International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 07 Issue: 01 | January - 2023 Impact Factor: 7.185 ISSN: 2582-3930

Impact of Information Technology in Business Decisions of Selected Service Sectors

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ABSTRACT

In this paper an attempt has been made to investigate the impact of information technology in Business Decision Making in various Service Sector Industries. Decision making is a hard task in business fields. It becomes even more complex as most of the service sector companies deals with problems related to the uncertainty of the service demand. A very systematic and practical approach has been adopted for finding the impact and effect of information technology on the overall business decisions and to explore the challenges that must be faced to provide intelligent strategies for efficient management and decision making that will increase organization's competitiveness and profitability. In the past two decade, businesses in India and globally, have invested heavily in the technology such as e-Mails, texting, websites and apps, ESS, DSS, MIS, intranet, internet, e-Commerce, telemarketing, net banking, CRM software, e-payments, data mining, data warehousing, to bring improvements in quality of customer services, scale and specialization in products, developing new marketing strategies etc. This study examines the contribution of Information Technology (IT) to a growth in services. Data at the firm level is employed to investigate how IT as a key technology, combined with non-technological determinants, can influence firm's performance. The study develops an argument that IT is one of the major success factors at the present time, and this particularly holds true in the case of service firms, primarily due to their fundamental characteristics of interactivity and intensity of information, which are highly compatible with this technology. It becomes all the more vital to address these issues for the service sector industries as they enjoy a dominant position in their contribution towards socio-economic development of the country. Present study addresses these issues as to what level the involvement of IT is important and crucial for these businesses and also suggest a model of IT success for the service sector industries in India.

Keywords : *IT, Business Decision Making, Service Sectors, Intranet, Internet, e-Commerce, Net Banking, MIS, Data Mining, Data Warehousing etc.*

INTRODUCTION

The service sector is the most dominant sector in world's economy and in India's GDP especially in majority of the developing countries. Moreover from the last decade, this sector alone has contributed in 2/3rd of employment and value addition in almost all industrialized economies. It is the fastest growing sector among the three traditional sectors: goods, manufacturing and services. In this changed context, service sectors with high degree of IT enabled tools and techniques are known for their cost effectiveness, increased efficiency and customer centric approach and are performing better than those who are ignoring these factors. In tune with global trends and practices, IT innovations in the last few years have changed the service sector industries in India. They have started taking information technology as a crucial component to achieve strategic and operational goals. In India, leveraging information technology has brought about improvement in:

- Quality of customer services
- Specialization in products and services
- Fee-based services as an alternative sources of income

- Geographical reach through communication networks and electronic delivery channels.
- Well equipped Risk management practices
- More robust internal control systems and regulatory compliance
- Highly cost efficient economies

In other words, we have started perceiving IT as a tool to achieve improvement in the efficiency (more output as compared to input) and effectiveness (final outcomes). This study will focus on the contribution of IT in appropriate decision making for the growth of service industries. The study develops an argument that IT enabled technology is one of the major success factors at the present business scenario, and it particularly holds true in the case of service sector industries, because of their fundamental characteristics of interactivity and intensity of information, which are highly unpredictable and compatible with this technology. The study indicates that IT tools increases the intensity of growth in productivity and profitability experienced by firms in the service industries. Growth in services was also found to be significantly linked to the level of IT intensity in service sector, especially when this intensity is complemented by organizational change.

In this study we will focus our research on three very important service sector industries which will be as follows:

