8

Inequality and the Digital Economy

Eli Noam

8.1 Introduction

For many years, policymakers in developed countries have believed and hoped that the Internet, and more generally the digital economy, would replace and enhance industrial jobs. This was important to developed countries as their traditional manufacturing activities were either being automated or were migrating to developing or emerging countries. It was also important as a way to find a productive space for younger generations who moved from the blue-collar jobs of their parents to knowledge-based occupations where they could utilize society's investment in their higher level of education. Lastly, such jobs, with their replacement of low-paying factory drudgery with well-paying digital tasks, were also considered to reduce class division and inequality.

Thus, in countries undergoing deindustrialization—and which isn't, among developed economies—an Internet-based economic growth has been widely recommended as a way to create economic activity and reduce the inequality of postindustrial society. In particular, the opportunities that the Internet affords to the "creative workforce" are believed to be an engine for employment.

Because this is important we have to confront the question openly, with no nostalgia for the past, with eagerness for the future, but without wishful

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thinking about the present. We now had several decades of digital evolution, and it becomes possible to measure rather than postulate. So let us look at the Internet as a job creator.[1]

8.2 Gains

The conventional story is one of great success. Industries that are negatively affected tend to be viewed as inefficient oligopolies such as the music industry or daily newspapers. The Internet is supposed to have caused up to 21% of GDP growth in 5 years in mature countries.[2] In the US, the Internet economy has reportedly created 1.2M jobs[3] directly, according to a Harvard Business School study.[4] In France, too, the Internet has supposedly created 1.2 million jobs directly.

But what kind of jobs? In the US, most of them were in e-commerce, not in anything really creative, but mostly in order fulfillment, i.e., packaging and shipping, as well as the delivery of the physical goods such as through trucking, accounting for more than 500,000 of the 1.2 million jobs. Internet service providers generated 181,000. Creative jobs were, in particular, in content-related employment, estimated at 60,000, and in software as a service, 31,500.[5]

These modest numbers are in contrast to the sometimes breathless hype. For the Internet of Things, a trade magazine gushed "While today there are just 300,000 developers contributing to the IoT, a new report from VisionMobile projects[6] a whopping 4.5 million developers by 2020, reflecting a 57% compound annual growth rate and a massive market opportunity."[7]

There were also new types of jobs spawned by various applications such as, new taxi drivers[8] due to the car service app Uber, or by people creating their own new income streams, for example, by renting out driveways on Parking Panda.[9]

There are also many indirect job creations. A study found that each Internet job supports approximately 1.54 additional jobs elsewhere in the economy.[10] Another study, conducted by the McKinsey Global Institute on data from 13 countries, found that for every job destroyed, the Internet created 2.6 new jobs, for a net addition of 1.6.[11]

8.3 Losses

Let us now also look at the downsides. Even a technology booster, Bill Gates, warned

> Software substitution, whether it's for drivers or waiters or nurses … over time will reduce demand for jobs, particularly at the lower end of skill set. … 20 years from now, labor demand for lots of skill sets will be substantially lower. I don't think people have that in their mental model.[12]

Gates was half right. Some job losses are upon us, as one would expect in any transition. But are they at the lower end of employment or at the middle?[13]

8.3.1 The Internet-Induced Job Losses in the Industrial Sector

In the US, industrial blue-collar jobs have disappeared at the rate of 350,000 industrial jobs each year in the US for 2 decades now. Plus the multiplier effect of jobs, about 1.6 per industrial worker and 2.5 per skilled industrial worker. This adds up to a job loss of about half a million each year.[14] Of course, many would have disappeared anyway, but more slowly. Transition time is important. People would have had more time to adjust, retrain, and relocate. The Internet has accelerated the outmigration of jobs. Erik Brynjolfsson and Andrew McAfee of MIT argue in their book, *Race Against the Machine*,[15] that progress in information and communication technology (ICT) may be occurring too fast for labor markets to keep up.

Take the photography company Kodak. It employed more than 140,000 people. It even invented the first digital camera. But Kodak went bankrupt when that same digital photography moved to Internetworked mobile phones. A major player in that new field is Instagram. Instagram was bought by Facebook for a billion dollars in 2012, and reportedly employed only 13 people.[16] It, and the designers of digital cameras will not provide employment for the tens of thousands of Kodak manufacturing workers who lost their jobs. Such digital camera makers, in the US, include General Imaging, Cobra, and SeaLife. Best known is the action-oriented GoPro. Its products, however, are built in China and Brazil.

