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Differentiating the Impact of Social Influence -
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ABSTRACT

Although widely accepted as critical determinant for an individual's adoption decision in households social influence is rather be known as the unloved child of technology adoption research. As several IS researchers pointed out the need for more sophisticated methods to assess social influence and a clarification of its role we aim to contribute to existing household adoption research by providing an empirical analysis observing the social influence of different referent groups and secondary sources on the behavioral intention to participate in social networking portals by different adopter groups. Therefore we evaluated survey data of 422 young professionals, 771 professionals and 226 managers with the help of multi-regression analysis. We come up with two interesting contributions to existing household adoption research. On the one hand social influence of different referent groups and secondary sources significantly affects the intention of adopter groups with different career status, age and prior experience and on the other hand social influence differs for both source (referent group or secondary source) and sink (adopter group) with varying adopter's career status.

Keywords

Household Adoption, Social Influence, Secondary Sources, MATH Model

INTRODUCTION

Since the internet was developed it has gradually caused a revolution of our communication system. It "*changed the way people live and work*" (O'Murchu et al. 2004) and became one of the most important communication media. What has before been communicated face-to-face, via telephone or fax, is meanwhile conducted online to a great extent. Independent from time and space information can be sent and received globally via the web. Thus internet based access to communication means has become omnipresent (O'Murchu et al. 2004).

Brown (2008) emphasizes that the "*wired from birth*" generation is actually inclined to expect that numerous things can be accomplished with the help of IT which so becomes more and more integrated and ubiquitous in daily life. Particularly communication with other individuals in the private and workplace environment turned from face-to-face to online networks. Especially virtual communities (VCs) are subject to great expansion as networks of interrelationships boom over the last years. The virtual and the real world mingle more and more. One species of the wide variety of VCs are social networking portals (SNPs). Their influence in the digital environment increases steadily and plays an important role in the participants' life. Boyd and Ellison (2007) observed that SNPs attract millions of users ever since they appeared. Their rapid increase has opened a broad field for investigation in recent years and Brown (2008) emphasizes that SNPs represent a very interesting research area for academic and industry researchers. Their booming presents a challenge to explain and understand their irresistible fascination. For this reason fundamental questions need to pick out factors influencing user's adoption decision to participate in SNPs in a household context as central factor. Additionally a deeper examination of potential user groups and their composition and nature respectively is clearly needed. So far several studies have extensively explored employees' or employers' adoption of IT products or services in the workplace but there is yet very little research on the adoption determinants on these user groups in a private household context (Venkatesh and Brown 2001) and the allure of SNPs in particular. These facts inspired us to focus on this subject.

Venkatesh and Brown (2001) stated already that the decision to adopt IT in workplace contexts and in private homes is influenced by different factors. Particularly the personal goals and the expenses regarding technology usage can be distinct. In their research on household adoption they developed the Model of Adoption of Technology in Households (MATH) (Brown and Venkatesh 2005). Within this research model the social influence of distinct referent groups as family members

or friends as well as the influence of secondary sources like TV, newspaper or radio appeared as major antecedents on users' decision to adopt IT. Despite the recognized importance for an individual's adoption decision especially in households, IS research struggled and still struggles in differentiating and defining the particular influence for both source (influence group) and sink (individual adopter). If you put the wheel of history in reverse one could see that the history of social influence in IS research is paved with construct removals out of several research models (Davis et al. 1989; Yao and Murphy 2007) and numerous insignificant results (Pavlou and Fygenson 2006; Hsieh et al. 2008). As a result many researchers demand "*more sophisticated methods for assessing the specific types of social influence*" (Davis et al. 1989), a clarification of "*the precise role of social pressure in technology acceptance*" (Agarwal 2000) respectively a research approach "*fully taken into account the social richness of interactions*" (Sykes et al. 2009).

To support and attain these objectives we tie in the research of Brown and Venkatesh as starting point to analyze the impact of both referent groups in a household context as well as secondary sources on users' adoption intention to join social networking portals. Furthermore we base our research on the results of a recently published special issue on IT adoption and diffusion in the household context (Dwivedi et al. 2008). As preceding studies mostly considered college students participating in SNPs like Facebook (Boyd and Ellison 2007) we observe in our approach the under-researched groups of young professionals (work experience < 4 years), professionals (work experience > 4 years) and managers (long time work experience), Especially executives represent an interesting research object in the background of the rising importance of business social networking portals like LinkedIn or Xing. Concerning the fact that prior research leaked to provide a differentiation for the social influence of distinct referent groups on distinct adopter groups (Eckhardt et al. 2009) we aim to contribute to existing research by providing an empirical analysis observing which source (referent group or secondary source) influencing which sink (young professional/professional/manager). With the help of multi-regression analysis research we answer the following research questions:

RQ1: What is the impact of distinct referent groups and secondary sources on the decision to participate in social networking portals?

