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ENABLING EFFECTIVE USER PARTICIPATION IN ERP IMPLEMENTATION: A CASE STUDY ON THE ROLE OF BRAINSTORMING SESSIONS

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Abstract¹

This research investigates the role of brainstorming sessions in promoting effective user participation in ERP implementation. An exploratory case study was conducted, with the data analysis based on the grounded theory approach and the findings organized in a theoretical model. Results show that brainstorming sessions were instrumental for effective user participation, resulting in high levels of users' psychological involvement and proactive participation behaviors. Brainstorming transformed both the subject and formality of user participation, featuring the users in the center of stage to lead the reflection and sharing in a personally meaningful and relevant manner. Senior management push and consultant support were also identified as factors affecting the success of brainstorming.

Keywords: ERP implementation, User participation, Brainstorming sessions (BS)

1 INTRODUCTION

Despite the long recognized importance of user participation as a key factor for information systems (IS) success (e.g., Cavaye, 1995; He & King, 2008; Ives & Olson, 1984; Markus & Mao, 2004), user participation has not received due attention in the literature of ERP implementation. Although the implementation team is considered important for ERP success in the literature (e.g., Lorenzo et al., 2005; Robey et al., 2002), work in this area has not drawn upon the traditional research on user participation.

This study investigates the potential of brainstorming sessions for promoting effective user participation. Brainstorming is a well-known technique for increasing the quantity and quality of idea generation (Osborn, 1957). Prior research has found that the benefits of brainstorming extends beyond efficient generation of creative ideas, to facilitating team-building and problem-solving (Rickards, 1999). The general benefits of brainstorming include reducing the dependence on a single authority figure, encouraging open sharing of ideas, stimulating participation among group members, promoting a non-evaluative climate, and being enjoyable and stimulating (Napier & Gershenfeld, 1985). These benefits make it an appealing to adopt at least some aspects of the general technique to

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facilitate user participation in IS development and implementation projects. It might be desirable to place IS developers or consultants in brainstorming sessions along with end-users and senior management to engage in open sharing of ideas in a pleasant climate and on equal footing.

This research examines issues related to effective user participation in ERP implementation. It specifically investigates the following research questions: (1) to what extent can senior management employ brainstorming sessions to promote effective user participation? And (2) what are the impacts of brainstorming sessions on user participation? As an exploratory case study, this research adopts a qualitative method and employs the grounded theory approach to data analysis. It inductively develops a theoretical model on how to facilitate effective user participation in ERP implementation.

This paper is organized as follows. Next, it briefly reviews relevant literature. Then, it describes details of the research methods in Section 3. Subsequently, Section 4 reports the research findings. Lastly, Section 5 synthesizes the key findings in a theoretical model and discusses the contributions.

2 RELEVANT LITERATURE

This section brief reviews two bodies of literature that are closely related to this work, (1) the traditional research on user participation, and user participation in ERP implementation, and (2) prior research on brainstorming.

2.1 Research on User Participation

Traditionally, user participation was defined as user representatives' participation in IS development process (Ives & Olson, 1984), with reference to a series of specific activities undertaken by users (Baroudi et al., 1986). The term user participation used to be used interchangeably with user involvement till clear distinction was made between the two by Barki and Hartwick (1989; 1994). According to Barki and Hartwick (1989), user participation refers to the participative behaviors, whereas involvement deals with a psychological state that users consider IS important and personally relevant. Moreover, user participation consists of three dimensions, overall responsibility over IS, relationship between users and IS staff, and users activities (Barki & Hartwick, 1994). The re-conceptualization was widely accepted, and adopted by subsequent research. This research follows the same tradition, and examines both user participation behaviors and users' psychological involvement.

Despite the existence of various methodologies, there is a lack of measures to secure effective user participation. Qualitative research has found that users tended to play a marginal, passive, or symbolic role in IS development (e.g., Beach & Orlikowski, 1994). For example, joint application development (JAD) fell short in promoting effective user participation, contrary to common expectation (Davison, 1999; Gasson, 1999). Although participatory design (PD) places a strong emphasis on the cooperation between users and IS developers, there exists little evidence on the adaptability of this approach beyond the Scandinavian cultural settings (Carmel et al., 1993).

