What Are the Roles of "People" under the Context of IS Project Management?

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Abstract

With more and more reports of IS project failure in recent decades, it is worth paying more attention to IS project management (or software development projects) in dealing with what happened during its progress. This study adopts a socio-technical perspective, which contributes in further exploring the roles and the members of "people" under the context of IS project management. Via literature review on theoretical parts and famous IS project cases, a proposed model is developed in the end of this paper. Even though this proposed model puts narrow focus on people and time-horizon without having a complete structure, it indeed provides a starting point for future study on the relation between people and IS project management based on a socio-technical, processes-oriented perspective.

Key Words: Project Management, IS Projects, People, Socio-Technical Perspective.

1. Introduction

Undoubtedly, project management is a complex task that involves interdisciplinary skills, strategic considerations, and auditing issues. Even more, when focusing on the projects relevant to information systems (IS) or software development, due to their specific features, certain project management becomes much more complex and much harder to deal with.

Project failure in IS or software development field is a costly problem. According to some surveys, it seems that troubled projects or project failures are not rare occurrences in recent decades, unfortunately [2; 9]. For example, it is reported that an astonishing 75% of all system development undertaken is either never completed or the resulting systems are not used [3]. Besides, Meta Group estimates that half of all new US software projects will go extremely over budget [8]. Furthermore, Standish Group indicates that 31% of new IS projects are canceled before completion at an estimated combined cost of $81 billion, while 52.7% of the projects completed are 189% over budget at an additional cost of $59 billion [4]. More surprisingly, the failing software projects are often found allowed to continue for a long period before appropriate management action is taken [12].

Among the factors that affect IS project management, "people" are regarded as one of the most important issues. However, despite its great impact of such incidents on society and businesses, this issue of IS project management has not been studied systematically. Instead, research on this issue has primarily focused on crafting guidelines for specific tasks [2; 11]. Therefore, it requires more models and frameworks taking various perspectives in illustrating the relationships or interactions among inner and outer components of IS project management.

This study has two objectives. Firstly, in order to explore a complementary view for understanding the progress of IS project development, the roles of "people" are discussed, which is mainly based on socio-technical perspective. Secondly, this study attempts to build a model in illustrating the interactions among the progress, key components, environmental aspects, feedback mechanisms, as well as the roles of "people" of IS project management.

The rest of the paper is organized as follows. In the Literature Review section, the primary focus emphasizes three aspects, namely foundations of IS project management, the roles of "people" under the context of IS projects, and models for IS project managements. Further, in the Case Study section, it illustrates four famous cases in regard to IS

project management. In the Model Construction section, this study integrates models proposed by previous literature, and then highlights the exact members of "actors," as well as the evolvement of an IS project based on time-horizon. Finally, in the Conclusion section, contributions and limitations of this paper are mentioned.

2. Literature Review

2.1 Foundations of IS Project Management

(1) Escalation of IS Projects

Accordingly, when an IS project is in the phase of development, overcommitment to a course of action is likely to make executives miss certain warning signs or misinterpret them when they do appear [10]. Then, it follows that the phenomenon of the arisen of project escalation or de-escalation will be found during this phase. While project escalation would cause the problems of IS projects, project de-escalation provides a chance for troubled projects being successfully turned around or sensibly abandoned [11].

(2) Characteristics of IS Project Management

Due to the nature of information systems or software development, IS project management has at least three specific features worth being addressed: (a) IS projects tend to be conceptual in nature; (b) IS projects are always capital intensive; and (c) IS projects should be regarded as a socio-technical system [4, 14].

(3) Key Factors that Affect IS Projects

In general, successful project management should satisfy the following characteristics or requirements: (a) having experienced personnel being involved; (b) the project team being committed; (c) having a plan that is both comprehensive and intelligent; and (d) having imperative and effective communication skills for the transfer of information [7]. However, when further regarding the key factors that affect the success of IS projects, extra aspects should be taken into consideration. Here, we put emphasis on two dimensions: contextual aspect (i.e., horizontal perspective) and time axis dimension (i.e., vertical perspective).

First of all, when emphasizing on contextual aspects, both inner components and outer environment of IS projects are mentioned. Important inner components include four issues: (a) building a collaborative relationship; (b) identifying the areas of potential conflicts; (c) writing down the formal agreements; and (d) weaving in a process to evaluate performance. Key elements of the outer environment involve the following three: (a) extending the environment to support the project past the delivery date; (b) constructing the system with as much attention to the needs of the user as possible; and (c) ensuring participation from all relevant parties [9].

