Changing shape: new industries, new jobs, new capabilities

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What do you do?

https://m.youtube.com/watch?v=8-Pi8yv7-18

This Armstrong and Miller clip is an excruciatingly funny insight into the changing world of work, of new industries and of new jobs emerging and old jobs disappearing,

It is increasingly likely that we either have already, or will in the future, encounter situations where our working lives have become so fluid, contingent and "flexible" that, in the end, we end up horribly busy doing we're not quite sure what.

The future

Always be careful about predictions...especially about the future

Two things we know about the future:

- At one level, it is unknowable as we move into the "second half of the chessboard" http://takingpitches.com/2013/01/21/the-second-half-of-the-chessboard/; https://www.linkedin.com/pulse/digital-abundance-second-half-chessboard-keith-haviland and confront change at exponential rates...we don't know what is coming or the speed with which it is arriving
    - But at another level, we know with Peter Drucker http://iranscope.ghandchi.com/Anthology/Drucker-Future.htm and William Gibson https://en.wikiquote.org/wiki/William_Gibson the future is already here, it's just not evenly distributed. There are clear "lines of inquiry" that we can already see and learn more about and, to some extent, start adapting to and exploiting...

The touchstones

Judge all of the discussion, prediction, hype and reality of the "new industries, new jobs" discussion against how they impact, shape or change three touchstones:

- **Power**...who can make what happen, and in what circumstances
- **Control**...how can people exercise some dimension of control over what happens, how and why
- **Rewards and benefits**...who gets to enjoy the benefits, how are the rewards shared
- **Accountability**...who gets to be held accountable for what actually happens.

These are the big architecture pieces that matter in determining how well we confront these big changes and make the equally big transitions they imply. They are all being redrawn, recalibrated and to some extent redistributed by the kinds of (largely) digitally-fuelled shifts in industries, employment and organisations,

The question we always have to ask ourselves is how; and as individuals, communities and a society, are we happy with the way these games are being played out?

The technology trends

"Any sufficiently advanced technology is indistinguishable from magic" Arthur C Clarke

- Automation/robots
- Virtual or augmented reality
- Artificial intelligence and machine learning – smarter machines, smarter people
- Mobility/cloud
- Big data and big analytics
- The Internet of Everything
- 3D printing
- Video
- Social
- Bio, nano...
- And often in all sorts of different combinations and mixes...the real power for change in the underlying structure of work and industries is from "recombinatorial innovation" which puts these technology capabilities together in different forms and in different contexts.

But perhaps this technology shift, which some are claiming will be as big as the Internet itself in terms of disruption and creative possibility, is in a class of its own perhaps

Blockchain and distributed ledgers or Distributed Ledger Technologies (DLTs)

See report from UK Chief Scientist on the application of the blockchain in government and the public domain:

www.gov.uk/government/uploads/system/uploads/attachment_data/file/492972/gs-16-1-distributed-ledger-technology.pdf

> "In distributed ledger technology, we may be witnessing one of those potential explosions of creative potential that catalyse exceptional levels of innovation. The technology could prove to have the capacity to deliver a new kind of trust to a wide range of services. As we have seen open data revolutionise the citizen's relationship with the state, so may the visibility in these technologies reform our financial markets, supply chains, consumer and business-to-business services, and publicly-held registers."
>
> "A distributed ledger is essentially an asset database that can be shared across a network of multiple sites, geographies or institutions. All participants within a network can have their own identical copy of the ledger. Any changes to the ledger are reflected in all copies in minutes, or in some cases, seconds. The assets can be financial, legal, physical or electronic. The security and accuracy of the assets stored in the ledger are maintained cryptographically through the use of 'keys' and signatures to control who can do what within the shared ledger. Entries can also be updated by one, some or all of the participants, according to rules agreed by the network."

