

# ‘Future of Work’ in India’s IT/IT-eS Sector

## Report of Workshop Proceedings

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# Introduction

This report provides an overview of the proceedings and outcomes of a workshop on the IT/IT-eS Sector and the Future of Work in India (hereinafter referred to as the “**Workshop**”), organised at Omidyar Network’s office in Bangalore, on June 29, 2018. The Workshop was attended by a diverse group of stakeholders which included industry representatives, academicians and researchers, and civil society. The discussions went over various components of the transition in the sector to Industry 4.0, including the impact of Industry 4.0-related technological innovations on work broadly in India, and specifically in the IT/IT-eS sector (hereinafter referred to as the “**Sector**”). The discussion focused on the reciprocal impact on socio-political dimensions, the structure of employment, and forms of work within workspaces.

The Workshop was divided into three sessions. The first session was themed around the adoption and impact of Industry 4.0 technologies vis-a-vis the organisation of work. Within this the key questions were: the nature of the technologies being adopted, the causes that are driving the uptake of these technologies, and the ‘tasks’ constituting jobs in the Sector.

The second session focussed on the role of skilling and re-skilling measures as mitigators to projected displacement of jobs. The issues dealt with included shifts in company, educational, and social competency profiles as a result of Industry 4.0, transformations in the predominant pedagogy of education, vocational, and skill development programmes in India, and their success in creating employable workers and filling skill gaps in the industry.

The third session looked at social welfare considerations and public policy interventions that may be necessitated in the wake of potential technological unemployment owing to Industry 4.0. The session was designed with a specific focus on the axes of gender and class, addressing questions of precarity, wages, and job security in the future of work for marginalized groups in the workforce.

## Preliminary Comments

The Workshop opened with a brief introduction on the research the Centre for Internet and Society (CIS) is undertaking on the Future of Work (hereinafter referred to as “**FoW**”) vis-a-vis Industry 4.0. The conception of Industry 4.0 that CIS is looking at is the technical integration of cyber-physical systems in production and logistics on one hand, and the use of internet of things (IoT) and the connection between everyday

objects and services in the industrial processes on the other. The scope of the project, including the impact of automation on the organisation of employment and shifts in the nature and forms of work, including through the gig economy, and microwork, was detailed. The historical lens taken by the project, and the specific focus on questions of inequality across gender, class, language, and skill were highlighted.

It was pointed out that CIS' research, in this regard, comes from the necessity of localising and re-examining the global narratives around Industry 4.0. While new technologies will be developed and implemented globally, the impact of these technologies in the Indian context would be mediated through local, political and socio-economic structures. For instance, the Third Industrial Revolution, largely associated with the massification of computing, telecommunications and electronics, is still unfolding in India, while attempts are already being made to adapt to Industry 4.0. These issues provided a starting point to the discussion on the impact of Industry 4.0 in India.

## Qualifying Technological Change

### Contextualising the narrative with historical perspectives

The panel for the first session commenced with a discussion around a historical perspective on job loss being brought about due to mechanisation. The distinction between Industry 3.0 and 4.0, it was suggested, was largely arbitrary, inasmuch as technological innovation has been a continuous process and has been impacting lives and the way work is perceived. It was argued that the only factor differentiating Industry 4.0 from previous industrial revolutions is 'intelligent' technology that is automating routine cognitive tasks. The computer, programmable logic control (PLC) and data (called the 'new oil') were also a part of Industry 3.0, but intelligent technologies are able to provide greater analytical power under Industry 4.0.

The discussion also went over the distinction between the terms 'job', 'task' and 'work'. It was argued that the term 'job' might be treated as a subset of the term 'work', with the latter moving beyond livelihood to encompass questions of dignity and a sense of fulfilment in the worker. With relation to this distinction, it was mentioned that the jobs at the risk of automation would be those that fulfill only the basic level in Maslow's hierarchy - implying largely routine manual tasks. Additionally, it was explained that although these jobs will continue to use labour through Industry 4.0, it is only the nature of technological enablement that would change to automate more dangerous and hazardous tasks.

