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The Future of Work: Apps, Artificial Intelligence, Automation and Androids by

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Working Paper

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The Future of Work: Apps, Artificial Intelligence, Automation and Androids

David Barnhizer

The analysis offered here is not a Neo-Luddite rage against “the machine”. As with the oft-stated reproach about paranoia, there sometimes are situations in which people are “out to get you”. In our current situation the threat is not from people but from the convergence of a set of technological innovations that are and will increasingly have an enormous impact on the nature of work, economic and social inequality and the existence of the middle classes that are so vital to the integrity, facilitation and durability of Western democracies.

The fact is that developed nations’ economies such as found in Western Europe and the US are facing a convergence of technologies that ostensibly fit into Joseph Schumpeter’s idea of “creative destruction” but with the unfortunate caveat that while we are experiencing Schumpeter’s “destruction” of a generation of economic and institutional forms on which governments and tens of millions of workers have relied, the emerging conditions involve “destructive destruction” without the “creative” phase of economic rebirth for a very significant portion of our populations.[\[1\]](#) The forces and technologies pushing us in this direction are relentless. In a globalized market economy that now sees corporate, financial and multilateral authority dispersed across borders we lack the ability to hold actors accountable or to intervene and impose effective limits on what is occurring even if we possess an adequate level of political will manifested by our leaders and key institutions.

This discussion is only peripherally about law schools and lawyers because those two institutions are nothing more than derivative manifestations of what is occurring in our larger systems, not the drivers or creators of economic and political forces. As US law schools experience a dramatic downward shift in applications and enrollments, concerned and increasingly panicked law faculties at many institutions are looking in the wrong direction and at the wrong factors in trying to determine their future. This is because anyone attempting to tease out strategies by which they can adapt to economic change by designing positive plans of action based on past cycles and workplace conditions is chained to a bench in Plato’s Cave—mistaking flickering shadows for concrete reality.

Begin with some basic assumptions and observations about the fragile nature of our economic structures. This includes our own general ignorance or lack of awareness about the conditions of work and how easily and quickly functions we take for granted can disappear, almost overnight. People wonder where the jobs went as they pass through the

self service line at their grocery, pump their own gasoline, make their air, hotel and car reservations on-line rather than through a travel agent or go through an endless series of non-human prompts on their telephones when they try to get through to “customer service”. They wonder where the jobs have gone when they pass through automated booths on turnpikes or parking facilities, or purchase tickets for events. When you enter a manufacturing plant you can sometimes marvel at how the robotic work forces construct our products with very few humans around to supervise.

I recently exchanged e-mails with a colleague on this issue. He described an experience that brought home to him how quickly the “automation/robotics” transformation is occurring.

“I had my eyes opened a few years ago when I visited what was termed a “factory” where digital electronic billboards are built. What I saw on the main floor was a series of machines and conveyor belts that were controlled from a small number of manned stations that featured an employee working on a notebook computer. These were assembling the digital “boards” from strings of LEDs. The boards then were conveyed to an assembly area where electricians wired them into the billboard “frames.” At dinner that evening, I asked the owner: “What will I see if I come back here in a few years?” His reply: “We expect that both the digital board assembly and the wiring into the frames will be primarily handled by robotics. Our manned work force will be minimal on each shift: 2-3 for random-check quality control and robotics maintenance.” I haven’t been back or checked directly, but I know that the cost of the finished product has dropped by over 50% since that visit. That tells me that his expectation has been met.”¹

Our interchange was stimulated as a reaction to an article that appeared in the American Bar Association’s Journal based on a reported study a new study by Dana Remus (North Carolina) and Frank S. Levy (MIT), “*Can Robots Be Lawyers? Computers, Lawyers, and the Practice of Law*”.² Weinstein responded to the study by stating: “This Study is a good candidate for first prize in the category of “Publication That Does Best Job of Ignoring the Likelihood of Exponential Growth in AI Technology””.

I responded to his comment by e-mail:

“AI will change things dramatically in ways we can't predict if we stick with a linear analysis. Plus, one of the most critical things is not simply what will happen with lawyer jobs in the traditional sense, but with the ability of

¹ E-mail from Alan Weinstein, Professor of Law, Cleveland State University, Jan. 6, 2016.

² “Will Technology Create a Lawyer ‘Jobs-Pocalypse’? Doomsayers Overstate Impact, Study Says”. See Paul Caron, Tuesday, January 5, 2016 “[Technology Will Not Create A Lawyer ‘Jobs-Pocalypse’](#)”.

people to do their own "lawyering" and with the emergence of new professions and systems that deliver "niche" legal services. The other point that no one seems to be talking about is what will happen to the economics and capacity of the underlying economic system on which lawyers currently "feed" and depend for sustenance. If the economic well-being of the American middle class plummets as is occurring and predicted then there will be a decrease in the ability of a shrinking "pie" of traditional clientele to pay lawyers and a reduced demand for lawyers' services. This does not even begin to consider the implications of a shift of economic productivity (and therefore need for lawyers) outside the US."³

This Is a "Transformative Event", Not a Cycle That Will Return to a Familiar Equilibrium

The replacement of relatively low level jobs has been assumed to simply be the consequence of another economic cycle in which other types of work emerge in sufficient numbers to fill the space and everyone is "happy" due to enough employment to go around. The problem with the cavalier acceptance that we are in some "business as usual" recycling of work in which new and equivalent work will automatically replace what has disappeared and that everything will return to "normal" does not apply to the conditions we are now experiencing.

