Cognition Change from Skype Internet Phone User by Qualitative Perspectives

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Abstract

A wave of Internet phone sweeps across the world in recent years, and the Internet phone technology has quickly changed people in psychological, social, marketing mix and situational influences. In order to analyze the shift from non- Skype users to becoming Skype users, a qualitative approach in a longitudinal percept is used to explore the affect and cognition of consumers. With a time period analysis, this study compares both individual and group schema differences by using in-depth interviews, open coding and axial coding. Our findings from the schema-based perspective provide evidences that different time period processes lead to different consumers affect and cognition of schema development. Moreover, the results reveal that consumers' affect has a positive impact on consumers' cognition, which in turn creates a positive influence on Skype usage. In the end, we conclude that both consumers affect and cognition play significant influence on Skype usage. These findings also present valuable information to different areas across relative efforts in consumers affect and cognition.

1. Introduction

With the rapid development of information technology (IT) and the exponential growth of the Internet usage, the Internet phone recently became a popular gadget on the Internet. The study in this paper is an attempt to investigate why certain products subsist while varied substitutes exist in the same field. A qualitative approach is used to explore the consumer behaviors of Skype Internet phone and compare the schema changes between Skype users and non-skype users in the same periods. These two groups, the Skype users and the non-skype users, are adopted deeply interview to collect data from participants through three different periods, week 5, week 10, and week 15. In order to preserve the context of the interviews, the theme transformed record to verbatim. In the period of 15 weeks, the theme tracked the cognition which constructed from four participants by interviewing for every five weeks. Moreover, the study displayed the cognition change by graph at different period of time.

Our contribution of this paper is to reveal the in-depth consumer behavior of Skype behind the quantified user satisfaction. We conduct the study by the grounded theory [11][20][22][25] using three sets of coding procedures, open coding, axial coding, and selective coding, which help the analyst break down the original data, conceptualize it and re-arrange it. We use NVivo software by QSR technology to organize the document and the relationships.

2. Literature review

Basing on the purpose of the study, the concept of VoIP, sensemaking and cognition change will lie on this present section.

2.1 VoIP

VoIP (Voice over IP) technology is gaining popularity and deployed both in home and enterprises, and there are over 200 million Skype downloads and approximately 85 million users worldwide [4]. Skype, created by KaZaa in 2003, becomes so popular that users are willing to accept a good service for free, even though service continuity and quality is not guaranteed [2]. The user satisfaction of VoIP has increasingly been the object of study in recent years, but the qualitative research in VoIP products is still rarely reported until now.

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Chen states the major challenges lies in the lack of an easily accessible and objective index to quantifying the degree of user satisfaction [4], and claims that there is no formal study that quantifies the level of user satisfaction of Skype voice phone service before the date of his paper published. The user satisfaction index is used in [4] to determine the degree of user satisfaction from the conversation patterns with the following three voice interactivity measures to capture the interactivity and smoothness of a given conversation: responsiveness, response delay, and talk burst length. Besides, voice encoding technology is also an important factor to determine the VoIP quality, and Markopoulou uses mean opinion score (MOS) to indicate user satisfaction of voice communication over Internet [18].

Sripanidkulchai asserts the key motivation for this transition from traditional phone services to VoIP services is not just the reduced cost, but the ease of integration of voice services with other network-based applications and across multiple sites, particularly in the enterprise environment. The integration issues and the learning gap are also important in our research. No matter how the performance of VoIP is, Hartpence asserts in [14] that for the near future, we must retain some portion of traditional telecommunications while whole heartily adopting IP based networking and the protocols that will carry us through next generation connectivity. Jiang also believes VoIP will eventually replace the old telephone equipments from our offices, due to the cost benefit and new services it offers [16].

Cadiz proposes the enhanced telephony prototype to survey the user experience using PC-phone, and finds that most PC-phone features make people easy to deal with incoming calls but do not seems to make it easier to call people, and claims that a great PC-phone user interface does not necessarily look like a phone [3]. Moreover, the EasyVoice in [5] allows a person with voice disabilities to use VoIP.

