

The Engineer ... No Longer a Person, but a Number on an Excel Sheet – Enterprise Resource Planning and Commoditisation of Labour

*Rajalaxmi Kamath and Eureka Sarkar,
Indian Institute of Management Bangalore, India*

ABSTRACT

Based on transcripts provided by 145 engineers working in various information technology organisations in Bangalore, India, the article examines the commoditisation of labour in this sector. In doing so, we specifically want to problematise algorithm-based decision-making embedded in the wider technology of Integrated Development Environments like Enterprise Resource Planning and its ramifications for business and labour processes. Standardisation and modularisation of tasks have made wide inroads in workers' lives, resulting in a replication of Taylorist mass-production techniques. In unpeeling the "materiality" behind such a development, we elaborate on how efficiency and profit motives of these firms are turning engineers into numbers on a spreadsheet. We conclude by commenting on the implications of this on labour's organisation and resistance and the future trajectory of working life.

KEYWORDS

ERP algorithms; labour; information technology; India

Introduction

The industry of the second half of the twentieth century increasingly tends to take men from the universities and colleges, men who have been able to acquire the ability to do creative and independent work; who have curiosity, the ability to synthesize, to analyze, to invent, and to assimilate, an ability which spins in a vacuum and runs the risk of perishing for the lack of an opportunity to be usefully put to work (Gorz, 1968: 105).

Daniel Bell (1973: 151), known for coining the phrase "post-industrial society" quotes this passage by Andre Gorz in his own book, *The Coming of Post-Industrial Society*, and goes to great lengths to invalidate Gorz's thesis. Bell claims that with the coming of post-industrial society, a younger and better-educated labour force will demand greater control over work. In a society embedded in knowledge and information as the primary resources, education and skills will shift from manufacturing to services. The new elites will be the scientists and engineers, with science and technology attaining a messianic standing. Around the same time, Harry Braverman's (1974) life and work sought to repudiate these findings, arguing that while there has been a shift towards more mental work, most of these white-collar jobs require little exercise of judgement or skill. The central tenet of Braverman's thesis was that the strategies of management control under Fordist-Taylorist

industrial labour processes have led to a de-skilling of labour.

Social scientists throughout the ages have extensively chronicled production and the working life of labour, trying to prophesy its future trajectories. The term “commoditisation of labour” can be traced to Karl Polanyi, whose contention was that labour power was not a commodity that was produced to be sold in the market, and that it could only be a fictitious commodity. “Labour power cannot be shoved about, used indiscriminately, or even left unused, without affecting also the human individual who happens to be the bearer of this peculiar commodity” (Polanyi, 2001 [1944]: 76). According to some scholars, Polanyi was quite optimistic about the emergence of a counter-movement or the Polanyian double movement, where society would take measures to protect itself against this unregulated commoditisation (Burawoy, 2010). This social counter-movement is based on the principle of social protection calling for proactive legislation, restrictive associations and other forms of intervention. Since Polanyi did not provide much guidance on the “how” of constructing this counter- or double movement, labour scholars and activists, in the renewed sway of capitalism today, have debated contentiously about the Polanyian double movement. There seems to be fledgling consensus that labour-based counter-movements in increasingly unregulated markets should be grounded in national, cultural, linguistic, social and institutional (thus, local) particularities. The key insight that these scholars provide is that the Polanyi problem is best interrogated in the world of work, which is being restructured and remodelled in this era of globalisation (Webster, Lambert and Beziudenhout, 2008).

The endeavour in this article is to look at the labour question from the standpoint of the Indian Information Technology (IT) and Information Technology enabled Services (ITeS) industry, and to infer why the Polanyian counter-movement looks increasingly difficult. Answers to this question range from the space–time mutability of capitalism and finance-led capital, to the complicit role of the state in amending labour regulations in favour of global capital (Harriss-White, 2002; Harvey, 2007). Labour scholars also point to the intersectionality between gender, race, ethnic and other categories that constrict the organising of labour (Herring and Agarwala, 2006). While all these explanations hold good, we want to problematise a more organisation-level, technology-led, global and comprehensive change in business practices (contra local and particular), spearheaded by IT firms. The impact on labour of globally networked business processes, especially Human Resource Management (HRM) processes, embedded in the wider, back-end technology of Integrated Development Environments (IDEs) like Enterprise Resource Planning (ERP) needs to be brought into focus.¹ ERP is a technology tool, a process management software that allows a firm to integrate many of its core functions related to the running of its business – finance, sales and distribution, production, logistics and human resources. This technology creates a suite of interconnected modules that replicate all the functional divisions of the organisation, making them more streamlined and efficient. Indeed, today it is seen as the critical back-end technology architecture for global businesses (Davenport, 1998).² We examine the role of this technology, promoted as a way to help firms to rejig business processes (Yeh, Miozzo and Vurdubakis, 2006), in breaking down and standardising core IT skills, and consequently abetting