Secondly, when stressing on time axis, due to the importance of the de-escalation effect (i.e., a way for ending a IS project smoothly), twelve factors that affect de-escalation are identified, such as change in top management support, change in project champion, organizational practices for evaluating decision makers (i.e., process vs. outcome), as well as separation of responsibility for approving and evaluating projects [11].

(4) The Importance of "Risks" under the Context of IS Project

When reviewing previous work on analyzing IS project management, success is explained by a wide variety of factors, such as technical, economic, and behavior issues. Among the factors, risk is regarded as one of the most consistent factors influencing the success of IS projects [2, 6, 12]. On the contrary, when exploring the driving force of IS development problems, failure to assess individual development risk is found to be a major source [6]. As a result, risk can be regarded as one of the most important determinant factors for IS project management.

When mentioning the consequences of risk, Applegate, McFarlan, & McKenney [1] indicate the possible casual effects that may result: (a) failure to obtain all or any of the anticipated benefits because of implementation difficulties; (b) higher-than-expected implementation costs; (c) higher-than-expected implementation time; (d) resulting systems that perform below estimate; and (e) system incompatibility. When detailed the following types of risks under the context of IS project management that might occur, Jiang & Klein [8] list nine types: (a) nonexistent or unwilling users; (b) large numbers of users or implementers; (c) turnover among stakeholders; (d) lack of user support; (e) lack of top management support; (f) insufficient resources; (g) technical complexity and newness; (h) lack of project team

experience; and (i) lack of competent project leaders.

2.2 Roles of "People" under the Context of IS Projects

From a theoretical perspective, based on Leavitt, and Lyytinen, Mathiassen & Ropponen [13], "actors" or "people" can be modeled as one of the key component among the IS project management. On the one hand, it represents individuals or groups of stakeholders who can set forward claims or benefit from software development. On the other hand, the interdependence between actors and technology, task and structure, helps to highlight the improper matching of people with technology, the actors' ability and shortcomings in relation to achieving the task and the ways of actors' behaviors in concordance with the prevailing organizational structure, respectively. For example, Lyytinen, Mathiassen & Ropponen [13] propose that under the project environment, all stakeholders should be observed, such as customers, managers, development groups, users, and consults; while under the management environment, project managers and project team members should be noticed. As a result, "people" or "actors" have various meanings themselves under different settings of IS project management.

From a practical perspective, the same conclusion can be drawn. In general, IS projects are group-oriented activities; as a result, they are subjected to all the vagaries of group dynamics, interactions, coordination, and communication. Besides, the diverse backgrounds of the team members make the ability to communicate and coordinate an extremely important issue if the team is to work successfully. Therefore, IS projects are unique in that they require the intense collaboration of three groups of stakeholders, namely IS staff, end users, and management [4]. Furthermore, when focusing on the actors responsible for triggering de-escalation, top management, internal IS auditors, external auditors / consultants, IS users, IS project team members, and IS management are mentioned in an empirical survey [11].

2.3 Models for IS Project Management

(1) Dimensions that Influence the Inherent Risk of IS Projects

Applegate, McFarlan, & McKenney [1] identify three key project dimensions that influence inherent risks of certain IS project management, namely project size (large vs. small), experience with the technology (low vs. high), and project structure (low vs. high). Amongst these dimensions, technology plays the most important role in risk evaluation; project size dimension is ranked as second; while structure dimension has the least effect on project risk.

(2) Framework for Linking Formal Methods and IS Projects

In order to full utilize the power of formal specification methods into the software development processes, Fraser, Kumar & Vaishnavi [6] identifies 4 generic strategies (i.e., direct unassisted, direct computer assisted, transitional unassisted, and transitional computer assisted) in supporting various IS projects, based on formalization processes. However, even though these strategies indeed provide well-structured tools in helping IS project management, they provide limited help for the whole of IS projects, especially for the complex parts of IS projects. As a result, it still requires more frameworks holding different perspectives in helping deal with IS project management.

(3) Relationship between IS Project Risks and Development Focus

In order to make a linkage between software project risks and development focus, Jiang & Klein [8] develop a model based on Alter's and Barki, Rivard & Talbort's [2] frameworks. For the dimension of risk measurement, there are two types of the risk sources: (a) objective measurement issue (which involves four measures namely project size, application complexity, technology acquisition, and insufficient resources); and (b) self-explanatory and personnel relation or skill-oriented issues (which includes five measures namely lack of team expertise, lack of user support, lack of user experience, lack of clear role definition, and intensity of conflicts). Besides, via empirical data, it is found that user focus is negatively related to three of the risks and commitment focus is positively related to four of the risks [8]. Consequently, the result indicates that different types of risks will affect different aspects of system performance, such as budget, user satisfactions, and system performance. Furthermore, it also implies that as long as the IS project takes the perspective from a user-oriented side, IS project development risks will be eliminated.

