@yahoo.fr

Mohamed Fadhel Djlassi*

Management PhD at the Higher Institute of Management of Tunis

Tunisia

E-mail : Jlassi.fadhel@yahoo.fr

*Correspondence: 41, Liberty Avenue, Bouchoucha City, the Bardo, Tunisia,
E-mail: jlassi.fadhel@yahoo.fr, **Tel:(+216) 58 069 305.**

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Abstract:

The use of online recommendation systems represents more than ever an urgent need to facilitate access to products and services offered within the electronic commerce platforms , namely in the matter of recommendation process. This research aims to understand the recommendation process by putting the emphasis on the credibility of social networks and the influence of the localization on the choice of sharing a provision of tourism services. The results of the experimentation show that the effect of the recommendation depends both on the purpose and nature of the recommendation, and significantly on the location of the source in the geolocation of the electronic element. Besides, the credibility of the source hinges not only on the credibility of the member or e-reputation or on the credibility of products or brands but also on the credibility of the localization.

Keywords: recommendation system, recommendation process, recommendation based localization, source credibility, localization credibility.

Résumé:

L'utilisation des systèmes de recommandation en ligne représente plus que jamais un besoin urgent pour faciliter l'accès aux produits et services offerts dans les plates-formes du e-commerce. Cette recherche vise à comprendre le processus de recommandation en mettant l'accent sur l'influence de la localisation de la source sur le choix de partager d'une prestation de services de tourisme. Les résultats de l'expérimentation confirment que l'effet de la recommandation dépend à la fois de l'objet et la nature de la recommandation, et d'une manière significative de la localisation de la source selon la geolocalisation de l'élément électronique. De plus, la crédibilité de la source est tributaire non seulement de la crédibilité de l'organe ou e-réputation, ou de la crédibilité de produits ou de marques mais aussi de la crédibilité de la localisation.

***Mots-clés*:** système de recommandation, processus de recommandation, recommandation basée localisation, crédibilité de la source, crédibilité de la localisation.

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Introduction

Recent advances in the localization has fundamentally improved the social networking services, allowing users to share their localizations and contents on the web site, such as photos and geo localized notes. These social networks are defined as social networks based on localization. Localization data permits to bridge the gap between the physical and the digital position and provide a better understanding of the preferences and behaviors of social networks' users. The addition of large sets of geo-spatial data driven research into new recommendation systems facilitates users' travel and social interaction between e-members.

Recently, advances in localization technologies and the creation of localization based social networking services like Foursquare, Twinkle, and Geolife (Zheng et al.2008; Zheng et al.2010b) contributed to the development of recommendation systems performance of tourism services. In such services, users can easily share their geospatial localizations and content on the localization in the physical world via platforms and social networks such as Facebook, Twitter, LinkedIn, Google and more. For example, users with a mobile phone can share online comments on social network of a restaurant where they dined.

These opportunities and challenges of recommendation systems have been discussed by many approaches, different data sources and methods to generate different types of recommendations (Adomavicius and Tuzhilin, 2005). Notwithstanding, previous studies (Adomavicius, G., Tuzhilin, A., 2005; Knijnenburg et al., 2012) focused on the purpose and nature of the recommendation of the provision of tourism services shared in social networks while ignoring the effect of the Localization of the source on the recommendation. As a matter of fact, the lack of work on the importance of localization of the source of a recommendation of a product or service, leads us to question the role or effect that could have a location in the process of recommendation of a product and / or service compared in terms of the purchase intention. Compared to the brand image and the reputation of the e-member, the geographical location and origin cities dissemination of the recommendation seem to play a crucial role in the recommendation process. More specifically, we address the credibility of the geographical source, the starting point of the process in question. Accordingly, in this

research the focus is led on the localization of the source and the origin of the recommendation. Thus, the research problem is based on the following central question:

What is the effect of locating the source of a recommendation of tourism products on purchase intention?

The resolution of this key problem would lead us to solve the following intermediate questions:

- Is the credibility of a geographical source a component of the referral process?
- Does the credibility of a geographical source influence the recommendation process to ultimately impact the purchase intent?

It's worth noting that this research paper is limited to the analysis of the tertiary sector, in particular tourism services: Golf, Spa Therapy, and Stay Hotel. These latter play a central role in the economy, notably when it comes to the Tunisian economy where tourism sector accounts for a cornerstone of the development of the country. Coming to the localization concept, it is defined in three categories: identified source localization, partially identified source localization and unidentified source localization. To put another way, the recommendation based localization is identified on the basis of the nature or kind of the source. Further, the source of the information can be identified totally, partially or not identified.