- Banking
- Education
- Hospitality and Tourism
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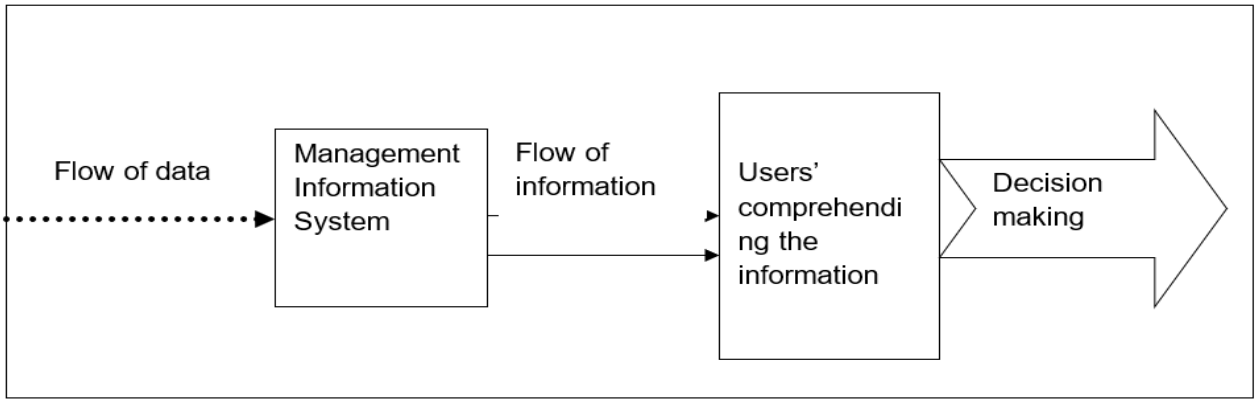
Information Systems for Decision Making in Banks

- One of classifications includes the transactional information systems that process data. This category enables the users to collect and process the day-to-day transactions of an entity. This type of information system is relevant to the operational level of management that deals with purchases, payrolls, payments, registrations, and exchange rates among others.
- Another category is the management information system that provides reports concerning the organization in a predetermined format. The MIS ensures that the managers are well-equipped with skills of planning, controlling, and monitoring of activities. The reports are given in weekly, monthly, or yearly basis. They contain the analysis of budgets, financial reports, salaries, and inventories among others.
- The third category is the decision support system (DSS) that enables users to make the correct choices. The system is only used to provide essential information to support the decisions made in an organization. The DSS is majorly used by managers and other users in accessing information from the data warehouse.
- An expert system is also a program of decision-making ensures the reduction in knowledge and expertise besides simulating the activities of specialists to those employees with less know-how. The system works with artificial intelligence technology in the delivery of information.
- Others include the office automated systems that ensure the ease of workflow and communication among employees irrespective of where they are located. This system manages documents through software such as Microsoft office, scheduling and communicate through video conferencing, voicemails, and electronic mails among others (Power 351). Lastly, personal and workgroup information systems are designed to meet the needs of the users. Furthermore, they increase the productivity of the team.

Merging the Theoretical Concept of the MIS Usage and Practical Application in Banking

The current banking systems apply a concept of the online banking system that is computer-based. various components that are required to run such systems include computer hardware and software, networks, data management techniques, and converters of the data into useful information among others (O'brien and Marakas 13). Through the usage of the MIS, businesses in the banking sectors gain competitive advantage. Such organizations operate as both real-time and online basis (O'brien and Marakas 13). Managers must find a balance that exists between

information technology and behavioral characteristics of people to ensure effective and efficient application of MIS to meet both strategic and tactical objects (O'brien and Marakas 13).



Flow of data. Source: (O'brien and Marakas 13)

IT in Education Sector Decision making process

Since the release in 1983 of the National Commission on Excellence in Education report "*A Nation at Risk",* there has been widespread call for education reform. The reform efforts of the 1980s and 1990s focused on organizational, curricular, and instructional changes necessary to improve the quality of education. Almost without exception, national reform reports advocated decentralization and enhanced teacher involvement in decision-making as a means of fostering necessary changes within education sector.

Education-based decision-making is a concept based on the fundamental principle that individuals who are affected by the decision, possess expertise regarding the decision, and are responsible for implementing the decision, should be involved in making the decision. Some educators use the terms *shared decision-making* and *institution-based management* interchangeably; others see shared decision-making as a component of IBM or decentralization. In general, the goal of institution-based decision-making is to "empower institution staff by providing authority, flexibility, and resources to solve the educational problems particular to their institution" (David, p. 52).

Key Elements

Education-based decision-making rests on two well-established propositions:

1. The institution is the primary decision-making unit; and its corollary; decisions should be made at the lowest possible level.
2. Change requires ownership that comes from the opportunity to participate in defining change and the flexibility to adapt it to individual circumstances; the corollary is that change does not result from externally imposed procedures. (David, p. 46)

These propositions recognize that those closest to the technical core in education systems, because of their access to information concerning students' diverse characteristics, needs, learning styles, and performance levels, are better positioned to make decisions about educational programs than those farther removed from the teaching and learning process. Thus, decisions concerning curricula, instructional technologies, and other institutional initiatives will be most effective and enduring when carried out by those who feel a sense of ownership and responsibility for those decisions.