It is difficult for users to participate meaningful for the following reasons: (1) Led by IS staff, users tended to be drowned in technical materials (Davidson, 1999). (2) The language of communication between the two sides tends to be technical, often involving a great deal of jargons (Beath & Orlikowski, 1994; Davidson, 1999). And lastly, (3) Users are put into a passive position, lacking motivation for substantive participation (Wilson et al., 1997). These problems prevent users from

participating in IS development in a meaningful and effective manner. Therefore, there is a clear need for further research on methods for effective user participation.

Few studies have been conducted on ERP implementation from the perspective of user participation. However, user participation issues were also touched upon in two other bodies of research on ERP implementation, albeit not as the main focus. The first one investigates critical success factors for ERP implementation. Secondly, user participation occasionally appears in recent research on ERP implementation team from the client side. Prior research has addressed the following themes: (1) the important role of absorbing ERP knowledge by the user team (Lorenzo et al., 2005; Robey et al., 2002); (2) the various types of ERP knowledge to be learned, such as the functionality of the software, idea of integration (Ko et al., 2005), and project management methods (Xu, 2006); and (3) factors affecting the user team's absorption of ERP related knowledge (Ko et al., 2005).

In summary, the significance of user participation, as an important issue in ISD, has not been duly recognized in ERP implementation research. Research on ERP implementation from the perspective of user participation is lacking, and this could be an area of significant research contribution.

2.2 Prior Research on Brainstorming

Initially applied to creating advertising campaigns, the four principles of brainstorming proposed by Osborn (1957) were to avoid criticism, go for quantity, combine and improve on already suggested ideas, and encourage wild ideas (free wheeling). Much research has been carried out on brainstorming as a tool for increasing organizational creativity in the management literature (e.g., Bolin & Neuman, 2006; Litchfield, 2008).

Earlier research has focused on comparing the quantity of ideas generated in nominal groups and interacting ones. Experimental studies in lab environments showed that the former never outperformed the latter (e.g., Bouchard et al., 1974). Later, in response to calls for studies with more realistic tasks and settings, empirical evidence was found that training on the brainstorming style yielded significant improvement in creative problem-solving at workplace (Basadur, et al., 1982).

In particular, a highly influential case study by Sutton and Hargadon (1996) shifted the directions for later research. Based on the practice of the famous product design firm IDEO, the study found that brainstorming yielded under-examined benefits in laboratory settings, going much beyond the simplistic measure of idea quantity. In an organizational context, to assess the effectiveness of brainstorming, the "effectiveness for whom" and "effectiveness at what" questions should be asked. The following three criteria were proposed to assess the effectiveness of brainstorming sessions: (1) the extent to which the output of brainstorming sessions meets the standards of the people who receive, review and use the output; (2) the extent to which brainstorming sessions enhance organization's capability to do competent work in the future; (3) the extent to which participating in brainstorming sessions contributes to the growth and personal well-being of participants (Sutton & Hargadon, 1996). The study led to calls for future studies to examine closely the contexts in which the brainstorming occurs, and in depth field studies to look into the organizational consequences that go beyond idea generation (Rickards, 1999). Brainstorming may also be desirable in IS development and ERP implementation.

3 RESEARCH METHOD

This research employs a qualitative method. Qualitative research fits well with the research questions, and is well-suited to address “how” and “what is” types of questions (Lee et al., 1999; Yin, 2003). Furthermore, in light of the absence of well established theories on effective user participation in ERP implementation, and the early stages of theory development, it is appropriate to adopt a qualitative research method (Edmondson & McManus, 2007). As an exploratory case study, this research involves inductive analysis, and interpretation of the observed phenomena, toward the exploratory construction of new theories. The data analysis is largely based on the grounded-theory approach (Lee et al., 1999).