As discussed in the analysis offered below, we have entered a technologically based historical moment in which our society is seeing its middle class "hollowed out". Some credible analysts describe what is occurring as an era in which there is a "great decoupling" between economic productivity and jobs. This "decoupling" is one in which we see economic productivity increasing while job opportunities are being reduced even as population grows and the demand for decent employment opportunities increases.

This growing gap between employment supply and demand includes not only a significant decline in what we think of as low or entry level jobs but a reduction in job opportunities we have come to think of as having an "upwardly mobile" quality. This is a unique economic phenomenon with serious implications for the integrity of our political system as social and distributive economic inequality in the US and other Western societies increases rather than keeping pace with the heightened productivity generated by automated work done by applications stimulated by the rapidly emerging sophistication of Artificial Intelligence systems and applications, robotics and automation at all levels.

In one of my own fields of law and law teaching, for example, information services and software applications have radically altered the nature of law practice and will soon be impacting heavily on law teaching. The impact will not simply be that of expanding the working set of teaching and research tools in a "business-as-usual" sense but will take the form of educational surrogates that replace a substantial number of traditional teachers.

³ Barnhizer, e-mail of 1/5/16.

This is because as a general rule traditional tenured law professors are far more expensive to maintain than can be achieved through alternative educational strategies.

Those alternative strategies by which we educate may generate outcomes that are worse, better or the same as that provided by current tenure-track and contract faculty, but nonetheless still be “good enough” for what is needed with the advantage that they can be reprogrammed to do what is wanted by the administrators of the system and are much cheaper to operate. The power of information capabilities, sophisticated analytic software, data management and interpretation and rapidity of research and communication are also transforming law practice at an even faster rate than legal education. This is most likely because, unlike law schools and universities, there are direct economic dynamics operating in the private practice of law that punish inefficiencies and reward efficiencies. One result of heightened efficiency adaptations in private law practice is that the employment opportunities for lawyers are plummeting.

Although the trends have been clear for some time, law teachers are only now beginning to understand that they are about to face a downsizing and career obsolescence that will stun and possibly revolutionize a largely smug professoriate, many members of which continue to think they are in control of their destiny.⁴ University faculty working in other disciplines than law are the “canaries in the mine” and are already experiencing the “wonders” of distance learning, computer-based programmed instruction and challenges to the traditional operation of lifetime tenure. More than half of overall university faculty are currently not on the traditional tenure track and an enormous amount of university teaching is already being done by adjunct teachers with heavy course loads and lower pay than tenure track colleagues or by graduate teaching assistants.

In many law schools a far greater percentage than is generally understood of the teaching responsibilities in the law school curriculum has been shifted to adjunct faculty members. These adjuncts receive payments that are 10-15 percent per course relative to what is being paid their traditional tenure track counterparts to teach the same course. Even this extreme gap is before we consider that the adjuncts receive no pension benefits, no health care or other insurance benefits from universities.

Job Obsolescence and Growing Inequality

A key part of what is taking place is what a report in the *MIT Technology Review* [the *MIT Report*] describes as the “great decoupling” of productivity from job creation and growth.

⁴ See, “Law Schools Have Shed 1,206 Full-Time Faculty (13.3%) Since 2010”, http://taxprof.typepad.com/taxprof_blog/2016/01/law-schools-have-shed-1206-full-time-faculty-133-since-2010.html.

This is accompanied by a growing inequality of income and opportunity. In describing that report David Rotman notes that:

“Erik Brynjolfsson, a professor at the MIT Sloan School of Management, and his coauthor Andrew McAfee have been arguing that advances in computer technology—from improved industrial robotics to automated translation services—are largely behind the sluggish employment growth of the last 10 to 15 years. Even more ominous for workers, the MIT academics foresee dismal prospects for many types of jobs as these powerful new technologies are increasingly adopted not only in manufacturing, clerical, and retail work but in professions such as law, financial services, education, and medicine.”[\[2\]](#)

Rotman continues:

“Anecdotal evidence that digital technologies threaten jobs is, of course, everywhere. Robots and advanced automation have been common in many types of manufacturing for decades.... A less dramatic change, but one with a potentially far larger impact on employment, is taking place in clerical work and professional services. Technologies like the Web, artificial intelligence, big data, and improved analytics—all made possible by the ever increasing availability of cheap computing power and storage capacity—are automating many routine tasks. Countless traditional white-collar jobs, such as many in the post office and in customer service, have disappeared.”[\[3\]](#)

Rotman further relates that: “Brian Arthur, a visiting researcher at the Xerox Palo Alto Research Center’s intelligence systems lab and a former economics professor at Stanford University, calls it the “autonomous economy.” *[Arthur states] It’s far more subtle than the idea of robots and automation doing human jobs, he says: it involves “digital processes talking to other digital processes and creating new processes,” enabling us to do many things with fewer people and making yet other human jobs obsolete.*” [\[4\]](#)

An intriguing aspect of the introduction of smart phones, texting, sites such as Facebook, and our incredibly expanded reliance on communication through electronic media rather than face-to-face interaction is that a fear has been voiced that our new generation of “technophobes” prefer such modes of behavior and are happy to avoid the rigors of direct human communication. This has significant implications for the legal profession in which much of its “value added” nature is presumably based on a lawyer’s interpersonal communications ability. But it also suggests that individuals most comfortable and skilled with communicating, obtaining information and knowledge, and using the power of the communications and research technologies provided by the Internet will have no resistance to obtaining their legal advice and legal services through such sources wherever those sources are located. This has significant implications for the private practice of law and many of those implications are negative for lawyers. An interesting commentary on the fact that people appear to be increasingly comfortable with communicating with robots

rather than flesh-and-blood people, assuming we could include lawyers in the latter group, is suggested in *“Life with robots: what people enjoy most is avoiding human contact”*. [5]

