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Ma Shun
School of Economics and Management, Wuhan University, Wuhan, 430072, China

Shen Xiao-Liang
School of Economics and Management, Wuhan University, Wuhan, 430072, China

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Why People Adopt Social Networking-based Mobile Data Service - A

Fit Perspective

Shun Ma[1], *Xiao-Liang Shen*[2]⌐

[1] School of Economics and Management, Wuhan University, Wuhan, 430072, China
[2] School of Economics and Management, Wuhan University, Wuhan, 430072, China

Abstract: Social networking sites (SNS) have greatly transformed the way in which people communicate and exchange various kinds of information. Although prior studies have extensively examined the antecedents of mobile data service (such as mobile news) adoption, there is little understanding on what has occurred when people pursue better-quality information from their peers via wireless networks and mobile devices. In this research-in-progress paper, we have chosen two most representative platforms (i.e., mobile micro-blogging and mobile Q&A), and examined users' information system adoption behavior under different information seeking strategies (i.e., the push vs. pull-based information seeking strategy). Built on the task-technology fit (TTF) theory, two forms of fit (i.e., task-technology fit and needs-technology fit) have been identified, and a theoretical model consisting of six research hypotheses was proposed. This study is expected to contribute to our collective understanding of information system adoption in general, and the use of social networking-based mobile data service in particular.

Keywords: task-technology fit; needs-technology fit; social networking; mobile data service; push-pull theory

1.　INTRODUCTION

Social networking sites (SNS) can be regarded as "sites used for creating and maintaining social connections among individuals--have become an important medium for people to interact in the cyber world" [1]. With the development of the Internet, and especially the popularity of Web 2.0, SNS starts to transform the way in which people communicate and obtain information. In addition, according to the 31st "China Internet Development Statistics Report", the number of mobile phone users has reached 420 million and the users account for 74.5% of all Internet users by the end of December, 2012 [2]. The widespread of mobile devices has further facilitated the information exchange among online crowds.

However, the popularity and prevalence of mobile phones have also make information retrieval in mobile circumstance into a more complicated and variable context than the stationary environment [3], which will pose a major threat to meet the various needs of users. As a result, the mobile data service commonly confronts challenges associated with fitting the diverse use requirements in constantly changing mobile circumstances. Furthermore, users of mobile data service care much about the simplicity, novelty and timeliness of the information provided [4]. The characteristics of mobile data service, such as mobility, localization, and signal stability, also greatly influence the quality of information and experience of users [5]. While concentrating on the diverse requirements and user experience is one strategy for dealing with these challenges which are not encountered in the traditional online context, a complementary approach might be to rely on examining the users' information system adoption behavior.

⌐ Corresponding author. Email: xlshen@whu.edu.cn(Xiao-Liang Shen).

The research on mobile commerce and users' behavior pattern in social commerce is not new to social networking sites (SNS), nor are they a particularly a new area of inquiry for social networking sites (SNS) researchers. In fact, over the past decade a rich body of research has developed. For instance, by using a classification scheme, Ngai and Gunasekaran have classified the mobile commerce articles into five distinct categories: m-commerce theory and research, wireless network infrastructure, mobile middleware, wireless user infrastructure, and m-commerce applications and cases [6]. However, none of these studies have examined the adoption behavior in social networking-based mobile data service, which gradually change our life and work in many different ways. In addition, while prior studies on users' behavior have sought to identify the key factors that affect users' behavior in social networking [7], most of them have overlooked the possibility of the impact of mobile information system. Therefore, addressing the above-mentioned challenges related to the pursuit of better-quality information under mobile environment is a growing concern for some researchers.