### Technology as a long-term enabler of job creation

It was argued that technology has historically been associated with job creation. Historical instances cited included that of popular anxiety due to anticipated job loss

through the uptake of the spinning machine and the steam engine, whereas the actual reduction in the cost of production led to greater job creation, increased mobility and improved quality of life in the long-term. Such instances were used to further argue that technology has historically not resulted in long-term job reductions.

The platform economy was posited as a model for creating jobs, through the efficient matching of supply and demand through digital platforms. It was indicated that rural to urban migration is aided by such platforms, as labourers voluntarily enrol in skilling initiatives given the certainty of employment through platformization. It was further argued that historically, Indian workers have been educated rather than skilled, and that platformization and automation, coupled with the elasticity of human needs, will provide greater incentives for technically skilled workers by creating desirable jobs.

### **Factors leading to differential adoption of automation**

In relation to the adoption of the technologies Industry 4.0, it was argued that the mere existence of a technology does not necessitate its scalability at an industrial level. Scalability would be possible only when the cost of labour is high relative to the costs entailed in technological adoption. This was supported by data from a McKinsey Report <sup>1</sup> which indicated that countries like the US and Germany would be impacted in the short term by automation, because their cost of labour is higher. Conversely, since the cost of labour in India is relatively cheap, the reality of technological displacement is still far away and the impact would not be immediate.

Similarly, a distinction was also made to account for the differential impact of automation in various sectors. For instance, it was indicated that since the IT/IT-eS sector in India is based on exporting services and outsourcing of businesses. Accordingly, if Germany automates its automobile industry, that would impact India less than if it automates the IT/IT-eS sector, as the latter is more reliant on exporting its services to developed economies. The IT/IT-eS sector was further broken down into sub-sectors with the intention of highlighting the differential impact of automation and FoW in each of these sub-sectors. It was agreed that the BPO sub-sector would be more adversely impacted than core IT services, given its constitution of routine nature of tasks at a higher risk of automation.

## **Disaggregating India's Skilling Approach**

The discussion around skilling measures was contextualised in the Indian context by alluding to data collected from the National Sample Survey Organisation (NSSO)

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<sup>1</sup> McKinsey Global Institute, *A future that works: Automation, employment, and productivity*, <https://www.mckinsey.com/~media/mckinsey/featured%20insights/Digital%20Disruption/Harnessing%20Automation%20for%20a%20future%20that%20works/MGI-A-future-that-works-Executive-summary.ashx>, (accessed 10 August 2018).

surveys. The data revealed that around 36% of India's total population is under the age of seventeen and approximately 13% are between 18 - 24. Additional statistics suggested that only around a quarter of the workforce aged 18-24 years had achieved secondary and higher secondary education and close to 13% of the workforce was illiterate. While these numbers included both male and female workers, it was pointed out that it was an incomplete dataset as it excluded transgender workers. It was suggested it should be this segment of the Indian demographic that is targeted for significant skilling pushes, which could be catalysed through specific vocational training centres. It was also suggested that there was a need to restructure the role of the National Skill Development Corporation (NSDC) in the Indian skilling framework.

A comprehensive picture was painted by conceptualising the skilling framework in India as 5 distinct pillars. This conceptualisation was used to debunk the narrative around NSDC being the sole entity pushing for skill development in the country. The NSDC's function in the skilling framework was posited as providing funding to skilling initiatives with programmes lasting for a period of 3 months. These 3- month programmes were critiqued for being insufficient for effective training, especially given the low skill levels of workers going into the programmes. The NSDC's placement rate of 12% as per their own records was used to support this argument. Further suggestions on making the NSDC more effective were made in a later discussion<sup>2</sup>.

Related to this, the second pillar of vocational skilling was said to be the Industrial Training Institute (ITI). The third pillar was said to be the school system which was critiqued for not offering vocational education at secondary and senior secondary levels. The fourth pillar comprised of the 16 ministries which governed the labour laws in India - none of whose courses were National Skills Qualifications Framework (NSQF) compliant.

