Development Implications of Digital Economies

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The Platform Economy and Digital Work:
A Developmental State Perspective

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Abstract

As advances in information and communication technologies make the platform economy increasingly important, digital gig work has gained prominence as a source of employment.

There are, however, concerns about the implications of new technologies and their socio-economic manifestations. A primary concern is with the opacity of algorithmic management. Another has to do with the ability of digital gig workers to negotiate their conditions of employment since they perform online tasks that individualize work, and they are spatially and socially removed from their employers and fellow-workers. There are also concerns about de-skilling, as much of the digital gig workforce undertakes menial and repetitive tasks.

But questions about labor conditions, or the impact of globalization and technological change are not new. In the 20th century, they were addressed by states in the global South taking an active developmental role to improve standards of living. It is against this backdrop that this paper will use India as a case to examine the continued relevance of the developmental state in the platform economy.

The paper will argue that the state continues to have a role in encouraging the demand for, and the building of, platforms within its jurisdiction. This will ensure that the employment opportunities offered by digital gig work are available, while making it possible to regulate the employment conditions of workers and the algorithms governing platforms. Alongside, creating a workforce with better and distinct skills will not only help workers gain a comparative advantage but also equip them to improve their position in the international division of labor.

1. The Platform Economy and Digital Work

Increasing economic globalization, and the evolution and spread of information and communication technologies (ICTs), has given rise to a digital economy comprising "the digital sector plus emerging digital and platform services" (Bukht & Heeks, 2017:1) (Figure 1). Platforms provide "the basic infrastructure to mediate between different groups" (Srnicek, 2017:26) and extract value from the interactions between "those who offer services and others who are looking for them" (Scholz, 2016:4).[1] In the digital economy, platforms have emerged as a new business model, in the form of "online marketplaces that involve at least three parties where the platform provider serves as an intermediary coordinating supply and demand sides of the other two parties" (Schmidt, 2017:5).[2] The World Bank (2015:3) estimated the revenues of the platform economy to be worth US$4.8 billion in 2016, and that it could grow up to US$25 billion in 2020.
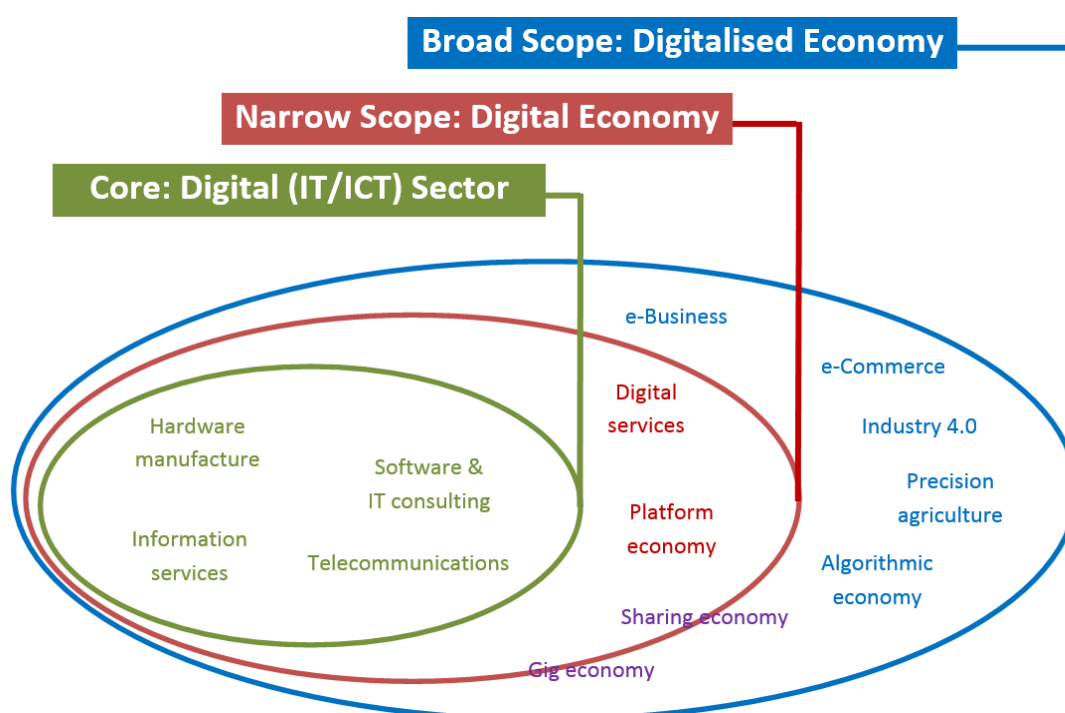
Figure 1: Scoping the digital economy
Source: Bukht & Heeks (2017:13)

The digital work (or "gig" work) that platforms help coordinate can be placed into two broad categories.[3] The first is physical gig work: location-based digital labor or "work on-demand

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[1] As infrastructure mediating between different groups, platforms hardly need be digital (Rysman, 2009). For example, shopping malls that bring together various stores, and customers seeking different products, are examples of platforms providing infrastructure that is physical.

[2] There have emerged a number of terms related to the platform economy, such as the sharing economy, or the on-demand economy (to describe the overall domain), and terms such as online labor, crowd work or digital labor, to describe the type of work done (Heeks, 2017a).

[3] Srnicek (2017:27-28) classifies digital platforms into four types. The first are advertising platforms, such as Facebook, which use information mined about users as the basis for generating revenues by selling online advertising space. The second are cloud platforms, such as Amazon, which rent out their infrastructure to third parties. The third are industrial platforms, such as Siemens, which build the infrastructure to transform

via apps" including "activities such as transport, cleaning and running errands" and "forms of clerical work … channelled through apps managed by firms" (De Stefano, 2016:1). Examples include platforms such as Uber or Airbnb. Srnicek (2017) also refers to these platforms as lean platforms, as they provide services with a minimal ownership of assets.

The second is digital gig work: "contingent (task- or project-based) intangible work delivered digitally and done for money, organised via online outsourcing platforms that are marketplaces bringing together buyers and sellers" (Heeks, 2017b:1). The tasks may vary from "menial and monotonous parceled activities requiring some sort of judgment beyond the understanding of artificial intelligence (e.g. tagging photos, valuing emotions or the appropriateness of a site or text, completing surveys) to bigger and more meaningful works such as the creation of a logo, the development of a site or the initial project of a marketing campaign" (De-Stefano, 2016:2). Offering tasks in online marketplaces is an effort to lower the transaction costs of identifying freelancers (or elancers) with the requisite professional abilities and technical skills from a crowd. A specific form of crowd work is micro-work, or the subdivision of a task "into tiny units for piecemeal work, each paid for with an equally tiny amount of money" (Schmidt, 2017:5). When a task cannot be subdivided but is solved "in a redundant fashion, in parallel, by an entire crowd, while in the end only one result is used and paid for, it is contest-based crowd work." (*ibid.*).

Meyers et al (2017) describe the different organizational models adopted for task fulfillment. The first is a micro distribution model where service providers operate a crowdsourcing platform on which large and complex tasks for clients are algorithmically broken into microtasks and offered to potential workers. Individuals register with the platform and can complete their tasks from anywhere convenient. Upon task completion they are compensated through a payment platform.[4] A variant of this, found on major digital labor platforms, such as Upwork and Freelancer, involves tasks whose scope is determined by the client. The second is a direct model where service providers operate delivery centers, in which workers are trained and employed to complete their work. There is typically a spatial division of labor between the offices of the service provider, which are located in proximity to clients, and delivery centers, which locate in regions with a low-cost

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traditional manufacturing into internet-connected processes that lower production costs and transform goods into services. The fourth are platforms, such as that of Rolls Royce, which generate revenue by using other platforms to transform a traditional good into a service and by collecting rent or subscription fees on them.