For educational institution-based decision-making to work, **four key resources** need to be present to develop the capacity to create high performance organizations:

1. ***Knowledge and skills*** in new instructional strategies; interpersonal, problem-solving, and decision skills for working together as a team; business knowledge for managing the organization, including budgeting and fiscal planning; and assessment strategies for analyzing, interpreting, and acting on institutional performance data.
2. ***Information*** about the performance of the organization, including student performance data, budgets, and demographic-trend data.
3. ***Power and authority*** to make decisions, especially in the areas of curriculum and instruction, staffing and personnel, and resource allocation and budgeting.
4. ***Rewards*** for high performance, including intrinsic and extrinsic rewards, such as salary adjustments, professional development opportunities, performance-based pay, group or team-based rewards, and public recognition for their accomplishments.

In general, the scope of decision making in education sector can be categorized in three areas:

1. Budget
2. Personnel and
3. curriculum

- **Regarding finance**, under institute-based decision-making models, they receive either a lump sum budget or some portion of the district budget from which they may make decisions regarding personnel, equipment, materials, supplies, and professional development. Staffing expenditures and decisions regarding staffing structures and assignments are key to schools making decisions that might substantively affect the institution's operation and effectiveness.
- In terms of **personnel decisions**, they are afforded flexibility and the power to determine how best to staff their institutions. Personnel decisions typically fall in two areas: determining staffing needs based on the institution's mission and educational plan and selecting people to fill the positions.
- In the third decision area, decisions regarding the **curriculum and instructional strategies** are determined at the institutional level within a framework of district or state goals. Decisions pertaining to budgeting, staffing, and the instructional program are often restricted and controlled, however, by district policies regarding matters such as class size, tenure, hiring, firing, assignment, curriculum initiatives, textbooks, and assessment procedures.

IT in Hospitality and Tourism Sector Decision Making System

The ever blooming hospitality industry is one of the major contributors to the economy of developed and developing countries and with the introduction of IT in this sector it has been fortified than ever. With the IT (information & technology) sector undergoing tremendous changes in last 30 years, it is revolutionizing world hospitality industry with innovative technologies that has made landmark setting various benchmarks and breakthrough for future advancements in coming years with automation and mechanization. Whole IT structuring and the hospitality industry procedure seems to be changed as result of the onset of internet and the IT world.

As of now, the IT sector has secured a very vital role in the hotel industry and it will be incorrect to associate it without data processing in hospitality. We have seen that the hospitality industry has revolutionized their customer's journey from travel to hotel with the help of improved information technology solutions.

As we know that the hospitality industry is often defined as the sectored system of innovation and production! Technology has played a substantial role in achieving economic growth by garnering economic means for consumers to travel. The augmentation and contribution of air travel as a means of transporting tourists to different locations is an important contribution of technology to the hotel industry. The evolvement and progress of AI with information technology has had a tremendous impact on the hotel industry which also includes the world of hotels.

This, in turn, has helped airlines to reduce costs and get closer to the customers by increasing their outreach. The boundless public use of the Internet has created a number of conditions that have been game-changers in both beneficial and detrimental ways to the modern travel agency. While computers have been an integral part of the hotel agency, since their widespread adoption, the Information Age has brought considerable new benefits. Few enterprise-level software allows hotels under specialized programs which are dedicated exclusively to managing their businesses and organizing their database.

Both customers and business can benefit from advances in communication, reservations and guest services systems. Technology's greatest impact can be seen on front desk where property management has quickened over the years, the speed of service, reduced labor cost, improved accuracy and modernized look and flow of lobby. Point of sale one of the most important technique for speedy transactions makes payment to the merchant in exchange for goods or services. Under the hospitality industry, the tourism suppliers like British Airways have started applying e-commerce operations thereby allowing their customers to directly access the reservations systems. The approach and application of mobile technologies have further impacted the hospitality industry. It is now possible for customers to view and choose various travel and tourism options by surfing the internet through their cell phones.

Hotel managers everywhere are acknowledging the fact that the internet provides a good alternative to take bookings for their establishments. Although many are still skeptical about its capability to increase travel purchases and hotel bookings, many agree that online promotions are a great way to create interest and awareness among guests.

