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IS Change Agents in Practice in a US-Chinese Joint Venture

Dorothy G. Dologite, Zicklin School of Business, Baruch College,
City University of New York, USA
Robert J. Mockler, St. Johns University, USA
Qinghua Bai, Tonji University, Shanghai, P.R. China
Peter F. Viszhanyo, City University of New York, USA

ABSTRACT

This article presents a case study that documents how information systems (IS) principals in China strategically shifted to different change agent roles to accommodate various IS implementation contingencies in the organization. The case concerns a US-Chinese joint venture, located in China. The change agent models hypothesized by Markus and Benjamin (l996) serve as a lens to interpret the case. Based on observations of how these roles emerged in different phases of implementing packaged software, a meta-category called "adaptor" is offered to visualize what the data revealed and to contribute to this emerging research area. Implications for practitioners and researchers are addressed.

Keywords: case study; change agents; computing in developing countries; IS implementation; packaged software.

INTRODUCTION

On a research trip in China, the first two authors were invited to do a case analysis of a US-Chinese joint venture (JV) that was implementing packaged software (Dologite et al., 1999). This was in 1996 when this kind of IS implementation was not expected to be found in a typical provincial manufacturing organization in central China.

In a more recent revisit of the data from this case, a story about the struggle to successfully implement the packaged software captivated our interest. In particular, our focus was drawn to how the Chinese IS principals flexibly adopted various change agent roles to handle the challenges encountered as the implementation process progressed.

In a conceptual paper, Markus and Benjamin (1996) identify three, fundamentally different, models of the change agent role performed by IS specialists. They are the traditionalist, the facilitator, and the advocate, presented in the three models identified in the Appendix. After a full discussion of each model, Markus and Benjamin (1996) conclude with a single statement about an "as yet unconfirmed, hypothesis" that "the most effective IS specialists are those who can shift rapidly from one model to another depending on the circumstances" (pp. 400-401).

The Markus and Benjamin's hypothesis, if demonstrated, could be relevant to better understand and explain the change agent phenomenon. What is currently missing in the IS literature is a study that documents and illustrates how IS implementers adopt various change agent roles to deal with the contingencies of installing IS in an organizational setting. This research seeks to fill this gap by contributing an empirical example, with the US-Chinese JV case. In doing this, the study sheds light on a phenomenon that is central to develop emerging theory and its related body of knowledge.

The following discussion begins with a review of the literature relevant to this research. It is followed by a description of the research methods used to construct this case study. Then follows the article's main focus, the case study itself. Finally, a discussion, followed by implications for practitioners and researchers, concludes the article.

BACKGROUND THEORY

Organizational change implies the presence, or absence for that matter, of resistance to change. Best (1985) defines resistance to organizational change as a natural response, from individuals as well as work groups, which attempts to reduce the impact of change to a less stressful level. To decrease resistance and increase awareness of the need for, and receptivity to change, a skilled change agent would not only implement isolated changes but also persuade the whole organization to view change as normal and necessary.

In an IS context, Markus and Benjamin (1996) propose that change agentry will most likely become the most important part of the IS specialist's work in an organization. They view organizations as moving toward outsourcing application development, computer operations, and even IS management in an effort to cut costs and streamline operations. Information technology (IT) implementation, however, is perceived as work that requires organization specific knowledge (as opposed to pure technical knowledge) and, therefore, will be kept in-house (Markus & Benjamin, 1996).

IS specialists alone cannot bring about the success of a new IT implementation. A large body of research (for example, Baroudi et al., 1986; Joshi, 1991; Majchrzak, 1992; Markus &Benjamin, 1996; Markus & Keil, 1994) shows that managers as well as end users of a system must bring their contribution to the process. An IS specialist skilled in change management could, however, serve an important role to reconcile competing interests as well as obtain the support of key participants.

Change Agents

The role of a change agent, and for that matter any organizational role, is the product of interactions between the individual and the organizational environment as represented by others, the interests of different groups, and the shared values and beliefs conferred by the organizational culture (Markus & Benjamin, 1996; Rogers, 1995).

In their conceptual paper, Markus and Benjamin outline three "ideal types" of change agents hypothesized to exist among in-house IS specialists (1996, p. 387). The models are identified in the Appendix and are briefly described next.

Traditional Model

The perception of the IS professional as an agent of organizational change, pre-

sented in the traditional model, reflects the views of many practicing IS specialists (Markus & Benjamin, 1996). It holds that because technology can be relied on to make change, IS specialists do not have to "do" anything to make change other than build systems or install technology (McWhinney, 1992, in Markus & Benjamin, 1996).

Further, traditionalists advocate that management should set specific objectives of the technological change. Consequently, IS professionals can distance themselves from bearing any responsibility for unintended or negative consequences of the system on the organization. Management, on the other hand, tends to blame IS specialists for failing to foresee and eliminate undesirable impacts (Markus & Benjamin, 1996).

Facilitator Model

The facilitator model is mostly reflected in the organizational development literature and holds that people, as opposed to technology, initiate organizational change (Cummings & Huse, 1989; Schwarz, 1994, in Markus & Benjamin, 1996). It finds that individuals make informed choices regarding their actions and behavior based on valid information. Consequently, people have to accept responsibility for their actions including outcomes of actions taken to create and initiate organizational change.

The IS specialist is an agent of change when helping people make choices by providing necessary information (Markus & Benjamin, 1996). From an ethical standpoint, the IS specialist feels obligated to increase people's ability for making a choice by acting as a process facilitator. This implies that the IS specialist has expertise in group dynamics and various aspects of human behavior in addition to technical skills. Moreover, the IS professional would feel obligated to serve the interests of the organization even when these interests are in conflict with particular interests of management or the specialist's own personal or professional interests (Schwarz, 1994, in Markus & Benjamin, 1996).

