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A Manager's Critical Role as IS Change Agent: A Case of Packaged Software Implementation in China

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ABSTRACT

This case study explores the change agent roles a manager can play to support an IS specialist when implementing packaged software. The case concerns a small US-Chinese joint venture, located in China. In part, because of the support roles played by the manager, the IS implementation eventually succeeded. The IS change agent models hypothesized by Markus and Benjamin (1996) serve as a lens to interpret the case. A framework is offered for perceiving how managers can provide change agent support in an IS implementation in general, and in particular in a packaged software implementation in a US-Chinese joint venture. Implications for practitioners and researchers are addressed.

Keywords

Change agents, packaged software, IS implementation, computing in developing countries, case study.

INTRODUCTION

In a conceptual paper, Markus and Benjamin (1996) identify three change agent models traditionally performed by IS specialists. They are the traditionalist, the facilitator, and the advocate, presented in the three models identified in the Appendix.

While a manager would not be called on to perform program coding and other traditionalist IS specialists tasks, could a manager be called on to perform the less technically oriented IS change agent roles of facilitator and advocate? This study presents a case that demonstrates how a manager not only took on and filled these roles, but also shows how he complemented other roles played by the IS specialist. The efforts of both the manager and the IS specialist are shown to represent an intricate balancing act that was critical to make the implementation of packaged software a success.

The literature at present does not provide an in-depth case example of how a manager works closely with an IS specialist, supporting and balancing change agent roles, in order to bring about a successful packaged software implementation. This research seeks to fill this gap by contributing an empirical example, with data from a US-Chinese joint venture (JV). In doing this, our study sheds light on the IS change agent phenomenon that is central to develop emerging theory and its related body of knowledge.

BACKGROUND THEORY

IS specialists alone cannot bring about the success of a new IT implementation. A large body of research (for example, Baroudi et al., 1986; Bassellier, Benbasat and Reich, 2003; Joshi, 1991; Majchrzak, 1992; Markus and Benjamin, 1996; Markus and Keil, 1994) shows that managers as well as end users of a system must bring their contribution to the process.

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 and Benjamin, 1996; Rogers, 1995).

In their conceptual paper, Markus and Benjamin (1996, hereafter referenced as M&B) outline three “ideal types” of change agents hypothesized to exist among in-house IS specialists (p. 387). The models, more fully identified in the Appendix, are briefly described next.

Traditional Model

The traditional model is the conventional perception of the IS specialist as a computer technical expert. The specialist is an agent of change by building technology that causes change.

Facilitator Model

The facilitator model finds the IS specialist is an agent of change when helping people make choices by providing necessary information (M&B). In this role, the IS specialist increases 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 they are in conflict with management or the specialist's own personal or professional interests (Schwarz, 1994; in M&B).

Advocate Model

The advocate model finds that the IS specialist does not hesitate to use symbolic communication, persuasion, and manipulation or even to exercise formal power or authority to achieve the desired outcome (Buchanan and Boddy, 1992; in M&B). “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” (M&B, p. 397).

While 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 M&B), the facilitator model finds support in the organization development literature (Cummings and Huse, 1989; Schwarz, 1994; in M&B)

Structural Conditions Related to IT Implementation

Markus and Soh (2002) “remind the IS community not to neglect the structural conditions (Orlikowski, 1992; M&B) within which IT use occurs.” More specifically, M&B find that structural conditions define and reinforce the change agent role undertaken by the IS specialist in an organization. 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.

Focus of Change Agents in this Study

By providing an empirical example of a manager functioning as a change agent in conjunction with an IS specialist, 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 packaged software in an organizational setting. This contributes to a better understanding of the change agent phenomenon in organizations.

RESEARCH METHODS

Our research approach is to use a case study to illustrate and explain how a manager’s support role as an IS change agent evolves in an organization that is implementing an IS. The method provides insight into the processes and problems of a manager 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 M&B 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), Dologite (1985). These phases are identified in the column definitions found in Figure 1.