RQ2: Is there a differentiation for the influence regarding referent group or secondary source and the adopter group?

To answer our research questions we structured this paper as follows. The subsequent section sums up existing results concerning the research object of social networking portals and introduces the underlying MATH model. After a precise description of our research methodology and the data collection process we examine the influence of both social environment and secondary media sources on the decision-making of young professionals, professionals and managers to join social networking portals with the help of multi-regression analysis. The empirical research will be explained and the results discussed in detail to provide valuable theoretical and managerial implications. The paper concludes with a brief summary of the study and suggestions for further research.

THEORETICAL BACKGROUND

Within this section we discuss the theoretical background of our research approach regarding the observed domain and the underlying theory. At first the current status of knowledge about virtual communities and social networking portals will be described to provide the necessary information about our research object. We conducted our literature review on virtual communities by screening all IS top journals of the 2004 JAIS ranking (Lowry et al. 2004) since 2001 as the concept of household adoption was introduced and early research on virtual communities was started. We accessed the journal databases using the function for general and advanced search following the procedure of current scientometric studies and meta-analyses in technology adoption literature (see e.g. Eckhardt 2009). Additionally we used Google Scholar to enhance our findings by proceedings and non-ranked journals. The results of our literature review are presented in the following subsection.

Virtual Communities and Social Networking Portals

There is still no common agreement on one specific definition of the term "virtual communities" in literature (Leimeister et al. 2004; Leimeister et al. 2008). This may be due to the fact that VCs are multidimensional research objects and can be analyzed for example on the basis of psychology, administrative science or computer science. Moreover so-called "buzz words" obscures a clear differentiation of scientific terms and jargon (Leimeister et al. 2004).

However there are some key characterizations that have been repeatedly summed up in previous approaches (Leimeister et al. 2008). We define VCs as groups of individuals who communicate and interact socially using the electronic means of a technical platform in a computer-mediated way. They share specific or common interests, problems, tasks or practices without the need of being in the same place or of belonging to the same ethnic group. Thus VCs make global interpersonal

connection possible. Social relationships with other members can be established and maintained on the basis of implicit and explicit codes of behavior (Leimeister et al. 2004, Leimeister et al. 2008; Li and Lai 2007; Ridings et al. 2002). Researchers have attempted to specify VCs. They focus on "the *people* who come together for a particular *purpose*, who are guided by *policies* (including norms and rules) and are supported by *software*" (DeSouza and Preece 2004). The most often cited definitions of VCs were originally given by Howard Rheingold (1993) a pioneer of online community development and research. He defined VCs as "*social aggregations emerging from the Net when there are enough people to carry on public discussions over a certain period of time, with sufficient human feelings to form webs of personal relationships in cyberspace*" (Rheingold 1993). So a virtual community is "*a group of people who may or may not meet one another face-to-face, and who exchange words and ideas through the mediation of computer bulletin boards and networks*" (Rheingold 1994). Rheingold (1991) describes the essence of virtual communities: "*People in virtual communities use words as screens to exchange pleasantries and argue, engage in intellectual discourse, conduct commerce, exchange knowledge, share emotional support, make plans, brainstorm, gossip, feud, fall in love, find friends and lose them, play games, flirt, create a little high art, and a lot of idle talk*" (Bagozzi and Dholakia 2002; Rheingold 1991).

Social networking portals (SNPs) are a recent trend and provide a new means of socializing (O'Murchu et al. 2004). They provide interested users to be connected online and to create and maintain networks for different reasons (O'Murchu et al. 2004). Participants of the portals are enabled to develop user profiles and present their identity online. Thus the individual is located in the centre of the community (Boyd and Ellison 2007). Various types of SNPs emerged over the last years (Boyd and Ellison 2007). The individual platforms focus for instance on work-related contexts (e.g. LinkedIn.com), on romantic relationship initiation (e.g. Friendster.com), on common interests (e.g. MySpace.com) or the college student population (the original incarnation of Facebook.com) (Ellison et al. 2007). Some sites address a widespread public, while others attract people with very specific interests like racial, sexual, religious and others (Boyd and Ellison 2007). Even offline social networks profit from the internet. They can be organized online in an easy and efficient way (O'Murchu et al. 2004).

