Investigation of key success factors for open innovation and firm performance in Indian IT and ITeS industry: A Systematic Literature Review

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Abstract: Information Technology is a growing industry in India. Currently it constitutes around 7.7% of India's GDP and the contribution is expected to rise by another 2.3% leading to a 10% share by the year 2025. Broadly the Indian IT sector can be categorized into two. They are the IT services and the IT enabled Services (ITeS). The expansion of the Indian economy has also led to the developments within the country to a large extent. The workforce in the sector constitutes more than 4mn. This field has further more wide opportunities of growth in terms of open innovation and the performances of the firms. Our nation lags behind the other countries of the world in both the terms. Being a nation filled with talents, this is an issue of concern and hence need to be addressed. As a result, a SLR has been prepared to understand the factors responsible for the growth of inventions and breakthroughs in IT and ITES along with those reasons responsible for the performance of any firm. Further research can be done with special focus on the corresponding factors which will prove to be a fruitful one for the IT sector and the Indian economy as a whole.

Keywords: IT, ITES, Open Innovation, Firm, Company, Performance

1. Introduction

Information and Technology is an integral part of Indian economy and makes a contribution of around 7% to the economy. India being a major source of IT and ITeS services has a major role to play. The fact that there is a wide scope for artificial intelligence and it is expected to make a share of one trillion $ US in Indian economy gives a brief picture of the development track of the nation in term of Information Technology. Further the government of India's expected contribution for the sector is to rise by 6% in the current year. The country spends more than 1bn US $ for the training of the employee of the sector. The factors responsible for the growth of any firm vary with the industry and hence the innovation instilling factors too. Open innovation has become a growing trend and many companies have adopted it. The most common example of the same in India is Philips and Netflix. According to an innovation index released by the Bloomberg, India ranks 50th in the list of countries. Similarly, according to the Global Innovation Index released together by the Confederation of Indian Industry (CII) and the World Intellectual Property Organization(IPO), India is ranked 48th. India, being a country filled with talents, the scope of innovation is boundless. Even then, the Indian sub-continent couldn't find a rank in the top 10 list of the innovation indices. Similarly, in the case of the performance of the Indian firms, which is measured across the globe in terms of Global Innovation Index, released by SAHA, India comes under the category of Group 2 countries and couldn't get a place in the group 1 list. Hence an extensive research is quintessential regarding the growth of innovation and performance of Indian IT and ITeS firms. As a result, this SLR is prepared to analyze the key factors responsible for the outgrowth of our nation in the corresponding field across the countries of the world. When more researches are carried on the factors analyzed, it can prove to be a fruitful work instilling the nation's development in terms of Information Technology and economy. If the factors responsible for the improvement in the innovation and performance can be marked and a careful analysis is done, the effect of the same can be adopted by various firms of the country and hence the development of the nation can be enhanced.

2. Methodology

The methodology used in this particular literature review is explained in this section. A careful analysis of the available research articles along with the related information is considered in this particular research. A number of articles were considered for the research and checked to segregate those which can be included in the research as well as excluded. Various criteria were used for the same. The literature chosen for inclusion and those excluded were based on various criteria. Those which were available as full-text was included and others were excluded in the research. Only the articles written in English were considered for the research and the rest was excluded including those of the widely spoken regional languages. All those papers after the timeline of 2010 were considered for the research. Papers earlier than the year 2010 were not considered for the research. In the case of the research question, it was entirely concerned with the key factors responsible for the open innovation

in IT and ITeS and the performance of the same. All those industries other than IT and ITeS were left. Further, papers without proper bibliography and the corresponding author details were excluded in the research. The inclusion and exclusion criteria are tabulated in the form of a table as shown below.

Criterion	***Inclusion***	***Exclusion***
Literature	*Full*	*Partial*
Industries	*IT and ITES*	*Other than IT and ITES*
Innovation type	*Open*	*Closed*
Time of papers	*2010 to 2021*	*Earlier than 2010*
Bibliography	*Papers with proper bibliography*	*Papers without proper bibliography*
Language Referred	*English*	*Non-English*

Table 1: Criteria for inclusion and exclusion of literature

The reviewer used the method of PRISMA for carrying out this particular research. All the relevant articles were collected from ResearchGate, Google Scholar and SciHub which proved to be great sources of the literature and paved way for the segregation of the literature based upon the criteria which is the basis of the research work which was ultimately followed by the abstraction of the relevant information used in the research and the review process followed by the analysis of the collected data.