Hotels can attract a new breed of customers *(millennial travelers)* by integrating technology in all aspects. However, technology is in an invariable state of flux and is constantly unlocking new opportunities aimed at improving customer satisfaction and boosting internal efficiency.

How IT has affected the Hospitality Sector in Decision Making

1. Reservations Systems: You can easily book a hotel room for anyone via the booking facility available online which allows easy access to consumers and travel (millennial) professionals; the systems enable individuals to make reservations and compare prices online. Many, like Expedia, make my trip and Orbitz, are available through online interfaces. Now, major hotels have a 24*7 AI Powered chatbot to increase direct bookings on website.

2. Mobile Communication: To keep customers updated of changes many hospitality businesses use mobile communication; they send delay notices, offer deals and sponsor location-based advertising. Depending on the type of business the reach can be increased through emails, text messaging or GPS tagging. Most of the travelers take some form of a mobile communication device with them on the road, whether it is a tablet computer or a mobile phone.

3. In-Room Technology: Nowadays traveler carries numerous electronic devices and reliable, wireless Internet connectivity ranks at the top of the list for customer needs. Guests can use the hotel's Web application to access room service options via online or an e-dining Internet site, or use an interactive service that finds nearby restaurants, transportation or shopping stops for them.

Areas where IT has impacted the most

1. Organization: While computers have been vital part of the hotel business since their widespread adoption, the Information Age has brought considerable new benefits. Data can be stored more quickly than in the past, just because of high-speed hardware and better software. Some of the latest enterprise-level software allows travel agencies specialized programs dedicated exclusively to manage their businesses and organize their data and process them accordingly. This organization allows agencies to run more efficiently, preventing capacity losses due to input time and other tedious tasks.

2. Coordination: Improved communications technology has greatly widened the ways in which a travel agency can communicate not only with customers but also with business connections and partner services and sponsors. High-speed Internet connections allow almost-instant video, voice, and text communication around the world often at considerably less expensive than traditional methods such as long-distance telephony and cell phone can offer. Data

can be sent almost instantaneously from the agency to an airline, hotel or other services, then reverted to customers. This allows bookings and coordination that might have taken hours or days to be processed almost instantly, greatly reducing wait times and lost productivity in an organization.

3. Self-Service Booking: One of the largest impacts on the travel industry *(which comes under the hospitality industry)* has been the rise of online or e-booking. Customers looking to book a trip no longer need to visit an agency they can go online to companies such as Expedia, Make my trip or Priceline and book an entire trip themselves. Airlines and hotels themselves also have cut off the travel agent altogether by allowing customers to book tickets and lodging directly from their sites.

Historical Research Findings:

The service sector, also known as the tertiary sector, is the third tier in the three sector economy. Instead of the product production, this sector produces **services, maintenance and repairs, training, or consulting**. Examples of service sector jobs include housekeeping, tours, nursing, and teaching. By contrast, individuals employed in the industrial or manufacturing sectors produce tangible goods, such as cars, clothes, or equipment.

Among the countries that place heavy emphasis on the service sector, the United States, the United Kingdom, Australia, and China rank among the top. In the United States, the Institute for Supply Management (ISM) produces a monthly index that details the general state of business activity in the service sector. This index is regarded as a metric for the overall economic health of the country because approximately two-thirds of U.S. economic activity occurs in the service sector.

Issues and challenges related to IT

In order to handle the IT systems properly, it is necessary to manage various issues concerning the IT managers in the banks. Kanungo (1999) reports that most important issues are :

- personnel issues such as training needs of technology users
- issue of user's capability to handle information systems effectively and
- Clashes and ambiguity of authority
- These are followed by technical issues related to obsolescence of technology and its absorption.
- Managerial issues are related to centralization and/or decentralization of IT department
- Achieving control on IT related expenses and devising methods of IT performance evaluation.

The main issues and challenges identified through literature are:

(i) **Deployment of open standards technology:** To implement the technology adhering to the open standards. Technology of one department should be compatible with the technology of other departments. Banks are now sharing ATMs, settling the inter bank payments on daily basis. Major challenge before banks is to implement advanced technologies more effectively than their competitors and still having technology compatible with competitors technology. Same is with other sectors.