Users' motivation, intention and behavior participating in VCs and SNPs have been analyzed in several approaches (see e.g. Li and Lai 2007). A majority of these approaches used popular behavioral science theories such as the Theory of Planned Behavior (Ajzen 1991) and the Theory of Interpersonal Behavior (Triandis 1980) but only few are founded in specific household adoption models. Therefore we chose the MATH model (Brown and Venkatesh 2005) as underlying for our research model. It is described in detail within the following subsection.

The MATH Model

Various studies with different approaches to investigate people's intention and behavior using IT have been worked out. To understand people's acceptance of IT and their behavior using it in private households Venkatesh and Brown (2001) developed in a longitudinal study a model called MATH (Model of Adoption of Technology in Households) based on the Theory of Planned Behavior (TPB) (Ajzen 1991). The TPB contains determinants influencing an individual's behavioral intention (BI) and actual behavior according. The influencing determinants are the attitudinal belief, the normative belief and the control belief.

The underlying attitudinal belief structure is formed by utilitarian outcomes (the extent to which using IT enhances the effectiveness of household activities), hedonic outcomes (the satisfaction derived from the consumption or use of a product), and social outcomes (public recognition that might be achieved as a result of adoption, such as increase in power, knowledge and status). The normative belief structure is formed by social influences. These influences are originally defined as "*the degree to which an individual perceives that important others believe s/he should use the new system*" (Venkatesh et al. 2003). Within the MATH model they represent the influence of family members and friends and by information of secondary sources (TV, newspaper and other media). The control belief structure relates to barriers inhibiting an adoption of IT posed by lack of knowledge, difficulty of use, high costs (recourses) and fear of obsolescence and rapid changes in technology.

In an extension of MATH, Brown and Venkatesh (2005) added in their study the household life cycle theory and the three demographic key variables: age, marital status and presence/age of children in the private household. The household life cycle model suggests that families pass through a set of stages in the course of their lives. Family forms are e.g. single parents, older parents, same sex couples and others. The members of a household (husbands, wives, and children) influence the household decision-making. Characteristics of household life cycles stages are the demographic key variables, which play moderating roles and vary with different life cycle stages. Subsequent studies identify friends, relatives or club members as important influence groups in the household context (Eckhardt et al. 2008). Also the socio-economic factor like income has to be considered in their study it has an impact on the household spending. The influences of workplace referents are included in the normative belief structure as an additional social influence.

The results show that within the attitudinal beliefs the application for personal use was significantly moderated by marital status and age. Utility for children and the utility for work-related use were significant in almost all life cycle stages moderated by age. Hedonic outcomes decreased with age. The influence of status increased with age. Determinants of control beliefs such as fear of technical advances, and declining costs increase with lower income and increasing age. The antecedents perceived ease of use and requisite knowledge increase with older age. Overall the results demonstrate that the influence of attitudinal beliefs varies with the life cycle stages. Income interacts with the normative and control beliefs within life cycle stage.

The findings also indicate that normative beliefs, the influences of friends, family members and of secondary sources significantly motivate the individual to adopt IT whereas the influence of workplace referents has no such effect. The demographic variables age and marital status moderate the influence of normative beliefs on the intention to use IT. Normative influence only increase with increasing age and decreasing income with married status. As prior research results on household adoption only provided the outcome that adopters are particularly influenced by their private environment with family and friends and only weak influenced by their working environment, they did not provide knowledge about which distinct adopter group is influenced by which distinct private or workplace referents as well as secondary source. Therefore we aim to contribute to existing household adoption research by providing an empirical analysis observing which adopter group is influenced by which referent group or secondary source. The findings of a multi-regression analysis are presented in the results section. Beforehand we introduce our research methodology including the process of data collection and data analysis.