¹ An IDE is a common software platform in an IT organisation that provides comprehensive facilities to its computer engineers for developing and coding software programmes. This platform provides uniform features for authoring, modifying, compiling, deploying and debugging software that the engineers use while working. Because it runs as a cohesive unit behind the User Interface (UI) on the organisation’s computers, it is referred to as a back-end technology.

² Firms do not have to buy and maintain the entire suite of the software. Cloud solutions have meant that subscribing to the software licences has made adoption of ERP solutions cheaper and more accessible.

commoditisation of labour. Scientific management tenets of Taylorism claim that knowledge or professional work does not lend itself to standardisation and removal of discretion as manual work does. However, standardisation can be a very practical outcome of a set of back-end, integrative systems-architecture that have made inroads in recent years. This is thus a story about technology and automation (also atomisation), but it is not couched in the oft-repeated adage of machines replacing humans, or human beings forced to echo the rhythms of machines. Rather, our narrative attempts to foster an understanding of the implications of machine-led algorithms making decisions relating to the work of people and the mechanical application of these decisions in the working life of labour.

Scholars and students of labour studies can learn a lot from the nitty-gritty of the processes of how labour (of all kinds) is recruited and managed (and now, laid off) in these firms through the networked integrative technologies that are increasingly becoming a part of all firms aspiring to a global vision. We situate our study in Bangalore's global IT sector, transcribing the lived experiences of its foot soldiers, the engineers. However, we feel it is relevant to the entire advancement of IT-led industrialisation that is paving the way for the future digital world. As one of our engineers so eloquently put it, "*because every firm, tomorrow, is a tech-firm*".³ Information technology is the prototype of the twenty-first century, just as textiles were for the nineteenth century and auto manufacturing for the twentieth century, and the IT firms in Bangalore are their vanguard. The future of labour in a globalised industry, we believe, can be read from what is occurring in these firms today. Daniel Bell (1973) asserts that not only will industrialisation in the twenty-first century work differently – knowledge-based industries encouraging teamwork and participation – but that there will be striking changes in the structure of occupational and professional work. We will show that, to us, Daniel Bell's optimism rings as false as Karl Polanyi's.

Methods

We make this contention on the basis of an extensive analysis of written submissions from 145 Bangalore-based IT engineers – two cohorts of 77 and 78 participants in November 2018 and January 2019 respectively. They were participants in an on-campus Advanced Certificate Programme in Business Management at a business school in Bangalore. This research study was an unintended, serendipitous consequence of a class assignment that they were asked to submit as a written, on-line, 300-word response to an open-ended question: "Do you think your labour is being commoditised in the IT industry?" This class assignment was given at the end of a teaching module on "Markets, State and Society" that was taught by one of the co-authors. (The other co-author was the Academic Associate for this course.) Its aim was to sum up a lengthy 90-minute in-class discussion on the meaning of "commoditisation of labour", the changing nature of the IT industry in Bangalore, instances of labour commoditisation in their companies, its causes and its repercussions. Advanced Management Certificate Programmes in business schools function as an introduction to Business and Management modules for senior executives in the industry, while they are still at work, typically engineers and other technical personnel. Instructors teaching these modules are encouraged to be hands-on and participatory, and not "lecture" the participants on too many theoretical constructs. Therefore, for this module, a beginning was made by eliciting their rudimentary understanding of the term "commodities". The distinction between niche products

³ All quotes in italics, henceforth, citing participants/engineers, are culled from the two rounds of transcripts submitted in November 2018 and January 2019, on which this essay is based. Details are given in the section below on Methods.

and mass-produced commodities is a recurrent theme in this industry. Participants were then prompted to enquire if their work was seen as a commodity by them and their employers.