(ii) **Justifying return on investment (ROI) from IT:** Anticipated improvements in performance resulting from IT investment include; cost reduction, quality improvement, increased flexibility, improved customer satisfaction, and overall improvements in operations. However, empirical evidence to support these anticipated benefits has been mixed. Some researchers have reported no relationship between IT investment and improvements in organizational performance. In light of this fact, justifying ROI on technology is a major challenge.

(iii) **Balancing the channels of transactions:** The business model adopted is the strategic deployment of technology to increase their reach by focusing on balancing the channels of transactions.

(iv) **Keeping personal touch with customers:** Customer service is important in any service sector because the product they deal with is only 'money'. Thus customer service becomes the only unique selling proposition (USP) which differentiates one from the other. The technology increases the gap between the customers and the personnel, but keeps the track of customer transactions in the central data warehouse. Major challenge in front of them is how to maintain personal relationship with the customers.
(v) **Use of the technology by the customers:** A Boston Consulting Group research on online banking shows that banks will start to get profits on the investment they make, when 20 percent of their total customers bank online ("Internet banking", 2004). New private sectors banks like ICICI, HDFC and Axis and some foreign banks operating in India are able manage 70 percent of the transactions off-branch.
(vi) **Security:** Security is the most important concern for a majority of the customers. Some are hesitant to trust online transaction, which they consider risky as it can open the doors to computer hackers. Operational risks can occur due to incorrect processing of transaction, compromises in data integrity, privacy and confidentially, unauthorized access or intrusion into the online system and transactions. These risks arise due to flaws in design, insufficient technology, negligence of customers and employees.
(vii) **Technology obsolescence:** Another area of major concern is the rate at which the technology becomes obsolete in terms of hardware and software. Lack of anticipation of technology obsolescence, while planning for implementation of IT applications, can put the pressure on technology initiatives. Padwal (1995) in his survey results indicated that rate of obsolescence of IT is faster than the rate of its
absorption.
(viii) **Technology outsourcing:** An important aspect of any technology solution is its cost effectiveness and rate of returns. A dedicated team of technical experts is available then innovative technical solutions that are cost-effective can be developed in-house. IT projects can be outsourced if technical experts are not available, in that case cost of such projects may be much higher.
(ix) **Technology penetration in rural sector:** In India, where the poverty ratio is still adverse, nearly 400 million Indians living below poverty line (Patnaik, 2011), and IT penetration is very low, there is a great challenge to increase the technology spread in rural areas and educate the people of these areas to use the technology by keeping the cost under control.
(x) **Retaining IT employees:** Over the decade now, IT field is the first choice of the professionals. This is because of availability of opportunity in the field and high salary.

METHODOLOGY

Objectives :
To explores the challenges that must be faced to provide intelligent strategies for efficient management and decision making that will increase your organization's competitiveness and profitability.
To provides insight and understanding into practical and methodological issues related to decision-making processes under uncertainty in selected service industries. It examines current and future trends regarding how these decision-making processes can be efficiently performed for better design of service systems by using probabilistic algorithms as well as hybrid and simulation-based approaches. Thus, the major objective to tackle strategic, tactical, and operational problems in service companies with the help of suitable IT enabled tool can be drawn successfully.
The use of new technologies in the decision-making process provided numerous opportunities to facilitate decisions selection. However, the decision maker should still be able to differentiate which knowledge should be used to serve in decision making, and which models, methods, tools, systems and procedures to be used in certain situations, with the purpose of successful decision selection. The relationship between IT and the growth of firms in service industries is of major concern. Organizational change is also taken into consideration to investigate its joint contribution with IT to the growth of service firms. Put simply, this study is concerned with two specific research interests, which are the relationship between IT and firm-level growth in service sector and the change in the process of decision making in these firms with respect to IT.

Information technology has made the decision making process more effective and productive. It has increased the well-being of the stakeholders. Developed methods of IT have made this process of business decision making much easier, economical, feasible and universal. The main objectives of the study are:

1. To study and analyze the impact of IT in decision making process of selected service sector industries.
2. To study the extent of IT deployment in these service sectors.
3. To compare the efficiency of these service sectors with respect to information technology deployment and their categorization
4. To measure the identified IT success factors for each category of service sector and compare different categories sectors on each of the IT success factors and
5. To develop IT success model for these service sectors.
6. To test a hypothesis of a causal relationship between variables as IT and Business Decisions in selected service sectors.