8.3.2 The Impact of the Internet on Service Jobs

Following the blue-collar jobs, the pink-collar jobs in retailing and clerical staffs began to shrink as retailing moved online. Similarly, service support jobs such as telemarketing or editorial work have been moving offshore. Middle management levels have been cut as ICT made supervision and

information exchange easier, thus reducing the need for intermediate levels of management.

Online shopping has been growing steadily, with a US share of above 12% ($473 billion) of total retail (4.03 trillion) and rising.[17] In the UK, a research project predicted, according to its director, professor Joshua Bamfield: "We expect 4000 to 5000 stores to close due to competition from online retail, with an acceleration in chains closing stores to focus more on online operations."[18] In America, the drop in retail jobs since 2007—after a four-year boom—has been pronounced, with a reduction of 900,000 jobs in 5 years, a nearly 6% decline.[19]

Retailing is not the only service industry to be affected. A short list of some of the major industries destroyed by the Internet[20] includes newspapers, travel agencies, stock brokers, and soon also universities. So we have more than a deindustrialization, but also a "de-servicization."

8.3.3 The Unequal Impact on Different Income Classes

The problem is not just the loss of traditional employment at a pace that was hard to counteract by digital employment, but that the losses are distributed unequally. In the United States, half the 7.5 million jobs lost during the Great Recession were in industries that pay middle-class wages. But only 2% of the 3.5 million jobs gained since the recession ended in June 2009 were in midpay industries. Nearly 70% are in low-pay industries, and 29% in industries that pay well.[21]

In the 17 European countries that use the Euro as their currency, the numbers are even worse. Almost 4.3 million low-pay jobs have been gained since mid-2009, but the loss of midpay jobs has not stopped. In Japan, a 2009 report from Hitotsubashi University in Tokyo documented a "substantial" drop in midpay, midskill jobs in the five years through 2005, and linked it to technology.[22]

Many middle-level jobs are easier to automatize by smart software programs, or to outsource and offshore, than low-level jobs. One can automatize travel agents and bank tellers, but it is harder to do it for road construction or cleaning crews.

A study by David Autor of MIT and David Dorn of the Centre for Monetary and Financial Studies in Madrid[23] graded occupations in terms of their vulnerability to automation. They identified the jobs of secretaries, bank tellers, and payroll clerks as among those most dominated by routine tasks. Industries that adopted IT at faster rates also saw the fastest growth in

demand for the most educated workers, and the sharpest declines in demand for people with intermediate levels of education. Thus, whereas in the 1970s and 1980s employment in middle-skilled, middle-income occupations grew faster than that in lower-skilled jobs, by the 1990s employment in middle-class jobs began to decline as a share of the total while the share of both low- and high-skilled jobs rose.

The data shows these trends, with middle-income occupations losing out, while upper and lower income occupations have been gaining (Fig. 8.1).

Of course, warnings about challenges to the middle class have been around for a long time, as Robert Gordon has pointed out,[24] and been a staple for political candidates on the stump. ICT was seen as a way to turn this around. Yet a study by Guy Michaels, Ashwini Natraj and John Van Reenen of the London School of Economics for 11 countries finds that industries that adopted ICT at faster rates (as measured by their spending on ICT and R&D) also experienced the fastest growth in demand for the most educated workers, and the sharpest declines for those with intermediate levels of education.[25]

This "hollowing out" of the middle-class workforce will continue.[26] The US Bureau of Labor Statistics predicts that employment in low-skilled service occupations will increase by 4.1 million, or 14%, between 2008 and 2018. The only major job category with greater projected growth is that of