[4] Prominent examples of this model include Amazon Mechanical Turk (AMT), microworkers.com and CrowdFlower. But even among platforms using a similar organizational model, there can be operational differences. For instance, AMT (https://www.mturk.com/) gives out Human Intelligence Tasks (HITs) – so called because they are tasks that require some degree of human intelligence. While task-givers ("requesters") and task-takers ("workers") have different logins, once a worker is chosen for a HIT, no one else can work on it for a certain time. It is removed from the system after a worker completes the task. If the worker does not complete it in the given time it is once again made available to other workers. AMT transfers payments only to a US Bank account or to an Amazon.com gift card, while international workers only have the gift card option. However, Indian workers have the option of being paid in rupees to a domestic bank account. Although the AMT payment mechanism encourages participation from people from the US and India, as of May 2018, AMT accepted requesters from 49 countries. In contrast to AMT; microworkers.com has only one login serving both the "employer" and the "worker" (see https://www.microworkers.com/login.php for template). Tasks are referred to as "jobs" and payments are made via online payment services like PayPal, Moneybookers (Skrill), or Payoneer, and no US bank account is needed.

labor force.[5] The third is a mixed model where, in a departure from the direct model, the service provider leaves the operation of the delivery centers and the management of employees to local partners, while only retaining responsibility for business development, marketing and sales, and final quality control.[6]

This paper focuses on work delivered digitally i.e. non-location based crowdworking. In other words, it will not address services that are facilitated by platforms but delivered physically, such as work-on-demand-via-apps. As a corollary, it will only consider the micro distribution model and not the direct and mixed organizational models for delivery. With these qualifications, Section 2 will describe the extent and socio-economic status of digital workers. It will highlight the contrasting views of those who see digital gig work as a means of overcoming the challenges of un(der)employment, especially in the countries of the global South,[7] against the growing concerns with other aspects of work on digital platforms: opaque algorithmic management, employment conditions that adversely affect wages and social security benefits, and the misallocation of relatively skilled workers to repetitive tasks and the prospect of their de-skilling. Section 3 will highlight how debates about the impact of technological advances on employment and de-skilling are not without precedent, and that the relationship is hardly uniform. Instead, it is mediated by various socio-political institutions and, in the global South, the developmental state[8] has historically been the dominant institution in influencing the trajectory of "technological catch-up" for "late-industrialization" and improvements in standards of living.

Section 4 will discuss how and why the developmental effectiveness of states varies by drawing on the case of India, which has the largest share of online workers (Figure 2). Although policy changes by the Indian state over the last three decades have not only enabled the growth of the world's largest ICT services export industry, an inability to generate sufficient employment opportunities and address the informalization of the economy has led to emergence of digital gig labor as a livelihood option for many. Section 5 will use the Indian experience to explore how states can take advantage of the employment possibilities that digital gig work offers, and which workers seek more of, while mitigating the concerns raised by such work. The section will argue for the encouragement of digital gig work as long as it is part of a larger developmental agenda by the state. The section calls on the state to encourage local "platform entrepreneurs" within its jurisdictional boundaries as a means of asserting its regulatory control over algorithmic platforms and employment conditions. To encourage the private sector, the state can also establish platforms both to

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[5] Examples of those who have adopted this model include Digital Divide Data (https://www.digitaldividedata.com/), a US non-profit, with delivery centers in Cambodia, Kenya, and Laos, and iMerit (https://imerit.net/).

[6] An example of this model is RuralShores (https://ruralshores.com), a US firm with delivery partners in rural India.

[7] The global South is used as shorthand for the relatively less affluent regions of the world i.e., any region that is not a part of North America, Western Europe, Japan and Australia/New Zealand.

[8] "A state is developmental when it establishes as its principle of legitimacy its ability to promote and sustain development, understanding by development the steady high rates of economic growth and structural change in the productive system, both domestically and in its relationship to the international economy" (Castells, 1992:56). Similarly, Johnson (1982:19) argues that it is the establishing of "substantive social and economic goals" to ensure catch-up, and developing the institutional means to achieve those goals, which makes a state "developmental".

provide employment and to digitize its activities. Finally, the state must build an educational system that can create a skilled workforce with a comparative advantage in the international division of labor of digital gig work, and to minimize the likelihood of de-skilling. The paper will then conclude with a summary of the key developmental debates around the platform economy and reiterate a developmental role for the state.

2. The Extent of Digital Gig Workers

Digital gig work is a "non-standard form of employment", a term that designates all employment that is definite, and neither full time nor part of a subordinate and bilateral employment relationship (ILO, 2016). As evident in the Online Labour Index developed in 2017 by the Oxford Internet Institute, the spread of the internet, and the connectivity it affords, has made for a global distribution of gig workers (Figure 2). The largest concentration is in South Asia, with India being home to 24% of online labor, followed by Bangladesh (16%), and the United States (12%). To Standing (2011:7), the emergence of digital gig workers is emblematic of "class relations in the global market system of the twenty-first century" and a "more fragmented global class structure".
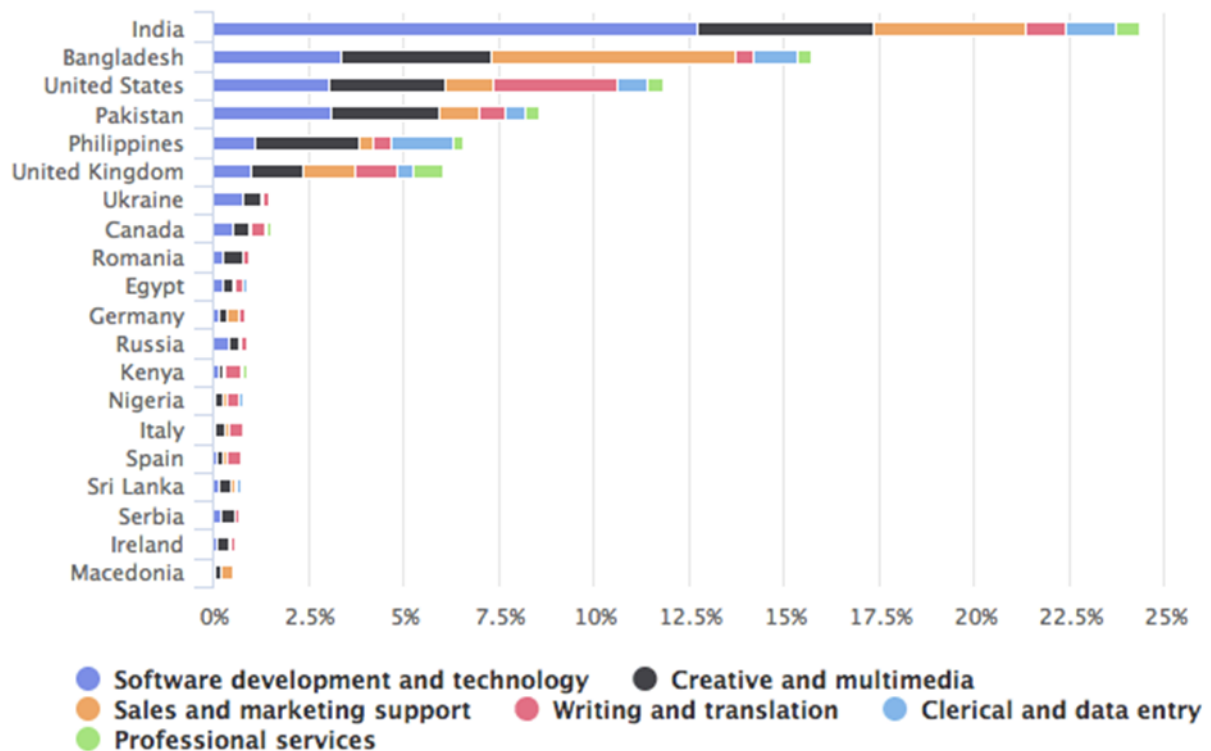
Figure 2: The global distribution of digital gig workers, July 2017
Source: The iLabour project

Standing identifies seven classes, two of which are of particular relevance here. There is a small group of well-paid "proficians", made up of independent own-account workers, offering accounting, legal, business consulting, software development and such services which typically require professional training. They engage in such contractual and non-standard forms of work out of choice and do not seek full-time employment in a single enterprise. Since they value the spatial and temporal mobility that digital gig work offers,

many are "digital nomads" or "remote, location-independent" workers (Sutherland & Jarrahi, 2017). They are a community of "online entrepreneurs with cosmopolitan lifestyles that are constantly self-represented online and with strong appeal for exotic places like Ubud, Indonesia or Chiang Mai, Thailand" (*ibid.*:97:7). Although members of this community may not necessarily know each other, or be situated in geographical proximity, they use such channels as the Digital Nomad Conference, and travel programs like Hacker Paradise, to work and travel together. While they vary in terms of the type of digital work they do, the digital platforms they use, and in the type of industry and form of mobility, they are united by "similar practices as exotic travelers by combining perpetual travel with work" (*op.cit.*). Thus, it is their lifestyle choices and work practices and not skills or type of work that enable them to display the characteristics of a community.

