A study on the lack of job creation in the Indian IT industry

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Abstract

The Indian IT industry has demonstrated an outstanding success story by its high-class delivery in providing software and infrastructure services to more than 60 countries. Two-thirds of Indian IT serving to the USA alone, spreading across half of all the Fortune 500 organisations. India has emerged as a world-class tech-savvy information technology country with a strong economic backbone. For decades, Indian industries performed exceptionally well and delivered top-notch solutions and services to its international partners in moving to a green IT globalisation hub. Despite its competitive performance and world recognised in-house talents, there is a point of saturation in jobs observed in the Indian IT industry. This study focuses on analysing the influential factors contributing significantly to the situation described above by interacting with leading industry experts.

Keywords: Employment, Contribution, Hiring, Attrition, Automation, Upskilling.

1. Introduction

The Indian IT industry has been an outstanding success story. Indian IT sector exports software services to more than 60 countries across the globe, which is two-thirds to the USA, including half of all Fortune 500 organisations. India is a developing economy powered by the techno-savvy human resources, and that helped to form a world-class information technology (IT) industry. Indian software organisations enhanced with the value chain, from the low-cost service to provide comprehensive and complexed software services from India to the MNC clients. A rich pool of Indian talented technical workforce is available in Indian sub-continent, this is possible because of the government investment in professional education, formed a series of reputed technical and management institutes such as IIT, IIM and NIT to meet the demands globally. Due to the condition of English-speaking, easily trainable, and hungry for higher wages, Indian firms sent staff to onsite client facilities in the United States of America [43].

"India is the world's largest IT services destination, accounting for around 55 % of the US$ 173-178 billion markets in 2016-17 and US$ 185-190 in 2017-18. The country's cost-effective strategy in giving IT services, which is about 3-4 times economical than the USA and hence, India continues to be its Unique Selling Proposition (USP) in the global sourcing market. The IT sector holds the third rank in India's total Foreign Direct Investment (FDI) share and has attracted US$ 29.825 billion of FDI inflows in the last 17 years. i.e. from 2000 to 2017. India's highly qualified talent pool of techies is the world's largest and are ready at a cost saving of 60-70 per cent to deliver to high-cost countries. A considerable number of excellently skilled human resources has enabled Indian IT companies to help MNC customers to save USD 200 billion in the past five years reported by IBEF in April 2018 [28]. IT & ITES organisations from India have set up around 1,000 global delivery centres in about 80 countries across the globe. [39]. India has become an intellectual capital for numerous global IT companies setting up their R&D centres in India by considering their future growth and more business from global customers by meeting their demands. Additionally, India has become the digital hub of the world, with around 75 % of global digital talent available in the country.

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The revenue from the IT industry and exports are expected to go up to USD 167 billion and USD 126 billion in the year 20118. To reach the further level in IT sector, The Government of India has taken multiple initiatives and extended tax relaxation to the IT sector such as software technology parks of India (STPI) and Special Economic Zones (SEZs). Additionally, the country is providing easy procedures and single window technique to set up the new delivery centres across the country. In Union Budget 2018-19, the government of India had announced to develop a national-level scheme towards the effort of Artificial Intelligence (AI) which will help in leveraging AI technology for development works in the country [28].

2. Overview of the Indian IT industry

2.1 History and Evolution of the IT Industry

Phase I: Before 1980

The software industry did not exist in India until 1960. The government of India had formulated the Software Export Scheme in the year 1972. This scheme chose hardware imports in exchange for software exports. Tata Consultancy Services became the first organisation to agree to this plan. Software exports from India were started in the year 1974. [36].

Phase II: 1980- 1990

There were numerous initiatives by the government; however, the software exports were not picking up as expected due to two substantial reasons such as 1). The exports of software were dependent on the imports of hardware, which was expensive, and the process for obtaining the same was much complicated. 2). The absence of infrastructural facilities for software development. To resolve these issues, the government of India framed a New Computer Policy in 1984, which had helped to simplify the import procedures and subsequently reduced the import price of hardware for the organisations. Additionally, in 1986, the government formulated Software Policy, which was a liberalised function of the IT industry. Based on this policy, the hardware imports were de-licensed, and that helped to make duty free for the exporters. In 1990, the government of India had developed several Software Technology Parks of India (STPI) to surge the exports of software and services. [36].

Phase III: 1990- 2000

During this decade, we were able to make several significant changes in the Indian economy, which includes commercial liberalisation, attract foreign investment, devaluation of the rupee and relaxation for business. These changes helped to attract multiple MNCs to Indian sub-continent. The MNC players have presented 'Offshore Model' for software services. The Global Service Delivery Model is a combination of Onsite and Offshore support modules. By using this delivery model, the Offshore Development Centre is found at various locations across the globe. During this tenure, due to the entry of several multinational companies in the Indian market, the competition got strengthened. Consequently, the players started investing in R and D to strengthen themselves and differentiate their services from other players. [36].

Phase IV: Post-2000

Due to many issues such as dotcom crash, Y2K and collapse (recession) in the USA economy, evidenced to be a benefit to the Indian IT sector. The Y2K problem needed the existing software to be compatible with the year 2000. Because of the lack of US-based programmers during this tenure, many small and medium-sized US firms were forced to use the services from Indian IT organisations. This scenario helped the Indian IT industry on the global map. Post-2002- 03 till now, the Indian IT industry had recorded a vigorous growth rate due to growth in the number of clients, mostly large-sized contracts, and a robust global delivery model. [36].

2.2. NASSCOM

Subhash discussed NASSCOM as "The National Association of software and services companies (NASSCOM) is the association for India's software organisations and founded in 1988. NASSCOM has been significantly playing in policy reforms, including rules limiting access to capital markets, issuance of stock options, simplifying the rules on foreign currency transactions, and improving telecom infrastructure. Through their regular annual reports in various subjects, NASSCOM has become the most consistent and reliable source of data and information about the IT industry. NASSCOM activities were attracted by the leading software players, who share a common interest concerning

policy recommendations and the Indian brand. NASSCOM appointed multiple dynamic leaders whose efforts were acknowledged and appreciated by various Indian organisation and media. NASSCOM's memberships increased from 38 members in 1988 to over 1000 firms in 2005. NASSCOM was less effective in standing for small and medium scale enterprises or domestic rather than export firms". [43].

2.3. Major Segmentation of IT Industry [36].

Indian IT sector can be majorly classified into three sectors:

- Software industry
- IT Services industry
- ITES (IT-enabled services)- BPO

2.4. Advantages of India's IT industry [36].

- **Technically Skilled Professionals:** The high number of world-class educational institutions with high quality and along with the policy for educational loans has eventually helped the growth of the IT industry.

- **English speaking population:** India is the world second largest country concerning English speaking crowd, next place to the USA.

- **Robust Telecom Infrastructure:** The accessibility to the advanced, robust and consistent telecom connectivity is the cause for the success that we made in the IT industry.

- **Lower costs of offshore outsourcing:** This is the primary key for offshoring to India cost. Over the period, India has demonstrated the ability to global clients with lesser prices.

- **Favourable Government Policies:** Relaxed and Liberalized policies for FDI, tax exemptions, supplying necessary infrastructure, assisting with subsidies by the government of India has given a boost to the establishment of the industries in India.

- **Quality Orientation:** IT organisations from Indian companies have got required certifications such as ISO 9001, Six Sigma, Just in Time, COPC certifications to meet the need and hence attract the global clients.

2.5. Government Initiatives and Future Road Map

The government of India came up with few initiatives to encourage IT, and ITES sector in India are as follows: [39]. In Union Budget 2018-19, NITI Aayog is planning to set up a national level programme that will permit efforts in Artificial intelligence, which will help in using the technologies to maximum advantage. India is the top offshoring terminus for IT organisations across the globe. With the improved capabilities in delivering IT services to global clients, evolving technologies now offer a different range of services by the top IT service providers in India. Revenue from the IT export is expected to grow by 7-9% year-on-year to USD 135-137 billion in the year 2019. [39].

2.6 Notable trends in Indian IT industry

- Social, Mobility, Analytics and Cloud (SMAC) have changed the entire business model of IT-BPM.

