Risk Assessment in Information Systems Outsourcing

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Abstract

While IS outsourcing is being increasingly seen as an effective alternative to acquire IS capabilities in shorter duration as well as at lower costs as claimed by outsourcing vendors and reported in literature, the risks of outsourcing can not be overlooked. There need to be assessment made of different risks of IS outsourcing by the companies that are planning outsourcing. This paper has tried to assess the different risks of IS outsourcing and also has tried to measure the intensity of the nine different outsourcing barriers by way of ranking these barriers.

Keywords: Information Systems outsourcing; IS outsourcing; outsourcing risks; outsourcing barriers.

INTRODUCTION

The rapid growth of information technology (IT) across the industries have offered competitive advantages, efficiencies and effectiveness in operations as well as helped realize the so sought after customer orientation to organizations. However it has also brought problems to the organizations by way of increasing complexities in the management of Information Systems (IS), changing IS application tools and high investments required in its IS infrastructure (Udo, 2000). Outsourcing has been seen as an effective solution to such problems. Over the years IS outsourcing has taken the shape from IT hardware maintenance in 60's to contract programming in 70's and currently to total outsourcing (Yang and Huang, 2000). Outsourcing has started to spread even in the IS security traditionally considered in-house IS functions (Fenn, et.al., 2002). From the available literature on outsourcing, Information System outsourcing origin goes back to year 1954, when GE corp. contracted with Arthur Anderson and Univac. IS outsourcing market was fuelled by the much publicized outsourcing contract which Xerox awarded EDS, a 10 year $ 3.2 billion contract in 1994 (Yang and Huang, 2000). Subsequently a number of organizations as J.P Morgan, Dupont, Xerox have entered outsourcing bandwagon giving the confirmation to the trend of IS outsourcing. A KPMG survey in Australia confirms the above trends towards outsourcing wherein it emerged that 61% of the participating companies are outsourcing currently with another 18% considering outsourcing option (Hurley and Schaumann, 1997). This trend has been further attested by various research agencies predicting high growth in IS outsourcing (source: IDC & PA Consulting group surveys; Institute of Outsourcing website). Different factors have boosted the growth and proliferation of IS outsourcing. These may include increased complexities in IS systems, shortage of skilled IS manpower, cost pressures on the organization and ROI demands on IS investments to the strategic factors of focusing on core competencies of the organization. However there are several concerns on IS outsourcing since 70% of total outsourcing were found unsuccessful (Lacity et. al., 1995). Summing up the scenario on IS outsourcing, it seems that there have been sufficient evidences of high interest as well as caution in the outsourcing of information system services.

INFORMATION SYSTEMS OUTSOURCING DEFINED

Outsourcing may be defined as the procurement of products or services from sources that are external to the organization (Lankford and Parsa,1999). The meaning of IS[1] outsourcing has evolved over time. Traditionally, it referred to the conditions under which the company's data were processed at an external computer service bureau. However, with times, the concept and definition has become blurred (Fink, 1994). A 1991 American survey of chief information officers concluded " There is little precision in the term IS outsourcing. Some respondents use the term to mean 'farming out any task, service or function', while others use it to refer exclusively to the data center utility. Various researchers have defined information Systems (IS) outsourcing. Martinsons (1993) defines the information systems outsourcing as the act of subcontracting all or parts of the IS function to an external vendor as an alternative to relying solely on in-house resources and capabilities. Loh and Venkatraman (1992) have defined IS outsourcing as the significant contribution by external vendors in the physical and/or human resources associated with the IS related infrastructure and processes. Takec (1994)

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[1] IT refers to the hardware and software resources, while IS includes IT and the human resources and business process into its domain. However, as is understood in the industry, IT and IS are used interchangeably in this paper.

includes the ownership dimension to the IS outsourcing defining it as 'transfer of IS related assets from the user to vendor and simultaneously vendor taking over the complete responsibility for the outsourced IS activity'. Grover et. al. (1993) defines IS outsourcing as the practice of handing over part or all of IS infrastructure to external service provider(s). This definition includes: applications development and maintenance, systems operation, networks/telecommunications management, end-user computing support, systems planning and management, and purchase of application software, but excludes business consulting services, after-sale vendor services, and the lease of telephone lines (Grover et. al., 1994). Hence Information Systems (IS) outsourcing or IT outsourcing used interchangeably would refer to use of external vendors performing internal organizational activities related to IS infrastructure. Function and activities that may be outsourced may vary from desktop maintenance to server management, network management, application design and development, facility management to as varied as vendor management, user training and total IS outsourcing.