As an example of the potential for widespread “job obsolescence” in the legal profession, and therefore the law schools that purport to prepare their graduates for careers in that profession, consider how discovery worked several decades ago and what now occurs through the use of “E-Discovery”. The implications for law firms (and their clients) are significant because the business model of law firms traditionally and particularly the larger ones, has been to “throw” a horde of young lawyers at massive discovery at significant hourly rates. Such actions have been the “bread and butter” helping to fund a large part of the firms’ budgets.

Technology has altered that business model dramatically in ways that are great for clients but bad for law firms’ “bottom lines”. For example: “When five television studios became entangled in a Justice Department antitrust lawsuit against CBS, the cost was immense. *As part of the obscure task of “discovery” — providing documents relevant to a lawsuit — the studios examined six million documents at a cost of more than \$2.2 million, much of it to pay for a platoon of lawyers and paralegals who worked for months at high hourly rates.* But that was in 1978. Now, thanks to advances in artificial intelligence, “e-discovery” software can analyze documents in a fraction of the time for a fraction of the cost. *In January, for example, Blackstone Discovery of Palo Alto, Calif., helped analyze 1.5 million documents for less than \$100,000.”* [6]

The implications are clear even if the specific job shifts, concentrations and losses are unknown. And E-Discovery efficiencies and methods are the easiest part of the ongoing changes in the nature of work in law and many other fields. One innovator whose company is involved in developing technologies that make the practice of law more efficient by being able to do more with less and at a lower cost has said that: “Quantifying the employment impact of these new technologies is difficult. Mike Lynch, the founder of Autonomy, is convinced that “legal is a sector that will likely employ fewer, not more, people in the U.S. in the future.” *He estimated that the shift from manual document discovery to e-discovery would lead to a manpower reduction in which one lawyer would suffice for work that once required 500 and that the newest generation of software, which can detect duplicates and find clusters of important documents on a particular topic, could cut the head count by another 50 percent.”* [7]

What Are Some of the Most Likely Changes as Income Inequality Becomes Worse?

- *There will be job loss at all levels.* This means that we have a tier, actually several tiers, of interest groups fighting over the distribution of available social goods and resources. Rotman states: “technological progress is eliminating the need for many types of jobs and leaving the typical worker worse off than before....“It’s the great paradox of our era,” [Brynjolfsson] says. “Productivity is at record levels, innovation has never been faster, and yet at the same time, we have a falling median income and we have fewer jobs. People are falling behind because technology is advancing so fast and our skills and organizations aren’t keeping up.” [13]

- *There will be a radical transformation of many economic, educational and political institutions.* Many of the changes will seek to enhance the ability of institutions to compel outcomes and satisfy the demands of dominant interest groups.
- *We will experience growth in unemployed and unemployable in the tens of millions.* These interests will offer reasons why they are entitled to support from available social resources. After all “it isn’t their fault” and in many instances this is entirely true. They did what they were told to do, “played the game” according to its rules, and are still out in the cold of unemployment and underemployment without adequate resources.
- *There will be a massive restructuring of our social, political, economic and educational systems.* A result is the transformation of the rules by which we have defined our system.
- *There will be an expanding need to provide resources for those not working.* This need will increase rapidly. Our economic system is designed to think that a five percent unemployment rate is the norm due to opt outs and structural shifts. It is not prepared to accommodate a 25-30 percent level made up of those who have opted out, are unemployed and unemployable. This imposes an enormous burden on the productive capacity and distributional equality and dynamics of the system.
- *We will experience a radical increase in income and political inequality due to a “hollowed out” middle class.* Those who have the skills to “run” the new systems will accrue most of the benefits while seeking to keep the burgeoning masses reasonably content. “Employment trends have polarized the workforce and hollowed out the middle class.... To be sure, David Autor says, computer technologies are changing the types of jobs available, and those changes “are not always for the good.” The result, says Autor, has been a “polarization” of the workforce and a “hollowing out” of the middle class—something that has been happening in numerous industrialized countries for the last several decades.”[\[14\]](#)
- *“Artificial intelligence will transform businesses and the work that people do. Process work, customer work and vast swathes of middle management will simply disappear, [the report 'Fast Forward 2030: The Future of Work and the Workplace'] said. [One key conclusion is that] "Nearly 50 per cent of occupations today will no longer exist in 2025. New jobs will require creative intelligence, social and emotional intelligence and ability to leverage artificial intelligence.... "The next 15 years will see a revolution in how we work, and a corresponding revolution will necessarily take place on how we plan and think about workplaces.” By 2030, a majority of real estate transactions may be made online. And most of them will be made using real time marketplaces, the report noted.”*[\[15\]](#)
- *There will be increased impacts on communications freedoms so that the governing systems in control of numerous nations are unchallenged.* Although it is hard for an American to realize, most countries do not share our traditions of free speech and in

fact do not want speech freedom. For them the power of the Internet is troubling and frightening. We have already seen this in terms of Russian and Chinese demands to have greater control of the Internet as well as the United Nations trying to get in on the action.

