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A SURVEY AND ANALYSIS OF THE LITERATURE ON INFORMATION SYSTEMS OUTSOURCING

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Abstract

With the development and penetration of business information systems, information systems outsourcing (IS Outsourcing) has attracted more and more interests from both managers and IT vendors. Meanwhile, there is an increasing number of theoretical research papers in academic journals. This paper reviews major theoretical research papers in this area and classifies them from the perspectives of research topics, research methods, journal categories, and theoretical foundations. Based on this review, we propose some directions for future research in IS outsourcing.

Keywords: Outsourcing, Information systems outsourcing, Research topic, Theoretical foundation.

1 INTRODUCTION

During the past twenty years, the informationization of Chinese firms has been developing rapidly. At present, CIOs (Chief Information Officers) are often facing two challenges. One is that the constantly increasing IT investment can be critical to a firm due to its large scale and the nature of risk. The other one is the fact that the development of IT is too fast that firms often lack employees with the required knowledge (Loh and Venkatraman, 1992; Smith and Mitra et al., 1998). So more and more CIOs have begun to consider whether to outsource part or all of the information systems functions.

In the decision process of information systems outsourcing, CIOs need to consider not only the capability and service level of the service provider, but also whether IS outsourcing can reduce the firm's IT costs or lower IT risks. This makes it necessary to carefully analyze the status quo of the firm's own information systems, in order to decide what to outsource, how to outsource, and the period of outsourcing. Many CIOs think that it is difficult to make these decisions with only practical knowledge. Insights from the theoretical research will be helpful for them as well.

With regard to the theoretical research of information systems outsourcing, there have been scarce integrated theories. Therefore, it is necessary to systematically analyze and summarize the research results about IS outsourcing. This will be helpful for advancing theoretical research in this field. This paper collects related literature about IS outsourcing published in both Chinese and English journals, summarizes the research results of the literature, and brings about some directions for future research.

This paper is organized as follows. The second part discusses the concept of IS outsourcing. The third part introduces the research method of this paper, and analyzes 69 papers about IS outsourcing. In the fourth part, we provide further analysis of English papers. The fifth part lists some future directions for IS outsourcing research. Finally, we make a brief concluding remark of this paper.

2 INFORMATION SYSTEMS OUTSOURCING

Information systems outsourcing, or IS outsourcing, is the practice of turning over part or all of an organization's IS functions to external service providers (Grover and Cheon, 1996). Common IS outsourcing practices include IT infrastructure outsourcing (servers, communication networks, etc), business process outsourcing (data entry, data process, etc), application development outsourcing, system integration outsourcing and so on.

The features of IS outsourcing include: (1) IS outsourcing implies that firms use external entities to manage internal information systems. The information systems of customers (usually non-IT firms) are the objects of outsourcing. (2) Information systems are man-machine systems, which are related to not only information technologies but also human activities. So IS outsourcing service providers need to understand both IT issues and the business processes of customers. (3) IS outsourcing is part of the informationization of firms. In order to align with the overall objective of IT departments, IS outsourcing should be carried out base on IT planning.

3 LITERATURE SEARCH AND ANALYSIS

We searched the literature about IS outsourcing in both Chinese and English journals that were published before Dec 31st, 2007. Six main-stream English information systems journals were selected. The selected journals include three north American IS journals: MISQ (MIS Quarterly), ISR (Information Systems Research), JMIS (Journal of Management Information Systems); and three European IS journals: ISJ (Information Systems Journal), JIT (Journal of Information Technology), EJIS (European Journal of Information Systems). We searched these journals for papers whose titles include at least one of the following five terms: outsourcing, outsource, outsourced, outsources, and sourcing. We obtained an initial sample of 49 English papers. But this initial sample included three book reviews and one special section review. Besides, the sample included four papers which were related to purchasing, offshoring, or production outsourcing. These eight papers are not suitable for this literature review, so they were excluded from the sample. This left with a sample of 41 English papers. As to Chinese papers, we searched the CSSCI (Chinese Social Science Citation Index)

database for papers whose titles include “information technology outsourcing” or “information systems outsourcing”. We obtained 28 Chinese papers.