Advocate Model

The advocate model finds support in the innovation, management, and change politics literatures (e.g., Beath, 1991; Kanter et al., 1992; Rogers, 1995; Semler, 1993, in Markus & Benjamin). "The distinguishing feature of this model is that change advocates work to influence people's behavior in particular directions that the change agents view as desirable, whether or not the change "targets" themselves hold similar views" (Markus & Benjamin, 1996, p. 397).

As an agent of change, the advocate does not hesitate to use symbolic communication, persuasion, and manipulation or even to exercise formal power or authority to achieve the desired outcome (Buchanan & Boddy, 1992, in Markus & Benjamin, 1996).

IS specialists adopting the advocate perspective add business value by advocating process change and user skill training as key components of IS-enabled organizational performance improvement (Markus & Benjamin, 1996).

Structural Conditions Related to IT Implementation

Markus and Soh (2002) "remind the IS community not to neglect the structural conditions (Orlikowski, 1992; Markus & Benjamin, 1996) within which IT use occurs." More specifically, Markus and Benjamin (1996) find that structural conditions

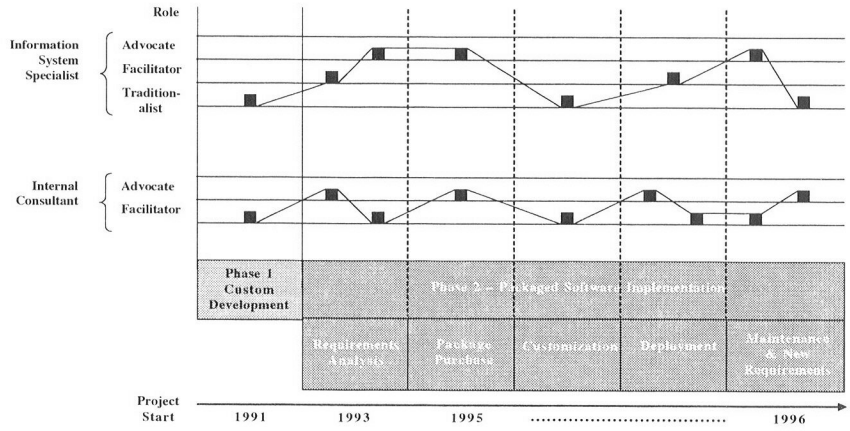
define and reinforce the change agent role undertaken by the IS specialist in an organization. It influences the processes of IS work and the outcomes of these processes (Orlikowski, 1992, in Markus & Benjamin, 1996). In this context, structural conditions are defined as different aspects of organizational culture, such as formal and informal channels of communication, company policies, standard operating procedures, and shared values and beliefs of employees. They also include the formal hierarchical structure of the company that is either directly or indirectly linked to IS work and its outcome. All are important as they enable the IS specialist to identify areas of difficulty when initiating organizational change, and to launch appropriate interventions. An intervention might be changing company policies related to IS in order to improve organizational success (Markus & Benjamin, 1996).

Focus of Change Agents in this Study

By providing an empirical example of change agents in practice, this study fills a gap in the literature. It documents and illustrates how IS implementers adopt various change agent roles to deal with the contingencies of installing IS in an organizational setting. This contributes to a better understanding of the change agent phenomenon in organizations.

The study further supports the Markus and Benjamin (1996) hypothesis that a flexible combination of models best describes the process of change agentry during an IS implementation. To make this concept more visible, this study offers a modification to the Markus and Benjamin (1996) framework. The modified framework includes a meta-model, the "adaptor," that incorporates the other three models. The revision has the potential to make the complexity of the change agent phenom-

Figure 1: Evolution of Change Agent Roles Observed in Chinese IS Team



enon more visible, especially in IS environments that involve installing packaged software.

RESEARCH METHODS

Our research approach is to use a case study to illustrate and explain how the change agent process evolves in an organization that is implementing an IS. The method provides insight into the processes and problems of functioning as a change agent in an IS implementation involving packaged software. Yin (1994) recommends the case study as the preferred strategy when "the focus is on a contemporary phenomenon within some real-life context" (p. 1).

The general analytic strategy is to rely on the propositions found in the Markus and Benjamin (1996) framework to organize the case discussion within the packaged software implementation phases (Yin, 1994). The packaged software implementation phases derive from Hoffer (2002), as well as from the first author's industry and research experience, published in Dologite (1982, 1985). These phases are identified in the column definitions found in Figure 1.

Employing a case in this positivist fashion requires attention to construct validity, internal validity, reliability, and external validity (Kirk & Miller, 1986; Yin, 1994).

Construct Validity

Using multiple sources of case evidence supports construct validity (Benbasat et al., 1987; Yin, 1994). In this study, data are mainly based on participants' own reconstructed interpretations of past events and processes that are assumed to reasonably reflect an external reality (Kirk & Miller, 1986; Niedumolu et al., 1996).

The Chinese researcher was on-site for most of the IS implementation effort in a training support role. His presence was essential to triangulate the findings that began with a full-day on-site session in China. The session included open-ended interviews as well as roundtable discussions in English. Three of the authors were present, in addition to eight organization and IS principals and users involved in the IS implementation. We observed systems in use as well as demonstrations that were conducted for our benefit. We collected company and product literature, which was later translated into English. We also had informal social contact with principals. E-mail then served as the continuing bridge among the principals and researchers as the study evolved.

To increase construct validity, key informants reviewed a draft of the case study report. They included the Chinese internal consultant, who had both managerial and "hands-on" views of the IS project, and the Chinese IS specialist in charge of implementing the project. Many sources (for example, Creswell, 1998; Lincoln & Guba, 1985; Miles & Huberman, 1994) recommend member checking, or going back to those who were studied to receive feedback, as a method to ensure the validity of study results.

Construct validity is indirectly supported by the research experience of the investigators. For example, the first two authors have been studying IS implementations in China since 1991 through five on-site research trips. The results of some of their findings have been published in Dologite et al. (1997, 1998, 1999) and Mockler et al. (1995, 1996, 1999). It is further strengthened by the first author's intimate knowledge of packaged software gained from almost 10 years of employment in the US computer industry devel-

oping and deploying packaged software with a software development organization. Her published work on this topic appears in Dologite (1982, 1985).