INFORMATION SYSTEMS OUTSOURCING RISKS

There are many risks that, in practice, indicate limits to outsourcing. Those who have outsourced have more regrets than they acknowledge. Glass (2000) in a editor's column predicted 'The end of Outsourcing Era by 2020'. It points that IS outsourcing that expects companies to lead to their financial transfusion and technological payoff would result in 'painful bloodletting'. The gains that are expected from outsourcing IS functions are not viable in long term. In a study of analysis of 116 sourcing decisions, Lacity and Willcocks (2000) found only 38 percent of 'total outsourcing' successful. By comparison, 77 percent of 'selective outsourcing' and 76 percent of 'in-house sourcing' decisions had successful outcomes. Information systems are the life-blood of organizations and need to be appropriately secured and controlled. However there is little agreement on what is the meaning and scope of security controls at information systems level. Armstrong (1991) defined the word security in modern business environment at the information system level in terms of *reliability* (protection against accidental problems) and *defensibility* (protection against deliberate misuse). O'Shea (1991) placed IS security into managerial context by referring to it as " the properties and mechanisms concerned with preserving the confidentiality of information according to some defined policy".

As the reliance of operations increase on IT systems because of increasing automation of operational processes as well as use of business intelligence tools powered by information technology e.g. Decision Support systems,

Office Automation Systems, CRM tools etc., IS itself becomes a part of overall business strategy of the company. There have been experiences of increased IS costs and poor service levels reported by companies (Lacity et. al., 1996) that have outsourced extensively their IS functions. When a company plans to outsource its IS function, it may have to face various risks ranging from security risks, technology and risks of strategic nature as over dependence on IS vendors, high switching costs and loss of competence in IS skills (Bryson and Ngwenyama, 2006; Whitten and Wakefield, 2006; Martinsons, 1993). There is potential threat of theft of intangible assets of the company in a outsourcing relationship, which are: proprietary information, intellectual property, and business information (Peltier, 1996). Many authors have maintained that outsourcing has more disadvantages than advantages (Lacity and Hirschheim, 1993; Hoffman and Vijayan, 1997; Nam et. al., 1996). Earl (1996) listed eleven possible risks in IS outsourcing. Kern et. al.(2002) has identified the risks of outsourcing when services of Application Service Providers (ASPs) are availed. However the decision to outsource IS services are not taken carefully and systematically. In a survey undertaken by Lonsdale and Cox (1997), only 20 percent of organizations were outsourcing in a sophisticated manner. Others were simply following the latest fad. When deciding on outsourcing their Information Systems, companies should have answer to the question 'Why should we not insource IS services'. The decision may be undertaken by keeping in view 'business value of technology' and the 'operational performance' of the associated service.

One important issue which is often inadequately addressed in IS outsourcing is managing the security of business information when the IS infrastructure which handles the information management is managed by the outsourcing vendor (Peltier, 1996; Sherwood, 1997; Barthelemy and Geyer, 2001). Another key issue in IS outsourcing is the agreement of legally binding responsibilities and liabilities by the parties to the agreement. There should be an organizational structure through which these responsibilities and liabilities are formally owned on each side of the agreement. Further there should be some agreed processes by which the security of the outsourced services can be jointly managed (Sherwood, 1997). In a case analysis for risk assessment at LISA in UK, Willcocks et. al. (1999) emphasized on building and retaining in-house distinctive core human resource capabilities in information technology. The capability to elicit and deliver business requirement, ensure technical capability, manage external supply and coordinate these to ensure control over the organization's IS destiny are critical issues to consider in risk mitigation

from IS outsourcing. Further IS outsourcing risk mitigation needs to be constantly revisited keeping in view the outsourcing vendors' long term market strategy (Mitchell and Fitzgerald, 1998; Kern and Willcocks, 2000). There is evidence of the IS managers especially in developing countries realizing the importance of risks emerging from outsourcing, and yet there are not appropriate risk management practices being followed (Adeleye et. al., 2004). Fink (1994) has reported that companies have given only considerations to business benefits from IS outsourcing and ignored the compromises to its IS security and controls. Table 1 gives the summary of risks of IS outsourcing as reported by few authors. Outsourcing may not have proved to be the panacea that many hoped it would be, in many cases. It can, however, provide tangible and varied benefits to those that implement it properly (Lonsdale and Cox, 1997). Thus an IS manager should figure out what are the various risks that the company may encounter and accordingly should consider these in the IS outsourcing plan.

