Impact of information systems outsourcing: a study of Indian banking sector

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Abstract: In recent years information system (IS) outsourcing is increasingly being explored as an option to get the better output from the IS infrastructure. However the results of IS outsourcing are mixed. This paper has tried to assess the impact of IS outsourcing in short, medium and long term. The study also has compared the impact of IS outsourcing according to the different degree of outsourcing. The study shows that there is significant improvement in short-term impact in terms of efficiency, service level and cost savings with the increase in degree of IS outsourcing. However, in long-term, impact of outsourcing may not be favourable at high degree of outsourcing.

Keywords: IS outsourcing; outsourcing; impact; outsourcing degree; selective IS outsourcing.


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M.P. Gupta is a Group Chair of IT and a Coordinator of the Center for Excellence in E-governance at IIT Delhi. His research interest lies in the areas of IS/IT planning, e-business and e-government. He has authored acclaimed book Government Online and edited two others entitled Towards E-Government and Promise of E-Government, published by Tata McGraw Hill in 2004. His research papers have appeared in national and international journals/conference proceedings. He has coordinated several national and international seminars/conferences and has been a part of their international programme committees. He is on the jury of Computer Society of India (CSI) National E-gov Awards.
1 Introduction

The rapid growth of information technology across the industries has led organisations to achieve efficiencies and effectiveness in operations, attain competitive advantages, and helped realise the much wanted customer orientation. However, it has also brought problems to the organisations on account of increasing complexities in the management of information systems (IS), rapidly changing IS application tools and high investments required in its IS infrastructure. Outsourcing has been seen as an effective solution to such problems by various authors (Palvia, 1995; Lacity et al., 1996; Willcocks et al., 2000; Aubert et al., 2004; Gonzalez et al., 2005; Walden and Hoffman, 2007; Beasley et al., 2009; Lacity et al., 2009) as well as many research agencies like International Data Corporation (IDC), Gartner, KPMG, etc. Over the years IS outsourcing has taken the shape from IT hardware maintenance in 60s’ to contract programming in 70s’ and currently to total outsourcing (Yang and Huang, 2000). IS outsourcing has witnessed rapid growth in recent past. According to IDC, world wide outsourcing market reported from $100 billion in 1998 to $151 billion in year 2003 with a 12.2% CAGR, while Wang and Yang (2007) reported the outsourcing market at $236 billion in 2007. The Gartner Group has projected worldwide spending on IS outsourcing to the tune of $325 billion by year 2013 (Qu et al., 2010). The outsourcing trend is evident from the findings of The Economic Intelligence Unit that while in 1990s 34% of companies undertook IS outsourcing, the figures were expected to have reached 58% by 2010 (Barthelemy, 2003). This trend has been further attested by various research agencies like IDC, PA Consulting group surveys and different websites such as the Institute of Outsourcing website and others predicting high growth in IS outsourcing.

Outsourcing may be defined as the procurement of products or services from sources that are external to the organisation (Lankford and Parsa, 1999). However the meaning of outsourcing of IS has evolved over time and the concept and definition has become blurred (Fink, 1994). Various researchers have defined IS outsourcing. Martinsons (1993) defines the IS outsourcing as the act of subcontracting all or parts of the IS function to an external vendor; while Loh and Venkatraman (1992) have defined IS outsourcing as the significant contribution by external vendors; Takac (1994) includes the ownership dimension to the IS outsourcing; Grover et al. (1993) defines IS outsourcing as the practice of handing over part or all of IS infrastructure to external service provider(s). Hence, IS outsourcing or information technology (IT) outsourcing that is used interchangeably would refer to use of external vendors performing internal organisational activities related to IS infrastructure. There are many ways to examine IS services for the purpose of outsourcing. For example, IS functions are just simply classified into system operation and software development (Aubert et al., 1996). Lacity et al. (1996) have categorised the IS outsourcing into four categories depending upon the extent to which a company relies on the outsourcer in terms of the proportion of IS expenditure for its IS activities and these are total outsourcing, total insourcing, selective IS outsourcing and de facto insourcing. Similarly others have categorised IS outsourcing (Apte, 1990; Apte and Winniford, 1991; Loh and Venkatraman, 1992; Grover et al., 1994) as complete IS outsourcing, facilities management outsourcing, systems integration outsourcing, application service providers, etc., Rental contracts for IS services as network service, service retention, service transfer and asset transfer (Takac, 1994), application development and maintenance, system operation, network/telecommunication management, end user computer support, system planning and management and purchase
of application software (Grover et al., 1996). Hence, it is evident from literature that there is high variation in the understanding of scope of IS outsourcing. This leads to emphasising the importance of the need to figure out the kind of activities that should be kept in the purview of IS outsourcing. This would result in devising the right IS outsourcing solutions and strategies.