2.1 PRISMA

The SLR paper was reviewed with regard to PRISMA, which stands for Preferred Reporting Items for Systematic reviews and Meta-Analysis. Since it enables the author for improve the corresponding data of research with a systematic review, it is used in this research. Further, it also assists in the meta-analysis. Systematic review and meta-analysis are integral parts of any research and hence PRISMA is used. Further, using PRISMA can be related some other advantages as well. They are (1) The formulation of clear cut research questions that paves way for the research to be done in a more systematic manner. (2) Enables a special criterion with inclusion and exclusion of the relevant and the less relevant literature. (3) It can evaluate the contents of large databases within a short span of time (Sierra-Correa and Cantera Kintz, 2015). Furthermore, the usage of PRISMA has enhanced the exploration of literature with a better assistance with the most appropriate terminologies used.

2.2 Resources

The selection of the appropriate literature was done using online mode. The databases of ReasearchGate, Google Scholar and ScienceDirect was extensively used for the searching of the articles on the process of research. All the three websites as mentioned earlier are provide all the necessary papers and books including the necessary ebooks with respect to the corresponding research. On a proper search in the database of Google scholar, around 17, 300 papers were revealed. Similarly 100 research papers were obtained on a search through the ResearchGate. ScienceDirect website also yielded analogous results. Among the three sites, the ResearchGate proved to be a major source of related papers. In the field of the innovation and firm performance an extensive research was done using the corresponding databases.