Around 95 per cent of these engineers worked in the various companies of Bangalore's IT industry, and the remainder worked in fin-tech, pharma, e-commerce and other IT-allied industries in Bangalore. Many participants had worked in several companies during their careers and were thus able to compare and contrast their experiences in these companies. Many had worked on-site (their lingo for working outside Bangalore, at the site of their client companies) and were able to compare work-sites and geographies. They were given some time to talk about their individual lived experiences and also asked to participate through a dialogue with others. The instructor (co-author) moderated this very lively and often heated discussion, pitching in only when it got too heated. The class discussion led to the homework assignment, enabling them to think through, reflect and distil the discussion that had taken place in class. Participants were asked to submit these 300-word responses via e-mail within a week.

Though these written narratives were not intended for the purpose of a formal research study, as we combed through the transcripts we realised that their experiences as engineers in their respective firms was, for us, a starting point for investigating the labour condition of the future IT-run world. We were gaining insights into this new phenomenon of ERP-driven work processes at the workplace, as the engineers were providing us a glimpse of this world and what it meant to them.

Our methodological approach, therefore, can be classified as being phenomenological in nature. Hermeneutic phenomenological research focuses on individuals and groups and their narratives, and tries to get beneath the subjective experiences of the individual to find an objective reality. It is a research methodology aimed at producing rich textual descriptions of select phenomena in the life-worlds of individuals that we are all able to connect to, and experience collectively. According to Kafle (2011), hermeneutic phenomenological methods call for a dynamic interplay between the following research activities: commitment to an abiding concern (which for us, in a business school in Bangalore through our course on Markets, State and Society, was to comprehend the world of the IT engineers of Bangalore); a stance oriented toward the question (that of commoditisation of labour, which was the specific topic of class discussion); probing the experience as it is lived (these classes were held on weekends, and the engineers were still working in their respective offices during the week); and describing the phenomenon through writing and re-writing. We thus had a rare opportunity to use these phenomenological methods of hermeneutic phenomenology in mining the texts – in this case, online submissions – in order to explore the lived meanings of our participants. We wrote to them seeking their permission to use quotations from their essays (anonymously), and they replied saying that there was a universal consensus among them about using their transcripts for this work.⁴ Subsequently, a draft of this paper was circulated to them, soliciting comments and feedback.

We discuss the implications of these write-ups below. In the following section, we examine how ERP determines the business model of India's IT and ITeS sector, and link this business model to the organisational and human resources (HR) practices followed by the companies. At the bedrock of these processes is the ERP architecture to which these firms subscribe, and in fact, oversee its implementation in companies world-wide. In later sections, we problematise the algorithm-run processes that have come to dominate the engineers' working lives. We conclude with some self-reflection and discuss how an insight into the working lives of these engineers might

⁴ In a private e-mail communication to the corresponding author, dated 9 August 2019.

make way for a more nuanced understanding of what it will take to be a worker in tomorrow's precarious world.

The IT/ITeS Industry and Commoditisation of Engineers

The Indian Information Technology and Information Technology enabled Sector industry emerged via what is called as the Offshore Development Centre (ODC) model. It began with businesses in the Global North being able to transfer low-skilled, standardised work to low-cost third-party vendors in the Global South by way of outsourcing their software development. Today, this model has enabled businesses across the world to reduce their annual IT spending and provide round-the-clock support for all their IT applications, laying the groundwork for an IT-led wave of globalisation. Enterprise Resource Planning as a part of the emerging business practices that enable organisations to go global plays a key role in this story. India continues to be the top sourcing destination with a significant share (55 per cent) of the world sourcing market; the Indian IT/ITeS industry has over 1 000 global delivery centres in over 200 cities in about 80 countries around the world. It employs over four million people. The ERP architecture that encodes its processes in a software that enables its people to work across geographies and time zones is the backbone of the Indian IT industry.

ERP and the IT/ITeS industry

Businesses today are generating and storing a vast amount of data. In most companies, this data is spread across hundreds of separate computer systems, in individual business functions, units, regions, factories or offices. Maintaining and regularly updating these and ensuring compatibility between such disparate systems represents a big cost to companies. The solution to this problem has emerged in the form of Enterprise Systems – commercial software packages, like ERP software. These are off-the-shelf solutions for a seamless integration of all information flowing through a company – financial accounts, operations, logistics, sales, marketing, customer relations and human resources. The software enables a company to automate the integration of vast amounts of data used throughout its entire organisation and to collate this data in a single repository to help with information flows.