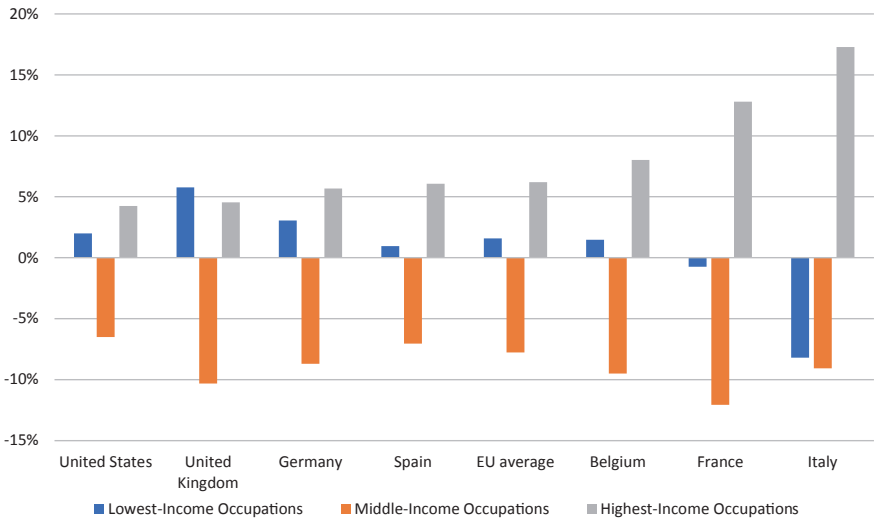

Fig. 8.1 Change in Employment Shares, 1993–2006 (*Source* Data from Goos, Maarten, Alan Manning, and Anna Salomons. 2009. "Job Polarization in Europe." *American Economic Review* 99 (2): 58–63)

professional occupations, which may add 5.2 million jobs, or 17%.[27] It is much lower for middle-class jobs. So we create a bottleneck. Menial Jobs at the bottom, professional jobs at the top, and a weakening in the middle.

This has a lot of implications. It means that the job mobility from lower to middle class, which had been the historic way to individual progress, is becoming more difficult. The lower occupations are blocked. Social mobility is thus declining. For much of the twentieth century, people's job prospects rose with extra education. While this is still true, the effect is lessened at the lower end. And this happens at the time when the cost of education keeps climbing steeply.

8.3.4 The Impact of the Internet on Younger Workers

It is generally believed that the Internet leaves behind older folks unprepared for the digital age, but that it is a great improvement in the opportunities of young people. If so, how come their standard of living today is lower than those of the preceding generation, and how come there is such a huge youth unemployment in many advanced countries?[28] Youth unemployment in 2015: USA 11.7%,[29] United Kingdom 14.4%,[30] France 24.1%.[31] If the Internet has done all these great things for the digitally native generation, and if it has made distance obsolete, how come they live more than ever with mom and dad?

There is a great illusion that since the Internet has been creating young multi-billionaires like Mark Zuckerberg, Sergei Brin, and Larry Page, it must be good therefore for an entire generation. But that is a sloppy and incorrect conclusion. The Internet creates, indeed, greater opportunities for a few young people, who have education, a spirit of entrepreneurship, and a great deal of luck. But this does not prove anything for the average opportunities of the young generation. Those opportunities follow the overall polarization of jobs—more opportunities at the professional top. More opportunities at the bottom. And fewer opportunities in the middle. Yet the middle is where young people with some skills and education must go, because it is the classic jump-off point to the top.

8.3.5 The Impact of the Internet on Older Workers

Paradoxically, a similar problem happens at the other end of the age spectrum. The rapid change in knowledge and technologies means that the learning curve is short, and that there is less value to the experience.

In the past, an experienced elder had advantages. Now, the old become expensive, out of date, and expendable. They get bumped out of the middle level jobs where there is less room and the competition for the jobs is tougher than before. Their skills become obsolete for the top jobs. And the medial jobs at the bottom are often physically too demanding. So there is less room for older workers. And this is just at the time when life expectancies rise. When retirement systems become unaffordable to societies. And when companies find ways to avoid paying taxes to contribute to the pot. Thus, the same technological progress that enables society to keep old folks' bodies alive longer is also shortening the value of their minds.[32]

8.3.6 Is the Creative Sector the Remedy for These Job Losses?

Is the creative sector going to be the substitute for all of those industrial and service sector jobs that are being lost? This claim, often heard, is absurd if one looks at the numbers. It just shows that many creatives who make the argument, or politicians and intellectuals, substitute wishful thinking for statistics. In America, the number of industrial jobs lost over the past decade has been 5 million, including the multiplier effects.[33] The number of retail jobs lost has been over a million.[34] The number of people with jobs in journalism, books, TV, film, theater, music, is less than one million.[35] So if creative jobs alone should do the compensation one would have to expand that sector by a factor of 7. Who would watch, read, or listen to all this new creation? People are not going to watch 7 times more TV, they already watch 7 hours a day. Plus, a lot more people produce content as volunteers, not as a job. On top of that, the globalization of media means that every other country's content is also available, and is also expanding, by the same logic, by a factor of 7. And, who is going to pay for all this, so that these creators actually get a paycheck?

