THE TRANSFORMATION OF IT FUNCTION DRIVEN BY IT OUTSOURCING: A CASE STUDY BASED ON ORGANIZATIONAL COORDINATION AND KNOWLEDGE INTEGRATION PERSPECTIVE

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Abstract: This paper mainly analyzes how a firm has the management assimilate information technology into organization work processes by restructuring IT function using outsourcing approach. Knowledge integration and organization coordination theory are used to build a conceptual research model to investigate the transformation process of IT function driven by IT outsourcing in Digital China as a case study. Then results indicate that the firm can integrate the individual knowledge of the senior executives, business managers/users and IT professionals across the firm into the organizational knowledge through building the favorable IT-business organizational coordination, to effectively assimilate the information technology into the organizational business and decision-making processes.

Keywords: Outsourcing, IT Function Transformation, Knowledge Integration, Coordination Mechanism

1. INTRODUCTION

Information technology diffusion and IT-related spending growth in China have passed the initiation and expansion stages, and are now go into the cooling and permeating stages gradually [1]. The basic characteristic of these stages is that the IT resources do not easily become a source of sustained competitive advantage with the gradual generalizing and commercializing of information technology [2, 3]. Thus, IS scholar have proposed the concept of IT capability, which is an organizational capability to mobilize and deploy IT resources in combination with other complementary resources. According to the Resource-Based Views(RBV), the firm’s IT capability is not easily duplicated by rivals [4], so it can be a source of sustained competitive advantage which helps the firm obtain business value from IT investment [5].
From the knowledge integration, IT capability may be viewed as the organizational capability to creatively and quickly combine IT resources with their business knowledge and competencies to realize IT-enabled business and process innovation. For such strategic IT innovation to occur, a simultaneously tight and adaptive collaboration must exist between firms’ IT and business professionals [5]. Thus, the most important goal of the IT organizational design is to enable such coordination, and to construct a partnership network between the business users and the IT professionals [6].

Figure 1 shows the direction of our research, the paper presents a case study of strategic IT outsourcing in Digital China Group with a focus on how the IT organizational coordination facilitate the exchange and the combination between the IT and business knowledge been resident in different functional units of the firm? How the knowledge integration leads to the diffusion and assimilation of information technology across the organizational processes.

This paper is organized as follows: Part two describes theoretical foundations and develops the conceptual research model. Part three is about the presentation and analysis of case study; Part four is the result and discussion; finally, the author indicated the paper’s main contributions and future research.

2. THEORETICAL DEVELOPMENT

The conceptual research model shown in Figure 2 was developed based on knowledge integration and organizational coordination theory. The model describes how the firm can integrate the individual knowledge from senior executives, business users and IT professionals into the organizational knowledge through a series of IT organizational transformations, and then how to realize effective assimilation of information technology into the organizational business processes and decision-making.

The following sections elaborate upon the conceptual model in Figure 1 and present the rationale for the anticipated pathways of effects. The analysis will discuss the conceptual and operational definitions: knowledge integration, IT coordination mechanisms and IT assimilation.

2.1 Knowledge Integration Perspective on IT Value

While knowledge is “owned” and “enacted” in the minds of individual employees, the integration of this knowledge to a collective level is both necessary and fundamental. Grant argued
that knowledge is created and held by individuals, so the integration of individual knowledge into organizational knowledge is an essential and distinct organizational capability [7]. Such knowledge integration is both necessary and fundamental for the differential success enjoyed by firms in IT assimilation. Without such knowledge integration, firms are unlikely to attain differential success in IT assimilation [8, 9].

Knowledge integration is the ability to obtain new knowledge through exchanging and combining of existing knowledge [10]. Nahapiet [10] defined and measured knowledge integration capability as the extent to which the senior executives, business managers and IT professionals have access to one another and other stakeholders and are capable of combining business and IT knowledge across the firm into new knowledge to realize IT-enabled business innovation.

(1) Knowledge Exchange
Knowledge exchange refers to individuals interacting to share their knowledge and to learn from others [10]. In the process of IT development, it should facilitate IT professionals exchanging their technical knowledge with business users. Similarly, business users in different business units should share more effectively their domain knowledge with IT professionals. This two-way knowledge exchange will help develop a shared knowledge base and a common language, which will lead to a collective vision and mutual understanding about the information technology [8]. Finally, this will lead to individual initiatives to assimilate the information technology into the organizational processes.