Jeffrey Rattikin suggested only a few years ago in the “*Current State of the Online Legal Services Industry*” that online legal sites can be listed in five categories.[\[16\]](#) This analysis was done in 2010 and the sophistication and scope of the effort has grown.

1. *Online Legal Form Libraries.* “In the last few years, a number of online legal form libraries have emerged, whose forms are available for direct download and use by the consumer. Such sites typically offer blank form templates for use around the country, basically an online version of the self-help legal books and forms available for years at bookstores and office supply retailers.
2. *Computer-Generated Document Providers.* One of the most significant developments in the field of online legal services has been the advent of the availability of computer-generated legal products developed for use without attorney involvement. This category of service is similar to the legal form library sites, but instead of blank form templates, the computerized document sites provide consumers with a somewhat customized agreement with all blanks filled in, based on the information provided by the consumer through an online questionnaire.
3. *Virtual Law Firms.* A very disturbing new form of online legal services has recently been introduced, an enhanced offshoot of the computer-generated document sites. Being dubbed as “Virtual Law Firms”, these services are typically no more than backroom computerized form generators, producing legal documents generated by computer based on the consumer’s own input on online questionnaires.
4. *Virtual Paralegals.* A few sites have sprung up which advocate the use of “personal legal services” performed online by a virtual paralegal, who offers to prepare basic documents without attorney supervision.
5. *E-Lawyering.* While the terms associated with online legal services are still evolving, as is the industry itself, the concept of real lawyers providing actual legal services for clients utilizing an online web interface is being loosely referred to as e-lawyering.
6. *Online communities, blogs, and social media portals.* A few lawyers have taken the static website one step further, by attracting clients through online communities, blogs, and social media portals such as LinkedIn, Twitter, Facebook and LexBlog. By providing news, information and opinions to the public through these new online channels, the e-lawyer can increase the visibility, client-awareness and perceived expertise of his or her practice.”[\[17\]](#)

We Are Nearly Always “Behind the Curve”

At least as it has been to this point, I don't think any job is better than that of the American law professor. During my career as a law professor, consultant, writer, environmentalist and activist I have had the fantastic opportunity to work with highly knowledgeable analysts in such varied locations as the Congressional Research Service, the US government's Office of Technology Assessment, the State Department, the President's Council on Environmental Quality, several Congressional sub-committees, the World Bank, the United Nations Development Agency and the UN's Food and Agriculture Organization, as well as a variety of environmental organizations like the World Wildlife Fund, the Year 2000 Committee, and the Natural Resources Defense Council. This experience also included a wide variety of projects, including serving as Rapporteur for a US House of Representatives Committee on Energy & Commerce workshop on Foresight Capability related to taking effective strategic action at a point it could make a difference, and a fascinating experience working as a Special Consultant on futures issues within an agency of the Mongolian government concerned with sound business development in that nation. The experiences included service as a corporate director, board member and president of an exceptional performing arts center, consultant to a major oil company, and as a corporate general counsel as well as a wonderful time as a Legal Services lawyer at the start of my legal career.

One “take away” from these diverse experiences and others in which I was involved is that governments, institutions and people with power almost never take effective action aimed at resolving problems or seizing opportunities at a point it could make a difference. This includes many corporations as I quickly discovered while working with a friend from the International Institute for Environment and Development (IIED) doing research for the Council on Environmental Quality on business decision making and companies' recognition of the seriousness of the issues discussed in the CEQ's *Global 2000 Report to the President*. It is not at all surprising that many businesses go bankrupt or muddle around until they are consumed by more alert and aggressive entities that are paying attention to unfolding trends.

In virtually any area of concern whether business, government or education, there is typically a great deal of analysis and voluminous written reports by “experts” offering a variety of suggestions. But in nearly all situations the existing power and reward systems deflect changes that might provide effective solutions. The problem is that real change suffers from the “sin” of impinging on vested interests and careers, not only of the people within a specific organization but those with which they have formed relationships. I remember interviewing the Vice President for Strategic Planning of one of America's largest companies shortly after sitting down with the company's internal corporate group tasked with identifying and producing ideas for effective action. The group's leaders described their productivity in glowing terms and much of it made sense. When we asked in private how he worked with that group, the VP in overall charge of the process responded, “Which? Oh, you mean those guys who write the reports? I try to read them sometimes but frankly we have other priorities.”

This mindset is not at all unusual. Our institutions—government, business and education—are nearly always “behind the curve” in relation to dealing with conditions that require effective solutions, in part because we really do tend to “play it safe” and “think inside the box” and also because we intuitively understand that change imposes new responsibilities that force us to alter our behavior. We are also “protecting our turf” against any loss of status or privilege. The result is tremendous systemic friction, resistance to change, waste, inefficiency, lack of honest dialogue, lost opportunities and continuing negative conditions that end up harming large amounts of people.

This means that given the nature of governmental and political decision making, it is close to inevitable that steps are only taken when a situation has become a serious crisis. The irony is that law professors comprise a unique political subsystem of their own, one that is filled with privilege and a lack of accountability. Law faculty individually and collectively typically claim the power of “Faculty Governance” and insist they be in control of the decisions about the curriculum and mission of their law schools. Law faculty members operate as a political collective and, unfortunately, even though their rhetoric is occasionally eloquent this means they are making choices based almost entirely on self-interest and preservation of the arrangements to which they feel entitled. What government and political actors (including law faculties) do is generally classifiable under the “too little too late” category of action whereby our “leaders” pontificate to appear forceful and “leader-like” even though they ignore reality or lack the political will to take the kinds of strategic steps that would make a positive difference at the point where intelligent and focused action could have made a difference.

