A Hermeneutic Phenomenological study of Online Community Participation
Applications of Fuzzy Cognitive Maps

Abstract:

Online communities are increasingly playing a major role in the internet market. They have become an integrated part of internet users' interests and achievements.

Understanding the factors which encourage individuals to participate in such communities, will serve as the principal guideline for the founders in assisting them to obtain requisite approvals to develop their business goals, plans and procedures.

This paper uses a mixed methodology in order to identify the strongest motivational paths towards online community participation. A Hermeneutic Phenomenological approach has been applied in order to illustrate users' lived experience and extract the motivations from deep semi-structured interviews with interdisciplinary experts in the fields of psychology, consumer behavior, Information technology and e-commerce.

In this paper, the application of Fuzzy Cognitive Maps (FCMs), as an innovative approach in modelling consumer motivations for online community participation has been discussed. Although motivations have been widely studied over the past few years, no one has focused on the causal relations between them. This study gives a comprehensive understanding of causal relations - to determine whether changes in one variable result in changes in another - and their strengths as well as strongest paths toward online community participation which helps decision-makers reach the desirable level of user's participation in online communities.

Keywords: Online Consumer Behavior; Motivation; Online Community Participation; Fuzzy Cognitive Maps; Hermeneutic Phenomenology; Mixed Methodology**.**

1. Introduction

Today, online communities are considered as major tools for communication. They are increasingly fulfilling internet users' desires of different types, ranging from information exchange to interaction with others (Nonneck et al., 2006; Huberman et al., 2009; Zhang and Hiltz, 2003) and identity creation (Shaw and Gilly, 2003).

Online communities may appear as websites or other internet platforms, which facilitate discussions about a specific topic, or groups of people that may interact with each other, using instant messaging tools (Bishop, 2007).

As businesses become more and more dependent on information technology, the ability of online communities to effectively deliver new systems and capabilities becomes even more important. However, despite the dynamics of today's online world, lots of online communities fail due to poor participation of their members. For example, in popular music sharing services such as "Gnutella", two-thirds of the members do not send any file, while 10% of subscribers share 78% of the entire files (Adar and Huberman, 2000). Groups which suffer from lack of participation usually face problems in providing services for members and customers. Therefore, understanding why people participate, plays an important role in achieving business objectives.

Through this Hermeneutic Phenomenological study, we identify the motivations for online community participation by taking users' lived experience into account. Then we define the causal relations between the concepts. Without studying such causality, the online community behavior cannot be investigated effectively in a dynamic business environment (Kang et al., 2012).

2. Theoretical background

2.1 Motivations for online community participation

Several theories on motivations and barriers to participation in online communities are discussed in various papers. Most studies depend heavily on theories such as Social Identity Theory (Stryker and Burke, 2000), Self Presentation Theory (Schlenker,1985), Self Efficiency Theory (Bandura,1982), Tragedy of The Common Model (Ostrom, 1990), Social Loafing Theory (Karau and Williams, 1993), Collective Effort Model (Karau and Williams, 1993), Maslow's Hierarchy of Needs (Bishop, 2007), Organizational Commitment (Lamp et al., 2010), Self-Determination Theory (Deci and Ryan, 2002) and Uses and Gratifications Theory (Papacharissi and Rubin, 2000).

Csikszentmihalyi (1975) has proposed Flow Theory in order to better explain the concept of motivation. Being in the state of flow, we feel "in control of our actions, masters of our own fate...we feel a sense of exhilaration, a deep sense of enjoyment" (Csikszentmihalyi, 1990, p.3). Research has focused on "Flow" during consumer's navigational behavior in online environments (Novak et al., 2000). In this state; users will probably be motivated to contribute to online communities.

Under the realm of these theories, various reasons users have for participating in an online community has been discussed recently. For example, altruism, perceived online attachment and perceived online relationship commitment are discussed as the motivations which lead to knowledge sharing behavior in social media (Ma and Chan, 2014). Motivational factors associated with the nature of online communities, individual characteristics, the degree of commitment and quality requirement and how they help in understanding lurking reasons and behavior (Sun et al., 2014) as well as intrinsic and extrinsic motivations as different driving forces for posters and lurkers have been discussed (Lai and Chen, 2014). Scholars have also focused on persuasive strategies for online health community participation and its psychological outcomes (Kim and Sundar, 2014) or motivations for joining such health communities associated with posting support (socio-emotional support motivations) or receiving support (informational motivations) (Welbourne et al., 2013). Personality traits and how they affect knowledge sharing in online communities (Jadin, et al., 2013) as well as extrinsic/intrinsive rewards in community context (Wang and Clay, 2012) are also highlighted. Scholars believe that factors like intrinsic motivations, shared goals, social trust and also social capital can drive users' freely innovation-conducive knowledge sharing in such online communities (Hau and Kim, 2011).