While the claims of creative jobs that will offset industrial and service losses are being touted, let us take note that journalist jobs are melting like butter in the sun.[36] That most musicians do not get paid anymore by anyone. That fewer people read books, though more books get written. That TV networks are a shade of their former selves, and the cable networks are very leanly staffed operations.

Even if one expands the definition of creative to software and design, and even if one includes a generous multiplier, the numbers do not support the notion that the creative sector will be an offset to the industrial and service job losses.

To conclude: the Internet is a force for inequality. It creates inequality among occupational classes, among regions, and among generations.

The preceding discussion can be equally adopted by neoliberal economists on the right and critical media scholars on the left. Where they part company is in the analysis of the causes, and therefore also of the remedies. Many of the latter believe that the problem is caused by profit-focused Internet moguls. Stop them and the world will be a better place. But this view is quite wrong even in terms of critical analysis. Some people end up at the top, by luck, pluck, and connections. The real question is not who ends up at top but whether the new technology defines economics, which defines a market structure and an employment configuration whose equilibrium is socially objectionable.

Thus, the emerging unequal employment system may well be not the result of failure but of success. It is the result of fundamental economics that restructure economies fundamentally. And because they are fundamental they are very hard to deal with through government policy.

8.4 The Fundamental Economics of the Digital Economy

8.4.1 Fundamental Characteristic #1 of the Digital Economy: Digital Activities Are Typically Characterized by High Fixed Costs, Low Marginal Costs, and Network Effects

Do the new Internet media make a difference on media industry concentration, in the way its enthusiasts believe? Internet media, after an early stage of a dynamically competitive market structure, often becomes highly concentrated. Various market segments have their dominant players—Amazon, EBay, Microsoft, Google, Facebook, Twitter, YouTube, Apple's App Store, and others. The Internet sector was believed to be wide open and competitive and would open things up for other industries, but it exhibits strong concentration trends. The underlying economics on the supply side are, high fixed cost and low marginal cost; and on the demand side, strong network effects. This leads to major economies of scale. And therefore, it results in highly concentrated industries, with a few firms the winners.

New information industries are more capital intensive than old ones. Their ratio of capital costs to operating costs is higher than in the past. In business terms, capex was growing while opex was declining. In consequence, their scale economies are greater and their market concentration is higher.

There are several business implications. The economies of scale lead to large-sized companies and consequently to a high market concentration. In the extreme, one encounters a winner-takes-all near-monopoly. There are therefore incentives to reach large size through mergers and/or to be a first-mover in a product in order to gain scale.

It means that the market structure among companies is highly unequal. Some firms win big, most lose out or are weak. This trend is likely to continue, especially if the pace of disruptive innovation in the sector slows down a bit.

8.4.2 Fundamental Characteristic #2 of the Digital Economy: A High-Risk Distribution of Success

A major characteristic of media is its high risk in the presence of competition. One often observes a "80–20" outcome in which 80% of all media products do not become profitable, 90% of all profits are generated by 10% of the products, and 50% of profits are generated by 1–2% of products.

Every industry and company is structured like a tournament. And the question is how such a tournament is set up. Is it "winner-takes-all"? The economic literature tells us that the higher the risk in the tournament, the greater one must make the disparity between the winners and the losers. One must compensate the players by a higher jackpot.[37]

In accordance with this analysis, creatives' incomes are much more unequally distributed than regular incomes, due to the risk characteristics of their companies and industries. And that can be observed. The tournament profile of compensation for aspiring creatives is extraordinarily steep. Pay differentials in media are especially high due to an oversupply of talent, as well as due to an incentives structure where the few "winners" receive the majority of the reward.

Creatives usually overestimate the odds for personal success.[38] They also accept low compensation and high risk because of the high level of personal satisfaction inherent in artistic careers. In creative activities, such as film and TV, or in sports, small differences in talent may typically result in extreme differences in reward.[39] These small talent differences are rewarded exponentially rather than linearly, which leads to highly skewed distribution of rewards. This model applies to many industries, but it is most pronounced in the creative industries because spots at the top are scarcer, and the bottom is much wider.[40] Thus, an economy with a stronger participation by creative is a more unequal economy. And a digital economy with a strong reward system for the winners is more unequal.