New industries

- Robotics
- Cybersecurity
- Commercialisation of genomics and new health technologies, including the further spread of "wearable health" as part of an integrated system of health and wellness
- Anything to do with the Internet of things or the internet of everything…transport systems, energy systems, smart campus/smart city design and installations,
- Deloitte's "growth 5"….gas, agribusiness, international education, tourism, wealth management…www.brw.com.au/p/business/deloitte_names_economy_five_super_BGVXzIjs9gMXhlSq4GOR3O
- And some old industries will still be there…professional services, hospitals and health care, transport and roads, hotels and pubs, manufacturing, learning and teaching, management…but none of them can expect to escape the demand to change shape, culture and practice under the influence of these pervasive factors…
    - Legibility
    - Accountability
    - Transparency
    - Connectedness and the crowd; pretty much coo-designing everything fro products and services to big social productions system" outcomes like power, safety, accountability, care, sustainability…

An example: Deloitte adopts AI platform for contract review and consulting (Attachment 1)

Another example…Take an old industry (disability care) and introduce new capabilities (digital/cloud):

> HireUp….www.hireup.com.au…"choice is a beautiful thing"…where eHarmony meets PayPal and, in the process, reinvents an industry and an employment model

Industries of the future…another place to look…http://alecross.com/the-industries-of-the-future/ (Alec Ross was Hillary Clinton's innovation advisor at the State Department and is now a consultant and strategist on innovation)

> Within 20 years, we'll see robot suits that allow paraplegics to walk and new drugs able to melt away most cancers. But we'll also see definitions of money blur the line between corporation and citizen and computer code being used as a weapon to destroy physical infrastructures halfway around the world

New jobs

- Basically, anything to do with data, collaboration, science, creativity, choice and automomy, service design, digital, social/collaboration…
- See **Attachment 2** for examples of new job roles and titles, some of which exist today, some of which do not, and the links to the original articles and studies
- Some of the real transformation is not so much in new jobs and new roles, but in the deeper structural changes to the nature of work and the way people organise for common purpose and shared outcomes (commercial, civic, educational…)

New capabilities

No matter how the evolution of work and the structure of industries shifts and changes. Some values should never go out of fashion in terms of their impact on how we work and organise.

Things like human and ethical values, clear thinking and honest speaking, integrity, mutual respect and understanding, recognition for people's work and capabilities...

But there are five capabilities that will infuse many, if not all, of the jobs of the future in some way or another, and are part of a bundle of capabilities that people will need to accumulate to successful navigate through the new architecture of work:

- Convening (as opposed to providing platforms); this is a kind of "film producer" model of working or "Hollywood" model
- Curating (as opposed to combining)
- Collaborating (as opposed to coordinating)
- Connectedness (as opposed to connectivity)
- Being digital (as opposed to doing digital); which means being clever at rebalancing the need for speed and the need for slow discernment and good judgement, being open and connected by default (the digital mindset knows how to work "the crowd") and being fearless (but not reckless) about experimenting with different ways of working, new ways to combine skills and expertise...

Implications for education and training

How do all providers of skills, learning and training avoid the risk that they end up preparing people for jobs that exist but soon won't, and fail to prepare them for jobs that don't exist, but soon will?

How do they avoid, in other words, "shooting behind the duck"?

- Revert to core...deep scholarship, deep knowledge
- A mission and mandate to innovate
- More partnerships and collaboration than you can poke a stick at (remembering that "collaboration is an unnatural act between non-consenting adults")
- Institutions that are porous, legible and humble...proud of what they can do but smart enough to know they can't do it all, or alone

Attachment 1

21st Century Contract Review: Deloitte Announces Deployment of Kira A.I. Software

Those fretting about the overreliance of machines, and the prospect of "machine-learning," may be too late to the game — and may soon find themselves left behind in industry's future.

Deloitte announced a partnership its Kira systems, a provider of A.I. machine learning software focusing on contract analysis and document review. Deloitte has deployed a customized version Kira's software throughout its audit and consulting departments to increase its operational efficiency and productivity.

"When we started with Kira, certainly the core focus was the review of contracts; within and across Deloitte, many of our services areas focus on review of a large volume of contracts," said Craig Muraskin, managing director of Deloitte's U.S. innovation group. He added that the company had been searching for efficient review technology for some time.