As can be seen, there is rather a large amount of literature, demonstrating motivations for participating in online communities. However, it is important to note that active posting and participation in online communities are not one-dimentional concepts, but rather a complex behavior which rises in the heart of user's lived experience. Little attention has been paid to studying this lived online experience so far. The present study, benefits from Hermeneutic Phenomenology to focus on this experience of online users. Moreover, as the investigation of online community behavior demands consideration of the complex causal effects, using Fuzzy Cognitive Maps, this study focuses on the nature and strength of the relations between motivations. This interdisciplinary piece of work shows that not only the motivations themselves are important to study but also the type of relations between them plays an important role which has not received much attention so far.

The more we refer back in the literature (See table 1) the less clues we can find of adopting such mixed methodology in studying the complex system of online behavior.

Table. 1 shows a chronological order of studies in online community participation with a specific look at the methodological approaches.

Table. 1: literature review		
Who/When (Author/ year)	**What (Motivations)**	**How (Methodology)**
Lampel and Bhalla, 2007	- Altruism - Sharing experience, - Reciprocity Building, - Online identity and - Online status seeking	This study is based on data from three sources: - A student Web discussion group, - A quantitative survey (IMDB.com), and - Three online community websites (Similar to Netnography)
Ma and Agrawal, 2007	- Higher levels of perceived identity verification - Persistent labelling - Self-presentation and - Deep profiling	This study tests the hypotheses using primary survey data collected from two online communities The theoretical model is multistage, suggesting the need for a structural equation modeling technique
Bishop, 2007	Three level conceptual framework: - Individual desires (social, order, existential, vengeance and creative) - Respective cognitive (their goals, plans, values,beliefs and interests) appraisals - The means (haptic abilities)	This study proposes a conceptual framework
Nonneck et al., 2006	Attidudinal differences between lurkers and posters: **Attractions for both:** - Achiving general understanding, - Doing something, - Playing games, - Reading conversations or stories **Posters' motivations:** - Receiving answers, - Telling stories, - Participationg in conversations, - Having access to expertise, - Community membership, - Making friends, - Having fun, - Offering experties, - Getting empathetic support, - Building professional relationships and - Entertaining others	This is an empirical survey-based study (Questionnaire)
Wasko and Faraj, 2005	Motivations together with the structural, cognitive and relational capital	This study uses structural equation modeling to test Hypotheses
Dolakia et al. (2004)	-Value perception (*purposive value, self discovery,*	This is an empirical survey-based study; CFA and SEM

	maintaining interpersonal interactivity, social enhancement, entertainment value) -Along with social influence variables (mutual agreement, group norms, mutual accommodation, social identity)	
Ardichvilli et al., 2003	Trust	This study is based on a qualitative study with three communities of practice as main units of analysis
Osterloh and Frey, 2000	Rewards (Intrinsic and extrinsic)	This is a n empirical study: laboratory experiments on the crowding effect

2.2 Hermeneutic phenomenology and lived experience

Hermeneutic Phenomenology has appeared with increasing frequency in consumer studies (Arnold and Fischer, 1994; Thompson, 1997, Granot et al., 2011) and information systems (Avison and Cole, 2007; Mingers and Willcocks, 2004; Myers and Klein, 2001). However, to our knowledge, using this qualitative research methodology specifically in online community context - within which, consumer studies and information systems come together - has not received any attention yet.

Hermeneutic Phenomenology is concerned with the life world or human experience as it is lived. It is focused on illuminating details and seemingly trivial aspects of experience that may be taken for granted in our lives. Its ultimate goal is to create meaning and achieve a sense of understanding (Laverty, 2003).

Hermeneutics can be defined as 'the theory or philosophy of interpretation of meaning' (Bleicher, 1980, p.1). Its main focus is on the meaning of a text or text-analogue (any human artifact, action, organization or culture) (Mingers and Willcocks, 2004).

Hermeneutic Phenomenology proposed by Martin Heidegger (1889-1976), primarily rejects the idea of suspending personal assumptions (Narayan Prasad Kafle, 2011).

Unlike Phenomenology, this approach asks the researcher to engage in a process of self-reflection. This means that the biases and assumptions of the researcher are not bracketed out, but rather are necessary elements for interpretive process (Laverty, 2003).

According to Heidegger, the interpretive process is achieved through a hermeneutic circle which means moving from one part of an experience to the whole experience and back and forth continuously in order to increase the depth of understanding of the experience (Laverty, 2003).