TTF intends to explain how to gain maximum effect in a favorable match among individual, task and technology [8], to obtain a better understanding of the users' adoption behavior in social networking-based mobile data service, TTF has been applied in this study. While the idea of TTF has been applied to mobile data service researches in prior research [9], it has not been assessed systematically to achieve fit for particular combinations of tasks and technology [10]. The specific sub-dimensions of TTF, for instance, the personal cognition and use context in mobile environment, which have an indispensible impact on the usage of mobile data service [11]. However, the researchers have paid little attention to examine how these sub-dimensions influence users' information system behavior. More particularly, needs-technology fit is formulated to study the usage type of data service based on TTF model and the fit between needs and technological features can promote the users' information adoption behavior [1]. However, few researches focus on this issue. Accordingly, the applicable fit (i.e., task-technology fit and needs-technology fit) and related sub-dimensions should be examined to determine their impacts on users' adoption behavior of mobile data service.

There are two major information retrieval ways: the push-based information seeking strategy and pull-based information seeking strategy [12]. The push-based approach is the combination of push-based data delivery and a broadcast medium, from which the data is disseminated on the broadcast channel and does not require a specific request from the data service client [13]. Hence the push-based data is in anticipation of user requests when considering most users are largely passive in information retrieval. However, there are also some users require the information flow stays in a predicable situation. This phenomenon is considered as a pull-based way. The pull-based data service transfers information by using a request-response style of operation. The users explicitly request the specific information by sending messages to a server via clients and then the server returns the related information to the users when the information request is received at a server [14]. As a result, the users' information system adoption behavior is different under these two kinds of information retrieval ways.

Drawing on TTF theory [8] and push-pull perspective [14], we develop a theoretical framework and a set of hypotheses that focus specifically on the examination of users' information system adoption under two different information retrieval strategies. In particular, two different social networking-based mobile data services (i.e., mobile micro-blogging and mobile Q&A), which represent the push-based and pull-based information seeking strategies, are selected as our research targets. Moreover, we identify task-technology fit and needs-technology fit as two most important aspects that affect the information system adoption behavior, and further examine their effects under different information seeking strategies.

In the following sections, the theoretical background for our proposed research model is reviewed. Subsequently, a description of the research methodology we intend to use to validate our research model is introduced. We end by briefly stating the limitations, potential implications and possible directions for future work of this research.

2.   THEORETICAL BACKGROUND

2.1 Task-technology fit

In recent years the fit idea has been widely used in the study of users' information system adoption behavior under mobile commerce environment [15]. This research is processed on a foundation of TTF, in which Goodhue and Thompson considered that technology utilization was dominated by the match degree between technology features and the characteristics of the task [8]. Also, based on the subdivision of TTF (i.e., task-technology fit, individual-technology fit and task-individual fit), the impact of personal differences toward user attitude was investigated [16]. By integrating the TTF and SCT (social cognitive theory), Lin and Huang found that TTF had substantial influences on KMS (knowledge management system) usage [17]. Study of mobile banking user adoption behavior drawn upon theories of TTF and UTAUT (unified theory of acceptance and usage of technology) have further shown that TTF has significant effects on user adoption and performance expectancy [18]. Accordingly, the TTF could be used to assess the users' adoption behavior of mobile data service.

Use conditions in mobile and stationary environments differ in various aspects [19]. More particularly, in social networking sites (SNS), for instance, the blog-based virtual communities, tasks performed are driven by individuals' desires and needs [20]. So use contexts are the substantive characteristics that mobile data services differ from non-mobile data services and users' needs will always exceed what mobile use context computing can offer [21]. However, previous research has concentrated on exploring the task characteristics in the mobile environment and rarely considered the users' needs. Particularly, in the combination among mobility, social and localization, the distinctiveness of task and how the mobile technology satisfy the users' diversified needs are not involved in the existing literature. Therefore, this paper revises the conventional task-technology fit and identifies two kinds of fits (i.e., task-technology fit and needs-technology fit) as the key factors so as to explore the information system adoption behavior under the mobile circumstance.