2.2 Sensemaking

When individuals face change, they experienced surprise, a "gap" in their expectations vis a vis their experience [19, 21]. They started to act in a more conscious and less automatic [9] sensemaking mode and to interact with each other to make sense of what is going on around them and to determine how they should respond. In the face of change, individuals exchange gossip, stories, rumors, and accounts of past experiences, and they take note of symbolic behaviors and actions [6, 7, 17, 23]. Through these social processes, recipients of change develop new understandings and interpretive frameworks.

Sensemaking is a conversational and narrative process through which people create and maintain an intersubjective world [1, 24] There are many channels through which concepts and ideas can reach a "sensemaker," both spoken and written, and both formal and informal. Sensemaking practices include conversations, utterances, documents, and storytelling [9, 24], and they can be symbolic, such as when they refer to the actions and behaviors of others. Sensemaking plays a central role in cognitive reorientations [6, 7, 17].

Schemata are central to organizational sensemaking. As structured units or clusters of thematically related knowledge [10] that can be hierarchically organized with embedded subschemata, they constitute the cognitive structures or frameworks by which generic concepts derived from past events and experiences are stored in memory [8]. Schemata are demarcated from one another by categorizations, or defining features, which develop from perceived similarities and differences [15]. Since people draw on schemata to interpret, understand, and respond to events and data, these clusters of knowledge "emphasize our active construction of reality" [10]. They are the bases upon which one relates knowledge, attributes meaning and fashions understanding [23].

2.3 Cognition change

To study of cognition and change have suggested that schemata can change (for instance, through senior managers' actions [17, 23], although scholars know more about the ways that schemata are maintained than about how they change [10]. Researchers have advanced several models for schema change. Schemata have a tendency to endure, even when individuals are faced with disconfirmatory evidence [10]. Furthermore, according to [25], in contrast, emphasized a schemata comparison phase that occurs at the individual level and results in the social negotiation of shared organizational schemata. In their view, schema change occurs through the eventual replacement of the old with the new. They attempted to link their results to models of schema change identified in social cognition, arguing that their findings supported the conversion model [21].

3. Research Design and methodology

According to Myers, "grounded theory is a research method that seeks to develop theory that is grounded in data systematically gathered and analyzed", and Myers thinks grounded theory is an inductive, theory discovery methodology [20]. Richardson has the

opposite views that researchers of grounded theory use an inductive strategy is the most famous misunderstanding, and he believes that abduction reasoning lies at the heart of grounded theorizing, and from Richardson's opinion, abduction, induction and deduction refer to different stages of inquiry [25].

We use abduction as the first stage, and the induction as the second stage. The research methodology is shown in Figure 1. The result of abduction is what we describe in the introduction section of VoIP popularity, and we can infer rules that anyone will use Skype if he or she is an intensive communication tool user and the cost factor is very important for him or her to select communication services. The results of abduction phase can be crosschecked with the results of induction phase. The data of this study are collected through unstructured in-depth interviews as described in [26]. We interview two different groups, the Skype user group and the non-Skype user group, in the fifth week, the tenth week and the fifteenth week. There are three persons in the Skype user group, and there are four persons in non-Skype user group. Due to the limitation of in-depth interview in qualitative research, it is very difficult to interview too many persons in our study. As we review the qualitative research papers, there are only ten persons in the research paper of Hale [13]. Moreover, the results of this paper can be validated by our future quantitative research. After the data collection, we code the interview context in open coding. The purpose of this process is to identify discrete concepts, and similarities. The axial coding and selective coding are used after retrieving concepts of interview contexts, then the schema tables for each interviewee is organized to interpret the results; besides, we can compare the differences between these two groups, and the shift in patterns of consumer behaviors and cognitions of individual users can also be investigated.