2.3 Fuzzy Cognitive Maps and the investigation of motivations for online community participation

"Cognitive maps are developed in simulation, organizational strategies modeling, support for strategic problem formulation and decision analysis, modeling of social and psychological processes, modeling of virtual worlds and analysis of their behavior..." (Kardaras and Karakostas, 1999, p.200). Moreover, scholars use this method in agent simulation (Ghasem-Aghaee and Ören, 2007) , causal knowledge-based design for electronic data interchange (Lee and Lee, 2007), knowledge management (Noh, Lee, Kim, Lee, & Kim, 2000) and diagnosis of language impairment (Georgopoulos, Malandraki and Stylios, 2003).

Simply put, they can be used to generate a more accurate description of a difficult or complex situation. This approach has been proven through the literature as a very useful cognition tool to model and analyze complex dynamic systems (Papageorgiou ,2011; Lee and Lee, 2007).

Cognitive Maps are proposed by Axelrod (1976) to be applied in ill-structured problems. The method is designed to extract the causal relations between the concepts (Kang et al, 2007).

A cognitive map is composed of nodes that represent the factors/concepts most relevant to the decision environment and arrows which indicate different causal relationships among factors (Kardaras and Karakostas, 1999; Kang et al., 2007).

Kosko(1986) presented cognitive maps with fuzzy weights as people normally apply fuzzy data and fuzzy sets as a mathematical method to represent their uncertainties (Kardaras and Karakostas, 1999).

The main argument of the present study is to understand that online community participartion behavior depends on how a variety of factors (for example, identity creation, sense of belonging and relationship building) and complexity of the causal relationships among them, make the adjustment process for online community behavior hard to be completely computerized. On the other hand, Managers are not able to analyze all the relevant factors at the same time and tend to evaluate the factors individually (Kang et al., 2007).

All in all, Cognitive maps have been found especially useful in solving problems where many decision variables and uncontrollable factors are causally interrelated with each other. However, little attention has been paid to utilize this technique in studying the lived experience in online community participation . Kang et al. (2007), has proposed a cognitive map which provides preliminary insights into the direction of online community voluntary behavior toward maximizing community commitment, loyalty and social participation. However, studying lived experience in online community participation results in a more complex system which highlights the importance of applying fuzzy cognitive maps.

The present study tries to answer following questions:
- What are the users' motivations to participate in online communities according to their lived online experiences?
- Are there any causal relations between the identified concepts? How strong are they?
- What are the strongest paths towards online community participation?

3. Methods

Based on a Hermeneutic Phenomenological study, the motivational factors were identified through conducting in-depth semi-structured interviews. The concepts and the causal relations between them were then modeled via cognitive mapping techniques (Kosko, 1986). Finally the strength of causal relations were defined. Figure 1. depicts the steps of research using a schematic representation.
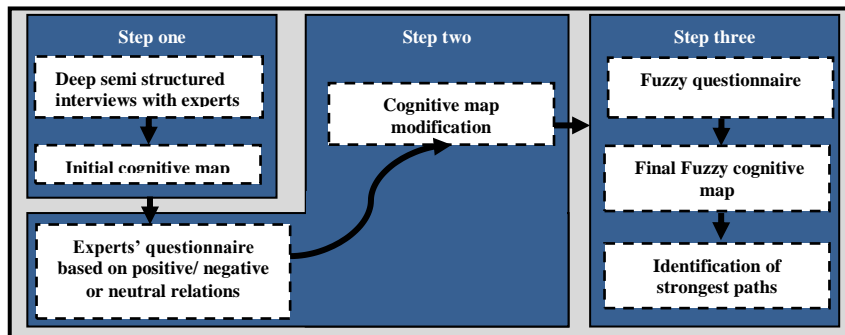
Fig1. Research process

3.1. A Hermeneutic Phenomenology- Methodology

In a research based on Hermeneutic Phenomenology, participants are generally asked an open question in order to precisely describe their own lived experience of the topic being explored. The discussions should be led as much as possible by the participant, not the researcher.

It is important that the interviewer together with the interviewee bring life to the specific experience, using imagination, the hermeneutic circle and attention to language and writing. In other words, "Understanding occurs through a fusion of horizons, which is dialectic between the pre-understandings of the research process, the interpretive framework and the sources of information" (Laverty, 2003, p.21).

Data gathering in qualitative interviews must be accurate and thorough; nothing more or less. There must be an interchange of viewpoints on a favourable topic between two parties (Dilley, 2004).

Researchers may continue the interviews until a point of saturation, in which a more accurate understanding of the experience will not be obtained through further discussion with interviewees.