"We saw this as an opportunity across many of our business ... and [over two years ago] we undertook a significant scanning effort to see what was out there in the marketplace, and who might have a relevant solution," said Muraksin. "We want to make sure we have the most cutting-edge technology. ... We came across Kira close to two years ago, and they were very small at the time, but we kept them on our radar. We liked what they were working on."

What kept Deloitte's interest in Kira's technology was its ability to adapt to a large variety of documents and functions, a pivotal need for any company with highly diversified record review operations.

"We really liked their machine learning capability. It is much more highly trainable, much more efficient to train and that was a key differentiator for us. We do a large variety of different types of documents, and some of the systems that are out there that were rules based, that had prescribed roles — they had less much flexibility. We really needed someone to have a very nimble machine learning capability so we could enter in different types of documents all the time," he added.

Deloitte first brought on Kira "around 18 months ago," Muraskin noted, and was able to reconfigure their products and deploy them across the company in a matter of months. The scale of the deployment makes Deloitte one of Kira's biggest customers.

"To date, I think we have trained over 3,000 practitioners here in the U.S. on the Kira platform, and it's been deployed across our different business — at this point, probably getting close to 1,000 different engagements. ... As a matter of relative scale, given who are and the operations we have in the order of magnitude, it's greater than their typical purchase, but [the implementation] has actually been a remarkable seamless effort," Muraskin said.

How Machines Learn

Kira's partnership with Deloitte is all the more interesting given the relative novelty of the company's platform.

"Back in 2011, when we started building our A.I., we thought, on the basis of speaking to a number of people with PhDs, that It would take us about four months to apply state of the art, sort of 'out of the box' machine learning technology to our problem [of contract analysis]," said Noah Waisberg. CEO and co-founder of Kira Systems.

"What we found is that yielded very mediocre results on finding provisions in contracts. So we went back to the drawing board."

Kira started working on building a machine learning platform entirely from scratch, spending years "building algorithms."

"After two and a half years, we got our system to be pretty accurate through a bespoke system of algorithms that we felt were well-suited to the task. What we do is we train those algorithms with examples of provisions from real contracts and data points from real contracts, and our customers can do that as well. That's how our system learns what is important to user," he added.

Waisberg believed, given the increased productivity Kira affords, the A.I technology will completely change the scale and abilities of future legal operations.

"I think the technology [will] change the nature of contract review itself. Contract review in a law firm context typically means pulling a sample of content to review, generally talking about 5 percent or less of those contracts in issue. We have been seeing the technology used ... in much larger review."

"When I was a lawyer, we would review typically in the hundreds and thousands of documents. ... We've now seen clients review tens of thousands, hundreds of thousands documents, so I think that the software will allow lawyers to do things they couldn't," he added.

The ability to process a higher volume of data does not come at the expense of time, but conversely, frees up employees to focus on essential tasks.

"Frankly, what this has been enabling [our practitioners] to do is get to the interesting and value added parts of the work more quickly," said Muraskin. The software helps them think "about what's in the document and content instead of gathering the information." It also "fosters their ability to be more valuable to the clients," and lets them see "what's enshrined in the agreement instead of having to go search through keyword. Practitioners are here to solve problems not here to run processes."

The Human Touch

This isn't, of course, to say that Kira's A.I. machine learning software can operate entirely independent of human oversight.

"Their review is as accurate or more accurate as it would be with other technology. ... But it is a human supplement. We do have some clients who have used it without much oversight, but most supervise the results that the software gives them and don't rely on it too heavily," Waisberg said. He later added, "But I think over time one change is going to be relying on the software more and more because it will get more accurate than it already is, more accurate reviews then they are doing."

The A.I. software is also being used in individual law firms, and though its deployment is on a much smaller scale than Deolitte's, it still seeks to bring the same efficiencies to many legal process.

"Kira gives us the ability to provide better service to our clients in a number of important ways: It easily manages the review of large numbers of documents in a large variety of formats, reducing the time taken for review and increasing its accuracy," noted Elizabeth Ellis, partner at Toronto-based Tory's.