The fifth pillar was constructed as the industry itself and the enterprise-based training it conducted. However, it was stated that India's share of registered companies who did enterprise-based training was dismal. In 2009, the share of enterprise-based training was 16% which rose in 2014 to 36%. Further, most of these 36% were registered large firms as opposed to small and medium sized enterprises. Unregistered companies, it was suggested, were simply doing informal apprenticeships.

### **Joint public and private skilling initiatives**

In addition to government sponsored skilling initiatives, attention was directed to skill development partnerships that took the shape of public-private initiatives. As an example, it was said that a big player in the ride-hailing economy had worked with

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<sup>2</sup> See discussion under 'Catalysing manufacturing-led job growth'.

NSDC and other skilling entities to ensure that soft skills were being imparted to their driver partners before they were on-boarded onto the platform.

It was also brought forth that innovative forms of skilling and training were gaining traction in the education sector as well in the private sector. This was instantiated through instances of uptake of platforms which apply artificial intelligence, and within that machine learning based techniques, to generate and disseminate easier- to-consume video-based learning.

## **Driving Job Growth: Solving for Structural Eccentricities of the Indian Labour Market**

### **Catalysing manufacturing-led job growth**

The discussion began by discussing specific dynamics of the Indian labour markets in the context of the Indian economy. It was pointed out the productivity level of the services sector is not as high as the productivity level of manufacturing, which is problematic for job creation in a developing economy such as India witnessing capital-intensive growth in the manufacturing sector. The underlying argument was that the jobs of the future in the Indian context will have to be created in the manufacturing sector.

Several macroeconomic policy interventions were suggested to reverse the trend of capital-intensive growth in order to make manufacturing the frontier for enhanced job creation. The need for a trade policy in consonance with the industrial policy was stated as imperative. This was substantiated by highlighting the lack of an inverted duty structure governing the automobile sector that has led India to be amongst the biggest manufacturers of automobiles. The inverted duty structure entails finished products having a lower import tariff and a lower customs duty when compared to import of raw materials or intermediates. However, it was highlighted that a dissonant industrial policy failed to acknowledge that at least 50% of India's manufacturing comes from Micro, Small & Medium Enterprises (MSMEs) and provided no assistance to MSMEs in obtaining credit, market access or technology upgradation. On the other hand, it was asserted that large corporations get 77% of the total bank credit.

Another challenge that was highlighted was with the Government of India's severely underfunded manufacturing cluster development programs under the aegis of the Ministry of Textiles and the Ministry of MSMEs. For sectors that contribute majorly towards India's manufacturing output, it was asserted that these programmes were astonishingly bereft of any governing policy and suffer from several foundational issues. Moreover, it was observed that these clusters are located around the country in Tier 2, 3 and 4 cities where the quality of infrastructure is largely lacking. The Atal Mission for Rejuvenation and Urban Transformation (AMRUT) program devised for the development of these cities is also myopic as the the target cities are not the ones

where these manufacturing clusters are located. The rationale behind such an approach was that building infrastructure at geographical sites of job creation would lead to an increase in productivity which would in turn attract greater investment. This would have to necessarily be accompanied by hastening the setting up of industrial corridors - the lackadaisical approach to which was stated as a key component of India being outpaced by other developing economies in the South East Asian region.

An additional policy intervention that was suggested was from the lens of setting up of skilling centres by NSDC in proximity to these manufacturing clusters where the job creation is being evidenced as opposed to larger metropolitan cities.

### **Carving out space for a vocational training paradigm**

It was asserted that the focus of skilling needs to be on the manufacturing rather than services sector, given the centrality of manufacturing to a developing economy undergoing an atypical structural transformation<sup>3</sup> - as outlined above. Further compounding the problem of jobless growth, it was stated that 50% of the manufacturing workforce have 8 or less years of education and only 5% of the workforce including those that have technical education are vocationally trained, according to the NSS, 62nd Round on Employment and Unemployment.