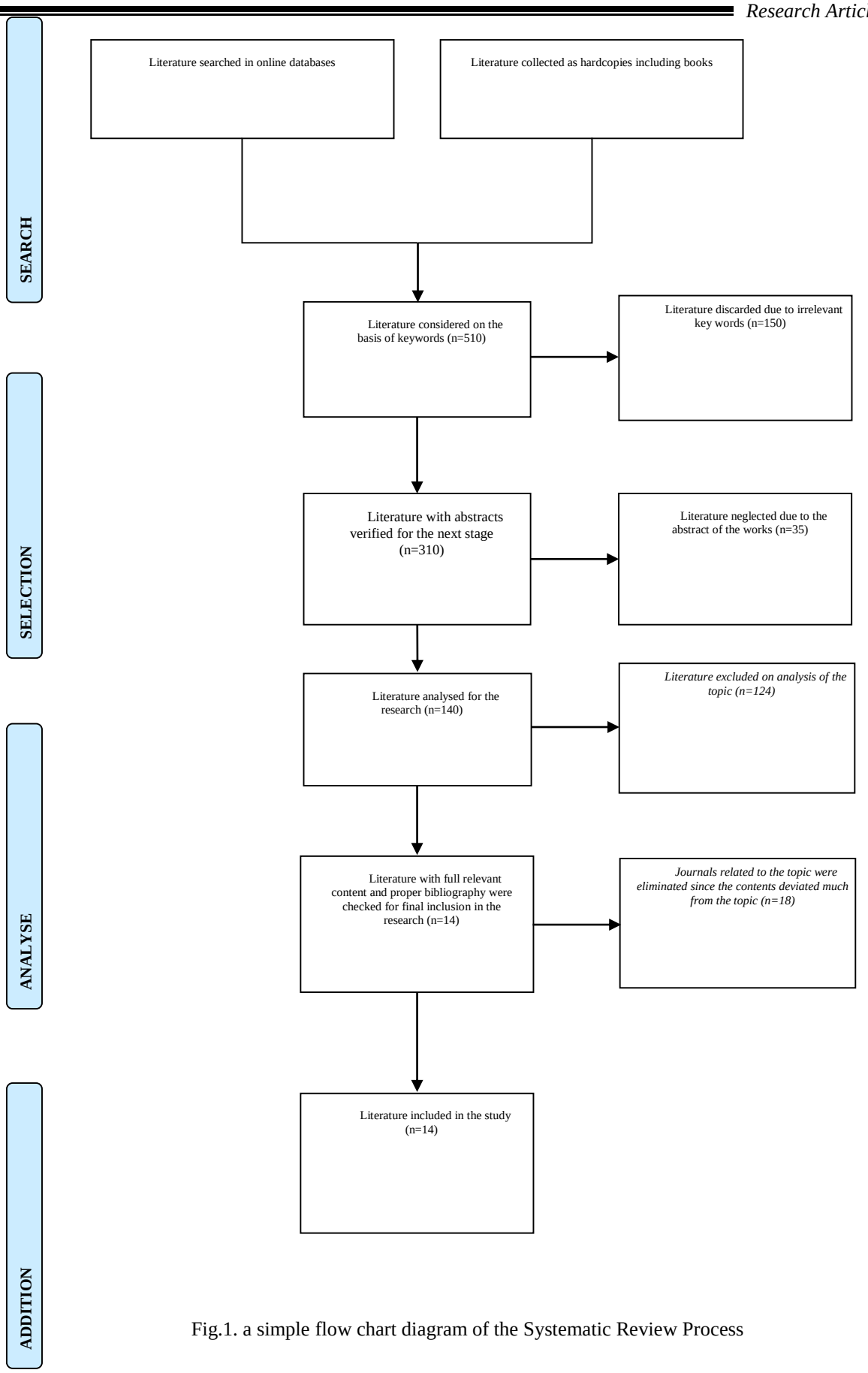

Fig.1. a simple flow chart diagram of the Systematic Review Process

2.3 Inclusion and exclusion criteria

With reference to the current study, a number of criteria were considered. The first and foremost one was the reviewing of literature from the sources and segregating them with respect to the content. If the content was a complete one it was considered for the research or else it was left out or excluded. Then the segregation was with

respect to the industry. All those papers dealing with IT and ITES were chosen from the thousands of papers available, which itself lead to a number of papers being selected. The next criterion was the segregation with respect to the innovation type. All papers with dealing with open innovation were included in the research and the papers related to closed communication were excluded. Other criteria were further used which included the year of publication of the literature considered and the literature prior to it was discarded. Mostly journals were considered for the research and review articles were not considered. All those sources which do not have a proper background of the study or a proper continuation or conclusion were ignored. Since there are a huge number of papers available in English with respect to the study, only English materials were considered for the research and the other language literature was excluded. Further table 1 shows a gist of the research literature segregation parameters.

2.4 Systematic Review Process

The most important aspect of the systematic Review process is that it provides clear cut idea with a predetermined embracement and expulsion standards. Basically, the systematic review process can be divided into four phases. In the first phase, the keywords relevant to the research were framed and searched in online databases along with the reference of thesaurus. The keywords were separated using AND and OR for further convenience. For example, ("IT") AND ("ITES") AND ("OPEN INNOVATION") AND ("FIRM" OR "COMPANY") AND ("PERFORMANCE"). As a result of the search, around 150 articles were wiped out. In the next phase, the abstracts of the research works were checked and the relevant articles were chosen which made around 140 articles. In the succeeding stage, the articles were read and the differences were understood. Some articles partially spoke about closed innovation and the concerned data, while another set of articles spoke about the management of high profiles in the IT and ITeS. Finally in the fourth stage, the total articles in hand accounts to 14. Hence the four stages of searching, screening, eligibility test and end result were passed through thereby undergoing qualitative and of the articles.

2.5 Data Extraction

In the case of preparation of an SLR, the Systematic Review Process is followed by the extraction of the relevant data from the articles chosen. Each of the selected articles was carefully analyzed and the extracted data from the corresponding articles has been recorded in a work book in Microsoft Excel for easy understanding and analysis of the collected information. The information has been tabulated in table 2 as shown below. The table gives a gist about the relevant information collected.

2.6 Research Questions

The main aim of a Systematic Literature Review is to get a condensed idea of the studies available till the time and get a deeper understanding of all the corresponding data involved in the processes. The entire research objected can be converted in the form of four research questions and analyzing them will provide the results of the research. The questions hence formulated are as follows:

RQ1: What is the position of IT sector in Indian economy?

RQ2: What are the factors responsible for open innovation in Indian IT and ITES firms?