Internal Validity

According to Yin (1994), the concern over internal validity for case study research extends to the broader problem of making inferences. He offers three analytic tactics, which are used in this study, to address internal validity. They are pattern-matching, the main tactic recommended for dealing with this issue, along with two related analytic tactics, explanation-building and a subset of time-series analysis, which is repeated observations.

The pattern-matching technique supports analysis, in this case, at both the embedded units of analysis, which are the phases and steps in the implementation effort, as well as the "whole" case (Yin, 1994). In the embedded units of analysis, the dramatically different patterns observed provide the most simple, or perhaps, gross-level, comparison with the conceptual models offered by Markus and Benjamin (1996).

At the whole-case level, pattern matching is again employed to draw a conclusion about the discovery of an overall "adaptor" pattern evidenced throughout the implementation effort.

The second analytic tactic used, explanation building, according to Yin (1994), is a special type of pattern-matching, where the goal is to analyze the case study data by building an explanation about the case. In most case studies, as in this one, it occurs in narrative form and reflects the development of the central hypothesis. In this study it relates to an unfolding demonstration of the adaptor type of change agent.

The third analytic tactic used to reinforce internal validity is repeated observations. In this single case study, repeated observations occur within every embedded unit of analysis.

Reliability

Reliability is demonstrated by the appropriate use of case study protocol (Yin, 1994).

Our case study strategy largely followed the established case study protocol identified by Yin (1994). It involved organizing and documenting the data collected into a database consisting of the following items.

- Case study notes that were the result of on-site open-ended interviews, observations, and document analysis.
- An audio taped narrative recorded immediately after on-site visits. This enabled the investigators to document their observations and interpretations that connected the specific pieces of evidence with the various issues that emerged. It is worth noting that this was most valuable to the investigators because it was almost impossible to conduct interviews in a way one would be comfortable doing in the West. The Chinese are very suspicious of visible note taking and any form of formal interrogation. Therefore, it was important to establish the research nature of a visit beforehand, but conduct the site visit as informally as possible. So the audio-taped narratives were essential.
- Word-processed transcriptions of the audio-taped narrative. These transcriptions, as well as field notes, were analyzed and the data were entered into tables, using techniques recommended by Miles and Huberman (1994). The tables helped organize core thematic categories, such as those identified on the X and Y-axis of Figure 1.

External Validity

External validity establishes the domain to which a study's finding can be generalized (Yin, 1994). Outsider checking helped corroborate our analysis. Individuals in positions to pass judgment evaluated the final report for this study. Among them are several consultants who have experience implementing packaged software and guiding resident change agents. One is a partner in a major international consulting organization who works in Southeast Asia and provides mainly IS consulting services to companies investing in China.

Nonetheless, our case remains a study of a single IS project in a single organization. Although significant insight can be gained from such research (Yin, 1994), further examination of the change agent concept in other contexts should be pursued to enhance external validity.

CASE STUDY

The US-Chinese JV case study is now addressed as an example of how the change agent processes and functions evolve in an organizational context. First, an overview of the context, foreign-Chinese JVs, the packaged software installed, and the JV participants, is given to provide perspective to the rest of the case. The subsections that follow discuss the change agent roles of the US partner and the Chinese IS team.

Context: Foreign-Chinese Joint Ventures and Their IT Dimension

While the contractual arrangements, as well as the advantages and disadvantages, of foreign-Chinese JVs is beyond the scope of this article, some insights on JVs and their IT dimension is relevant.

In many cases, Western companies have found that IT, and a demonstrated commitment to bring this technology into a JV, facilitated the timely completion of their requests with authorities for setting up a new company (Glasser & Pastore, 1998). The Chinese have been known to call this "technology for market," which is to ask foreign companies to transfer technology in exchange for access to Asia's exploding marketplace (Kranhold, 2004).

China has been inviting foreign joint ventures ever since it opened to the West in 1978 and simultaneously lessened the role of central planning to encourage the natural growth of market forces (Chao et al., 1997).

In opposition to such interest, Chinese management frequently perceives IT as a cost center partly because manual-processing labor is very cheap (Dologite et al., 1997, 1998; Glasser & Pastore, 1998). The prevailing belief is that it is difficult to justify spending money on something that, in management's view, could be solved by assigning more people to the task.

In addition, in the Chinese business culture, managers strictly control access to information. Information is often treated as an individual, rather than an organizational resource (Martinsons, 1991). Discretionary power is preserved through the delicate control of critical information, which is made available selectively to subordinates instead of being distributed widely among organizational members (Martinsons, 1991). Formal codification of critical information inside a computer system in order that others can access it would involve substantial changes to the culture of information and its personal value (Davison, 2002).

Patience and the ability to effectively convey the importance of IT in establishing advanced managerial practices in a

company have helped foreign managers to persuade their Chinese counterparts to allocate the necessary funds for IT investment (Glasser & Pastore, 1998).

The appropriate level of IT investment, as perceived by multinationals engaged in JVs, ranges from the latest, cutting edge systems to packaged software (Glasser & Pastore, 1998). Advocates of the former base their arguments on the mission criticality of the new venture and need for integration into the parent company's global network. In the latter case, the financial resources of the JV, as well as the expected payback period, may dictate limited investment in new IT. Further, the technological sophistication of end users as well as that of IS professionals, who are to implement a new system, might argue for an off-the-shelf software package purchased from a local vendor that provides initial training and continued technical support (Glasser & Pastore, 1998).