All of the papers were searched in the school library. The above searched papers constitute the analysis objects of this paper. The 41 English papers and 28 Chinese papers were listed in Appendix 1 and Appendix 2, respectively.

We read through these 69 papers, and compared English papers with Chinese papers from the perspectives of research topics, research methods, and journal categories. By doing this, we got a comprehensive understanding of IS outsourcing theoretical research, as described below.

3.1 Research topics

There are three stages in an IS outsourcing project according to time sequence: before outsourcing, outsourcing process, after outsourcing. The corresponding research topics are outsourcing decision, outsourcing implementation, and outsourcing outcome. In addition, some papers discussed topics that were not limited to any single outsourcing stage, such as papers covering more than one outsourcing stage and papers discussing IS outsourcing in a general sense. We labeled this kind of papers “general outsourcing”. Therefore, the research topics of IS outsourcing can be classified into four categories: outsourcing decision, outsourcing implementation, outsourcing outcome, and general outsourcing. The number of papers included in each category is listed in Table 1.

Research topic	Number of Chinese papers	Number of English papers
outsourcing decision	8 (29%)	9 (22%)
outsourcing implementation	5 (17%)	19 (46%)
outsourcing outcome	2 (7%)	10 (24%)
general outsourcing	13 (46%)	3 (7%)
Total	28	41

Table 1 Research topics in IS outsourcing

In terms of research topics, we can see the following features of IS outsourcing papers from Table 1: (1) The most frequently discussed research topic of Chinese IS outsourcing papers is “general outsourcing” (46%), and the next is “outsourcing decision” (29%). Most “general outsourcing” papers talked about IS outsourcing in a general sense, such as the importance of IS outsourcing, the classification of IS outsourcing and so on, lacking in-depth analysis. By contrast, the most frequently discussed research topic of English IS outsourcing papers is “outsourcing implementation” (46%). These English “outsourcing implementation” papers usually studied the specific process and methodology in outsourcing implementation, and they included in-depth discussions about empirical facts. (2) The rate of Chinese papers that study “outsourcing outcome” is very low (7%), but there is a higher rate of English papers discussing this topic (24%). This indicates that foreign researchers have paid closer attention to the impact brought about by IS outsourcing, i.e., the value of IS outsourcing. In order to for IS outsourcing to develop further, outsourcing suppliers should provide values to customers. So it is necessary for Chinese researchers to pay more attention to “outsourcing outcome”.

3.2 Research methods

Alavi and Carlson once put forward a classification framework with regard to research methods adopted by MIS researchers (Alavi and Carlson, 1992). In their framework, research methods were classified into non-empirical methods and empirical methods. Each category can be classified further into several research methods. We employed this framework to sort out the research methods adopted by the 69 papers. Table 2 illustrates the summary of the research methods of these papers.

From Table 2, we can see that the most frequently adopted research method in Chinese IS outsourcing papers is “opinion”(71%), which is a kind of non-empirical method, while only two Chinese papers are based upon empirical data. By contrast, in English IS outsourcing literature, 78% of English papers adopted empirical methods. So there is an obvious difference between Chinese and English papers in terms of research method. In MIS field, foreign papers have done deep research and drawn

convincing conclusions based on empirical facts. Chinese MIS research, however, is gradually improving its quality.

Category	Research method	Number of Chinese papers	Number of English papers
Non-empirical	opinion	20 (71%)	1 (2%)
	conceptual models	2 (7%)	3 (7%)
	conceptual overviews	2 (7%)	0
	mathematical models	2 (7%)	3 (7%)
Empirical	case study	1 (4%)	13 (32%)
	secondary data	1 (4%)	1 (2%)
	survey	0	18 (44%)
Mixed		0	2 (5%)
Total		28	41

Table 2. *Research methods in IS outsourcing⁺*

3.3 Academic journals

Because it is not feasible to compare Chinese journals with English journals directly, we analyze these journals separately.

According to the classification framework of CSSCI database, journals that published Chinese IS outsourcing papers belong to three disciplines: management, library & information science, and economics. Table 3 summaries the journals that published the 28 Chinese papers.