3.1.1 Data collection and analysis

In this phase, we use non-random purposive sampling method because it allows for the selection of participants who have related experience with the phenomenon. The sample include the experts in fields of online businesses who are familiar with E-commerce and have related experience in establishing an online community or active participation in one of them.

Experts are asked to simply describe their own lived experience of participation in online communities. To conduct hermeneutic analysis of the transcripts, each statement is interpreted in order to create an understanding of the online user's motivation phenomenon (see also Van Manen, 1990). In this research, data is gathered from 10 (point of saturation) deep semi-structured interviews. Conducting subsequent interviews is helpful in revising the transcriptions.

Becoming a part of the Heuristic process, we discover the patterns and emerging concepts from the interviews; like repeated words and expressions, metaphors and intense emotions and feelings (Mckoy, 2010). Each interview reveals several similar core themes/commonalities that are reflective of the lived experiences of each participant.

168 themes/commonalities are derived from 10 transcribed narratives as the outcome of this phase, which are then cathegorized under 21 main themes including (not in any priority order):

- Infrastructural barriers and prejudice
- Technical support
- Attraction
- Common concerns
- Sense of community
- Information exchange
- Incentives
- Building power
- Identity creation
- Conductive conditions
- Relationship building
- Trust
- Sense of belonging
- Virtual living
- State of Flow
- In line values/norms -between community and individuals-
- Commertial benefits
- Entertainment
- Self satisfaction and
- Having related knowledge

3.2 Construction of (Fuzzy) Cognitive Map
3.2.1 Data collection and analysis

After extracting the motivations from the transcripts, the next step is to define if there are any positive or negative causal relations between the concepts. In cognitive maps, a positive relation between two concepts (C_i, C_j) means that any increase in C_i results in an increase in C_j, while negative relations, represent the fact that any increase in C_i leads to decrease in C_j (see Appendix A – polarity).

In order to define causality/polarity, a questionnaire is designed and distributed between the same 10 experts (as in the previous step) and asks them to specify whether there are positive, negative or neutral causal relations between concepts. The outcome of this phase is 149 themes with positive/negative polarity (19 relations were identified as being neutral and were deleted) which are then cathegorized under the same 21 main concepts as before.

Fuzzy weights are used in this study in order to define the strength of causal relations between the identified factors. To do this, each mutual relationship includes one linguistic fuzzy weight which determines the accuracy of the experts' choice.

To identify the linguistic fuzzy weights, a questionnaire (149 questions) based on a 5 point Likert scale is designed using GoogleDocs and distributed online between 75 experts (46.6% female, 53.3% male). The sampling method here is based on snowball sampling method (Goodman,1961). The process starts with the same previous experts and then they are asked to send the questionnaire to their colleagues and counterparts. In this phase, participants are asked to assign fuzzy weights (Very Strong, Strong, Moderate

,Weak or Very Weak) to each relation. The corresponding fuzzy weights ranging between (0, 1) are shown in Fig .2
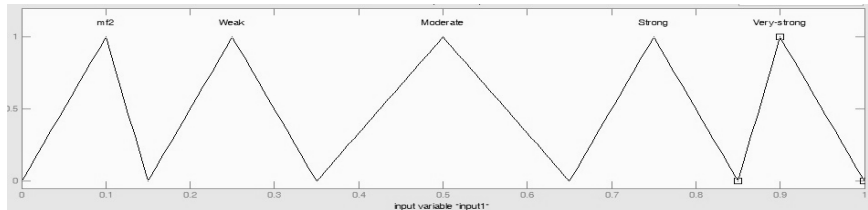

Fig 2. Linguistic Fuzzy Variables

By aggregating the answers with the aid of fuzzy toolbox in MATLAB software, the linguistic fuzzy weights for relationship strengths between identified factors have been obtained (see Appendix A).

4. Findings and Discussion

In this section, the strongest paths leading towards the central node ($C1=$ participation in online communities), are identified. The minimum weight of the relations in each path (the degree of belief) (Kardaras and Karakostas, 1999), is considered as the total weight of the path. Therefore, concepts such as 'Common Concerns', 'Technical Support', 'Conductive Conditions', 'Identity Creation', 'Relationship Building', 'knowledge', 'Trust', 'Information Exchange', 'Sense of Community', 'Sense of Belonging', 'Incentives', 'Infrastructural Barriers' and 'Attraction', form the strongest paths towards participation in online communities.

