

Work, Interrupted

The New Labor Economics
of Platforms



Prepared by

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in partnership with



Institute for the Future

The Institute for the Future (ITF) is an independent, nonprofit strategic research group with more than 40 years of forecasting experience. The core of our work is identifying emerging trends and discontinuities that will transform global society and the global marketplace. We provide our members with insights into business strategy, design process, innovation, and social dilemmas. Our research spans a broad territory of deeply transformative trends, from health and health care to technology, the workplace, and human identity. The Institute for the Future is located in Palo Alto, California.

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The Basic Concept of “Work” Has Recently Come Into Question

This report is intended to highlight the issues raised by our transition to more networked work models from a worker-centric perspective—in short, the new labor economics of digital platforms.

From its founding in 1968 to the present, Institute for the Future (IFF) has been on track to anticipate the changing nature of work—and to create truly workable futures. Starting with early experiments in computer-based communication on the ARPANET through the emergence of so-called groupware for work teams to the more recent IFTF Workable Futures Initiative to define future work skills for on-demand work, IFTF has sought to prepare the public for the coming phase shift in the way we work.

Digitally connected work platforms are a critical element of this phase shift, and our new report, *Work, Interrupted: The New Labor Economics of Platforms*, explores these platforms from multiple points of view. Undertaken with support from the Ford Foundation, the study includes: the historical arc that has brought us to where we are today, the technology shifts driving new ways of working, the challenges that today’s systems present to traditional thinking about labor economics, and the possible pathways toward positive platforms for digitally connected livelihoods that work for everybody.

The shift toward platform-driven work offers both opportunities and challenges for creating more workable futures (as shown in the framework that follows). Platform work is neither inherently good nor bad. It has both potential for upsides to be amplified and downsides to be mitigated.

For example, forecasts suggest that by 2025 upward of 540,000,000 people could benefit from online platforms. Our analysis finds that platforms can provide workers access to jobs more quickly, ultimately reducing the duration of unemployment. Job seekers may utilize platforms to gain extra income

while they are searching for traditional jobs. In addition, platforms offer more flexible work arrangements than a traditional job, which could potentially provide greater inclusion of people with disabilities.

At the same time, unstable work schedules and job instability are critical concerns for many platform workers. A survey conducted by Intuit found that more than half of respondents felt that they were not receiving enough work on platforms and over 20 percent cited lack of job security as a detriment. Furthermore, workers on platforms may earn less than comparably-skilled traditional workers and may even be subject to new kinds of discrimination.

This is a critical moment. If deployed wisely, online platforms not only have the ability to benefit both clients and providers, they also show immense potential to better address issues like underemployment and skill development. However, we believe that in order for online platforms to begin to reach their potential, the challenges need to be recognized and rectified as well.

It is a worthy challenge—one that we are excited to have had the opportunity to explore in this report.

In this report, we first give an outline of the recent high-level conversations where the future of work has come under scrutiny before diving into the empirical evidence for where we are today. We then bring in relevant technology trends and put forward the argument that networking work is inevitable for the simple reason that networking just about everything is inevitable. From there, we dive deeper into the new mechanics of platforms themselves. We explore the kinds of design mechanisms that digital



platforms open up, along with the opportunities, challenges, and economic anomalies that they create. Finally, we argue that if designed intelligently, platforms have the potential to solve a number of the chronic dysfunctions found in industrial economies.

Hollow Recovery Meets the Rise of the Robots

We have always found it to be critical to look backward to see forward, and this issue is no exception. Indeed, much of the current conversation around work has been shaped in just the last few years. The hollow recovery in the aftermath of the 2008/2009 recession gave rise to a heated and wide-ranging conversation on the changing world of work and the idea that many of the opportunities that provided economic and social stability in the 20th century have forever lost their footing. At the heart of this discussion is the effect of technology on the economy—the labor market in particular—as machines are increasingly taking over human cognitive tasks. A 2013 study by researchers at Oxford University posited that as many as 47 percent of all jobs in the United States are at risk of “computerization.”¹ More recently, the World Economic Forum’s 2016 report, *The Future of Jobs*, estimates that five million jobs will be lost to automation by 2020 and that the number will keep growing.²

At the same time, there has been growing attention to the issue of economic inequality, alongside growing concerns over an increasingly polarized society. Though described variously as comprised of winners/losers, digital haves/have nots, and high-skill achievers/low-skill survivors, attentions converge around the point that both white- and blue-collar jobs are disappearing and the middle of the American economy is being steadily carved out.³

These concerns are not without significant precedent. British economist John Maynard Keynes coined the term “technological unemployment” in the 1930s to describe the displacement of workers by labor-saving machines and the dawn of a new era of greater leisure. In the 1990s, economists Sherwin Rosen and Robert Frank predicted that globalization and

technology could create “superstar” or “winner take all” labor markets.⁴ In his 1995 book, *The End of Work*, Jeremy Rifkin warned of a new phase of history—one characterized by the steady and inevitable decline of jobs in the face of a high-tech revolution. Sophisticated computers, robotics, telecommunications, and other technologies will replace humans in most every sector, from manufacturing, retail, and financial services, to transportation, agriculture, and government. The future of work, Rifkin argued, is polarized between an information elite and growing numbers of permanently displaced workers, who have few prospects in an increasingly automated world.

The tone of the current discussion has become more urgent as commentators see that the impact of this transformation is neither small nor short-lived. However, it has also become more hopeful, as more people join the new world of work and advocate for policies and protections that safeguard incomes as well as social meaning in this time of disruption. Increasingly, issues like inequality, persistent underemployment, and unevenly distributed access to opportunities are viewed as the outcome of poor choices, and as such the pathway toward otherwise catastrophic ends can be avoided through better design.

As the post-recession economy was beginning to stabilize, economist Tyler Cowen described a world cleaved in two by technology. In his 2013 book, *Average is Over*, Cowen predicts a country where success is largely confined to a small cadre of high achievers while everyone else slumps into a realm of lower expectations and diminished opportunities. “He says: We will move from a society based on the pretense that everyone is given an okay standard of living to a society in which people are expected to fend for themselves much more than they do now.” In his telling, successful laborers will be those who can best adapt to a machine-driven world, offering skills that are complementary to technology. Cowen is but one voice among many on this subject. Notably, economists Robert Gordon of Northwestern University, Michael Spence of New York University, and former Treasury secretary Lawrence Summers have also described the economic havoc of inequality, stagnation, and polarization.



Among the most influential on the subject are MIT professors Erik Brynjolfsson and Andy McAfee, who offer a slightly more optimistic hypothesis—namely that the global economy is on the brink of a period of dramatic growth driven by smart machines and new opportunities for human work. In their 2014 book, *The Second Machine Age* (largely a reprise of their 2012 ebook *Race Against the Machine*), Brynjolfsson and McAfee are staunchly against the position that smart machines will reduce human labor to irrelevance, and offer instead the view that technology's bounty will lead to new kinds of work. In turn, they argue that new skills will be valued: in place of performing repetitive physical or transactional tasks, humans will have opportunities to use their creativity, empathy, and problem-solving skills. While they don't foresee an easy transition, they advocate for creating a glidepath in the form of altered educational systems that move away from the industrial-era emphasis on math and reading to a broader set of interpersonal and intellectual skills that allow humans to work gracefully alongside machines.

That said, Brynjolfsson and McAfee hardly dismiss the threat of technological unemployment and provide a classification of three overlapping winners and losers that technical change creates: 1) high-skilled vs. low-skilled workers; 2)

superstars vs. everyone else; and 3) capital vs. labor. They maintain that the winners in one category are more likely to be winners in the other two as well, which concentrates the effects of



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skill-biased technical change, increasing the demand for high-skill labor while reducing or eliminating the demand for low-skill labor.

They—and others⁵—argue that this radical reshaping of work calls for new policies to protect the vulnerable while distributing the gains of the new age. They caution: “The wrong interventions will hurt the economic prospects of millions of people around the world and leave them losing a race against the machines, while the right ones will give them the best chance of keeping up as technology speeds forward.”⁶

Richard Susskind and Daniel Susskind similarly predict a world in which conventional professional categories will soon become obsolete. Their 2016 book, *The Future of the Profession*, envisions an unambiguous decline in demand for traditional employment categories and the conventional professional worker. But, they argue, new and emerging roles will offer the potential to provide good work, drawing especially on skills like creativity and craftsmanship, advanced reasoning, and empathy.⁷

Running parallel to the work of Brynjolfsson and McAfee, futurist Martin Ford argues against the idea that technology will displace old jobs while creating new opportunities. He argues instead that technology now threatens jobs for even the

most educated and highly skilled, and tasks that would seem to require distinctively human capacities for nuance or feeling are increasingly assigned to algorithms. Looking to companies



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like YouTube and Instagram, which have “tiny workforces and huge valuations and revenues,” he says new jobs will “rarely, if ever, be highly labor-intensive.”⁸ In a recent article he further elaborated: “The innovations of the future—regardless of how dramatic and broad-based they may be—are very unlikely to create that number of jobs, and the jobs they do create may well require skills and education beyond the capability of the average worker.”⁹ Ford argues instead for broader changes to economic policy, such as a guaranteed minimum income—a position that many have come to advocate for^{10,11}—that could help translate innovation into prosperity for all. Ford’s hopeful regard for policy levers is not shared by all, however. Academic-entrepreneur Vivek Wadhwa, for instance, does not believe that government can do as it did in the industrial age in terms of creating general employment opportunities. According to Wadhwa “They can barely keep up with the advances that are happening in technology, let alone develop economic policies for employment.” He argues that as waged opportunities dry up and technology causes the price of goods to decrease, the goal of full employment may be out of tune with reality: “we may not need the entire population to be working. There is surely a possibility for social unrest because of this; but we could also create the utopian future we have long dreamed of, with a large part of humanity focused on creativity and enlightenment.”¹² Wadhwa is far from alone in imaging the utopian dimensions of the future labor market. After all, robots could mean an end to drudgery—the freedom to engage in more creative, emotional, or meaningful pursuits. A small body of writers and scholars including Peter Frase and Benjamin Hunnicutt—dubbed “post-workists”—welcome the end of labor as

we know it and the shift away from work for work’s sake. Others, however, including Brynjolfsson and McAfee, caution against the embrace of a workless future, stressing the important if less-tangible benefits of employment, such as personal meaning and value.¹³

A number of theorists have also noted how the future of work is tied to the changing geography of opportunity and economic activity in the US and increasing regional specialization.¹⁴ According to Richard Florida, “The economic landscape is being reshaped around two kinds of hubs—centers of knowledge and ideas, and clusters of energy production.”¹⁵ Outside these metro areas, he says, the economy remains weak and prospects are few. While these hubs are dynamic centers of job creation and innovation, they also have the effect of concentrating wealth and opportunity. Florida argues “As these clusters of highly educated people form and grow, they tend to push out the middle class, resulting in a ruthless sorting of people and places. As great as its potential may be, this new economic landscape is also notable for its widening fissures.”