TABLE 1: SUMMARY OF IS OUTSOURCING RISKS

Author(s)	Outsourcing Risks
Barthelemy and Geyer, 2001	Authors have identified risks of IS outsourcing under three categories and these are: Control concerns, Cost and performance concerns and thirdly Internal opposition concerns.
Earl, 1996	Based on discussions with buyers and vendors, author has identified eleven risks of outsourcing and these are: weak management, inexperienced staff, business uncertainty, outdated technology, hidden costs, loss of learning and innovation, technological indivisibility, fuzzy focus etc.
Martinsons, 1993	Potential dangers of outsourcing are: loss of flexibility, irreversibility, higher long-term costs, failure of outsourcer to understand business needs, and neglect of internal improvements.
Peltier, 1996	Outsourcing leads threats to proprietary information, intellectual property, and business information.
Willcocks et.al., 1999	Authors have identified ten risks of IS outsourcing relating to technology, management, expectations, contracting etc.
Glass, 2000	Risks of IS outsourcing relate to business information, entangled corporate goals, technological atrophy, loss of bargaining power, higher costs for same service.
Kern et.al., 2002	Authors listed the risks of outsourcing through ASP route under three categories and these are: business risks, technical risks, and economic risks.

Banks have in recent times aggressively followed the IS adoption and have experimented with outsourcing and hence are considered for assessing the IS outsourcing risks. The banking sector is the leading contributor to IS outsourcing as per the surveys by research agency IDC. This phenomenon is observed in India too. In recent times banks have aggressively pursued outsourcing in there IS strategies. The reasons range from the entry of private banks, increased competition, to improve customer service and cut costs. Even the public sector bank, Bank of India has taken the outsourcing wherein the bank entered into outsourcing agreement with a global IS outsourcing vendor, Hewlett Packard.

RESEARCH MODEL

Literature survey revealed that there are many studies on issues related to information systems outsourcing, but very few studies have examined information systems outsourcing practices in Asian countries. There is no evidence of any such study in Indian context. Therefore, there is a need to study IS outsourcing practices in Indian organizations. The study is executed by conceiving a research model of assessing the risks of outsourcing the information systems services in the banks in India. The Research model is presented in Figure 1. The research aims at identifying and assessing the
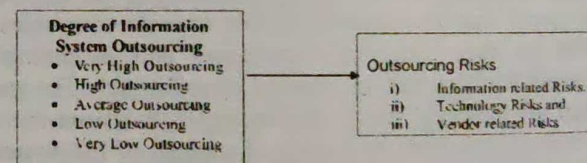

Fig. 1: IS Outsourcing Risks: The Research Model.

The variables that are identified here would be measured empirically in the study and these are given below.

DEGREE OF INFORMATION SYSTEMS OUTSOURCING

It emerged from the literature review and discussions that there are mainly three types of Information Systems sourcing practices prevalent and these are measured primarily based upon the proportion of IS expenditure going to the third party IS vendor. These are as *Total Insourcing Total Outsourcing Selective Sourcing*. However it was observed this classification did not apply in Indian banks because, as very few Indian banks practiced total IS outsourcing. And hence based upon the inputs obtained from the literature survey and understanding of the actual

.practices in Indian banks, Degree of outsourcing would be measured on the proportion of IS expenditure going to the third party IS vendor for the Information System services and five categories of outsourcing have been arrived at which have been defined as:

- Very Low IS Outsourcing (VL)   < 20% of IS Expenditure
- Low IS Outsourcing (L)   20-30% of IS Expenditure
- Medium IS Outsourcing (M)   30-40% of IS Expenditure
- High IS Outsourcing (H)   40-50% of IS Expenditure
- Very High IS Outsourcing (VH)   >50% of IS Expenditure

IS OUTSOURCING RISKS

Risk may be defined as ' the possibility of any form of loss'. In the context of information system risks that are assessed are: disclosure of information, outdated technology, loss of in-house expertise in information systems etc. The components that constitute IS risks from outsourcing was arrived from the literature review and with discussion with IS executives in banks. The outsourcing risks have been divided into three categories and these are as:

Information related Risks,

Technology Risks and Vendor related Risks

Information related Risks are the risks that emerge from disclosure of sensitive information, business plans and other operational data. These risks arise as there is involvement of outsourcing vendors in managing the bank's information system infrastructure and hence the access to these resources either physically or through remote access.

Technology related Risks are those risks which a bank may face as it outsources information systems to external vendors resulting in loss of in-house information system expertise and risks that outdated technology that may be provided by the outsourcing vendor.

Vendor related Risks include risk corresponding to chances of vendors using bank's information to leverage its bargaining position, contract renewal bargaining power and possibility of transfer of knowledge to outsourcing vendor that may have business value for the bank.