Working across geographies, the IT companies are fervent about embracing standardised procedures and processes that define the tasks, roles and responsibilities of each engineer. The ERP system, in fact, operates on this logic of standardisation which enables it to achieve interoperability across laws, protocols and codes. This in turn enables people to work in a uniform way across the organisation, according to universal standards. The ERP technology by its very nature is designed to address the fragmentary nature of information. At its core is a single comprehensive database that collects and feeds data into modular applications supporting virtually all of the company's activities across units, offices and functions across the world. For this, the work has to be modularised to a considerable degree. A typical project might consist of several integrated modules, covering several aspects related to sales, inventory, finance or HR. An engineer working for such a project is not expected to be an expert in all modules, or even on a single module, and might be required to take care of just a sub-module. This is analogous to the architecture of the ERP system where all that is required is each module or sub-module of the system to “communicate” with other modules seamlessly, thereby achieving integration.

The big shift that has occurred with ERP is that since it is an off-the-shelf generic solution, business processes often have to be modified, in non-trivial ways, to fit the ERP system. Some

amount of customisation is possible; however, the integrated architecture of the system increases the complexity of making too many modifications. The impact of ERP systems on a company's organisation and culture after its implementation is only beginning to be researched and understood (Dery, Hall and Wailes, 2006). ERP has led to a greater standardisation of processes, a common operating system across regions and centralisation of information within the organisation. This possibility of standardisation and modularisation has meant that there has been a deskilling of the skill sets. An engineer is no longer required to have knowledge of the entire code for the project but has to deal with bits and pieces of code that can be "patched-up" later. The modularisation aimed at by the ERP also fits in well with this wider trend in the software industry, where programming is no longer a craft. Object-oriented languages allow for modular programming and software programmes to be developed like an assembly-line tool, where work is divided among several teams, not requiring much knowledge of how the parts fit into the whole. Once the technology, language, framework and structure have been learned, they can be applied across most projects. Engineers hired for various projects come with pre-defined skill sets, language skills and work experience. Most of the languages used by professionals in this industry have been standardised (for example, C++, Java, SQL), and the assumption in the industry today is that anybody with a degree in Computer Science or a related Engineering field can write the required software.

Today [the] nature of job types is so SOP [Standard Operating Procedures] driven and standardised that it doesn't require a special skill set and just requires basic understanding of code writing techniques, making the workforce dispensable and easily replaceable.

In fact, this ability to replace workers as and when required is the leitmotif of the Indian IT/ITeS sector. According to the engineers in our sample, the software companies take great pride in demonstrating to their clients that their work is process-driven to such an extent that they can replace any engineer without disturbing the delivery and timelines of the project.

Our organisation treats us as commodities to be moved across one project to another as per their business requirements.

The initial planning and designing of the project might involve some research and development, which is done by the "architects" of the project, the architects being the senior engineers who do the initial prototyping. Other engineers then execute that design. When the project enters the maintenance phase, all that an engineer has to do is make corrections to the code, as and when required, which drives the process of standardisation. This also suits the client companies, since breaking down complex tasks into comparable service-level agreements based on billable hours makes it easier for them to attract bids for the projects from several Indian IT companies.

Business processes of the IT/ITeS industry

Our open-ended questions was: "Do you think your labour is being commoditised in the IT industry?" In response, many of our participants emphasised that the business processes of this industry are geared to treating the software engineers as "resources" along with the other inputs that are used in their business and coded into the ERP. They are seen as headcounts who produce a certain amount of work in person-months per day for the company.

The employees in an ITeS are addressed as 'resources' by Management, which is a more glorified name for labour.

An IT Services company's business model is designed to treat human resources as commodities to serve business needs.

The IT/ITeS sector of India essentially comprises various companies, large and small, who compete with each other to provide IT and IT-enabled services to paying customers, typically on cost parameters. The fast-paced nature of technological change means that firms are scrambling to keep up with the changing technology and are competing with each other on costs. The costing of these “resources” is based on the level of experience and for each hour of service that the engineer provides. Companies bid for projects based on a listing of these costs.

The pricing model is akin to creating a menu card with rate lists for activities that businesses can pick and choose.

Companies can thereby bill their client companies for their engineers on an hourly or daily basis. Thus, one of the key requirements of the model is to have on-tap provision of engineers, 24/7. In the ODC model, typically, the Offshore Development Centres act as the extended arm of the company's IT unit, and have to increase or decrease their staff levels to meet customer requirements. What is critical for the ODCs is to demonstrate their ability to provide the required number of engineers in a given, predictable timeline. Most of the work is project-driven, with IT companies vying with each other for such projects. This need to have a “bench strength” – even if it means some are left without a job – is built into the HR processes. This is because even slight delays in delivery could mean loss of subsequent projects from the client, thus putting an incredible amount of pressure on the engineers who staff these projects.