RESEARCH METHODOLOGY

As research method for the investigation of young professionals, professionals and managers' intention and behavior to use SNPs data we used a multi-regression analysis to evaluate the collected data of an online survey. In the following subsection we present a detailed data capture and analysis. On the basis of the obtained and valid results we evaluate the acceptance of SNPs in private households specializing on managers of two different branches. Figure 1 summarizes our research model testing for the impact of social influence of referent groups and secondary sources on the intention to use social network platforms.
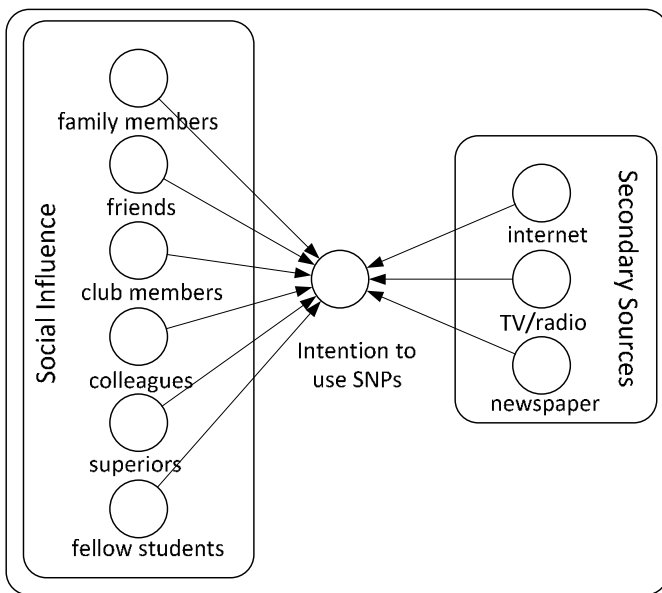
Figure 1: Research model

Data Collection

To observe the decision-making in household adoption we targeted our survey on employees with more and less than four years of working experience as well as employees on managerial level of both sexes participating in SNPs in their private homes. Therefore an online questionnaire was developed in summer 2008 to collect data from people participating in SNPs. To operationalize the measures used we followed the propositions of Ajzen (1991), Venkatesh et al. (2003), Kim et al. (2007)

and Brown and Venkatesh (2005). The questionnaire was available online at the website of university's information systems department. An email invitation was sent to the researched target group.

In total we received 422 responses by young professionals, 771 by professionals and 226 by managers with diverse job profiles, coming from different branches and backgrounds. For these three groups we carried out a cross-sectional study to get results for the social influence of different referent groups and secondary sources on different job profiles.

The selected data was analyzed with the help of SPSS Version 16.0. Therefore a multi-regression analysis was accomplished. A multi-regression determines the best equation describing a set of x- and y-data points while using the method of least squares (Gefen et al. 2000). Variables in this survey were measured on a 5- and 7-point Likert scale using questions ranging from "strongly agree" to "strongly disagree". The detailed description of all questions used in this analysis is presented in the appendix.

Data Analysis

To observe the decision-making of regular employees in household adoption we targeted our survey on young professionals, professionals and employees on managerial level of both sexes participating in SNPs in their private homes. They were asked to what extent their decision-making to join in SNPs is affected by normative influences (social influences and media) considering present as well as future usage. As influencing determinants we chose on one hand the referent groups of family members, friends, club members, colleagues, superiors and fellow students and on the other hand the secondary sources internet, TV/radio and newspaper (Eckhardt et al. 2008). In our research the dependant variable to explain is the behavioral intention to use SNPs. Our analysis observing the differentiated impact of both referent groups and secondary sources on the three respective adopter groups is presented in the following section.

RESULTS

For answering our research questions we used a multi-regression analysis which was conducted to test for significant impact of different social influence sources on the intention to use social network platforms. A five step analysis afforded testing for significant changes in R^2 as well as for significant regression coefficients (Bensaou 1997; Le Blanc et al. 1990). In the first step, we tested for the influence of friends, in the second one for family, in the third one for people of the working environment, in the fourth one for people of the private environment and in the last one for secondary sources. Furthermore we differentiated the influence for the three groups observed: young professionals, professionals and managers. The results are summarized in Table 1 and indicate that there is a significant change in R^2 as well as a significant coefficient which are different for the three samples tested.