But Ellis noted that the nascent A.I. legal technology may still be trying to find its footing in the marketplace.

"At this stage, it's easy to think that A.I. applications either do too much or not enough. If A.I. tools are merely used to make current work processes cheaper, without exploring whether there are additional client requirements that can now be met, we may not be seeing the real advantage of this technology. On the other hand, A.I. is simply a tool. Even as it becomes increasingly powerful and sophisticated, A.I.-based solutions are most effective when wielded judiciously by knowledgeable and experienced users."

Muraskin attributed this to "a lot of fragmentation in the marketplace. ... But we will see it settling in the next couple of years, this is a paradigm shift in how work is done ... in harmony with people."

Indeed, it is hard to doubt the staying power of A.I. technology in the legal industry, given its valued benefits in an industry whose core operations will always entail shifting through thousands of documents and records.

"There is a tremendous upside for A.I. applications in law. We are only starting to explore ways to leverage the ability of A.I. tools to analyze and provide insight on large quantities of data. We will see many new applications, from enabling lawyers to develop expertise more quickly to redefining how lawyers and clients work together to manage risk," said Ellis.

Read more: http://www.legaltechnews.com/id=1202751683263/21st-Century-Contract-Review-Deloitte-Announces-Deployment-of-Kira-AI-Software-#ixzz42MYh1Mss

Attachment 2

New jobs, new titles, new functions

Visual Executive Officer..A VEO is a visual translator for the 21st century. I help people see their brand in a cross section of all the media that they use. I spend a lot of time making observations, and then those ideas get transformed into what I call "brand image maps. http://www.fastcompany.com/44240/visual-executive-officer-veo

Director, Ethical Hacking ... We look for baseline technical skills. What we want are people who are familiar with computer systems before we teach them how to break into them. And of course, we also do extensive background checks. http://www.fastcompany.com/43847/director-ethical-hacking

Master of Disaster ... We all have bad days, but Gordon Ballinger's best days are disasters. When distress calls beckon at MapInfo Corp., Ballinger slips on his superhero suit (sports jacket and map-patterned tie), grabs a power drink (coffee, high-test), and helps federal, state, and local authorities access the information they need to recover quickly from calamities. http://www.fastcompany.com/43961/master-disaster

Crayon Evangelist...Kimberly Kay Railsback turns high-tech into high art. As crayon evangelist at InteQ Corp, a management-service provider in Bedford, Massachusetts, Railsback oversees all of the company's graphic-design needs. Where do her colorful ideas come from? Railsback draws inspiration from her design kit: a box of crayons. Favorite shades? Black, of course, and slime green. http://www.fastcompany.com/43407/crayon-evangelist

Check out some of these other collections of titles and roles of the future....http://www.futuristspeaker.com/2011/11/55-jobs-of-the-future/. Here's a few...

1. **Augmented Reality Architects** – Much like the paint we put on houses and the flavorings we add to food, the future will seem boring if our reality hasn't been augmented in some way.

2. **Alternative Currency Bankers** – According to Javelin Strategies, 20% of all online trades are already being done with alternative currencies. The stage is being set for next-gen alt-currency banks.

3. **Seed Capitalists** – In the startup business world there is a huge gulf between initial concept and fundable prototypes. This dearth of funding options will require an entirely new profession. Seed capitalists will specialize in high-risk startups. Counter to todays investment-world thinking, if they get more than 100% return on their investments, they will be docked for not taking enough risk.

4. **Global System Architects** – Our systems are transitioning from national systems into global systems. Architects of these new global systems will play a crucial role in future global politics.More details here.

5. **Locationists** – People who specialize in adding the relevance of "place" to our global online communities.

6. **Waste Data Managers** – To insure data integrity in today's fast evolving information storage industry, multiple redundancies have been built into the system. Achieving more streamline data storage in the future will require de-duplication specialists who can rid our data centers of needless copies and frivolous clutter.

7. **Urban Agriculturalists** – Why ship food all the way around the world when it can be grown next door. Next generation produce-growing operations will be located underground, often below the grocery stores where the produce will be sold directly to customers. More details here.