Discipline	Journal Title	Number of papers
Management	Journal of Industrial Engineering and Engineering Management	4
	Science of Science and Management of Science & Technology	3
	Economic Management	2
	Science & Technology Management Research	2
	China Soft Sciences	2
	Foreign Economics and Management	1
	Science Research Management	1
	Modernization of Management	1
	Science & Technology Progress and Policy	1
Library & information science	Journal of Information	2
	Information Science	2
	Information Studies: Theory & Application	1
	Knowledge of Library & Information Science	1
Economics	Economic Research Journal	1
	Studies of International Finance	1
	Inquiry into Economic Issues	1
	Shanghai Finance	1
	Modern Economic Science	1

Table 3. *Academic journals that publish IS outsourcing papers (Chinese)*

Now there are no specific IS journals in CSSCI database. As a result, IS outsourcing papers appeared in several different types of journals. There are no dominant journals that publish IS outsourcing research. But journals in the management category published relatively more papers on IS outsourcing. The journals that published the most IS outsourcing papers are Journal of Industrial engineering and Engineering Management, and Science of Science and Management of Science & Technology.

⁺ (“mixed” means that a paper adopted two or more research methods)

Table 4 shows the journals that published the 41 English papers. We can see from Table 4 that all of the main-stream MIS journals that we studied have published a number of IS outsourcing papers. Among them, JMIS and JIT published the most IS outsourcing papers.

Journal		Number of papers	Journal		Number of papers
North America	MISQ	5	Europe	ISJ	4
	ISR	6		JIT	11
	JMIS	11		EJIS	4

Table 4. *Academic journals that publish IS outsourcing papers (English)*

4 FURTHER ANALYSIS OF ENGLISH PAPERS

The above comparative analysis indicates that IS outsourcing research in China has lagged behind that in North America and Europe. In this part we only analyze English papers; so as to provide some suggestions for IS outsourcing research in China. Here we discussed three issues: (1) the relationship between research topics and research methods; (2) the theoretical foundations in IS outsourcing research; (3) the correspondence between research topics and theoretical foundations, that is, what theoretical foundations are suitable for what research topics.

4.1 The relationship between research topics and research methods

In this part, we discuss the research methods used in each research topic. The analysis object is the 41 English papers. Table 5 lists the relationship between research topics and research methods.

Research topic	Research method	Number of papers
outsourcing decision (9 papers)	survey	9
outsourcing implementation (19 papers)	case study	11
	survey	2
	mathematical models	2
	conceptual models	2
	secondary data	1
outsourcing outcome (10 papers)	opinion	1
	survey	6
	mathematical models	1
	conceptual models	1
general outsourcing (3 papers)	mixed	2
	case study	2
	survey	1

Table 5. *The relationship between research topics and research methods*

It can be seen from Table 5 that, in the research topic of “outsourcing decision” and “outsourcing outcome”, the most frequently used research method is survey. By contrast, the most frequently used research method is case study in “outsourcing implementation”. One possible explanation for this obvious difference is that, when studying “outsourcing decision” and “outsourcing outcome”, we usually talk about static statuses, which often generate cross-sectional survey data. But when studying “outsourcing implementation”, the research topic is a dynamic process. Case study is appropriate for studying “outsourcing implementation” because it usually involves data on multiple periods.

4.2 Theoretical foundations

The 41 English papers that we retrieved can be classified into two categories in terms of theoretical foundation. Papers in the first category discussed IS outsourcing directly, and did not refer to other disciplines. This category includes 19 papers. The remaining 22 papers belong to the second category. They referred to disciplines beyond MIS. Some of them even adopted two or more theoretical

foundations of reference disciplines. Table 6 classified the 22 papers in terms of their reference disciplines and theoretical foundations.