In sharp contrast to the proficians are the "precariat" – in the same category as the unemployed, socially ill misfits – who manifest unique class characteristics (Standing, 2011). They have "minimal trust relationships with capital or the state", do not have "the social contract relationships of the proletariat", and thus don't enjoy the "labour securities" that a welfare state provides (*ibid.*:8). The precariat have a "truncated" status which cannot be mapped onto the Weberian notion of status groups.[9]

The globalization of gig workers has led to debates on the developmental possibilities of digital gig work, especially in countries where employment opportunities are limited. Platforms have projected themselves as "a revolution in labour markets, suggesting that they can help lift people out of poverty" (Graham et al, 2017:2). Development agencies, such as the United Nations Development Program (UNDP) and the World Bank, have promoted digital gig work as a vehicle for development. Youth unemployment is a particularly pressing concern in the global South. Of the world's 1.2 billion people between the ages of 15 and 24, 87% are to be found in the global South, two thirds of whom are either unemployed or "trapped in low quality jobs" (World Bank, 2015:46). Digital gig work is viewed as having the potential to alleviate un(der)employment, when augmented with broader national employment strategies. When digital gig work is outsourced to vulnerable and disadvantaged population groups it is called impact sourcing.[10]

The proponents of digital gig work also highlight the temporal and spatial flexibility it grants to workers. The World Bank (2015:1) views digital gig work as offering a win-win situation for both job-givers and job-seekers by arguing that employees gain "broader access to specialized skills, more flexible and faster hiring processes, and 24-hour productivity" while workers can "access and compete in global job markets, from anywhere at any time, as long as they have computer and Internet access". The fixed costs incurred by entrepreneurs are reduced as they can hire labor only when needed while individuals who would have

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[9] Weber (1978:932) defined status groups as "every typical component of the life fate of men that is determined by a specific, positive or negative, social estimation of honor" that "need not necessarily be linked with a class situation." Social status is based on non-economic qualities such as honor, prestige, ethnicity, race and religion, as distinct from the economic basis of class.

[10] The term impact sourcing was used by a report commissioned by the Rockefeller Foundation to emphasize the use of business process outsourcing (BPO) to create sustainable jobs that provide information-based services to clients, and improve incomes for those at the base-of-the-pyramid (BoP) (Heeks, 2013). The BoP refers to those who live on annual incomes of less than $3,000 of local purchasing power.

otherwise not been able to work for reasons such as lack of mobility, health issues, or family commitments, can now enter the workforce (Schmidt, 2017).

On the other hand, there are grounds to question whether digital work offers a level playing field. As intermediaries which coordinate the interaction of two sets of agents, each of whose actions affect outcomes for the other, typically through network externalities, platforms lie at the heart of two-sided markets (Rysman, 2009). Such markets exhibit two types of network effects: "a same-side effect, in which increasing the number of users on one side of the network makes it either more or less valuable on the same side; and a cross-side effect, in which increasing the number of users on one side of the network makes it either more or less valuable to the users on the other side" (Eisenmann et al, 2006:95). Same-side effects are typically negative – one can imagine a digital platform becoming more attractive to gig workers as the number of task-givers grows, but that too much competition for work can also lead to diminishing interest in the platform. But cross-side effects are typically positive and, to the extent that the "homing" costs which "network users incur – including adoption, operation, and the opportunity cost of time – in order to establish and maintain platform affiliation" are high (*ibid.*:97), the size of the networks generated on both sides increases the likelihood of a winner-take-all outcome and monopolistic behavior.

Aside from this economic property, there are social concerns. As Castells (2010:77) argues, ICTs have enabled the creation of an "informational, global and networked" economy capable of applying "its progress in technology, knowledge, and management to technology, knowledge, and management themselves. Such a virtuous circle should lead to greater productivity efficiency, given the right conditions of equally dramatic organisational and institutional changes." But the informational economy has not reduced social inequity as it is highly selective in "connecting localities throughout the planet, according to criteria of valuation and devaluation enforced by social interests that are dominant in these networks" (Castells, 2002:x). In other words, the uneven geographies of informational capitalism are not very different from earlier manifestations of capitalism.

Within the broad brush strokes of Castells, there are at least four specific concerns. A primary concern has to do with the mechanism of control over workers. Platforms embody "an *architecture* - a design for products, services, and infrastructure facilitating network users' interactions – plus set of *rules*; that is, the protocols, rights, and pricing terms that govern transactions" (Eisenmann et al, 2006:95, original emphasis). As the implementation of the architecture and rules of digital platforms increasingly relies on advances in artificial intelligence (AI) and machine learning, there are concerns about "algorithmic management", defined as work settings where "human jobs are assigned, optimized, and evaluated through algorithms and tracked data" (Lee et al, 2015:1603). Algorithmic management continuously tracks workers' behavior; constantly evaluates the performance of workers from client reviews, and the client's acceptance or rejection of their work; automatically implements decisions, without human intervention; and, requires workers to interact with a "system" rather than humans, thus depriving them of opportunities for feedback or discussion and negotiation with their supervisor, as would be typical in offline jobs (Möhlmann & Zalmanson, 2017). Worse, there is low transparency.

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The low transparency, or what Burrell (2016) terms opacity, renders algorithmic management particularly problematic as it implies that workers have no access to the logic or criteria behind key decisions being made about their performance evaluation and, consequently, future opportunities. According to Burrell, opacity may result from one of three reasons. First, it could be the result of intentional institutional action or "willful self-protection by corporations in the name of competitive advantage, but this could also be a cover for a new form of concealing sidestepped regulations, the manipulation of consumers, and/or patterns of discrimination." (*ibid.*:4). Second is what she terms opacity arising from technical illiteracy, or not possessing the specialized skills required to read, write, and comprehend code. The third, which is understanding "the algorithm in action, operating on data" (*ibid.*:5), is the most insidious because of the complexity that arises when algorithms, however clearly written, *learn* from interacting with the heterogeneous properties of vast quantities of data.

A second related concern is the nature of the employment relationship. Playing the role of an intermediary allows a platform provider to shift most of the costs, risks and liabilities to the other two parties. Similarly, despite offering a "workforce" to potential task requesters, most platforms do not recognize gig workers as employees; instead, workers are classified as self-employed persons or independent contractors, which potentially allows employers to minimize their legal and social responsibilities, such as providing minimum wages or other employment benefits. According to a survey by the ILO (Berg et al, 2018),[11] while workers were paid on average US$4.43 an hour, that figure fell to US$3.29 an hour when unpaid hours, such as search time, were also included (*ibid.*:49).[12] Besides low earnings, gig workers have low levels of social protection coverage – only 61.3% had any access to healthcare, 35% a pension or retirement plan, and 37% had other social insurance (unemployment benefits, workers compensation, disability insurance, etc.) (*ibid.*:60). Further, the greater an individual's dependence on gig work, the less likely they are to be protected. For instance, a mere 16% of the workers for whom gig work is the main source of income were covered by a retirement plan, compared to 44% of those who had other sources (*ibid.*:59).

The lack of a unified regulatory regime, and the inability of an atomized workforce to collectivize, reduces the bargaining power of digital gig workers. What makes bargaining harder is that the supply of labor exceeds demand (World Bank, 2015) which, in turn, highlights the third concern: a majority of digital labor is located in the global South (Figure 2) whereas, according to 2016 data from the iLabour project, most of the jobs are posted by employers in the global North: 52% from the United States (US), 6.3% from the United Kingdom (UK), 5.7% from Australia and 5% from Canada. An analysis of data flows between the global North and the global South also bears testimony to this. Based on a study of 60,000 anonymized transactions completed on oDesk (now merged into Upwork)

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[11] The survey of 2,350 gig workers was conducted in August 2017 across 75 countries and drawn from five platforms: AMT (489), CrowdFlower (355), Clickworker (455), Prolific (495), and Microworkers (556). The survey was complemented by in-depth qualitative data gathered between October 2016 and March 2017 from 228 workers spread across the following platforms: AMT, CrowdFlower, Clickworker, Prolific, MyLittleJob and Upwork.

[12] Paid work refers to the "actual work tasks that the crowdworker was paid for" whereas unpaid hours is the "time spent looking for tasks, earning qualifications, researching requesters through online forums, communicating with requesters or clients and leaving reviews, as well as unpaid/rejected tasks/tasks ultimately not submitted" (Berg et al, 2018:49).

researchers at the Oxford Internet Institute concluded that countries where data and tasks are more bought than sold are situated in North America or Europe whereas in the global South the supply of labor exceeds the demand for it (Casilli, 2017).