2 Impact of IS outsourcing

Outsourcing affects a company in short-term as well as in long-term. Effects of outsourcing may not be instantaneous and its long-term impact may be more significant than the short-term effects (Beasley et al., 2009; Gwebu et al., 2010). The outsourcing allows the firm to streamline operations and focus on what it does best. There are instances where companies have been trying to return to profitability, by using outsourcing (Thouin et al., 2009). IS outsourcing has impact on stock valuations too and these have been reported in both directions – upward as well as downward. Agrawal et al. (2006) reported increase in the stock valuations after the companies undertook IS outsourcing though others have reported the opposite (Florin et al., 2005; Oh et al., 2006; Qu et al., 2010). IS outsourcing is not limited to large organisations only, even the small and medium sized organisations are reported to have adopted IS outsourcing (Rohde, 2004) for varied reasons.

Various authors have described in details about the benefits as well as disadvantages of IS outsourcing. The companies that outsource IS functions have reported benefit from cost savings, reduced employment costs, strategic fitness, improved management effectiveness, technology acquisition and upgrade; improved flexibility and the better service quality of IS (Martinsons, 1993; Juma’h and Wood, 2000; Yang and Huang, 2000; Martinsons and Cheung, 2001; Gonzalez et al., 2005; Beasley et al., 2009; Faisal and Banwet, 2009). Outsourcing may result in flexibility into their bureaucratic structures in public sector that would result in higher degree of satisfaction among internal customers (Harris et al., 1998). However, outsourcing can lead to risks too. Martinsons (1993) has identified risks of over reliance on IS vendors and loss of strategic flexibility as the potential disadvantages. Others have listed the risks which range from incomplete contracting, lack of maturity and experience on part of company and vendor (Willecocks et al., 1995), loss of innovative capabilities and technological indivisibility (Earl, 1996; Hoecht and Trott, 2006), project life cycle risks (Chou and Chou, 2009), intangible costs of outsourcing, technological captivity to vendor, etc. (Palvia, 1995), switching costs (Whitten and Wakefield, 2006; Whitten et al., 2010), negative impact on employee morale and performance (Elmuti and Kathawal, 2000), strategic and operational risks (Adeleye et al., 2004), hidden costs (Khalfan, 2004), risks from social, political and cultural perspective (Bahl and Rivard, 2005) and so on. The risks of outsourcing are relevant to the suppliers’ too as has been reported by different authors (Auudhe and Mathew, 2009; Mao et al., 2008).

The assessment of outsourcing technology’s impact on organisational functioning is complex due to the many influences on performance metrics (Grover et al., 1998; Gwebu et al., 2010). An information technology survey in UK by PA Consulting Group showed that over 40% of participants felt unable to make an estimate. This would suggest that companies are not able to measure the impact of outsourcing. This is mainly due to multiple dimensions associated as strategy, economics, management, technology, quality
and difficulty of predicting these cost, technology, and demand evolution for more than three years (Bounfour, 1999; Yang and Huang, 2000). Bryson and Ngwenyama (2006) advocate that IS outsourcing relationship cannot be based on zero-sum philosophy and needs to be based on win-win basis between vendor and the client. There is need to look for innovative forms in IS sourcing (Vardarajan, 2009; Ferreira and Laurindo, 2009; Krishnamurthy et al., 2009) Hence, it emerges from the literature review that companies have experienced positive effects of IS outsourcing in terms of cost savings, focus on core competence, financial flexibility. However, there are cases where outsourcing of IS has resulted losses in form of decreased employees’ motivation, loss of innovative capabilities, technological captivity to vendors, etc.

3 Specific to banking sector in India

Information technology has transformed banking by opening up new cost-saving, risk-reducing, and profit-enhancing strategies by replacing the physical banking with technology-aided banking (Ang and Cummings, 1997; Morrison and Brien, 2001). Continuing technological advances in computers and communications steadily has reduced transaction cost of banking. Technological innovations in financial products transformed financial services by way of sophisticated cash management, securitisation of mortgage loans, massive trading in government securities, and money market mutual funds with IS handling the speed and enormous volume of financial transactions (Steiner and Teixerira, 1990; Nitsure, 2003) while telecommunications spread information instantaneously, linking formerly separate financial markets into an integrated world market. This has led to the practice of process innovations and outsourcing in the banking sector (Valuenotes, 2009).

The world over, banks are increasingly using outsourcing, to third parties who may be unrelated or member of the group/conglomerate as a means of both reducing cost and accessing specialist expertise, not available internally and achieving strategic aims. However IS outsourcing brings in its wake, several risks. The failure to manage these risks can lead to financial losses/reputational risk for the bank and could also lead to systemic risks within the entire banking system in the country. It would therefore be imperative for the bank outsourcing its activities to ensure effective management of these risks. In this direction the Reserve Bank of India (RBI), which regulates the banking sector in India, has formulated the guidelines that are to be followed by the banks in India practising outsourcing.