It is desired to assess the risks associated with IS outsourcing. For this IS outsourcing in banks in India have been considered. For this study banks have been divided into five categories based on the extent of IS outsourcing. The analysis may give insights into the relationship of IS outsourcing risks with the degree of IS outsourcing. The banks that have been considered in this study belong to Public sector, Private and Foreign banks. The analysis is also made according to the ownership i.e. among the three categories of Public, private and Foreign banks.

Research Methodology

A questionnaire survey has been used for obtaining quantitative input. Set of ten Questionnaires along with a brief of IS outsourcing were mailed to all heads (Information Systems Department) of all the commercial banks operating in India to conduct survey of information systems managers. These heads of their respective IS departments in their respective banks were requested to get filled these questionnaires from their senior managers in their IS department which met the minimum requirement of being in executive post and having minimum of five years of experience in executive position. Rural Banks and Co-operative banks were not included in the study, as these banks have localized presence and are not intensive users of Information technology tools. For obtaining qualitative input, purposive sampling was done to choose banks. Three banks in each sector i.e. public sector, private sector and foreign banks were chosen to get the qualitative insight into issues relating to information systems outsourcing through interviews and observation.

On administrating the questionnaire, 162 responses were received from 43 banks meaning thereby that more than one respondent from a bank was considered for data analysis. Out of these, three questionnaires were half filled and efforts were made to get them completed, but with no success, and therefore were not considered for further processing. Hence total of 159 responses were found valid and included in the study. Thus these 159 responses from the banks have been divided into four groups according to the degree of outsourcing of information systems services in these banks. These are very low, low, medium, high and very high IS outsourcing. Table 2 gives the details of the number of responses falling in the five groups of banks according to the degree of IS outsourcing. It is seen that in the category- very low IS outsourcing, there are only 6 responses (3.7% of total responses) and hence these have been clubbed with "Low IS outsourcing" for further analysis. Thus these 159 responses from the banks have been divided into four groups according to the degree of outsourcing of information systems services in these banks. These are low, medium, high and very high IS outsourcing. Further interviews and observation techniques were used to get the qualitative inputs. Data obtained from interview and observations are further supplemented by secondary sources such as annual reports, press release and articles published in business magazines and newspapers.

Category	obtained	responses
VERY LOW IT OUTSOURCING	6	3.7%
Low IT Outsourcing	49	30.2%
Average IT Outsourcing	30	19.2%
High IT Outsourcing	45	28.4%
Very High IT Outsourcing	29	18.2%
Total	159	100%

ANALYSIS OF INFORMATION SYSTEMS OUTSOURCING RISKS

Analysis of information system outsourcing risks is done by finding the mean score of the four categories of banks based on their degree of outsourcing on the three components of IS risks as defined earlier. Further multi-range analysis to compare the four categories of banks is done using Duncan's test for multi- range analysis. Table 3 gives the mean scores and multi-range analysis output. Mean risk score for the four categories of banks pursuing different degrees of outsourcing have been plotted in Figure 2. In case of information related risks, it is seen as in the Figure 2 that mean score of IS risk increase as outsourcing degree is increased at banks with medium outsourcing, it then shows decline at high outsourcing), but at further increased outsourcing (banks having very high outsourcing) IS risks show higher level.