Thus, there is an international division of labor, which should not be surprising considering the extent of un(der)employment, and the relatively low wages in the global South. Indeed, the ILO survey (Berg et al, 2018:36) found that, in Asia, 80% of gig workers had an undergraduate degree, while the corresponding figure in Africa was 47%. Despite such qualifications, when paid and unpaid work hours are counted, the average hourly earnings of workers in North America was US$4.70, and US$3.00 in Europe and Central Asia. However, the average hourly earnings in Asia and the Pacific were only US$2.22, and even lower in Africa (US$1.33) (*ibid.*:52). These aggregate numbers also conceal differences in pay between countries even on the same platform (Figure 3). The concern is whether the tendency of workers to undercut one another in their eagerness to obtain work (Graham et al, 2017) will lead to a race to the bottom in terms of wages, and perpetuate socio-spatial disparities.
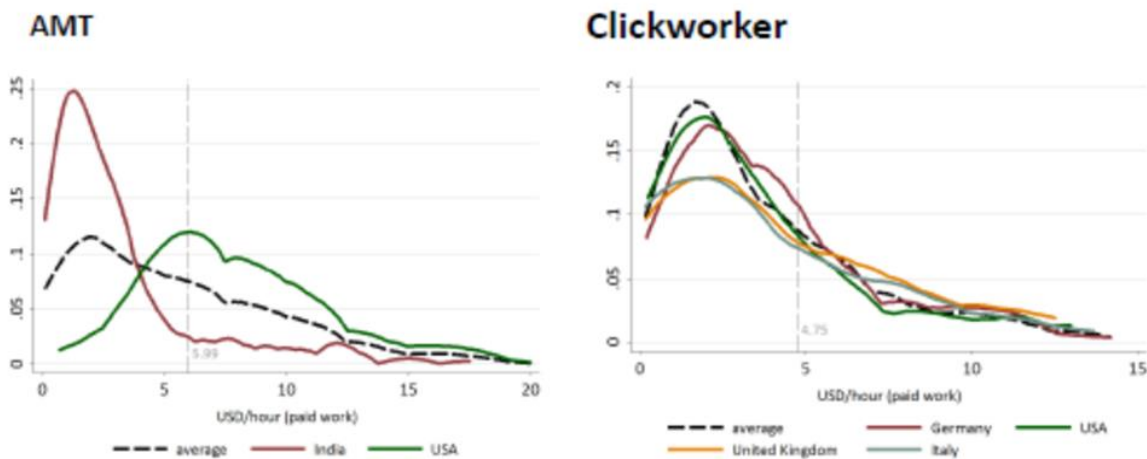
Figure 3: Differences in pay between countries on the same platforms
Source: Adapted from Berg et al (2018)

The above concern is reminiscent of arguments over the emergence of a "new international division of labor" (NIDL) with the growth in offshoring, to the global South, of low-skill, low value-added manufacture from the 1960s (Frobel et al, 1980). The NIDL emerged with the vertical disintegration of the production process into smaller fragments, and advances in transport and communication to connect industrial sites and a labor pool distributed globally. Critics argued that the knowledge underlying technology and production continued to lie with the North and that, for the South, especially where environmental and labor regulation was lax, the NIDL only meant "bloody Taylorisation," (Lipietz, 1982) or the repetitive performance of unskilled tasks under repressive conditions.

The final concern has to do with how individual "gigs" or "tasks" form a fragment, often miniscule, of the entire work process. Although the portrait that emerges of gig workers from the ILO survey (Berg et al, 2018:36) is that they are relatively well-educated – 25% had a technical certification or some university education, 37% an undergraduate degree, and

20% postgraduate degrees, as Figure 2 indicates, very little of digital online work would match the profile of Standing's proficians. The prominent exceptions are India, where 55% of online workers undertake software development and technology work (which is explained in Section 4), and the UK, 22% of whose workers are in professional services (such as law, accounting, or business consulting). The rest are workers undertaking highly fragmented work. While, in theory, this gives workers the flexibility to carry out tasks across different platforms for different employers (i.e., multi-homing), such fragmentation of tasks deprives the worker of any control over the work process. With the worker merely executing instructions, with little scope for independent thought, de-skilling is a possibility.[13]

Ironically, the debates about alienation and de-skilling, or the likely extent of other socio-spatial disparities, seem less a matter of concern for the workers in the gig economy. According to the ILO survey (Berg et al, 2018:62), 88% wanted *more* work, or a weekly average of 11.6 additional hours per week. The desire was especially high in Africa (98%), Asia and the Pacific (91%), and in Europe and Central Asia (91%). The leading reasons for undertaking gig work were to supplement income from other sources (32%), and a desire to work from home (22%), either because of domestic responsibilities or for health reasons (*ibid.*:37). Of those surveyed, 58% attributed the lack of tasks as the reason for limiting their work, while an additional 17% said that the tasks available were not well compensated (*ibid.*:62). There was also the perception that the likelihood of better earnings was low, especially in the global South, thanks to discrimination on the basis of nationality (or gender) on certain platforms, reflecting the regulatory vacuum in which online marketplaces function (Beerepoot & Lambregts, 2015). Notwithstanding any discrimination, 51% choose to work on only one platform since spreading oneself across various platforms raised transaction costs arising from the need to learn new skills and establish a reputation.

What the discussion in this section points to is that while digital platforms are a new technological means for the globalization of work, there are broad concerns regarding what Berg et al (2018:1) term decent work, or "work that is productive; ensures equality of opportunity and treatment for all women and men; delivers a fair income, security in the workplace and social protection for families; provides prospects for personal development; and gives workers the freedom to express their concerns, organize and participate in decisions that affect their working lives." But tensions over the possibilities offered by new technologies, and the costs of their social deployment, are not new as the following section describes.

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[13] An atomized workforce can also contribute to de-skilling. As Orr (1996) highlights in his study of Xerox technicians, the repair of photocopy machines often demands more than what is described in official manuals. Sharing their experiences during the course of work helps technicians construct coherent stories about the machines they repair. The oral narration of these stories becomes a social resource in dealing with the subtleties and unanticipated challenges at work. When such resources are missing, a fragmented workforce can experience de-skilling over time.

3. The Historical Relationship Between Technology and Work

Although digital gig work is a contemporary form of work based on current technologies, the optimism about its potential and concerns about its damaging effects, discussed in the previous section, are not without historical parallels. There have long been debates about the social impacts of new technologies and, in the past century, Keynes (2008:20-21) coined the term technological unemployment to describe a "temporary phase of maladjustment" due to "our discovery of means of economising the use of labour outrunning the pace at which we can find new uses for labour." There is also evidence of adjustment accompanying the diffusion of ICTs since the 1970s, in an increasingly global economy, as the "traditional form of work, based on full-time employment, clear-cut occupational assignments, and a career pattern over the life-cycle is being slowly but surely eroded away" in all OECD countries (Castells, 2010:290). The rise in flexible and non-standard forms of work arrangements to support the mobility, profitability and productivity of capital has led to de-institutionalization and the "individualization of labor in the labor process" (*ibid.*:82). Digital gig work is thus a continuation of the earlier trends of flexible and non-standard forms of employment.

Less clear is the extent to which generalizable claims can be made about how "temporary" the adjustments will prove, or the extent of their long term impacts. As Castells (2010:280) emphatically says, various studies confirm the lack of "systematic links" between ICTs and employment, as specific outcomes depend largely on "macro-economic factors, economic strategies, and sociopolitical context". The broad relationship between technology and work can only be understood as a "complex interaction within a social system" comprising "management decisions, systems of industrial relations, cultural and institutional environments and government policies" (*ibid.*:256).[14]

Lessig (2006) makes a similar, but broader, argument about how behavior in cyberspace is governed by code, and that the architectures of some spaces are more regulable than others. As he succinctly puts it, the architecture of cyberspace is its politics. More recently, McAfee & Brynjolfsson (2016:149) too give assurance that advances in AI and robotics do not demand policies for a jobless economy and that the best strategy would be "not to slow the technology" but to "strive for flexibility", so that "people, organizations and institutions can learn and grow their way into a healthy future".