An average engineer faces a lot of stress and pressure to meet deadlines ... like an assembly-line worker.

The churn-and-burn mentality of modern workplace ... companies are oblivious to the ripple effect caused by this sort of bottom-line thinking.

These pithy statements from the engineers give us the gist of where the Indian IT industry stands in relation to the academic debate on whether flexible and team-based work of a post-Fordist era is transforming lives of skilled/professional workers for the better, as Daniel Bell (1973) contends, or whether they are seeing a Bravermanian development of Taylorist mass production techniques and manual work (Crowley et al., 2010). Our task is to unpeel the “materiality” behind such a Taylorist development, which goes beyond the external environment or the internal culture of these firms. We show how the efficiency and profit motives of these firms are finding a material peg in their networked technology systems, and thus can be taken to their utmost logical extent.

Human resources and the IT/ITeS industry

The HR function in organisations has constantly been at the forefront in incorporating new technology. In fact, one of the earliest business processes to be automated in organisations was payroll administration. It is not surprising that now, with the adoption of the ERP systems, the major design principle of the human resources management of the Indian IT/ITeS sector – from billing clients to configuring projects and project teams to evaluating managerial performance – is

done on the basis of billable person-hours. It has become the backdrop of the entire workflow management system of an engineer from recruitment to the company to entry into various projects, work teams and tasks, obtaining leave, salaries, bonuses and incentives of all kinds that are automated in the HR system. ERP enables HR managers to do their jobs with very little face-to-face interaction, very different from the traditional systems of coordination that existed in an organisation in the past. According to the engineers in this study, what matters to HR at the end of the day is the head-count charge to the client companies. The system is geared to equalise everybody to the eight-hour billability and the corresponding revenue that the engineer brings in. When incentives and bonuses are algorithmically linked to the profit that the engineer garners for the company, it is not surprising that they feel that individual ability scarcely matters and that their performance is being evaluated on the basis of their “billable utilisation”.

The HR processes of the organisation are designed such that employees could be ‘plug and play’ – replaced by another engineer with [a] similar skill set without affecting the schedule or outcome of the projects.

One can argue that this is no different than slavery as there is no human sentiment here and it is dehumanising [the] workplace by treating human resources like replaceable objects.

With the ERP in the IT/ITeS sector, the need for “body-shopping” of engineers – that is, flying the software engineers to be physically present at their off-shore clients’ worksites – has come down. ERP has created a network of “virtual” engineers, requiring a greater standardisation of the work processes across the sector. In the earlier legacy system, an IT company in India may have had to house a group of on-site engineers to maintain the IT system of its clients. Now, with all companies (including Indian IT companies) tuned into a common ERP system, most of this work is carried out by the Offshore Development Centres of these firms, mostly in the Global South, staffed by an army of off-site engineers. Akin to what Aneesh (2006) calls “virtual migration”, they are logged onto the computer networks of their clients abroad, working on projects as a part of “virtual teams” consisting of people spread across several physical locations.

IT engineers are increasingly being viewed as undifferentiated and interchangeable across humans and machines.

The workforce is expected to not question the managers or customers, reach [the] office at a certain time, achieve a minimum threshold of productivity and behave in a standardised manner.

This standardisation and modularisation of the workforce has resulted in greater casualisation in the IT companies. The main task of the HR personnel in today’s IT industry is managing this contractual workforce (called “contingent” workforce). If it is a one-time hire, these are typically independent contractors and consultants who are not on the company’s payroll and are hired from a staffing agency or on an ad-hoc basis. Contractors may work remotely or on-site. The parent company that bids for the project has a fixed headcount of permanent employees on their payroll. Based on the project needs, contractual employees from various other outsourcing companies are hired in various capacities to fulfil technical, functional and testing needs. Once the project is over, if these employees cannot be re-hired for another project, they are sent back to their parent company without any obligation of serving notice.

Have a problem with an employee's productivity or behaviour? Get rid of him. When a manager doesn't 'get it', push the low performer into a different department and hire someone new. This sends a clear message to team members: shape up or ship out.