3.1 Research Setting

K Company is a multinational producing mainly bathtubs and other bathroom appliances. Headquartered in the U.S., it has factories in Beijing, Shanghai, and several other cities in China. This research concerns SAP implementation in the K Factory in Shanghai. After successful adoption of SAP in other companies overseas, K Factory was chosen to be the pilot in China. The Headquarters dispatched seasoned internal SAP consultants to the project. In February 2006, the project was officially launched, to implement five modules. This paper uses “users” thereafter to refer to “key users,” as long as there is no ambiguity in meanings.

By April 2007, the second round of tests was completed, but the results were very disappointing. Users became resentful of SAP, and confrontational with the consultants. It was under such a difficult situation that the brainstorming sessions (BS) were initiated. It was hinted by all informants that the BS was the turning point for the project. Subsequent to the BS, the next two rounds of test proceeded smoothly, and users and consultants cooperated closely. In October 2007, the system was rolled out successfully.

By the time the interviews were conducted, the SAP had been in operation for three months. Despite of remaining issues to be resolved, the entire business process was executed via the SAP system. The project objective was achieved, which was to reach a state of integrated management of the materials flow, capital flow, and information flow.

3.2 Data Collection

The informants were the deputy general manager (GM) for operations, and most of the key users. The interviews were conducted in January 2008. Each interview had three parts. First, personal background of each informant was collected. Second, each informant discussed the specific work performed at each stage of SAP implementation, as well as how they interacted with the consultants and other users, to construct the complete storyline of each informant in the SAP implementation process. Lastly, reflective and interpretive questions were raised, for example, “in your opinion, what roles were played by users in the SAP implementation, what factors might have affected users’ function?” Usually, we tried to avoid interrupt informants’ response, to allow them to talk freely according to their spontaneous thoughts. All interviews were recorded, and transcribed, which resulted in about a 90,000 word document.

In addition to formal interviews, there was informal exchange with the informants, e.g., during lunch

and on company commuter bus, to gain a thorough grasp of the relevant details. Moreover, the authors were given the opportunity to tour the production site, walk through the workshop to understand the work process, and observe the routine morning meeting on SAP. Furthermore, before the field study, we also collected relevant background information and documents about the project, including the web site of the company and public domain reports comparing prior and post SAP implementation at the K Factory.

3.3 Data Analysis

Our data analysis was inductive in nature based on themes (Strauss & Corbin, 1998; Van Maanen, 1979). In essence, it started out with open coding of the interview data to recognize the first-order concepts, which became the basis for identifying the second-order concepts. Then, more aggregate concepts were formed by associating and categorizing the second-order concepts, for constructing theories. Lastly, relationships among the aggregate concepts were proposed and interpreted to develop a theoretical model. This process is consistent with the “selective coding” process by Strauss and Corbin (1998). Figure 1 below shows a synthesized summary of different levels of concepts.