If the relationship between technology and work is influenced by various institutions, in the case of the global South, none is more important than the state in the process of technological "catch-up" with more prosperous counterparts, and of "late industrialization". The best evidence of the role for the state is the socio-economic transformation and affluence of the four "tigers" of East Asia – South Korea, Singapore, Taiwan, and Hong Kong – in the latter half of the 20th century. To Evans (1995), these countries could *construct* comparative advantage thanks to their exemplary developmental states. Such states are

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[14] This point is illustrated by the different trajectories of employment structures in the G-7 countries, all of which experienced a decline in the share of manufacturing employment between 1970 and 1990. Thus, the US and Canada moved to a service economy model, with a services to industry employment ratio of 3.0 and 3.3 respectively, whereas the corresponding ratios for Japan and Germany were 1.8 and 1.4 (for the period 1987-1990) respectively (Castells, 2010:225).

characterized by "embedded autonomy": i.e., they are sufficiently autonomous from various social groups and internally coherent to independently formulate a development project, while also cultivating formal and informal ties to groups within civil society that helped them achieve those project goals. Evans also identifies the roles that effective development states take on. He argues that a state confining itself to the roles of a "custodian" (regulation and policing) and a "demiurge" (where it takes on a direct role in production, presuming that private capital is incapable of doing so) will be developmentally less effective than states that take on the roles of "midwifery" and "husbandry". These latter roles refer to assisting the emergence of entrepreneurs and directing them into new areas of production, including cajoling them into meeting challenges in the global market.

More specifically, Amsden (1989) argues that the developmental state enabling catch-up becomes an entrepreneurial force by targeting economic sectors in which to construct comparative advantage, rather than relying exclusively on natural endowments. Sectoral targeting requires financial and social incentives, including tariffs and subsidies, building physical infrastructure and, crucially, investments to develop an education system that permits continuous learning from technology that is initially borrowed. For instance, Amsden and Chu (2003) point to how Taiwan entered the world semiconductor market by offering low-skill, low-wage assembly work. Over time, state backing created an industry to give Taiwan a "second-mover advantage" and transformed the country into the world's leading semiconductor manufacturer.

Contrary to the fears of the NIDL theorists, the East Asian NICs have shown that it is conceivable to move beyond exploitative niches in the international division of labor with technological upgrading. After World War II, many former colonies which had gained independence also began to pursue developmental strategies to catch-up. But few developmental states could deliver what the East Asian tigers had done, as the discussion of the Indian case in the next section illustrates.

4. The Indian Developmental State, its Polices and Outcomes

This section will explain how the limitations of the developmental outcomes of the Indian state set the stage for its incorporation into the digital gig economy. Following independence in 1947, the Indian state adopted central planning and took the lead in pursuing an autarkic import-substitution-led industrialization (ISI) in which the public sector and public sector enterprises occupied the "commanding heights of the economy".[15] State policies – which also took the form of an array of controls and licensing procedures implemented in an ad-hoc fashion, and came to be contemptuously referred to as "permit-license-quota-raj" – discouraged entrepreneurship and investment, and proved inimical to innovation.

To use the language of Evans (1995), as an autonomous Indian state took on the roles of a custodian and a demiurge, India's economic growth between the 1950s and the 1980s

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[15] There is a vast literature on India's post-independence economic record. Unless otherwise mentioned, this section will rely on the fine overviews by Bardhan (1998) and Kohli (2012) for the political economy of development, and on Chakravarty (1987) and Kar & Sen (2016) for the trajectories of economic policies.

averaged little more than 3.5% (Table 1), which the economist Raj Krishna pejoratively termed a "Hindu" rate of growth (Ahluwalia, 1985). The relative ineffectiveness in the role of the state meant, for instance, that although India established the Department of Electronics (DoE) (MeITy - the Ministry of Information Technology since July 2016) in 1971 to formulate electronics policy, the globalization of the semiconductor industry from the 1960s bypassed the country (Henderson, 1989). India was unable to take advantage of its comparative advantage in labor-intensive manufacturing to entrench itself in the NIDL. These tendencies were evident in the decline in India's share in world trade, from 2% in 1950 to 0.4% in 1990 (Ahluwalia, 1996:21).

Table 1: Annual average GDP growth rates in India

Year(s)	Growth Rate
1951-1956	3.5%
1956-1961	4.2%
1961-1966	2.8%
1966-1969	3.9%
1969-1974	3.2%
1974-1979	4.7%
1979-1980	-5.2%
1980-1985	5.6%
1985-1990	5.6%
1990-1992	3.4%
1992-1997	6.5%
1997-2002	5.5%
2002-2007	7.7%
2007-2012	8.0%

Source: Planning Commission (2008, 2013)

By the 1980s, when India's relatively poor performance became evident, tentative efforts were made to dismantle the regulatory apparatus of ISI and the emphasis on self-sufficiency. Deteriorating public finances, and a balance of payments crisis in mid-1991, induced a further shift in economic policies, including devaluation of the rupee, trade liberalization and duty rationalization, openness to foreign investment, and a new industrial policy that removed entry barriers for new firms, a process that is still underway.[16] Since then, as Table 1 shows, India's economic growth has improved and led to its inclusion in the BRICS grouping as a major emerging economy.

Arguably, the brightest aspect in this growth has been the rise of the ICT services industry (Table 2). In the early 1980s, a group of technologically and commercially pragmatic bureaucrats heading the DoE were keen that India become to software what Taiwan and Korea were to hardware (Lakha, 1990). Not only did they push policies to explicitly support

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[16] For a description and assessment of various aspects of the reforms, see the collection of essays in Bhagwati and Panagriya (2013), and in Hope et al (2013).

the industry but there was also a shift in the approach to policy-making.[17] Whereas until the 1980s, it was concentrated within a closed bureaucratic apparatus, since then the state has increasingly drawn on inputs from the industry which, in 1988, formed the National Association of Software and Services Companies (NASSCOM) i.e., the state became more embedded, and took on the roles of husbandry and midwifery (Evans, 1995).[18] Indian firms responded to the changed developmental approach of the state, with the technical skills available in the country, to meet the needs of a rapidly globalizing industry.[19] Indian firms pioneered a global offshore delivery model based on software factories with the technology, quality processes, productivity tools, and methodologies of the customer workplace (Parthasarathy, 2010).

Table 2: India's ICT services: global revenues and exports

Year	Revenues (current US$m)	Exports (% of revenues)
1985-1986	81	29.6
1990-1991	243	52.8
1995-1996	1,253	60.2
2000-2001	8,386	75.1
2005-2006	30,300	77.8
2010-2011	10,073	77.4
2015-2016	118,800	82.3

Note: Global revenues and exports includes income from subsidiaries abroad
Source: Revenue and exports data from NASSCOM and MeITy annual reports

However, in the 1980s and the 1990s, the production for exports in the Indian ICT services industry was akin to Braverman's (1974) portrayal of the organization of work under monopoly capitalism in the 20th century. Braverman spoke about the separation of conception from execution, of mental from manual labor, and the proletarianization of professionals, leading to the commodification of intellectual work. A small group within the office undertook mental labor, while manual labor characterized the work of the mass of clerical workers. In the case of ICT services outsourcing to India, the only difference was the geographical distance separating the mental from the manual labor. The delivery of offshore ICT services resembled the direct delivery model of the digital gig work service providers discussed in Section 1. Despite the relatively high skills of engineers deployed to write

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[17] Early promotional policies included the Computer Policy of 1984, and the Computer Software Export, Development and Training Policy of 1986, which provided easy access to hardware and software (Subramanian, 1992).

[18] The clearest instance of proactive policy based on industry feedback was the establishment, in 1990, of the Software Technology Parks (STPs). STPs were export processing zones dedicated to the software industry that combined infrastructural support in the form of high-speed data communication links, with financial incentives by not taxing export earnings (Parthasarathy, 2010).

[19] Despite relatively low literacy levels, post-independence India managed to train a large number of engineers. One indicator of skills availability is the annual output of graduates with a Bachelor's degree in engineering. This output grew from 247 at the time of independence in 1947 to 237,000 in 2006 (Banerjee & Muley, 2010:9). The corresponding figure for the U.S. in 2006 was 104,200 (*ibid.*:31).

software, they were often described as "techno-coolies" with little control over their work or their work conditions (van der Veer, 2008).

Irrespective, by 2009, India became the largest ICT services exporter (Parthasarathy, 2010). This quantitative expansion in the new millennium was also accompanied by qualitative changes. The industry gained a greater share of revenues from product development and engineering services (Table 3), in areas such as embedded systems, thanks in part to deeper international ties.[20] These ties, mostly to the US, were increasingly facilitated by expatriate Indians, or "argonauts", who began to combine technologies from Silicon Valley, with engineering talent in India, to define new products and services, rather than seeking cheap labor to work on routine tasks for customers (Saxenian, 2006). At the other end of the skill spectrum, there was also a growth in business process outsourcing (BPO) which, by 2015-16, accounted for nearly a quarter of exports.