A gulf in primary and secondary education vis-a-vis vocational training was pointed as one of the most predominant causes behind the much touted 'skills gap' that the Indian workforce is said to be battling with. Using data to further cull out the argument, it was said that in 2007, the net enrollment in India for primary education had already reached 97% and that between 2010 - 2015, the secondary education enrollment rate went from 58% to 85%.<sup>4</sup> It was hypothesised that the latter may have risen to 90% levels since. Furthermore, the higher education enrollment rate also commensurately went up from 11% in 2006 to 26-27% in 2017.<sup>5</sup> It was argued that this is impossible to achieve without gender parity in higher education. This gender parity in education was contrasted with the systematic decline in the women's labour force participation that India has been witnessing in the last 30 years.

Consequently, the 'massification' of higher education in India over the past 10 years was critiqued as ineffectual in comparison to the Chinese model, as the latter focused on engaging students in vocational training, which the Indian education system had failed to do. The role of the gig economy in creating job opportunities despite this gap

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<sup>3</sup> R. Verma, Structural Transformation and Jobless Growth in the Indian Economy, The Oxford Handbook of the Indian Economy, 2012.

<sup>4</sup> S. Mehrotra, 'The Indian Labour Market: A Fallacy, Two Looming Crises and a Tragedy', CSE Working Paper, April 2018.

<sup>5</sup> *ibid.*

between educational and vocational training was regarded as important, especially given the lack of growth in the traditional job markets.

## Accounting for the Margins

With relation to the profiles of workers within sectors, it was indicated that factors such as gender, class, skill, income, and race must be accounted for to determine the 'winners' and 'losers' of automation. Several points were discussed with relation to this disaggregation.

### Technology as an equaliser? Gender and skill-biased technological change

First, the idea of technology and development as objective and neutral forces was questioned, with the assertion that human decision-makers, who more often than not tend to be male, allow inherent biases to creep into outputs, processes, and objectives of automation. Data from the Belong Survey in IT services<sup>6</sup> indicated that the proportion of women in core engineering was 26% of the workforce, while that in software testing was 33%. Coupled with the knowledge that automation and technology would automate software testing first, it was argued that jobs held by female workers were positioned at a higher immediate risk of automation than male workers.

The 'Leaky Pipe Problem' in STEM industries i.e. the observation that female workers tend to be concentrated in entry level jobs, while senior management is largely male dominated was also brought to the fore. This was used to bolster the argument that female workers in the Sector will lose out in the shorter term, when automation adversely impacts the lower level jobs.

A survey conducted by Aspiring Minds<sup>7</sup> which tracked the employability of the engineering graduates was utilised to further flesh out skill biased technological change. As per the survey, 40% of the graduating students are employable in the BPO sector, while only 3% of the students are employable in the sector for software production. With the BPO sector likely to be impacted more adversely than core IT services, it was emphasised that policy considerations should be very specific in their ambit.

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<sup>6</sup> Mohita Nagpal, 'Women in tech: There are 3 times more male engineers to females', *belong.co*, <http://blog.belong.co/gender-diversity-indian-tech-companies>, (accessed 10 August 2018).

<sup>7</sup> Aspiring Minds, *National Programming Skills Report - Engineers 2017*, <https://www.aspiringminds.com/sites/default/files/National%20Programming%20Skills%20Report%20-%20Engineers%202017%20-%20Report%20Brief.pdf>, (accessed 11 August 2018).



## **Social security and the platform economy**

The discussion around the platform economy commenced with a focus on how it had created economic opportunities in the formal sector by matching demand and supply on one hand, and by reducing inefficiency in the system through technology on the other. It was pointed out that these newer forms of work were creating millions of entrepreneurship opportunities that did not exist previously. These opportunities, it was suggested, were in themselves flexible and contributing the greater push towards enhancing the numbers of those that come within the ambit of India's formal economy.