8.4.3 Fundamental Characteristic #3 of the Digital Economy: The Presence of Non-Maximizers of Profit

Many individuals in the digital field derive utility from the process of creating a product, not from profiting from its sale. Producing the good is not a chore but a benefit. When this occurs it is hard to distinguish production from consumption. In media production, creatives are incentivized to maximize recognition, not profit, or a combination of the two. Online media provide a greater way to create content and find an audience by lowering the cost of production and distribution, and hence have increased this non-profit participation. As a result, it becomes more difficult for participants to survive economically. The notion that "one can't compete against free" affects companies as well as individuals. This is another factor in skewing the income distribution further.

8.4.4 Fundamental Characteristic #4 of the Digital Economy: Excess Supply

Media production increases exponentially at a substantial rate, while media consumption increases linearly and slowly. Content rises by about 12%, and attention rises by less than 4%. Given the gap between production (supply) and consumption (demand), excess supply is inevitable. Compared to 1998, fewer than half as many of the new products make it to the bestsellers lists, reach the top of audience rankings, or win a platinum disk.[41]

In almost any scientific field, more research articles were written just this year alone than in the entire history of human beings before 1900. In the field of chemistry, within a span of thirty-two years (1907–1938), one million chemistry articles were authored and abstracted. In contrast, it took less than one year for a million such articles to be produced in 2010. Every thirty seconds, a new book is published. Every day, ten new feature films and 1500 television shows are produced.

This has consequences for both content style and marketing.[42] Attention is the scarce resource.[43] As Nobelist Herbert Simon observed, "a wealth of information creates a poverty of attention."[44] New media consumption must be mostly supported by substitution from existing media in terms of time or full attention. Inevitably, this leads to rising competition for "mindshare" and "attention." Such competition, in turn, leads to pressure on prices, discussed in the next section, and hence to a lowering of compensation.

8.4.5 Fundamental Characteristic #5 of the Digital Economy: Price Deflation

When competition occurs, prices drop toward long-term marginal cost. In the short term, marginal cost is near-zero and does not cover fixed cost. The result of price competition with low marginal cost has been price deflation in information products and services. This is a good deal for the consumer who enjoys substantial "consumer surplus." They must shell out much less than they would be willing to pay if they had no choice. But it creates a difficult problem for the supplier.[45] Price deflation to marginal cost poses a threat to long-term viability since low prices make it difficult to cover costs and achieve profitability. And that is indeed what has been happening. Information has become cheaper for many a decade. It is often becoming difficult to charge anything for it. Music and online content is increasingly free. Free newspapers are being handed out. Such a price deflation is one of the fundamental economic trends of our time.[46] The entire competitive part of the information sector—from music to newspapers to telecoms to Internet to semiconductors and anything in-between— has become subject to a gigantic price deflation in slow motion. This leads to economic pressure, to price wars which squeeze out weaker companies and subsequent consolidation of the more viable survivors, and to lower compensation for all employees.

8.4.6 Fundamental Characteristic #6 of the Digital Economy: The "Reverse" Cost Disease

For a long time, the income in creative industries has risen, even though productivity has not. This impact is known as the "cost disease," a term coined by William J. Baumol and William G. Bowen.[47]

The "cost disease" phenomenon seems counterintuitive. In the long run, workers' real incomes rise due to their rising productivity. This raises incomes across the economy. One must therefore pay low productivity occupations, like creatives in media, more than before, because they now have better-paying alternative opportunities. These increases in the cost of production may offset the cost savings from any technical progress in those creative activities. Thus, workers in occupations experiencing no growth in labor productivity at all nevertheless receive higher wages as a result of increases in productivity in other sectors of the economy. The labor-intensive performing arts thus become relatively costlier to produce, thus showing low productivity.[48] And yet, the people employed in these activities actually get paid more than in the past.

However, this driver of income growth characterized the past. The same logic now depresses creatives' incomes. As industrial wages decline relatively, they also affect the creatives' compensation.

8.4.7 Fundamental Characteristic #7 of the Digital Economy: Instability

As a result of the various factors, the digital economy is more volatile than the industrial economy. It is more subject to economic cycles and greater instability. The dynamics are as follows: an innovative idea raises hope. A boom gets on its way, becoming a bubble. But in a competitive environment, competition drives prices down to marginal cost. Marginal cost is close to zero. Such a price is not sustainable for long. Companies go out of business en masse. Investors flee. The economy descends into a downward spiral. But soon, the survivors stabilize the industry. Prices rise, and with it profitability. At that point, new entrants emerge. The industry becomes more competitive. A new cycle begins.