(2) Knowledge Combination
Knowledge combination refers to the process of bringing together "elements previously unconnected or by developing new ways of combining elements previously associated" [10]. When individuals who hold different levels and kinds of knowledge begin to combine ideas, they will synthesize and create new knowledge.

In IT applications, the permutations and combinations of business and IT knowledge resident in individuals and departments across the firm

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**Figure 2 Conceptual Research Model**
will create contextually-specific, new organizational knowledge. This cross-level knowledge integration is reflected by the extent to which the information technology diffuses and assimilates into the core organizational strategies and processes to shape new IT-enabled competitive advantages.

It takes the view that the knowledge resources to successfully deliver business value through IT are distributed throughout the organization. Crucially, this knowledge is not located solely within the IT function, how can this knowledge be integrated and coordinated? This is a challenge that all organizations face and in following sections these questions are explored.

### 2.2 IT-Business Coordination as Core Competence of IT Function

Coordination mechanisms are organizational designs linking stakeholders via formal structures and processes as well as informal mechanisms that provide opportunities for voluntary collaboration. These coordination mechanisms create lateral linkages across individuals or units to facilitate communications and interactions, so they are vital to the integration of business and IT knowledge across the firm.

IT-enabled business innovation requires the attention, involvement, and commitment of IT functions, senior management and business (line) management. Thus, one of the challenges facing CIOs is how to design and build effective intra-organizational horizontal coordination among these key stakeholders, that's also the core competence of IT function. This paper discusses how to build organizational coordination between CIO and TMT (Top Management Team) members and between mid-level business managers (users) and IT professionals. Organization coordination theory indicates that informal organizational structures, as a supplement to formal mechanisms, play a far more important role than expected in promoting knowledge integration across the firm.

(1) Coordination between CIO and TMT

Research has shown that the gap in understanding between the CIO and the TMT is a major obstacle to IT-enabled business innovation. Thus, the primary goal of the coordination mechanisms between the CIO and the TMT is to facilitate the exchange of individual ideas and knowledge to form shared beliefs about information technology in the firm.

These coordination mechanisms between the CIO and members of the TMT refer to their formal and informal interactions, which mainly include the following three aspects.

- Firstly, the CIO’s membership in the TMT and the CIO’s hierarchical distance from the CEO will influence the extent of networking with senior business executives and the existence of trusting relationships.
- Secondly, the IT steering committee normally composed of CEO, CIO and other senior executives, is one of the most frequently researched formal coordination mechanisms, since the IT steering committee is responsible for important decisions about IT investments. CIO in leading firms use these mechanisms to educate their senior business stakeholders about IS issues, "seed" them with creative ideas for IT use, and stimulate executive thinking about IT innovations.
- Thirdly, the CIO’s informal interactions with the CEO/TMT will enable senior executives to exchange their strategic IT and business knowledge so as to blend them together to foster effective assimilation of IT. Johnson proposed two dimensions for measuring interactions between the CIO and TMT based on
their communication frequency and the communication channel richness, especially face-to-face communications.

The coordination mechanisms between the CIO and the TMT share a symbiotic relationship with knowledge integration with richer and more frequent engagements facilitating the development of more shared beliefs, and with more shared knowledge also facilitating better interactions.[20]

(2) Coordination between IT Function and Business counterparts

The coordination mechanisms between the IT functions and other business units seek to foster interactions and collaboration between the IT and business mid-level managers[15] to enable increasing levels of shared knowledge, for both IT-knowledge-able business managers and business-knowledge-able IT managers[8,14]. This shared knowledge will enhance the firm’s agility and innovation in business strategies and processes through the combination and synthesis of existing knowledge.

A variety of formal and informal coordination mechanisms have been used by firms:

- The most important mechanism is the cross-functional task team which enables users to understand the benefits that can be realized by applying IT in varied specific business areas within an organization[5,17]. Figure 3 shows how the IT expenditures managed by the IT function are reduced gradually with their business counterparts playing a key role in IT investment decision-making[21].