The Platform Economy

For many Americans, employment no longer follows the conventions that defined the better part of the 20th century: waged employment at a firm offering a salary and benefits in exchange for fixed tasks. Instead, recent years have seen growing numbers participating in what is variously described as the “gig,” “1099,” “on-demand,” or platform-based economy. By 2020, more than 40 percent of the US workforce will be so-called contingent workers, according to a study conducted by software company Intuit in 2010. That’s more than 60 million people. A number of freelance marketplaces have emerged in recent years, including UpWork, Guru, and HourlyNerd, which match high-skill service professionals specializing in writing, design, accounting, law, business, and code—among other skills—with businesses of all sizes on a per-project basis. These platforms stand to benefit both clients and providers—



offering the former with access to resources not housed internally, and the latter a source of primary or supplementary income. In 2013, on Elance and Odesk, which have since merged as Upwork, there were 2 million businesses seeking services across 2,500 skills and eight million registered freelancers, who in 2013 completed \$750 million in work projects. The merged platform expects to have \$930 million in annual freelancer billings this year. A quarter of its eight million freelancers are based in the US. Their annual earnings come to \$179.8 million a year, or 19 percent of the worldwide total. According to 2015 research from the Freelancers Union, fully one-third of working Americans have freelanced in the past year.¹⁶ A recent survey from the Center for Global Enterprise indicates that platform companies have a total market value of \$4.3 trillion and an employment base of at least 1.3 million direct employees—and millions of others indirectly employed.¹⁷

The expansion of platform-mediated work has prompted a growing discussion around the implications for the economy, labor, and policy—and elicited polarized reactions. Academies Martin Kenney and John Zysman have argued that the labels used to describe this phenomenon matter because they “influence how we study, use, and regulate these digital platforms.” Some tout the new freedoms and flexibility afforded workers, along with new opportunities to capture otherwise-unused human capital. Some even argue that in place of clear economic benefit, platform-based work can provide non-economic rewards, such as increased autonomy and entrepreneurial activity. McKinsey, for instance, takes an optimistic view: their 2015 report makes the case that labor platforms can draw inactive labor into the workforce, boost productivity, and raise GDP.¹⁸ Others lament the decline of traditional labor-employer obligations and the collapse of safety nets, and see the spread of platform-based work as a symptom of the growing precariat—and a global race to the bottom of labor standards.¹⁹ The National Employment Law Project, for instance, maintains that the technology used by these companies and others holds



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enormous potential to benefit both businesses and workers, but that maintaining labor standards is necessary to ensure that workers don't shoulder an undue burden of risk.²⁰

These significant shifts in the nature of employment have prompted efforts to rethink the way workers are classified. Regulatory controversy has arisen, with a storm of interest around platforms' classification of workers in ways that adversely affect wages and benefits.²¹ Krueger and Seth Harris, a former deputy secretary of labor, have proposed the creation of a new “independent worker” designation.²² These workers would not be eligible for overtime pay or unemployment insurance, but they would have the right to organize, and their employers—whether online or offline—would withhold taxes and make payroll tax contributions.

The “platformization” of the economy has sparked not only a discussion around labor, but around the differentiation of platforms themselves.^{23,24,25} Kenney and Zysman suggest that a unifying feature is that the advantage of platform-based companies often “rests on an arbitrage between the practices adopted by platform firms and the rules by which established companies operate, which are intended to protect customers, communities, workers, and markets.”²⁶ While acknowledging the growing economic significance of platforms, they admit to more questions than answers with regards to the immediate and long-term effects of labor platformization. Kenney and Zysman asks: “Will the platform economy, and the reorganization it portends, catalyze economic growth and a surge in productivity driven by a new generation of entrepreneurs? Or will the algorithmically driven reorganization concentrate substantially all of the gains in the hands of those who build the platforms? Will it spark a wave of entrepreneurial possibilities, unleash unimagined creativity, free workers from oppressive work schedules, or



unleash an avalanche of dispossessed workers who are trying to make a living with gigs and temporary contracts? If we do not interrogate these technological trajectories, we risk becoming unwitting victims of their outcomes.”²⁷

A host of commentators have placed emphasis on the idea that the problems currently surrounding labor insecurity are not inherent to technology, but rather result from poor design and management decisions. As a result, it is possible to correct course through design interventions. Tim O’Reilly, has said, for example: “Technology is destroying jobs, but only because we have told it to do so. We have told it that people are a cost. We have told it that people should be eliminated from the system. There are a set of choices, and we have actually built incentives into our economy to encourage those choices.”²⁸ In its place, he argues, technology can be used to augment human labor, allowing people to do what was previously not possible. O’leilly argues “We have to stop worrying about ‘jobs’ and start focusing on how to use the current generation of technology to enable people to do things that were unthinkable in the 20th century.”²⁹

SKILLS

With the changing shape of the labor market has come increasing attention to the question of skills, namely what capacities workers will need to be successful in the coming marketplace. In the face of rapid automation, even those educated at elite higher educational institutions have floundered, seen as lacking the capacities needed to land or keep a good job. Accompanying this is a widespread concern over the nation’s “skills gap”—namely in mid-level skills³⁰—an idea premised on the potential mismatch between the unemployed/ underemployed and unfilled private sector roles. However, assertions of a skills gap have aroused considerable debate, both over how to best address it and whether it even exists in the first place. Some say that the data used in support of a skills gap lacks credibility and as a result,

pundits and policymakers are perpetuating a myth that frequently places added burdens on workers themselves.³¹ *New York Times* columnist Paul Krugman argues, for instance, that the skills gap is a complete “myth” that diverts attention away from the real issues of job growth and unemployment. He notes, “The crucial point is that unemployment remains much higher among workers at all education levels than it was before the financial crisis... If employers are really crying out for certain skills, they should be willing to offer higher wages to attract workers with those skills.”³²

Wharton professor and author of *Why Good People Can’t Get Jobs* Peter Cappelli has similarly mused: “The first thing that makes me wonder about the supposed ‘skill gap’ is that, when pressed for more evidence, roughly 10 percent of employers admit that the problem is really that the candidates they want won’t accept the



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positions at the wage level being offered. That’s not a skill shortage, it’s simply being unwilling to pay the going price.”³³

With regards to skills, Tyler Cowen argues that traditional higher education will only be of benefit to a small number of individuals, and for the greater population cheaper and more rapid models will make more sense. In his view, motivation outweighs traditional means of success: the “slacker twenty-two-year-old with a BA in English, even from a good school” will no longer have a “clear path to the upper middle class.” He maintains that the woes of millennials, who are struggling to find their way in the labor market, are “a harbinger of the new world of work to come ... lacking the right training means being shut out of opportunities like never before.”



New Protections for New Work

The general shift toward automation and platform-based work has also prompted a heated discussion around how to protect workers in this rapidly changing and largely unknown environment. A deep ambivalence underscores discussions of how technological advancement affects the lives and livelihoods of average workers. While some extol the benefits of increased flexibility, mobility, and collaboration, others argue that this shift represents an incursion against hard-won rights and that the language of heightened self-reliance and autonomy is code for vulnerability.

More recently, these criticisms have seeded interest in creating protections for digital laborers. Trebor Scholz, assistant professor at The New School in NYC asks what the possibilities for labor solidarity are in the digital age, and maintains that analyses of labor platforms often focus on business growth and regulatory issues at the expense of workers'



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experiences. Hestates that, “In Silicon Valley and the halls of business schools all over the country, discussions about these market incumbents focus on their revenue streams and resistance against regulation but the workers who wake up to go to work online every day are a blind spot in these discussions.”³⁴ Scholz makes the case, however, that precariousness is not an inevitable outcome of labor in the new economy and that platform cooperatives could provide needed securities. He argues, “Worker-owned cooperatives could design their own apps-based platforms, fostering truly peer-to-peer ways of providing services and things, and speak truth to the new platform capitalists.”³⁵





Platform opportunities **to be amplified**

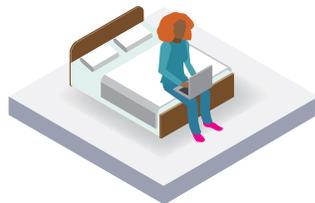
Employment Creation & Access

According to McKinsey, up to **540,000,000** people could benefit from online talent platforms by 2025 and as many as **230,000,000** could find new jobs more quickly, reducing the duration of unemployment.³⁶



Flexible Hours

In 2005, **82%** of independent contractors reported that they preferred their more flexible work arrangement to a traditional job, and only **9%** reported that they would prefer a traditional work arrangement.³⁷



Greater Inclusion of People with Disabilities

Many platforms support telework arrangements that may have the potential to improve the working conditions of people with disabilities and can offer work opportunities for people who have chronic diseases and who are unable to leave their houses.³⁸



Reduced Environmental Impact

One car-sharing vehicle (e.g., Lyft) has the potential to replace **9 to 13 individual vehicles**.³⁹



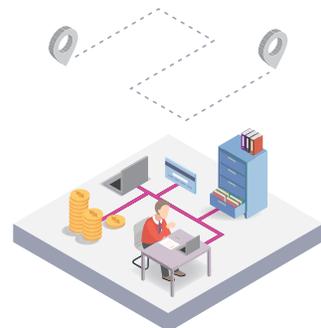
Extra Income During Traditional Job Searches

Part-time workers and independent contractors report an appreciation for the flexibility that such work offers; this type of work is particularly helpful for those seeking income during an extended job search.⁴⁰



Formalizing Informal Labor

“One way of looking at the recent exponential growth of online platforms in service delivery is to see it as a formalization of the informal economy, with the transparency of an open market replacing the old word-of-mouth methods of finding work, and the replacement of unrecorded cash-in-hand payments by trackable online payments, opening up at least the possibility for taxes to be collected and fairness to prevail.”⁴¹



Platform challenges to be mitigated



Unstable Work Schedule

An Intuit survey of platform workers found that **57%** felt they were not getting enough work; **22%** cited lack of job security as a detriment.⁴²