In order to judge the soundness of this qualitative research, we use the four criteria from Guba and Lincoln [12] for qualitative validation. These criteria are confirmability, dependability, credibility, and transferability. Confirmability refers to the degree to which the results can be confirmed or corroborated by others. The researcher can actively search for and indicate negative instances that contradict prior observations. Each researcher can conduct a data audit that examines the data collection and analysis procedures and makes judgments and corrections. For dependability, the research is responsible for describing the changes that occur in the setting and how these changes affected the way the research approached the study. The credibility criteria involve establishing that the results of qualitative research are credible or believable from the perspective of the participant in the research. The credibility can be judged by the participants. At last, the qualitative transferability is primarily the responsibility of the one doing the generalizing. The confirmability, dependability, and credibility can be verified, and we leave the transferability in the future work, because we don't generalize the case in this paper.

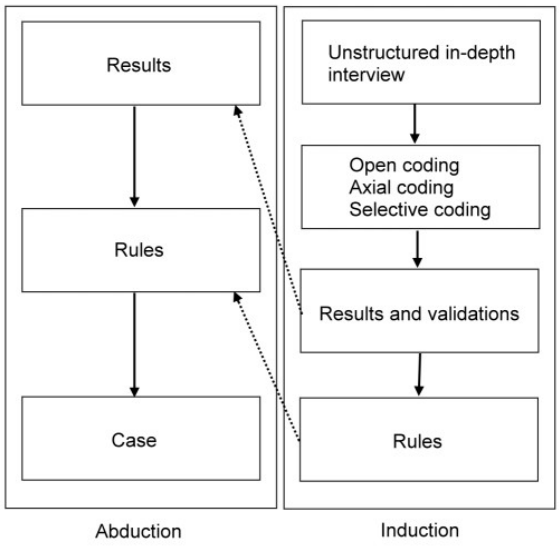

Figure 1. The research methodology

4. Interview and Coding

We interview two groups of users, the Skype users and non-Skype users. The persons in the group of Skype users have already used Skype as an important communication tool, and the persons in the group of non-Skype users didn't or rarely use Skype to communicate with their friends. Table 1 and Table 2 show the profiles about the persons of Skype users and non-Skype users.

Since we use unstructured in-depth interview, we design the questionnaires to make the participants to express themselves as possible, and the questionnaires are just the main scope of the interviews. The whole period lasts for fifteen weeks, and each interview is hold in week 5, week 10, and week 15. Due to the large size of the coding books, we just show the partial axial coding in Table 3.

Table 1. The profile of Group-1, the Skype user group

Interviewee ID	G1-01	G1-02	G1-03
Occupation	Associate Professor in Electronic Engineering	Manager of cargo company	Graduate student in Information Management

	dept. of science and technology university		dept. of science and technology university
Gender	Male	Male	Male
Age	41	41	23
Background	Ph.D.	Bachelor	Graduate student

Table 2. The profile of Group-2, the non-Skype user group

Interviewee ID	G2-01	G2-02	G2-03	G2-04
Occupation	Vice-curator of university library	Graduate student in Information Management dept. of science and technology university	Undergraduate student in Information Management dept. of science and technology university	Art teacher
Gender	Female	Male	Female	Female
Age	45	24	20	34
Background	Master	Bachelor	Undergraduate student	College diploma

Table 3. The partial axial coding of G1-01

Axial	Code	Code Description	Week 5	Week 10	Week 15
Free of charge	It's free	Important features of Skype	*	*	
Saving of communication fee	decrease of phone bill	Motivation of using Skype	*	*	*
Easy to use	It's very easy to use	Experience of using Skype			*
Quality expectation	If the quality can be improved, it might replace home phone	User requirement of Skype			**

5. Schema Tables

Each user is interviewed in three periods, some interview contexts may change or unchanged. As Figure 2 shows that area 1 indicates the contexts appear only in week 5, area 2 indicates the contexts appear only in week 10, and area 3 indicates the contexts appear only in week 15. Each coding context is allocated in appropriate areas, from 1 to 7; therefore, it's very obvious to observe the changing. The schema changes of G1-01 of Skype user group in three periods are shown in Table 4, and other twelve schema changes are omitted in this paper since they are in the same structures. We retrieve the same or similar concepts from all schema tables into Table 5 and Table 6 which show the comparison of Skype and non-Skype user group in three periods, and every concept in Table 5 and Table 6 are categorized into psychological influences, social influences, marketing mix, and situational influences.