This discussion was countered by suggesting that the shift of the workforce from the informal sector to the formal sector, which companies in the gig economy claimed they contributed to, have instead restricted the kind of lives gig workers have been living historically. As an instance, it was pointed out that a farmer who had been working with a completely different set of skills was now being asked to shift to a new set of skills which would be suited for a very specific role and not transposable across occupations. In other words, it would not be meaningful skilling. It was also pointed out that what distinguishes formal work from informal is whether the worker has social security net or not - mere access to banking services or filing of tax returns was not sufficient for characterising a workforce as being formal in nature.

Relatedly, the possibility of social security was discussed for the unorganised sector and microworkers. One of the possibilities discussed was to ensure state subsidised maternity, disability, and death security, and pensions for workers below the poverty line. The fiscal brunt borne by the government for such a scheme was anticipated to not be above 0.4% of the GDP. It was suggested that this would move forward the conversation on minimum wage and fair work, which would be of great importance in broader conversations around working conditions in the platform economy.

## **The interplay of gender and platformisation**

It was highlighted that trends in automation are going to change the occupational structure in the digital economy - the effect of which will especially be felt in cognitive routine jobs given their increased propensity to platformisation. A World Economic Forum report<sup>8</sup> was cited which indicated the disproportional risk of unemployment faced by women given their concentration in cognitive routine jobs was also brought up.

The discussion logically undertook a deeper look at the platformisation of work with a specific focus on freelance microwork and its impact on the female labour force and culled out certain positive mandates arising from such newer forms of work. It was

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<sup>8</sup> World Economic Forum, *The Future of Jobs Employment, Skills and Workforce Strategy for the Fourth Industrial Revolution: Global Challenge Insight Report*, January 2016.

suggested that industries are more likely to employ female workers in microwork due to lower rates of attrition, and flexible labour. It was reiterated that freelancing in India extends beyond data entry and other routine jobs, to include complex work - thereby also catering to skilled workers desirous of flexibility. Platforms designing systems to meet the demand for flexible work were also discussed, such as platforms geared towards female workers undertaking reskilling measures and counselling for females returning from maternity leave or sabbaticals. Additionally, the difficulty of defining freelancing under existing frameworks of employment, compounded by the lack of legal structures for such work, was outlined.

## **Systemic challenges within the Indian labour law framework**

### **Static design of legal processes**

Labour law was, naturally, acknowledged as a key determinant in the conversation around both the uptake and impact of automative technologies encapsulated within Industry 4.0.

The archaic nature of India's labour law framework was highlighted as a major impediment to ensuring both worker rights as well as the ease of conducting commerce. It was pointed out that organised labour continues to be under the ambit of the Industrial Disputes Act, which was made effective in 1947, has undergone minimal amendments since. This was critiqued on the basis that the framework for the law is embedded in its historical context, and while the industrial landscape in the country has transformed drastically since the implementation of the Industrial Disputes Act, the legal framework has not evolved. Similarly, the Karnataka Shops and Establishments Act, 1961 which regulates the Sector today was enacted much before the Sector even opened up in India in the 1990s.

Additionally, it was pointed out that the consolidation of the fragmented extant framework of labour laws in India was being consolidated into 4 labour codes without any wholesale modernisation push reforming the laws being consolidated. Consequently, it was argued that the government has to drive changes through policies alone as the legal framework remains static. Barriers to implementation of adequate policies were also discussed, such as the political impact of labour policies, lack of state initiative to deal with the impact of the future of work, apart from the historic inability of the law to keep up with the state of labour and economy.

### **Labour law arbitrage**

One of the reasons behind the increasing contractualising of labour in India was attributed to over-regulation. There was consensus that the labour law regime was not conducive to industry in India leading to greater opportunistic behaviours from industry participants. It was acknowledged that the political clout that a lot of

contractors (of labourers) enjoy along with providing primary employers greater flexibility to hire and fire employees at will has led to a widespread utilisation of contract labour entities.

It was further stated that industry behaviour has adopted several other tools of arbitrage to not consider labour law as a key impediment in the ease of scaling business. Empirical evidence of labour law arbitrage was cited to drive home the point - according to national surveys, 80-85% of enterprises employ less than 99 workers as the law mandates stricter compliance requirements for enterprises employing 100 or more workers<sup>9</sup>. This was acknowledged a serious hurdle to scaling businesses.