Thus, the information economy is an unstable economy. And because of the acceleration of technological progress ("Moore's law"), the cycles almost inevitably accelerate in frequency and maybe in amplitude.

8.4.8 Fundamental Characteristic #8 of the Digital Economy: The Transformation of Firms into "Network Companies" Leads to a "Freelance" Economy

The economic system based on the electronic networks changes work relations. Firms become organized as networks. They hire by project. They outsource to contactors. They do everything they can to reduce the fixed costs and to shift it to others. Examples are computer chip making and film production. Most chips today are designed by companies but not manufactured by them. Sometimes even the design gets outsourced to design bureaus. The same holds true for the Hollywood studios. Most of the films they distribute are made by independent entities, which in turn contract with others for their temporary services. Increasingly, collaborators are assembled for projects on a project basis. Companies contract workers, consultants, and outsourced vendors.[49] In the same way that "just in time" production has shifted manufacturing, capital assets, inventory, and risk to the suppliers of components, so it is now giving rise to "just in time" workers—employees

whom a business can hire on a moment's notice to fill a moment's need.[50] These "just in time" workers have few of the benefits that traditional employees have gained over time. No health and safety protections, retirement plans, or overtime pay. This organizational model has the potential to become the model for the mainstream firm of the future, given its project-oriented, fluid management structure, flexible skills deployment, and reduction of fixed costs.

8.5 Consequences for Digital Management

Is it realistic for digital managers to think that they can avoid these issues? That they can take credit for just about anything positive that is happening, from Tahrir Square to the Obama election to microfinance in developing countries, but that somehow the negative developments are someone else's fault?

There are two tracks for digital companies' actions, the first is that of their policy positions, and the second is that of management actions. As profit maximizing managers, they will inevitably create value and wealth, but also be part of creative destruction. Outside of noble but superficial philanthropic and socially responsible actions, they cannot avoid the fundamental forces described above. This means that they must understand the environment in order to function in it.

8.5.1 Expect a Return of Unionization

To create employment benefits for the new type of employees, labor unions in the freelance tech sector are likely to emerge, following the model of unionization of creatives in theater, film, and music. The constraint is the difficulty of effectively striking when the work can be easily outsourced to offshore locations. This suggests that the most likely strategy of labor will be that of political pressure and legislation.

8.5.2 Expect a New Wave of Political Disputes and Activism in the Digital Economy

Income and employment issues are part of a much larger discussion over the control of information resources. This includes advocacy for unimpeded access of content to the Internet ("net neutrality")[51]; the "open

source" movement that battles Microsoft[52]; the "copyleft" community that challenges copyright systems that favor media companies[53]; the privacy protection advocacy against the use of personal information by marketers and governments[54]; the peer-to-peer file sharing, which has moved beyond financially convenient piracy to an ideology on cultural creativity[55]; the "open innovation" concept of user-based technology communities that has challenged the traditional proprietary R&D system[56]; the "unlicensed spectrum" initiatives that seek to undermine the exclusivity of access to airwaves of broadcasters and wireless providers[57]; the push against a "digital divide" that is based on the income, skills, and geography[58]; the move to municipal and free WiFi connectivity challenging phone companies[59]; and more. All of these developments have their particular reasons but also a common thread. They are manifestations of a wider conflict over the extent and nature of control in the information society.

Most observers are familiar with the various flash points but have not always connected the dots and recognized the emerging social movement on the model of environmentalism. For years, information companies and governments have touted their activities as the key to the planet's economic and cultural future and the solution to most of its problems. No wonder that control over this sector is being contested by more than business competitors. As the information sector permeates society, society, in turn, permeates the information sector with its internal and international conflicts.

8.5.3 Expect a New Wave Government Policies

Given these fundamental economic and technological drivers, it is almost inevitable that the economic equilibrium of the internet economy, left to itself, will not be at a level of diversity and employment that many people consider necessary. Recent decades have led to a reduction of regulatory restrictions and interventions because of the expectation that technology and market forces would overcome inequalities in democratic societies. If this hope is not realized, the pendulum will inevitably swing back to various interventionist approaches of regulation, breakups, and subsidization, promoted by the various activist initiatives described above.