RQ3: What are the factors responsible for a successful firm performance in Indian IT and ITES services?

RQ4: What are the limitations in implementation of the above factors in IT and ITES firms?

3. Research Question Result

This section deals with the answers of the research questions which were formulated in the previous section. An outline is given on the studies conducted and further questions which arose where explained in brief in the sections. Further, clarifications were given on the subsequent headings.

3.1 What is the position of IT sector in Indian economy?

India is in a well-deserved position in World information technology market. Untiring and industrious workforce is the back bone of the industry. It has contributed a significant share to the GDP of the nation in the fiscal year of 2020. The employees of IT sector are more than 4mn in number. The United States remains to be the greatest beneficiary of the Indian IT industry receiving more than half of the outsourcing of Information Technology Services of India.

The starting of IT industry in India can be traced back to the year 1967 when Tata Consultancy Services was created. A greater share of the IT industry revenue has been contributed by the exports and it accounts for 79% of the same. The inland scenario of the industry also shows a steady growth. Before a span of around 15 years, one-fourth of the industry employees contributed two-fifth of the country's GDP. As far as India is concerned, the major hotspots of technology are Kolkata, Bengaluru, Hyderabad, Delhi, Chennai and Pune.

Globally, the Technological developments across are measured in various indices. Hence the innovation in the IT and ITES firms and the performance of the corresponding firms can also be measured in the same indices. These indices are created with respect to the total number of nations considered in the research. Some of the most important of the indices are:

1. Global Innovation Index by Cornell University, INSEAD and the World Intellectual Property Organization
2. IT industry Competitiveness Index by Business Software Association
3. Networked Readiness Index by World Economic Forum
4. ICT development Index by International Telecommunication Union

5. Space Competitiveness Index by Futron Corporation

According to the latest edition of the Global Innovation Index India released in 2020 remains at 48th position and Switzerland topped the list. The research results of Bloomberg, CII and IPO which are shown in indices indicate that India is far behind in innovation which is supported by the fact that the IT industry Competitiveness Index released a few years back shown that India couldn't top even in the list of first 10 nations.

The major IT companies in India are TCS, Infosys, Wipro, HCL Technologies, L&T Infotech, Tech Mahindra, Mphasis, Mindtree and Oracle Financial Services software.

ITeS stands for Information Technology enabled Services. It is often referred as Remote Services. It covers the entire range of Information Technology related services which is related to the improved efficiency of the organization. In other words, the IT enabled services is the enhancement of the assistance offered by the Information Technology services. A credit Customer Relationship Management and an ameliorated database of information are the kinds of the assistances. This results in direct and indirect benefits depending upon the time taken.

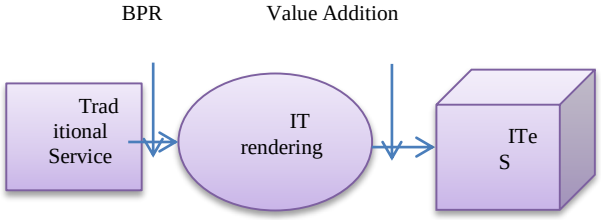

Fig 1 Diagramatic Representatin of ITeS

The above figure shows the representation of Information Technology enabled services.

ITeS has been widely used in various sectors which include Customer Support Service, E-Distribution, Tele services in marketing etc. The ITES industry itself is predicted to contribute a share of more than 50 mn $ US to the Indian economy.

3.2 What are the factors responsible for open innovation in Indian IT and ITES firms?

The success of any firm lies in its working and methodology with special regards to the management. This is the same in the case of open innovation too. The factors supporting open innovation in IT and ITeS firms are as follows

Cooperation

A proper cooperation is a quintessential factor in the case of IT and ITeS firm. A proper cognizance in the teamwork is required for a mutual understanding (Schiele, 2012).

Confidence

A perfect interaction gives a smooth relation and hence paves way for the sharing of the expertise and the past experiences which are the result of a coaction (Tranekjer and Knudsen, 2012).

Sharing of ideas

When the imparting of ideas reaches a perfect stage, the innovation reaches its peak. It is always necessary to work in cooperation sharing the ideas and technology (Puck, Rygl and Kittler, 2007).