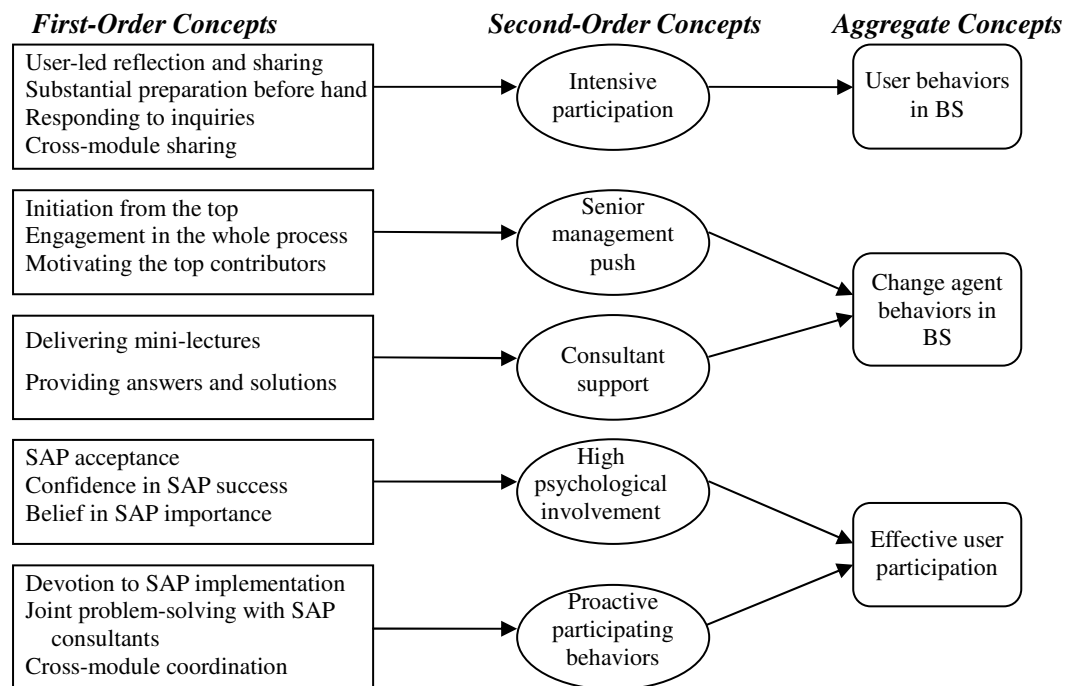


Figure 1. Overview of Concepts

For example, “SAP acceptance,” “confidence in SAP success” and “belief in SAP importance” are the three first-order concepts related to users’ psychological state and attitudes, which can be appropriately represented with users’ psychological “involvement” as conceptualized by Barki and Hartwick (1989, 1994). Therefore, we chose “high psychological involvement” to label this second-order concept. In the next step, the second-order concepts were formed into aggregate concepts. “Intensive user participation,” “senior management push,” and “consultant support” refer to behaviors of various groups of stakeholders. Correspondingly, “user behaviors” and “change agent behaviors” were used to denote the different roles of stakeholders.

4. RESEARCH FINDINGS

4.1 User Behaviors in Brainstorming

The participating users of ERP implementation were the leading actors in the entire BS process. Intensive user participation, as a second-order concept, corresponds to four first-order ones as shown in Table 1.

The daily BS featured a user in the ERP implementation team reflecting and sharing personal understanding of the module (or sub-module) in which he or she was involved. The introduction would give a chance for the non-participating users and users of other modules to understand their own work. This took a great deal of careful preparation before hand, to make sense for others, including the GM sitting in the audience. The featured speaker often sought advice from the consultants, asked for help from personal friends, or searched on the Internet. The preparation for taking the leading role forced users to study hard and understand ERP thoroughly.

Concepts	Representative Quotations
User-led reflection and sharing	Each person participating in the SAP talked about his own module, and prepared PPT slides for those who had not got SAP training, confirmed his understanding, and asked for problematic areas. (Tommy)
Substantial preparation before hand	Our GM appointed me to be the second speaker. ... I got some SAP information from my personal friends, and got on the Internet right away to search. (Cade)
Responding to inquiries	After the talk, the audience started to raise questions. How about this and that? He'd explain to them one by one. ... He had to prepare a lot before taking the podium. (Tommy)
Cross-modules sharing	[After brainstorming] I started having some concrete understanding, when I needed something, then getting it from other people. Okay, he could provide this stuff... that could be more intuitive. (Rita)

Table 1. Intensive Participation in Brainstorming Sessions

During the BS, once the featured user completed his or her talk, the audience started raising questions and getting answers. This process prompted the speaker to reflect deeply, recognize areas of misunderstanding, and mismatch between ERP and existing business logics. For example, after an introduction by the key user responsible for generating inventory reports, users in the Production Department complained that the existing inventory report was not able to provide certain details needed for their daily operations, and specific examples were offered with regard to what information was needed, e.g., the arrival and shipping quantities of specialty products. Such specific scenarios were instrumental for users to discover ERP limitations in meeting local business requirements or incompatibilities with business logics. If a key user had much to talk or was asked many questions, he or she could be appointed by the GM to continue on the next day. That user would do more preparation, and information search to address the questions.

Through attending the BS and listening to other users' and consultants' explanation, not only did users acquire understanding of their own modules, but they also got acquainted with other modules, although they were mainly concerned about their own responsible modules. The BS allowed users to dramatically enhance their understanding of SAP, as indicated by Tommy of the Logistic Department,

“I felt like that it was the fastest growing stage for me.”