- Secondly, Brown[5] found that liaison roles are highly valued by firms for sharing and blending business and IT knowledge as well as knowledge resident in varied functional units. For example, the key IT user representing business/functional units is one of the most frequent integrator roles. Key IT users are business representatives contribute to the IT development and further understand IT and business domain knowledge, so they can facilitate communication and interaction between IT and business managers.

- Thirdly, IT training can help business managers to understand the benefits that can be realized by applying IT to their business areas within an organization and to provide guidelines for them[13]. Besides improving the business users’ technical ability, IT training also provides informal channels for business managers and IT professionals to exchange idea, and build partnership.

- Finally, informal relationship building in organizations provides channels for interpersonal communication and knowledge flow, and increases incentive for cooperative knowledge sharing. The most frequent used informal mechanisms include physical co-location, periodic briefings or conferences, and human resource practices such as job rotations[5,16].

2.3 Transformation IT Function through Outsourcing Approach

IS outsourcing is accepted gradually by the enterprise till now in China. However, the goal and effect of outsourcing has not been restricted to cost savings today, it has become a very important strategic initiative through which the firm
can redesign the role and structure of IT function.

The "IT Value Chain" model was developed to aid the focusing of IT activities by helping a firm understand the areas in which IT functions can add value (in terms of additional revenue) versus those activities where the main contribution is cost saving [13]. As Figure 4 shows, IT value is created for of infrastructure, application, business process and business model levels. The first two levels emphasize value realization, while the last two emphasize value creation. Accordingly, IT development will lead to build infrastructure, applications, business partners and leaders [14].

![Figure 4 IT Value Chain and Outsourcing/In-House](image)

At a higher level, the IT value chain reflects how senior and mid-level executives understand the business value of information technology and then actively enhance interactions and collaboration with IT functions to facilitate the building of coordination mechanisms between the IT and the business areas. So, the critical important task of IT function is to enable such intra-organizational coordination.

### 2.4 Technology Assimilation-IS Success Measurement

IT assimilation is defined as the extent to which information technology diffuses across organizational work processes and becomes routinized in the activities associated with those processes [12]. Assimilation is an important construct in the causal chain of influence from the organizational adoption of information technology to the evidence of its impact on business values [12]. In this paper, we conceptualize IT assimilation along two dimensions: business process, and decision-making [18]. The processes dimension refers to the use of IT to improve individual processes and the integration of processes across organizational boundaries. The decision-making dimension refers to the use of IT to enhance the collection, transfer, and distribution of information useful to business managers’ decision-making.

### 3 CASE STUDY-DATA COLLECTION AND ANALYSIS

#### 3.1 Methodology

An explanatory case study in the Digital China Group was used to empirically investigate the conceptual model shown in Figure 1. The case describes the process of IT development in Digital China, including IS outsourcing, IT organizational transformation, and two core business applications.

Data was collected through interviews within Digital China of the vice-manager of the Information System Department (IS Dept), the product manager of the Distribution Business unit, director of BI (Business Intelligence) project group and ERP(Enterprise Resources Planning) consultant of the outsourcing supplier. Members of IT steering committee, varied business departments and the IT consultant group were also interviewed.

(2) The case study also analyzed internal reports including the IT strategy, IT organizational structure, minutes of some IT meetings, and
documents describing E-bridge, ERP and BI.
(3) Public information mentioned in the media
and on the Internet was also collected.

3.2 Case Study in Digital China
Digital China Holdings Limited was spun off
from Legend Group Limited in 2000 and sepa-
rately listed on the Hong Kong Stock Exchange
on 1 June 2001. Digital China focused on product
Distribution, System Integration, and IT Ser-

vices.

Figure 5 Four Stages of e-Business

The president, Guo Wei, believes that e-Business
solutions are the most effective way to release
the energy of the Internet, and that this is a spi-
raling process as shown in Figure 5. This vision
leads to the tri-level strategic plan of the Digital
Nerve System, shown in Figure 6.

Figure 6 Digital Nerves System of Digital China

The IT Service Group is the core business unit
which provides the service business and IT out-
sourcing service to Digital China. Most of the
100 personnel in the IS Dept were transferred
to the IT Service Group, with only 10 employ-
ees left in the IS Dept. Their functions have
been restructured into a lean team that mainly
focuses on IT planning, services management,
and the BI project. Thereby, the different busi-
ness units in Digital China form this special
market exchanging relationship. They exchange
and control each other by signing the Services
Level Agreement (SLA), in which rules about
performance evaluation, service level and cost
are written in detail. This outsourcing model
improves the utilization of IT services by the
business unit and advances the benefit of the IT
expenditure.