It may be interpreted that initially as banks increase outsourcing, there is increase in risk level, further with the learning curve in managing outsourcing relationships, the risks show decreasing trend as outsourcing increases. However further increase in outsourcing may lead to higher exposure to information related risks. Further pair-wise comparison between the four categories of banks according to degree of outsourcing has been done and results given in Table 3.
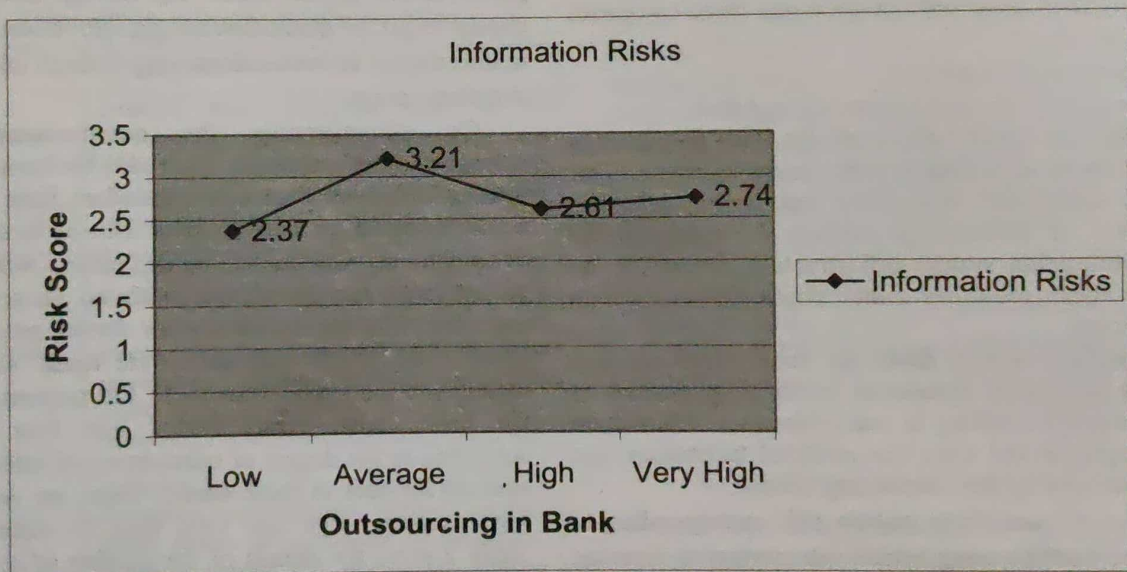

Fig. 2: Information Related Risks in four Categories of Banks According to IS Outsourcing

TABLE 3: ANALYSIS OF RISK COMPONENTS ACCORDING TO DEGREE OF OUTSOURCING

Multi-Range Test Analysis Of Risk Components Among Four Category of Banks According to Degree of IS Outsourcing										
Risk Component	Low Out sourcing (S.D)	Medium Out sourcing (S.D)	High Out sourcing (S.D)	Very High Outs ourcing (S.D)	Low Vs Medium Out sourcing	Low Vs High Out sourcing	Low Vs Very High Out sourcing	Medium Vs High Out sourcing	Medium Vs Very High Out sourcing	High Vs Very High Out sourcing
Information Risks	2.37 (0.84)	3.21 (0.69)	2.61 (0.82)	2.74 (0.88)	*	-	-	*	*	-
Technology Risks	2.68 (0.81)	2.95 (0.77)	3 (0.53)	2.88 (0.75)	-	-	-	-	-	-

Vendor related Risks	2.5	2.99	2.56	2.79		*		-		-		*		-		-
	(0.73)	(0.58)	(0.65)	(0.91)											

Significant at .05 level
Values in parenthesis indicate standard deviation

Results show that in case of Information related risks following groups of banks pair-wise, have reported significantly different levels of risks.

- Banks having low IS outsourcing and banks having medium IS outsourcing.
- Banks having medium IS outsourcing and banks having high IS outsourcing.

- Banks having medium IS outsourcing and banks having very high IS outsourcing.

In respect to *technology related risks* Table 3 shows that risk increases as degree of outsourcing increases but at very high outsourcing mean score of risk shows decline from the previous level. The results are shown diagrammatically in Figure 3.
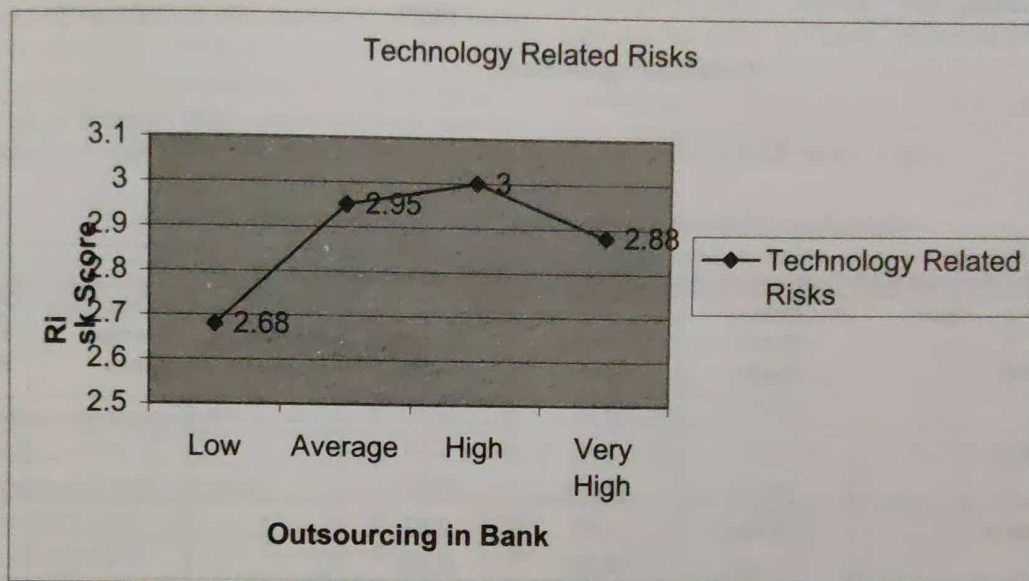