PACKAGED SOFTWARE INSTALLED: MRP & MRPII

The software package the JV installed is material requirements planning (MRP). Basically, it is an inventory and production control system that enables a manufacturer to schedule material acquisitions to meet future production demand (Sum et al., 1997; Wong & Kleiner, 2001). Theoretically, the software enables the company to acquire raw materials and components, timed precisely, to achieve just-in-time deliveries and zero inventory levels. The inaccuracy of bills of materials and inventory records and the occurrence of unanticipated events, however, result in a certain level of inventory and material shortages. The literature specifies desirable MRP targets of 95% inventory accuracy and 98% bill of material accuracy (Turbide, 1996).

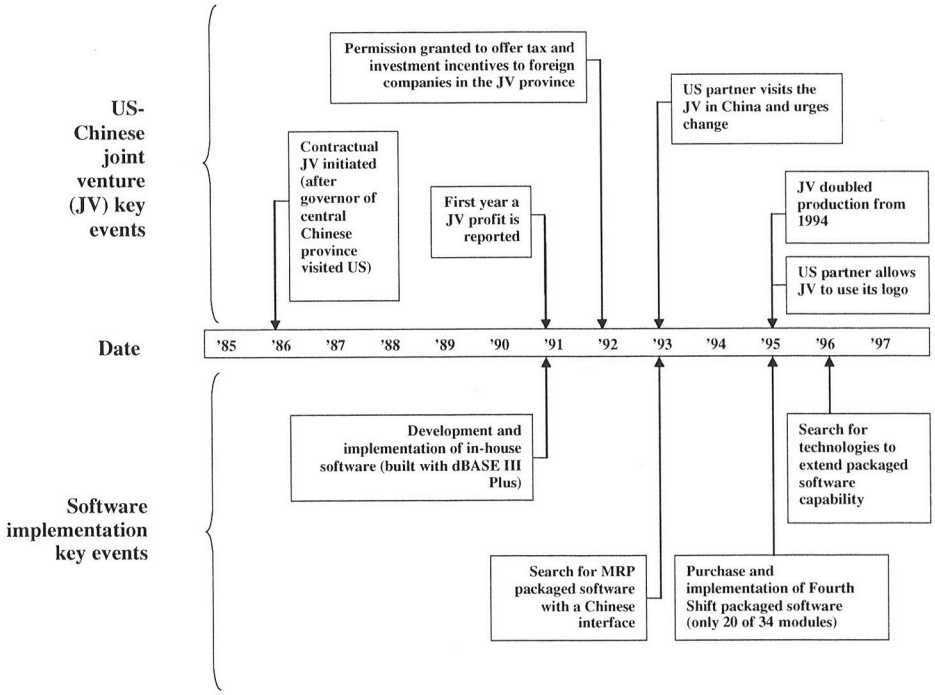
Manufacturing resource planning (MRPII) is a more advanced software package that integrates MRP into a whole set of supporting applications, such as production and capacity planning, accounting and financial applications, customer service, management information systems, and electronic data interchange (EDI) (MRP II, 2004; Wong & Kleiner, 2001). These functions are built around a relational database management system to share data and are completely interdependent. The software package's primary goal is to collect and disseminate information from and across different functional areas of the company in order to achieve efficient allocation of resources and coordination of processing activities (Turbide, 1996).

Research Site

The JV that represents the site for this study was set up in 1986 after the governor of a central China province visited the US and invited the US company to invest in China. The new enterprise is located in a city within the governor's province that has particularly become attractive to foreign companies looking to establish a JV. After 1992, it was granted the right to offer tax and investment incentives to foreign companies. Figure 2 presents a timeline that summarizes the US-Chinese JV key events that emerged from our study.

The US side owns 52% of the venture, while the remaining 48% is equally divided between two Chinese state-owned enterprises. The JV employs about 150 people and manufactures small gasoline engines. The Chinese partners provided the land and buildings from an existing operation while the US partner transferred production technology and imported manufac-

Figure 2: Timeline of Key Case Study Events



turing equipment from the US In the first years of the operation, the JV experienced difficulty in transferring the Western production technology and quality control procedures to the new entity. The patience exercised throughout this period by the US partner demonstrated its commitment to the success of the venture. Personnel from the US were sent to China to train employees in the proper sequence of production steps, in the implementation of contemporary sales and marketing concepts, and in the principles of total quality management. The JV finally turned a profit in 1991 and nearly doubled its production in 1995 (compared to 1994) after the acquisition and subsequent successful implementation of Fourth Shift — a commercial software package designed around the concepts of MRPI (*http://www.fs.com*). After the implementation of the software package the quality of the finished products improved to such an extent that the US partner allowed the JV to use its logo.

The organization of the JV, as well as our observations, reveal that decision-making in the company is highly centralized. It is centered on the general manager (GM), who functions as a CEO in Chinese enterprises. Although there are four levels of management under the GM, our concern is with the first level. It consists of internal consultants to the GM. One functioned as the main operational decision maker, who also served as an informal liaison and supporter of the IS group.

There was no formal IS department. IS was considered a staff function and reported to a fourth-level manager of the General Office. Our concern is with an IS specialist in the IS group who worked with the internal consultant to realize the packaged software implementation.

JV Participants

The JV participants of this study were purposely recruited on the basis of their position in the company and their knowledge of IS on the one hand, and that of operations and management attitudes toward the IS implementation process on the other. The subjects were directly involved in the whole process of initiation, selection and development of the IS.

At the time of the IS implementation, the chief engineer of the JV was promoted to be an internal consultant to the GM. He knew the technology from both the management and the IS viewpoints. He was an older person whom everyone treated with respectful deference. He spoke fluent English and conducted himself and our meetings with the demeanor and the depth of technical, as well as strategic-level, knowledge normally identified with the CEO of US small business organizations. His place in the organization was highly visible; for example, in publicity photos he is always positioned standing next to the GM.

The main resident IS specialist was a young engineering graduate of a local university who also spoke fluent English. He was the technical person who researched the packaged software and learned how to use it from English manuals. He was the one who modified the package so that it could be used throughout the JV's four production lines and the assembly workshop. He was part of a small group of technical people responsible for implementing IT in the organization.