- In May 2017, the government of India announced to launch a new scheme named Phased Manufacturing Programme (PMP) to enhance the production of mobile phones in the Asian sub-continent. Tier II and III cities are aiming to gain the attention of IT companies.
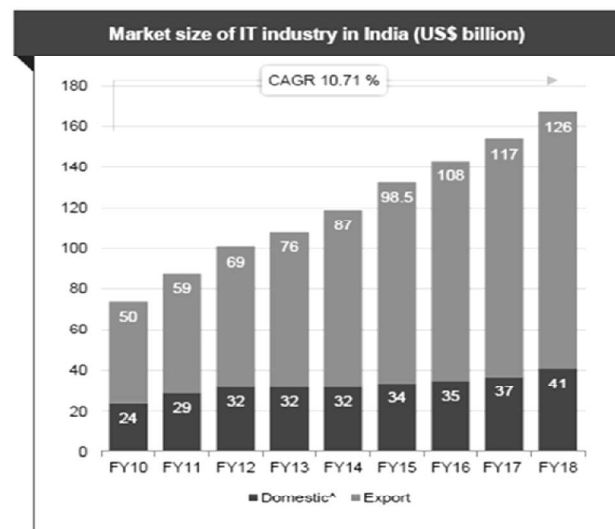
Figure 1: Growth (Market size) of the Indian IT industry

Source: https://www.ibef.org/industry/information-technology-india.aspx

- India's IT sector is undergoing a significant move from a few large-size agreements to numerous small-size contracts. The number of newcomers in technology is predictable to reach 50000, which may add other 2% to

the GDP of the country. Service Delivery approaches are being transformed, as the commercial is being moved to capital expenditure (CapEx) based models from operational expenditure (Opex).

- Indian companies have already set up more than 1,000 global delivery centres in about 80 countries across the globe. India's IT outsourcing sector is the central terminus across the globe, accounting for approximately 55% of the total market.

- From the report released by the Department of Industrial Policy and Promotion (DIPP), the IT segment (hardware and software) in India gained FDI inflows worth of USD 29.825 billion from the year 2000 to 2017. Upcoming and disruptive technologies like as cloud computing, social media and big data analytics, are creating new road maps of growth across verticals for IT organisations.

- Major players with a variety of capabilities are attracting ground as they change the strategy from being small service providers to full-service players where they can offer infrastructure, system integration and consulting services.

2.7 The contribution of the IT sector in the Indian Economy

The growth of the Indian economy has influenced the IT sector. Planning, development, execution and support of information systems is stated to as information technology. IT sector accounts for 6 per cent of the GDP of India. IT industry offers employment to 23L of people, directly or indirectly [53]. IT sector also plays a critical role in India's exports, which is accounting around 18% per cent in the year 2001. India produces around 1.5L engineers per annum, technically and socially. Majority of the engineers migrate to developed countries across the globe and able to be part of an integral part of the great human resource. From the year 2000 onwards, India has increased its level to be one of the largest IT termini in the world. As of 2006, India contributed 40 per cent of India's GDP and 30% of export revenue. [53]

2.8. Top performing IT organisations in India

Some of the notable performers in the IT sector are IBM, DXC, Accenture, CGI, Atos, TCS, Wipro, HCL and Infosys.

This list is the combination of the IT companies that are being run in India by MNC and the companies that are based in India.

2.9. The contemporary situation of Indian IT industry

A member from NASSCOM forum [47] discussed as "the industry may face some issues due to the Exporters losing margins due to rupee appreciation against dollar, In the next 3 years, over 1 million jobs are likely to be at risk due to automation, Visa restrictions coming to play in the US, UK, and Singapore. The deal is that the world is moving at a fast pace, markets are getting tougher, margins are shrinking, the boon for one industry becomes the bane for another, threatening automation jobs, digital technologies and artificial intelligence becoming pervasive. I will not get into an environmental crisis, political diplomacy, population, and poverty, because they have always been there, and requires a slightly different lens to comment on. By considering the current situation below five unique techniques can tailor the organisation: EVALUATE - the organisation must innovate, but what the organisation should not do is blindly emulate. Spend time in evaluation, INNOVATE - Pick the brains, and the brains around the organisation! BACK-UP PLANS – so organisations do not worry if this fails, because it is in place already, BE CYBER-SECURED – the most important, COLLABORATE – the winning streak".

In Forbes [48], an expert discussed as "At least 200,000 software engineers in the Indian IT industry may lose their employment each year over the next three years, according to McKinsey & Company says, basing on the McKinsey report, Head Hunters India Founder K. Lakshmikanth said that "opposite to the reports given by the media. i.e. 56,000 IT professionals losing their jobs this year, however, the real number would be something in between 1.75 L and 2L thousand per year,"   Artificial intelligence and robotic automation will pinch the rug out from the big Indian IT firms. Due to the AI and automatic robotic costs will come down to the end users. Concerning the H1-B visa that companies like Tata consultancy services rely on software engineers from India to reduce the cost. The strategy developed by America's president Mr Trump is creating it harder for those companies to bring in those employees, requiring strong proof to understand that the USA does not

have such capability within their region. Rob Lutts, chief investment officer for Cabot Wealth Management, said that "Artificial intelligence is a troublesome force for the big IT outsourcing companies". The McKinsey report says the major challenge in the future would be to re-educate the workforce in an industry that has familiarised to be the IT factory of the world. Huge employees, approximately half of the 3.9 million employed in India, are expected to become redundant or no longer useful in the forthcoming years. The toughest hit will be to the older IT professionals in their mid-30s. They will be replaced by up-and-coming technical talent more capable in new computing methods".

NASSCOM indicated the current scenario of the employment in May 2017 report [50],

Figure 2: Various contemporary issues in Indian IT industry

Source: NASSCOM report on Jobs and Skills: The Imperative to reinvent and disrupt, https://www.nasscom.in/sites/default/files/Jobs_and_Skills.pdf

"It is a period of "Flux" due to Automation, Digital Businesses and Market Fragmentation. The pattern indicates that the organisations like Wipro, TCS, Tech Mahindra and Infosys seem to be performing badly with Year on Year growth. Policy Changes in Immigration Norms and the "Mr Trump" effect have taken a toll temporarily, but the market will swing back to the original form soon. Continued Digital Transformation world over will create new markets for IT in the next 3–4 years. However, it is time to innovate so that we can have better abilities to be in the race with other developing nations like

Ukraine, the Philippines which are already catching up fast on cost-arbitrage model", discussed by a director at NorthstarClicks [14]. An academician expressed his view as "Nowadays much turbulence is going in the IT Industry of India. The IT Industry is the talk of the world. In the Indian IT sector, the number of employees is close to four million people in over 16,000 companies. Some of the known issues are: There is a disruption all over the globe; the IT industry is at a higher risk. Reports from many agencies have shown that the job cuts in the IT sector. For the next three years, there would be two lakhs job cut per annum as the Indian IT companies are still not prepared to serve in the new technologies. As per McKinsey & Company report, nearly half of the IT sector professionals are not trained based on the newer technologies. Another reason mentioned by the IT experts is the "Rigorous performance appraisal system" on a regular basis to align organisation's workforce with business objectives, strategic goals of an organisation, and client demands are also the influencers for Job Losses. The growth of cloud-based services is growing at a faster pace. Organisations are merging the learning of new technologies and reskilling. However, those initiatives are not giving results as expected. The IT services companies are being asked to switch to the on-demand pricing model, which forces them to cut operational cost and ultimately leads to layoffs. [14]. However, it is seen that the IT industry is moving in a positive direction because of the following reason. There is a vast Foreign Direct Investment (FDI) inflow, Leading Indian IT organisations like Tata consultancy services, Infosys Limited, Wipro Limited and Tech Mahindra have changed their portfolios and offerings. These organisations have started demonstrating their ideas in Blockchain technology, artificial intelligence through the innovation centres, R and D centres, to create differentiated and advanced offerings. Google decides to bring its first data centre in Mumbai, India by 2017.