By doing so, the literature review deals, among others, with the concept of localization, by shedding light on the role of this latter in social networks and its main characteristics. It also reviews the previous research in the matter of the contribution of recommendation systems based on social media; and opens up new perspectives of the subject. Moreover, the challenges of the new localization properties of these recommendation systems for social networks will be put forward. Afterwards, the hierarchical property **,** the types including objectives, methods as well as the recommendations based on the data source of recommendation system are highlighted, with an emphasis on the concept of source credibility, which accounts for a main contribution of the current study. The experimentation leads us to discuss the results and generate both theoretical and managerial implications; and to go through the future perspectives in this realm.

1. Literature review

1.1.Recommendation process: the concept of localization in social networks

A social network is an abstract structure made up of individuals connected by one or more types of relationships, such as friendship, common interests, and knowledge sharing. A social

network service is a participatory digital or virtual representation of social networks in the real world. These services reflect the actual users of social networks, but also enable their growth by allowing users to share ideas, activities, events, and interests. The addition of localization data strengthens the link between social networking services and social networks in the real world. Zheng (2009) proposed a formal definition for the localization of social networks [Zheng, 2009 2011; 2012] "A social network based on the localization means not only adding a localization with an existing social network so that people in the social structure can share integrated localization information, but also consists of the new social structure consisting of individuals linked by interdependence derived from their localizations in the physical world as well as their localization-media content, such as photos, video and text".

An overview of social networks is based on the localization in which the addition of localizations creates new relationships. Based on this new information, three forms of social networks based on the localization are achieved: localization-localization, user localization, and user-user. Indeed, previous researches pointed out that the distance affects social network based localization in the following ways:

- The User-user distance influences the similarity between users. For example, users with nearby localizations history are more likely to have similar interests and preferences (Li et. al., 2008; Xiao et al. 2010), and users who live close to each other are more likely to be friends (De Scioli et al., 2011).
- The user-localization distance affects the likelihood that a user will be interested in a site. For example, foursquare users visit the restaurants nearby to their homes more often than distant restaurants (Levandoski et al. 2012).
- The localization-localization distance affects the correlations between localizations. For example, the malls are often placed close to each other (Ye et al. 2011c). From the time of each visit, an order that may indicate some similarities between their preferences can be created (Zheng et al., 2009d) or can involve traffic conditions (Tang et al. 2010).

Another networking service is defined as the localization based social networking services, such as Facebook, Google Plus, LinkedIn, Flicker, Panoramio, Twitter and Foursquare that encourage people to share their current localizations, such as restaurants or museums.

1.2 The impact of localization in social networks

The localization of users contains a rich set of information reflecting their preferences, once the patterns and correlations in the stories were analyzed (Eagle and Pentland, 2009). The distribution of localizations often corresponds to a law of power which means that closest places have a much higher probability of being visited (Couldry, 2004; Brockmann et al., 2006; Jiang et al., 2008). Brockmann et al (2006) addressed the phenomenon of stories localization. Recent surveys have found similar patterns among users in relation to the localization of stories in localization based social networks. Noulas et al. (2011) studied a large data point on the localization gathered together and they found that 20% of the check-in of users occurs within 1 km, 60% occur between 1 and 10 km, 20% occur between 10 km and 100 km, and a small percentage at distances greater than 100 kilometers. Analyses such as those discussed above, coupled with user surveys and correlated with the localization and its models are used to provide the user preferences indicators which may help in the recommendation systems.

1.3 The hierarchical property (current localization of the user)

The hierarchy of localizations covers several levels: for example, localization can be as small as a user designating a small restaurant or as large as a user identifying a city. Sites with different granularities form a hierarchy where localizations on a lower level relate to smaller geographic areas. For instance, a restaurant is situated in a district, the district belongs to a city, and the city belongs to a county, and so on.

Different localization granularity levels involve different types of localization tracking and user localization, even given the same localization histories of users. These hierarchical relationships should be considered, for example, users who share places at a lower level (as a restaurant) will likely have a stronger relationship than those who share places a higher level (as living in the same city). This hierarchical property is unique in localization-based social networks.

The current localization of the user holds a vital role in the generation of recommendation in social networks based on localization, and this is for three reasons:

Firstly, the current localization of a user can be represented on the various geographical scales (hierarchical property settings). The choice of an appropriate geographical scale attached to a recommendation on social media is as important as it is difficult. For example, we should use fine-grained recommending restaurants to a user, while a relatively coarse granularity (as in a

city) is possible recommendations for new localizations.

Second, people tend to visit more nearby locations than distant locations. However, the quality of localization, such as the recommendation of a restaurant, is also important to assist fellow users to make a decision to try that establishment or not.

Third, because tourists travel from place to place and attraction to attraction, a sequence of locations is recorded on social media, hence the current localization of a user affects the decision of future trips (Golf, Spa therapy, or Stay hotel).