Team

The working environment should be a diversified on with no bias in terms of gender, qualification, abilities etc. The work force must be a dedicated one with a pleasing personality(Bullinger et al., 2012).

Motivation

The employees must have sense of self-motivation and they must motivate the fellow employees too. All of them must be ready to gain new skills at any point of time and must develop self-involvement for the same (Feller, Finnegan and Nilsson, 2011).

Mechanism

There must be a proper systematic arrangement for structuring, configuring, controlling and evaluating the team. Together with a good decision making skill there is vital role for the mechanism as a factor (Lee, Hwang and Choi, 2012).

Mediators

Managers, coaches and intermediaries along with a collaborative research institute will prove to be a major support for the evolution of open innovation in IT and ITeS firms (Amy Muller and Nate Hutchins, 2012).

Resources

An appropriate supply of sufficient resources for the employees involved along with good equipments will be beneficial for innovation in IT and ITES especially when a clear cut balance is done with the daily job and the innovation work (Niehaves, 2009).

Plan of Action

Gaining proper awareness regarding the technical issues concerned, plans regarding open innovation concepts and the alternatives are all included in the concerned plan of action (Schiele, 2012).

Methodology

A perfect understanding of the stages involved in the processes, phases involved in the product life cycle and different attribute of innovation(Schiele, 2012).

Leadership

Initiatives must be taken from the part of the leaders and make the necessary moves with regard to the process of innovations in information technology depending on whether it is IT or ITeS (Dodgson, Gann and Salter, 2006; Ollila and Elmquist, 2011).

Culture

A culture which is not afraid of any failure when seen from an outsiders view is a must for innovation in the IT and ITeS (Nakagaki, Aber and Fetterhoff, 2012).

3.3 What are the factors responsible for a successful firm performance in Indian IT and ITES services?

The factors responsible for the successful performance of IT and non IT firms can be easily understood and sorted out to a certain extent as compared to those of open innovation.

The characteristics of the firm

The first and foremost factor is the firm itself. All the characteristics of the firm including the savoir-faire, extent of the firm, degree to which the recent technology is applied and the Information Technology utilization along with the proper management play a major role in the success of firms in IT and ITeS (Han, Lee and Seo, 2008).

The employees

The employees and their capacity to do the work, their expertise in the field, their acquaintance with regard to the working business environment, their participation in the activities and their common vision to achieve (Currie, Michell and Abanishe, 2008).

Training

The training provided to the employees with regard to the expectations of the clients and the output they must produce (Danvila del Valle, Ángel Sastre Castillo and Rodríguez- Duarte, 2009).

Detrition

In one way or the other, the commitment of the employees matter with regard to their number in the organization (Huselid, 1995).

Risk

In some cases, despite the work gets completed from the firm side, the client doesn't make the already discussed payment owing to the dissatisfaction of the product or service (Bahli and Rivard, 2003).

Cost

Since the competition is inevitable in any field, reasonable fees for the product or service on the side of the firm will be an advantage.

Information Exchange

Proper exchange of information is the key to a proper communication and hence when this this done in the case of clients and the service provider will be an important factor (Khan and Fitzgerald, 2004).

Agreements

Issues are all a part of any firm and it includes those of the intellectual property rights. There is also a necessity for the information to be secured to access the services promptly on time.

Firm Environment

The external environment of the firm plays a major role in the working of the organization and the construction of the firm along with the regulations of the administration of the country hold the responsibility to a larger extent (Estrin, Baghdasaryan and Meyer, 2009).

Global Situation

The global situation influences the efficient working of the firm. Situations like depressions push the whole of the world to a situation out of hand. The cold war between countries eventually affects the firm performance and even causes trade wars (Kingshott, 2006).

Financial factors

The key performance indicators of any firm like liquidity, solvency, profitability etc also play a main role as in the success of IT and ITeS firms (Katou and Budhwar, 2007).