An IT expert expressed his thoughts as "We have 2 or 3 important reasons for the current situation such as i. Automation implemented in all related areas. ii. Developed countries like USA, UK, Australia, Singapore policies, Visa procedures and their local recruitment policies". A Senior Associate at CTS discussed that "Indian IT will survive for sure. However, the profit margin of 20% or 30% is not possible like before. Also, there is no chance of

increasing headcount. The major recruiters like Infosys, TCS, Wipro and HCL reduced their numbers. They select only from a few leading institutes. The hike for the experienced employees will be very marginal. Also, the experience of the Indian workforce in developing and maintaining enterprise applications is handy, and hence, they are still very much inclined towards continuing their partnership with our company at least for the foreseeable future. Another person illustrated as "Yes, the IT industry will survive for multiple more years. It might not create jobs furthermore, but it will survive. TCS, Infosys, Wipro and HCL are big giants, and they know how to manage the situation. This scenario will create issues for the IT professionals who are in a comfort zone and will soon be termed as redundant if they do not change their mindset".

Founder CEO of a start-up company discussed as "Our IT companies started and succeeded in using the cost arbitrage (difference in USD and INR exchange rate). Nowadays, developing countries like Taiwan, Philippines, Russian countries started giving low-cost IT services to US clients. In the last five years, the US economy has slowed down drastically. If we combine various factors such as the US economy, resourcing rates going down, less outsourcing projects and other countries provide low-cost resourcing option, soon India will be affected. In my view, Indian IT companies should come up with new strategies. a) Start providing high-end services as India have enough talent pool. b) The US market, they had produced very bug success stories such as Facebook, Google, Salesforce, Intuit. India market itself is a big market, and for sure we can do something better than what we perform currently. [14]

An official from NASSCOM described the situation as "The Indian IT-BPM sector has remained a global powerhouse. It has exhibited rapid evolution regarding expanding their vertical and geographic markets and attracting new customer segments. The sector has transformed from technology providers to strategic business partners and offered a considerably wider spectrum of services over the years. The IT sector has positively impacted India through various factors such as job creation, foreign exchange and exports. Quarter results of companies like TCS, Wipro and Infosys being positive denotes an optimistic and sustained growth through the year".

An IT professional with 15 years' experience mentioned his

view as "to survive, Indian IT organisations need to do: Employer, employee and industry should be ready to re-skill and up-skill, technical experts should be willing and to learn the latest of the technology and master it at a fast pace. Enhancing the skills is a continuous process, Non-technical people should be prepared to take a newer or different role, and responsibility in people, talent management, business analysis, domain consultancy, relocation or migration to client locations may be another critical aspect for survival in coming days. There are various small changes that the old folks will need to bring within themselves the most important of them will be developing the right attitude towards accepting change and being opening to learning by reducing the resistance. Considering the younger generation as competition and moving oneself beyond the limits is equally indispensable.

An employee who is in IT for more than a decade expressed his valuable input as "Most of the work which was done by service companies do not require application design or architecture skills. Employees can do many things with a conventional understanding of the domain and a good understanding of technology. This is generally found in the 3 to 5 years of experience level. There might be a need for the experienced employee to lead the team and have complete control of the project. However, such roles are very less, so it is tough for employees to continue in the technology steam after certain years of experience. They then must move to the management stream. The middle management is always in risk and management removes the managers through the lean model. The increased wages of Indian labours are also triggering the cost of outsourcing to India to go up and giving less. To reduce the labour cost, companies have started recruiting science graduates at entry level. If employees are agreeable to compromise on salary, maybe even agree to a less, organisations may be willing to preserve them.

The flexibility of young employees compared to experienced employees is different. Younger employees have less family responsibility which allows them to spend more time in delivery. This has no connection to productivity. In the case of employees with 10+ years' experience, may have more family responsibilities. This entire discussion means that companies prefer less experienced employees. So, to ensure the job in IT after

certain years of experience, either one must move into a consultant role or move to the management stream, like domain or process expertise, which adds more value to the organisation.

An employee with 12 years in IT industry with global experience in North America, Europe & India discussed as "seniors, or experienced people will face several challenges retaining their existing roles with current legacy IT skill sets. Digital skills, especially in Cloud, Big Data, Mobility, Social, Analytics, Robotics and AI need to be learned by everyone regardless of their seniority to stay relevant. Having said that experienced people would also be required as complex projects require much more than technical skills. It is also about using the experience gained through working on other complex projects, managing multiple stakeholders and working with teams spread globally". A Project Manager from Nutcracker mentioned as "the steps that have to be taken into consideration to survive in the IT industry. Learn new things each day, and there are millions of technologies, million little things employees can do, design / develop/ test/manage/lead. Meet experienced and new people, learn from them, get to know their journey, learn how to keep updated. Earn money and strive to earn more by upgrading the latest skills. See places, get some onsite client-facing time, interact with new cultures, travel and expand horizons.

What are some tricks and hacks to survive in Indian IT industry? Explained by an IT veteran as "Employees should have strong technical skills and try to be an expert in the domain. Always good to have hands-on skills if employees are the technical side of things. Employees should have a stronghold in whatever they do. If employees want to move up the management track, then they must be willing to get fired any time and may never end up getting another job unless they have high-level contacts in any other company besides their own. Employees cannot move backwards when they move up the management track. The employee must be willing to spend late nights and spend weekends as well as working on proposals if they want to have an experience of Pre-sales. Lots of vacancies always exist for Presales roles as well as Bid Management. Sales roles are not easy to get unless an employee start their career in sales or they have lots of experience in delivery. If the employee is billable, he

or she is safe. They are in a non-billable role always put the employee in some risk at some stage. Never expect a promotion after middle management stage. Even if the employee gets promoted keep trying to sustain. Even if employees do not get a promotion, do not get upset and leave unless they are 100% sure that the business will succeed. Starting up something may eat up 5–10 years of someone's life and many of them never succeed, and they cannot go back into an IT job again since they have a gap especially in India. It is challenging to sustain at the top unless they have strong support. So never make any enemies".

Indian IT industry has been an essential sector of the Indian economy for many years. However, lately, due to various reasons, the situation has got changed, in the financial year 2017. The outcome of the top three IT companies namely Wipro Limited, Tata consultancy services, and Infosys Limited has been on the lower level. The fourth quarter brought some confidence for Tata consultancy services; however, the investors are feeling bullish. The organisations those who have made a substantial footprint in the global IT arena are now fighting for their positive returns. Multiple scenarios like the slowdown of the economy at the worldwide level, aggressive competition, employee's resignation and others have shortened (impacted negatively) the growth of IT industry in India. Some of the action plans that could save the IT industry are 1. The leading IT companies need to redesign or restructure their business delivery models to meet the challenges of the global economic slowdown. 2. The IT legends in India like Wipro limited, Tata consultancy services, Infosys limited, and others must take fruitful steps to progress their status in the global field. 3. The strategy is needed to handle the problem of competition from MNCs in retail and healthcare sector, and there is a need of redesigning the offshore business models, and it should be invention based and productive in the IT companies. 4. The governments such as U.S.A, U.K and other Western countries should consider in changing the policy decisions to recuperate the slowdown of their economies, which would benefit not just those countries but also to the global stakeholders. 5. Instead of giving generic support, the Indian IT companies should think about expanding the abilities to the latest technologies like Cloud Computing, Big Data, Research & Development and should update themselves in providing

such IT services to Retail, Healthcare sector, Science & Technology, Robotics, Space Research and other such areas. This approach will ensure to survive in the market.

An employee from Hyderabad mentioned his view for the question of whether recession year for IT Industry "No, it is not a recession year for IT Industry, definitely not in India. IT industry in India is likely to be safe until another 15–20 year. However, it is very critical for the employees of any organisation to keep themselves updated with the latest technologies in their domains. With the recent technologies and methodologies coming into the light, traditional and legacy technologies are not relied upon anymore. Hence, it is imperative to keep ourselves updated from time to time. If employees are up to date with the market, they can never be taken out of the job. The people who only lose jobs are the ones who stick to legacy systems are too stubborn to change and who are deemed not valuable to the organisation".