1.4 The historical localizations of the user

Previous studies (Eagle and Pentland 2006; Eagle et al 2009) have shown that a user's historical behavior is a powerful indicator of user preferences. A user's historical localizations associated with recommendation based source localization (e.g. geotagged photos) reflect more accurately the experiences, lifestyles, preferences and interests of a user online behavior (Zheng Zhou and 2011). However, it is not trivial for a user to model the history because of the hierarchy, the distance, and the properties of the sequential localization.

1.5 The stories of the localization of other users

The stories generated by other users shaping social opinion, which is one of the most important information bases for recommendations. However, to emphasize the social views of the "historic" localization, two challenges are faced.

1) It is difficult to design a model to always represent the localizations of users and make the stories comparable.

2) Users have varying degrees of knowledge about the various geo-spatial regions. For example, local experts of a city tend to find high quality restaurants and shopping centers. Consequently, the weighting of the data of different users based on their experience and knowledge is helpful when it comes to deduct social views from massive data related to the user but also to its localization. In addition, the user's knowledge is connected to the region and exchange with the granularity of localization.

A site is not only an extra dimension of information about the user, but also an important object in the recommendation based source localization. To interpret the similarity or correlation between two objects in a heterogeneous graph must integrate information from nodes relative to other types. In fact, a shared localization of two people could be evidence of similarity, or it could simply indicate that localization is very popular. Thus, a user can

become a travel expert in a city after visiting many interesting places for several months, while a researcher needs a number of years to become an expert in a field of research.

1.6 Types of recommendation systems

1.6.1 The objectives of the recommendation.

Four types of recommendations are common in recommendation based source localization: recommendations on the site that involve autonomous areas to a user; the recommendations of the user, which assume popular users (such as local experts and opinion leaders), potential friends (i.e., that share the same interests and preferences), or communities that a user may wish to join because of shared interests and activities; activity recommendations, which refer to the activities in which the user may be interested in taking into account the interests and localization and finally social media recommendations, which require social media, such as photos, videos and web content for the user, taking into account the localization of the former and the metadata of the localization of social media .

1.6.2 The methods of the recommendation system.

The main methods used by the internet user in recommendation based source localization are categorized into three groups: a recommendation based on content, using data from a user's demographic profile and consumer preferences (e.g., age, sex and favorite cuisines) and characteristics of localizations (such as the categories and labels associated with a localization) to make recommendations; recommendation based on the analysis that applies link analysis models to identify experienced users and attractive localizations; and the recommendation of collaborative filtering which deducts the preferences of a user through the remarked behavior.

1.6.3 Recommendations based on the data source

Recent researches have focused on these recommendations, including the development of multiple prototype systems (Chow et al. 2010; Park and al.2007; Takeuchi Sugimoto and 2006; Yang et al. 2008;Ye et al. 2010; Zheng et al.2010a; Zheng et al.2010c; Zheng Xie and 2011; Zheng et al.2009b). These recommendation systems are divided as follows:

- **The profile of the user**

These localization recommendation systems offer places by matching the profile of the user to the localization, such as a description of text, semantics and tags (Park et al 2007). This

system corresponds to the given user profile including the age, gender, food preferences, and income against the price and a category of restaurant using the own social network.

In this context, Ramaswamy et al., (2009) focus on the recommendations made to enable localization based on a low-end device to be only able to voice and short text messages (SMS). Furthermore, Kodama et al., (2009) select the hire of candidates using semantic data and make a final recommendation to the aid of a horizon operation (Börzsöny et al. 2001 which takes into account the price of the distance of the candidate localizations. Moreover, Sheng et al., (2010) proposed a method for entire regions recommendations which have extensions and geometrical point of interest.

In addition, other previous studies pointed out to the characteristics of localizations that can be used later in a localization recommendation system based on a user's profile (Read et al. (2011), Ye et al., (2011a). Ye et al. (2011b) extended these works by taking into account two additional aspects: a set of explicit models including the total number of records, the total number of unique visitors, the maximum number of records in a single visitor, the distribution of recordings for a week, and distribution of recording time in a 24 hour period, and an implicit relationship that reveals the relationships between localizations in the registration behavior.

- **The stories of user localization**

The history of the localization of the user included: the classification of online localization history (for example hotels and restaurants) and the history of the registration system in social networks. The use of the history of user localization, as described Above, to make recommendations has advantages by relying on the profile data to the historical like localization that capture the classifications of other users. It improves the quality of the recommendation ignoring poorly studied localizations that corresponds to different user profile. For instance, many online web services such as Yellow page, allow users to express explicitly their preferences for the classifications used localizations. Hence, using classifications, several studies suggest a localization recommendation system using collaborative filtering models that gives personalized recommendations for localizations that take into account the classifications of users (Chow et al. 2010; Horozov et al. 2006; Ye et al., 2010; Del Ready and Capra, 2010).

- **Representative search**

According to Ye et al. (2011c) it includes a) users' preferences which are extracted from the history of recording, b) social relationships of the user, which are measured by the distance of the user relative to others in the social network and c) the geographical distance between users and the localizations of candidates.