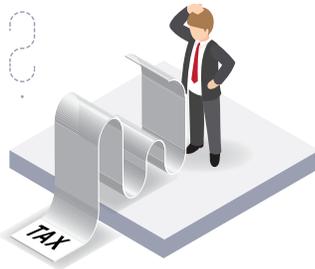
Lack of Interaction With Co-workers

Studies that show increased social contact with co-workers gives workers a boost in both mood and productivity.⁴⁵



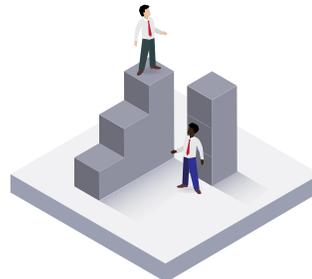
Confusion Around Tax Issues

Twenty percent of workers cited confusion about tax classification as a deterrent to gig work.⁴³



New Discrimination Issues

Using a new data set combining pictures of all New York City landlords on Airbnb with their rental prices and information about quality of the rentals, one study found that non-black hosts are able to charge approximately **12% more** than black hosts for an equivalent rental.⁴⁶



Reduced Access to Benefits

“As involuntarily self-employed people are often in an economically precarious situation, they frequently have a limited ability to pay for insurance. In addition, low-earning self-employed people who choose to insure themselves against risks often face a disproportionately large financial burden when doing so, as insurance contributions do not vary according to income but are instead a fixed amount. As a result, freelancers, and especially those with low incomes, may decide not to acquire insurance against social risks as a result of financial restraints, leading to serious problems if a social risk—such as illness, a shortage of orders, similar event—occurs.”⁴⁴



Earning Less Than Comparably-skilled Traditional Workers

Uber’s driver-partners are highly educated. Nearly half of Uber’s driver-partners have a college degree or higher, considerably higher than the corresponding percentage for taxi drivers and chauffeurs (**18%**), and above that for the workforce as a whole as well (**41%**).⁴⁷





The Data for Work Platforms Today is Ambiguous

Scale and Taxonomies of Labor Platforms

The size of this platform-based workforce remains a significant question of growing interest, due in no small part to the difficulty in classifying laborers in alternative work arrangements. In 1995, the Bureau of Labor Statistics (BLS) first published the Contingent Work Survey (CWS), which analyzed “contingent work” and “alternative employment arrangements” for the first time. The agency periodically released its analysis of this economic sector until 2005, when the agency lost funding to do so. However, the BLS has announced that it will work with the Census Bureau to reissue the supplement every two years, starting in 2017.⁴⁸

Economists Lawrence Katz and Alan Krueger, research associates at the National Bureau of Economic Research, are working to fill the current void with a 2016 paper, and include in their work a new labor category of “workers using an online intermediary.”⁴⁹ While the “Uberization” of the economy is actually quite small when compared to traditional contingent work and alternative employment, Katz and Krueger note that online intermediaries are growing at a significant rate.

A central complicating factor is that research suggests most contingent workers who turn to digital intermediaries draw their incomes from multiple platforms or look to on-demand work as a means of supplementing formal employment.^{50,51} In one study, JP Morgan Chase analyzed data from a sample of one million US customers and found that 1 percent of adults were earning money from online labor platforms in a given month; this number went up to 4 percent when considering the three year period of the study, 2012-2015.⁵² The Chase findings similarly suggested that online labor serves as a secondary source of income, and that

earnings from platforms offset dips in non-platform income. A 2016 study from Europe found that nearly one-fifth of adults surveyed online reported finding some sort of work through platforms; roughly one quarter reported that their platform-based work accounted for more than half their income. In response to the study, Oliver Kothiq UNI Europa Regional Secretary notes that platform-based work will likely begin to skew labor markets toward cheaper labor in other countries. He says, “People working through



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online platforms in the UK are part of a truly global labour market. They will increasingly find themselves competing with workers in emerging economies, for example those in China, India, and Eastern Europe, who will be able to charge significantly lower rates.”⁵³

However, other research suggests that in spite of popular impressions, there has not been an upward trend in the number of Americans who are self-employed or engaged in contracting work. Justin Fox, writing in Harvard Business Review (HBR), puts it thusly: “You can see the age of self-employment everywhere except in the self-employment statistics.”⁵⁴ Abraham, Haltiwanger, and colleagues state: “Available survey data seem at odds with the popular perception that there has been significant growth in the overall prevalence of gig employment... the percentage of the workforce that is self-employed has shown no upward trend and in fact has been drifting downwards at least since the mid-1990s.”



To date, Institute for the Future has documented more than 1500 work platforms operating globally, such as Upwork, Freelancer, Guru, Witmart, TaskRabbit, Fiverr, and Gigwalk.



Each label comes with a set of assumptions about relative moral, political, and economic value. “The variety of platforms nearly defies categorization.”

Today, there is not a common overarching name for the phenomenon of finding and contracting work on a digital platform— labels in current circulation include the **1099 economy, gig economy, on-demand economy, contract economy, platform-based economy, collaborative economy, and sharing economy**. Each label comes with a set of assumptions about relative moral, political, and economic value. Kenney and Zysman observe: “The variety of platforms nearly defies categorization. To illustrate, Google and Facebook are digital platforms providing search and social media, but also platforms on which other platforms are in turn built. Amazon is a marketplace, as are Etsy and eBay. Amazon Web Services (AWS) provides infrastructure and tools with which others can build, while Airbnb and Uber are forcing deep change on quite different businesses.”⁵⁵

Some commentators have drawn distinctions between the mechanisms through which work is requested or obtained, distinguishing “crowd-work” from “**work-on-demand via apps**.” According to Antonio Aloisi of Bocconi University, the first expression covers jobs completed remotely on virtual platforms by workers, in response to online calls and potentially involving people from all over the world (HourlyNerd, CrowdSpring, Fiverr, CoContest). The second expression refers to types of work performed in the real world and therefore locally (WoNoLo, JustPark, PostMates, Deliveroo). In addition, there are platforms that connect clients to more skilled labor, which he terms “**professional online marketplaces**,” such as UpWork, and open innovation platform, as well as “**premium services platforms**,” such as Uber.⁵⁶

A 2015 McKinsey report offers a different typology, distinguishing between three categories: jobs- and social media-based matching sites; platforms where free agents such as freelancers, consultants, and other contingent workers

can connect with projects or assignments; and platforms that provide tools and data to enable workers and employers to make better job-related decisions.⁵⁷

In written testimony for the US House of Representatives, Arun Sundarajan distinguishes between three different constituents: **platforms** (marketplaces), **entrepreneurs** (small businesses, micro-entrepreneurs), and **consumers**. “The platforms are the person-to-person marketplaces which facilitate the exchange of goods and services between peers. The entrepreneurs are the individuals or small businesses that supply goods and services in these marketplaces. The consumers are the individuals who demand: buy, rent, consume. (Both the entrepreneurs and the consumers are often referred to as ‘peers’.)”

In terms of labor platforms, Sundarajan distinguishes between **professional service provision** (platforms that create a new channels for existing providers of different services, often expanding their business opportunities in a way that allows individuals to become entrepreneurs rather than working with a traditional organization) and **general-purpose freelance labor provision** (platforms that create new marketplaces for different kinds of freelance labor). He maintains that peer-to-peer (P2P) education and finance platforms represent other categories, but ones that potentially overlap with the more distinct labor platforms. He further argues that these platforms facilitate a growth in general entrepreneurship: “For many individuals, the relatively low-risk micro-entrepreneurship allowed by peer-to-peer business may be the first step to broader entrepreneurship, perhaps an ‘on-ramp’ of sorts to freelancing or starting an independent business, by generating supplemental income, extending expertise, and creating a broader professional network.”⁵⁸



In a 2016 report for the Center for Global Enterprise, Peter Evans and Anabelle Gawer offer a classification of platform types, in which they position labor platforms as part of the larger platform ecosystem. They distinguish types as follows:

- **Transaction platforms**, which facilitate transactions between different types of individuals and organizations that would otherwise have difficulty finding each other, such as in Uber, Amazon Marketplace, and eBay.
- **Innovation platforms**, which consist of technological building blocks that are used as a foundation on top of which a large number of innovators can develop complementary services or products.
- **Integrated platforms**, a technology, product or service that is both a transaction platform and an innovation platform.
- **Investment platforms**, consisting of companies that have developed a platform portfolio strategy and act as a holding company, active platform investor, or both.⁵⁹

Our own 2016 analysis at Institute for the Future has uncovered more than 1500 work platforms across a number of categories. Perhaps not surprisingly, the largest of these is Uber with a total of just shy of \$9B invested in it to date. Interestingly, the second most funded business in this space, Airbnb, has received less than a third of the amount of equity funding that Uber has, at just shy of \$2.5B. Overall, the platform investment environment favors simple standardized transactions over more complex and customized work. It shares this trait in common with early factory industrialization, in which complex production processes had to be broken down into clear discreet sequences of steps.

Whether platform-centric work will also tend toward standardized “microtasks” over the long run is an open question. On the one hand, modularity and standardization could unlock tremendous economic benefits by facilitating the emergence of “global supply webs,” or fluid production networks designed to mate-

rialize any good or service where it is needed, when it is needed. On the other hand, micro-tasks may prove to be less fulfilling work than more craft-oriented labor and could serve as a springboard to further automation by outlining exactly the steps where rote processes might be coded as software. Indeed, it is also possible to imagine greater depth being added to routine tasks with the addition of game mechanics. Over the long run, this question of the psychological relationship between people and platform work may be the most critical factor in the direction that the shift in work takes.

Surveillance

Technology ethnographer Alex Rosenblat and digital media scholar Luke Stark conducted a case study Uber’s Drivers: *Information Asymmetries and Control in Dynamic Work* that examines labor in the on-demand economy using the rideshare service Uber. They argue “that Uber’s digitally and algorithmically mediated system of flexible employment builds new forms of surveillance and control into the experience of using the system, which result in asymmetries around information and power for workers.” By exploring the main features of Uber’s system, Rosenblat and Stark find that labor under algorithmic management is characterized “by opposing conditions of surveillance and resistance,” not by freedom and flexibility. They conclude, “The digital connectivity of platform-based work enables both a type of continuous, soft surveillance by employers/platforms. It also enables more precise, efficient matching between “supply and demand” in real-time by the platform/ employer.”⁶⁰

Gender

Turning to the role of gender in the future of work, data is scarce. In an effort to shed light on the issue, Jason Chan and Jing Wang conducted an analysis of transactions on a large labor matching platform (unspecified), where they found a positive bias toward hiring women. They note that while female workers may benefit from a hiring bias, women may still be at a disadvantage when it comes to wages.