Figure 3: Technology Related Risks in Four Categories of Banks according to IS Outsourcing

It may be inferred that at high levels of outsourcing, banks buy the service rather than the IS product/service and hence technology risks may be perceived lower at high outsourcing. Another reason behind this may be that at high outsourcing levels, vendors are able to create a profitable relationship with their client banks and are driven by a well planned outsourcing contract with banks that takes care of technology related risks. Pair-wise comparison on technology related risks among the four groups of banks indicate there is no significant difference as given by results from Table 3.

In case of *Vendor related risks* mean score of the four categories of banks show in Figure 4 that mean score of IS risk increase as outsourcing degree is increased at banks with medium outsourcing, it then shows decline with banks having high outsourcing, but at further increased outsourcing level (banks having very high outsourcing), IS risks show increase from the previous level. It indicates that banks can optimize on their exposure to the vendor related risks by avoiding both low outsourcing as well as very high outsourcing. Banks need to determine the outsourcing level at which beneficial

exchange between vendors and bank can be achieved coupled with incorporation of sufficient controls related to vendor management in their outsourcing contract.

Pair-wise comparison between the four groups of banks is also analyzed and results are given in Table 3. Results show that there is significant difference on Vendor related risks between

- Banks having low IS outsourcing and banks having medium IS outsourcing.
- Banks having medium IS outsourcing and banks having high IS outsourcing.
- Analysis of Risk Components in Public, Private and Foreign Banks

Risk components have also been analyzed according to the ownership nature of banks i.e. public sector, private sector and foreign banks. Pair wise comparison of these banks is also done using multi range test applying Duncan's test for multi range test. The results are shown in Table 4.
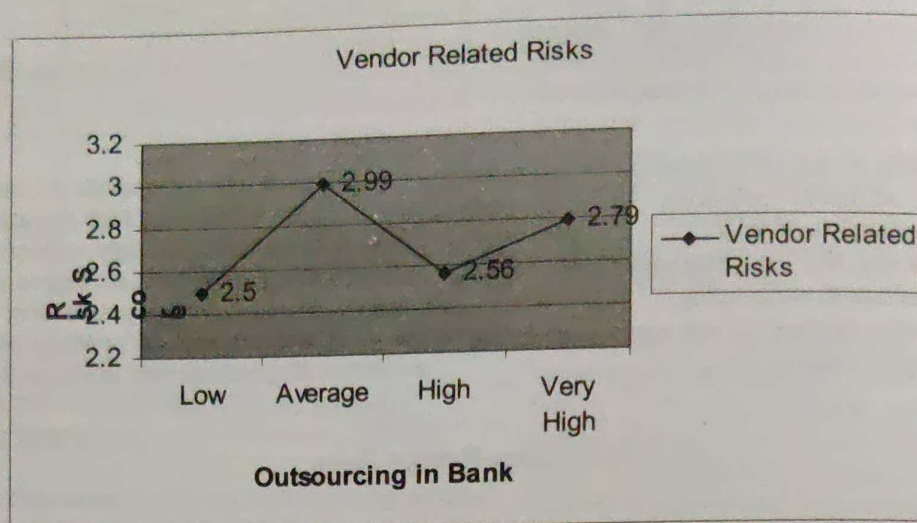
Fig. 4: Vendor Related Risks in Four Categories of Banks according to IS Outsourcing

TABLE 4: ANALYSIS OF RISK COMPONENTS IN PUBLIC, PRIVATE AND FOREIGN BANKS

Multi-Range Analysis Of Risk Components Among Public, Private And Foreign Banks						
Risk Component	Public Sector Banks (S.D)	Private Banks (S.D)	Foreign Banks (S.D)	Public Vs Private Banks	Public Vs Foreign Banks	Private Vs Foreign Banks
Information Risks	2.65 (0.91)	2.90 (0.89)	2.40 (0.67)	-	-	*
Technology Risks	2.93 (0.84)	2.65 (0.74)	2.62 (0.53)	*	*	-
Vendor related Risks	2.73 (0.82)	2.74 (0.70)	2.45 (0.61)	-	-	-
Significant at .05 level Values in parenthesis indicate standard deviation						

Results from Table 4 show that foreign banks have experienced lowest information related risks (mean score of 2.40) while private sector banks report highest risk (mean score of 2.90). Comparing pair wise comparison, it is shown from the Table 4 that there is significant difference between the private banks and foreign banks on information related risks. Foreign banks have reported lowest technology related risks (mean score of 2.62) while public sector banks have reported highest risks related to technology (mean score of 2.93). To check if the difference is significant between the banks, Table 4 shows that the there is significant difference between

- Public sector banks and Private banks, and
- Public sector banks and Foreign banks.