Outsourcing by Indian banks started in a very basic level in the form of Annual maintenance contracts some 15 years back. Foreign banks and private banks are just, as was in the case of technology usage, in the forefront of outsourcing revolution that is slowly but surely entrenching its way across the banking sector. A major milestone in IS infrastructure outsourcing by India Inc. was written with Bank of India outsourcing the implementation and management of its core banking solution to HP. Though at $150 million, this is one of the largest BFSI infrastructure-outsourcing contracts in the entire Asia-Pacific and it spurred other Indian banks, public as well as private banks, to jump into the total outsourcing bandwagon. Yes Bank, a new age private bank, outsourced its entire technology requirements for its offices and branches across India to Wipro Infotech, an Indian IS company. A unique ‘pay-per-use’ model will help Yes Bank stave off up to 30% in costs, progressively over the next seven years. The arrangement
ensures that Yes Bank’s initial technology investments are minimal, and its overall IS spends are variable and predictable, in line with its planned growth.

At present most of the outsourcing that takes place are low-end staff related and non-core banking operations. Experts estimate that the Indian market would be ready for outsourcing core banking operations only in another four to five years. Processes like e-banking, e-commerce, IS outsourcing and the outsourcing of the set-up and maintenance of ATM operations are the major areas likely to be exploited in the near future. As confidence in outsourcing starts building up, the banking industry is likely to move from facilities management to IS outsourcing. banks are also likely to move from just outsourcing IS services to business process outsourcing, the phenomenon that has been witnessed in companies in the USA and Europe.

4 Research model and propositions

Literature survey revealed that there are many studies on issues related to IS outsourcing, but very few studies have examined IS 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 organisations. The study is executed by conceiving a research model of assessing the impact of outsourcing the IS services in the banks in India. The research model is presented in Figure 1. The impact variables have been taken from a model as proposed by King and Malhotra (2000), and have been modified for our study. The research aims at identifying and assessing the impact in three categories according to the time period in terms of short-term, medium-term and long-term impact. The impact would be analysed according to the degree of outsourcing of IS services ranging from low to very high. Short-term impact is assessed in terms of efficiency of IS, cost savings and service levels provided by IS. Further medium-term impact is assessing outcome-based performance, controls over the IS and risks posed from IS outsourcing. Long-term impact is visible on the core competencies and learning competence of the banks.

Figure 1 Impact of IS outsourcing: the research model

- **Degree of information system outsourcing**
  - Very high outsourcing
  - High outsourcing
  - Average outsourcing
  - Low outsourcing
  - Very low outsourcing

- **Short-term operational impact**
  - IS efficiency
  - Cost savings
  - Service levels

- **Medium-term tactical impact**
  - Outcome-based performance
  - IS control
  - IS risks

- **Long-term strategic impact**
  - Core competence
  - Learning competence
4.1 Research variables and propositions

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

4.1.1 Degree of IS outsourcing

It emerged from the literature review and discussions that there are mainly three types of IS 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 and selective sourcing. However, it was observed this classification did not apply in Indian banks because, as very few Indian banks practiced total IS outsourcing. This is in line with the findings by Cullen et al. (2005) reporting varying levels of IS outsourcing practiced in different countries. And hence, based upon the inputs obtained from the literature survey and understanding of the actual practices in Indian banks, degree of IS outsourcing would be measured on the proportion of IS expenditure going to the third party IS vendor for the IS 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

4.1.2 Impact of IS outsourcing

It is very important to consider the impact of outsourcing considering not only the benefits that would be roped in by the vendor but it should also include all the likely risks associated with the outsourcing relationship. Impact of outsourcing may be divided into three categories depending upon the time period as short-term impact, medium-term impact and long-term impact.

- **Short-term impact:** This category would include the effects of outsourcing which are usually felt in six months to one year from the start of outsourcing. These may be concerning the change in the efficiency, service levels of the IS operations, cost savings, etc.
- **Medium-term impact:** This impact would result over a time span of one year to three years from the initiation of outsourcing. It usually deals with the tactical business concerning the change in overall performance levels of whole systems and processes, control over IS including experiences with the outsourcing vendor and its associated risks.
- **Long-term impact:** Long-term impact of outsourcing would be felt usually after three years and onwards and deals with subjects usually strategic to the company. It would consist of the changes in the organisation culture, impact of the new
organisation structure after outsourcing, increase/decrease in core strengths of the company and development of new skills and competencies by the company.

4.2 Research propositions

Cluster of research propositions as derived from the research model are given below:

4.2.1 Efficiency of IS

Efficiency is concerned with the resources consumed in producing a given service in a timely manner according to the agreed standards.

Efficiency of IS may be measured in terms of system through put, down time of IS, response time to queries, system responsiveness to changes in processes.

The logic of outsourcing is that if the external service provider would be in a better position to deliver the services by virtue of its expertise in the area, higher sensitivity to the user requirements and clearly laid down service deliverables. Hence, higher the outsourcing increased, higher would be the efficiency of the IS. The following is hypothesised:

Research proposition P1 Efficiency of IS would be significantly different in banks practising different degree of IS outsourcing.