(4) Learning Cycle Model for IS Projects

Unlike studies focusing on the process of a single IS project, Ewusi-Mensah [4] suggests that every IS development project should be viewed as both a learning experience and an experimental process. As a result, a learning cycle model for IS projects is proposed to address this endless progress [4]. In other words, it implies that

executives should seize every opportunity to become fully informed and knowledgeable about all the major issues and aspects of the IS project development process. For the IS projects being cancelled in the end, these cancellation decisions should be handled sensitively in order to minimize damage momentarily. Besides, postmortem exercise should be made standard practice for all cancelled projects. On the contrary, for the IS projects being implemented successfully, in order to correct errors detected after system implementation or to adapt new needs, they still require maintenance later [4].

(5) Steps for De-escalation for IT Projects

In order to cut the losses of an organization when a big IS project goes awry, Keil & Montealegre [10] identify four steps for processing de-escalation, which indeed provides a useful guideline in examining the de-escalating of an IS project. In general, the proposed four steps involve: (a) recognizing the problem; (b) reexamining the present course of action; (c) searching for alternative courses of action; and (d) implementing an exit strategy [10].

(6) A Framework for IS Project Risk Management

IS project risks can be interpreted as incongruent states within a socio-technical model of organizational change that include task, structure, technology, and actors [14]. More specifically, risks involve software risks, implementation risks, project portfolio risks, or requirement portfolio risks. Therefore, based on Leavitt's organizational change model (i.e., structural view) and Simon's behavior model (i.e., process view), Lyytinen, Mathiassen & Ropponen [13] propose a framework for IS project risk management under the context of hierarchical software development. In this model, it illustrates the key issues among the interactions between three environments (i.e., system, project, and management environment) and four components (i.e., task, structure, technology, and actor). Further, with the examination by two real cases, this framework is approved to be useful.

3. Case Description

This section illustrates four cases that are famous in dealing with IS project management. The first one is the BAE automation system, which is famous for its size, coordination problem, and the conflict among several stakeholders in the late 90s. The second one is the CONFIRM project, which is cited as the most advanced reservation system in the combined industries of the late 80s. Also worth realizing is how the problems of ethical and financial issues cause the failure of this project. The third one is the TrustPlus project, which highlights the way for turning an almost failing IS project into a profit type. The final IS project case is Taurus, which illustrates how a financial IS with certain expectations of implementation delay is still continuing to develop while being pressed to ultimately fail.

3.1 Project of BAE Automation System

The IS project of the BAE automation system is the Baggage-handling boondoggle of Denver International Airport. The initial ground breaking for the Denver International Airport (DIA) project occurred in late 1989, and the original plan called for completion of the airport by fall 1993. Even for some delay, after surveying and implementing for months, BAE held its first test in early 1994. However, many problems were discovered at that time. Months later, after experiencing so-called de-escalation progress, Denver International Airport finally opened again in late February 1995. It was 16 months behind schedule and close to $2 billion over budget. Detailed information about the BAE case can be found in [1, 10]. As a whole, the problems of this project can be drawn as follows:

(1) The project nature: high complexity with big project size.
(2) People-related issues (or stakeholder issues) including: little support from airlines, the payback pressure of the issued bonds, little time for "participative management" to gain commitment and buy in, too many players within the committee, the manager putting a high-level task force to find a short-term alternative solution, and the lack of stakeholder commitment.
(3) Other dimensions includes: the too-short implementation timeframe, too high interdependence between sub-groups, lack of "crisis-driven" approach being adopted, and failure to manage design and contruction change processes.

3.2 CONFIRM Project

The project CONFIRM was initialized in 1988, which was cooperated by Hilton Hotels Crop., Marriott Corp.,

Budget Rent-A-Car Corp, and AMR Information Services Inc. As the given name, CONFIRM was supposed to be the most advanced reservation system in the combined industry of travel, lodging, and car rental. The clients relied on the professionalism of the specialists who developed the highly successful airline reservation system named SABRE, which is a classic example of how an IS can gain strategic advantages for its user organization. Unfortunately, when Hilton tested the system, three and half years after the project had begun, with a total of $125 million invested, the project was canceled. Detailed information about this case can be found in [3, 4]. The problems of this project can be summarized as follows:

(1) Unforeseen and insurmountable technical difficulties.
(2) Underestimation of cost and completion dates.
(3) Failure of the developers to understand the system's requirements, or changing the requirements after the project started.
(4) Lack of proper mechanism in auditoring and mutual understanding, even though the committee was composed in a proper way.
(5) Lack of intensive collaboration between three groups of stakeholders, namely: IS staff, end users, and management.
(6) Difficulty in tightly cooperating across organizational boundaries.