2.10. Hiring and Attrition rate

Employee's count increase by the top four Indian IT organisations in 2017-18 fallen by more than three-fourths. By the end of March 2018, the Indian IT organisations Tata consultancy services, Infosys, Wipro and HCL Technologies have added 13,972 headcounts compare than 59,427 addition in the year of 2016-17. [49]. "The slowing down of hiring or even the reduction of headcount progresses much faster than we did anticipate," mentioned by Tom Reuner, from HfS Research. The 2017-18 financial outcomes of the above companies also indicate that the industry has been able to point the revenue irrespective of the head account addition firmly. For example, in 2017-18, TCS declared the revenue growth of 8.6%, though its headcount growth just by 2%. India's second-largest IT services company, Infosys, announced revenue growth of 7.2%, whereas headcount addition is only 1.9%. In the case of T, they just added 7,775 employees in 2017-18, whereas they have added 33,380 employees in 2016-17, even as employee attrition rates chop to a low of 11% in the fourth quarter.

2.11 Possible reasons for fewer job creations in the Indian IT sector

Based on the various secondary data that are available from the research papers, research agencies and the experts

discussions in the forums there could be multiple factors that are contributing towards the fewer job creations in the Indian IT sector, they are : Cloud Solutions ,Automation, Juniorization, Upskilling the existing employees, Cross technology movement within the organization for cost cut, Downsizing the employee's size to maintain profit margin, Lower economy growth of developed countries like UK and USA, H1B visa conditions made by the USA Govt. The authenticity and level of influence of the above factors in the job creation need to be confirmed by the primary data which we are going to collect from the industry experts through quantitative and qualitative data.

3. Review of literature

Agrawal discussed that the Indian IT sector has attained an iconic status in the economy of India and considered a highly influenced parameter in India's economic growth. The Indian IT and ITES share in National GDP has progressed from 1.2 per cent in FY 1997-98 to 4.8 per cent in FY 2005-06. The total revenue from the industry exceeded USD 36 billion for FY 2005-06 with a growth of 28 per cent over the prior year. The industry is highly export-oriented has significantly contributed towards the Indian export and foreign exchange reserves. As per NASSCOM report in 2006, the industry presently provides direct employment to about 1.3 million people and additionally, generates an additional 30 lakhs employment prospects through indirect and induced jobs. NASSCOM McKinsey Report in 2005 predicts that the industry is aiming US D 60 billion in exports by FY 2009-10 and hence, will be able to produce an extra one million jobs [40]

Arora discussed as "It is well known, software production and exports from India have multiplied, particularly since the early 1990s. The most frequently used source, the Indian software industry association, NASSCOM, estimates and indicate that software service exports in 2005 were about $13 billion". Further, he discussed that India's appearance as a key exporter of IT and software services in less than 15 years have excited for the reasons of its victory and triggered hopes for similar accomplishment in other industries. The consequent growth of exports of other business services seems to authenticate the belief of experts that India's IT and software success would have expanded benefits for the Indian economy. Indian software exports approach started as Indian firms "rented out"

programmers to the American customers, by sending them to work for the client, typically in America itself (Either in the office located at America or the customer's location). Athreye says that the "on-site" work model, pioneered by Tata Consultancy Services, was rapidly emulated by all other firms that entered the Information technology industry in the early 1980s. [41]

Lema, R argued that popular business media is also occasionally an advocate the views. A Forbes employee is assessed as follows: 'India is still the world's back office for its excellent service. India's technology industry is a 'services' industry. The Indian's technician does not think much, but the customers do. India executes'. In the IT sector, there was a declined demand in the technology sector in the USA in 2001. However, software exports from India increased from just over USD 5 billion in 2001 to nearly USD 18 billion in 2006. Experts in the IT industry agreed that the 2001 slow-down in the IT sector was an inflexion point in which service providers and customers revised and reconfigured their business delivery models. Concerning the demand, this has been supported up by research which has indicated that the offshore outsourcing to India has become more profound and knowledge seeking. Though, the experiential changes on the demand side are rarely complemented by supply-side. [42]

Subhash conversed that the industry has grown more than 30 per cent yearly from the last two decades. From the exports worth about $50 million in the late 1980s, the Indian IT industry grew at around 30% a year to more than $200 million exported by 1993. In the successful years of the mid- and late 1990s, software exports reached 50–60 % annually, reaching $6 billion by 2001. Even at the time of the infamous 'dot com' bust, software exports sustained to grow by about 25% annually, which is the significant growth in the software industry anywhere in the world. Presently, India's software industry status back to health condition, 33% growth rate with projections for 2008 which is closer to $60 billion. The software industry's share of GDP has also grown harmoniously. The IT share of overall GDP in 2004–05 was 4.1%, which is likely to grow to 7% by 2008. Software industry exports are majorly information technology and software services instead of products. While Indian IT firms export to more than 60 countries globally, the United States devotes nearly half the

worldwide market and is the main terminus. The India's software exports are as follows: USA- 69.4%, UK-14.5%, Japan-3%, Germany-2.8% and Singapore-1.8%. [43]. In the IBEF report 2006, discussed that over the past decade, the IT sector had become one of the known fastest emerging industries in India, propelled by exports. The main business areas that have contributed significantly (96%) to the industry's IT exports are Software and services, i.e. IT and ITES. Over a period, the Indian IT sector has demonstrated the capability as a preferred worldwide sourcing base and predictable to continue to grow in the future too. The service offering by the Indian IT and ITES industry to the global customers vary from simple tasks to extensively major complexed projects. [39]

G. V. Vijayasri [53] discussed as "The mainframe manufacturer asked Indian IT giant Tata Consultancy Services to install the system software for one of the US-based customers, in the year 1974. India has got a good reputation because of its contribution to the world's IT sector. Organisations such as Dell, GE, HSBC, Microsoft, HP and some Indian MNC organisations like Wipro Limited, Micro land and Infosys Limited have set up their Delivery centres in metro cities like Hyderabad, Chennai, Mumbai, Calcutta and Delhi. They select these cities because those cities supply good infrastructure, good floor space, power and uninterrupted telecom facilities to the MNC organisations. These factor influences in high growth statistics of India and the changing perception of the IT organisations about India. Special subsidies and incentives for exports may be the inefficient approach of motivating the growth of the Information Technology sector. Special central government initiatives are needed to upsurge the availability of IT training and related education which will create an impact. By following this approach, the State government also should frame policies to encourage the IT sector. State governments may have to remove the general restrictions in starting the business.

S. Annapoorna and S.T. Bagalkoti discussed a few issues concerning job opportunities. Employment opportunities by the IT industry are not so significant when we compare to the total workforce in India. However, it is unavoidable to accept that the IT sector has changed the environment of employment conditions such as recruitment pattern and work conditions [54]. The count of IT employees is minimal

as per Heeks [56] and Mukherjee [57], as they contribute only 0.08% of the cumulative workforce. There are some remarkable changes in urban lifestyle nationally and globally due to the development of the IT sector. IT employment has changed all the regular job patterns and conditions. There is an unusual condition in the IT sector, either the IT sector ensures job security or even employees wanted with the same employer till retirement, unlike Non-IT sector. IT jobs are "Footloose industries" as indicated by Ramesh [58]. The character of the employees along with the technical skills are needed to work, traditional qualifications and individual's ability is no longer needed. Also, there is an assurance for a lifetime job. However, that can be ensured through skill development.

In the report issued by PWC in 2015 discussed that most Indian organisations still do not realise the changes that are needed [59]. Many of them are not responding swiftly enough. To accomplish the scale of transformation essential for India's Winning Leap, businesses in as much as 40 per cent of the country's economy will have to deliver new solutions and develop new capabilities. Shalini Jain discussed as "To expand the IT Industry in India, there are few suggestions: Development of inter-personal means of Information Technology. We must also eliminate poverty and illiteracy from rural India. Women and adult education are much needed as they contribute much to transformation. Community and religion-based conflict should be eliminated. Educational institutions should open in rural areas for girls as they will help to uplift the condition of the girl child in the society. Eventually, that helps to control the rural migration towards urban. Cost of using IT should be minimal so that the common can also opt for it" [60]. To enhance the IT sector's influence on the Indian economy, there are few of the suggestions arrived from this research. They are: Govt policy to be strengthened through defined policies and long-term investors should be encouraged. Comprehensive curricula to be prepared to meet the demands of the emerging technologies that are needed for the industry. Industry-Academia collaboration must be strengthened. Good power and communication facility should be given. The strategy is needed to attract more foreign investments so that the Indian IT industry can be rejuvenated. Build-up technological R&D centres is an immediate needed. By doing this, upgrading the technical skills for survival in the

ferociously competitive technology-based situations. Shrabanti Pal discussed the different phases of the IT industry starting before 1984 [61]. The author also showcased the revenues performed by IT industry from the International and domestic market, the percentage of export revenues from the pre-liberalized period [62]. T.S. Srinivasan examined the consequences of Y2K problems with its effect on IT sector that made significant differences in revenues.