4.2.2 Service levels

Service levels of an IS may be referred to the standards of deliverables from IS that may be utilised by the users of that IS. Service levels corresponding to an IS can be measured in terms of IS service availability, relevant information, completeness of information, user friendly features, number of errors, etc. It has been observed that many internal IS departments are faulted by users for unsatisfactory services that they provide. When users pay to external vendors for services, they tend to focus on high-priority projects and to be more precise in establishing their requirements. Hence, high service levels may be achieved through high degree of outsourcing. Hence:

Research proposition P2 Service levels of IS would be significantly different in different banks that practice varying degree of IS outsourcing.

4.2.3 Cost savings

Cost of acquiring IS services would include from the cost of IS hardware and software, IS spares, employees wages and overheads, training costs and other components as communication costs vendor managements costs. In an internal IS setup there may be overuse or under use of IS resources be it IS equipment or skilled IS manpower as these are treated as ‘free services’. In many cases the organisation may not be able to calculate the total cost of these services because of faulty transfer pricing mechanism. Cost savings has been reported to be key driver for IS outsourcing (Lacity et al., 1994; Fischer et al., 2008; Lacity et al., 2009). Through the outsourcing of IS services, the organisation is able to consume the required IS services at real costs. Further the user may be able to get cost benefits from the shared IS infrastructure of the external IS services provider. It is translated into:
Research proposition P3  Cost savings due to outsourcing would be different in banks practising different degrees of IS outsourcing.

4.2.4 Outcome-based performance

Outsourcing approaches rely on outcome-based performance measures instead of behaviour-based performance measures that exist in Internal sourcing setup. When a performance system is more outcome-based, the role of senior executives in monitoring and directing the day-to-day activities and behaviour of personnel and other resources should be less, and hence organisation would involve more objective performance measures. The outcome-based performance derived from IS outsourcing defined for this study has the dimensions in terms of overall satisfaction with the IS, effectiveness of management, quality of planning, staff turnover, operational performance, optimum financial returns on IS investments, quality of service to customers and value additions offered to customers.

Hence it leads to the proposition:

Research proposition P4  Different degrees of IS outsourcing would result in different levels of outcome-based performance.

4.2.5 IS controls

Control is defined as the power of directing. Its scope includes those policies and procedures necessary to prevent, detect and correct errors and irregularities that affect data and the efficiency and effectiveness of IS setup. The attributes of IS that are being studied in this study are as:

- Controls and flexibility in input/output formats, selection of technology, capability to assess IS tasks, control over IS personnel, control over retaining IT employees, control in system development process.
- Maintaining control over an outsourced IS setup is complicated by the power of the outsourcing vendor and this power is determined by the degree of outsourcing. This can be expressed as:

Research proposition P5  Banks with different degrees of IS outsourcing would require significantly different level of IS control and monitoring mechanism.

4.2.6 IS related risks

Risk may be defined as “the possibility of any form of loss”. In the context of IS following risks in outsourcing process may occur as disclosure of business plans and operational data, outdated technology forced by vendor, transfer of knowledge to vendor, loss of in-house IS expertise, etc. These risks are dependant upon the extent of outsourcing. This is stated as:

Research proposition P6  The degree of risks associated with IS outsourcing in banks would be significantly different in banks that practice different degree of IS outsourcing.
4.2.7 Core competence skills

Core competencies are individual or groups of intangible assets that constitute and embody the organisation’s capabilities, skills, knowledge, experience, people, resources and intellectual property that are the source of company’s ability to deliver unique value to its customers. While IS may be driven by strategy, strategy may also be influenced by the emergence of new technologies and the development of new information-based capabilities. It leads to research proposition:

Research proposition P7 The degree of IS outsourcing would result in different levels of core competence in the different groups of banks.

4.2.8 Learning competence

Learning competence may be referred to as the availability of the environment that facilitate the acquisition and development of new competencies and maintaining and updating the existing core competencies. Banks that rely heavily on outsourcing may find their internal skill-sets deteriorating as they become ‘locked out’ from learning new skills and technologies that are critical in the marketplace. This results in:

Research proposition P8 The learning competence in groups of banks practising different degrees of IS outsourcing would be different.

5 Research methodology

A questionnaire survey has been used for obtaining quantitative input and for testing the developed research propositions. Set of ten questionnaires along with a brief of IS outsourcing were mailed to all heads (information systems department) of the 97 commercial banks operating in India to conduct survey of IS 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 cooperative banks were not included in the study, as these banks have localised presence and are not intensive users of Information technology tools.

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. All of these 159 responses from the banks have been divided into four groups according to the degree of outsourcing of IS services in these banks. These are low, medium, high and very high IS outsourcing. Table 1 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 six responses (3.7% of total responses) and hence these have been clubbed with ‘low IS outsourcing’ for further analysis. The data obtained through this have been tested statistically to support (or not support) the
propositions. 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.