Figure 7 shows the Digital China virtual collabor-
ative framework with the IS Dept as the cen-
ter place, including senior executives, mid-level
managers, and the outsourcing vendor. These
organizational arrangements greatly improved
the firm’s IT competence. The two organiza-
tional arrangements around the IS Dept are
the business and technology consultant group,
the IT and BI liaison person. The business con-
sultant group composed of mid-level managers.
While key IT users from business units across
the firm who are responsible for prioritizing IT
application in relevant business areas and act-
ing as the bridge between the IT and business
counterparts. Technology consultant group in-
cludes the technology experts from the IT Ser-
vices Group who provide advice on strategic IT
initiatives. The IT Steering Committee is com-
posed of CXOs, general executives of the three
business units, the CIO and others. The commit-
tee mainly approves for IT strategy planning.
IT application priorities and other strategic IT-
related decisions. As the IT functions were
transformed, the senior executives, and mid-level managers gradually became involved in the IT development with the IS Dept as the core executive department.

![Figure 7 IT Organizational Structure](image)

The CIO, Ms Zheng, recalls two critical successful factors for the IS outsourcing. Early in 1997, I began work at Lenovo and collaborated with President Guo, so I built a good interpersonal relationship with him. President Guo also understands the strategic impact of IT, so he supported and helped me to transform the IT organization from a functional model to an outsourcing model. Thus, the coordination mechanisms should facilitate business partner ownership of and accountability for all IT projects. Therefore, the business units should be involved in the planning, analysis, design and implementation of the IT project in their business areas. Now, all IT projects have dual project managers, with a business manager accountable for IT project, and a project manager from the IT function who mainly provides professional knowledge and makes technology decisions.

The business managers and IT professionals in Digital China cooperated to integrate E-bridge and SAP R/3 into a redesigned order fulfillment process. The 3500 original distributors out of a total 6000 distributors make transactions through the Internet now with their orders accounting for about 95% of the total. The order fulfilling process based on E-Bridge and SAP R/3 is shown in Figure 8. The distributor places an order through the Internet using E-bridge which is transferred to the SAP R/3, which simultaneously starts the logistic and accounting activities. The order processing duration has been dramatically reduced from 2 hours in FY1999 to 3 minutes in FY2002, while the management of account receivable and customer credit has also been improved. After the order has been successfully confirmed, the E-Bridge automatically sends a mobile phone message to the distributor, with information about the accounting and logistics words through e-mail.

![Figure 8 Order Processing in E-Bridge/ERP](image)
Digital China product manager said: If we did not have the SAP R/3 and E-bridge, we will never know how to manage the large-scale, rapid developing business. ‘No business no IT and No IT no business’, represents our mutual understanding and collaboration (Product manager, Distribution Business Unit).

The BI project is the only IT application managed by the IS Dept. The four IT professionals responsible for the BI project are all experts in BI development with a great deal of business knowledge and skills. BI differs from applications like SAP R/3 and E-Bridge as it mainly relies on business managers and users for development and use to acquire agile and flexible. Therefore, the IS Dept has the BI liaisons as seeds in the business units to continuously develop innovative business applications with IT professionals together, and to transfer knowledge and experience to the other business users.

<table>
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<tr>
<th>Table 1 Preliminary Benefits of BI</th>
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<tr>
<td><strong>Product managers</strong></td>
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<td>Waiting time reduced:</td>
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<td>1.5 hours/day to 10 minutes/day</td>
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<tr>
<td><strong>Data Analyst</strong></td>
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<tr>
<td>Data processing time reduced:</td>
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<tr>
<td>1.5 hours/day ≦ 15 minutes/day</td>
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The corporate PSI (P = Purchase, S=Sale, I=Inventory) application is one of the innovative BI applications jointly developed by the IT professionals and the BI liaison well received by the CEO. As shown in Table 1, the BI application provides managers with right, timely information about their businesses. The BI project is being continuously upgraded with the long-term goal to explain how the business state has developed and to confront the business.

**4. RESULTS AND DISCUSSION**

The data collection and analysis are summarized based on the research model in Table 2.