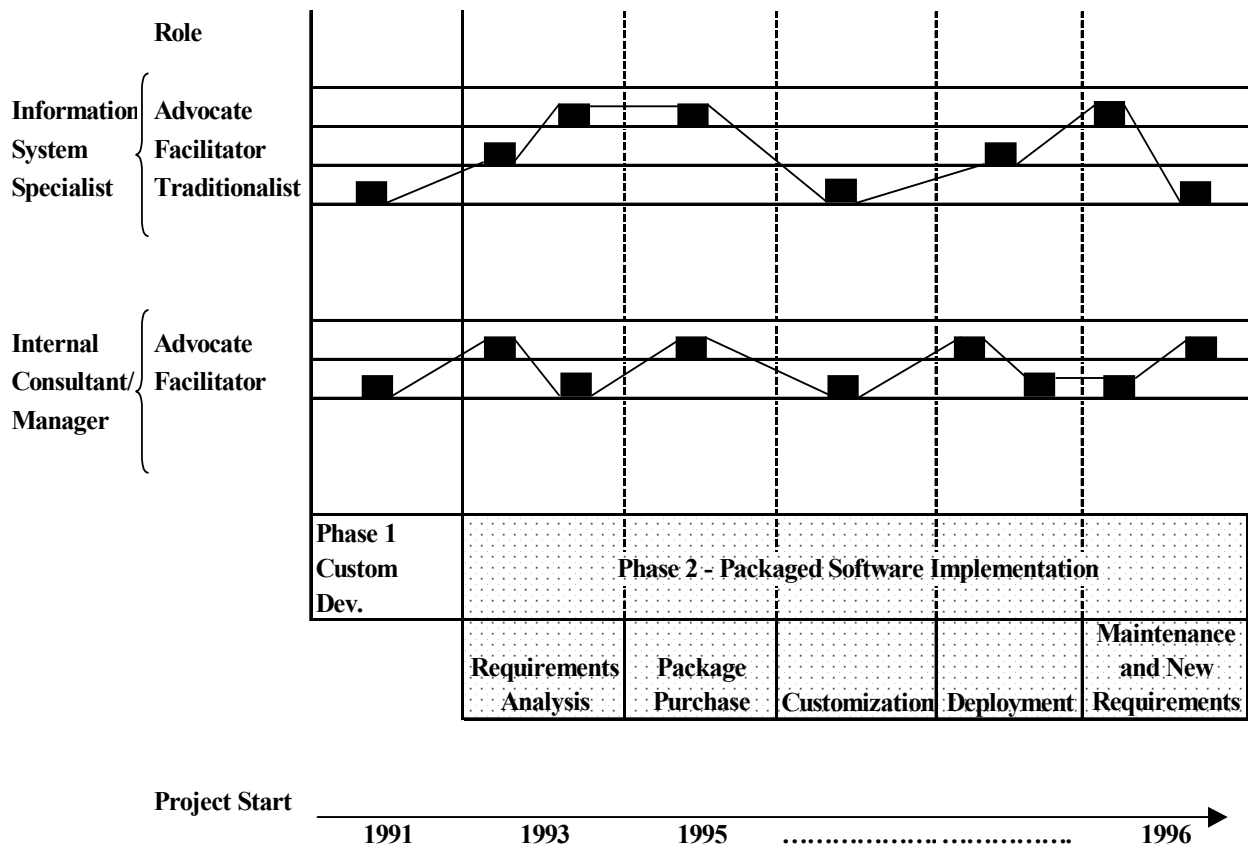


Figure 1. Evolution of Change Agent Roles Observed in Chinese IS Team

Construct Validity

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 and 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. Email later served as the continuing bridge among the principals and researchers as the study evolved.

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.

Reliability

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.
- Word-processed transcriptions of the audio taped narrative. These transcriptions, as well as field notes, were analyzed and the data was 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

Outsider checking helped corroborate our analysis. Among the individuals who evaluated the final report were several consultants who have experience implementing packaged software in China and guiding resident change agents.

Although significant insight can be gained from single case research (Yin, 1994), further examination of change agent concept in other contexts should be pursued to enhance external validity.

THE CASE STUDY

The Context: Chinese Joint Ventures and their IT Dimension

In many cases, Western companies have found that a commitment to bring IT into a Chinese JV, facilitated the completion of their requests with authorities for setting up a new company (Glasser and Pastore, 1998).

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; Dologite, et al, 1998; Glasser and 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 and 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 and Pastore 1998).