Table 1  Statistics of obtained responses

<table>
<thead>
<tr>
<th>Outsourcing category</th>
<th>Responses obtained</th>
<th>Percentage of total responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very low IT outsourcing</td>
<td>6</td>
<td>3.7%</td>
</tr>
<tr>
<td>Low IT outsourcing</td>
<td>49</td>
<td>30.2%</td>
</tr>
<tr>
<td>Average IT outsourcing</td>
<td>30</td>
<td>19.2%</td>
</tr>
<tr>
<td>High IT outsourcing</td>
<td>45</td>
<td>28.4%</td>
</tr>
<tr>
<td>Very high IT outsourcing</td>
<td>29</td>
<td>18.2%</td>
</tr>
<tr>
<td>Total</td>
<td>159</td>
<td>100%</td>
</tr>
</tbody>
</table>

Since the research model for this study consists of three major impact components, i.e., short-term operational impact, medium-term tactical impact and long-term strategic impact. Separate factor analysis was performed for each of these components. Items with factor loading of less than 0.5 were not considered for further analysis. Further, the instrument was tested for reliability. Reliability measures the internal consistency of the instrument. This is assessed using Cronbach’s alpha. High values of Cronbach’s alpha indicate high internal consistency of the multiple items measuring each construct, hence indicating high reliability of the individual construct. The results of the instrument are presented in Table 2. The reliability coefficients are more than the cut-off value of 0.6, which is recommended as acceptable for empirical research of similar nature.

Table 2  Reliability testing

<table>
<thead>
<tr>
<th>Construct</th>
<th>No. of items</th>
<th>Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>IS efficiency</td>
<td>4</td>
<td>0.704</td>
</tr>
<tr>
<td>Service level of IS</td>
<td>5</td>
<td>0.684</td>
</tr>
<tr>
<td>IS costs</td>
<td>6</td>
<td>0.641</td>
</tr>
<tr>
<td>Outcome-based performance</td>
<td>9</td>
<td>0.746</td>
</tr>
<tr>
<td>IS controls</td>
<td>7</td>
<td>0.725</td>
</tr>
<tr>
<td>Risks</td>
<td>7</td>
<td>0.672</td>
</tr>
<tr>
<td>Core competence</td>
<td>3</td>
<td>0.713</td>
</tr>
<tr>
<td>Learning competence</td>
<td>5</td>
<td>0.662</td>
</tr>
</tbody>
</table>

6  Findings

The questionnaire used for eliciting quantitative data was aimed at measuring the impact of outsourcing of IS services in short term, medium term and long term. There are three short-term variables and these are efficiency, cost savings and service level. There are three medium-term impact variables and these are outcome-based performance, IS
control and IS related risks. Long-term impact is measured through two variables that are core competence and learning competence. The summary statistics of the impact variables for the four groups of the banks are shown in Table 3.

Table 3  Mean score of impact variables

<table>
<thead>
<tr>
<th>Impact variables</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
<th>Very high</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Efficiency</td>
<td>3.64</td>
<td>0.60</td>
<td>4.26</td>
<td>0.40</td>
</tr>
<tr>
<td>Service level</td>
<td>3.73</td>
<td>0.59</td>
<td>4.02</td>
<td>0.37</td>
</tr>
<tr>
<td>Cost savings</td>
<td>3.19</td>
<td>0.43</td>
<td>3.42</td>
<td>0.27</td>
</tr>
<tr>
<td>Performance</td>
<td>3.91</td>
<td>0.53</td>
<td>3.99</td>
<td>0.30</td>
</tr>
<tr>
<td>Control</td>
<td>3.54</td>
<td>0.61</td>
<td>3.63</td>
<td>0.30</td>
</tr>
<tr>
<td>Risk</td>
<td>2.51</td>
<td>0.60</td>
<td>3.04</td>
<td>0.55</td>
</tr>
<tr>
<td>Core competence</td>
<td>3.65</td>
<td>0.67</td>
<td>4.17</td>
<td>0.38</td>
</tr>
<tr>
<td>Learning competences</td>
<td>3.70</td>
<td>0.53</td>
<td>3.87</td>
<td>0.32</td>
</tr>
</tbody>
</table>

Note: SD stands for standard deviation.

It is seen from Table 3 that banks that fall in higher IS outsourcing category have reported higher mean score than the banks that fall in low outsourcing category. Similar trend is seen in case of impact variables of service level and cost. It implies that banks that outsource more of their IS functions have experienced higher satisfaction on account of short-term effects of outsourcing. This leads to the presumption that IS outsourcing can provide short-term gains. For medium-term impact variables: performance and IS control, banks in low outsourcing category again lag behind the banks that outsource extensively. However, in case of performance variable, it is observed that difference between banks with high and very high outsourcing is small. In case of long-term impact variable: core competence, Table 3 shows that banks in high outsourcing category report higher score than banks in low outsourcing. Similarly, in case of learning competence, an interesting trend is observed. While the learning competence increases as degree of outsourcing increase, however at very high outsourcing, learning competence shows decline as compared to previous lower level of outsourcing indicating thereby that very high outsourcing may not be good for learning competence in banks.