The authors also found that employers tend to be swayed by gender-based perceptions of the



type of work, in that “they are more likely to hire women for feminine jobs and men for masculine jobs.” They determined, however, that with increased experience in hiring online, employers tend to relinquish this bias. The authors commented that “We theorize that repeated usage of the online marketplace allows the employer to learn and build up confidence in the efficacy of the institutional measures for addressing agency problems (e.g., time tracker which monitors workers actual working hours, online procedures to dispute the work quality and charges incurred). After gaining trust in the online labor platform, employers’ reliance on inherent biases to make hiring decisions is likely reduced.”⁶¹

Advocacy and Labor Perspective

Moshe Marvit, labor attorney and fellow at the Century Foundation, laments that “Inside the machine, there is an overabundance of labor, extreme competition among workers, monotonous and repetitive work, exceedingly low pay, and a great deal of scamming. In this virtual world, the disparities of power in employment relationships are magnified many times over, and the New Deal may as well have never happened.”⁶²

In a more hopeful approach, Aniket Kittur, of the human computing lab at Carnegie Mellon, and colleagues have proposed a framework for improving conditions for crowdwork stake-

“ The digital connectivity of platform-based work enables a type of continuous, soft surveillance by employers and platforms.

holders. The authors ask: “Can we foresee a future crowd workplace in which we would want our children to participate? Drawing on theory from organizational behavior and distributed computing, as well as direct feedback from workers, we outline a framework that will enable crowd work that is complex, collaborative, and sustainable.” Looking across different forms of

digital labor, they examine issues of hierarchy, job design, quality control, opportunities for on-the-job learning, and worker motivation.⁶³ By way of design interventions, they propose that platforms might serve to create career ladders, improve task design through better communication, and facilitate skill development and concrete learning.

In February 2016, executive leadership at the American Federation of Labor and Congress of Industrial Organizations (AFL-CIO) weighed in on the future of work: “While the number of people who earn a majority of their income from work ‘on demand’ via digital platforms constitutes only a tiny slice of the workforce today, some predict this kind of work could become much more prevalent in the future.” They went on to take the position that gig workers should be classified as employees: “Making the right policy choices begins with ensuring people who work for on-demand companies enjoy the rights and protections of employees.”⁶⁴

The National Employment Law Project, in a September 2015 white paper, has also taken a stance for worker protections. Authors Rebecca Smith and Sarah Leberstein maintain that people doing gig or on-demand work are, and should be, employees under the law, and should therefore get the full range of benefits, including minimum wage. “Regardless of how these businesses characterize their relationships with workers, they should not be allowed to shut workers out of what our nation’s baseline labor standards were intended to convey: the opportunity to achieve and sustain economic security through work.” They go on to address the technology’s enormous potential to

benefit both businesses and workers. “To ensure that this potential is met, we must enforce our existing labor standards aggressively and adapt them where and as needed, to ensure they deliver essential labor rights to all, protect law-abiding employers, and secure the safety net and tax dollars connected to employment for the good of us all.”⁶⁵



At the organizational level, the Fair Care Pledge is a collaboration between Care.com and the National Domestic Workers Alliance that commits individual domestic employers to pay a living wage, provide paid time off, and commit to basic standards. The National Domestic Workers Alliance also developed the Good Work Code. This set of eight principles for defining “good work” for digital laborers includes a livable wage, safety, stability, and opportunities for advancement. Twelve companies initially signed on to the Good Work Code from Care.com to a startup that arranges veterinary house calls (VetPronto).⁶⁶

Closer to the worker level, the California App-Based Drivers Association (CADA) represents owners and drivers from Uber, Lyft, Sidecar, Toro Ride, Opali, and others, working closely with Teamsters Local 986 to ensure that app-based drivers can speak with a unified voice. Sara Horowitz of the Freelancers Union advocates for uncoupling benefits from jobs, and the nonprofit group Peers claims it wants to make the sharing economy a better work opportunity by making it easier for workers to find, compare, and manage work in the sharing economy.⁶⁷



Can we foresee a future crowd workplace in which we would want our children to participate?





Over the Longer Term, Networked Work is Inevitable

To better understand the future of work, it is helpful to examine the astonishing shift that is happening in technology. While social norms and policy continue to move at more-or-less their historical pace, an emerging constellation of underlying technical capabilities is moving in pace with Moore's Law: exponentially increased computing power is rapidly becoming available at relatively lower cost. At this point in history, digital technologies are not only the fastest-moving things on the field, they are actually altering the rules by which businesses and individuals play.

This expanding gap—between fast-moving commercial applications of technology and society's slower ability to channel them—is arguably the single-biggest systemic issue facing the future of work in industrialized economies. Many technologists engaged in this conversation are reaching the conclusion that work and economic activity as we know them are about to be fairly severely disrupted. While there are a number of factors at play, it is possible to simplify the fundamental technology changes to two simple elements: more powerful networks and more powerful processing.

The dynamics of next-generation networking and next-generation processing are catalyzing a broader “**coordination economy**.” This phenomenon is most visible in the emergence of digital platforms, but it is not clear that these new digital systems will help sustain workers in the same way industrial-era systems have done. While digital technologies are moving at a rate that may make direct legislation difficult, it may yet be possible to find and champion system architectures that support “**prosperity by design**.”



While there are a number of factors at play, it is possible to simplify the fundamental technology changes to two simple elements: more powerful networks and more powerful processing.

Networking, Coase Theorem, and the Fragmentation of Work

The development of digital platforms in the coordination economy has led to a breakdown in traditional work structures. To understand the shift toward fragmentation, we can examine new network technologies in the light of well-established economic principles such as the Coase Theorem. In his influential 1937 article *The Nature of the Firm*, economist Ronald Coase proposed an explanation for the development of hierarchical, top-down structures in a free-agent market. While it should be possible to produce outputs by simply bringing together individual free agents, firms tend to appear. Coase proposed that firms do not form altruistically for the good of employees, but rather as a byproduct of self-interest and some basic economic rules.

Coase pointed out that the problem with an economy composed entirely of free agents is in the transaction costs it would generate. For every hire of a free agent, there are expenses incurred beyond the financial payments to be made for the work: the process of searching for a worker, bargaining with them, researching relevant information, and losing any trade secrets. Repeating the process for every work project becomes costly and tedious over time, making it more worthwhile to simply contract with an individual once and pay them a salary. From the perspective of the Coase Theorem, which also addresses efficient bargaining,



the fact that the arrangement provides steady income for the employee is a bit of a happy accident.

The Coase Theorem has seen a revival in relevance in recent years, driven by underlying shifts in network technologies. In the last decade, the emergence of network-based work platform applications has begun to smooth out some of the transaction costs related to hiring individuals. Indeed, this function could almost be the definition of a “platform.” Numerous sites—like oDesk and Elance (now Upwork), FancyHands, Topcoder, GigWalk and Mechanical Turk—have sprung up in the wake of increased network density, providing a much cleaner way to contract for the services of free agents and contract employees. These network-based systems allow for ongoing work interactions, and their reputation systems help address the information costs that Coase highlighted. By lowering transaction costs, the platform systems have also begun to change the underlying economics of hiring. Following from Coase’s original logic, this transformation should steadily nudge the economy away from reliance on large hierarchical organizations.

We appear to be at the very beginning of a long arc of network expansion that may reinforce the trend toward fragmentation. The emergence of early geographic awareness, for example, has already catalyzed much network-based activity over the last few years. Moving forward, more kerosene will be added to the fire, with the likely emergence first of a basic Internet of Things (IoT), followed by a series of intermediate processing nodes. Networked nodes will coordinate local IoT interactions—including interactions with people—lowering transaction costs and contributing to the further fragmentation of work.



In the last decade, the emergence of network-based work platform applications has begun to smooth out some of the transaction costs related to hiring individuals.

Processing, Moore's Law, and the Automation of Work

The parallel development of dramatically increased computer processing power and its impacts are perhaps more familiar, and are best understood as the result of a long-standing industry trend rather than an economic principle: Moore’s Law. Brynjolfsson puts forward this argument in *Race Against the Machine*, and similar recent works agree.

The amount of total computer processing power available per dollar tends to double every 18 to 24 months. This observation, first described by Intel founder Gordon Moore in his work examining the number of transistors that would fit on a microchip, has held true for decades. Indeed, as pointed out in W. Brian Arthur’s work at the Santa Fe Institute, the technological phenomenon is likely rooted far more deeply than Moore’s Law, in the combinatorial nature of technological innovation itself. Each new technology can serve as a building block for subsequent technologies, which can then be recombined as a multiplier to build further technologies, and so on.⁶⁸

In this context, automation can simply be thought of as labor by machine processes. Automation has a long history of taking over processes—elevator operation, telephone switchboards, and DVD rental, among numerous others. However, while increased automation brings to mind images of robotic systems competing directly for jobs, it is in machine learning that processing power will have its most powerful impact. In this application, complex processing and sophisticated heuristics will be brought to bear on production and decision-making. Importantly, once a new process has been designed, it is non-rivalrous—able to be infinitely



replicated at vanishing additional cost with the touch of a button. Once a human process has been replicated with comparable quality by machine learning, it is captured for good.

Advances in Networking + Advances in Processing = A Coordination Economy

These advancements in networking and processing are mutually reinforcing, and Uber, using machine intelligence to match customers with drivers, is perhaps the best example of this logic at work. PulsePoint, Shyp and similar geographically-aware platform ventures have applied early versions of the same logic, automating the connection of atomized network nodes. In short, coordination.

However, as atomized network work systems break down jobs into smaller individual tasks, they are also creating a “connect the dots” map to further automation. For example, Uber uses automated routing to bring driver and passenger together and then plan the actual route; the driver is essentially performing but one step in a larger chain of tasks. It is no coincidence that Uber CEO Travis Kalanick is on record with the view that the use of human drivers is a transitional step before fully-automated vehicles hit the market.⁶⁹

Indeed, the logic of the coordination economy is at the heart of the Institute for the Future’s own explorations into coordination across job gaps, employees, and job skills. As processing and networking continue to mature, market trends will only reinforce this logic. If we take both Coase’s Theorem and Moore’s Law seriously, then the shift to coordination economics is virtually a given for tangible economic production processes, and the connections within organizations will increasingly be made by algorithms. The future of work is coordination.