The Packaged Software Installed: MRP And MRPII

The software package the JV installed is material requirements planning (MRP). It is an inventory and production control system that enables a manufacturer to schedule material acquisitions to meet future production demand (Wong and Kleiner, 2001).

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) (Wong and Kleiner, 2001).

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 US side owns 52 percent of the venture while the remaining 48 percent 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 manufacturing equipment from the US.

Although there are four levels of management under the general manager (GM), who functions as a CEO in Chinese enterprises, our concern is with the first level. It consists of internal consultants to the GM. One functioned as the main operational decision maker and is referred to as the "internal Consultant/manager" in this study.

There was no formal IS department. IS was considered a staff function and a small group of technical people reported to a fourth-level manager of the General Office. This manager played no active role in the case.

The main resident IS Specialist was a young engineering graduate of a local university who spoke fluent English. He was the technical person who researched the packaged software and learned how to use it from English manuals. He worked closely, throughout the packaged software implementation, with the internal Consultant/manager.

Analysis of US-Chinese JV

Our study finds that the Chinese IS team, consisting of the internal Consultant/manager 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/manager 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, evolved 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 it refused to fund the purchase of packaged software. As previously pointed out, in China, IS is typically looked on as a cost sink.

During the custom software phase, the internal Consultant/manager 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 internal Consultant/manager and the IS Specialist changed.

Step One - Requirements Analysis

The internal Consultant/manager adopted the behavior pattern associated with the advocate change agent to obtain adequate funding and support to buy MRPII packaged software. He championed 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/manager, 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 and Egri, 1991; Nayak and Ketteringham, 1986). As Heng, Trauth, and Fischer (1999) describe it, the team can be characterized as a mix of project manager and IT champions.

Step Three – Customization

Once the package was purchased, the internal Consultant/manager 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/manager remained 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 resident internal Consultant/manager to wear the hats of both facilitator and advocate for organizational change while the IS Specialist once more adopted the stance of a facilitator.

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/manager 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/manager's advocate role, were in place to help ease the way to a successful package implementation. First, the Consultant/manager'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/manager 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 required the Consultant/manager to exercise his usual dual roles of facilitator/advocate while it thrust the IS Specialist into the role pattern identified with an advocate.

The Chinese team 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; Dologite, et al, 1998; Franz et al., 1991).

Throughout this phase, the internal Consultant/manager 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.

In this phase, the IS Specialist once again became an advocate who attempted to influence management, mainly the internal Consultant/manager, 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. Later, the IS Specialist put on his traditionalist hat of the technical expert to build the technology that can cause change.

DISCUSSION AND IMPLICATIONS

The data show how a manager flexibly moved between two change agent roles to support an IS specialist when implementing packaged software. The balancing act was in response to various contingencies or challenges arising within the organizational context. In part, because of the support roles played by the manager, the IS implementation eventually succeeded.

Figure 2 provides a generalized framework, abstracted from this study's data, for perceiving how a manager can provide change agent support for an IS implementation. It shows how a manager's assumption of advocate and facilitator change agent roles support and complement the IS Specialist in those same roles. Together they effect organizational change that utilizes all the technical changes that the IS Specialist is in a unique position to build.