2.2 Push vs. pull perspective

Information dissemination flow of the data service can be classified as either "push" or "pull" [22]. Servers that possess push capability frequently push information that are of interest to a user. In contrast, based on the specific requirements, users pull the information they needed via clients [23]. Moreover, the information retrieved in a push-based approach is a kind of data duplication, but retrieving information in a pull-based way is a dynamic formation of an on-demand routing structure [24]. Consequently, in the push approach, the data transmission is based on the publish/subscribe/distribute paradigm. The pull-based way, conversely, information dissemination is always initiated by the users via client [25]. In this regard, the push-based information seeking strategy is a passive adoption behavior, while the pull-based data service can be considered as an active information retrieval way. As the adoption behavior is probably different under the two forms of information seeking strategies, there is a growing concern regarding the ways and the contexts in which information can be disseminated to the users.

As a broadcasting information dissemination platform, mobile micro-blogging enables the users publish tweets on their personal Twitter page and then the tweets will be sent from the micro-blogging server to the people who subscribe to other people's tweets [26]. Hence the information flow of mobile micro-blogging is based on the publish/subscribe/distribute paradigm and the adoption behavior of micro-blogging can be considered as the push-based information seeking strategy. In contrast, mobile Q&A is an instant Q&A community integrating Q&A (question and answer) with mobile devices and allows question-asking behavior implementing with multimedia and contextual information (e.g., photos, voice, and locations) [27]. As a result, the information flow is initiated and expected [22] by the users and thus this adoption behavior should be

regarded as a pull-based information seeking strategy. Given these factors, we chose the two most representative platforms (i.e., mobile micro-blogging and mobile Q&A) as the study targets for the examination of users' information system adoption behavior under two opposite information seeking strategies.

3. RESEARCH MODEL AND HYPOTHESES

The task has been characterized by time sensitivity, location dependency, and context embeddedness [10]. But new changes on the task such as social interactivity and local verticality will take place when considering socialization element and localization element. Accordingly, task in mobile data service can be characterized by thee above five specific dimensions. For the category researches on the technology features of social networking-based mobile data service, which comprised mobility, identifiability, localization, interactivity and prompt connectivity [28]. Therefore，the above dimensions of task and technology can be used to assess the matching utility of task-technology fit, which will then be used as the characteristic factors for the evaluation of task-technology fit and the predictor variables for the adoption behavior of social networking-based mobile data service. The TTF considers the needed technological characteristics of the task as a major factor determining users' information system adoption behavior [17]. According to the theory of task technology fit (TTF), an adequate match between information system technologies and organizational tasks will facilitate the information system adoption behavior in mobile environments [19]. Therefore, we propose the following hypothesis:

Hypothesis 1: Task-technology fit positively influences social networking-based mobile data service (both mobile micro-blogging and mobile Q&A) adoption.

The Uses and Gratification Theory regarded the information adopter as an individual who had unique needs and suggested that the activity of medium engagement was a satisfactory process between specific requirements and particular incentives [29]. Drawing upon this theory, the specific needs which based on the new platform of social networking-based mobile data service have yet to be further empirically investigated: cognitive need, emotional need, personal integrative need, social integrative need and tension release need. Hence the users' needs can be characterized by the above five specific needs. In the previous section, we identified users' needs as an important element which is related to the adoption behavior of mobile data service. Needs-technology fit is defined as the match degree between technologies and users' needs in shaping usage type and assisting the users' information adoption [8]. Drawing on the needs-technology fit model, IP and Wagner have found that the success of weblogging software as a social technology is directly related to the fit of its technology features with the needs of its users [1]. Hence, the following hypothesis is postulated:

Hypothesis 2: Needs-technology fit positively influences social networking-based mobile data service (both mobile micro-blogging and mobile Q&A) adoption.