1.6.4 Recommendations to the user

The recommendations of the user involve the discovery of popular users recommendations (Valente 1996, Burt 1999; Gilbert and Karahalios 2009), the friend recommendation (Chen et al. 2009; Backstrom and Leskovec 2011; Roth et al. 2010; Xiang et al. 2010; Yin et al., 2010), and the discovery of the community (Lin et al. 2009; Wiese et al. 2011) that have been extensively studied in the context of traditional social networks. In fact, traditional approaches recommendations of the user are based on the social structure underlying instrument and the user interaction models. The localization based social networks offer a new way to make recommendations to the user considering localization user stories. Historical localizations provide rich contextual information and significant correlations with actual social behavior (Cranshaw et al., 2010). Several studies show that actually geographic information plays a critical role in determining the relationship of the user in social networks (Goldenberg and Levy (2009, Liben-nowell et al. (2005), Scellato et al. (2011).

1.7 Source credibility

The source credibility has been granted several definitions. Overall, it refers to a person's perception of the truth of a piece of information. It accounts for a multi-dimensional concept that serves as a means for the receiver of the information to rate the source or transmitter of the communication in relation to the information. Further, this rating correlates with the willingness of the receiver to attribute truth and substance to the information (Hovland et al. 1953, p.21). Accordingly, credibility is linked to information, and can be described as a communication phenomenon.

It's worth to be noted that those dimensions are highlighted that relate to both dimensions of credibility which were identified in initial source credibility research by Hovland and colleagues (Hovland et al. 1953; Hovland & Weiss 1951), notably competence ('competence', 'expertise', 'expertness', 'knowledge ability', 'qualification', 'smart dimension') and trustworthiness ('trustworthiness', 'character', 'personal integrity').

A highly credible source usually led to more behavioral compliance than did a low-credibility one (Crano, 1970; Crisci & Kassinove, 1973; Levine, Moss, Ramsey, & Fleishman, 1978;, in the straight persuasion and the foot-in-the-door conditions; Woodside & Davenport, 1974, 1976). According to Bannister, 1986) and Suzuki, 1978**),** degree of perceived credibility of the source influenced recipients' intention to use suggestions made by the source as to how to improve performance; and the acceptance or rejection of the suggestions from the source.

Furthermore, source credibility was found to have a direct effect on the persuasion process in the context of recreation behavior management (Manfred0 & Bright, 1991). In addition, it was found to affect behavioral response. For instance, Weick, Gilfillan, and Keith (1973) found that musicians playing a composition attributed to a low-credibility composer made more mistakes than did those playing the same tune attributed to a highly credible one. Some studies have shown that the perceived trustworthiness of the source affects persuasion (Walster and Festinger (1962, Hass & Grady, 1975; Kiesler & Kiesler, 1964, Mills, 1966).

2. Research Methodology

2.1. Data collection: experimentation

The research methodology adopted by the researchers is experimentation. The research is based on monitoring 12 volunteers. 3 links are sent to volunteers. These links relate to three tourism services and especially Golf, Spa therapy and a stay in a hotel chain Ibero Star. Shares carried out by the volunteers are either not share, share once or share several times (multiple). The participant "shared" what they were doing on one of their online platforms. The sample is composed of persons who use social networks; their age is between 22 and 52 years old. The total of respondents is equal to 758, 350 women and 408 men. This study is stopped for a total of 8948 sharing links about hotels, golf and spa therapy in 17 days.

It is worth noting that this study focuses on three tourism services that differ according to three ranges. The three types of tourist services are: Golf, Spa therapy, Stay Hotel Hammamet 5 stars belonging to the IBEROSTAR chain, and for each phase recommendation process a number of tourism services which is equal to 9, indicating that each service encompasses three brands: the first brand that is good and 95% price, a second brand which is quite good and 55% of price, and finally a third brand that is unknown and 50% price (table 1):

Tourism services	Range_1	Range _2	Range _3
Service_A **Golf**	Small range Golf package with a good price	Small range Golf package with an attractive price	High range Golf package with market price
Service _B **Spa therapy**	Small range with an interesting price	average range with an interesting price	High range with market price
Service _C **Stay Hotel**	Small range with an interesting price	average range with an interesting price	High range with market price

Table 1: Products and Services according to the range

2.2 Results and discussion

At this stage, we measured how many services were selected (i.e. of the number of clicks made by members of virtual communities), and where these products were located. The results indicate that on average, 9.67 (= 4.78 St.d.) provisions were selected, among them 5.42 were located in www.tripadvisor.fr 5; and 4.25 were in Multiply, Plaxo, LinkedIn, twitter, Google plus and Facebook. To cut the story short, figure 2 (left) shows concretely the distribution of these provisions.