Analysis of US-Chinese JV

The following analysis of the US-Chinese JV considers the change agent roles of, in turn:

- The US partner who initiated fundamental organizational change in the new JV, but who remained largely US-bound. While this change agent role is unremarkable and follows well-documented practice in the IS literature, it is given here to provide insights for the exposition of the Chinese participants.
- The Chinese participants who were onsite in the JV to carry out the organizational change initiated by the US partner.

Role of the US Joint Venture Partner

Since its inception, the Chinese operation had been disturbed by substantial problems in production, quality control and inventory management, characteristics common to traditional Chinese state-owned enterprises. The problems are amply documented in the popular as well as professional literature (Chen, 1995; China Survey, 2000; Dologite et al., 1998; Franz et al., 1991; Harding, 1997; Nafziger, 1997; Norton, 2003; Thornhill, 2002). The US JV partner recognized that Chinese labor-intensive operational processes prevailed, because in China labor is very cheap (Bin et al., 2003). Also, the lack of adequate training for the labor force, and unsystematic management practices, caused much of these problems. The transfer and implementation of Western operational practices to the JV would be important far beyond the requirement to satisfy contractual obligations. The very existence of the JV had come to depend on it, since the operation was losing money since 1986, and was unsuited to take over the production of cast iron engines from the US plant, the strategic reason behind the establishment of the JV.

US management determined that the implementation of an MRPII software

package would initiate needed organizational change that could help transform inefficient Chinese production processes, planning and control, which remained from its days as a state-run institution. The US partner repeatedly urged the Chinese management of the JV to implement material requirement planning concepts in day-to-day operations.

Consequently, in 1991 the JV developed in-house MRP software using dBASE III Plus software. The impact on ameliorating the problems of the organization was, however, only marginal. The software did not include the latest developments in MRP concepts, such as integrated sales and financial support, reflected in the MRPII concept.

Eventually, in 1993 the president of the US partner visited the JV (for only the third time in seven years) to participate at a two-day board meeting and urge organizational change to meet Western quality standards for products and production. Later that year the Chinese partner initiated contact with a software vendor in Shanghai to get information about the Fourth Shift software package. This application software was recommended by the US management and is a microcomputer-based client/server approach to MRPII. Its 34 modules provide manufacturing, sales and financial support as well as EDI and decision support.

The company purchased the software two years later from a new authorized, local distributor. Then it implemented the software in a matter of months throughout the four production lines and in the financial department. The staff from a local university provided 40 hours of training to the 30 people who use and maintain the system.

Those who had to learn how to use the system were given an exam at the end of the training period. For high scores on the exam, employees received a bonus. For low scores, they were told that in the event of an economic downturn they would be the first to be laid off. Such an employee mandate would be considered heresy, at the time, in a pure Chinese state-owned enterprise whose "cradle-to-grave" welfare practices provided employment for life, including full pension care (Chen, 1995; Dologite et al., 1998; Harding, 1997; Song, 2003; Thornhill, 2002).

The behavior of the US JV-partner closely matches the pattern of the advocate in Markus and Benjamin's (1996) model of change agentry. For example, by his presence at the meeting, the president communicated a clear message about the seriousness of management's intentions regarding quality and the importance attributed to a new IS system. The fact that this was only the third time that he visited the JV elevated this board meeting to a level of importance equal to that of the meetings in which the JV agreements were signed.

The use of shock is demonstrated by the fact that the president himself participated at the board meeting where the decision to purchase the software was adopted. Threat to exercise formal power made sure that every employee who had to use the system really learned it. The reward and punishment system that was instituted, which was unusual in 1996 and not observed elsewhere, is other evidence of the use of formal power by management to achieve the desired outcome.

Additionally, structural conditions match a role orientation pattern compatible with the advocate model. For example, while the US partner had no direct managerial authority or delegated control over the Chinese operations, it had valued resources to dispense. The main one was its supply of orders for an otherwise failing business. It stimulated the Chinese partner

to seek a Chinese supplier of the requisite MRPII software, as well as to learn how to install and use the software.

Roles of the Chinese IS Team

Our study finds that the Chinese IS team, consisting mainly of the internal consultant to the GM and the IS specialist, demonstrated various change agent behavior patterns as the project evolved. The pivotal role in the project was carried by the internal consultant, who we found initially performed a facilitator role. As we iterated over our data, we found exceptions to this fixed role. The data showed him variously wearing both facilitator and advocate change agent hats to effect change in the organization. Both these roles were essential to support the work of the subordinate IS specialist.

The IS specialist, on the other hand, demonstrated the most dramatic shifts during the packaged software installation project. His behaviors started in a pattern consistent with a single-dimensioned traditionalist change-agent. This pattern recurred several other times during the evolution of the package implementation. But several deviations from this role caused us to iterate back and forth through the story that the data were telling us and the Markus and Benjamin (1996) models. Eventually, a multidimensional profile surfaced. We traced the IS specialist's role evolving from the IS traditionalist through the facilitator to the advocate change agent. The manifestation of these role patterns with both members of the Chinese IS team is summarized in Figure 1 and described below.

Phase One - Custom Software: Because the US partner mandated the use of IT but did not supply funding or expert support, the IS specialist first built a homegrown version of MRP software using dBASE III Plus. He had no organizational change responsibilities beyond building technology, consistent with a role orientation of the IS traditionalist. The custom-built software ultimately was a failure and follows a pattern consistent with the IS traditional model.

The Chinese operation decided to build custom software because they refused to fund the purchase of packaged software. As previously pointed out, in China, IS is typically looked on as a cost sink. We found, for example, that funds are only available at the start of a new five-year economic plan cycle. There follows a rush to spend IT funds for hardware that is often outdated because it is cheaper. During the rest of the five-year interim until the next cycle, no funds are available for application software to run on the purchased hardware, for staff training to run the hardware, or for hardware maintenance contracts. It was not unusual for the research team at many research sites to find hardware, from IBM mainframes to rooms of PCs, dark and unused because of an inappropriate allocation of funds. Such a mindset existed at the case company to color the funding picture.