Most of the companies engaged in Service sector strive to integrate its various functions of planning[, production, marketing, controlling and coordinating with IT enabled tools and techniques for best efficient and effective business outcomes. Since no major study has been undertaken to address and bridge the actual knowledge gap by exploring the effects of IT on decision making process of these service sectors, my main focus will be to analyze this gap and to find a better model for the decision makers and managers.

Scope of the study:

The scope of this study is limited to cover only three service sector industries operating in Ajmer, India. All other categories of service sector are excluded from the study. The three service sectors selected for the study are:

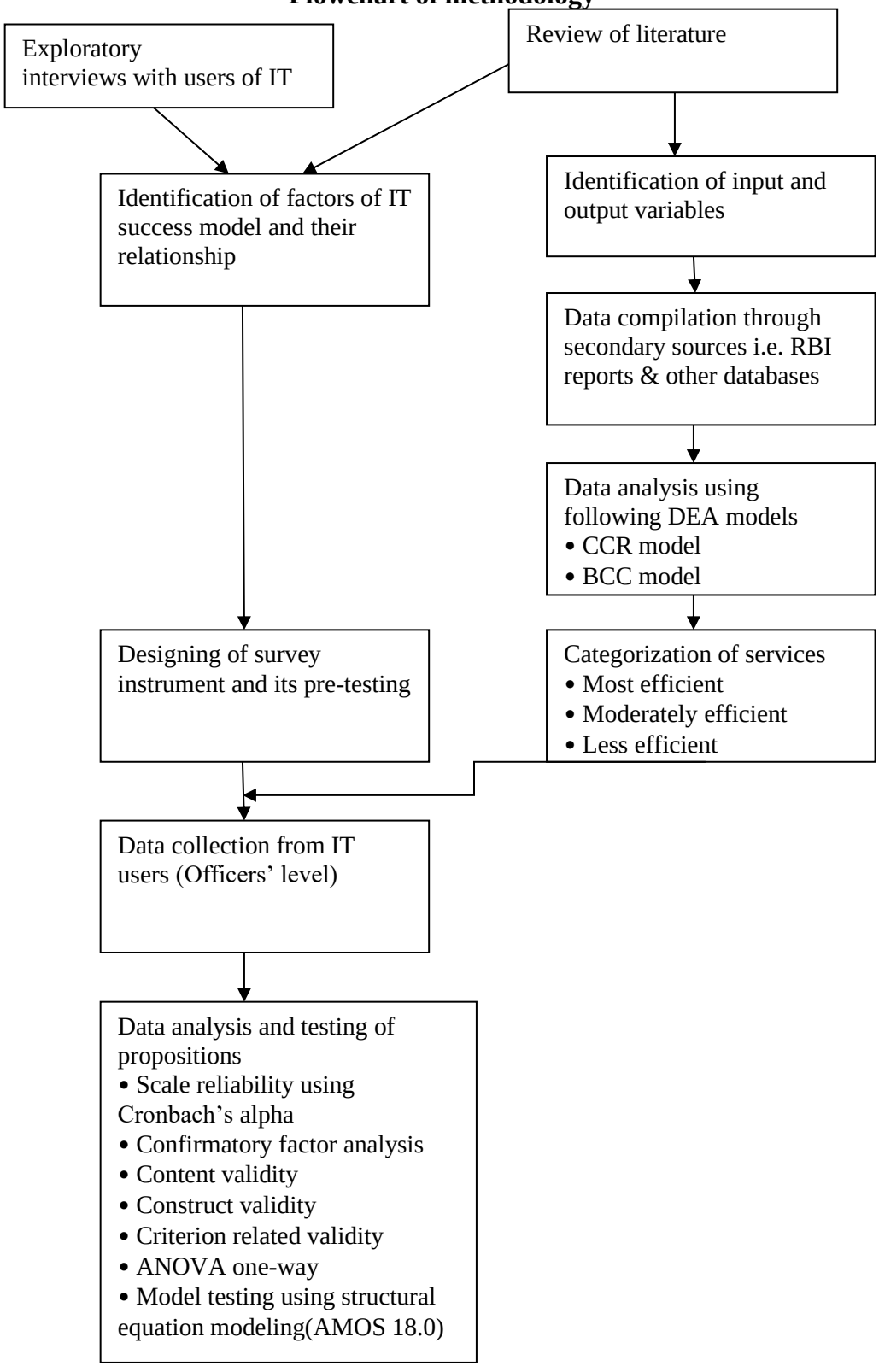
1. Banking
2. Education
3. Hospitality and Tourism