	Service	Range 1	Range 2	Range 3
Service A	6950	1737	2780	2433
Service B	11120	2851	4670	3599
Service C	9730	2630	4184	2916
Total	27800	7218	11634	8948

Tableau 2: Classification of links sharing according to the brand 1

As a matter of fact, the static basic functions provided by tripadvisor.fr for browsing / filtering got more luck, which allowed members of virtual communities to get an average of 39.79% of important provisions. The winners of the second and third came to the sort list Multiply, Plaxo, LinkedIn, twitter, Google plus and Facebook respectively based on popularity (27, 51%) and popular brands of services (12.18%). While the popularity list tripadvisor.fr got

much less successful (5.28%). There were in fact only two participants who accessed "Top Golf stays" in tripadvisor.fr, against 9 in Multiply, Plaxo, LinkedIn, twitter, Google plus and Facebook. When it comes to the other selected tourist services provisions, they were either found through keyword search (for example, a member of the virtual communities enters the name of a model) (6.53%), or via Multiply, Plaxo, LinkedIn, twitter, Google plus and Facebook (4.83%) or the recommendations of tripadvisor.fr (i.e. “Tourists who have tried it, also tried ... “3.89%).

We noticed that the links of each service were shared unequally between the 3 phases of the recommendation process. In fact, for the first phase, the links have been shared in the order of 2.33%, and 13.98% were shared in the second phase; while for the third, the highest percentage share level is observed representing 83.91%. This means that, the number of shares increases gradually as the member of a virtual community moves from one phase to another recommendation process (Table 3). Along similar lines, amplification shares of numbers highlights the importance of virtual communities for e-members seeking to choose a provision of a tourist service.

PHASES	Services	Contributors	Communities	Links	%
Phase_1	9	12	6	648	2,33
Phase_2	9	36	12	3888	13,98
Phase_3	9	108	24	23328	83,91
Total	9	156	42	27864	100%
Rounded				27800	

Table 3: Links Distribution of tourism services.

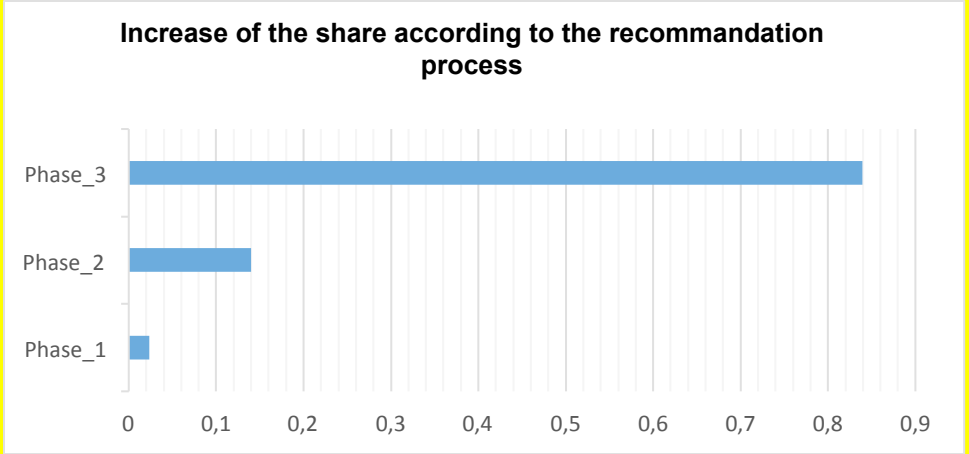


Figure 1: Distribution of links according to the steps of process recommendation

Based on the results of this research, we find that tourists follow opportunities when sharing links of tourist services. The aim of the recommendation performance depends not only on the credibility of the source with respect to the member of the virtual community and / or e-reputation but also on the credibility of the localization. The literature review has shown that a link exists between the localization and the recommendation of tourism services (Ehmig Groh, 2007; Guy et al, 2010). Then, the credibility of the source is highly dependent on the localization of the source; which means that the geographical localization of the e-member is very important as shown in the two graphs (1, 2).

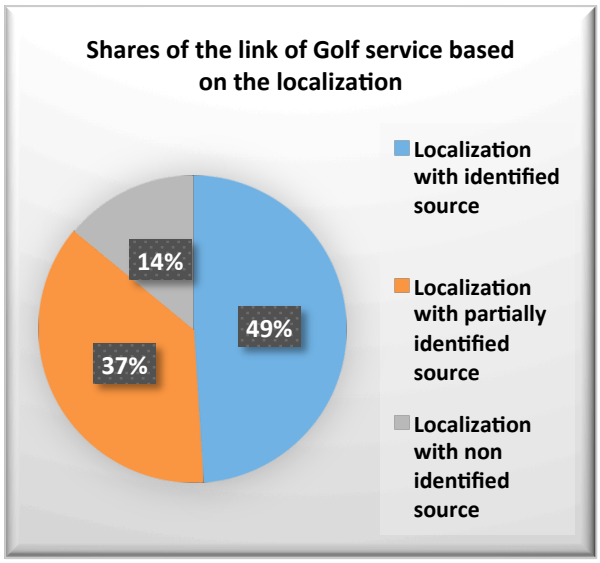
Tourism services	**Number of shares**	**Identified localization source**	**Partially Identified localization source**	**Not identified localization source**
service A	2433	49,38 %	37,22 %	13,4 %
service _B	3599	48,29 %	38,12 %	13,59 %
service _C	2916	49,89 %	39,55 %	10,56 %