In case of *Vendor related risks*, foreign banks here also have reported lowest such risks (mean score of 2.45) while private banks report highest vendor related risks (mean score of 2.74) followed closely by Public sector banks (mean score of 2.73). Pair-wise comparison shows that no two groups of banks are significantly different at 0.05 level.

Barriers to Information Systems Outsourcing

Outsourcing of information systems is accompanied by structural changes in any organization especially in context of its IS division. Outsourcing is associated with a radical approach of the management to have a mutually advantageous alliance with the outsourcing vendor usually over long periods especially in cases where significant portion of IS activities are outsourced. In such an alliance both the client and the outsourcing vendor need to understand each other's requirements and the concerns. In this context, the client's dependence upon the IS vendor increases depending upon the extent of outsourcing undertaken. This relationship hence tends to raise some of the concerns, which expose the clients to different risks. Following are the nine likely reasons that discourage information system outsourcing decisions that have been arrived upon from literature survey and the discussion with executives in the industry and are referred to as IS outsourcing barriers.

- Over dependence on Outsourcer.
- Difficulty in changing / modifying Information Systems.
- Security of Information.
- Inability of Outsourcer to understand business needs of bank.
- Resistance from Bank's employees.
- Resistance from IS personnel.
- Higher operating Costs.
- Retrenchment of IS personnel due to IS Outsourcing.
- Loss of IS expertise.

It was desired to identify the intensity of the each barrier to IS outsourcing which can lead to ranking of these barriers. For this the respondent was made to give its response on a 5-point likert scale on each of the barrier. Ranking of the nine identified barriers was performed based upon the mean scores on these barriers and results have been shown in Table 5. It has been found that *over dependence on outsourcing vendor* is the highest level risk (with mean score of 3.943) closely followed by *Inability of Outsourcer to understand business needs*(mean score of 3.940) and *higher operating costs* (mean score of 3.92). It emerges from the Table 5 that *Resistance from IS personnel* and *Retrenchment of IS personnel* due to IS outsourcing are the least feared risks. Since the banks are increasingly expanding the IS infrastructure, threats perceived by IS employees regarding their job security is low. Further the perception of IS outsourcing risks has been measured under the four categories of banks according to the degree of outsourcing i.e. banks in low, medium, high and very high IS outsourcing.

TABLE 5: BARRIERS TO INFORMATION SYSTEM OUTSOURCING ACROSS ALL BANKS

Mean Score of Barriers To IS Outsourcing in Four Categories of Banks According to Degree of Outsourcing						
Reason	Rank	All Banks	*Low Out sourcing*	Medium Out sourcing	High Out sourcing	Very High Out sourcing
Over dependence on Outsourcer.	1	3.943	3.945	4.200	3.844	3.828
Inability of Outsourcer to understand business needs of bank.	2	3.940	3.891	4.100	4.044	3.750
Higher operating Costs.	3	3.924	3.764	4.00	4.333	3.517
Difficulty in changing / modifying Information Systems.	4	3.792	3.691	3.833	3.911	3.759
Loss of IS expertise.	5	3.641	3.745	4.000	3.422	3.414
Security of Information.	6	3.579	3.654	3.800	3.289	3.655
Retrenchment of IS personnel due to IS Outsourcing.	7	2.410	2.631	2.467	2.222	2.241
Resistance from Bank's employees.	8	2.006	2.454	2.467	1.511	1.441
Resistance from IS personnel.	9	1.911	2.182	2.367	1.489	1.580

It is observed that *Overdepedence over IS outsourcing vendor* is the most important concern of IS managers in the banks falling in low IS outsourcing as well as in the very high IS outsourcing except in the banks in high IS outsourcing category. It reflects that extremes in IS outsourcing, low as well as high exposes the banks to overdependence on the outsourcing vendors. The least critical risk is the *Retrenchment of IS personnel* and it is same in all the four categories of banks.