My approach will be of **Exploratory Research**, for exploring and describing the information regarding all circumstances with respect to our dependent (Business Decisions) and independent (IT) variables. I have selected these sectors because of the outgrowing scope and recent developments in these industries and because of the dominant position enjoyed by these sectors in their contribution towards socio-economic development of the country.

Research Methodology

Based on the objectives of the study, research propositions are formulated and grouped into **three** categories. **First category** is a cluster of propositions based on **comparison of IT efficiency of these service sectors.** They are categorized as “most efficient”, “moderately efficient” and “less efficient” in IT deployment after testing the first category of propositions. **Second cluster of propositions** are based on **measurement of IT success factors** and then comparing the “most efficient”, “moderately efficient” and “less efficient” service sector on each of the IT success factors. Third cluster of propositions are based on the **proposed model of IT success**.

Flowchart of methodology



Exploratory investigations

An exploratory qualitative study has been undertaken to better understand the IT measures and relationship among them. For this, personal in-depth interviews, comprising of open-ended questions with the employees, were conducted. In all, 5 employees designated as IT employees and 7 employees working at the officers' cadre were selected for in-depth interviews. Each interview lasted 30 to 45 minutes. The in-depth interviews focused on the following issues:

- What are the IT related problems faced by the employees? How are they addressed?
- What are the key factors leading to user satisfaction with IT systems?
- Whether IT has improved individual's performance? If yes, how?
- Whether IT has improved office's performance? If yes, how?

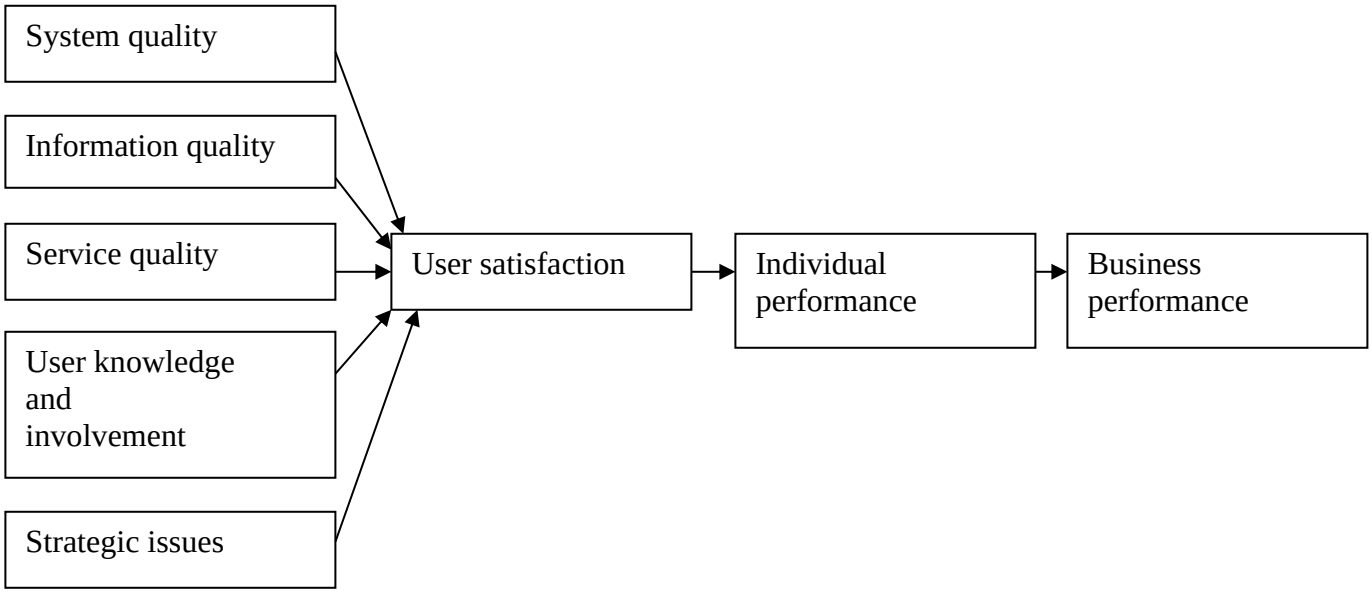
Insights from Exploratory Investigations