3.3 TrustPlus Project

In 1988, the Bank of America's (BOA) trust investment system, TrustPlus, was scrapped after insurmountable difficulties to resolve program errors occurred on behalf of the developer and bank's staff. BOA spent $20 million on the development project and another $60 million on trials to fix it. However, with better strategy in dealing with this nearly failed IS project, BOA took the strategy of selling its trust portfolio to other banks and withdrew from this lucrative business altogether. More detailed information and decsriptions can be found in [3, 5]. Even though the bottom line was better in the end, which made this IS project worthwhile, problems during the IS development period still require addressing:

(1) Unforeseen technical difficulties.
(2) Failure of the developers to understand the system's requirements.
(3) Requiring more time and human resources for fixing.
(4) Lack of a real expertise in estimating and controlling the execution of IS projects.

3.4 Taurus Project

In 1986, the London Stock Exchange began the Taurus project, a computerized system for equities settlement. During the design and development phase, because of lots of challenges (such as external pressures, limited resources, and required time-to-market, restructuring of the organization itself, as well as the argument within the committee), everything seems to be in a mess. In other words, at that moment, not only was the direction of the IS project development inconsistent, but so was the monitoring mechanism. Also, different stakeholders held various or even opposite opinions for the Taurus project. Finally, the management was pressed to search for alternatives and cancelled this on-going project, because of the long delay and costly expenditure. Detailed information can be found in [10]. To sum up, the problems of Taurus could be listed as follows:

(1) Ignoring the negative feedback and external pressure.
(2) Suffering the pressures from the stakeholders.
(3) Opposite opinions, requirements and expectations about Taurus, which led to lots of wastes in either time or cost.
(4) Lack of detailed IS plan, analysis, and monitor mechanisms for the Taurus project.
(5) Missing the opportunities to de-institutionalize the IS project in the early phase.

4. Analysis and Proposed Model

From pervious literature reviews on theoretical parts and case studies, even though many of the issues are addressed in various perspectives, "people" undoubtedly can be regarded as one of the most important factors in

determining the success of IS project management. Not only do the types / positions of stakeholders vary with time, but so do the ways of affecting / interacting in the IS project, which further raises the complexity of describing the role or effect people have in the context of IS project management. In addition, the concept "organizational learning" should be also be put into the context of IS project management so that it can reflect the dynamic nature of experience growth and paradigm shift for certain companies.

As a result, in order to clarify the roles of different people, as well as the interaction during the whole IS project process, this study integrates the models proposed by Lyytinen, Mathiassen & Ropponen [13], Ewusi-Mensah [4], Keil & Robey [11], and Jiang, Klein & Chen [9]. As shown in Figure 1, this proposed model helps illustrate the whole process of IS project management, as well as the actual people for the concept "actors."