Comparison of research variables among banking groups is done using analysis of variance (ANOVA) test. Table 4 presents the results of ANOVA test. F-value in the ANOVA test allows us to accept or reject the null hypothesis that all group means are equal. Rejection allows us to conclude that some of the group means are different, i.e., a significant value of F indicates that at least one of the pair wise differences is significant but it does not indicate which differences are significant and which are not. To understand this, pair wise comparison using Duncan’s Mean test for multiple range analysis is also done. The results of pair-wise multiple comparisons are presented in Table 4.
Table 4

Results of multiple pair-wise comparison

Comparison of impact variables amongst four categories of banks with different levels of IS outsourcing

<table>
<thead>
<tr>
<th>Impact variable</th>
<th>Low vs. medium</th>
<th>Low vs. high</th>
<th>Medium vs. high</th>
<th>High vs. very high</th>
<th>F-value</th>
<th>p-value</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficiency</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>38.49</td>
<td>0.0000</td>
<td>**</td>
</tr>
<tr>
<td>Service level</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>15.52</td>
<td>0.0000</td>
<td>**</td>
</tr>
<tr>
<td>Cost savings</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>55.08</td>
<td>0.0000</td>
<td>**</td>
</tr>
<tr>
<td>Performance</td>
<td>-</td>
<td>*</td>
<td>*</td>
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<td>9.86</td>
<td>0.0000</td>
<td>**</td>
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<tr>
<td>Control</td>
<td>-</td>
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<td>-</td>
<td>0.97</td>
<td>0.4095</td>
<td>-</td>
</tr>
<tr>
<td>Risk</td>
<td>*</td>
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<td>-</td>
<td>-</td>
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<td>*</td>
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<td>31.88</td>
<td>0.00</td>
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<tr>
<td>Learning Competence</td>
<td>-</td>
<td>*</td>
<td>-</td>
<td>-</td>
<td>5.53</td>
<td>0.0012</td>
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</tbody>
</table>

Notes: *Implies significant at 0.05 level
**Implies significant at 0.01 level.

Results of ANOVA indicate that while there are significant differences among banking sector on research variables (such as efficiency, service level, costs, risk, core competence) the differences are not significant for the IS control variable. Detailed discussion on the results, for the various variables is provided below.

6.1 IS efficiency

Results indicate that IS efficiency is significantly different among the four groups of banks (p = 0) as obtained from results of ANOVA test (Table 4). Pair wise multiple comparison presented in Table 4 shows the difference is significant between all the groups of banks, i.e., banks with low, medium, and high IS outsourcing except between banks with high IS outsourcing and banks with very high IS outsourcing. While the group mean of banks with very high IS outsourcing is slightly higher (Mean of 4.47) than group mean of banks with high IS outsourcing (Mean of 4.46), however the difference is not significant. This shows that outsourcing increases the efficiency of IS. However, the improvements may not be significant at very high degree of IS outsourcing.

6.2 IS service level

Service levels of IS differ significantly across banking groups (p = 0) as given by ANOVA test (Table 4). To understand difference between the groups, pair wise multiple comparison presented in Table 4 shows the difference is significant among the following group of banks, i.e., banks with low, medium and high IS outsourcing with one another. There is no significant difference between banks with high IS outsourcing and banks with very high IS outsourcing. While the group mean of banks in very high IS outsourcing (4.34) is different (higher) than group mean of banks in high IS outsourcing (4.27) but the
difference is not significant. Hence, it can be interpreted that service level of IS increases significantly up to a level of outsourcing and after that increase in service level is there but it is not significant.

6.3 Cost savings

Results indicate that IS cost savings vary significantly different among the four groups of banks (p = 0) as obtained from results of ANOVA test (Table 4). Further to understand difference between the groups, pair wise multiple comparison shows the difference is significant among all the groups of banks, i.e., banks with low, medium and high IS outsourcing with one another. There is no significant difference between banks with high IS outsourcing and banks with very high IS outsourcing. While the group mean of banks with very high IS outsourcing is slightly higher (Mean of 4.34) than group mean of banks with high IS outsourcing (Mean of 4.27) but the difference is not significant. This shows that outsourcing increases the cost savings of acquiring IS services. However, the improvements may not be significant at very high degree of IS outsourcing.