The ERP enables this mimetic application of the global ODC model at a local level. Engineers not assigned to projects are typically kept 'on the bench' – that is, they are not currently employed but remain on the rolls for recruitment into future projects. IT firms would rather sub-contract engineers as and when they get new projects. Reduction in full-time employees reduces the company's financial burden in terms of healthcare, pensions and other benefits. Amendments to labour laws, both by the central and state governments, have made it possible to hire such contract labour in the IT Industry on a large scale (Sundar, 2015). The justification given is the need to create a suitable business environment to attract capital and investments. Most companies are moving away from hiring permanent employees, who will have to be "kept on the bench" and are resorting to such a "blended" workforce of full-time and contractual employees, very much like their clients in the Global North.

Algorithms and the Post-Industrial, Globalised Workplace

[Engineers] ... are the throw-away people, middle-class workers at risk as much as their working-class peers. Unions are not welcome; pension benefits are scaled back; sickness, paternity and maternity benefits are pitched at regulatory minimum.

Our work speaks to an old tradition of "bringing work back in" to the analysis of technology in organisations. Our focus is on the interaction of workers with technological artefacts and its implications on labour organisation and labour resistance. While Braverman (1974) spearheaded this, the criticism was that technology was seen as having inherent intrinsic and objective properties that made workers react to it in certain ways, making it deterministic. The view was that modern technologies, especially information technologies, are "socially constructed", contingent and negotiable for use by skilled workers (Orlikowsky, 2000). In this article, we wish to point out that the algorithmic nature of ERP technology has made work processes far more standardised and routinised, making the modern skilled worker as replaceable as Braverman's factory worker. The difference is that for the latter the impact of this technology was palpable when the worker had to adjust to the rhythm of the machine. For the former, work is driven by processes that are devised to suit a technological artefact like the ERP, where the aim is to capture and collate all actions of workers as data and integrate this for faster and real-time decision-making by corporations. The advent of Indian IT/ITeS firms as large software factories has led to a renewed debate on de-skilling of software engineers (Aneesh, 2006). There are some specific features of the Indian IT industry that amplify this de-skilling process. The Indian IT industry is a numbers game, requiring many programmers to be put into several projects, often for the low-end jobs of routine maintenance and testing; this necessitates standardisation of processes and requires generic programmers (Ilavarasan, 2006). This was viewed by our respondent engineers as leading to commoditisation of labour-power, where their skills are treated like any other commodity, to be bought and sold at will. To that end, our work speaks more directly to Carol Upadhyaya and A.R. Vasavi's (2012) research in the Indian call centres, where they talk of flexibilisation, despatialisation and disembodiment of labour. We wish to take this question further by asking what this means for

the burning issue of organising labour at workplaces and the future of the labour movement in general.

Today, the ERP discourse has been overwhelmingly dominated by a concern with implementation (Dery et al., 2006; Carton and Adam, 2010). The information systems literature on ERP provides a standard critique of the objectification of technology and the need to “co-constitutionalise” it with the local, social milieu (Kallinikos, 2004). Based on the implementation of the ERP system in a large UK corporation, Knox et al. (2012) find that introduction of the ERP to further global business plans led to an undermining of the workers’ local and collective knowledge, leading to commoditisation of labour. These repercussions on working lives of labour are being recognised, but they need to be parsed out more, especially after the ERP systems have been fully integrated into the organisations’ functioning and decision-making. Since ERP can offer real-time information and streamline data flows, companies see this as providing tremendous gains in productivity. In large and global business organisations, its importance will only grow. For example, the largest ERP vendor, Germany’s SAP, has shown revenue growth from 16.8 billion Euros in 2013 to 23.5 billion euros in 2017.

In taking the example of the global Indian IT industry, we point out how a technology management system like the ERP has made this possible through algorithmicising. A commingling of several forces had led to the commoditisation of the lives of engineers – that is, changes in (a) business processes; (b) HR and recruitment processes; (c) fragile and fluid workplaces and project teams; and (d) knowledge systems and knowledge creation. The use of such integrated network architectures has in fact provided the material and the knowledge base for de-skilling of knowledge work just as Taylorism led to alienation and de-skilling of manual work. It has made possible an unparalleled pursuit of Taylorist ideologies of efficiency and profits, without too much messy and complex human intervention.

Labour is not like a carrot or a stereo system or an inanimate product that can be negotiated for the highest profit or the lowest price.

HR-related research on commoditisation of labour still looks at it from a narrow lens of a breakdown of managerial capabilities for motivating and retaining employees. Our engineers did not fight shy of pointing fingers at the management or the HR departments of their companies in contributing to the woes of their working lives (Shah, Russel and Wilkinson, 2017). In the HR narrative, this is seen more as a knee-jerk reaction to the increasing volatility and uncertainty in workplaces,⁵ despite it being proven beyond doubt that commitments and bonds attract better workers (Rousseau, 2004).