Discipline	Theoretical foundation	Application in IS outsourcing research	Number of papers
Economics	Transaction Cost Theory	It proposes that firms are organizations that pursue economic efficiency. Therefore, the basic factor that determines whether IS function should be outsourced is cost.	9
	Agency Theory	It concerns the incompatible goals between agents (outsourcing service providers) and principals (customers). It is necessary to coordinate the different interests of customers and suppliers in order to facilitate the success of IS outsourcing.	5
	Property Rights Theory	It focuses on how to allocate the intellectual property rights that are generated in the process of IS outsourcing.	1
	Game Theory	It studies the competitive activities of outsourcing suppliers and customers in the process of IS outsourcing, and discusses how to achieve an equilibrium under the condition that both sides maximize their own benefits.	1
Management	Financial Management	It explains IS outsourcing with the help of some financial indicators stemming from the field of financial management.	4
	Innovation Diffusion Theory	It views IS outsourcing as a type of management innovation	2
	Core Competence	It suggests that, in the intensively competitive market environment, firms should pay attention to the development of core competences, and outsource non-core functions.	2
	Contingency Perspective	It proposes that, the decision of organizations should be contingent, so should IS outsourcing.	2
	Institutional Theory	It proposes that, when considering a management change such as IS outsourcing, the decisions of firms are often strongly influenced by the practices of other firms.	1
	Incentive Theory	It concerns how to motivate people, such as IS outsourcing suppliers.	1
	Resource Dependence Theory	It proposes that, in order to fully utilize existing resources and capabilities, and build competitive advantage, it is necessary for firms to obtain complementary resources and capabilities from outside. IS outsourcing is such a method to do this.	1
	Knowledge-based View	It views “knowledge” as an important resource that can guide management decisions. It proposes that IS outsourcing is a way to utilize suppliers’ professional knowledge and skills.	1
Sociology	Social Exchange Theory	It proposes that IS outsourcing relationship involves dynamic interpersonal interactions. It explains IS outsourcing using such concepts as trust, commitment and communication among people.	2
	Power Political Theory	It concerns the effect of “power”. It uses this concept to explain the conflict, coordination and mutual dependence between outsourcing customers and suppliers.	2
	Psychological Contracts	A psychological contract refers to an individual’s mental beliefs about his or her mutual obligations in a contractual relationship. This theory focuses on the psychologically perceived obligations of the other party of the IS outsourcing contract.	1

Table 6. *Theoretical foundations in IS outsourcing research*⁺

⁺ (Some papers employed two or more theoretical foundations, so the sum of the numbers in the fourth column is greater than 22. The final sum is 35.)

It can be seen from Table 6 that, transaction cost theory is the most frequently used theory in IS outsourcing literature. The next are agency theory and financial management. Therefore, current research focuses on economic indicators such as cost and profit. One possible explanation is that these indicators are easy to be quantified and are convenient for firms to make decisions based on them.

4.3 The correspondence between research topics and theoretical foundations

We have summarized the theoretical foundations for IS outsourcing. Another question that is worth considering is what theoretical foundations are suitable for what research topics. This can provide some suggestions for future IS outsourcing researchers. In this part, we only analyze the 22 papers which have clear theoretical foundations. Table 7 illustrates the correspondence between research topics and theoretical foundations.

Research topic	Sub-topic	Theoretical foundation
Outsourcing decision (8 papers)	Study outsourcing decision from the perspective of economic issues (such as cost and benefits) (6 papers)	Transaction Cost Theory (3 papers)、Financial Management (4 papers)、Agency Theory (2 papers)、Contingency Perspective (1 paper)、Institutional Theory (1 paper)
	Study outsourcing decision from the perspective of firm strategy (2 papers)	Innovation Diffusion Theory (2 papers)
	Study outsourcing decision from the perspective of information technology (1 paper)	Knowledge-based View (1 paper)
Outsourcing implementation (8 papers)	How to manage IS outsourcing risks (3 papers)	Transaction Cost Theory (3 papers)、Agency Theory (2 papers)
	The process of creating value for customers (1 paper)	Core Competence (1 paper)
	How to allocate the intellectual property rights created in the process of IS outsourcing (1 paper)	Property Rights Theory (1 paper)
	How to manage the bidding process (1 paper)	Incentive Theory (1 paper)
	How to understand the structure and function of the IS outsourcing contracts (1 paper)	Game Theory (1 paper)
	How to deal with the culture and power issues in the process of IS outsourcing implementation (1 paper)	Power Political Theory (1 paper)
Outsourcing outcome (5 papers)	The influence of interpersonal interaction on IS outsourcing success (3 papers)	Psychological Contracts (1 paper)、Social Exchange Theory (1 paper)、Power Political Theory (1 paper)、Transaction Cost Theory (1 paper)、Resource Dependence Theory (1 paper)
	The influence of firm strategy on IS outsourcing success (1 paper)	Contingency Perspective (1 paper)
	The influence of economic factors on IS outsourcing success (1 paper)	Transaction Cost Theory (1 paper)
General outsourcing (1 paper)	How to understand IS outsourcing in a general sense (1 paper)	Transaction Cost Theory (1 paper)、Agency Theory (1 paper)、Social Exchange Theory (1 paper)、Core Competence (1 paper)