Table 3: Exports shares of components of India's ICT services exports

Year	Software Services	Product Development	Engineering Services (a)	BPO Services (b)	Total Exports (c)
2007-2008	67.2%	9.4%	3.2%	20.2%	34,841
2008-2009	64.0%	8.9%	4.1%	22.9%	36,636
2009-2010	60.7%	8.2%	7.6%	23.5%	38,753
2010-2011	68.8%	4.9%	4.7%	21.6%	47,600
2011-2012	66.8%	8.3%	3.9%	21.0%	51,800
2012-2013	66.3%	5.6%	5.0%	23.2%	62,600
2013-2014	68.0%	6.4%	5.4%	24.6%	71,300
2014-2015	67.8%	4.3%	6.2%	21.7%	82,000
2015-2016	67.0%	4.2%	5.6%	23.2%	88,000

Notes: (a) refers to embedded solutions; product design engineering (mechanical and electrical but excluding software); architectural and other technical services; and any other services
(b) refers to customer interaction services; finance and accounting, auditing, book-keeping and tax consulting services; human resource administration; legal services (including IP management); business and corporate research; medical transcription; content development, management and publishing; any other service
(c) In millions of US dollars. This figure is not the same as in Table 1 as the Reserve Bank of India (RBI) does not count income from subsidiaries abroad as exports (unlike NASSCOM and MeITy)
Source: RBI *Surveys on Computer Software and Information Technology Enabled Services Exports*, various years (https://rbi.org.in/scripts/Pr_DataRelease.aspx?SectionID=364&DateFilter=Year)

Horton et al (2017:1-2) argue that the growth of offshore ICT services to places like India best suited large firms, with a volume of work to justify the fixed costs in learning about overseas options, including contractors, terms and prices, and to reorient their business processes around the overseas work, whereas "digital platforms are also extending the use

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[20] Here again, the state helped firms with legal changes, important among which was the passage of the Semiconductor Integrated Circuits Layout-Design Act 2000, which provides for the registration and protection of integrated circuit layouts and designs for a 10-year period (Krishnadas, 2000). Further, while software patents are not permitted in India, the government issued an ordinance on 27 December 2004 to modify the Patent Act "to provide for patents when software has technical applications in industry in combination with hardware" i.e. embedded systems, effective 1 January 2005 (see http://pib.nic.in/newsite/erelcontent.aspx?relid=6074)

of global labor to many smaller start-ups, and overseas tech development has become the norm for many US and European entrepreneurs given the cost savings possible." This demand side argument is augmented by supply side arguments that India's experience as a provider of ICT services in general, and of BPO services in particular, "ultimately influence today's geographic diffusion of online gig work and can explain online gig work platform usage in parts of the global South." (Graham et al, 2017:3). However, such an argument, which relies on path-dependency, fails to explain why Indian labor was willing to move from BPO work to fragmented gig work, as part of an atomized workforce, rather than seek more skilled work in ICT services. The answer, we argue, lies in other institutional features of India's developmentalism.
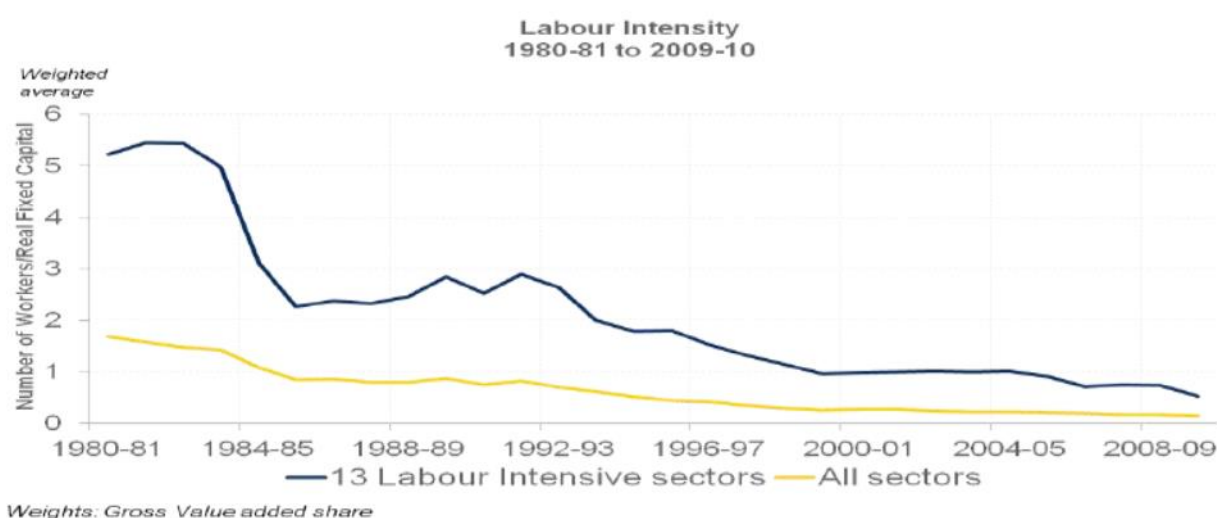
Figure 4: Decreasing labor intensity in India
Source: Sen & Das (2014:6)

Table 4: Annual percentage growth in employment, output shares, and in labor productivity (1984-2010)

Economic sector	Employment	Output	Productivity
Aggregate economy			3.7
Aggregate services	0.3	1.5	4.9
Registered manufacturing	-0.2	0.6	4.4
Unregistered manufacturing[21]			2.2

Source: Adapted from Amirapu & Subramanian (2015)

Despite the relatively rapid economic growth in recent years, employment opportunities have not grown quickly enough to meet demand because "India uses more capital-intensive techniques of production than countries at similar levels of development, and this has remained the case after two decades of economic reforms" (Sen & Das, 2014:2). Annual

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[21] The unregistered manufacturing sector covers all the manufacturing, processing, repair and maintenance services units employing less than 10 workers and using power, or less than 20 workers and not using power. (http://mospi.nic.in/sites/default/files/reports_and_publication/cso_national_accounts/chpeight_nad003.pdf) This unregistered sector is similar to the unorganized or the informal sector (see Footnote 22).

growth in employment in registered manufacturing between 1984 and 2010 has a negative sign, although productivity growth was higher than the national figure (Table 4). Data from fifty-two three-digit sectors of the National Industrial Classification, for the period 1980-81 to 2009-10, show that the labor intensity in organized manufacturing fell from 1.45 to 0.33, with the pace of decline being the highest for the most labor intensive sectors (see Figure 4; *ibid.*:6). As Table 4 shows, services not only experienced a growth in employment, but also experienced the biggest growth in productivity. But even the ICT services sector, whose revenues grew to US$139.9 billion in 2018, and is the largest private sector employer in the country, only employs about 3.9 million directly, and about 12 million indirectly (in services such as transport, real-estate, housekeeping, and security services) (NASSCOM, 2018).

Table 5: Informalization[22] in the Indian economy by major sectors (as share of employment)

2004-2005	Organized Sector		Unorganized Sector		Total
	Formal	**Informal**	**Formal**	**Informal**	
Agriculture	0.76	0.99	0	56.75	58.50
Manufacturing	1.21	2.10	0.1	8.83	11.73
Non-manufacturing	0.53	1.45	0	4.42	6.41
Services	4.48	1.89	0.19	16.80	23.36
Total	6.98	6.43	0.29	86.30	100.0
2011-2012					
Agriculture	0.06	0.16	0	48.69	48.90
Manufacturing	1.48	2.79	0.06	8.28	12.60
Non-manufacturing	0.69	3.77	0.01	7.18	11.65
Services	5.62	2.72	0.22	18.29	26.84
Total	7.84	9.43	0.29	82.43	100.00

Source: Srija & Shirke (2014:42)

A consequence of the growth characteristics of the Indian economy, which Amirapu & Subramanian (2015) describe as "pre-mature non-industrialization", is the high level of informalization (Table 5) and precarity in the employment contract. Another consequence, as the spoils of economic growth are shared only among a few, is growing inequality. Drawing on three rounds of All India Debt and Investment Survey Data, Anand & Thampi (2016:Table 8) show that, in 2012, 50% of wealth was concentrated in the top 5% (up from

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[22] India's National Commission for Enterprises in the Unorganized Sector (NCEUS, 2009:3) uses the terms "informal" and "unorganized" interchangeably. "The unorganized sector consists of all unincorporated private enterprises owned by individuals or households engaged in the sale and production of goods and services operated on a proprietary or partnership basis and with less than ten total workers." Unorganized workers refers to "those working in the unorganized sector or households, excluding regular workers with social security benefits provided by the employers, and the workers in the formal sector without any employment and social security benefits provided by the employers."