Cinni K.R. and Dr Rosa K.D illustrated "India has developed its brand in the global IT market. Today, India considered a superpower in the IT world. Due to the IT industry, India has moved from a rural, agriculture-based economy to a knowledge-based economy". Information technology companies need to have sufficient cybersecurity and quality management procedures in place to meet global demands. India is a big market for IT, and Organizations must frame strategies to develop and acquire domestic market [63]. Organisations to build the workforce who is loyal, which will be cost efficiency and excellence in quality. Government to create IT-friendly policies to ensure the growth of the domestic and global market. Mohit Dubey and Aarti Garg [65] discussed as "The IT industry has fetched a revolution in India during the 1990s. The performance of India's software and IT service sector in the last decade has been extraordinary and accountable for more than 20 per cent of total exports and contributed 2.6 per cent of GDP". The ITES sector of India attracts a vast number of degree passed out students in the BPO and KPO firms. This approach has solved the unemployment issues of Indian sub-continent to a great extent. The lifestyle and purchasing ability of the ordinary citizen of India have enhanced significantly.

4. The motivation for this study

From the review of literature, it is evidenced that limited studies were conducted about the Indian IT industry, and most of them were specific to subjects such as growth, contribution to the Indian economy, contribution to the global IT and forecasting about the IT sector and no formal researches being conducted around the trending issue - lack of job creation in ITO industry by involving multiple organisations. The employment issues visible in the usual life of ITO industry triggered the necessity for further research to find out a solution to mitigate the current

difficulties in the ITO industry so that the employment can be increased, and the business can be retained.

5. Research Design

5.1 Objectives of the study

- To understand the current employment situation of India's IT industry
- To identify factors influencing the lack of job creation in India's IT industry
- To find out the possible solutions for retaining the growth of India's IT industry
- To find out the possible solutions for increasing the employment opportunities in India's IT industry

5.2 Research questions:

- Is the Indian IT sector facing a lack of job creation currently?
- What are all the factors influencing the lack of job creation in Indian IT sector?
- What are the initiatives needed to retain current employment in the IT sector?

5.3 Problem statement

There are only a handful of formal and informal researches conducted in the IT industry about the trend and job opportunities. The past studies did not emphasise the complete information about the factors that are influencing the IT business growth and creating more employment by involving multiple IT organisations in contemporary situations. It is essential to conduct a formal academic research in IT industry to understand the current employment situation in India's IT industry, identify the factors influencing the lack of job creation in India's IT industry, to find out the possible solutions for retaining the growth of India's IT industry and to increase the employment opportunities in India's IT industry.

5.4 Target audience and Organisations

Participants are from 9 top-performing IT organisations Which includes the Indian based organisations such as Wipro, TCS and HCL and MNC based organisations such as IBM, Accenture, Atos, CGI and DXC that are being operated in India and they are playing majorly in India's IT industry. Forty-seven respondents participated across all

the organisations.

5.5 Questionnaire and Data collection

The heterogeneous mixture was necessary to get the best possible outcomes. The questionnaire (Online, Google form) distributed to the respondents through email and LinkedIn chat. The respondents were given ten questions for evaluation. The first six questions were closed-ended questions while the last four questions were open-ended. The data collection happened in June and July 2018.

5.6 Sampling size and sample technique

The sample size for this study is 51. Based on Forrester and Everest research reports, from the top 20 top performing IT organisations, we have collected data from 9 organisations. By considering the homogenous nature of the respondents, we have decided to have 5-6 respondents from each organisation is appropriate and can justify this pilot (Miniature) study on the lack of job creation in the IT industry. Purposive sampling is the technique used for this data collection based on the factors discussed and highlighted by the researchers as per the researchers Sudershan Reddy and Kannamani [68] [69]. There was a significant effort attempted to maintain the participant ratio from each organisation.

5.7 Data analysis tools and Techniques

A Google-based online survey from Used for data collection. Respondents were contacted through e-mail system to introduce the purpose of research and to distribute the questionnaire. Microsoft Excel and IBM SPSS tool were considered for the data analysis of this research.

6. The outcome of the study

6.1 Quantitative study

Respondents from nine organisations participated in this survey, and we have at least 3 participants from each organisation and a maximum of 7 participants.


1http://www.dqindia.com/dq-top-20-2017-meet-indias-top-20-it-companies/
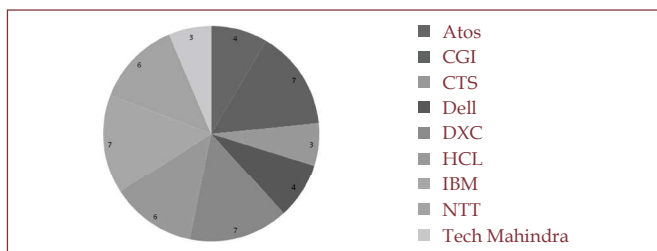
**Figure 3 –** Organisations participated in the study

Participants are from various employment categories such as "Managers, Senior Management Professionals, Professionals, Leadership professionals and Project management Professionals". Though the number of respondents varies from each category, the span of control is maintained. Detailed classification of each group has been given below.

- **Managers** = (Functional, People, Service Delivery, Account Delivery, Operations Manager)

- **Senior Management Professionals** = (Associate Director, Director, General Manager, Tower Head, Vertical Lead, Business Lead, Assistant Vice President, Associate Vice President)

- **Professionals** = (Engineer, Analyst, Consultant, Tech Lead, Team Lead)

- **Leadership professionals** = (President, CEO, CFO, CIO, CTO, EVP, SVP, VP, Country Head, Regional Head)

- **Project management Professionals**
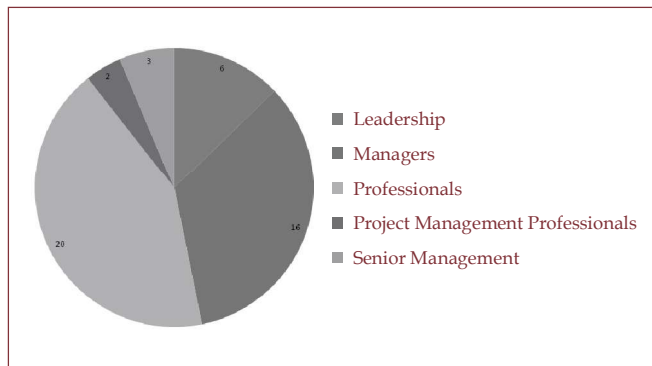
Figure 4 - Various level of professionals participated in the study

We have asked the question as "Job openings in IT came down drastically in 2017-18, do you agree?", 66% of the respondents mentioned as 'Yes', 21.3% mentioned as 'Somewhat' and 12.8% mentioned as 'No'. From the response pattern, we could conclude that majority of the respondents agreed that the Job openings in IT came down drastically in 2017-18. The qualitative response confirmed this opinion.
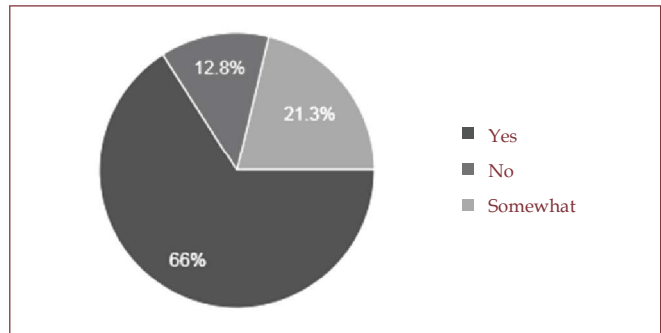
Figure 5 - Response pattern for the question "Job openings in IT came down drastically in 2017-18".