The complex nature of our work makes it difficult for us to know where and how our efforts contribute to the larger goals of our organisation.

From our understanding of the IT/ITeS industry, this goes beyond the lack of managerial capability or inclination to invest in retaining workers, or even the sway of the profit motive. In his perceptive book, *The Unnamable Present*, Italian author Roberto Calasso (2019: 73) alludes to how the algorithm can end up blithely eliminating all that cannot be fed as discrete, digital data into its

⁵ Rousseau (2017) later developed the concept of a “psychological contract” in order to better specify how employers and employees understand the employment relationship.

software, leaving no scope for *mediation* – “continual adjustments and compromises”, as he defines it. In the IT sector, we are seeing work-related processes becoming hard-wired through technology tools, leaving little room for individual discretion; this gives rise to situations where algorithms can constrict human decision-making. The quality of work is monitored ostensibly with hard parameters defined around availability, response time and utilisation, and the softer aspects of delivering these services are algorithmised using these Key Performance Indicators. How all this ends up affecting working life in these organisations is what we have tried to highlight. These tendencies are exacerbated in the environment in which these IT firms are operating – frequent technology churns and disruptions, and a single-minded emphasis on cost-cutting and profitability.

Having said that, what is the shape of the “counter-movement” that is emerging – if indeed it is emerging?

Counter-movements and Conclusions

The IT job markets are shifting towards people with double-stemmed or Pi-shaped skills, who are strong in at least two skills and are also functional in several others.

We also see merciless ‘restructuring’ in IT organisations, keeping the ‘strategic roadmap’ ahead. It is understood that the onus of looking for a new job, reskilling/ upskilling remains with the employee.

As employees, we need to set ourselves apart from the crowd and remember that success is just outside of our comfort zone.

The emergence of the IT/ITeS industries is a manifestation of the latest phase of global capitalism, evaluating new markets, spaces and sources of labour. In the earlier wave of globalisation, goods destined for the Global North were produced in the factories and plantations of the Global South and not connected to the ultimate consumers. Today the Internet and sophisticated communication technologies are making it possible for companies to have transnational production networks of goods as well as services. This lays the ground for an integrative back-end technology that can provide real-time data flows across all these production units, which is the promise of ERP.

However, the literature on “counter-movements against neoliberalism” in the Global South is still grappling with situating workers in this industry in the larger labour movement discourse. Huws and Sturman (2004) have gone on to show that the work process in technology industries is in some ways similar to that of commodities, inasmuch as the work is routinised, the workforce is not permanent, and forms of management and control are similar. And yet, the class-based identity of these tech-workers is problematic, because of their identification with their middle-class, primarily urban, educated backgrounds. Upadhyaya and Vasavi (2006) narrate informal strategies of resistance like absenteeism, high labour attrition and individualised acts of subversion and sabotage in the call centres of Bangalore. There has been some documentation of “subjectification” of work in the call centres and the strategies of resistance that workers deploy (Winiacki, 2004).

In this article, by pointing to an all-pervasive technological trend of the ERP spanning all sectors, we want to take the narrative beyond call centres to labour processes in formal industrial organisations, both services and manufacturing. Features of work that were once peculiar to the Indian IT sector – the need for mobile, flexible and disposable workers, fast-paced obsolescence

of knowledge, transnational networked production and work spaces – will increasingly become the features of most future businesses. Analysing the responses of engineers working in this industry, we wish to emphasise that work processes in future global industries, led by back-end integrative technology systems like the ERP, will have repercussions for labour movements worldwide. To understand why workers do and do not resist, it is crucial to understand the dynamics of workplaces and work processes. ERPs have led to “atomisation” of all labour, where data can be collected on individual workers on a real-time basis. However, making use of this data is far more insidious. This feeds into what Beck (2000) calls as a process of “individualisation” in the workplace. In this “new workplace” we find that work processes are controlled through means not very different from the top-down methods of Taylorism. It goes beyond “information panopticon” surveillance mechanisms at workplaces (Zuboff, 1988), where explicit surveillance is unnecessary since work processes have been modularised and standardised so that no room is left for individual discretion. A feature of such atomised engineers is that they no longer have any collective identity as employees or can even think of organising to negotiate with management. The only way out is constant reinventing in the labour market. The constant need for re-tooling creates an uncertainty; together with labour flexibility, this creates novel forms of risk, which workers then need to manage by creating new forms of sociality, developing personal economic strategies or re-orienting their selves in significant ways (Beck, 2000), thereby taking us further away from Polanyi’s counter-movement.