38% in 1991), while the share of the top 1% in the same period increased from 17% to 28%. This is despite inclusive development being the theme of the 11th (2007-2012) and the 12th Five-Year Plans (2012-2017) of the government (Planning Commission, 2008, 2013).

According to Sen & Das (2014) there are three reasons for the growth characteristics that have followed India's embrace of more outward-looking policies. First, as liberal imports since the 1990s led to a fall in the price of capital goods relative to the price of labor, firms increasingly substituted machines for labor. A second reason, which gives firms additional incentives to indulge in labor substitution, is regulation and the continued difficulty of doing business. A World Bank study of 190 countries gave India a rank of 100 in terms of the ease of doing business (Table 6). Although this data was limited to a survey in select cities in the different countries (in India it was Mumbai), it is indicative even if not definitive.

Table 6: Comparing ease of doing business in India (global position)

Aggregate rank	100
Starting a business	156
Dealing with construction permits	181
Registering property	154
Getting electricity	29
Getting credit	29
Paying taxes	119
Trading across borders	146
Enforcing contracts	164
Resolving insolvency	103
Protecting minority investors	8

Source: World Bank (2018)

Even the low ranking in the ease of doing business table does not capture how exiting a business is even more of a challenge, especially since the Industrial Disputes Act, 1947, makes it mandatory to obtain government permission before retrenching workers from any establishment with more than 100 workers. But permission to retrench is rarely granted. In 2018, the government proposed a Code on Industrial Relations Bill 2018, to allow factories with up to 300 workers to retrench and lay-off employees, or close, without the government's prior approval, and to increase the severance pay for retrenched workers from 15 days to 45 days' salary for each completed year. Faced with opposition from trade unions, the bill never became law. As an alternative, in 2018, the government introduced the category of 'Fixed Term Employment Workman' in the Industrial Employment (Standing Orders) Act, 1946, to give employers the flexibility to address the challenges of globalization and new work practices, while requiring that workers under the new category be treated no

differently from permanent workers in terms of the hours of work, wages, allowances and other benefits.

The third reason is the limited attention paid to education. Although a better educated society can potentially be a means of overcoming the challenges posed by growing informalisation and inequality, government expenditure on education in India is only 3.8% of GDP, compared to the world average of 4.8% (UNDP, 2018). What is spent may also not be earning the best returns. According to a World Bank (2018) report, in rural India, nearly three-quarters of the students in Grade 3 could not solve a two-digit subtraction and, by Grade 5, half could still not do so. Moreover, half of the children in Grade 8 were unable to solve a Grade 4 division problem, and one out of four children left the grade without basic reading skills (ASER, 2018).

School children are not alone in going through a system that does not educate them well-enough for the labor market. Despite the large numbers of engineering graduates, there is dissatisfaction in the industry with the quality of manpower (Kapur, 2010; Varshney, 2006). According to a 2016 report by the independent education assessment company Aspiring Minds, only 18% of graduating engineers in India were employable in engineering roles by the ICT industry.[23] In 2015, the All India Council for Technical Education (AICTE), the regulatory authority for technical education, announced a reduction of undergraduate engineering seats by 40% following concerns about the dismal quality of education across the country. Varshney (2006) suggests that the poor quality of private engineering education in India is a result of market failure, due to informational asymmetry between institutions and students. He argues that the presumptively higher costs have pushed high quality engineering education out of the market to allow "lemons" (Akerlof, 1970), or low quality education, to dominate.

Engineering education is but emblematic of an education system that has emphasized quantity over quality. As a result, Altbach's (1993:4) description a quarter century ago, still rings familiar:

> "Indian higher education seems like an enigma wrapped in a contradiction. Pockets of excellent teaching and research are surrounded by a sea of substandard colleges. The best graduates compete successfully in the world job market, but unemployment at home is the reality for many. Scholarship is often superseded by politics and, in many institutions, crisis is the norm. A system which was at one time highly selective has opened its doors to large numbers, yet at the same time there is conflict and sometimes violence over what remains a scarce commodity."

With inadequate education, and a regulatory system in a domestic economy that is unable to generate employment opportunities, turning to digital gig work in the global economy seems a rational individual decision despite the fears of alienation and de-skilling. Indeed,

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[23] This was calculated "….according to the current hiring philosophy of IT Services companies, where the candidate is not expected to already possess the required software skills or soft skills, but is imparted training over a period of 3 to 6 months. The hiring criterion for this industry, thus, is that the candidate should be trainable in technical and soft skills. This requires both a basic command of language and technical skills, together with requisite cognitive skills to respond to training in a short period of time...currently 17.91% of the graduates are trainable into software engineers within a period of 3 to 6 months." Aspiring Minds (2016:11).

even the discussion paper presenting the National Strategy for Artificial Intelligence envisions digital gig work as a means to provide employment by relying on labor cost arbitrage to serve countries worldwide through relatively low-skilled jobs such as data annotation, image classification, or speech recognition.

5. Policy Options for the Developmental State

It is not only in the Indian context that the inability to generate sufficient employment opportunities has led to recourse to digital gig work. To deal with the issue of unemployment, many countries such as Nigeria, Malaysia and Kenya, have launched digital platforms to connect the un(der)employed with jobs in different countries. For instance, the Nigerian government, in partnership with the World Bank, launched The Microwork for Jobs - Naijacloud initiative in all its 36 states in March 2013 to help increase awareness among young Nigerians about virtualized job opportunities. In 2015, the Malaysian government launched e-Rezeki, a programme which enables citizens, especially low-income groups, to generate additional income by doing digital assignments via online crowdsourcing platforms. E-Rezeki facilitates non-location-based assignments classified as either 'digital works', which require specific skills and a longer time to accomplish a task, or 'digital micro tasks' which do not require specific skills and can be completed within minutes. Malaysia has partnered the US crowdsourcing platform Massolutions (a managed portal for online outsourcing work) so that the work process is controlled by the government (Malik et al, 2018). Similarly, in 2016, Kenyan launched Ajira Digital as an online platform to enable access to digital gig work and to build wealth and grow the "middle class of the country".

The primary goal of the initiatives described so far is to match demand from the crowdsourcing industry with the supply of services from citizens. Although a few programs also offer training, and the Malaysian case affords the state a degree of control over the work process, merely connecting citizens to global labor markets, to address the immediate pressures of unemployment, can come at a cost. It risks going down – borrowing from Segenberger & Pyke (1991) – the "low-road" to development. Taking the "high-road" requires a development agenda which articulates a mechanism to move from microtasks requiring minimal skills, to undertaking more skilled, remunerative, tasks. The move must give workers a greater say, if not control, over employment conditions, and improve aggregate productivity. The rest of this section will explore how the developmental state can seize the employment opportunities that become available with changing technologies even while addressing emergent concerns.

5.1 Jurisdictional Control over Platforms
As the Indian case showed, it is the difficulty of doing business and the difficulty of finding employment in the formal sector that nudges many to seek precarious gig work. But since the transnational nature of those interacting on the platform challenges the state's jurisdiction, encouraging local "platform entrepreneurs" within national regulatory boundaries is an option. Promoting local platforms could potentially permit greater state action to address concerns about the algorithmic control over task assignment and evaluation, and its impact on the employment relationship. There are different approaches to consider to make gig work more transparent and reduce algorithmic opacity. One means of overcoming intentional opacity, is requiring open-source code or, in case of proprietary

concerns, making it available for regulatory scrutiny when necessary. Akin to the suggestions by Pasquale (2017) in the context of robotics, it can be argued that it should be made mandatory for the original creator of the code to build in constraints in the code's evolution that enable recording influences, thus ensuring that a person or entity is accountable for actions.

Wachter et al (2018) suggest the pursuit of the "right to explanation" with "counterfactual explanations" to help those who may not have the technical literacy that the understanding of code demands, and to help overcome the opacity resulting from the complexity that results when algorithms operate at the scale of applications and their data. Counterfactual explanations essentially take an algorithm and show what the outcome would have been for workers with different attributes, without making too many demands on the intellectual property of the designers of the algorithm. It can help workers understand the rationale for outcomes, whether they are fair, and what changes are required for more preferred outcomes in the future.

Locally-run platforms can play a particularly important role in generating local employment by catering to local tasks (for example, tasks in the local language), without necessarily being closed to workers in other countries. To encourage the growth of such platforms, the state could initially provide incentives, such as infrastructure in the form of inexpensive and reliable access to the internet (as India did for the STPs), and limited tax exemptions on profits. Once work regulations for socially acceptable conditions are in place, drawing more workers into digital gig work will ensure stable working conditions for them.