| | | YOUNG PROFESSIONALS | | | | | PROFESSIONALS | | | | | MANAGER | | | | |
| | | (N=422) | | | | | (N=771) | | | | | (N=226) | | | | |
		B	SE	Beta	R2	delta R2	B	SE	Beta	R2	delta R2	B	SE	Beta	R2	delta R2
FRIENDS	**Friends**	**,369**	**,046**	**0,366***	**,134**	**0,133***	**,557**	**,036**	**0,483***	**,233**	**0,232***	**,487**	**,070**	**0,422***	**,178**	**0,178***
FAMILY	Friends	,376	,049	0,373***	,138	,004	,567	,041	0,492***	,233	,001	,510	,077	0,442***	,191	,013
	Siblings	-,098	,089	- 0,063			-,038	,085	-,019			-,074	,157	-0,039		
	Children	,064	,068	0,055			-,033	,056	-,024			,164	,107	0,127		
	Parents	,044	,105	0,025			,049	,098	,021			-,265	,194	-0,124		
WORK	Friends	,357	,050	0,354***	,145	,007	**,502**	**,046**	**0,434***	**,243**	**0,010***	**,392**	**,083**	**0,339***	**,234**	**0,043***
	Siblings	-,129	,090	-0,083			-,042	,085	-0,021			-,130	,155	-0,069		
	Children	,046	,069	0,040			-,055	,057	-0,041			,162	,106	0,125		
	Parents	-,014	,110	-0,007			-,018	,106	-0,009			**-,543**	**,211**	**-0,254***		
	Colleagues	,108	,084	0,076			**,206**	**,074**	**0,119***			**,434**	**,151**	**0,252***		
	Superiors	,043	,066	0,042			,021	,061	0,016			,081	,106	0,065		
PRIVATE	Friends	**,364**	**,052**	**0,361***	,146	,001	**,502**	**,047**	**0,434***	,245	,002	**,363**	**,083**	**0,314***	,255	**0,020****
	Siblings	-,131	,091	-0,083			-,050	,085	-0,025			-,191	,155	-0,102		
	Children	,042	,072	0,036			-,073	,059	-0,054			,134	,105	0,104		
	Parents	-,012	,114	-0,007			-,049	,109	-0,021			**-,627**	**,219**	**-0,294***		
	Colleagues	,113	,085	0,080			**,195**	**,075**	**0,113***			**,401**	**,150**	**0,233***		
	Superiors	,045	,067	0,044			,009	,062	0,007			,017	,108	0,014		
	Fellow Student	-,028	,054	-0,030			-,007	,051	-0,006			,128	,092	0,112		
	Acquaintance	,016	,065	0,016			,078	,062	0,061			,144	,118	0,114		
MEDIA	Friends	**,350**	**,053**	**0,3471***	,162	,015	**,496**	**,047**	**0,430***	,252	**0,006****	**,328**	**,082**	**0,285***	,304	**0,049***
	Siblings	-,138	,091	-0,089			-,058	,085	-0,029			-,089	,154	-0,047		
	Children	,044	,072	0,037			-,069	,059	-0,052			,088	,104	0,068		
	Parents	-,007	,114	-0,004			-,051	,109	-0,022			**-,562**	**,216**	**-0,264***		
	Colleagues	,082	,085	0,058			**,167**	**,076**	**0,097***			**,331**	**,147**	**0,193***		
	Superiors	,025	,067	0,024			-,002	,062	-0,002			-,012	,105	-0,009		
	Fellow Student	-,067	,056	-0,072			-,022	,052	-0,019			,071	,093	0,062		
	Acquaintance	-,016	,067	-0,016			,074	,062	0,057			,102	,117	0,081		
	Newspapers	,041	,071	0,043			**,137**	**,057**	**0,118***			**,217**	**,091**	**0,193***		
	Internet	,046	,064	0,051			,000	,052	0,001			**,189**	**,084**	**0,185***		
	TV/Radio	,127	,110	0,083			-,092	,092	-0,050			**-,292**	**,162**	**-0,160****		

Note: *** p<0.05, ** p<0,1, Test for multicollinarity is negative

Table 1: Regression analysis results

As one can see in Table 1 there are differences for the three groups tested concerning source (referent group or secondary source) and sink (adopter group: young professionals, professionals, managers). First, for young professionals only the group "friends" could be evaluated to have a significant impact on the intention to use social network platforms. Furthermore, only in the first step of the multiple regression analysis a significant change in R^2 could be estimated. Second, for professionals, friends, colleagues and the secondary source newspaper have a significant impact and only for step one, three and five a significant change of R^2 could be evaluated. Third, for managers, friends, colleagues, and especially the secondary sources (newspapers, internet, TV/Radio) are important.

Based on these statistical results the next section mentions some possible limitations of our research before in the last section our results are discussed and implications for theory and practices are highlighted.

Limitations

As of every empirical research the results of this study are also limited. One limitation is the duration of our online survey it was carried out in a short period of time with just two months. In addition it might be affected by common method variance as we collected our data at the same time using the same questionnaire (Podsakoff 2003). We designed this study with different scales and varying order of item appearance in order to follow the guidelines to avoid common method variance

(King et al. 2007). Furthermore we only investigated the behavior of young professionals, professionals and managers so there might be differences for groups of different hierarchy level and career status. Moreover we did not explore the influence of husbands and wives who might also be an interesting subject particularly splitting up the two sexes, to what extent and in which way are males influenced by their wives and females by their husbands. As we only surveyed people in Western Europe it is obvious that people with different cultural background living in other world regions might be influenced by other referent groups or secondary sources.