Table 7. Theoretical foundations in IS outsourcing research⁺

⁺ (There are 8 papers about the topic of “outsourcing decision”, but the sum of the papers in the sub-topics of “outsourcing decision” is 9. This is because there is one paper that employed both economic and technological perspectives to investigate “outsourcing decision”).

According to Table 7, we can see the following features: (1) Transaction cost theory has been applied in papers studying different stages of IS outsourcing. This implies that transaction cost theory is widely suitable in IS outsourcing research. (2) Papers based on financial management focused on the issue of IS outsourcing decision, that is, whether to outsource IS functions. But in our sample, no papers that studied outsourcing outcome referred to financial management. This implies that financial management has mainly been used to study early stages of IS outsourcing. One possible explanation is that the outcome of IS outsourcing is difficult to judge by financial indicators, or that the value brought about by IS outsourcing for firms is not limited to financial value. (3) Papers that used agency theory mainly studied the decision and implementation of IS outsourcing, and did not pay attention to the outcome of outsourcing. One possible explanation is that we should consider the issue of principal-agent relationship before the outsourcing project is completed. When the project is over, it is useless to try to control the agents any more.

5 SUGGESTIONS FOR FUTURE RESEARCH

Based on the above literature analysis, we put forward the following suggestions for future research.

First, pay more attention to topics related to the social environments of IS outsourcing. During the past several years, information systems research has focused less on technology development and more on the social context in which information technologies are designed and used (Sidorova and Evangelopoulos et al., 2008). Firms have realized that we should rely on the combination of technology and management to solve problems. We can see that up to now IS outsourcing research results based on sociology are rare. In the future, IS outsourcing research could draw more on the theoretical foundations in sociology. For example, are there any unique characteristics of the IS outsourcing practices in the social environment of China? If so, why are things in China different from those in North America and Europe?

Second, attempt to study new IS outsourcing patterns. For example, SaaS (Software as a Service) is a new pattern of IS outsourcing that deserves deep research by academia. Possible research topics include: What industries and firms are more suitable to use SaaS? What are the critical success factors for SaaS?

Third, investigate the relationships and differences between IS outsourcing and outsourcing of other functions. At present firms outsource more and more other functions besides IS. For instance, commercial banks outsource the function of cash transportation to public security service companies, firms outsource the job of employee recruitment to consulting companies, and firms outsource logistics to third-party logistics companies. Possible future research questions include: what are the relationships and differences between IS outsourcing and outsourcing of other functions? Will they bring different influences to firms?

6 CONCLUDING REMARKS

With further development of Chinese economy, the scale and scope of firms' information systems will continuously expand, and firms will need more and more information technology knowledge. In this sense, Chinese firms will demand more IS outsourcing services, facilitating the development of IS outsourcing service companies. From now on the IS outsourcing market of China will grow rapidly. And it will be a strategic issue for CIOs to consider whether to outsource IS functions.

As an important research stream in information systems field, there are still many questions that need to be studied. IS researchers and practitioners should cooperate to advance IS outsourcing research. By summarizing related theoretical research literature, this paper analyzed the research topics, research methods, journal categories, and theoretical foundations for IS outsourcing. Future IS outsourcing research could progress more rapidly with the help of this paper.

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