But governmental actions are becoming more difficult. Government rules worked moderately well on the operational level when industries were simple and tools of control existed. But the government's powers today are much more limited. If Google has significant market power in Argentina, how should or could the search engine market there be restructured? If a Korean firm is dominant in interactive games, what then is the Swedish

(or the EU's) government's remedy? If Skype's voice quality declines, who would deal with that, if at all, and how? And these are merely conceptual questions, to which are added those of politics, litigation, international trade, intellectual property rights, and international enforcement. It is always difficult for laws or regulations to modify fundamental transitions of industries. It is particularly difficult to do so where, as in the case of media infrastructure of the Internet, any policy in a free society needs to be done with a light touch.

8.5.4 The Need for Direct Business Action

Digital firms need to contribute directly to overcoming some of the dislocation effects which they have created, or else they will find themselves regulated in unfavorable ways. This goes beyond a little PR-driven philanthropy. They should channel their talent, creativity, and problem-solving skills to help those on the losing side of the equation. On the educational and skill side, they should contribute to STEM education, and send some of their best and brightest team members to teach it. This should include the training of older people. It is disgraceful how the Internet sector first marginalizes older folks, then makes fun of them, leaves them destitute, and does not lend a helping hand.

8.5.5 Stop Claiming to Be the Solution

The least productive approach for digital managers is to try to take advantage of a problem they helped create, by proclaiming that they should receive more help, more governmental support, more access, less regulation, etc. and everything will be fine. That will only damage their credibility and backfire.

8.5.6 Stop Arguing That Seeing a Problem Is Anti-technology Luddism

Every time there is a technology shift, there are doubts and fears. Throughout history, technology has been a job creator.[60] But that did not help those that were dislocated. In the Industrial Revolution, which proceeded at a much slower pace, millions of Europeans ended up destitute and had to migrate to sprawling city slums or to distant shores. Social and political revolutions and upheavals abounded. Now, the pace of dislocation is even faster. And the problem might be deeper. As the MIT study by Brynjolfsson and McAfee argues:

> The pattern is clear: as businesses generated more value from their workers, the country as a whole became richer, which fuelled more economic activity and created even more jobs. Then, beginning in 2000, the lines diverge; productivity continues to rise robustly, but employment suddenly wilts. By 2011, a significant gap appears between the two lines, showing economic growth with no parallel increase in job creation.[61]

8.5.7 Recommend, Support, and Finance Governmental Actions Where Appropriate

What might such governmental strategies be? This is a big topic. Foremost, it should become easier for people to retrain and obtain new skills. One proposal: let people of over 40 years of age take time off—say a year—to retrain. This would be funded—tuition and living expenses—by the Social Security system (or similar pension arrangements elsewhere). In return, the retirement benefits for the person would commence later. For each month of retraining "sabbatical," that person's retirement date would go up by one month. This would approximately fund such a system. There should also be a required job training during an unemployment period where public benefits are received. There should be free online or part-time training courses with certifications. And there should be mandatory and higher requirements for STEM courses in both secondary schools and college, and more vocational training. College degrees should have required dual majors: one in a "practical" area, and the second one in any other area.

A second major governmental strategy is to strengthen those industries that are more stable. These tend to be local in nature rather than global. They are, in particular, industries that deal with the human body, with the home, with maintenance, and with hospitality and leisure. Some jobs are still beyond the reach of automation and outsourcing: construction jobs, jobs with unpredictable patterns, jobs requiring dexterity and judgment, jobs for small batches or with numerous variations,[62] or jobs that require an understanding of human nature. Such jobs, as well as those that are local in nature, deserve development priority.

To conclude: The impact of Internet-induced economic displacements in developed economies will not go away. It will get worse in the short term. This creates a challenge to managers and policymakers in the digital sector. Otherwise, a backlash will create forces that will restrict innovation. It is therefore important for academics, public–policy analysts, NGOs, companies, and governments to think creatively about new approaches to these issues, and to balance the public interest, technological innovation, and financial investment in the emerging environment.

Notes

1. An earlier and preliminary version of this article is in the Pamplona conference proceedings of the International Media Management Academic Association, Wildman, Steve, and Monica Herrero, eds. (2015), *The Business of Media: Changes and Challenges* (Lisbon: Media XXI).
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