Table 4: Shares of links based on the localization

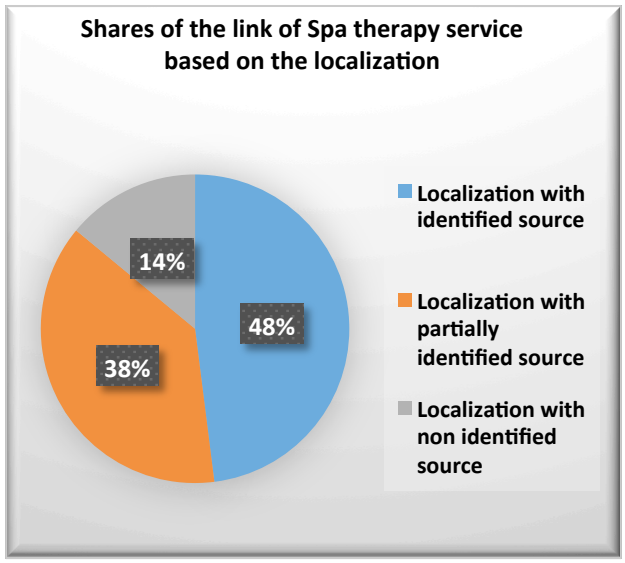
This research paper has shown that tourism services for the third range where the credibility is based not on either the e-reputation of members and brands yet it is an unknown brand and recommended by not known persons. It is noted that 86.6% of recommendations (49, 38%+37, 22%) to the Golf stay (graph1) comes from the recommendation based identified source localization and partially identified source localization (Table 1). For recommendations based on an unidentified source localization, the number of shares represent

13.4% of total shares for the third range of tourist services associated with the Golf stay, this result underlines that virtual Communities include members who take the risk to follow the recommendations of a tourism provision services at low prices and not Known and from an unidentified source. Furthermore, results reveal that 86.41% of members of virtual communities share and follow the recommendations based identified and partially identified sources of the Spa therapy stay (Graph 2). Tourism services are recommended by social network members if the source of the recommendation is based on a well-Known source and/or a partially identified localization. It should be mentioned that 13.59% of the shares of members of virtual communities justify the characteristics of risk takers. Although the localization is based on an unidentified source, tourists / Consumers do not hesitate to share the recommendations of the third range of Spa therapy.

The provision of tourist service Stay hotel chain Ibero Star is characterized by a number of shares which is equal to 2916, it means 89.44% of the shares is a recommendation based identified source localization (49.89%) and a partially source localization (39.55%), this means that the strong recommendation of a hotel stay depends not only on the members who shared the recommendation but also on the localization of the recommendation. Consumers share links of a provision of tourism services mainly from a well-known source which is identified or partially identified. It is remarked that there are members who share the hotel recommendation of links from a localization based on an unidentified source, this leads to infer the criterion for the selection of risky options by members of virtual Communities (see Graph 1 et2).



Graph 1: Sharing the first provision of tourism services by source localization



Graph 2: Sharing the second provision of tourism services by source localization

This research highlights the importance of the localization based on the identified, partially identified and unidentified sources in the shares of the recommendations of links for the benefit of tourism services. The members are not interested in shares for unknown brand products at low prices with unidentified source localization; they seek the localization that presents less risk at the source of the recommendation.

This research paper has argued that users of social media tends to share the links of tourism services at low prices with unknown brand at 50% of market price in the case of a recommendation which is based on an identified source localization or at least partially identified source localization.

Based on the results, we found that Internet users share links weakly not known branded services for low prices and with a recommendation based on a localization of an unidentified source. Accordingly, we synthesize the recommendation process based on the source credibility as follows (figure 2).