Theoretical Contribution to household adoption

Finally regarding the results of our approach we could sum up that our paper offers two interesting contributions for household adoption research. At first we could generally confirm a strong social influence of referent groups and secondary sources on SNP users of different career status and with different prior usage experience. This represents an interesting result as experience was found to be an important moderator determining the significance of subjective norm respectively social influence in technology adoption by prior research (Venkatesh et al. 2003). Our second contribution includes the finding that the impact of social influence differs for both source (referent group or secondary source) and sink (adopter group), as we found different social influencing factors for the observed groups of young professionals, professionals and managers regarding their behavioral intention to participate in SNPs. This is consistent with results of current research approaches assuming that the original role and measurement of social influence in technology adoption so far is not appropriate (Eckhardt et al. 2009; Sykes et al. 2009). In particular a scientometric study of the construct subjective norm in IS research showed that the original measurement of social influence in technology adoption research *"people who are important to me think that I should use the system"* derived of the Theory of Planned Behavior (Ajzen 1991) is significant negatively correlated with a significant impact of subjective norm on an individual's behavioral intention (Eckhardt 2009). Finally we can conclude that future approaches on social influence in household adoption research need to consider both to measure the influence individually and to evaluate this influence regarding control variables as experience, career status and hierarchy level of both adopter and referent.

Further Research

As we exclusively investigated adopters' behavior but did not consider non-adopters future research will gain interesting results by focusing on this group. We showed in this research that the social influence of different referent groups and secondary sources differs for adopter groups with different job profiles concerning the overall impact of the social influence, in which way normative beliefs might influence non-adopters could be answered by further investigations in this field. Additionally data capture over a longer period of time and a longitudinal study would offer deeper insights about the specific influence of referent groups and secondary source on adopters over time. Particularly interesting emerges the issue how the influence of specific groups and source changes over a period of time. It might also be worthwhile comparing job profiles of different branches or one might even explore and compare people with an entirely different status of career, integrating top managers, high school and university graduates or apprentices to the observed groups of young professionals, professionals and managers.

Another specific suggestion for further research about SNPs is to distinguish different behavioral activities of individuals while using SNPs. Previous literature has identified three types of participation behavior such as general participation, lurking (only viewing messages without posting any) and active participation. It would be interesting to classify people according to their particular behavior and analyze their individual influencing factors.

Finally this research consequently leads to questions about the weight of importance of each influencing factor. It might hold that one factor can be more important than others.

CONCLUSION

This research presents an interesting contribution to the understanding of IT adoption and usage behavior in private households and outside the workplace.

Our research question regarding the impact of social influences and secondary sources on the decision to participate in SNPs can be answered in the affirmative. Young professionals, professionals and managers do listen to other people's opinions and recommendations. Additionally they are influenced by different types of media, such as radio, TV and the internet. We showed that all influencing factors (except family) have a significant impact on the behavioral intention to participate in SNPs.

And the deeper we immersed ourselves into the matter and the more detailed we analyzed the influencing factors particularly in respect of the participants' career status and hierarchy level in the company the clearer a very interesting conclusion appeared: considering the different job profiles our results show that young professionals are mainly affected by friends whereas professionals and managers are rather influenced by friends, the working environment, the private environment and the media. Thus normative influences (family, friends, and media) on the private decision to participate in SNPs seem to vary with the individual's career status and hierarchy level in the company for both adopter and referent.

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APPENDIX

Construct	Indicator	Source
Intention	I am planning to continue using SNPs in future.	Ajzen (1991), Venkatesh et al. (2003)
Family	My children recommended using SNPs. My parents recommended using SNPs. My siblings recommended using SNPs.	Venkatesh et al. (2003) Kim et al. (2007)
Friends	My friends recommended using SNPs.	
Private	Club members recommended using SNPs. Acquaintance recommended using SNPs.	
Working environment	Colleagues recommended using SNPs. Superiors recommended using SNPs.	
Secondary Sources	Using SNPs is recommended in the Internet (blogs, forum, and websites). Using SNPs is recommended in TV and radio. Using SNPs is recommended in newspaper.	Brown and Venkatesh (2005) Kim et al. (2007)

Table 2: Operationalization of constructs