6.4 Outcome-based performance

Outcome-based performance differ significantly across banking groups (p = 0). To understand difference between the groups, pair wise multiple comparison presented in Table 4 shows the difference is significant among the groups of banks, i.e., banks with low, medium and high IS outsourcing. However, there is no significant difference between banks with low IS outsourcing and banks with medium IS outsourcing as well as between banks with high IS outsourcing and banks with very high IS outsourcing. While the group mean of banks on performance in medium IS outsourcing is higher (3.99) than that of banks in low IS outsourcing (3.90), performance is not significantly higher. Similarly banks in very high IS outsourcing have reported only small lead in performance variable over the banks in high IS outsourcing. Hence, it can be interpreted that performance of banks shows significant improvement difference from the medium IS outsourcing degree to high IS outsourcing degree only. It shows that significant improvements in performance in bank are materialised only when a critical minimum level of outsourcing of IS is attained and further at very high degree of IS outsourcing also, banks may not generate significant improvement in performance.

6.5 IS controls

IS controls do not differ significantly across banking groups (p = 0.4095). However, analysing the means of the four groups of banks, it is observed that control over IS increases consistently (though not significantly) as degree of IS outsourcing increases through banks in low IS outsourcing (mean of 3.54), banks in medium IS outsourcing (mean of 3.63), and in banks in high IS outsourcing (mean of 3.76) and is maximum at this level (high IS outsourcing) of IS outsourcing. IS controls then shows decline towards banks in very high IS outsourcing (mean of 3.72). It indicates that after a high limit of outsourcing, control over IS starts declining. This is line with the observations of many authors who have advised proper control in outsourcing relationships (Heiskanen et al., 2008).
6.6 IS risks

Risks emerging from IS are significant across the groups of banks ($p < 0.0027$). Pair-wise comparison indicates there is a significant difference between banks falling in low and medium IS outsourcing and between banks in medium and high IS outsourcing category. It is observed that amount of risk increases as degree of outsourcing increases from very low to medium IS outsourcing (mean score 2.51 to 3.04). However, risk then shows decrease at high IS outsourcing level (mean score of 2.70) and further upon increasing outsourcing, risks again show upward trend at very high IS outsourcing (mean score of 2.80). Banks that outsource in very limited scope of their IS may experience higher risks as there are likely to be conflicts in the ownership of responsibility in such relationships between the bank and the outsourcing vendor.

6.7 Core competence

Core competence in banks differ significantly across the banks ($p = 0$). Table 3 shows that mean score of banks on core competence increases as they increase the degree of outsourcing indicating that core competence in banks increase as the degree of outsourcing increases. To understand differences between the groups pair-wise multiple comparison presented in Table 4 shows the difference is significant between all pair-wise bank groups except between the group of banks having very high and high IS outsourcing. Hence, it can be interpreted that core competence skills increase significantly up to high IS outsourcing but after that increase in core competence is there but it is not significant increase. This supports the management philosophy of one school of thought that believes IS functions are non-core activities and should be outsourced to remain competitive.

6.8 Learning competence

Learning competence in banks differ significantly across the banks ($p < 0.0012$). Pair-wise comparison indicates there is significant difference between banks in low and high IS outsourcing as well as in very high IS outsourcing. It is observed that learning competence skills increase as the degree of outsourcing increases continuously up to high outsourcing level only and at very high outsourcing level, banks experience decrease in learning capabilities. Thus, banks that outsource extensively run the risk of losing competitive skills in long term.

7 Discussion on outcomes

Results show that degree of IS is significantly related to the impact of outsourcing in short term, medium term and long term except on one impact variable, which is, IS controls. It leads us to believe that IS outsourcing leads to positive results in short term, medium term and long term which has important implications for managers who are going to make IS outsourcing for their organisations. As for as IS controls are concerned, it seems that IS outsourcing may be perceived by managers not to affect the IS controls. When this observation was probed in more details in the interviews with respondents, the IS manager in one bank that outsourced extensively (in very high IS outsourcing
category), the manager responded with observation that “we are not bothered with IS technicalities and are concerned only about the output performance from these IS functions. We have the sufficient control systems built into the outsourcing alliance with the outsourcing vendor”. The IS managers in banks that outsourced extensively believed to have meticulously prepared the outsourcing plan, technology to be used, detailed documented specifications of IS function and deliverables of IS functions. Hence, the managers had adequate confidence in IS controls in the outsourcing relationship with the vendors. The banks in low outsourcing category (inhouse IS setup) reported high control as these banks have active role in all the activities of IS acquisition. Another reason for such response over IS controls in these banks may also be attributed to the fact that IS functions are increasingly being considered too complex and non-core functions. Hence, there is lesser importance attached to control over how IS services are generated and managers are interested more in the output of IS activities.

Further analysing the impact of outsourcing at different degrees of outsourcing, it has emerged that outsourcing leads to positive effects up to a level and at very high level of outsourcing, either the impact does not lead to significant improvement or there is negative impact. While outsourcing IS may in general give positive results in short term, its impact in medium and long term may not follow the same trend. Long-term impact especially in form of learning competence in IS outsourcing is not favourable at high degree of outsourcing levels. This validates various authors advocating for selective IS outsourcing (Lacity et al., 1996; Willcocks et al., 2000; King and Malhotra, 2000; Straub et al., 2008).