During the custom software phase, the internal consultant functioned as a facilitator for both the IS specialist and the organization. He provided a supportive climate that enabled the IS specialist to stay focused on new software development. While he had no formal authority for business results, consistent with his role orientation, he did bear some functional responsibility because his boss, the GM, was a political appointee who remained detached from the daily business of running the company.

Phase Two - Packaged Software: When the in-house produced software proved inadequate to support the expectations of the US partner, the change agent roles of both the IS specialist and the internal consultant changed.

Step One - Requirements Analysis: The internal consultant had to adopt the behavior pattern associated with the advocate change agent to obtain adequate funding and support to buy MRPII packaged software. He had to champion the need for packaged software to his superiors. On the other hand, he remained the organization's facilitator in charge of carrying out the mandate of the JV agreement, which was to bring operating processes and controls up to quality standards that met the approval of the US partner.

Several organization structural conditions were in place to make his facilitator role work. For example, he functioned outside the hierarchical chain-of-command because he was not a client group (or official IS professional) member. He also had a need to:

- Build the IS specialist's capacity in order to increase the project's success and IS credibility.
- Help make his client, the IS specialist, self-sufficient and reduce his resentment at trying to build a system with inappropriate support.

To support the internal consultant, the IS specialist began to experience his role change from that of traditional IS change agent to that of facilitator and advocate. His task became promoting the change by helping to increase management's awareness, from a technical viewpoint, of the requirements for an improved system.

Step Two - Package Purchase: After the Chinese IS team succeeded in making the requirement for packaged MRPII software technically acceptable, they began a quest to purchase the software. Both complemented each other, assuming behavioral roles associated with the advocate change agent, to bring the MRPII package, Fourth Shift, into the organization.

The pair traveled to major Chinese manufacturing cities until they located an organization that had a version of Fourth Shift software, modified with a Chinese language front-end.

Because of low funding, the Chinese IS team could buy only a sub-set of the full package and had to learn and implement it locally, using English language manuals, without expert support. The new local vendor of the package, at this stage, functioned mainly as a transfer agent.

The team's behavior is consistent with previous studies that find IT champions attach importance to securing resources (Beath, 1991; Frost & Egri, 1991; Nayak & Ketteringham, 1986). The Chinese team, in this case, actively and energetically went about securing organizational resources for their project. As Heng, Trauth, and Fischer (1999) describe it, they can be characterized as a mix of project manager and IT champions.

Step Three – Customization: Once the package was purchased, the internal consultant could settle back into the role pattern characteristic of a facilitator while the IS specialist could resume the traditional IS role by rebuilding, or customizing, the software package.

Because software was purchased for only one instead of the necessary four production lines, and the financial functions were excluded, the IS specialist immersed himself in the software modification task.

In other words, the IS specialist served as management's "pair-of-hands" to build the technology that would cause change, while the internal consultant re-

mained supportive to facilitate the project's progress.

Step Four – Deployment: The deployment phase, when the customized software package was rolled out to the shop floor, required the IS specialist once more to adopt the stance of a facilitator, while the resident consultant wore the hats of both facilitator and advocate for organizational change.

Together, the Chinese IS team created local-language training materials and hands-on workshops to help facilitate the shop-floor implementation of the packaged software. Local university computer science faculty was enlisted by the internal consultant, who advocated for help to leverage in-house deployment efforts and to prepare and deliver shop-floor training modules.

Two other structural conditions, compatible with the internal consultant's advocator role, were in place to help ease the way to a successful package implementation. First, the consultant's position lacked delegated control authority over the change targets. This stance is predicted to have a greater probability of success than if he had direct authority. Second, to spiral down to the shop-floor worker level, it was clear that the internal consultant had unspoken line authority over everyone in the plant and was indeed responsible for achieving business outcomes that would result from the IT deployment project.

Step Five - Maintenance and New Requirements Analysis: Once deployed, the maintenance of the packaged software was an issue overwhelmed immediately by new requirements analysis and a new software development cycle. It thrust the IS specialist into the role pattern identified with an advocate while the consultant exercised his usual dual roles of facilitator/advocate.

The IS specialist was keenly aware, and regretted that, the Chinese JV partner purchased only 20 of the 34 Fourth Shift modules available. The modules for decision support and EDI were not purchased. In other words, the MRPII software could serve only tactical purposes related to production and inventory management and control.

This approach by the Chinese JV partner, however, is consistent with findings that Chinese management makes little use of IS for strategic-level planning purposes (Dologite et al., 1997, 1998; Franz et al., 1991).

In this phase, the IS specialist once again became an advocate who attempted to influence management, mainly the internal consultant, in a direction he viewed as desirable. Matching the behavioral pattern associated with an advocate change agent, he initiated a campaign to research and learn about decision support software in order to enhance the packaged software. As an example, he aggressively interrogated the US authors about the benefits of expert systems to enhance the decision support capabilities of the custom software he is designing. Later, the IS specialist expects to put on his traditionalist hat of the technical expert to build the technology that can cause change.

Throughout this phase, the internal consultant remained an advocate for change by facilitating the IS specialist's quest to enhance the packaged software. As an example, he invited the US researchers on-site in part to learn about Western approaches to enhance software functionality.

DISCUSSION

The perspective on the change agent function analyzed in this study offer insights

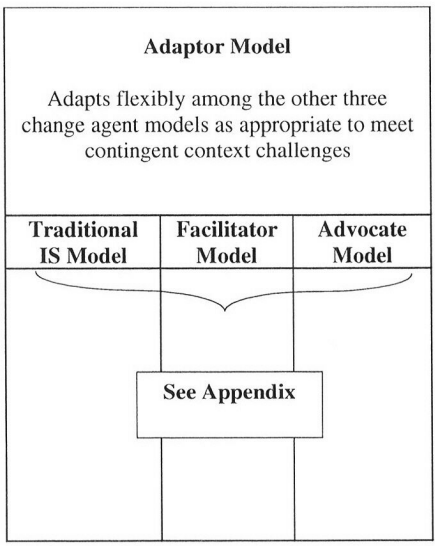
into the process of how change evolves in an organization implementing new computer technology, in particular package software, and in the particular context of China.