Within this context, however, there are three general models for online work platforms. Each model has some basis in the practices that have already evolved over the past decade in which platform-based work has expanded.

Approaches to digital workforce coordination include the following:

- 1 Networked Labor Model** | A market in which contract labor is the dominant form for certain classes of workers, as distinct from “regular,” salaried/wage earning employees. In this model, firms rely heavily on outsourced labor by contracting directly with workers on an as-needed basis, and workers are free to take on as many projects for as many employers as they wish.
- 2 Employment/Temp Agency Model** | An intermediary/third party that provides a combination of detailed, contextual information about the needs of employers and workers; professional judgment in the service of matching jobs and skills, administrative support services, and a “soft,” human interface rather than a self-service model.
- 3 Internal Work Routing Model** | Using labor platforms to obtain workers on a task- or project-basis, allowing firms to respond quickly to changing conditions without taking on the full overhead associated with regular employees.⁷⁰ Hiring functions in this case are regarded as a role for project/department managers, rather than HR departments.

All of these models have very interesting historical precedents and in some cases, they might be considered the contemporary equivalents of workplace models that have existed in the US over the past hundred or more years, when many of the enduring relationships between labor and employers were beginning to be established.





Platform Design Mechanisms Offer New Opportunities and Challenges

Algorithmic Matching

Employment agencies and subcontractors can be seen as early precursors to the algorithm-based matching of people with work, which manifests differently across various platforms. Each platform's design approach is essential to shaping the worker experience. Uber, for example, has designed software to handle the entire process of matching workers (drivers) to jobs (passengers), with little input from either party. This assigned-match approach may work particularly well in situations where a service is seen as relatively undifferentiated between providers, or where a platform has substantial information about its worker and user base.

With adequate data, a job can be routed to the worker best suited to the task. Over time, this increasingly intelligent algorithmic work-matching may become an incredibly powerful tool; indeed, it promises to be one of the most dramatic real-world applications of big data. Picture a world where an elevator will automatically hire the nearest repair technician when it detects that something has gone wrong—work demand could be generated without human mediation.

Recommendation Engines

While full algorithmic matching may take time to be effectively introduced into more complex fields, recommendation engines today are already making strides in pairing people with work. Like traditional employment agencies, these systems—though software-based—typically use information about individual workers to highlight candidates for roles based on a combination of qualifications and feedback from previous work engagements.

Many platforms employ the recommendation approach. Upwork, for example, recommends freelancers based on a client's specified needs while still allowing an employer to search and hire any worker on the platform. Similarly,

TaskRabbit proposes a few specific “Taskers” as a way to minimize the problem of having every worker compete for every piece of work. Because information asymmetry between clients and workers can create challenges in translating needs to available skills, a glossary or thesaurus may also be a helpful tool to bridge the gap and ensure a good match.

Passive Matching

It should be noted that many of today's work platforms do not use matching software at all. Craigslist is a good example: employers post jobs and more narrowly-defined gigs as part of a running list visible to everyone. The historical roots of passive matching are deep. Although slow-moving by today's standards, newspaper classified sections and job boards are analog platforms that have played a critical role in the ecology of work for decades.

Self-Scheduling

From a worker standpoint, one of the most attractive design mechanisms frequently incorporated into work platforms is the ability to set one's own schedule. This is particularly true on platforms that facilitate relatively small, discrete tasks such as deliveries, rides, and simple information work. However, self-scheduling is not a given; platforms depend on various incentives to influence scheduling choices. At the extreme, digital mechanisms can constrain workers' time choices, as when digital scheduling software is used to tightly match employees' schedules to irregular activity levels.

These scheduling mechanisms can result in “clopening” (scheduling workers to work very late at night and then open very early the following day) and other mandatory work periods of just a few hours spread throughout the day with several unpaid hours in between. Some ride services have required drivers to work on specific days or at specific hours as part of



their contracts. Bounties or rewards for working longer hours can have a similar effect. Automatic pricing algorithms, such as those used by Uber for rush-hour (peak usage) pricing, may also lead to de facto, external scheduling rather than true self-scheduling.

Monitoring Systems

Where surveillance and monitoring is concerned, platforms are in an interesting position relative to traditional work arrangements. Typically, platform workers are geographically removed from employers and have substantial freedom in how they organize their work. At the same time, platform software is often built to include surveillance functions. Striking the right balance of responsibility and accountability will continue to be a challenge.

Delivery apps, for example, track exactly how long each delivery takes and the exact route taken. Hourly online platforms can monitor exactly what a worker is doing on their computer while “on the clock.” A new generation of wearable technologies, able to monitor individuals’ activities in much greater detail, will only serve to drive monitoring-related dilemmas to the forefront of debate.

Microtasking

Digital platforms also provide the opportunity to think differently about the structure of work. This is perhaps best evidenced by the emergence of crowdsourcing platforms such as Amazon’s Mechanical Turk—systems designed to break larger jobs into tiny tasks to be performed by hundreds, or even thousands, of individuals. These systems are particularly well-suited to projects that can be reframed as exercises in repeating simple steps over and over, and often they break jobs into units so small that they challenge the very concept of “work.” Often this “microwork” is low-paid by the standards of industrialized regions; although, it also offers emerging markets access to work at a higher pay rate than might be available locally. The psychological impacts of microwork are also an open question, as some have argued that the approach could cause workers to feel dissociated from the projects they work on.

Automated Onboarding

One innovation by digital labor platforms is the automated onboarding of new workers. In many cases, demonstrations can be run on the platform itself to show a new worker exactly how to do the various tasks necessary for earning money through the system. This onboarding-by-demonstration approach can be similar to the demonstration by a veteran employee of tasks or duties on the first day of a job. This process has inducted thousands of employees into new positions, and the mechanism is worth continued development for a future of work that is more agile.

Worker Support

One of the basic functions of management is responding to worker issues as they arise, and in numerous platforms, this function is at least partially digitized. In some cases, platforms simply provide a Frequently Asked Questions (FAQ) document. In others, information is presented via digital chatbots similar to those found on many smartphones (e.g. Siri, Cortana, Google Now). Where digitized answers are not available, platforms often use matchmaking mechanisms to connect new workers with more-knowledgeable peers. For example, the software testing and debugging platform Test.io has project coordinators who supervise new digital workers for optimal software testing protocols and results. Such coordinators can be contacted via the platform throughout the project’s onboarding process.

Competency Tests

Matching individuals to more complex work requires data about them, and perhaps the most basic data is simply whether or not they are up to the task. Used by sites like Upwork, Mechanical Turk, and Freelancer.com, competency tests can rank the relative abilities of a potential worker in likely areas of work. In some cases, tests serve as a minimum qualification for access to certain kinds of work. Where workers need to pay for tests in order to access higher-paid gigs (as with Freelancer.com), competency tests create stratification: workers either have funds on hand to pay for a test or must take on lower-paying work until they have



earned enough to pay for it. Looking ahead, platforms could devise a mechanism to deduct test costs from future earnings, or to accept official third-party transcripts and test scores for a small fee.

Digital Upskilling

An area of great potential is the use of platforms to train workers and provide skills needed to do entirely new kinds of work. Here, Duolingo is a particularly interesting example. The company provides free language learning software for more than twenty languages. As students progress, Duolingo begins to mix in actual crowdsourced translation work for paying clients. Using this model, the company earns a profit from third parties for providing skills training. Moving forward, it is possible to imagine an extension of this “productive training exercise” approach. As platforms become better at identifying the training needs of individuals, learning materials and upskilling can be routed to those who are on the threshold of a new earnings bracket.

With advances in algorithms and big data, platforms themselves may be able to learn from their training exercises and the outsourced work itself. Future platforms may fully automate task routines based on analysis of the inputs from platform workers. This machine learning would, in turn, change the nature of available work. In this way, platforms can be seen as stepping-stones toward greater automation. Changing requirements of the human workers would call for a new round of upskilling.

Reducing the “Costs” of Freelancing

For traditional workers considering the move to freelancing, there may be a perception that transitioning into the unfamiliar territory of gig work is too risky or requires significant upfront investment. Moreover, there are very real costs associated with freelancing, from accounting and recordkeeping to tax and regulatory compliance. Freelancers may simply not be aware of these until they learn the hard way—through a letter from the IRS or state department of revenue, or when they attempt to enter a field with licensing requirements and must bring their solo practice

into compliance. A number of potential service ideas could help entering freelancers better assess their decision to become an independent contractor. There may also be opportunities for supporting services that integrate earnings and payments data from work platforms into other systems typically handled by employers, such as accounting and tax preparation, health plans, retirement, and insurance, and banking. These may all help to lower the psychological costs associated with entering self-employment, as well as provide valuable services to freelancers.

Project Success Consulting

Evidence from several studies suggests that a large amount of hiring on platforms comes from small businesses seeking outside help due to internal constraints, such as a lack of time or limited number of employees. Research also clearly points out that the skills that will be required of in the future of work will be qualitatively different than they have been over the past century, and one unexamined area of platform hiring is the role of the client’s project management skills. Platforms excel at providing new opportunities for clients and workers to connect and evaluate each other, but a poorly planned project is likely to generate unpleasant results for the client and the worker. If this situation persists, one would expect a problem with attrition that could have been cured with a dose of better planning. Platforms that invest resources in ensuring project success may enjoy higher retention rates. Because platforms may hesitate to engage in projects this way (due to liability or limitations on expertise), this may present an opportunity for third parties to provide services to clients.

Regional Platform Support

The skills-testing features used by some platforms appear to be oriented toward standardized types of knowledge. Presumably this, along with reputation mechanisms, should provide adequate information for clients to make hiring decisions, but in some cases the standard tests may not provide useful information or justify the freelancer’s time. For example, someone with a master’s degree in computer science may not be willing to take yet another test, while contractors



with specialized and hard-to-measure skills may not have an opportunity to demonstrate their capabilities. If there were another way to confirm worker capabilities, such as membership in a “guild” of some sort that was transferrable across platforms, clients could better gauge the abilities of applicants. The guild itself could also receive aggregated feedback, similar to the agency affiliation once used in oDesk. A key differentiating feature is that these guilds could be sponsored in real space through affiliations with schools, non-profits, or other entities with established reputations.