The employees provided valuable insights on the questions asked to them. The important insights obtained by analyzing the employees' responses are described below:

- Consensus emerged that system quality, information quality and service quality are the major factors leading to users' satisfaction. In addition to these factors, other factors i.e. user's knowledge and involvement and strategic issues like proactive involvement of top management in IT-related decisions, adoption of modern technology and alignment of IT systems with processes and objectives, also results in users' satisfaction.
- Respondents affirmed the indicators selected to measure the contribution of information technology systems and services on employee's performance.
- Respondents were in confirmatory with the indicators selected to measure the contribution of information technology systems and services on performance.

Research model

The study is executed by dividing the individual sectors in three categories i.e. "most efficient", "moderately efficient" and "less efficient" on the basis of IT efficiency scores, obtained through application of DEA technique. To understand the reasons of differences in IT efficiency, the identified IT success factors are measured for each.



The model of IT success has been proposed through the review of published research works and from the exploratory interviews. As per proposed model the IT success factors i.e. system quality, information quality, service quality, user's knowledge and involvement and strategic issues affect user's satisfaction. User's satisfaction is the direct antecedent of individual performance, which further affects performance.

CONCLUSION

The study found that most IT-intensive service firms have outperformed after the involvement of IT in its day to day decision making with respect to before time zone when IT was not used in terms of both productivity and profitability growth. Thus it can be concluded that IT is one of the major economic driving forces, particularly for service industries, during the current techno-economic paradigm. IT involvement has thus guaranteed timely and increasing success in decision making, achieving a positive outcome of decision making, use of stored data and information, easier access to reports, the possibility of feedback from decision-makers, the research potential consequences of available decision. Thus IT is used as a vital element for decision making in all the business sectors. Many various techniques of Decision Making involve Group Discussions, Brainstorming, Delphi technique, Marginal Analysis and Cost-Benefit Analysis.

The decision maker, when deciding, faces unambiguous, dubious and risky situations, fear of decision-making and other restrictions that can make decision-making process difficult slow it down or disable it. For the quality decision making in such circumstances a timely dispose of information is necessary, carrying out an assessment of potential solutions and analysis of the impact of the environment with a view to a positive outcome. Since every decision brings changes, timely decision selection among possible solutions will be reflected in the short term or the long term on the further course of actions of decision makers in relation to the outcomes.

For this purpose, various business information systems that facilitate the decision-making process and thus profitable fixes are used. Investment in such systems should be seen as a cost-effective investment, although these systems are expensive. Separation of important from less important data and information and the ability of timely and accurate decision-making differs the unsuccessful from successful decision makers. Therefore, the decision maker must be aware of new technologies and modern trends and be ready to face the challenges of today. The original role of computer systems is the collection, processing, storage and availability of data and information for future use and sharing. Data and information needed to determine the possibilities of available decision are available to the decision maker by simplifying choice by converting them into new opportunities, knowledge, future development opportunities among new values. Since the decision maker makes the final decision, the new technology also plays an important role in the process of private and business decision-making by providing assistance in calculating a greater choice of possible solutions. By analyzing the problems and consequences of the selection, the forecast of future selection results, reducing fear in decision making, simplification in the selection decision, the new capabilities in the mode of thinking and choosing solutions, creating new value. The role of new technologies in the business decision-making is repeated. As the new technologies primarily affect the development and emergence of new tools, models, methods, techniques and systems that are tailored to customer requirements, and decision makers, but also the types of decisions that need to be made, there is a requirement that the upgrade and use are continued in the future in order to improve and simplify the decision-making process. Furthermore, increasing success in decision making, achieving a positive outcome of decision making, use of stored data and information, easier access to reports, the possibility of feedback from decision-makers, the research potential consequences of available decision are just some of the benefits arising precisely from the use of new technology in the decision-making process.

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