We have asked the question as "Do you think (President Mr Trump) America's outsourcing strategy brought down the number of positions in India?", We have given three options and, given the option to explore if there is any input that the respondents wanted to share. 46.8% of the employees felt that America's outsourcing alone is not playing a role in bringing down the numbers, it means there are many other reasons too. 34% of the respondents mentioned as "No", it means America's policy is not playing any role in lack of job creation in India. Only 12.8% of respondents mentioned as "Yes". Only three respondents are given different answers such as "Focus on automation, the transition to cloud infrastructure and cost control. From the trend, it could be concluded that America's outsourcing strategy I not influencing in brought down the number of positions in India.
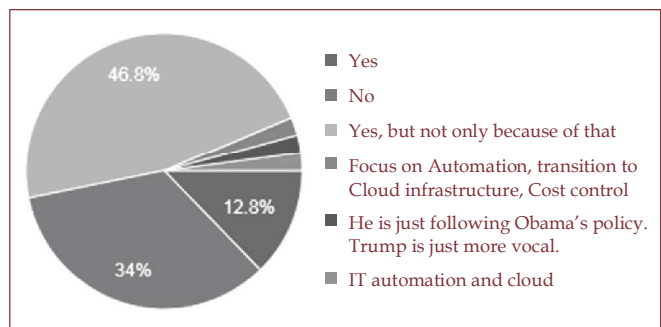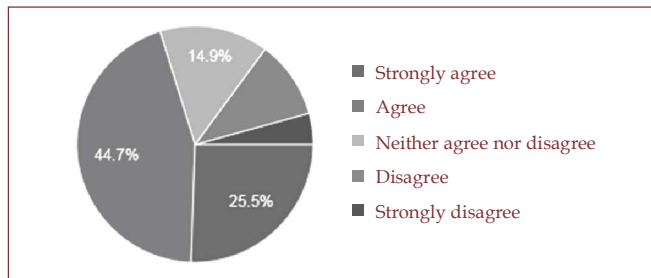
Figure 6 - Response pattern for the question on "President Mr Trump) America's outsourcing strategy brought down the number of positions in India".

We have asked the question as "The hiring of experienced employees is either not happening or very minimal nowadays- Do you agree?" and given five answers for them to choose. Around 70% of the respondents mentioned as 'Agree',


14.9% of the respondents mentioned as 'Neither agree nor disagree'. 14.9 of the respondents mentioned as 'Disagree'. From the trend, it can be concluded that the hiring of experienced employees is either not happening or very minimal nowadays, which indicates the current lack of job creation situation in the IT industry.

Figure 7 – Response pattern for the question "The hiring of experienced employees is either not happening or very minimal nowadays."

We have asked the question as "Currently, there is an undeclared recession in the Indian IT industry - Do you agree?" and given five answers for them to choose from. Around 51% of the respondents mentioned as 'Agree', 27.7% of the respondents mentioned as 'Neither agree nor disagree' and 21.3% of the respondents mentioned as 'Disagree'. Conclusively, half of the respondents agreed that there is an undeclared recession in the Indian IT industry. The response pattern indicates that the hiring opportunities are in place currently and it is not like the recession scenario.
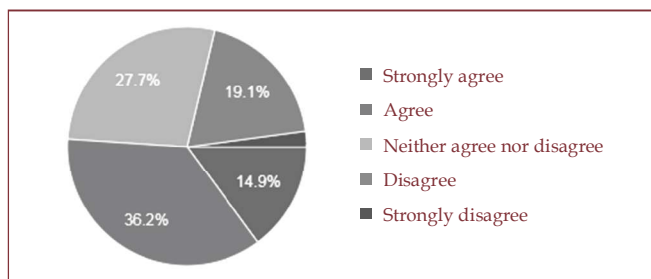
Figure 8 – Response pattern for the question "Currently, there is an undeclared recession in the Indian IT industry - Do you agree?

6.2. Qualitative study

Out of 10 questions that we have asked respondents, question numbers 7 to 10 are open-ended. For the question **"What are the reasons for the current lack of job creation in the IT**

industry in India- Your thoughts, please?" Respondents have responded with the variety of responses which replicates the current situation of the Indian IT industry. Automaton and latest technologies like Aws, Azure, and Cloud would result in massive job reduction and becoming a big disruptor to the traditional business model of IT Services. Customers are moving towards the latest technologies, and we do not have such skill sets to meet the demand. Increasing wage levels also another influencer, employers want lesser people on the bench, lesser training investment and needs ready talent. IT sector is passing through a paradigm shift. A lot of level 1 work is getting automated, and at the same time, there is much digital technology coming into play. It is c to learn how we can update ourselves with the new technology and stay relevant.

Also, other factors like lack for foresight and leadership, incompetent senior and middle management who grew into those management roles without spending and gaining adequate experiences in lower levels to understand the business well, identifying emerging threats or disruptors and being adequately prepared to stay ahead are some of the other factors. Skill-gap continues to be the most significant factor, and the industry is not ready for new demand skills. Deal sizes are shrinking which as well means there is less room for people in a project who are not direct contributors. Nowadays, the number of contracts being awarded to Indian IT companies with offshore demand is less. The Indian IT industry hiring fewer professionals because of the onshore vs offshore ratio is somewhat 1:3 which is influencing the current decline. There is no lack of job creations, but it is lack of resources awareness on latest technologies and not coming out of comfort zone to learn according to the emerging technologies for their cross skills. IT companies are not hiring nowadays by creating a false scare and forcing employees to work extra hours. Since there is no strict policy and regulations in India, companies are utilising these loopholes for their benefit.

There is no dearth of IT jobs in India for rightly skilled engineers. IT companies need to take up some training initiatives for employees for new technologies. The employees are expected to learn the technologies by themselves which may not be feasible for all the employees. Currently, we are going with the IT revolution as similar in the past - industrial revolution. There are multiple factors for this reason - transformation, cost optimisation, digitisation, automation in every level, Bionix, RPA, self-managing products as such databases, big data analytics, cloud and many. Every country wanted to stop offshore their work, to protect their citizen's

employment (As what Mr Trumph is doing now).

For the question *"To perform well and create more Jobs in Indian IT industry, what steps should be taken by the Govt, employers and employees?"*, Respondents have given feedbacks to improve job opportunities. The government should encourage and support the IT industry in India. More investment in training in the latest technologies are needed, focus needed from employees an employer. Our education system and content are too old. Need a complete revamp, especially in engineering stream. Instead of depending on the foreign country market, India must investigate opportunities in the domestic market as we are a country with 1 Billion population, so the needs are also high. Government to accelerate the development of e-governance models at all levels within the country in a transparent and corruption-free manner. We have so much to do, and the domestic market still lies untapped. This could provide immense job opportunities and serve as a training ground to a large pool of unemployed, unskilled and inexperienced people. Employers to think ahead and think out of the box, in a people-centric manner to empower employees to do right for the customer. Continuous skills development of the workforce in emerging technology is unavoidable. Govt should consider Aadhar based job creation to track all people have a job or not if someone was having any loss of job than consider providing the expenses until he gets new opportunities. It must be similar to the way as and when there is a tax deduction. Try considering the insurance as well for employee who is suffering job loss for various reasons.

Employees should introduce self-thinking, this to get a more Western standard on the people. Invest in training to secure valuable positions in Cybersecurity, Cloud and move away from the traditional mode of service delivery. IT organisations should stop promoting exports, India itself is a big market. Make it easy to support an Indian client and Govt by removing tax incentives for export only. Either remove tax for domestic customers or remove SEZ tax shelter. Training approach to new technologies is needed from the government. The government should be able to create more employment opportunities in India than it is now, and employers should be willing to manage the employment ratio to the nominal rate. Also, India should further strengthen its diplomatic ties with the US and Europe in the fields of investment and more employment front as more investment means more infrastructure and job opportunities for the Indian population. Also, more importantly, the reservation system in the Indian economy should be removed entirely while seeking employment, as the reservation is somewhat acceptable until

the college degree is attained, but after the college degree, all the individuals should compete based on merit and not by reservations. Also, one of the critical factors which we all seem to be missing is the population control as we should follow China's one-child policy until the time we can bring it under control, and our country's resources can accommodate the population demands to the maximum. Because incoming 10 - 15 years, the population will explode further, and the markets are limited to accommodate everyone.