A Further Digression about Law Schools

I see law schools as almost uniformly fitting into the “too little too late” category. There is a great deal of meaningless talk but very little effective action except for that which is being driven by falling enrollments and shrinking revenues—problems unfortunately being addressed by admitting lesser qualified applicants or even clearly unqualified applicants to shore up revenues. This is entirely unsurprising for several reasons. One involves the conditions of tenure. This offers what is generally considered to be a lifetime employment guarantee accompanied by very pleasant conditions of employment, status, numerous perks and a substantial salary. No one in his or her right mind walks away from such a situation willingly. This becomes even more unlikely when we take into account that there is a shrinking employment market in the legal profession and scant likelihood that law professors could obtain equivalent employment positions in the upper echelons of a profession that is undergoing fundamental change and restructuring.

The combination of the job expectations of tenured academics, the lower stresses involved in academia relative to law practice and the fact that law professors no longer can have a realistic expectation that they can easily shift to quality positions in law firms make it extremely unlikely that the collective represented by members of a law faculty will be persuaded to voluntarily make critical changes in their employment environment. It also has made it inevitable that to pursue change most law faculty members had to be pretty much “hit upside the head” by plummeting enrollments, reduced applications in numbers

and quality, dropping revenues, eliminated perks, unhappy universities forced to subsidize law schools that had previously been significant sources of revenues, and increasingly bitter graduates burdened by significant debts who can either not find a “law job” or a position that allows a living wage plus debt repayment. Law faculties ignored for several decades the fact that law schools were graduating too many lawyers relative to employment opportunities, and continually raised tuition levels for law students because Federal loan rules allow graduate students to “max out” on loans and this made it possible to steadily increase faculty salaries and perks.

Law Schools and Lawyers Reflect and Are Shaped by the Economic and Social System, Not Vice Versa

The message running through this analysis is that what happens with law schools and the legal profession cannot be separated from the conditions and transformations taking place in overall economic contexts. These include the amorphous “global” situation and transnational, national, regional, sub-regional, state and local economic situations. Each of these contexts relates to issues of job creation and destruction as well as the movement of labor and populations in search of better lives. But each context also has its own set of specific characteristics that dictate not only what consequences are likely to occur but involves the issue of whether decision makers and workers most affected by the rapidly changing conditions possess the leverage, authority, insight, knowledge and skills required to deflect the worst consequences of the unfolding changes, or take advantage of the opportunities created by transformational shifts.

The alternative for some law schools, law firms and numerous other institutional actors is to wither or even collapse in the face of altered competitive conditions over which they have little or no control or that they have ignored to the point it is too late to take effective action. Much of the power behind the changes is being generated by the convergence of a set of key technological developments the expansion of which into our production and educational systems cannot be avoided. Some of those are discussed immediately below.

The Convergence of Transformative Elements

Entrepreneur Richard Waters suggests that we are only at the beginning of the transformation and that we make a mistake if we see computers and information systems as just another tool. Another innovator in the AI field states: “Technologically, it’s a paradigm shift from putting commands into a box to a time when computers watch you and learn.” His company raised \$15 million to “train computers to replace expensive white-collar workers such as financial analysts. “We don’t describe what we’re doing as AI — we call it, ‘automating human-intensive knowledge work’,” [Waters says]. Probabilistic techniques are used to “train” machines as they churn through the data, until they are able to see patterns and reach conclusions that were not programmed in at the outset.”[\[8\]](#)

Taken together this convergence (already partially manifest) will have devastating effects on the nature of work and the number and quality of available jobs. Nor will those affected be on only one level of work as opposed to multiple levels of employment. As lawyers and

recent law graduates have discovered, the “winds of change” are blowing through the economic system in ways that are eliminating work opportunities from the most “intellectual” activity to the most basic areas of services and labor. Nothing is sacrosanct. Given that many employment levels will be eliminated or shrunken dramatically without a “creative” substitute for what has been destroyed, the consequences of this technological convergence for businesses, governments, social programs, educational institutions and other areas of concern will be profound. One effect will be that our political, educational and economic systems will be altered in unpredictable ways due to growing income inequality, the continuing loss of the middle class, and the growing need for income redistribution to those pushed out of work because their jobs no longer exist.

Five Key Elements of the “Convergence”

Stated with a broad brush, the primary developments funneling into this already unfolding “convergence” include the following.

1. The **Labor Saving and Efficiency Multiplying** growth of information creation, storage, communication, sharing and application systems made possible through computers, the Internet and the rise of incredibly large and powerful companies such as Google, Apple and Amazon.
2. The emergence of **Sophisticated Software Applications** that make it possible to reduce or eliminate many of the functions of millions of jobs in numerous industries. This includes not only lower level positions such as bank tellers, store check out workers, receptionists, gas station attendants, toll booth collectors, etc. but increasingly is eliminating higher level employment niches in accounting, medicine, law support, journalism, finance and securities, real estate and insurance. In areas such as tax, worker’s compensation, real estate, estate planning, auditing, legal writing and more, consider what effects this will have for lawyers, paralegals, CPAs, real estate and insurance agents, etc.
3. The **Software Evolution** is also making it possible for non-specialists seeking knowledge in an area of need to access the “mysteries” of formerly arcane disciplines so that they can have insight into matters about which they formerly sought assistance. Their knowledge may be imperfect or “spot on” but the reality is that the behavior is occurring and we are becoming a nation of “pseudo-experts”. As I write this little essay, Harvard has just announced a project in which it will put all judicial decisions on the Internet and grant free access. The Internet already has numerous legal materials available and this phenomenon will only increase in scale, quality and diversity of information. Coupled with interpretive software applications many citizens will have unprecedented access to law in an array of forms.
4. **Robotic Systems** have been replacing human workers for decades, but the movement is accelerating due to the globalization of labor and, as indicated above, the incredible developments in information, software and design. An extremely important factor in what will occur is the emergence of an innovative cadre of technological specialists who are designing systems daily that heretofore were the “stuff” of science fiction. The development of this pool of innovative, savvy, brilliant