The study shows that there is significant improvement in short-term impact in terms of efficiency, service level and cost savings with the increase in degree of IS outsourcing. This is in line with many authors who have found cost savings from the IS outsourcing (Lacity et al., 2009). However, at very high degree of outsourcing while there are improvements on these impact variables but these improvements may not be significant. Thus, outsourcing of IS up to high levels may produce positive results but very high levels of outsourcing may not produce proportionate returns. Performance parameters show significant improvement only when a reasonable degree of outsourcing is attained and further at very high outsourcing degree the performance of the banks may not increase significantly. This is conforming to the experience of IS outsourcing wherein too high IS outsourcing has not resulted expected benefits (Lacity and Willcock, 1998; Seddon, 2001; Straub et al., 2008). It may be interpreted that benefits of outsourcing start at medium level only and on other extreme, beyond a level (at very high outsourcing) also, benefits are not significantly higher. This can be attributed to the reason that there is a gestation period in outsourcing relationship, and after this period only, the benefits start pouring in for the organisation. This has the relevance particularly for the managers whereby the managers need not panic on the problems that may arise in the initial period of the outsourcing relationship.

There is no significant relationship found between the IS controls and the degree of IS outsourcing. It is observed that IS controls initially increase when outsourcing increases but further more outsourcing leads to decrease in controls over IS. One of the reasons may be that learning through experience in managing outsourcing relationship leads to more controls over IS even though outsourcing increases. However, at high outsourcing levels, there is possibility of shift of power in favour of the outsourcing vendor. Risks emerging from IS outsourcing increases initially but as outsourcing increases further, the banks may experience lower risks. One reason for this would be that initially at low
outsourcing there may not be a strong vendor relationship leading to weak IS controls built into the systems but at higher levels of outsourcing, banks and vendors, because of high stakes for both parties, tend to put countermeasures leading to lower risks. This emanates from the experiences of the practising managers and organisations wherein they have evolved strategies to deal with specific outsourcing risks as reported by different authors (Lacity and Willcock, 1998; Apte et al., 1997; Watjatrakul, 2005; Sakthivel, 2007). However, at very high outsourcing levels, risks have reported increase in level.

Results show that outsourcing promotes building of core competence in banks. There are cases which have found the importance of learning curve effects resulting from IS outsourcing (Lacity and Willcock, 1998; Lacity et al., 2009). Various banks that have outsourced more have reported higher core-competence skills than those banks that outsourced lesser of their IS. However, in long-term, outsourcing may not facilitate learning competence in banks. Similar concerns have been reported in the literature (Barthelemy, 2003; Kaiser and Hawk, 2004). At limited outsourcing learning competence tends to increase in banks as outsourcing increases but at high levels, this shows declining trend. Hence, in long-term banks are advised to address this issue if they plan high outsourcing.

8 Concluding remarks

In recent years IS outsourcing has witnessed increasing interest. While proponents of outsourcing have discussed the benefits of outsourcing, there are critics who have reported the risks of outsourcing. This study has tried to assess the impact of IS outsourcing in Indian banks. The study assessed the impact of outsourcing in short, medium and long-term impact variable. The study shows that there is significant improvement in short-term impact in terms of efficiency, service level and cost savings with the increase in degree of IS outsourcing but at very high degree of outsourcing while there are improvements on these impact variables but these improvements may not be significant. Thus banks that that face tough competition or lag in their IS infrastructure compared to their competitors, are advised to consider outsourcing of IS in their banks as a solution to faster acquisition of IS capabilities.

In the medium-term, outsourcing shows significant improvement only when a reasonable degree of outsourcing is attained and further at very high outsourcing degree the performance of the banks may not increase significantly. It is observed that IS controls initially increase when outsourcing increases but further more outsourcing leads to decrease in controls over IS. Similarly, risks emerging from IS outsourcing increases initially but as outsourcing increases further the banks may experience lower risks. As banks outsource their IS, relationship with outsourcing vendor are formed to create mutually beneficial value propositions. This mutual beneficial exchange happens at a critical level, which may lie somewhere between very high outsourcing level and low outsourcing level. Thus banks need to identify this level at which outsourcing would give optimum results keeping in view not only their interests and capabilities but also of the outsourcing vendors to create the desired mutually beneficial win-win relationship.

It has been found that those banks which have high IS outsourcing are able to focus on their core competences significantly better than those banks with low outsourcing. However, at very high outsourcing, the improvements are not significant. Learning capabilities in banks show significant improvement as outsourcing increase only up to
medium degree only and at very high outsourcing levels, it shows negative growth. Thus, banks deciding on IS strategy have to make a trade-off between their existing skills and the desired future skills for their survival as well as preparedness for future skill sets.

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References


Impact of information systems outsourcing