4.2 Behaviors of Change Agents

4.2.1 Senior Management Push

The BS was propelled by the senior management, which is captured in a second-order concept, “senior management push” encompassing three first-order ones (see Table 2). The BS were advocated personally by the GM, and the deputy GM was responsible for managing it. They attended to each session throughout the process. The GM frequently raised questions to the speaker. If the explanation was not clear or no answer was given to the GM, it would badly reflect upon the speaker. Furthermore, senior management took measures to motivate outstanding performance. For instance, because of his excellent preparation and talk, Cade, a user in the Finance Department, was promoted to take charge of the FICO module, later a member of the three “Decision-making Trio” for the SAP project, and deputy head of the Finance Department after the project success.

Concepts	Representative Quotations
Initiation from top	Brainstorming was a spontaneous measure of ours. Because after the second test, people started complaining, with a bad feeling toward the system. In response we decided to do it. (Steven, deputy GM)
Engagement in the whole process	He (Mr. Yang, the GM) sat there listening everyday, and asked many questions. So, we were all quite nervous. ... If someone had a lot to cover, or triggered many questions, the GM would say, “get more preparation afterward, and talk about it again tomorrow.” (Tommy)
Motivating the top contributors	For example, Cade was always well prepared for the brainstorming sessions. He did better than his manager. ... He was able to stand up to the occasion and got promoted. It is all about seizing the opportunity. (Steven)

Table 2. Senior Management Push

Senior management’s behaviors stimulated an earnest desire among the users to learn and understand SAP, which alleviated their fear for SAP. The active participation by senior management sent a clear message to all employees: Senior management was firm and confident in SAP, the implementation must move forward. Users got the message and had to accept the system, as described by Steven, the deputy GM, *“the brainstorming was designed to induce acceptance, stimulate understanding, as the SAP had to be adopted, impossible to backtrack. ... Senior management’s commitment was very important. Otherwise, people would be just complaining. The situation was turned around, because we were most active. We worked on it enthusiastically, so they (employees) became enthusiastic, too.”*

4.2.2 Consultant Support

The ERP consultants and MIS staff from the China headquarters were invited to attend the BS, and to offer their expertise. The assistance was substantial and important for the BS. “Consultant support” is considered a second-order concept with the corresponding first-order concepts and evidence shown in Table 3. By answering questions and providing suggestions on the spot, the consultants helped users better understand the system. Furthermore, the consultants delivered in-depth coverage on special topics. For example, the consultant for the logistics module gave a special talk on how to control inventory level with SAP. As a result of the BS, the nature of the relationship between the users and the consults shifted from task-orientation to learning-orientation, and from finger-pointing to joint problem-solving.

Concepts	Representative Quotations
Delivering mini-lectures	When we talked, they (consultants) sat in the audience, but they stood up to talk occasionally. The consultant showed us how to control inventory with kanban, control inventory with purchase point, safety stock, and how to calculate safety stock, and explained these to us. (Tommy)
Providing answers and solutions	The brainstorming was also the process of resolving problems that we came across. ... For example, what should be done for this type of problem? What is the cause of this problem, where is the cause? And how to deal with it? (Rex)

Table 3. Consultant Support

4.3 Effects of the Brainstorming Sessions

4.3.1 High Psychological Involvement

The BS lasted for over a month. The deputy GM and informants mentioned about the tremendous positive effects brought about by the BS. Such effects are reflected in higher psychological involvement, a second-order concept (see Table 4).

As can be seen from Table 4, increased psychological involvement is reflected in the following three aspects. First, users became willing to accept SAP along with the business process changes, as a result of the BS. The BS helped appreciation of the compromise between long-term gain and short-term pain. Users began to understand that in the short term, ERP might increase workload, and make things complicated instead of simplified (e.g., two sets of book-keeping, and work dependence on others), but they were willing to accept this, because *“in the long run, once everyone becomes familiar with the system in a stable state, it will bring us benefits.”* Moreover, as users gradually understood the system, they became more accommodating to the limitations of the system, and the incompatibilities with the existing business logics. Therefore, users were willing to put in extra effort to work around the incompatibilities, by *“adopting a good mindset”* and the belief that *“the key to implement the system lies in the people.”*