There are two different information seeking strategies, the push-based information retrieval way and pull-based information retrieval way, in the social networking-based mobile data service. For the users who obtain information in a pull-based approach, their information system adoption behavior is oriented by users' requirements and questions. Mobile Q&A users tend to ask a broader range of questions related everyday life situations such as checking a bus schedule or asking for simple restaurant suggestions than the traditional social Q&A users in the stationary environment [30]. For example, the mobile Q&A user who is in a rush asks the people in the airport a question about whether the flight has departed based upon the specific location. Consequently, for those people, they are more likely concentrate on the needs of cognizance, personal integration and tension release. Meanwhile they are intensively pay close attention to the task characteristics such as time sensitivity, location dependency, context embeddedness and local verticality. The users retrieving

information in a push-based way, in contrast, are guided by their own interests and the server. Micro-blogging acts as a new informal communication medium which can be used to enhance information sharing, building common ground, and sustaining a feeling of connectedness among colleagues and friends [31]. For example, the micro-blogging users browse information released by the man they subscribe to [26], as a result, the emotional need and social integrative need tend to be more significant. And the micro-blogging followers care much about social interactivity. This leads to the following hypotheses:

Hypothesis 3: Needs-technology fit related to cognizance, personal integration and tension release has a greater influence on mobile Q&A adoption, as compared to mobile micro-blogging.

Hypothesis 4: Task-technology fit related to time sensitivity, location dependency, context embeddedness and local verticality has a greater influence on mobile Q&A adoption, as compared to mobile micro-blogging.

Hypothesis 5: Needs-technology fit related to emotion and social integration has a greater influence on mobile micro-blogging adoption, as compared to mobile Q&A.

Hypothesis 6: Task-technology fit related to social interactivity has a greater influence on mobile micro-blogging adoption, as compared to mobile Q&A.

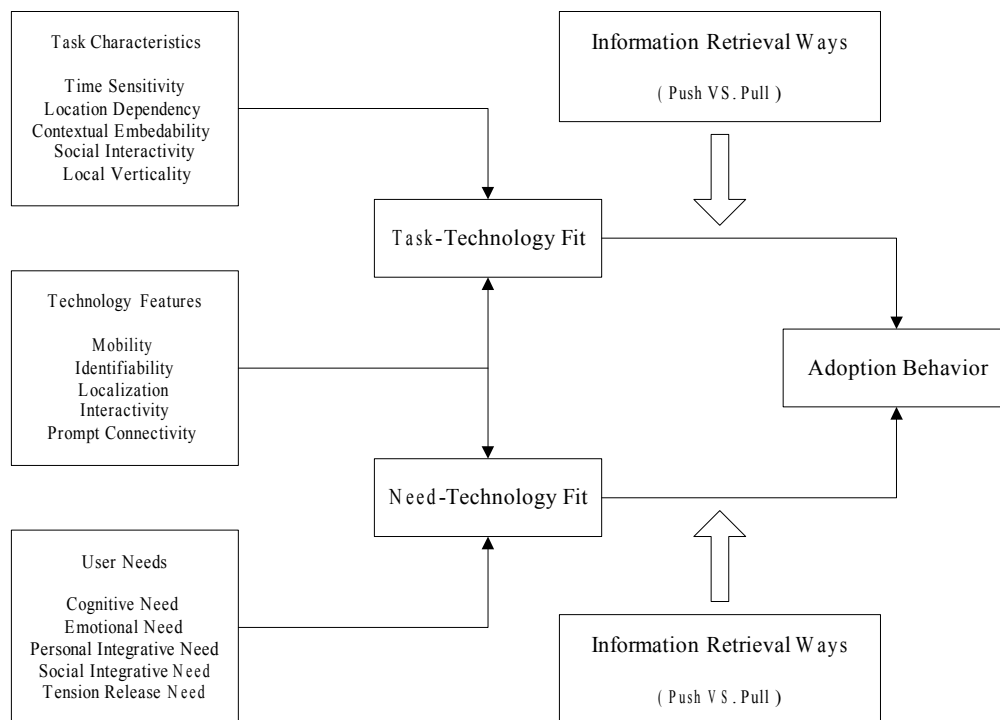Figure 1 represents the overall research framework.