1. The IS Dept in Digital China has been transformed to a business partner through IS outsourcing with a lean team of only 10 employees.

2. The coordination mechanisms between the CIO and the TMT provide shared beliefs and mutual understanding about the IT strategic roles across Digital China.

3. The coordination mechanisms between the IT function and business counterparts effectively facilitate the exchange and combination of individual knowledge resident in the varied business units of Digital China to build organizational-level knowledge and to realize IT-enabled business innovation and effective assimilation into the organizational processes and decision-making.

**5. CONCLUSIONS AND FUTURE RESEARCH**

The paper investigates the causal relationship between IT organizational transformation and IT assimilation from the knowledge integration perspective. The study presents a case study for how IT organizational transformation facilitates the exchange and combination of individual knowledge across the firm to effectively assimilate information technology. The study also provides guidelines for how to design and implement transformation of the IT functions.
### Table 2 Case Summary and Mapping based on the Conceptual Model

<table>
<thead>
<tr>
<th>Conceptual Model</th>
<th>Digital China</th>
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<tbody>
<tr>
<td><strong>IT Outsourcing</strong></td>
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<tr>
<td>Outsourcing Model</td>
<td>Insourcing: IT Service Group of Digital China acts as the services vendor.</td>
</tr>
<tr>
<td>IT Role Change</td>
<td>IT strategic planning; IT services management; BI Development.</td>
</tr>
<tr>
<td>Lean IT Function</td>
<td>From large function (100 employees) to a lean team (10 employees).</td>
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<tr>
<th>The Transformation of IT Function</th>
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<tbody>
<tr>
<td><strong>Coordination between CIO and TMT</strong></td>
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<tr>
<td>Hierarchical level of the CIO</td>
<td>The CIO reports directly to the senior vice president who is the director of the IT steering committee.</td>
</tr>
<tr>
<td>CIO as TMT Member</td>
<td>CIO belongs to the TMT. The CEO builds IT vision and strategy, but the CIO as the executive.</td>
</tr>
<tr>
<td>IT Steering Committee</td>
<td>IT steering committee in Digital China includes the CEO, CIO and other senior executives. The senior vice president, COO, acts as the director.</td>
</tr>
<tr>
<td>Informal Relationship-Building</td>
<td>Early in 1997, Ms Zheng as CIO began at Lenovo and collaborated with President Guo, so built a good interpersonal relationship with him.</td>
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<tr>
<th>Coordination between IT Function and Business counterparts</th>
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<tbody>
<tr>
<td>Cross-Functional Team</td>
<td>All IT applications have dual project managers: one is a mid-manager in the business area, one from the IT function.</td>
</tr>
<tr>
<td>Key IT Users</td>
<td>The IT liaison and BI liaison act as the bridge between the IT and business units.</td>
</tr>
<tr>
<td>IT Training for Business User</td>
<td>A series of courses, including e-learning through the Intranet.</td>
</tr>
<tr>
<td>Informal Relationship-Building</td>
<td>IT professionals have built good working partnerships and interpersonal relationships with business managers/users.</td>
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<th>Knowledge Exchange</th>
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<tr>
<td>Shared Vision and Mutual Understanding</td>
<td>‘No business no IT and No IT no business’ represents our mutual understanding and collaboration.</td>
</tr>
<tr>
<td>IT Knowledge transfer to business users</td>
<td>Business users in Digital China have become the main contributors to the IT-enabled process and management innovation.</td>
</tr>
<tr>
<td>Business Knowledge transfer to IT professionals</td>
<td>IT professionals have accumulated a great deal of business knowledge and can interact and collaborate with business managers/users.</td>
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<tr>
<th>IT Assimilation — Knowledge Combination</th>
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<tbody>
<tr>
<td>IT Processes Assimilation</td>
<td>The order fulfillment has been dramatically improved by the E-bridge and SAP R/3.</td>
</tr>
<tr>
<td>IT Decisions Assimilation</td>
<td>The decision-making patterns of senior executives and business managers have gradually changed through the application of BI.</td>
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Future studies will replicate this case study with cross case analysis to enhance the reliability and validity of the results [17]. Future studies also design the operational definition of the constructs, including the IT coordination mechanism and knowledge integration with quantitative survey-based research.

References