Similar needs, objectives, problems and interests under a broader name of common concerns, shape one of the stronget motivational paths. People usually look for sympathy or similarity when participating in online communities. Apart from that, the number of members in the online community, rate of users' participation, genuine profiles and the relationships between users, or in other words 'sense of community', can significantly motivate users to participate in such societies. Although we supposed this concept to affect sense of belonging, results show different patterns. This sense of belonging deals with the importance and priority of the subject for the user and the level of users' involvement in that area.

It is also seen that 'trust' plays an important role which can be affected by the popularity of online community, the level of security, rules and regulations regarding privacy policy and 'knowledge'. 'knowledge' is about how much users are familiar with the online community environment or how much expertise they have regarding the discussion topics. Technical support including the level of accessibility, userfriendly(ness), appropriate categorization and layout (professional design) as well as loading spead and useful features can facilitate user participation and therefore is considered as a strong motivation. Moreover, infrastructural barriers including filtering, low internet speed and the threat of hackers have negative effects on online community participation. The possibility of being hacked can negatively affect "trust" as well.

Another concept is attraction; whether structural, thematic or contextual attraction of online community. For example a management student is more motivated to participate in online

communities on management. But at the same time the context is important for him/her. for example as a marketing student he/she might not be interested to engage in debates on organizational behavior. Moreover, the way the debates and discussions are structured plays an important role in his/her participation.

Conductive conditions play a major role in online community participation. Sometimes the mental conditions or educational/professional requirements of users drive them to participate. For example when they are frustrated and seek to find someone to talk to, when they are searching for information to do an assignment or when they are preparing presentations for a meeting, they would probably participate more in online communities.

Extrinsic/ intrinsic incentives are another important factors which can affect online participation. A friendy atmosphere with trust and respect flowing between the members and receiving individual attention are some of these incentives. Moreover, when an online community facilitates finding jobs for users, gives regular feedbacks to them and, put simply, when it is result-oriented, users become more motivated to participate.

Relationship building, identity creation and information exchange are other factors that affect online participation. Sometime users seek to build relations within a virtual world, because it is easier and faster. They can share experiences and interests with each other or even talk about the shared experiences they had together (for example, when relationships get stronger and they meet each other in offline world or another virtual worlds). Building professional relationships and expanding the circle of communication are another relational factors which result in online community participation.

Users can also have more access to resources and more novel ideas when participating in online communities. They can learn and become up to date. Users can achieve all these benefits with a lower cost compared to the offline world. Therefore, information exchange is another motivation for online community participation.

The last but not the least is the concept of identity creation, which means users participate in online communities in order to introduce themselves to the crowd, build a brand for themselves and gain prestige. Figure 3. illustrates these strongest paths, the strength of causal relations and the polarities.

Managerial implications

Founders of online communities should be aware of common concerns (social, political and professional) of their target market. They should also identify the requisite options and technological features of online communities in order to best satisfy users' needs. Target market assessment, regarding the community span of activity, and then customizing the content and features accordingly, will be significantly influential.

Online communities are expected to provide opportunities for users to present themselves (their values, believes, skills and expertise) and create their own brands (identity). Incentives, rewards and credits which are given to users as a result of their participation or the importance of their knowledge and expertise to the community, will probably promote their prestige and social status.

In order to satisfy the relational needs of users, creating groups or having a page in social networks such as Facebook is helpful. The managers should also clarify the values and norms of their community by advertising, public relations and positive word of mouth.

Finally, encouraging a strong culture of communication is totally effective in stimulating motivations among online community users.

Fig 3. The strongest motivational paths toward online community participation

Concluding Remarks

Today, being involved in online communities has become a normal routine in people's lives. Developing an online community is a challenging function. It is important to have the right cababilities necessary to keep members motivated.

The study makes a number of contributions. Using Hermeneutic Phenomenology, we studied online commiunity users' lived experiences of their participation. this method considers every detailed aspect within human experiences in order to create meaning and develop a sense of understanding. In addition, the Fuzzy Cognitive Maps methodology has been proven through the literature as a very useful approach and cognition tool to model and analyze complex dynamic systems. The present study used Hermeneutic Phenomenology and Fuzzy Cognitive Maps in order to generate a more accurate description of the difficult or complex situation of online consumer behavior.

Results show that attracting participation to online communities is not possible without understanding the importance of social/psychological aspects of human lives. Our study shows the multifaceted nature of motivations and the causal relations between them in order to highlight the importance of looking to the phenomenon of online community participation as a complex system in which not only the constructs but also the nature of the relations between these constructs are important.

Due to the broad nature of the current study, we were not able to define each motivation in depth. Fellow researchers may build on our findings and develop further studies to investigate each motivation separately. Moreover, it is effective to make the proposed FCM more dynamic, using an appropriate learning method, which can be revised through passing of time.

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