Problems behind other apparently well-intentioned legislation from a public policy lens having counterproductive consequences was also highlighted. In the space of labour laws, the example of the recently enacted Maternity Benefit (Amendment) Act, 2017 was cited. By enhancing maternity benefits, without accounting for other provisioning such as a paternity benefit inclusion, it was anticipated that companies may entirely shy away from hiring women.

### **Policy Paralysis**

The discussion progressed towards a high-level discussion around the efficacy of law vis-a-vis state policy as a means to create a system of checks and balances in the context of Industry 4.0. It was highlighted that law, by design, would be outpaced by technological change. The common law system of law operating in India is premised on a time-tested emphasis on post-facto regulation. In other words, it is reactionary. While policy making in India suffers from a similar plague of playing catch-up, it is in large part due to a bureaucratic structure premised on generalism - a pressing need for domain expertise in policy making was emphasised upon. Having said that, it was stated that it is the institutional design of policy making institutions that needs rectification. What was acknowledged was the success, albeit scant, that individual states have had in policy making catering to specific yet diverse domains. A greater push towards clear and progressive evidence-based policy pushes was stressed upon with the anticipation that it would lead to self-regulation by the industry itself - be it in terms of the future of employment or of the economic direction that the industry will embark on.

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<sup>9</sup> Ministry of Statistics and Programme Implementation, *All India Report of Sixth Economic Census*, Government of India, 2014.

## Concluding Remarks

The discussions during the course of the Workshop situated the discourse around Industry 4.0 within the contours of the Indian labour realities and the IT sector within that.

As a useful starting point, various broader perspectives around the impact of technological change on the quantum of jobs were brought forth. While the industry perspective was that of technology as an enabler of job creation in the long-run, it was sufficiently tempered by concerns around those impacted adversely in the short to medium-term time frames. These concerns coalesced towards understanding the potential impact of Industry 4.0 on the nature of work, as well as mitigation tools to ease the impact of technological disruption on labour.

Important facets of technological adoption within the Sector were highlighted, such as potential for scalability as well as the distinct eccentricities of the various sub-sectors the IT sector subsumed. The differential impact within the various sub-sectors was pegged to the differential composition of automatable tasks (routine, rule-based) within each sub-sector. However, questions regarding the exact contours of task composition were left unanswered signalling a potential area for further research. On the other hand, the primary challenge to technological adoption faced from the labour-supply side was skilling, or the lack thereof. This was contextualised in the larger scheme of structural issues plaguing the skilling machinery operating in the country, which lead to inadequate dispensation of technical and vocational education and training (TVET). In terms of additional structural issues that would potentially have an impact on how Industry 4.0 plays out in the Indian context, attention was directed towards overdue reform of the labour law framework which has already struggled with incorporating newer forms of working engagements such as platform and gig work, that are being evidenced as a part of Industry 4.0.

An underlying theme that found mention across sessions was the need to devote attention to prevent further marginalisation as a consequence of technological disruption of the already marginalised. Evidence from government datasets as well as from literature around concepts such as skill biased technological change, the leaky pipe problem, and the U-shaped curve of female labour force participation were cited to explicate these issues. The merits of different policy measures to address these concerns, such as social security, living wages, and maternity benefits were also discussed.

While the Workshop touched upon several facets of the discourse around Industry 4.0 in the Sector, it also sprung up areas that require further inquiry. Questions around where in the value chain use-cases for Industry 4.0 technologies were emerging needed a more comprehensive understanding. Moreover, the impact of Sector Skill Councils (SSCs), a central aspect of the skilling ecosystem in India, wasn't touched

upon. An additional path of inquiry that emerged pertained to evolving constructive reforms to legal and economic policy frameworks as top-down interventions within the Sector that could be anticipated to play a significant role in the uptake and impact of Industry 4.0 technologies.