Change Agent Framework

First, the data showed how IS principals flexibly moved through the various change agent roles in response to various contingencies or challenges arising within the organizational context. While the discrete components of the Markus and Benjamin (1996) framework provided a template to discern identifiable behavior by the IS principals, the framework did not account for everything we uncovered.

The findings in this case lead us to modify the Markus and Benjamin (1996) framework to acknowledge the overwhelming presence of the meta-role, called an "adaptor" role in this study, played by the IS change agent. As presented in Figure 3, the adaptor change agent role identifies and makes visible important relationships that exist among the other three roles. It supports an understanding of what Markus and Benjamin (1996) call the "most effective" type of IS change agent — one who can move flexibly among all three roles.

Figure 3: Modification of the Markus and Benjamin 1996 Change Agent Framework



The expanded framework offers an IS specialist a more representative model to draw on to help guide the change effort while navigating through an IS implementation.

The time dimension evident in Figure 1 highlights a pattern in the changing role of an IS agent as the project evolves from one stage to another. The emergent pattern is that the IS change agent assumes the role of advocate and facilitator to a larger extent in the beginning (project inception) and the end (training and installation) of the project than in the middle of the project (technical development). This pattern reflects a general pattern found in the authors' practical and research experiences, and is identified by Markus and Tanis (2000) when implementing enterprise resource planning software packages. Markus and Tanis (2000) find, for example, that the middle of the project involves typical technical development activities, as found in this study, of "software customization" as well as "integration of software bolt-ons" (p. 192). These activities contrast with the earlier project inception activities, where "selection of software," and later activities, and where "training" and "adding people to accommodate learning" occupy the IS change agent involved with an enterprise resource planning package implementation.

The new adaptor construct theoretically sets up expectations. It implies that all three skill areas potentially are necessary in an IS implementation effort, especially one involving packaged software. It supports the Markus and Benjamin "tenta-

tive conclusion that all IS specialists who do or could work with in-house clients need to be intellectually familiar with, and behaviorally skilled in, all three roles in order to be most credible and most able to contribute to organizational success with information technology" (1996, p. 400).

Our study additionally extends the power of the change agent framework beyond its original large-company, internal IS focus by demonstrating its applicability to the area of small business as well as to non-US organizational cultures. All areas would be enriched and strengthened by additional research efforts.

While the intent of this research is to enhance an understanding of the change agent phenomenon within a contextual situation, it is believed that our specific context can be used to inform other studies in other organizational and national contexts.

Implications for Practitioners & Researchers

There are several implications this study offers for both practitioners and researchers.

As with any case study, our context and IS implementation are contingent on the organization studied. While this limits the scope for generalization, the intent is to contribute an empirical example to better understand and explain the change agent phenomenon. It is expected that other studies, with different organizational contexts, other IS implementations, and other national contexts, will continue to contribute to the emerging conversation on IS change agents.

Our study adds to a growing body of research that focuses on analyzing the extent and depth of the use of IT in Chinese enterprises in general and JVs in particular. We offer the following propositions tailored to guide practitioners thinking about or already engaged in US-Chinese JVs. Again, we urge IS researchers to consider doing related studies.

- An entrepreneurial and flexible Chinese IS professional team is needed on-site to adapt to varying change agent roles in order to overcome operational and technical contingencies and challenges of the new IS package selection and implementation process.
- A Western change agent, preferably high-level executive, must initiate the change process.

These propositions allow restating our specific findings more generally by deriving general interaction patterns that may be meaningful beyond the confines of the one research site. The same propositions, therefore, can be generalized and restated, by removing context, and offered to further guide practitioners and to encourage IS researchers to validate.

- Entrepreneurial and flexible IS professionals are needed on-site who can adapt to various change agent roles in order to overcome operational and technical contingencies and challenges during a new IS software package selection and implementation effort.
- A change agent, preferably high-level executive, has to initiate an organizational change process.

It is beyond the scope of this study to address how managers and IS specialists of Western companies planning to operate in China will have to overcome, in addition to the cultural differences, the challenges posed by the fundamentally different managerial practices present in the Chinese business environment.

The findings of this study do imply, in addition to the points made above, that

- The implementation of packaged software can initiate organizational change and may facilitate the transition away from traditional Chinese processes.
- The use of commercial packaged software may enable the rapid implementation of a total solution to a business process, leapfrogging the need for an experienced and extensive Chinese IS development staff and for extensive capital investment in IT.

Recent research demonstrates that knowledge about, and skill in using, software packages continue to rise in the Chinese workforce, and that management considers IT a vital part of an organization's competitive strategy (Stylianou, 2003). On the other hand, recent research warns Asian organizations about the possible difficulty when implementing packaged software because of the differences in cultural, economic, and regulatory context when a package is modeled on European or US industry practices (Soh et al., 2000).

It is possible to explore the practical implications of this study from a broader perspective. One question that surfaces is "How does the experience of implementing packaged software in other emerging economies compare to this study?" If similar results are tracked, they can make a contribution to:

- Demonstrate how IT plays a strategic role in transforming work practices in emerging economies.
- Accelerate the progress of transitioning economies that choose to adopt processes and technologies known to be standards in developed economies.

Such an effort would support Hofstede's (1997) notion that "common practices, not common values, are what solve practical problems" (p. xiii).