5.2 Platforms as Public Goods

Besides local entrepreneurs, the state could also put out its work on the local platforms or on platforms launched by itself, as a public good, to generate demand for digital gig work for developmental ends. As Tendler (1997) argues, the role and influence of public procurement in building local economic capability in the global South is neither adequately acknowledged nor understood. One such initiative that is underway, is the [Digitize India Platform](#) (DIP) as part of the Digital India Program. Launched in 2015, the DIP aims to enhance digital public service delivery to citizens, by creating archives of searchable digitized documents from the vast repository of data in different formats, media, and languages, which reside with public organizations. To make it possible to search for specific documents, specific data within a document, and to extract data from documents for processing, a template with the key data fields is created to facilitate transcription. Every field is then separately captured as an image and distributed randomly by the system to two transcribers who enter the data seen in the image. If there is a mismatch between the two transcriptions, the image is sent to a third transcriber. Two matching transcriptions are then stored in the database.

On the DIP, tasks can be offered by ministries and departments of the central and state government of India, any other agency or organization of the government such as public sector enterprises, and international organizations that belong to the United Nations. Individuals can sign up on the government platform as 'digital volunteers'. After an initial assessment of language proficiency and data entry skills, the volunteers need to enter the data as seen in an image given to them. They earn reward points for their approved work which is converted to monetary payments that are transferred to their bank accounts.

Although work on the DIP is only open to Indian citizens, the provision for peer review, the award of points for choice of tasks which can be shared on social media, and the milestone-based rewards represent an attempt by the state for control over the work process that makes it more transparent.

5.3 Education and Skills Training

As mentioned in Section 2, those engaging in digital gig work are relatively well educated, although there is little relationship between education level and tasks performed. When workers with relatively high levels of education are forced to turn to routine tasks such as categorization and content access, the resulting underutilization, and possible de-skilling, of the workforce raises opportunity costs for development. To utilize an educated workforce, demand for relevant skills is one aspect, for which local platforms can play a useful role. But, as the Indian case shows, the quality of education and the type of skills are crucial. When quality suffers, and workers have credentials that do not equip them with skills, 'educated' workers turn to routine tasks. Similarly, training people with skills that are easily taught or duplicated will only increase supply over demand and decrease the bargaining power of workers.

By playing an active role in shaping the education system, the state can help build comparative advantage. With regard to the quality of education, the improvements will likely ensure that even if workers start off taking on low-wage, low-skill jobs, there is a possibility for them to move to jobs that demand better skills and are more lucrative and, as a consequence, offer better bargaining power over the conditions of employment. Such a movement increases the likelihood of establishing and sustaining platforms such as the Bangalore-based Vedantu which offers online tutoring services to students, primarily for science subjects for school-leaving examinations in India. However, its one-to-one tutoring means it enrolls more than 40,000 students, across more than 1,000 cities from more than 30 countries. Tutoring on a platform like Vedantu represents the kind of opportunity that digital labor can offer workers with skills.

While a platform such as Vedantu can potentially be opened anywhere, the state also can help provide people with special skills which are unique to a country. For instance, the demand for tutoring in both the Carnatic and Hindustani systems of Indian classical music, especially among the diaspora, has led to the emergence of platforms such as the Shankar Mahadevan Academy that brings together students and music teachers. Although Indian classical music may be a niche, the argument here is precisely because it is a skilled niche, it gives India a comparative advantage.

What the examples of Vedantu or the Shankar Mahadevan Academy represent is a possible movement within the international division of labor, potentially from the ranks of the precariat to the proficians. Of course, to the extent that the state is unaware of the shifting global demand conditions for skills, amidst new technological possibilities, it must be embedded in the entrepreneurial "platform class" it encourages i.e., the kind of interaction between the state and NASSCOM that led to the sector-specific policies which enabled the growth and transformation experienced by the Indian ICT services industry since the mid-1980s.

6. Summary

To examine how states can establish and pursue a developmental agenda in the gig economy and the age of platform capitalism, the paper progresses by unraveling the different facets of the issue. It began by surveying the empirical terrain of task-based work that is delivered digitally. To its cheerleaders, digital gig work is revolutionizing labor markets by making them more flexible, and offering developmental possibilities by helping overcome widespread un(der)employment, especially among underprivileged populations of the world. But skeptics counter that platforms can generate network externalities to display monopolistic tendencies. There is also social concern, prominent amongst which is the opacity of algorithmic management that workers are subject to. Other concerns encompass employment conditions which include, but are not limited to, low wages and limited social security benefits; the possibility of low wages becoming even lower as labor supply exceeds demand, leading to a possible "race to the bottom"; and the likelihood of de-skilling as a seemingly inexhaustible "reserve army of labor" in the global South undertakes fragments of tasks with little idea of the whole that they may be contributing to. Notwithstanding such concerns, and even some reservations about employment conditions among workers, they want more digital gig work, rather than less, a reflection that their primary concern is finding some form of paid employment.

Against the backdrop of the characteristics of, and the concerns with, digital gig work, and the preference for more such work among gig workers, the question becomes: is addressing the concerns raised by gig work, and ensuring more work, a case of wanting to have the cake and eating it too? History suggests not as no systematic relationships have been established in the long debate on the relationship between technological change, employment and skills. Rather, the relationship is mediated by the institutional environment and, in countries playing technological catch-up and attempting late-industrialization, the developmental state is crucial. Such a state mediates between the global and the local economies, in partnership with social actors such as private capital, to improve productivity and standards of living. Prominent examples of successful developmental states in the late 20th century are the four East Asian tigers.

The successes in East Asia, however, were not only the exception in the post-World War II era, but they also drew on manufacturing prowess. It thus raises the next question: to what extent can lessons from East Asia offer a guide for developmentalism for the 21st century digital gig economy? It is here that the Indian case provides a guide because it is *not* an exemplar like its East Asian counterparts. The Indian state, instead is like most others – what Evans (1995) refers to as an intermediate state. As a result, from the mid-1980s, India abandoned its autarkic ISI policies and chose to gradually embrace the global economy. As this decision coincided with the increasing globalization of the ICT services industry, the resulting opportunities were seized upon by sector-specific promotional policies that the government laid down with inputs from the industry. As a result, India became the largest exporter of ICT services.

If becoming the largest exporter of ICT services was an achievement that helped some of its citizens, being home to the largest number of digital gig workers, with relatively high levels of education, points to the limits of development unleashed by the intermediate state.

Despite policy changes, most of the labor force in the country works in the informal sector, especially as more liberal access to capital goods and rigid labor regulation have discouraged hiring in the formal sector. Reinforcing this phenomenon is an education system that emphasizes quantity over quality, thus raising doubts about the employability of those with credentials.

This raises the final question: to what extent does the Indian experience qualify as a developmental success and what lessons does it offer? Whether the Indian experience is a developmental success depends on how digital gig work is viewed. If it is narrowly seen as a means to overcoming un(der)employment, then the connections to the global platforms become an end in themselves, such as in Kenya and in Nigeria. An alternative approach is to view digital technologies not as a magic wand to the multi-dimensional challenge of development, but as offering a spectrum of employment possibilities with different skill requirements and employment conditions, just as the East Asian tigers did with manufacturing. Similarly, even if a high proportion of the graduates from India's education system do not have the skills which are good enough for the formal ICT services industry, half the digital gig labor force undertakes some kind of software and technology work. This paper argues that such an approach raises the possibilities for state-society action to enable employment while addressing the concerns that digital gig work raises.

This paper discusses three policy actions which must ideally be undertaken in parallel. First, encouraging entrepreneurial initiatives to establish local platforms within the jurisdiction of the state will not only widen the range of employment opportunities, it will also enable greater regulatory scrutiny of algorithmic management and employment conditions. The second is for the state to directly establish platforms as public goods to encourage digitization of its own activities and data, and to act as a means of encouraging greater private sector activity. Whether in the private sector or in the public sector, establishing local platforms that are open to all nationalities, will ensure that a country moves from merely serving global platforms to becoming a global center for platforms. Third, improving the quality and content of education will give workers seeking digital gig work, especially low-skill, low-paying work, an opportunity to move to higher-skill, better-paying work, in the international division of labor with greater control over employment conditions. It is essential that education impart unique domain knowledge which, when offered over the infrastructure provided by digital technologies, becomes the basis for sustained and dynamic comparative advantage.

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