Further Barriers to IS outsourcing are also compared according to the ownership nature of the banks i.e. among public sector, private sector and the foreign banks. As mentioned earlier the nine reasons that have been identified are ranked based upon the responses of respondents. For this, first banks have been categorized into three groups: public sector, private sector and foreign banks. Further mean score of responses for each of the nine reasons are calculated in each of three categories of banks. Ranking of the risks based upon mean scores for each risk can provide details for analysis of importance of barriers of Information Systems outsourcing. Table 6 provides the details of barriers to IS outsourcing in the three categories of banks. Overdependance on Outsourcing Vendor comes out to be most crucial barrier to outsourcing in public sector banks and private banks but not in foreign banks. However all the three categories of banks have reported Inability of Outsourcing vendor to understand business needs of banks as one of the most important concern that discourages information systems outsourcing in these banks.

TABLE 6: BARRIERS TO IS OUTSOURCING IN PUBLIC, PRIVATE AND FOREIGN BANKS.

Mean Scores of Barriers To IS Outsourcing in Public, Private and Foreign Banks				
Barrier	All Banks	Public Sector Banks	Private Banks	Foreign Banks
Over dependence on Outsourcer.	3.943	3.985	4.059	3.738
Difficulty in changing / modifying Information Systems.	3.792	3.591	4.059	3.786
Security of Information.	3.579	3.773	3.647	3.190
Inability of Outsourcer to understand business needs of bank.	3.940	3.870	3.861	4.167
Resistance from Bank's employees.	2.006	2.420	1.900	1.471
Resistance from IS personnel.	1.911	2.167	1.911	1.500
Higher operating Costs.	3.924	3.697	3.902	4.301
Retrenchment of IS personnel due to IS Outsourcing.	2.412	2.631	2.450	2.020
Loss of IS expertise.	3.641	3.727	3.882	3.214

TABLE 7 GIVES THE TOP THREE CRITICAL BARRIERS TO IS OUTSOURCING IN PUBLIC, PRIVATE AND FOREIGN BANKS

TABLE 7: RANK OF BARRIERS TO IS OUTSOURCING IN PUBLIC, PRIVATE AND FOREIGN BANKS

Reason of IS Outsourcing	Rank in Public Sector Banks	Rank in Private Banks	Rank in Foreign Banks
Over dependence on Outsourcer.	1	1	
Difficulty in changing / modifying Information Systems.		2	3
Security of Information.	3		
Inability of Outsourcer to understand business needs of bank.	2		2
Resistance from Bank's employees.			
Resistance from IS personnel.			
Higher operating Costs.		3	1
Retrenchment of IS personnel due to IS Outsourcing.			
Loss of IS expertise.			

The results show that overdependance is seen crucial factor in case of public sector and private banks while high costs emerge critical factor in foreign banks.

CONCLUSION

The paper emphasizes the importance of assessing the IS outsourcing risks while deciding the outsourcing. The outsourcing risks can be divided into three categories of Information related risks, technology risks and vendor related risks. The study has analyzed the outsourcing risks according to the degree of outsourcing and analyses the varying pattern of risks at different levels of outsourcing. It is found that banks that outsourced to lesser extent faced lesser information related risks. While the risks increased as outsourcing increase, however at high outsourcing level, the risks show decrease from the previous levels. This may be greatly attributed to more caution and countermeasures taken by banks that outsourced at high levels coupled with the higher stakes of both the outsourcing vendor(s) and the banks. Quite similar trend is observed in case of technology related risks. In such case, it is observed that technology risks show lower scores at very high outsourcing compared to average and high levels of IS outsourcing. This is attributed to banks associating the IS technology as the non-core functions and also increase availability of standard IS services by variety of IS vendors. Vendor related risks are low at low IS outsourcing level and at high and higher categories showing a zig-zag movement. While at low outsourcing level, it is understandable owing to limited role of IS outsourcing vendor. In the case of high and very high outsourcing category, the trend may be explained by the fact that in such cases vendors' stakes are high that lead to risk sharing as perceived by the banks. This requires the manager to analyse the type of outsourcing risks that may be relevant to his company and according provision can be made for the suitable countermeasures in contingent situations.

The banks are also analyzed according to their ownership, categorizing under three categories of

Public sector, Private and Foreign banks. It is observed that foreign banks have reported lesser risks than in public sector and private sector banks. This can be attributed to the experience of the foreign banks in IS outsourcing which for other two category of public and private sector banks in India is relatively new. Further ranking of the nine IS outsourcing barriers show that overdependence on outsourcer may be most crucial barrier. The barriers are reported to be different for different banks that practiced IS outsourcing differently as also upon the ownership nature of the bank

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