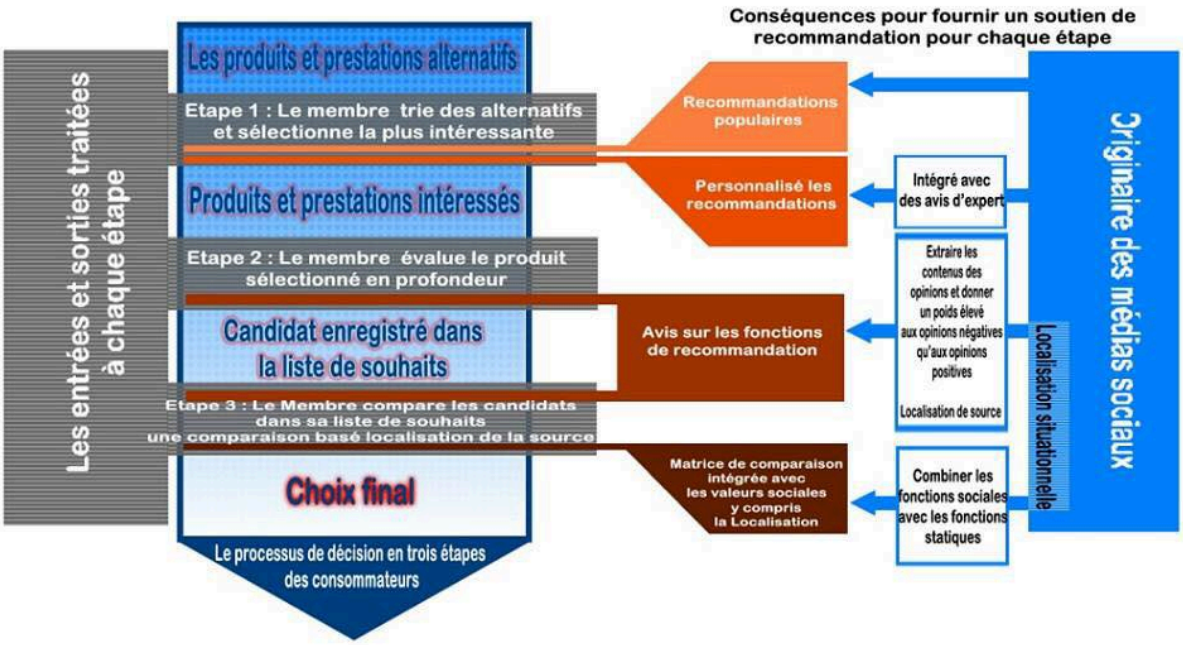


Figure 2: Recommendation Process based on the source credibility

Based on the experimentation adopted in this research, we establish the recommendation process which is explained as follows:

The members of the virtual community follow opportunities to recommend tourism services (e.g. Golf, Spa therapy, Stay hotel) if the member who shared finds that it has a high quality with a known brand and a good price. In search of this opportunity members of social networks consider all alternatives at the first step of the recommendation process of the

tourism services while focusing on two main sources of credibility which are the e-member credibility or the member e-reputation and the brand or product/service credibility. In the first step of recommendation process, the recommendations of the benefits of tourism services are popular and members of social networks rely not only on the recommendation systems but also on the expert opinion. In a second step, the e-member is interested in an analysis of the benefit associated to the recommendation, where in-depth analysis of the characteristics of the provision of tourism services is performed; the focus is on a recording of a list of candidate wishes based on the functions of the recommendation: the purpose, nature, and e-members who shared the recommendation. In this context, opinions or comments on the recommendation are very significant to the extent that they influence the second stage of the process of the recommendation process.

The opinions of tourists / Consumers / e-members can have positive or negative impact on the wishes list. Before making the final choice, the e-member compares the candidates based on the list of wishes, the ranks of provision of tourism services: brand, price, the e-member credibility and source localization credibility. This research suggests that the comparison at the third step is based on the localization of the source of the recommendation, which accounts for the originality of this study.

2.3 Interpretation

Localization can bridge the gap between the physical world and the digital or virtual world, giving rise to new opportunities and challenges to traditional recommendation systems in the following ways:

- Complex relationships: Localization in a social network can help build new relationships between users, between sites and between users and locations. New recommendation scenarios can be generated, such as the recommendation of a physical location. This new knowledge can augment traditional social media recommendation scenarios.
- The importance of knowledge: Localization is one of the most important elements on the context of a social media user. A thorough knowledge of the behavior and preferences of a user can be learned through their historic social networks and their localizations (Ye et al., 2009). Localization data of the social media user can generate improved reviews on social media of the latest goods and services, for example, the generated localizations regarding the most preferred dish in a restaurant or the most

popular activity at a point of interest can be evaluated accurately by recommendation systems. The choice of the provision of tourism services (Golf, Spa therapy, and hotel) can be influenced by the localization source based recommendations on social networks.

Altogether, this research highlights the crucial role of the source credibility at the recommendation process, a third pillar is added to previous research and deriving the originality of this research paper which is the source localization credibility. The factors of this latter are presented as follows (Figure 3).