In the flexibility found in the Chinese IS team lies implications for practice and the education of IS practitioners. The question surfaces, are we training our IS students to competently negotiate the various roles they will be thrust into when implementing packaged software? As we observe a global move to packaged software installations, such as ERP packages (Brown & Vessey, 2003; Kumar & van Hillegersberg, 2000; Markus & Tanis, 2000; Robey, Ross & Boudreau, 2002; Stevens, 2003), is the next generation of IS graduates ready to cope? Readers are directed to Markus and Benjamin (1996) for a discussion about a "proposed educational program on change agentry" that outlines a plan for educational reform. It advocates for the IS academic community to proactively engage in developing the soft skills necessary for effective change agents.

Future research studies are needed not only to provide a more substantial body of evidence and test our findings, but also to focus on each implementation phase and compare changes within phases. A related issue is whether the change agent construct is more allied with the individual or the situation. Another area of study would answer the question about whether there are gray areas or new models to be explored other than those offered in Markus and Benjamin (1996) or this study. These concerns gain an added dimension from the Markus and Benjamin (1996) observation that the change agent function will most likely become the most important part of the IS specialist's work in the organization, especially as other aspects of this work are outsourced.

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APPENDIX

Agentry Model	Traditional IS Model	Facilitator Model	Advocate Model
Role Orientation (the change agent's attitudes, beliefs, behaviors)	- Technology causes change - IS specialist has no change responsibilities beyond building technology - Specialist is an agent of change by building technology that causes change; specialist is a technical expert - Specialist is an agent of change by serving the objectives of others; specialist is the manager's pair-of-hands - Specialist does not hold self responsible for achieving change or improvements in organizational performance	- Clients make change using technology; technology alone does not - Facilitator promotes change by helping increase clients' capacity for change - Facilitator avoids exerting expert or other power over clients - Facilitator serves interests of all clients, not just funders and direct participants - Facilitator values clients' informed choice about conditions of facilitator's work; works to reduce client dependence on facilitator - Facilitator does not hold self responsible for change or improvements in organizational performance; clients are	- People, including the change advocate, make change - Advocate influences change targets in direction viewed as desirable by advocate - Advocate increases targets' awareness of the need for change - Advocate champions a particular change direction - Advocate tactics include communication, persuasion, shock, manipulation, power - Advocate and change targets are responsible for change and performance improvements - Advocate shares credit or avoids taking full credit for outcomes
Structural Conditions Compatible with Role Orientation	- IS is sole-source provider of services - Clients have limited technical and sourcing options - Low IS budget pressure exists - IS is centralized, responsible for many clients - IS is "staff" function-responsible and rewarded for expert/functional performance, not business performance - IS holds "control" role-with delegated authority over certain processes, decisions, behaviors - IS builds systems	- Facilitator is not a client group member - Facilitator's function lies outside the hierarchical chain-of-command - Facilitator's function is not formally responsible for business results, though some functional responsibility is inevitable	- One type of change advocate has no managerial authority and no delegated control, but may have valued resources to dispense - Another type of change advocate has line authority over the change targets and responsibility for achieving business outcomes - A third type of advocate occupies staff positions in the organizations for which change targets work; those who lack delegated control authority have much greater credibility than those who have it
IS Structural Conditions Incompatible with Role Orientation	- Decentralized IS - Outsourced IS - Purchased systems - Diversity of client technology and sourcing options - Strong IS budget pressure - New technologies that demand different "implementation" activities	- Valuable expertise in technical or business matters - Formal responsibility for business or technical results - Staff control over clients' processes, decisions, behaviors - Concerns about locus of employment	- Absence of managerial authority over target - Staff control over target's processes, decisions, behavior
Consequences of Model Applied to IS Work	- Widespread system failures for social reasons - Key systems success factors defined as outside IS role and influence - Technical organizational change blocked by IS - Low IS credibility - IS resistance to role change	- Greater attention to building user capacity might increase project success and IS credibility - Emphasis on client self-sufficiency would reduce client resentment and increase IS credibility - Many new ITs offer more scope to IS specialists who act as facilitators than to those who act as experts/builders	- Role fits a need in situations where IS specialists have or could have better ideas than clients about effective business uses of technology - Role might increase IS credibility; role emphasizes communication, which is a key factor in credibility

Dorothy Dologite is a professor of computer information systems at the Zicklin School of Business, Baruch College, City University of New York. She wrote 12 books and published many articles related to computer information systems. Her 15 years of computer industry experience before becoming an educator includes positions with computer hardware and software firms. She lectured and conducted workshops on computers in China, Russia and other countries. As a Fulbright Scholar, she helped develop a strategic information system for a Malaysian government agency. Her current research interests include diffusing IT in developing economies, exploring IS-driven change in organizations, and applying knowledge-based and other intelligent systems technology to business and educational environments.

Robert J. Mockler is the Joseph F. Adams professor of management at St. John's University's Graduate School of Business. He received a BA and MBA from Harvard and a PhD from Columbia Universities. He is a director of the Strategic Management Research Group and its Centers of Knowledge-Based Systems for Business and of Case Study Development. He authored or co-authored 40 books and monographs, 100 case studies and over 200 articles, book chapters and presentations. He has lectured and consulted worldwide, been a Fulbright Scholar, received national awards for innovative teaching, and taught MBA and executive courses in Europe, China and Latin America. His current research interests include multinational strategic alliances, the diffusion of IT in developing economies, and the application of knowledge-based and other intelligent systems in business and educational environments.

Qinhua Bia is a professor of management science and management information systems, School of Economics and Management, Tonji University, Shanghai, China. He is the head of the Management Science and Management Information Systems Department. He authored or co-authored eight books and published over 60 articles in his academic area. His current research interests include implementing MRPII as well as ERP applications in the enterprise, integrating information and organizational requirements, and managing strategic information in the organization.

Peter Viszhanyo received an MBA in International Studies at the Zicklin School of Business, Baruch College, City University of New York, where he also did research on packaged software implementations in Chinese joint ventures. He received a BS in Electrical Engineering from the Technical University of Timisoara, Romania. He has worked for an international organization focusing on packaged software implementations in global installations. Currently he is a manager of client services at a major developer of Web-based infrastructure software.