Concepts	Representative Quotations
SAP Acceptance	At the beginning, we felt like, hey, once we got SAP running we would not need to do much, ... and then later on gradually we learned that it was nothing like this. SAP was just a tool for us, and the key was still the people. (Rita)
Confidence in SAP success	In my opinion, the most important point about brainstorming is encouraging everyone to have confidence. ... At least I gained my confidence through the brainstorm, and I was pumped up. (Cade)
Belief in SAP importance	Gradually, you'd feel, if you used SAP properly, it indeed was able to help resolve the efficiency issue in our work, then others such as the lead time of your orders, delivery quantities, inventory levels, etc. ... It indeed brought along much convenience, and helped the company's bottom-lines, too. (Rex)

Table 4. High Psychological Involvement

Second, users gradually gained confidence in SAP implementation and the use of SAP, e.g., *“I believe I should be able to use the ERP nicely, and I can complete the large amount of tedious work.”* For example, as Rex reflected, during the BS, the materials module was frequently blamed for the inaccurate master data. Through the complaints from other departments and explanation by the

consultants, users understood the problems and how to solve them. Therefore, they felt that the system was not really that difficult, and they could overcome the difficulties with their effort. Similarly, Cade, the key user of the Finance Department, also felt one of the key effects of BS was lifting up users' confidence, which helped generate the enthusiasm to work hard for SAP implementation.

Lastly, the BS helped users realize that the potential gains of SAP to individuals and to the organization, and that SAP was necessary and important to the company. Subsequently, in later tests, users gradually experienced the gains of SAP implementation, e.g., *"ERP brings to me higher work efficiency, and raises the operational efficiency."*

4.3.2 Proactive Participating Behaviors

One of BS's other major positive impacts is proactive participating behaviors. This second-order concept is built upon first-order ones, as shown in Table 5.

Concepts	Representative Quotations
Devotion to SAP implementation	The outcome of the brainstorming was really nice. At least, as far as I am concerned, everyone started to move, adopting a proactive mode, instead of passive as before. (Tommy)
Joint problem-solving with SAP consultants	Their team (consultants) certainly wanted to do it well, but if you kept picking on them, always looked for fault, the collaboration would not be pleasant. So, we adopt a more positive approach. (Steven)
Cross-module coordination	Toward the end, a decision-making trio was set up, consisting of Steven, Tommy and me. Why? When problems arose, ... we put them together to discuss, through the joint decision by the trio to solve the problem. (Cade)

Table 5. Proactive Participating Behaviors

The BS were associated with significant users' behavioral changes. First, users devoted more effort to the SAP project, and became more enthusiastic about their responsibilities for the project. Previously, the users were passive, waiting for the consultants to direct their work. After BS, users had a good command of SAP knowledge and functions of the system, which helped them to realize the root cause of problems emerged in the earlier tests. For example, after BS, key users took the initiative to double-check the master data of materials, products, and BOMs. This work laid a solid foundation for the SAP to go live. All of the key users sacrificed the most part of their October 1st national holiday week for the SAP project's official rollout.

Second, as a result of the BS, users and SAP consultants started to collaborate in joint problem-solving. For instance, when users realized that certain local requirements could not be met by the SAP, they took the initiative to contact consultants of the Headquarters in the US. They would either request for modifications to the system configuration or seek compromise. Since the BS occurred in the middle of the project and the main framework of system had taken shape, it was very costly to modify the configuration scheme. Consequently, the project team jointly decided to compromise measures by making the system and the business process mutually adapting to each other.

As another example, users responsible for order entry and shipping complained about the difficulty with entering miscellaneous fees for US-bound export. When creating such an order, in addition to product charges, miscellaneous fees such as packing expenses needed to be included as a separate

item. However, the configured SAP had no such a field for inputting these fees. After negotiation, the consultants added a text field for recording packing fees. This did not exactly meet users' need, because the packing fees could not be automatically calculated based on the product quantity. Instead, users had to manually calculate the packing fees. There were many similar circumstances where the consultants compromised to fit the local requirements, and the users adjusted their expectation and business logics to suit the system. The two sides collaborated in joint problem-solving to deal with the incompatibility problems.