From the transcripts of our engineers, we sense a counter-movement emerging in two forms, very different from what Polanyi would have imagined. The first is the albatross of “re-skilling” and “re-tooling” that we spoke of above. Their optimistic narrative here is that technology disruption can be seen as a boon because there is always scope for differentiation and specialisation. The ideal scenario for the engineers is an employee-driven market where highly skilled professionals with niche skills work as freelancers, consultants and solopreneurs, providing niche services to multiple companies:

‘Be your own CEO’ and create your own brand.

The downside was also quite apparent to them: that this might only lead to commoditisation at a faster pace – the project being won by the cheapest quote in the cloud, so to speak.

The second is what is being spoken of today as the “gig economy” or the on-demand economy, where individuals can *work from anywhere*. Vendors with a quick and instant job with standardised specifications can hire such freelance workers. Engineers also pointed to the rising popularity of Open Sourcing, which has meant that they do not have to work with an employer to get their efforts recognised. Workspaces are now in the “cloud” and we can see the emergence of a different kind of mediator – the aggregators.

The question remains, what prevents a Polanyian counter-movement from emerging and what are the implications for resistance? Within the organisation, a “blended” workforce comprising both permanent and contingent employees is hardly conducive to the emergence of a coherent and integrated labour voice. Algorithmised decision-making has further narrowed the scope for the so-called dividends of post-Fordist innovations around flexible, project-based teamwork and co-worker relationships. Most solutions are far away from any form of organising, even as a professional body with professional ethics. The burden is squarely on the individual engineers and their efforts to adapt. Employees are caught up in a spiral of continual certifications and re-skilling to stay ahead of the automation curve, no longer seeing each other as part of the same objective or subjective class (Sheriyarji, 2019).

By viewing labour as a commodity, we at once get rid of the moral basis on which the relation of employer and employed should stand.

This work began with a classroom module discussing the commoditised lives of engineers in Bangalore's IT/ITeS industry. It took on a life of its own – with ERP and algorithms, business processes, gig economies and solopreneurs. The question remains – on what basis can we extrapolate the experiences of 100-odd participants in an Advanced Management Certificate Programme to the entire IT sector of Bangalore? Our answer is that while Bangalore is the magnet for aspiring IT engineers, there is also the well-known fact that the industry is facing severe attrition rates (Basu and Sarker, 2019). But more importantly for us, the engineers whose voices we have tried to reflect, while dwelling on the individual angst of their working lives, were also able to describe to us, very cogently and objectively, the business systems and processes that have made it so. This gives us the confidence to state that they (and so, we) were able to unearth some underlying and systemic reasons for their reality. Our aim here is not to vilify the ERP-led algorithms as a Trojan horse that brings with it the insidious outcome of commoditisation of labour. However, the ERP has managed to concretise systems and processes that put efficiency before everything else. It is not that firms have not woken up to the deleterious effects of this, but we do wish to identify sites that are gradually chipping away the already eroding bargaining power of labour – even rescinding the identity of their working lives. Identifying these factors is not easy, because it is conjoined with narratives of technology, productivity and efficiency.

Our work also begs a re-looking at Indian IT/ITeS organisations – not from the off-shoring trope used in analysing them, but studying them as archetypes for labour processes of the future. This is as much their story – global in scale, firmly pegged in the knowledge economy, and frenetic about cost-cutting and efficiency, with these logics performatively embedded in algorithmic technology systems. We belabour the fact that our findings have to be seen beyond the Indian IT/ITeS sector, since ERPs are increasingly seen as *de rigueur* by enterprises (Davenport, 1998), and thereby have implications far beyond this sector. We conclude by affirming that studying labour processes in this industry will, by far, give us our best vantage point to understand labour issues and working life in the coming era, reminding ourselves once again that *de te fabula narratur*.⁶

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⁶ It is of you that the story is told (Horace, quoted in the Preface to the first German edition of Marx's *Capital*, Volume 1, 1867).

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BIOGRAPHICAL NOTES

RAJALAXMI KAMATH is an Associate Professor at the Indian Institute of Management Bangalore, teaching courses related to Markets, State and Society. [Email: rajalaxmik@iimb.ac.in]

EUREKA SARKAR is an Academic Associate at the Indian Institute of Management Bangalore. [Email: Sarkar@iimb.ac.in]