8. **Business Colony Managers** - The average person that turns 30 years old in the U.S. today has worked 11 different jobs. In just 10 years, the average person who turns 30 will have

worked 200-300 different projects. Business colonies are an evolving new kind of organizational structure designed around matching talent with pending work projects. The operation will revolve around some combination of resident people based in a physical facility and a non-resident virtual workforce, with some opting to forgo the cost of the physical facility entirely. People who can effectively manage this type of operation will be in high demand.

And some more

http://mashable.com/2014/04/28/jobs-of-the-future/#_Na3w6Uadgqw...these are some of my favourites...

Nostalgists are interior designers who will be tasked with helping the wealthy elderly design spaces that reflect their favorite decades. Whether this means recreating a 1980s living room or a 1950s kitchen, nostalgists will help recreate happy memories for their clients.

This career path combines the roles of therapist, historical researcher and interior designer, and an eye for historical detail is essential.

Telesurgery (also known as remote surgery) allows trained surgeons to operate on patients remotely using robotic arms, a master controller and a sensory system that provides feedback to its user. This is a concept that's already being practiced.

Telesurgeons will specialize in performing surgeries on patients in far off locations. In addition to a degree in medicine, these surgeons will have backgrounds in robotics and telecommunication technology.

The **rewilder's** job will help undo the damage that humans have caused to the countryside. This means tearing down fences or ripping apart roads and replacing them with forests and natural greenery.

Folks interested in wildlife management, agriculture and environmental sciences will be great fits for this career.

These designers will make careers out of perfecting the art of upcycling. Upcycling is a way to use trash to create new, better quality items. Garbage designers will see to it that upcycling attempts are efficient and successful, designing ways to make new items with very little waste. The requirements for this job will include a background in materials science and engineering, and a familiarity with industrial design.

Simplicity experts will find ways to help businesses streamline and simplify their day-to-day operations. They'll be tasked with condensing three days of work to half an hour of work or reducing 15 administrative steps down to just three. Folks who excel at math, have an eye for design and a keen sense of human connections will do well in this line of work.

It can be tricky for hospital patients and their families to understand the complex hospital system. But with the help of a **healthcare navigator**, patients will have better access to information they need.

While healthcare navigators will have answers to questions regarding procedures and paperwork, they'll also provide support for families struggling to cope with the stress of illness. Excellent navigators will have the knowledge of a healthcare specialist and the sensitivity of a social worker.

As life spans increase, planning for the last phases of life will become standard practice. **End of life therapists** will act as guides to planning for the years before a client's death. This will involve being straight-forward but sensitive about ways to making dying a smoother process. A background in social work, healthcare, education and psychology will be helpful in this career path.

Games make excellent tools for helping people of all ages to learn new skills. The **gamification designer** will combine game logic with everyday activities, events, services and products to make the world a more playfully challenging place. These designers may also work with doctors and therapists to create games that help people bounce back from the stress of illness.

Gamifications designers will become certified in their fields and will develop a background in human motivation and play behavior. They will also learn to translate game design into real life experiences.

As robots start to play even larger roles in our lives, wealthy people will own robots who act as servants or caregivers. People looking to purchase robots for their homes will work with **robot counsellors** to determine which model is best suited to a family's particular needs. If a robot does not fit in with the family, the counsellor will be on hand to determine better options and to provide care and customer service.

Successful robot counsellors will have skill sets similar to those of today's family counsellors. This means a keen understanding of social work, family counseling and sociology. Robot counsellors will also have training in sales and marketing.

A **media remixer** takes the job of DJ or VJ to another level by remixing various forms of media into one cohesive new project. These remixers will bring together audio, video, images and augmented reality to create projects ranging from marketing campaigns to wedding entertainment to installation art. These remixers will likely work in a freelance capacity, and will need to be self-driven and able to juggle multiple projects at once.

Highly creative and entrepreneurial types will make excellent media remixers, as knowing how to build a personal brand will be key to their success.