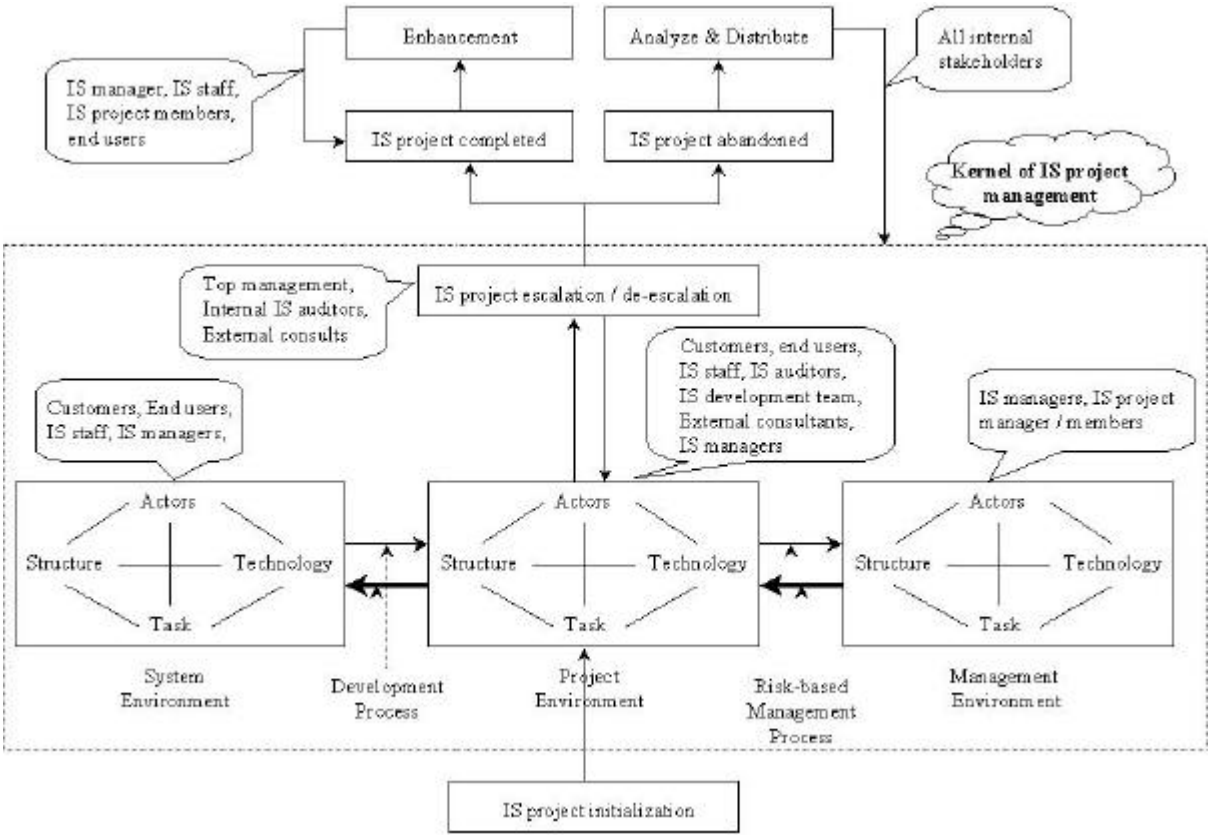

Figure 1 Proposed Model for People-focused IS Project Management

In general, there are three key issues being addressed in the model. First of all, the roles of "actors" or "people" are identified and illustrated for each part or section. Secondly, the organizational context or socio-technical perspective is adopted, which helps to reflect the interaction mechanism among three environments and four components. Finally, due to the importance of continuous learning, time horizon is included, which also indicates two loops for successful and unsuccessful IS projects.

We identify the "actors" for each environment of IS project management. According to Keil & Robey [11] and Lyytinen, Mathiassen & Ropponen [13], roles of the "actors" include at least six types, such as top management, IS managers, IS project managers, IS staff, project team members, end users, internal / external auditors and consults, customers, and stakeholders. As known, the more frequently the member he or she shows up in several environments, the higher involvement of the IS project he or she should have. Consequently, for example, IS managers should be more active in reacting or pro-acting to the changes happening during IS project development.

Besides, by separating the layer of environments (i.e., system environment, project environment, and management environment), as well as the phase of project escalation or de-escalation, not only do the interactions between components require clear addressing, but also the key issues.

Furthermore, with the IS project suffering the phase of project escalation or de-escalation, the decision makers,

including top management, internal IS auditors, and external consultants have to take whole issues into consideration and make a final decision immediately. Hence, during this stage, people would be the key in deciding what will happen.

Finally, in order to address the learning cycle among the organization for the IS project management, this study further illustrates this continuous loop. If the IS project is successfully completed, further enhancement, maintence, and feedback are required. On the other hand, unfortunately, if the IS project fails or is abandoned, it requires further analyzing and then distributing of this knowledge to stakeholders of certain IS projects. This process will help create better progress in future IS project management and IS projects.

5. Conclusion

With more and more reports of IS project failure in recent decades, it is worth paying more attention to IS project management (or software development projects) in dealing with what happened during its progress. This study has two objectives. Firstly, providing a complementary view for understanding the progress of IS project development, based on the roles of "people." Secondly, building a model in illustrating the interactions among the roles of "people," the progress, key components, environmental aspects, and feedback mechanisms of IS project management. Via literature review on theoretical parts and famous IS project cases, a proposed model is developed in the end of this paper. It highlights the exact members of "actors," as well as the evolvement and progress of an IS project based on time-horizon. What is more, the ongoing learning ability for a certain organization is addressed herein. Even though this proposed model puts narrow focus on people and time-horizon without having a complete structure, and even though this model lacks empirical validation, it indeed provides a starting point for future study on the relation between people and IS project management based on a socio-technical, process-oriented perspective. Besides, due to the complexity of IS projects, it requires more data for verifying and modifying the proposed model.

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