Platforms Present Us With a Number of Potential Economic Anomalies

Although there is not a consensus definition of “platforms,” MIT Professor Michael Cusumano distinguishes it as follows: “A platform or complement strategy differs from a product strategy in that it requires an external ecosystem to generate complementary product or service innovations and build positive feedback between the complements and the platform. The effect is much greater potential for innovation and growth than a single product-oriented firm can generate alone.”⁷¹ While platforms for labor are often framed as near-perfect markets, there are a number of economic anomalies and issues that have been documented and are worth deeper exploration. Platforms are “designed” markets, and they challenge some of our economic preconceptions—by breaking away from some underlying economic definitions and frameworks and by providing deep empirical data in place of economists’ more familiar theoretical generalizations and estimates.

Impact Goes Beyond Just “Coase Theorem”

Interest in why firms exist dates to the beginning of modern economic thought. Adam Smith approached the issue at the very beginning of *The Wealth of Nations* in his discussion of specialization at a pin factory. The message: the emerging industrial model was remarkably productive compared to what had been the prevailing system of artisanal, craft labor, with its “time lost in passing from one species of work to another.”⁷² Specialization, in theory, allows individuals to work in their areas of greatest ability, and even provides an opportunity to match machine and labor to even greater effect. Implicit in this notion is that an entity—the firm and its internal organization—can represent a more productive model than alternatives, such as hiring individual day laborers or independent contractors.

Interest in theories of the firm remained dormant for many years until Coase published *The Nature of the Firm* in 1937, and Coase’s theorem—that costs can be minimized by bringing workers together under the direct control of management as employees of a firm—is at the center of many

modern conceptions of how companies choose to manage their workforce. The idea has also been central to how economists view emerging work platforms. A recent high-profile paper by Seth Harris and Alan Krueger describes “the Coasian explanation for the growth of online intermediaries,” as “new technology enables a



New technology enables a more efficient means for companies to contract with third parties.

more efficient means for companies to contract with third parties.”⁷³ In this view, labor platforms should reduce transaction costs, such that contracting out for workers should increase relative to hiring employees in the traditional sense.

Labor platforms share features of independent contracting and conventional employment approaches.⁷⁴ Platforms such as Upwork, Freelancer.com, and Guru emulate traditional employment relationships: projects may be substantial and require a number of different tasks, and work may be closely monitored and directed by the hiring firm. One example could be the work performed by administrative assis-



tants, where the work relationship may be open-ended and loosely defined, but the worker may be expected to be available at the complete discretion of the hiring party. Other projects advertised on platforms more clearly resemble market-type relationships, where a contractor is sought to provide a defined package of services or project-based work that the firm cannot perform on its own due to limited resources or expertise.

Ajay Agrawal, the Peter Monic Professor of Entrepreneurship at Rotman School of Management and others suggest that while platforms may reduce market frictions such as search costs, these reductions can be offset by new sources of friction, such as an overwhelming number of workers applying for gigs and straining the ability of managers to assess each applicant thoroughly. Other issues also arise, such as the difficulty of verifying workers' credentials, qualifications, and work progress. Additionally, the lack of face-to-face interaction prevents high-bandwidth information transfer between employer and worker. These issues are not found in traditional markets and add more complexity to the platforms picture than is accounted for by the Coase Theorem alone.⁷⁵

Shift from “Jobs” to “Tasks”

Traditional work arrangements, and the economic assumptions used in studying them, consider the **job** to be the basic unit of analysis, whereas labor platforms are often designed in a way that treats jobs as a summation of discrete, billable **tasks**. Not only do platforms support a finer measurement of labor over time, they can also create entirely new categories of work, further distancing them from the traditional work model.⁷⁶ Platforms allow firms, particularly small- and medium-sized, to break jobs into multiple tasks and distribute them to any number of individuals. The quality of the work product may then depend more on the ability of managers to properly define and scope the work than on the skills of any particular worker. At the same time,



The deconstruction of tasks into smaller and smaller pieces on platforms presents the potential to replace skilled labor with increasing amounts of unskilled labor.

the wide range of choices offered on platforms allows workers to affirmatively select gigs that build on their existing knowledge base or fit their interests. Together, these may lead to a bifurcated market of higher-skilled, higher-wage specialty workers and low skilled, low-wage task labor.

The deconstruction of tasks into smaller and smaller pieces on platforms presents the potential to replace skilled labor with increasing amounts of unskilled labor, which has already been observed with tasks such as speech transcription and copyediting. Furthermore, researchers have found that complex work such as writing, product design, and translation may be also amenable to novice platform workers given appropriate technological support, such as writing templates and translation tools. Kittur and colleagues consider this development to be “a new form of Taylorism”—named after one of the originators of the scientific management discipline—“in which organizations optimize cognitive efficiency at the expense of education and skill development.” This is an ironic development, as Taylorism has largely fallen out of favor in the manufacturing sector in favor of other approaches that recognize the role of workers in actively creating value (as opposed to management alone creating value). The authors also conclude that the short time commitments associated with platform work could provide opportunities for “heightened exploitation and dehumanization” of workers.⁷⁷

Harris and Krueger offer suggestions to mediate the issue in *A Proposal for Modernizing Labor Laws for Twenty-First-Century Work*. They propose that Congress and, where appropriate, state legislatures, enact legislation to establish a third legal category of workers—which they call



“independent workers”—for those who occupy the gray area between “employees” and “independent contractors.” They believe that workers on platforms do not easily fit into the existing legal definitions of employee and independent contractor. Employees, unlike independent contractors, qualify for a range of legally-mandated benefits and protections, such as workers’ compensation insurance coverage, the right to organize and bargain collectively, and overtime compensation. Establishing a third legal category of workers, they argue, “would help to protect and extend the hard-earned social compact that has protected workers and improved living standards over the past century, reduce uncertainty, and enhance the efficient operation of the labor market.”

This independent worker has some characteristics of an independent contractor and some characteristics of an employee in a traditional employee-employer relationship. Harris and Krueger reason that on one hand, independent workers have the ability to choose when to work, or whether to work at all, and they may work with multiple intermediaries simultaneously. It is therefore impossible in many circumstances to attribute independent workers’ work hours to any employer, making independent workers similar to independent businesses. On the other hand, “the intermediary retains some control over the way independent workers perform their work, such as by setting their fees or fee caps, and they may ‘fire’ workers by prohibiting them from using their service. In these respects, independent workers are similar to traditional employees.”⁷⁸

Reputation Effects

The vast number of workers and distributed nature of the work preclude platforms from managing quality directly, and most do little up-front screening or certification. A primary challenge platforms face, then, is information asymmetry, in which one party has information—such as knowledge of their own skills and attributes—which the other party does not. Also known as the lemon problem, this phenomenon was described by George Akerlof, Joseph Stiglitz, and others in studying markets (such as labor)

where information is critical to the decision-making process. With a lack of critical information, buyers (firms) will tend to offer lower wage rates, which drives higher-quality sellers (workers) out of the market, sometimes referred to as “the bad driving out the good.”

The results are markets comprised of only low-quality workers and low-paying firms. However, platforms can mitigate information asymmetry through systems that reveal buyer experiences with sellers, and vice versa. Reputations are established through a two-way feedback mechanism that allows buyers and sellers to numerically rate each other after each transaction, and these ratings are made available to prospective clients. The two-way feedback mechanism is “designed to incentivize players to behave well in the current period using the threat of future punishment.”⁷⁹

A field experiment confirmed that more information available about worker quality makes workers more desirable and valuable to employers. One experiment randomly selected and hired 952 contractors (the treatment group) who had no prior work experience on oDesk and provided feedback on their performance. Meanwhile, a control group consisted of 2,815 contractors who applied for posted jobs but received no feedback. A comparison of employment performance showed the subsequent income of contractors with feedback almost tripled relative to the income of control contractors, who continued to have no feedback over the following two-month period. While only one study, this experiment demonstrates that even a minimal amount of positive information may help increase a worker’s future earnings substantially.⁸⁰

Another study, on oDesk, found that inexperienced workers affiliated with an independent outsourcing agency, with information included in the worker profile, have substantially higher job-finding probabilities at the beginning of their careers. The dramatic effect of these informational features suggests that employers are faced with high levels of uncertainty in the hiring process due to information asymmetries inherent in online hiring.⁸¹



Previous research on the reputation systems of e-commerce sites may shed some light on whether measures of trust and performance built on repeated interaction and personal relationships can be obtained on work platforms. In a 2010 examination of the reputation mechanism on eBay, researchers found that sellers receiving negative feedback experienced a large decrease in their sales rates. In a negative feedback loop, negative feedback increased for sellers with negative feedback, though additional negative reviews had less impact compared to the initial rating. Sellers with worse reputations were also more likely to exit eBay, and just before their exit, they tended to receive more negative feedback than their previous average.⁸²

Positive feedback may also produce undesirable results, such as in the case of reputation inflation, which has become pronounced on some platforms. In a recent paper, economists John Horton and Joseph Golden suggest two factors behind a measured increase in positive feedback scores. First, giving negative feedback is more “costly” to the rater than giving positive feedback, because poorly-rated parties can retaliate. Second, what is considered “bad” feedback (and hence what prompts retaliation) depends upon the market penalty associated with that bad feedback. They propose that when any ambiguity in a review can be construed as “bad” by the rated party, raters will tend to leave more positive feedback.

Horton and Golden also found that when buyers are allowed to give anonymous or aggregated feedback to the seller they were more candid, and buyers who had the strongest incentive not to be candid (those using the marketplace regularly, and who could be hurt by negative public feedback) showed the biggest “candor gap.”⁸³

Though feedback systems may be flawed, reputations have a significant impact on buyer and seller success, and improving the utility of these mechanisms will remain a major concern for platforms. In a 2016 report for the European Parliament on the online sharing economy, the



Platforms can mitigate information asymmetry through systems that reveal buyer experiences with sellers, and vice versa.

authors suggest that among the issues to be resolved is the mitigation of social exclusion due to reputational effects:

“New measures seem justified in support of the rehabilitation of those excluded from platforms, including the prospective establishment of community platforms for that purpose. However, this should not occur through the regulation of still evolving financial ratings systems. Possible options in addressing this issue are the following alternatives:

- tolerating a degree of social exclusion (laissez faire approach),
- establishing a right to a reputational Year Zero,
- regulating reputational scoring so that only socially desirable exclusions occur,
- creating community platforms where reputation can be rebuilt.”⁸⁴

Price-Setting Anomalies

The intersection of supply and demand at a market-clearing price is part of labor market orthodoxy, but there is some evidence that the process does not work as expected in labor platforms. A perfectly competitive labor market supply assumes employers pay wages according to work quality that reflects employees’ job performance. This assumption implies that if employers lower or raise wages, the quality of goods and services workers produce changes proportionately. However, a paper published by the Oxford Internet Institute argues that digital work platforms do not follow this normative economic story. Paying people who crowdsource (known as crowdworkers)



marginally higher wages does not clearly produce higher work quality.