Figure 1.　The proposed research model

4.　RESEARCH METHODOLOGY

Data to test the hypotheses will be from Mobile Sina Weibo and Moboq.com. Sina Weibo is a large (more than 424 million registered members), micro-blogging site with a broad range of conversational topics arise in this community, including current events, complaints, and details about daily activities. Adhering to the slogan of "believing goodwill of strangers", Moboq is promoted as a mobile Q&A community, with the goal of supporting instant question and answer based on location. Moboq users can ask a variety of questions about one particular location and may get a lot of answers from the other users who conform to the corresponding position

in a short time.

This paper will develop a questionnaire and conduct a survey to collect the pools of items of concerned characteristic variables of task-technology fit and needs-technology fit. These items will be categorized and modified based on the expert investigation method. Accordingly, both newly created and existing items will be listed and the appropriate scale will be established. Then we will design a revised questionnaire to test the relevance of the mentioned variables. And a seven-point Likert scale ranging from "extremely disagree" to "extremely agree" will be chosen as the response format in the questionnaire. The data will be culled from the survey of users who come from Mobile Sina Weibo and Moboq mobile platform, and each user name can only finish one questionnaire survey. To encourage the interviewees to accomplish the questionnaire more easily, the questionnaire survey will be conducted in China. Finally, by the use of multiple regression model and structural equation model, the relevance of characteristic variables and the hypotheses will be examined.

5. POTENTIAL LIMITATIONS AND IMPLICATIONS

This study is potentially subject to several important limitations. First, the actual study subjects are two kinds of single application platform (Mobile Sina Weibo and Moboq Mobile Q&A) only, which will call into question regarding generalizability of the results and only repeated replication in other communities could determine. In addition, other factors, such as service quality of data service, may need to be further examined. In particular, further investigation is needed on other forms of fit to better examine the users' information system adoption behavior.

Nonetheless, the study, which investigates the adoption behavior of social networking-based mobile data service, still has some theoretical and practical implications. This study provides possible contributions to the mobile data service research and the TTF theory in the following three ways. First, this research has illustrated the complexity and uncertainty related to use contexts of mobile data service, which may draw researchers' attention to the investigation of usage type and motivation of information retrieval in mobile circumstances. Second, our analysis of users' information system adoption behavior has prompted us to add other forms of technology-related fit (i.e., needs-technology fit) to TTF. Finally, we have defined a variety of characteristic variables related to the two fits (i.e., task-technology fit and needs-technology fit) that can be applied to mobile data service.

The practical implications for mobile data service operators should be vast. First, this research-in-progress paper will shed much light upon the effects of the two fits (i.e., task-technology fit and needs-technology fit) on the information system adoption behavior, which can be further translated into concrete design guidelines for other social network sites (SNS). More particularly, we try to assess the relevance and importance of these characteristic variables of the two fits and understand the diversity of the two fits influence on micro-blogging users and mobile Q&A users so as to promote the application and implementation of actual data service platforms. Besides, the critical variables of task characteristics, technology features and user needs will be measured and defined. Hence this study has the potential to inform mobile data service platform operators to know if, and how, the two fits (i.e., task-technology fit and needs-technology fit) might be used as tools to strategically provide management countermeasures and shape a practical platform.

6. FUTURE RESEARCH DIRECTIONS

This research suggests that matching degree of the two fits might not only affect the design of mobile data service platforms, but could also impact people's participation into the mobile data service platforms. However, this study and its data may not completely eliminate the effect of other dimensions such as service quality, hence future research could build upon this study to examine whether other characteristic dimensions and technology

related fits may influence the adoption behavior of social networking-based mobile data service. Future, an investigation into the specific fit, and testing to see the extent they impact the information system adoption behavior, for instance, the fit between time sensitivity and mobility, should be explored. Finally, future work could study how the users feel when they use the mobile data service and in what way the mobile data service affects users' experience and efficacy.

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