Third and lastly, the BS promoted cross-module coordination. As part of a highly integrative system, modules of SAP co-exist in high interdependence. Smooth processes required tight synchronization among the modules. Therefore, users had to have awareness of other related modules. During the BS, the project team established a pattern of cross-module coordination, which facilitated the free flow of knowledge between modules and enabled joint effort in problem-solving during the BS. The daily SAP progress review meetings was another platform, for key users of different modules to come together to discuss emerging problems and their causes. The sharing and exchange of information formed the basis for the "Decision-making Trio" to make the call with solutions. In addition, informal discussion also increased.

5 DISCUSSION

5.1 Theoretical Model

A theoretical model is proposed based on the data analysis, as shown in Figure 2. Our data analysis shows that user participation was affected by senior management push, in the form of initiation, advocating, and enthusiastic engagement in the entire process. It was a recurring theme in interviews with all informants that they were driven by the senior management to participate in the BS actively. *"I felt, to me, the biggest driving force came from the senior management. If he (the GM) had not cared about it, I probably would not have done it. I might have felt this project was optional to us. However, senior management's attention was really a strong motivator, and it kept move people forward,"* indicated a user. These observations lead to the following proposition:

Proposition 1: Senior management push has a positive effect on the intensity of user participation in brainstorming sessions.

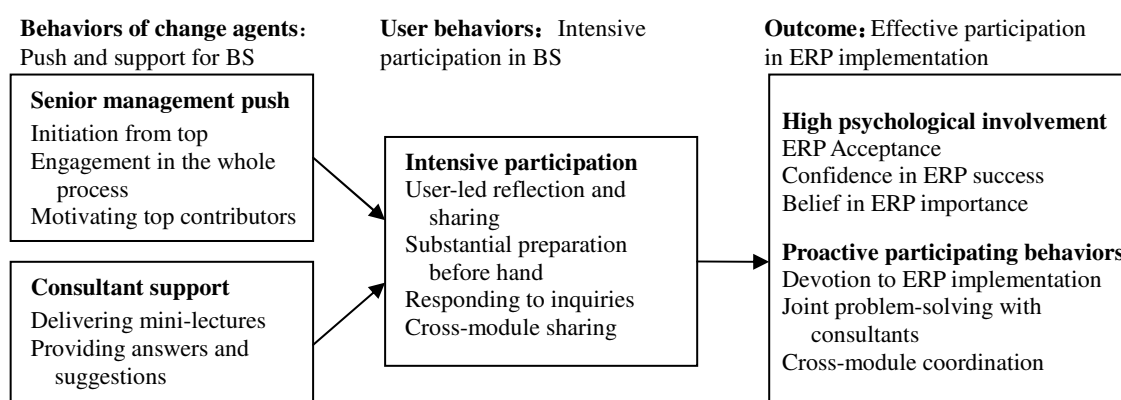


Figure 2. Theoretical Model

The consultants also played an important supportive role in the BS, as they helped answer questions and ran mini-lectures on specialized topics. *"The fellow (consultant) responsible for the PP module*

explained to us ... such as BOM, and talked about 'routines,' which were PP stuff. This material was really helpful for finance, because the cost calculation in finance was based on this information," as indicated by Cade, a key user from the Finance Department. Therefore, the positive effect of consultant support is summarized as follows.

Proposition 2: Consultant support has a positive effect on the intensive user participation in brainstorming sessions.

Furthermore, users' intensive participation via the BS led to new recognition and learning of ERP knowledge, which were associated with psychological and behavioral changes. The reason was that BS shifted the focus of user attention to necessary change in work routines, business implications of ERP operation, impact on function units and individuals, and cross-functional impacts. Moreover, along with subject change, the formality is also fundamentally transformed in several important ways. Through BS the language of communication switched to that of the users, instead of IT languages filled with jargons. As a result, the process becomes a sense making one for the users, as they described their own understanding of ERP to each other. It made it easier for users to relate the system to their own practices, and contribute ideas. Moreover, the BS featured users in the center of stage enthusiastically reflecting, sharing, and responding to inquiries from their peers. The process became personally relevant to users' interest, which gave them the incentive to understand ERP. Users took actions proactively, as they approached the consults for idea exchange, sought advice from their personal friends outside of the firm, and collected relevant materials. In short, both the subject and formality of participation has changed via the BS, which resulted in a range of proactive user behaviors.