In a longitudinal study of workers on Amazon Mechanical Turk, Sara Kingsley and colleagues argue that poor work quality is not intrinsic to these workers. “We do not believe crowdworkers are inherently bad actors, so poorly skilled to be unemployable elsewhere, or are seeking to ‘game the system.’” Rather, “we believe crowdsourcing platforms are, at present, poorly-designed labor markets.”

To correct these frictions, the authors propose a number of design-level solutions. For example, crowdsourcing platforms could incorporate online chat services directly into the platform, permitting requesters to talk directly to workers in real time. Other tools could communicate critical information quickly among all parties working in a virtual system. For example, prompt answers to a question about what constitutes fair pay for a particular task could rapidly circulate opinions among participants. In many cases, workers with imperfect information set their own prices, rather than accepting an offer from an employer that presumably hires enough people to have a coherent sense of the market.⁸⁵

Economists John Horton and Richard Zeckhauser found that algorithmic wage negotiations have the potential to further complicate the question over time. Mechanical Turk workers were “generally reluctant to make counteroffers or end negotiations” with a bot that systematically made high or low offers on tasks. This resulted in wide disparity in average wages between the high- and low-offer groups.⁸⁶

Through administrative data and fieldwork analysis of TaskRabbit, Zoe Cullen and Bobak Pakzad-Hurson revealed that for particular multi-worker job, pay among workers differs on average by over fifty percent when workers are the first to propose a price. However, when workers are in the same location, employers deliberately raise the pay of lower bidders, reducing disparity irrespective of differences in

assessed productivity or reservation values. Yet the same employer that compresses pay when workers are co-located will allow disparities when workers are physically separated. Cullen and Pakzad-Hurson further documented that operating under pay transparency, employers deliberately minimize pay disparities among workers—but not necessarily otherwise.

As pay relates to output quality, Cullen and Pakzad-Hurson found that when renegotiation of pay is permissible, output quality rises slightly.



For particular multi-worker job, pay among workers differs on average by over fifty percent when workers are the first to propose a price.

When renegotiation is not permissible, however, average quality of output declines by a full standard deviation and a small number of workers fail to complete the task altogether. They also found that large employers and male employers are slightly less likely to reduce pay disparities and that “communication channels increase the eventual pay of men much more than the eventual pay of women.”⁸⁷

“Company Store” Issues

Platforms are increasingly finding ways to collect multiple income streams and additional fees from workers, and creative strategies are being devised. Since July 2015, Uber has been recruiting new drivers by offering short-term leases through a Delaware-based subsidiary called Xchange Leasing. Drivers pay a \$250 upfront deposit and then make “simple and convenient” weekly payments that are automatically deducted from Uber earnings over the course of the three-year life of the lease. At the end of three-year lease, Uber keeps the \$250 deposit to release the drivers from the lease. Uber predicts that its financing and discount programs, which include Xchange, will put more than 100,000 drivers on the road in 2016. Although Uber claims that Xchange isn’t intended to be a moneymaker, many critics accuse the company of looting the pockets of its drivers.⁸⁸



Platforms and Discrimination

Unwarranted—and often unlawful—discrimination on platforms is gaining attention and undergoing increased scrutiny. According to Laura W. Murphy of the American Civil Liberties Union, “There is no one product change, policy or modification that can eliminate bias and discrimination. Tackling these challenges requires a sustained and multifaceted approach.”⁸⁹

Using a new data set combining pictures of all New York City landlords on Airbnb with their rental prices and information about quality of the rentals, Edelman and Luca show that non-black hosts charge approximately 12 percent more than black hosts for an equivalent rental. They point out that “Airbnb has little incentive to reduce discrimination, which helps explain the reputation system that Airbnb has established. In a litigation context, the posting of names and photos—with nothing more—is unlikely to create liability for platforms such as Airbnb.” This is due to Airbnb’s position as a passive platform for others to place content, a relationship that courts consider when determining whether a person or business is unlawfully discriminating against protected classes of people. Airbnb, like Craigslist or other platforms that do not actively solicit information about race, gender, or familial status, generally cannot be held accountable for the actions of its users. Edelman and Luca differentiate Airbnb with a court judgment issued against Roommates.com, which did ask its users to provide this kind of sensitive information.⁹⁰

On September 8, 2016, responding to accounts of discrimination from its guests, Airbnb released a 32-page report that serves as a blueprint on how they will combat discrimination. Airbnb told its rental hosts that they must agree to a “community commitment” and adhere to a nondiscrimination policy. Airbnb also said that it would attempt to reduce the prominence of user photographs, which indicate race and gender, and will accelerate the use of instant bookings, which lets renters book places without host approval:

“We’re asking everyone to agree to something we’re calling the Airbnb Community Commit-

ment, which says: We believe that no matter who you are, where you are from, or where you travel, you should be able to belong in the Airbnb community. By joining this community, you commit to treat all fellow members of this community, regardless of race, religion, national origin, disability, sex, gender identity, sexual orientation or age, with respect, and without judgment or bias.”⁹¹

Discrimination by Worker Country of Origin

In *Hiring and Learning in Online Global Labor Markets*, Roy Mill used data from the online matching site Freelancer.com to examine the effect of freelancers’ country of origin on their likelihood of being hired. He found that freelancers from developing countries are less likely to be hired when they have no individual reputation, and as individual reputation becomes better, this country-of-origin effect disappears. Mill concludes that “Online platforms allow developing countries to export labor services, but the ability to penetrate foreign markets depends on the perception of the quality of these services in the importing economies.”⁹²

In an analysis of internal data from Nubelo, the largest online labor platform targeting the Spanish-speaking market, Hernan Galperin and colleagues found that employers favored domestic employees. Based on their most conservative estimate, foreign workers are 15 percent less likely to obtain contracts in Nubelo compared to domestic workers; however, the discrimination appeared to be statistical rather than “taste-based.” When more information became available about workers’ quality, discrimination decreased.⁹³

Gender and Platforms

Galperin and colleagues also analyzed gender data, finding no evidence of discrimination against women, contrary to some findings in traditional labor markets. In fact, women had a small hiring advantage in this case, particularly among female employers. However, women were less likely to submit bids and tended to ask for lower wages, particularly when bargaining with male employers.⁹⁴ As previously noted,



Chan and Wang also found a positive bias toward hiring women.⁹⁵

Katz and Krueger conducted a version of the Contingent Worker Survey, as part of the RAND American Life Panel in late 2015, to monitor trends in alternative work arrangements. An alternative work arrangement is defined as temporary help such as agency workers, on-call workers, contract company workers, and independent contractors. They found that women in alternative work arrangements more than doubled from 8.3 percent to 17 percent between 2005 and 2015, and that overall, women are more likely than men to be employed in an alternative work arrangement. Diverting to age for a moment, this research also showed that individuals between 55 and 74 are the major drivers of the platform economy's growth.⁹⁶

Global Labor Arbitrage

“Wage gaps between rich and poor countries persist partly because labor cannot freely move between them due to immigration restrictions imposed by rich countries,” according to Mill’s Hiring and Learning in Online Global Labor Markets. Trade in services within platform-based labor markets tends to flow between wealthy and less wealthy nations, or North to South; employers tend to be clustered in wealthy countries, while contractors often reside in less-wealthy countries. This directional flow has the potential to sustain, or even exacerbate, wage gaps between rich and poor nations.⁹⁷

In *How Do Online Platforms Flatten Markets for Contract Labor*, Ajay Agrawal and colleagues, drawing on data from oDesk, find that workers from less developed countries (LDCs) are at a disadvantage in online labor markets. Platform-specific experience, however, can offset this penalty. Specifically, they find that “platform-specific experience, which increases the likelihood of success for all applicants, has a disproportionately large benefit for LDC applicants. We attribute this to the standardized and easily verifiable attributes of this platform-specific information, which disproportionately benefits LDC applicants because their education and off-platform experience is costlier for DC [developed countries] employers to interpret.”

Their work suggests that finding ways to reduce uncertainties around workers’ reputations and experience would significantly improve hiring efficiency, with greater benefits accruing to LDC workers for whom online wage rates tend to be higher than average national wage rates.⁹⁸

Elizabeth Lyons, in her 2014 doctoral thesis, examines the related information asymmetries between LDCs and DCs, with similar results. Using observational data from oDesk, Lyons found that although workers from LDCs are disadvantaged relative to workers from DCs (in terms of their likelihood of being hired by employers from DCs), verifiable information provides relatively greater benefits for those LDC workers.⁹⁹

Related trends in international hiring practices were found by Vili Lehdonvirta and colleagues when analyzing data from Elance-oDesk, with 89 percent of labor (by value) on the platform being offshored. They note that while most employers reside in rich countries and most workers reside in poor countries, workers are more likely to find jobs in their own domestic markets. Moreover, domestic contractors get paid more than international contractors for the same type of work. Their analysis suggests that “this bias against international contractors is not only due to practical factors such as time zone differences and language-based communication difficulties, but especially to what can be termed a ‘liability of foreignness,’” that is, costs of doing business abroad. They suggest that as firms are acquiring the skills to outsource more complex tasks, it is likely that high-skill activities will occasionally be performed by foreign workers. They expect, however, “that foreign workers in those higher skill categories are likely to be severely affected by liability of foreignness issues.”¹⁰⁰

Lehdonvirta and colleagues also found that almost all of the top 20 buyer countries are rich countries, while almost all of the top 20 seller countries are low- or medium-income countries. “Online labour markets are thus almost certainly contributing to the earnings of many people in low-income countries, and may even be a mechanism by which workers from lower income countries can earn larger incomes.”



Nonetheless, their research does not indicate that online labor markets are likely to close earnings gaps between countries.¹⁰¹

Ilaria Maselli and Brian Fabo examined the case of an Italian crowdsourcing platform for interior design, CoContest, to determine whether such a platform is profitable and why professionals would choose to provide their work through it. The authors' analysis shows that a straightforward pattern of northern employer/southern contractor is not represented here, because designers employed on the platform are from Italy, a high-income country. Although returns are low and crowdsourcing does not offer profitable full-time employment, CoContest can make sense for designers that are new to the labor market and facing high entry barriers.¹⁰²



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We Have the Opportunity to Nudge Future Networked Work Systems Toward Positive Platforms

The emergence of a middle-management tier, concessions won by an extended labor movement, and grand political bargains like the New Deal and Great Society all converged to create the modern work economy. Yet we have no reason to assume that these structural supports will carry over into a coordination economy. It is the platforms we create today that will shape the future of work.