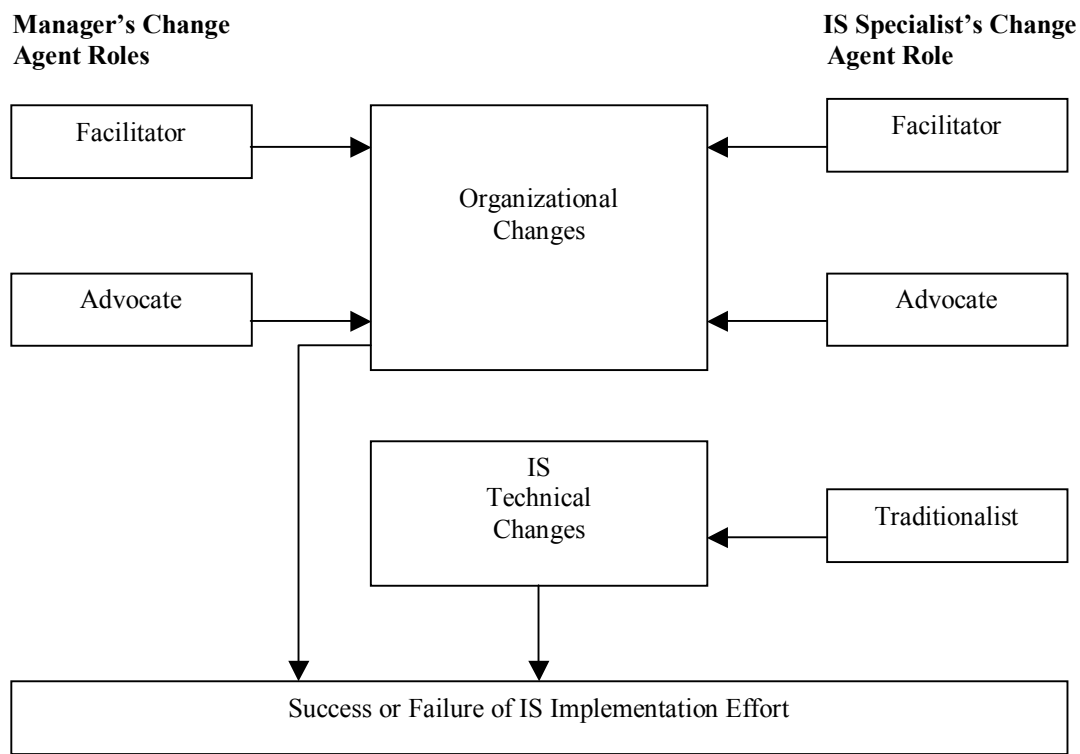


Figure 2. Framework for Perceiving How Managers Can Provide Change Agent Support for an IS Implementation

The total impact of the organizational and technical changes, as evident in Figure 2, make a difference in the success of failure of an IS implementation effort.

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 a manager's critical role as an IS change agent, both alone and as a complement to the IS specialist. It is expected that other studies, with different organizational contexts and with other IS implementations, will continue to contribute to the emerging conversation on managers as 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 JV's in particular. We offer the following proposition 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 a new IS package selection and implementation process.

This proposition allows 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 proposition, 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.

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.

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 IS change agent construct is more allied with individuals or situations.

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APPENDIX: SELECTED SECTIONS FROM: MARKUS AND BENJAMIN'S (1996) COMPARISON OF THREE IS CHANGE AGENT MODELS (SEE REFERENCE FOR FULL DETAIL)

Agentry Model	Traditional IS Model	Facilitator Model	Advocate Model
<p>Role Orientation (the change agent's attitudes, beliefs, behaviors)</p>	<ul style="list-style-type: none"> - 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 the manager's pair-of-hands - Specialist does not hold self responsible for achieving change or improvements in organizational performance 	<ul style="list-style-type: none"> - Clients make change using technology; technology alone does not - Facilitator promotes change by helping increase clients' capacity for change - 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 	<ul style="list-style-type: none"> - 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
<p>Structural Conditions Compatible With Role Orientation</p>	<ul style="list-style-type: none"> - IS is "staff" function-responsible and rewarded for expert/functional performance, not business performance - IS builds systems 	<ul style="list-style-type: none"> - 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 	<ul style="list-style-type: none"> - One type of change advocate has no managerial authority and no delegated control, but may have valued resources to dispense - 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
<p>IS Structural Conditions Incompatible With Role Orientation</p>	<ul style="list-style-type: none"> - Purchased systems - Diversity of client technology and sourcing options - Strong IS budget pressure 	<ul style="list-style-type: none"> - Valuable expertise in technical or business matters - Formal responsibility for business or technical results - Staff control over clients' processes, decisions, behaviors 	<ul style="list-style-type: none"> - Absence of managerial authority over target - Staff control over target's processes, decisions, behavior
<p>Consequences of Model Applied to IS Work</p>	<ul style="list-style-type: none"> - Widespread system failures for social reasons - Key systems success factors defined as outside IS role and influence - Technical organizational change blocked by IS 	<ul style="list-style-type: none"> - Greater attention to building user capacity might increase project success and IS credibility - Many new ITs offer more scope to IS specialists who act as facilitators than to those who act as experts/builders 	<ul style="list-style-type: none"> - Role fits a need in situations where IS specialists have or could have better ideas than clients about effective business uses of technology