3.4 What are the limitations in implementation of the above factors in IT and ITES firms?

Author	**Literature**	**Drawback**
(Obradović, Vlačić and Dabić, 2021)	Open innovation in the manufacturing industry: A review and research agenda	Details with regard to IT and ITES was limited
(Bigliardi *et al.*, 2021)	The past, present and future of open innovation	Details with regard to IT and ITES was limited

(Amit Chatterjee, 2020)	*Role of IT- ITES in Economic Development of Asia Issues of Growth, Sustainability and Governance*	Details with regard firm performance was limited
(Yun *et al.*, 2020)	The Culture for Open Innovation Dynamics	Details with regard to IT and ITES was limited
(Rosa *et al.*, 2020)	Measuring open innovation practices in small companies at important Brazilian industrial centers	Limited analysis
(Pedersen, 2020)	What can open innovation be used for and how does it create value?	Details with regard firm performance was limited
(Jugend *et al.*, 2020)	Public support for innovation: A systematic review of the literature and implications for open innovation	Details with regard firm performance was limited
(Dahlander and Wallin, 2020)	Why Now Is the Time for "Open Innovation"	Limited Analysis
(Corchuelo Martínez-Azúa, López-Salazar and Sama-Berrocal, 2020)	Determining Factors of Innovative Performance: Case Studies in Extremaduran Agri-Food Companies	Limited details restricted to the industry
(Sivam *et al.*, 2019)	Key settings for successful Open Innovation Arena	Details with regard firm performance was limited
(Liu and Racherla, 2019)	*Innovation, Economic Development, and Intellectual Property in India and China: Comparing Six Economic Sectors*	No indepth analysis
(Hungund and Mani, 2019)	Benchmarking of factors influencing adoption of innovation in software product SMEs: An empirical evidence from India	Further more information on topic required.
(Dhar and Joseph, 2019)	India's Information Technology Industry: A Tale of Two Halves	Literature limited to the industry
(Jaspreet Kaur and Suresh Bapuji Mohitkar, 2018)	Status of IT and ITeS industry in India	Limited research on the topic
(Bogers, Chesbrough and Moedas, 2018)	Open Innovation: Research, Practices, and Policies	Details with regard firm performance was limited
(Arora and Bodhanwala, 2018)	Relationship between Corporate Governance Index and Firm Performance: Indian Evidence	Details with regard Information Technology was limited
(Selvam *et al.*, 2016)	Determinants of Firm Performance: A Subjective Model	Details with regard innovation was limited

4. Discussion and Conclusion

The research results reveal that the key success factors for the development of information in IT and ITeS are those which are always a concern for the firm. Similar results are yielded in the case of the performance of the firm too. Information Technology is an industry of India which holds a lion's share in GDP of our nation with respect to the economy. ITeS is already a profitable industry and has a higher scope for future development. Irrespective of the fact that innovation is a part of the educational culture of our nation, a number of innovations has been made every year in our country and IT being the most sought after industry has a wide scope for open innovation in the working environment.

In the case of open innovation in IT and ITeS industry, the cooperation and collaboration among the employees are achievable to a great extent but the corresponding technology which yields an environment for innovation is most often a point of concern. Though hundreds of companies are available in IT and ITeS, the support in terms of technology and infrastructure is limited. This leads to mere conceptions of extraordinary inventions which when practically made will bring about extraordinary results.

The performance of IT and ITeS firms are more or less dependent on the management itself. As discussed earlier, the operation of a firm and a good performance is influence more by the organization and the external factors. Proper trainings are a part of the firm operation and the training even if doesn't give a wide insight into the client views, it proves to be detrimental. No organization is risk averse and hence risks are inevitable. But, a careful analysis of the risks will enable the organization to get a higher performance. Apart from the employees and costs related to the business, the external environment plays a major role and to a certain extent is out of hand. As far as the global market is concerned, depression and cold war couldn't be controlled by the firms in IT and ITeS. Such scenarios could only be tackled partially with a proper planning.

Many researches had been done on open innovation in IT and ITeS and the factors responsible and the deterrents to it. Similarly, a number of studies have been conducted with respect to the performance of the firms in IT and ITeS with reference to the supporting factors and deterrents. A careful analysis of the factors is lacking in most of the studies and hence blocks the future scopes of the studies. This paper provides an optimal research of factors and further in depth researches can be done on each of the factors to get a deeper understanding which will support the development of open innovation and firm performance in IT and ITeS firms across the nation.

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