IT people must start with the latest technologies and must come out of their comfort zone to learn according to the emerging technologies for their cross skills and there are a lot of new jobs in the IT industries to which the current Indian blood are getting prepared, whereas the experienced IT people have to adapt to the new changes happening in the market. Organisations should plan for developing skills, change the delivery model and train people in the updated tools. We need institutions to introduce more general courses across the industry. Many should become master's in mathematics and Statistics and then become proficient in learning at least one programming language with database skills along with learning Artificial Intelligence & Machine Learning. Employers should create an environment that allows creativity.

First and foremost, encourage employees to leave the office on time and not disturb during personal times. Increase the number of IITs and create more graduate programs (master's and PhD) in Math and engineering. The government should encourage entrepreneurship so more and more companies come up and can create jobs for people. Help in funding some training costs for employees by the government which can significantly benefit the IT industry. Reinforcing IT Governance and security is much needed. Innovation and proactive approaches in all streams must be improved.

For the question "What is the future of the Indian IT industry- Your thoughts, please", respondents predicted the Indian IT industry as follows: Going forward we can see less IT jobs in India. Indian it industry must grow into latest technologies - big analytics data, robotics, artificial intelligence, and other digital trends, develop ready products and solution assets. India would continue as a low-cost centre and skill centre for IT. Our younger generation is fast paced to cop-up with the shift and can navigate through the digital journey. IOPS operating in a sweatshop model are in for a rude awakening. Companies must have an innovative approach, target towards the value chain and go back to the roots of empowering and

enabling the human capital which is the single most critical investment for future growth. Move more towards professional work culture and steps to remove sycophancy from the ranks. Indian IT industry has the experience (and the cash reserves) to whether the disruptive changes were driving the industry. However, being nimble and adapting to change faster than the change itself is key to staying ahead of the game.

The future of the Indian IT industry is bleak unless the Government, Industry Technology Leaders and IT organisations invest more in people rather than anything else. Automation will increase, and skill-gap will continue to be a challenge. For most of the enterprise's mix of traditional and new solutions will be best suited. Indian IT industry needs to invest in the right skilling and enforcing better standards for its employees. Robotics and Automation and less manual intervention will be there. However, new jobs will be an area where automation cannot be deployed, and human judgement is needed. Another respondent mentioned as "Indian IT industry future will be very bright. Stop reading pessimistic news articles. The amount of Talent in India makes it impossible for any competition to emerge. We are to SW and IT Services what China is to Manufacture". If IT companies invest in new technologies and people, they will have a good future. Things are changing in an extensive and fast phase, and people must keep up-skilling and cross-skilling themselves on the latest technology, there are many opportunities in the new things like big data, digital, Blockchain artificial intelligence, automation. Current generation learns this. However, the experienced professionals of various technologies in the past must start learning and compete with the newcomers in the market to survive. IT service from India will be too expensive, and other countries will provide better and cheaper services. IT Industry would evolve with the current trends. It will grow revenue-wise and hence, profit margins will also improve. However, job growth would be stagnant unless the adoption of IT in Indian companies as well as the government increases.

There would not be huge progressions, but the current progress can be retained for a few years. Massive potential with emerging technology like AR, VR, Voice, Data Science, Hybrid Cloud, ML/ DL, robotics will play a significant role in the Indian IT industry. The critical requirement is the ability to provide high-end services as opposed to "Keep-the-lights-on Operations" and or standard coding services. If the relevance is not addressed, then IT will slowly become a low-cost commodity service. Technologies keep changing, and people need to learn and re-learn new things as that is the only way

out in the IT industry. A respondent from IBM mentioned as "There will not be many jobs generated in future as most of the onshore work get adsorbed by the existing staff in India (because of low-cost centre). There is no point in encouraging a career in the IT field in the education system, and this field is not any more stable. As most of the IT jobs will be posted as such in crowdsourcing or freelancer job portal to get their job done and it will become a cheaper market than any other. Hence there is no value".

For the question *"According to you, currently, what are the main challenges of the IT industry?"*, (the challenges indicated by the respondents are: Automaton, People dependence, rising wage levels, cost cut, dependency on USA, Work hours, pressure on job, skill development, lack of availability of path-breaking leadership, lack of focus and budget in training people to secure the right jobs, company mergers, less job opportunities, getting new projects and lack of good right candidates are some challenges. Lack of awareness on a career path for the existing experienced professionals since the change in the industry is very fast and vast. Skill demand in India to manage and support the emerging technologies across the globe (like Hadoop, big data, analytics, mobility and Blockchain). No much focus or concentration on the IT security or safety for data. Another respondent given a response which is contradicting the previous statement as "There are no challenges in the industry, it is all about people staying relevant to the industry".

Promoter led management control, and culture in majority IOPs also have huge limitations thought has its advantages in the hands of experienced hands-on ones. Threats from the South East Asian and Eastern European countries for work that was traditionally handled by IOPs. Companies are not willing to spend on the training of employees and not making them self-sufficient with the automated IT world. Lack of Skilled resources, to provide proper L & D in organisations, no innovations. Training and certification costs are high for new technologies which are not affordable for all companies and employees. As a result, experienced professionals are losing out on jobs. Also, the standards and expectations of employers from employees have drastically gone high which is not required. Lack of HR policies for employees and management vision. HR Practices need to be improved, and we should go the Japanese way concerning job security and quality. Made in India for software should elicit the same response to Made in Japan in products. Indian IT sector mostly focused on services. Its share in the new invocation is very less. The USA and other developing countries are not interested in moving R&D in

India. So, India and the world are losing the innovation capabilities of thousands of Indian youths. IT is treading towards Artificial intelligence (AI), Robotic Process Automation (RPA), Internet of Things (IoT), Analytics (Data Science) and Hybrid cloud. However, the required staffs are not significant. Well! IT is not interested in full-time employment from now and in the future. Hence, this field can be considered unstable.

7. Discussion and Interpretation

From the response pattern, we could see that most of the respondents agreed that the Job openings in IT came down drastically in 2017-18. Also, it is crystal clear that America's outsourcing strategy is not influencing in bringing down the number of positions in India and it plays a minor role. Majority of the respondents confirmed that the hiring of experienced employees is either not happening or very minimal nowadays, which indicates the current lack of job creation situation in the IT industry. Only 50% of the respondents agreed that there is an undeclared recession in the Indian IT industry. The response pattern indicates that the hiring opportunities are in place currently and it is not like the recession scenario.

For the question "What are the reasons for the current lack of job creation in the IT industry in India- Your thoughts, please?" we have got multiple answers in various aspects. Automaton and latest technologies like Aws, Azure, and Cloud would result in massive job reduction and becoming a big disruptor to the traditional business model of IT Services. Customers are moving towards the latest technologies, and we do not have such skill sets to meet the demand. Skill development and deploying the right people for a management role is inevitable. More than supporting foreign client, Indian IT market to be developed with the proper planning.

For the question "To perform well and create more Jobs in Indian IT industry, what steps should be taken by the Govt, employers and employees?", Respondents have given feedbacks to improve job opportunities. The government should encourage and support the IT industry in India. More investment in training in the latest technologies are needed, focus needed from employees an employer. Our education system and content are too old. Need a complete revamp, especially in engineering stream. Instead of depending on the foreign country market, India must look into opportunities in the domestic market as we are a country with 1 Billion population, so the needs also high. Continuous skills development of the workforce in emerging technology is unavoidable. Govt should consider Aadhar based job creation

to track all people have a job or not if someone is having any loss of job than consider providing the expenses until he gets new opportunities. It should be similar to and when there is a tax deduction. Try finding the insurance as well for the employee who is suffering job loss for various reasons. IT people have to start on the latest technologies and have to adapt to the new changes happening in the market. Organisations should plan for developing skills, change the delivery model and train people in the updated tools. Employers should create an environment that allows creativity. There is a need for increasing the number of IITs and generate more graduate programs (Masters and PhD) in Math and engineering. The government should encourage entrepreneurship so more and more companies come up and can create jobs for people within India.