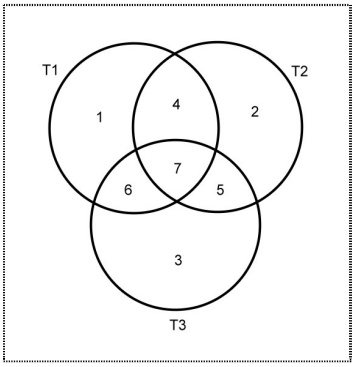

Figure 2. The schema change of users in three different periods.T1: week 5, T2: week 10, T3: week 15

Table 4. The schema change of G1-01 in three periods

1	● Save more in international calls ● Use Skype in any time ● 70% in certain location ● Skype phone cannot replace home phone
2	● Good experience using Skype ● Skype requires network connection
3	● It's a good alternative of phones ● It's very easy to use ● It might replace phones if the quality can be improved ● Recommend couple friends to use it ● No relatives nor friends using MSN ● More relatives and friends using Skype ● Recommend to use it when going abroad ● Phone fee is too expensive
4	● No idea about the Skype phone ● Office user ● Use ADSL in home ● Skype is free ● Prefer to use Skype than other tools ● Regular Skype user
5	● No video in Skype ● Skype is set to auto login when power on the computer
6	● Poor quality when the bandwidth is low
7	● Decrease the phone bill ● It's convenient

	● To talk with many friends at the same time ● Business purpose or just chatting ● 60% in certain location ● intensive communication requirement ● Use Skypeout to call home phone ● It's cheap for Skypeout

Table 5. The comparison of Skype user group in three periods

	Skype user group
Week 5	● It's cheap and saving of communication fee. ● To use for business purpose or chatting ● Steady working location ● Intensive Skype needs ● Understanding of communication charging rate
Week 10	● It's cheap and saving of communication fee ● To use for business purpose or chatting ● Steady working location ● Intensive Skype needs ● Understanding of communication charging rate ● Skype will auto login when power-on computer
Week 15	● It's cheap and saving of communication fee ● To use for business purpose or chatting ● Steady working location ● Intensive Skype needs ● Understanding of communication charging rate ● Skype will auto login when power-on computer ● Charge rate of home phone is too high ● Skype is easy to use

Table 6. The comparison of non-Skype user group in three periods

	Non-Skype user group
Week 5	● Long distant calls ● Email and MSN ● No friend using Skype
Week 10	● Saving of communication fee ● Long distant calls ● Not regular Skype user
Week 15	● Long distant calls

6. Conclusions

We find that the main reason why persons of Skype user group continue to use Skype is affected by marketing mix since the terms of cost saving show in week 5, week 10, and week 15 in Table 5 and Table 6. Besides, Table 5 and Table 6 indicate the users of the Skype user group are more sensitive to prices, functionality, and alternatives than the others. If the users of non-Skype user group become regular Skype users, they are most affected by the social influences, because non-Skype users require friends to use Skype with as shown in Table 5 and Table 6. If the social influences can not turn the non-Skype users become regular Skype users, the marketing mix issues are not important to them. The persons who become members of Skype will use their social influences to their friends or relatives, and the marketing mix will become more influential than before.

We can infer that the feature of free services is not the most important factor to change a non-Skype user to be a Skype user. The psychological influences and the situational influences seem not important factors in our study. We also can conclude that the marketing mix and the achievement motivation are the main reasons for Skye users to keep using Skype, because they can use Skype in various purposes in cheap price; whereas, the contractual groups and motivation are the most important factors for non-Skype users to become regular Skype users. If the contractual groups and motivation are not influential enough, any other factors can not affect non-Skype users in any degree.

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