and even seemingly “off-the-wall” designers is taking the “possible” into realms that we could not anticipate even a few years ago.

5. **Artificial Intelligence** (AI) has been declared by physicist Stephen Hawking, who is probably not the dumbest man on Earth, as a fundamental threat to human survival. Even a casual observer of the developments in the AI field can understand the negative potential of the technology after watching movies like *2001* and *War Games* (Just kidding). But even if AI does not destroy or enslave humans in the physical sense after deciding that biological humans are some kind of destructive planetary disease, Artificial Intelligence will inevitably replace numerous categories of employment even at the highest levels of our current activity. Some of this is already occurring in medicine, journalism and finance. But the speed and sophistication of AI is not only exciting if you are a SciFi devotee such as myself, but frightening when we consider the technology’s implications. And here I am not even bringing in the issue of AI implants in humans as super-capable Androids some are speculating as being possible in the near rather than distant future.

Let’s Talk *Worst Case Scenario* for Law Schools and Lawyers

For law school pundits seeking to interpret the nature, extent and duration of the “crisis” in legal education and employment, many are looking at month-by-month or even week-by-week snippets to try to explain where legal jobs are heading. At one moment the trend is up and another down. The problem with relying on piecemeal short-term data sets to project future reality is that the dynamics of what is going on are far more “macro” than “micro”. For the purposes of this discussion it is vital that we understand the dynamics are also dependent on the impacts of developing technological and organizational forces such as described above rather than the past conditions and organizational structures of economic, educational and political forms. Once we take the powerful and interactive set of macro-forces into account the “past is gone” and the future is bleak for many sectors of work and education. As suggested, the situation goes far beyond law schools and lawyers. It will in fact be determinative of the composition of a wide range of socio-economic classes as they are transformed through the restructuring of work and the loss of jobs.

What I am talking about is not the absolute replacement of the “human factor” in the legal profession but the effects of the technological developments on the nature and number of law jobs. It is also that a limited number of entrepreneurial and innovative lawyers will apply the technology and software to create what I guess can be called “virtual” or even “android” law practices that can attract and handle far more clients, at lower rates, and with far fewer lawyers. The lawyer becomes overseer and facilitator and manager. But the tools available allow for lower costs and less labor in the form of a reduced need for lawyers. My point is that “a” lawyer will be able to use these new capabilities to replace the need for other lawyers. I am speaking to the future of law jobs in relation to labor savings devices and technologies, not about the disappearance of specific functions. The mantra is “More with Less” and at lower cost.

Part of what is occurring and will become much greater is that there will be an increase in what might be thought of as “gray market” systems that use the enhanced software to

provide common legal services and in doing so impact heavily on lawyers who rely on contracts, real estate, insurance, divorce and so forth as their bread-and-butter. Along with this is likely to come the Walmart-type commercialization and mass production of basic legal services in which (as is already occurring in Canada) the large chain offers legal services on-site in specific high volume areas of legal service. The commercial “scaling up” of legal services backed by efficient large commercial entities will in many situations devastate the solo and small generalist types of law practices. In the US, since a significant proportion of new law graduates have been going into solo law practices, often out of necessity due to the lack of other job prospects, this approach would prove devastating for many “solos”. Even outside of the “for profit” type model, there are lots of legal apps being developed in an attempt to fill the “justice gap.” These will end up adapted to some for-profit settings and who knows what will result at that point.

“Good Enough” Will be OK

The ultimate use of the AI power and advanced software applications that can do amazing things far more rapidly than humans will not be determined solely by such technological capabilities but by the pressure by firms and other economic actors directed at the system's needing to accept the products as surrogates for the traditional material or way of doing things. For example, it isn't that people enjoy having to go through endless computer generated on-line and telephonic options when dealing with businesses and governmental agencies. Such systems are not “better” than direct human-to-human interaction but companies save a great deal of money by substituting these technological options for real people. That is the key consideration here.

On the other hand we should not glorify current legal service as provided by the legal profession as being uniformly excellent or even good. There are many contexts in which lawyers perform ineptly, are negligent, “churn” cases to maximize revenues or offer subpar representation. This means that the technology-driven and AI capabilities—coupled with different kinds of business forms able to improve the economies of scale of legal work and offer lower prices—are likely to provide equal or superior quality of work at lower costs than can be found by clients in many current situations.[\[9\]](#)

Income Inequality Is Going to Get Worse Rather than Better: The “Great Decoupling” of Economic Productivity and Job Creation