Proposition 3: The intensive user participation in brainstorming sessions has a positive effect on users' proactive participating behaviors in ERP implementation.

Furthermore, data analysis results show that intensive user participation was associated with high psychological involvement. The relationship is stated as the following proposition.

Proposition 4: The intensive user participation in brainstorming sessions has a positive effect on users' level of psychological involvement in ERP implementation.

In response to call for studying brainstorming in organizational settings (Rickards, 1999), this study adapts and extends the analytical framework on brainstorming sessions developed by Sutton and Hargadon (1996). The effectiveness of the brainstorming sessions in this research may be explained based on the analytical framework. First, according to the framework, assessment of brainstorming sessions should address to whom they are effective. In this study, the sessions shifted the main stakeholders of ERP implementation from overseas consultants to the local managers and users, which made a difference in user behaviors and the outcome. The effectiveness of the brainstorming can be explained by the shift, as the outcome was indeed more acceptable to the primary participants of the brainstorming sessions. Second, consistent with Sutton and Hargadon (1996), this research found that the brainstorming sessions had a positive effect on the growth of the participants. Users as the primary participants gained a great deal of contextualized understanding of ERP from the discussion and sharing, and subsequently were able to join and follow the transition toward ERP-based process management in the company. Some users received promotion due to their strong contribution to the ERP implementation. Lastly, whereas a key criterion of brainstorming session is its long-term effect on the organization's capability (Sutton & Hargadon, 1996), this research supports this assertion. A

legacy of the brainstorming session was users' commitment to ERP, exhibited in their participation behaviors and psychological involvement (Propositions 3 and 4).

5.2 Implications

This research has identified brainstorming sessions as a highly effective approach for senior management to facilitate user participation in ERP implementation. The new style can transform the subject and formality of user participation. This is in sharp contrast to the traditional methods of user participation, which tends to be technically oriented (e.g., based on data flow diagrams, test scripts, and formal methodologies) (Davidson, 1999), dominated by the IS developers (Markus & Mao, 2004) leaving the users without sufficient motivation (Wilson et al., 1997) and in a marginal and symbolic position (Beath & Orlikowski, 1994).

As a result of the subject and formality change, the BS style of user participation can result in two significant benefits: High level of psychological involvement, and proactive participating behaviors, tapping into both user participation and involvement, as conceptualized by Barki and Hartwick (1989; 1994). This research substantiated the conceptualization with qualitative evidence from the ERP implementation context:

Lastly, specific to the ERP implementation context, this research examines a unique but understudied aspect of user participation, which is the interaction among users. ERP implementation required not only interaction between users and consultants, but also that among users, due to the highly integrative nature of ERP and its process-oriented operation across functional areas. For example, BS in this study involved substantial interactions and coordination among the users. The daily "Decision-making Trio" meeting also reflected the need for intensive cross-module communication among the users to resolve interdependence among different modules (Davenport, 1998; Markus & Tanis, 2000). An effective platform such as BS was shown to be extremely useful to stimulate organizational interactions among users, for them to understand the organizational impact and integrative nature of ERP in particular.

6. CONCLUSIONS

This research has filled a gap in ERP implementation research, by addressing the following key issues: How can senior managers as change agents promote effective user participation? What are the effects of brainstorming sessions? And what affects users' participation? This research inductively develops a theoretical model on brainstorming sessions for facilitating effective user participation. It concludes that brainstorming sessions could be a highly effective measure, albeit not the only one, to stimulate intensive user participation, which could result in users' high psychological involvement and proactive behaviors. The benefits of brainstorming sessions might be generalizable to other settings of ERP implementation and information systems development, as a means for senior management to promote effective user participation and to manage change.

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