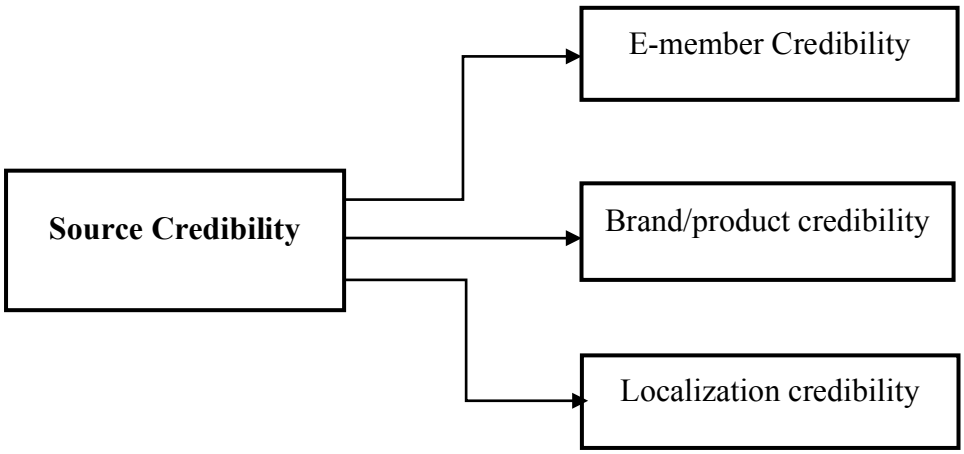


Figure 3: The source credibility factors as regards the recommendation

2.4 Contributions of the study

This research has been granted an added value and an obvious originality since it brings to the fore the source of the recommendation, which represents a key factor in the process of the recommendation; such factor that is ignored in previous studies. Indeed, a share of a recommendation from an identified source localization contributes to a better understanding of the provision of tourism services on the share of members of virtual communities even if that provision is characterized by an unknown brand and low price with a high risk. Thus, this research presents a contribution at the recommendations in social networks based on localization in order to facilitate research in this subject. These contributions are summarized as follows:

- We have distinguished between social networks based localization of traditional social networks and define their characteristics, challenges and opportunities.

- We classify the main recommendation systems into three categories, the hierarchical property, and the types including objectives, methods as well as the recommendations based on the data source of recommendation system, and the recommendation to the user. Moreover, the types include notably the main contributions of each system.
- The focus is set on the main methods to assess the social networking recommendations based localization.

Theoretical Implications

Through this experimental research, we were able to model the process of tourist recommendation by highlighting its main determinants. Furthermore, this research strengthens the results of work on the credibility of the source in terms of not only the reputation and e-reputation but also the source with respect to the message and the product carried in the recommendation. Our key contribution is to bring to the fore the credibility of the source with regard to geographic location.

Managerial implications

Following the results of this research, tourism professionals will be able to integrate the concept of the recommendation and in particular the credibility of the source of such a recommendation in their marketing strategies in order to watch for market opportunities. This means that the recommendation process would be the perfect tool of inbound marketing strategy, which is likely to enable service providers to raise the sales volume and to grab market share relatively important. To put it another way, the customer is henceforth at the heart of product and services marketing strategy.

Limitations and future research perspectives

As with any research, ours is not without limitations. Indeed, further researches about the concept of recommendation based localization seem very interesting in order to well understand the behavior of virtual communities' members in sharing recommendations for tourism services links. Moreover, the product ranges that we presented prove too general; it would better to envision specific products, with prices and specific brands. In addition, our research has focused only on tourism services; which is likely to limit the generalization of results; while other services should be investigated in order to give greater external validity to our modeling. Keeping in mind that the concept of the recommendation based on the location

needs to be further decanted in such a way we understand the behavior of members of virtual communities as for the sharing of links relating to tourism services. Finally, it is interesting to carry studies with larger number of members of virtual communities to test the system and consolidate the results of the current study while focusing on the close link entre credibility and source localization, by using other data sources such as online interaction and user location history (Zhen Yu and al., 2014) so as to make the most effective recommendation.

Conclusion

This research permits to answer to the research question through the study of the behavior of members of virtual communities in a complex decision making process while focusing on the credibility of the localization of the recommendation.

A framework of recommendations is presented in three steps while incorporating a new concept not considered in previous research to find out the source of the localization. In a first step, when members of virtual communities study popular and personalized recommendations alternatives, they are likely to affect the comparison of alternatives. In a second step, members of virtual communities assess the provision of tourism service in detail while focusing in depth on the services features and functions based on the opinions and comments of e-members. In a third step, members of virtual communities make comparisons between candidates wishes that are recorded in their wish list, and include the values of social features in a comparison matrix to facilitate and confirm the final choice. This last step takes into account the crucial role of the localization and the different forms of localization in determining the choice of the recommendation of a provision of tourism services.

Ultimately, the results of this research can be very helpful for managers and practitioners who are interested in promoting their services, including those who tried to merge the popularity of benefits and particularities of their services based on a study of customers' recommendations. The building of the recommendation system in three stages is adapted to the needs of virtual communities' members.

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