For those concerned with things such as the growth in income inequality, the message is that inequality is about to get worse rather than better. Not only is it going to get worse in Western Europe and the US, one consequence is that we can expect a continuing reduction in the size of the middle class as well as a large-scale expansion in the proportion of our population that is dependent on public services and support. One researcher has referred to this as a “hollowing out” of the American middle class with profound implications for policy choices on numerous levels. David Autor, an economics professor at the Massachusetts Institute of Technology, says the United States economy is being “hollowed out.” “New jobs, he says, are coming at the bottom of the economic pyramid, jobs in the middle are being lost to automation and outsourcing, and now job growth at the top is

slowing because of automation. ... Nowhere are these advances clearer than in the legal world.”[\[10\]](#)

Although it most likely cost him the 2012 presidential election Mitt Romney’s “47%” warning about the proportion of people in the US who pay no income tax was not shown to be inaccurate. Given what is going on in the economic sectors affected by the technological events described above the portion of the population whose financial support and benefits are provided by a smaller and smaller working population is going to get worse. The *MIT Report* by David Rotman on Brynjolfsson’s and McAfee’s work described what is occurring as informational technologies and software further penetrate our economic system as a “great decoupling” in which productivity continues to grow but employment opportunities decline in a negative dynamic that has no historical equivalent.

The *MIT Report* presents an analysis that is frightening when we truly work through its implications. David Rotman explains: “Brynjolfsson and McAfee describe what they see happening. “[B]eginning 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. Brynjolfsson and McAfee call it the “great decoupling.” And Brynjolfsson says he is confident that technology is behind both the healthy growth in productivity and the weak growth in jobs.” [\[11\]](#)

A strong middle class is central to a healthy democracy. The “decoupling” also means that many of the kinds of jobs that sustained our middle class at a substantial level in ways that were core to social mobility in the American democracy are disappearing and greater economic benefits flow to a socio-economically “upper class”. Brynjolfsson and McAfee “believe that rapid technological change has been destroying jobs faster than it is creating them, contributing to the stagnation of median income and the growth of inequality in the United States.” [\[12\]](#)

A socially disruptive result is expansion in the proportion of the American population that is not working at all, is under-employed or increasingly lacks the knowledge and skills needed to function in the new economy in which competition for available jobs has intensified. This has profound implications for the health of any reasonably democratic system. One of the most important problems associated with this is that those who are working and making a reasonable income will be required more and more to contribute to the welfare of the unemployed, the unemployable and the underemployed. Increased social tensions and an ineffective political system will increase dramatically. As to the upper income levels, the “One Percent” will quickly become the “Two Percent” and soon after that the “Five or Ten Percent” because a major segment of the population will demand support and politicians will continue to pander to those demands.

One almost certain element of this shift will be fewer applicants for enrollment in institutions such as law schools, at least in their traditional formats. The rich “elite” law schools such as Harvard and Yale will be fine but many others are in trouble. Although law schools are not even the primary focus of my analysis as opposed to the overall health of our social and political system, this transition will be accompanied by a continuing

reduction in the employment prospects for the traditionally (and expensively) educated crops of new law graduates. *Under the “too little, too late” heading mentioned above, curricular tinkering or even significant alterations will not make much difference in a context where there are increasingly limited employment opportunities.* Part of the shrinking employment opportunities phenomenon is the simple fact that the ordinary lawyer can now do so much more with less. A result is that fewer backup services of a labor-intensive nature are required to practice law in terms of paralegals, lawyer assistants, researchers, secretaries and office managers, “gofers”, court personnel and so forth. This will get much worse.

For some lawyers in smaller or solo practices the developments are not all bad. The new technologies can produce a much better economy of scale that allows more to be done with less and at lower cost. This simultaneously generates an efficiency multiplier for some lawyers while reducing the need for support services, including hiring new law graduates because you can now do in an instant what used to take considerable time. What was law practice on a “shoestring” can now be a carefully designed professional practice entity that supplies all essential resources and services to clients. But, once again, there are positive and negative effects based on who you are and what you are doing. It is presumably a positive development for clients who we can hope are charged lower fees due to the efficiency gains. It is a positive development for solo and small-scale law practices that gain greater economies of scale due to the technologies.

It is, however, a negative situation for many new law graduates because much of what they have had to offer in the traditional sense is no longer needed. It is a negative development for law schools that do not make significant adaptations to accommodate the reality because we will need far fewer lawyers to serve the existing pool of clientele in need of legal services and able to pay for those services. The same phenomenon will impact on a wide variety of work activities. To the extent the new efficiencies result in a reduced cost structure for clients one potentially positive outcome may be to draw a previously underserved class of clients into play and expand the pool available to lawyers.

Inequality, Merit and the Development of a *Lumpenproletariat*

In speaking about the imperfections of a democratic system of government over time, Aristotle observed that the ultimate defect of a democracy was that the majority would redirect the system’s resources for their own benefit and that those who demonstrated “merit” greater than the norm would be objects of scorn and jealousy to the point of ostracism. His point was that we all have a strong tendency to prefer and support actions that benefit us. Without attempting to seem Malthusian, we face an out-of-control set of developments that appear irresistible. These developments will significantly increase the numbers of unemployed, partially employed and unemployable segments of our populations.

This does not mean that the emergent *lumpenproletariat* will go “quietly into the night” nor that all or even the majority of the economically dispossessed are fairly fit into that Marxian category. We will see heightened demands and impacts on available resources and

insistence that the political system provide support in the form of increased entitlements. In many instances this will be a permanent shift and an increasingly expensive and insoluble problem as costs grow and resources from labor “thin out”. It also represents a form of deliberately designed class warfare. Rather than try to deal with the challenge our “leaders” define it as one in which the solution is the continual expansion of social benefits to classes of Americans who include the permanently unemployed, the unemployable, the previously productive and the non-productive.