For the question "What is the future of the Indian IT industry-Your thoughts, please", respondents predicted the Indian IT industry as follows: Going forward we may see less IT jobs in India. Indian it industry has to grow into the latest technologies - big analytics data, robotics, artificial intelligence and other digital trends, develop ready products and solution assets. India would continue as a low-cost centre and skill centre for IT. The future of the Indian IT industry is bleak unless the Government, Industry Technology Leaders and IT organisations invest more in people rather than anything else. Automation will increase, and skill-gap will continue to be a challenge. If IT companies invest in new technologies and people, they will have a good future. Things are changing in an extensive and fast phase, and people must keep up-skilling and cross-skilling themselves on the latest technology, there are many opportunities in the new things like big data, digital, Blockchain artificial intelligence and automation. Current generation learns this. However, the experienced professionals of various technologies in the past must start learning and compete with the newcomers in the market to survive. IT service from India will be too expensive, and other countries will provide better and cheaper services. IT Industry would evolve with the current trends. It will grow revenue-wise and hence, profit Margin would also improve. However, job growth would be stagnant unless the adoption of IT in Indian companies as well as the government increases.

For the question "According to you, currently, what are the main challenges of the IT industry?", The challenges indicated by the respondents are: Automaton, People dependence, rising wage levels, cost cut, dependency on USA, Work hours, pressure on job, skill development, lack of availability of path-breaking leadership, lack of focus and budget in training

people to secure the right positions, company mergers, less job opportunities, getting new projects and lack of good right candidates are some of the challenges. Lack of awareness on a career path for the existing experienced professionals since the change in the industry is very fast and vast. Skill demand in India to manage and support the emerging technologies across the globe (like Hadoop, big data, analytics, mobility and Blockchain). In other words, it can be mentioned as there are no challenges in the industry, it is all about people staying relevant to the industry. Companies are not willing to spend on the training of employees and not making them self-sufficient with the automated IT world. Training and certification costs are high for new technologies which are not affordable for all companies and employees. As a result, experienced professionals are losing out on jobs. Also, the standards and expectations of employers from employees have drastically gone high, which is not required. We should go the Japanese way concerning job security and quality. Made in India for software should elicit the same response to Made in Japan in products. Indian IT sector mostly focused on services. Its share in the new invocation is very less. The USA and other developing countries are not interested in moving R&D in India. So, India and the world are losing the innovation capabilities of thousands of Indian youths.

8.   Recommendations

- As expressed by the experts for the question "To perform well and create more Jobs in Indian IT industry, what steps should be taken by the Govt, employers and employees?", Most of the respondents suggested the combined effort from the employee, employer and government of India (GOI). *1). Employees are required to develop an innovative approach with automation capabilities. Employees should nurture their skill sets and upskill with the emerging technologies such as Artificial intelligence (AI), Robotic Process Automation (RPA), Internet of Things (IoT), Analytics (Data Science) and Hybrid cloud 2). Employers would require defining a strategy for training employees by partnering with product vendors with a cost-effective approach to nourish employee skill sets and achieve organisational roadmaps. Organisations need to introduce creative research and development centres,* most of the respondents evidenced this approach through all the qualitative questions, and this tells us the importance of developing the skills in such technologies. *Organisations would need to recruit managers with efficient technical and management capabilities to meet the organisational demand and help in to forecast the future state of the industry and market saturation. 3). The government of India should consider*

introducing an Aadhar based system to track emerging technologies and certifications to help Indian talents learn the most sought-after technologies in advance. The government should also look for opportunities to introduce technical and management certification with a subsidised cost to motivate the professionals. Though the government of India has many plans in place already, the specific approach needed to develop the hard (demanding skills) on an urgent basis.

- As suggested by one of the senior management professionals for the question about the improvement plan, it *would be worth to set up more IIT and IIM branches to produce bright scholars with technical and management skills. More qualified Master and PhD professionals will help to retain Indian's talents with high employment opportunities.* Sometime back there was an announcement for a few more IIT and IIMs. However, it would be more effective if IITs start the course for data science, AI, robotics, machine learning, and other latest technologies so that the business demand can be met.

- As mentioned in the discussion chapter, most of the experts that the course design in India is not up to mark. MHRD of India should focus on preparing and aligning the course curriculum of engineering colleges with the industry requirements such as developing interpersonal skills, building core technical skills and establish psychological behaviour to nourish the quality of the engineers while preparing them for the future engagements in the industry.

- As expressed by most of the experts from the IT industry for the question about the current challenges, some of the action plan needed by the GOI. *1). The government of India should think about setting up more research centres to analyse and understand the latest developments on global technology trends and to appropriately forecast the uprising technology demands in the industry and to help upskilling professionals by introducing cutting-edge training centres in-house within the Indian subcontinents. 2). India should further strengthen its diplomatic ties with the US and Europe in the fields of investment to cultivate more employment opportunities and financial growth for the Indian population. 3). Domestic IT market should be developed and nurtured to limit the import of foreign IT products. IT entrepreneurship should be encouraged by providing scholarship programmes and sponsoring pieces of training to up bring its talents and bring about a healthy IT industry with empowering financial growth.*

9. Conclusions

From the study, it is understood that the Indian IT industry is facing various challenges currently. Automaton and latest technologies like Aws, Azure, and Cloud, resulting in massive job reduction and becoming a significant disruptor to the traditional business model of IT Services. Customers are moving towards the latest technologies, and Indian IT sector does not have sufficient skill sets to meet the demand. In the real ground, there is no lack of job creations. However, it is a lack of resources awareness on latest technologies and employees are not coming out of comfort zone to learn according to the emerging technologies for their cross skills. Revolution is inevitable, and the same applies to all industries, including the IT sector. Information technology has been evolving since 1995 and transformed through multiple evolutions to shape a better world for humanity [65]. As the necessity grows and consumer demand shifts from one area to another, information technology greets every challenge and won billions of hearts by delivering excellent products, appliances, applications and software to see the world at the fingertips. India has transformed itself as a warehouse of highly skilled professionals fulfilling most of the global demands through offshore servicing in the IT industry. Several elements such as cost factors, financial impact, availability of skilled professionals, and labour laws at the global level are influencing the uprising demand for IT outsourcing and offshoring of services to Indian subcontinents.

To paraphrase an old saying – *"The only constant in life changes. Life changes every day for every person in some way. We expect the seasons to change, children to grow taller, birthdays to keep piling on, strawberries in June and the crisp smell of fall in October. We expect to grow older, to watch children marry, to retire from our jobs and play with our grandchildren. We even recognise that sickness and death are expected events in our lives"* [67]. Change is the only constant, inevitable truth in the earth. Success and glory will kiss the feet of one who accepts change with a positive attitude in life. Restraining oneself and opposing to the changes will lead to an unattainable failure to humankind.

As most of the respondents expressed their view through qualitative response, it can be concluded that the Information technology has transformed itself with cutting-edge techniques and automation which in turn leads to cost-effective solutions and reduction in workforce to deliver highly critical solutions globally crossing the boundaries of geography. Over the last few decades, India has showcased tremendous growth and prosperity in IT industry segment. However, it has recently exhibited a noticeable slowdown in creating employment opportunities in the Indian IT sector due to various reasons discussed in the previous chapters. For the research objective "To find out the possible solutions for increasing the employment opportunities in India's IT industry", to overcome the shortage in employment opportunities in the IT sector, multiple and combined initiatives should be taken by employees, employers and the government as it was evidenced by most of the experienced employees in the IT industry, which is also discussed in the recommendation section in this research and survey document. By performing this, we will also be able to retain the economy of India to a great extent from the contribution of the IT sector.

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Abbreviations: APAC- Asia Pacific, **BPM-** Business Process Outsourcing, **FDI-** Foreign Direct Investment, **INR-** Indian Rupee, **IT-** Information Technology, **ITES** -Information Technology Enabled Services, **NAC-** NASSCOM Assessment of Competence, **SEZ-** Special Economic Zone, **SMB-** Small and Medium Businesses, **TPI-** Software Technology Parks of India, **US$** - US Dollar, **USP-** Unique Selling Proposition, **NASSCOM-** National Association of Software and Services Companies, **IBEF-**India brand equity foundation, **MNC-** Multinational companies, **R&D-**Research and Development, **TCS-**Tata Consultancy services, **BPO** - Business process outsourcing , **PMP-** Phased Manufacturing Programme, **GDP-** Gross domestic product, IBM- International business machine, **CSC-**Computer science corporation. **GOI** - Government of India, **IIM –** Indian Institute of management,

IIT- Indian Institute of technology, **PhD** - Doctor of philosophy.

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