Even now, the social and regulatory constructs that built the modern work economy are being disrupted. Foremost among these constructs is the idea of the “job” itself, and there is no reason to believe that the social contract built around “the job” will not be revisited, as well. Without intentional design, there is also no assurance that any future platforms will be structured to support broad concepts of well-being.

Indeed, while the move toward greater coordination may be inevitable, the shape these initiatives will take is not. Just as industrialization offered a succession of new tools at the center of numerous production-related social contracts, so too will coordination tools develop. Indeed, many coordination tools already compete with traditional providers of services—from house-cleaning to general labor—in ways that may undermine the support of workers at a middle-class level. Is this undermining process unavoidable? If so, the current labor force could soon be in a position analogous to that of traditional taxi service owners. New coordinated services like Uber and Lyft have benefitted from the legacy structures, social conventions, and regulatory provisions that protected traditional taxi service owners—while those owners are discovering that they are not well-positioned for developing structures.

As with industrialization, outcomes will depend in large part on the design dynamics of systems

now under construction. Yet the competitive logic of the current market does not encourage any single player to prioritize the development of a greater understanding of the externalities created by different approaches, much less to act on that greater understanding. The emerging economic realignment is unlikely to be friendly to workers by accident, but it may be possible for the future of work to support broader prosperity by design. It may be possible to build better outcomes into the technology itself.

Today we are faced with the challenge of not knowing precisely how to design more “**positive platforms**.” The economics of labor platforms are dimly understood at best, despite promising early work. However, we do see evidence that not all platforms are equally positive, and that knowledge could be a good start. The popular website 99Designs.com, for example, relies on an ongoing prize model, commissioning dozens of designers to submit completed works with the intention that the customer will choose and pay for just one. While this is a valid business model, it produces substantial unpaid labor in an already often low-paying field—the system encourages a fairly extreme kind of international arbitrage. On the other hand, coordination engines are being explored by foundation initia-



It is the platforms we create today that will shape the future of work.

tives, international development players such as Samasource, and municipal agencies like San Francisco’s Office of Economic Development, and we see that platforms themselves may be able to offer a kind of safety net, providing some basic employment options to anyone with a broadband connection.

It is critical to note that, to the degree that these



initiatives are taking shape against a larger backdrop of eroding social contracts, they may be swimming against the tide. As we create these systems, we must intentionally design for prosperity. Without such intentional design, new platforms risk further undermining the position of unskilled and less-entrepreneurial workers—disadvantaging the most vulnerable and potentially creating an economic climate of universal underemployment.

Catalyzing Movement Toward Positive Platforms

Moving forward, there is every reason to believe that the combinatorial speed of technological innovation will continue to outpace the agility of social and governmental responses. On the whole and from a global economic standpoint, it is important to recognize that platforms are likely to be positive developments that increase total trade and material wealth. However, they are self-contained and human-designed market economies—their structure and any positive or negative externalities are likely to have outsized impact as they scale to direct the flows of millions of workers, products, and services. In a sense, each new work platform is a unique experiment in labor economics, with its own strengths and weaknesses.

The dynamics of the dilemma inherent to a coordinated economy may suggest an initial approach to addressing it. Elements of coordination platforms could be deployed in a way that might support prosperity by design: more efficient matching; democratized access to means of production; collective leveraging of export, legal and other resources; increased velocity of transactions; potential returns to countries that show leadership in building global platforms; opportunities for unobtrusive positive “nudging;” community network effects; and greater alignment of worker-employer incentives. Yet it is worth recognizing the possible downsides of these kinds of platform designs: skirting of beneficial regulations and social conventions; transfer of additional cost/



Once global standards have been successfully deployed, it will be extraordinarily difficult to dismantle them and restructure in ways that are more favorable to supporting prosperity.

risk to workers; risk of decreasing total work through focus on only paying for periods of peak productivity; manipulateness; the possibly-monopolistic characteristics of network effects; further disenfranchisement of participants who may be poorly suited for entrepreneurship; direct competitive exposure to lower-margin direct substitutes globally; and even greater ease of ultimate automation.

Now is the critical time for setting early protocols and conventions. Because these platforms serve not only as marketplaces but also as the tools for complex technical interfaces, early network effects may serve to lock in any initial design faults for quite some time. Once global standards have been successfully deployed, it will be extraordinarily difficult to dismantle them and restructure in ways that are more favorable to supporting prosperity. However, initial structure can create favorable conditions in cases where platform and worker incentives are aligned.

In this fast-moving technical environment, building leadership with the platform design community itself is one way to yield substantial benefits. After all, digital code and codes of governance blur in these environments. Here, technicians are not only the literal builders of new market economies; they also are developing new de facto institutional frameworks. In many cases these frameworks will not rise to the level of real-world policymaking oversight for years, if at all. Yet they can nonetheless impact the lives of millions over that time frame.

To ensure that advances in networks and processing have the most positive impacts possible, the logical next step is systematic study. Meaningful examination of the factors that allow a platform to push toward an economic future that works for all will provide a critical foundation



moving forward. Both general upsides and general downsides of some platforms have already been the subject of public debate; a more formal and in-depth evaluation of the actual dynamics of platforms is the logical next step toward prosperity by design.

Indeed, there are several realistic large-scale possibilities that could be within the reach of positively deployed platforms.

One area of great potential is **economic growth**. A key element that makes automated systems so powerful is that they are becoming a huge part of the demand-side of transactions. Platforms are not only stimulating economic growth by producing work, they are also beginning to play the role of the consumer—something that has never been done at scale before. Once there is a substantial amount of demand-side transactions triggered by automated systems, we could inevitably expect an increase in total production, much as Wall Street transaction volumes have exploded with the heavy introduction of automated market trading systems.

Indeed, this increased economic velocity could provide part of the solution to the question of technological unemployment. Even if digital platforms help automate more jobs, they could still create more opportunities for workers overall. For example, if a sector of the economy doubles with the deployment of automation and workers lose a third their jobs to technology, there would still be more work available to workers; the total amount of human work would go up even as the share of work delegated to humans goes down.

Positive platforms could also help to **reduce the friction in labor markets as they exist now**. In the traditional workplace there have been many problems with aggregating work into coherent “jobs,” often creating permanent pigeon-holes for labor in which employees are stuck for years at a time, which can consequently leaves employees feeling dissatisfied or underutilized in their place in the

economic system. If deployed well, platforms could create a space that allows and encourages workers to reach their full potential.

Designed well, platforms could conceivably guarantee that workers are being routed to job opportunities that are deemed most valuable to them. Jobs could be allocated based on amount of compensation they provide and the basic individual preferences of workers.

By extension, these systems could also provide an unprecedented opportunity for **providing workers with targeted opportunities to acquire new skills**. As we all know, in order for jobs to be successfully completed when they need to be completed, it is imperative for workers to possess the right skillset. In today’s economy, a classroom, a vocational setting, or an unemployment roster has been proven to be inefficient for guaranteeing work and stimulating



A more formal and in-depth evaluation of the actual dynamics of platforms is the logical next step toward prosperity by design.

economic growth. On the contrary, platforms could potentially create and promote a space for learning new skills in an environment where people could actually get paid while learning. Furthermore, by applying platform logic to training, platforms could provide a solution to some of the upskilling problems we are currently facing with the traditional workplace model. By offering a space for workers to learn and gain new skills or enhance their current skillset, platforms could be a huge potential win for both the worker and the economy.

Platform work also has the potential to address problems on a global scale by creating a new toolbox devoted to specific problems such as energy and environmental issues. In order to effectively combat global issues, there needs to be a way to deploy international labor on a larger scale that has not existed prior. Ambitious



deployment of a global platform based logic could become more effective than any solution we currently have in our work arsenal.

In order for platforms to be positively deployed, we need to start building the system now. Platforms have the potential to truly address under-employment and unemployment by breaking apart jobs that would subsequently create more work and stimulate GDP growth. Platforms could also reduce friction that has long been a result of the traditional workplace model, redeploy skills, and address global problems in new and more efficient ways, just to name a few. Ultimately, positive platforms could help solve today's problems while potentially manufacturing tomorrow's problems. However, without deploying positive platforms, we will be faced with both today and tomorrow's problems.

There is much to gain from adopting a forward looking approach.



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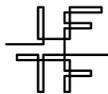
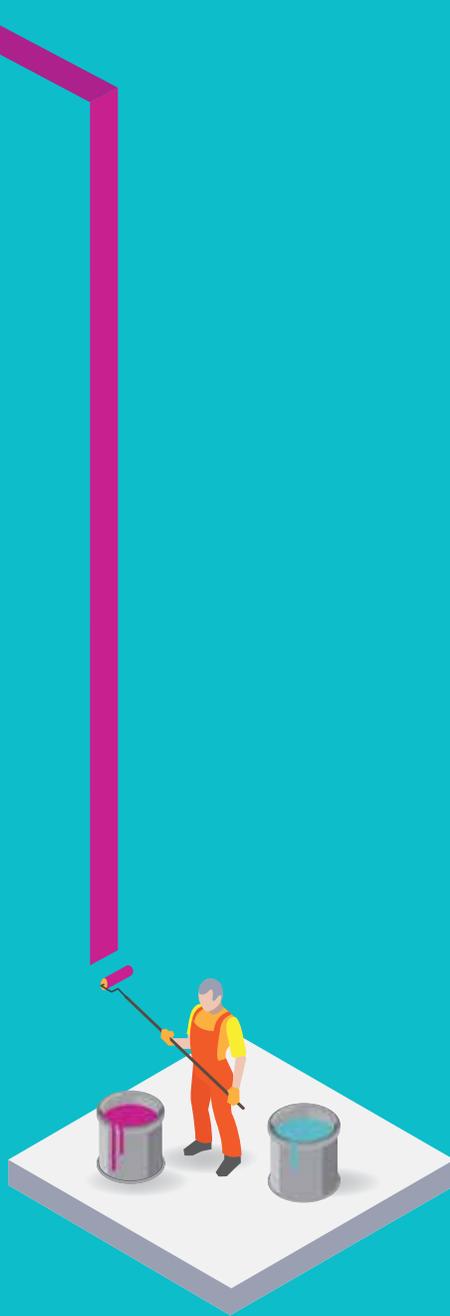
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