This “solution” that will be almost automatically sought to deal with the challenge of rising inequality is already reflected in the calls for increased taxes on the “One Percent”. This associates with the almost lunatic demands for the elimination of “income inequality” to the point of equivalence. These are among the signs that we are entering a phase in which the moderately productive, the less productive and the non-productive are flexing their political “muscle” in the form of voting for so-called “leaders” who promise to enact laws redirecting resources to them and away from those who actually created the economic opportunities sustaining the system. One inevitable outcome will be a form of “class warfare” in which politicians seek to gain and maintain power by pitting one group against another.

The intensification of some form of class warfare seems inevitable because a problem all human communities have is that even though there is a link between justice, desert and merit, we are generally very inept in determining what constitutes merit. This means that even though there is a clear logic in the social formula that one should be rewarded in accordance with the quality of his or her contribution, that logic always falls victim to individual and interest group selfishness to the point of preventing fair distributions of social goods. At the base of the issue is that there is no consensual “fair” or agreed on conditions of individual or group merit. This is caused by the fact that we are invariably subjective in judging our own merit and that of the interest group to which we pledge allegiance *vis-a-vis* others’ individual and group merit. Part of this is that we are envious of any system that accords others more than us because if this is so they must somehow be considered more meritorious than us. Acknowledging others’ greater merit and desert is in our minds a grant of superiority over us. Few humans are willing to do this as a voluntary act.

An Observation

To the extent we can foretell what is going to happen most of my points are contained in the main text of this analysis. Outside of those comments my main observation is that outside a primary core of the most highly regarded law schools that are generally immune to the considerations described here because there will be a continuing need for some lawyers and the law schools are at the top of the reputational “food chain”, developing productive strategies that protect a law school against the effects of change is generally a “crap shoot”. At this point what is going to happen is largely outside the control of law faculties and deans. A fair number of law schools need to shut down. Although the for-profit law schools have turned out to be disgusting predators there are numerous others for which there is no real legitimacy if they try to keep functioning as law schools have

traditionally done. If some have the ability and courage to “reimagine” themselves into other kinds of educational institutions then they are to be admired. Otherwise, whom are we kidding? There is no need for traditionally educated lawyers in the volume we have been turning out for decades.

A far more important point that we need to deal with is the fracturing and distortion of our society due to growing inequality, transformation of the nature of work, and the increasing gaps between high quality work opportunities and power and the expanding proportion of our citizenry locked into the lower ends of the socio-economic structure. This has the potential to tear our political and social systems apart.

[1] See Joseph Schumpeter, *Capitalism, Socialism and Democracy* (1942).

[2] David Rotman, “How Technology Is Destroying Jobs”, *MIT Technology Review*, June 12, 2013.

[3] “How Technology Is Destroying Jobs”, *MIT Technology Review*, id.

[4] “How Technology Is Destroying Jobs”, *MIT Technology Review*, id.

[5] Stuart Dredge, *Guardian*, November 3, 2015. <http://www.theguardian.com/technology/2015/nov/03/life-with-robots-silicon-valley-robotics-social-interaction>.

[6] Ramin Rahimian, “Armies of Expensive Lawyers, Replaced by Cheaper Software”, *New York Times*, March 4, 2011. A version of this article appeared in print on March 5, 2011, on page A1 of the New York edition.

[7] Rahimian, “Armies of Expensive Lawyers, Replaced by Cheaper Software”, *New York Times*, id.

[8] Richard Waters, “Investor rush to artificial intelligence is real deal”, *Financial Times*, January 4, 2015. <http://www.ft.com/cms/s/2/019b3702-92a2-11e4-a1fd-00144feabdc0.html#ixzz3NxmiiO3Q>.

[9] See, David Barnhizer, “Abandoning an “Unethical” System of Legal Ethics”, 2012 *Michigan St. L. Rev.*

[10] Ramin Rahimian, *Armies of Expensive Lawyers, Replaced by Cheaper Software*, *New York Times*, March 4, 2011.

[11] David Rotman, “How Technology Is Destroying Jobs”, *MIT Technology Review*, June 12, 2013.

[12] David Rotman, “How Technology Is Destroying Jobs”, MIT Technology Review, June 12, 2013.

[13] David Rotman, “How Technology Is Destroying Jobs”, MIT Technology Review, June 12, 2013.

[14] David Rotman, “How Technology Is Destroying Jobs”, *MIT Technology Review*, June 12, 2013.

[15] “Fast Forward 2030: The Future of Work and the Workplace”, [http://www.cbre.com/o/international/AssetLibrary/Genesis%20Report Exec%20Summary_1029.pdf](http://www.cbre.com/o/international/AssetLibrary/Genesis%20Report%20Exec%20Summary_1029.pdf). And http://www.business-standard.com/article/pti-stories/50-of-occupations-today-will-no-longer-exist-in-2025-report-114110701279_1.html.

[16] Jeffrey A. Rattikin, “Current State of the Online Legal Services Industry”, January 2010, <http://www.texaslegaldocs.com/blog/default.aspx/Current-State-of-the-Online-Legal-Services-Industry>.

[17] Jeffrey A. Rattikin, “Current State of the Online Legal Services Industry”, January 2010, <http://www.texaslegaldocs.com/blog/default.aspx/Current-State-of-the-Online-Legal-Services-Industry>.