

5 Key Challenges for Building, Managing and Leading a Hybrid Workforce

Introduction

"IN THE FUTURE, WHEN MICROSOFT LEAVES A SECURITY-FLAW IN THEIR CODE IT WON'T MEAN THAT SOMEBODY HACKS YOUR COMPUTER. IT WILL MEAN THAT SOMEBODY TAKES CONTROL OF YOUR SERVANT ROBOT AND IT STANDS IN YOUR BEDROOM DOORWAY SHARPENING A KNIFE AND WATCHING YOU SLEEP."

~ DANIEL H. WILSON

Peter Drucker wrote:

"WE LIVE IN AN AGE OF UNPRECEDENTED OPPORTUNITY: IF YOU'VE GOT AMBITION AND SMARTS, YOU CAN RISE TO THE TOP OF YOUR CHOSEN PROFESSION, REGARDLESS OF WHERE YOU STARTED OUT"

When considering the rate of technological change over the years, I believe that this idea (that has become core to the way in which we raise and educate our children) is under threat. In the future, where more of the day-to-day work currently undertaken by humans is automated, up to and including knowledge work, how can managers and leaders build organisations in which humans can work in co-operation with machines, rather than being replaced by them?

There has been much sensationalist writing in the media over the years on the topic of robots replacing humans in the workforce, as more and more of the tasks that currently form our day-to-day work are automated. Link bait headlines proclaiming mass world-wide unemployment, machine take-overs and other threats to life as we know it, all as a result of the exponential growth in computing power, capabilities of new technology and increasing costs of the labour force - and more than a little lazy reporting. A recent trip to Detroit, once one of the most prosperous cities in America, offering a bright future, underpinned by the giants of the automotive industry and now little more than a shell, with poor infrastructure, no means of regeneration and bankrupt. A stark example, it clearly indicates that these sensationalist headlines have a kernel of truth at their core - the workforce and the conditions they work in are undergoing seismic shifts of a variety of fronts. However, the topic of a hybrid workforce presents a unique set of challenges for all of us wishing to play a role in managing and leading the future workforce - not least because for the time being, this is still very much a greenfield site..

For those new to the subject of a hybrid workforce as a serious consideration, could do worse than in the first instance, to consider the most important question when deciding how to manage in the digital age: what role will humans play in the hybrid human-machine reality that is already creeping into the modern 21st century organisation? Examples such as Amazon's warehouse with

robotic shelves, the exoskeleton trailed at Daewoo allowing humans to lift bulky, heavy chunks of metal and the financial services startups using algorithms to deliver financial advice show us how close to being an everyday reality the hybrid workplace is. The role of humans and managers in this scenario is entirely dependent on whether we select an automation or co-operation model dominates.

What follows is an exploration of five of the key management challenges that will be encountered in our journey to build and run a hybrid human-machine workforce.

Challenge one: automation versus co-operation

"WHATEVER YOU MAY BE THINKING WHEN YOU APPLY FOR A JOB TODAY, YOU CAN BE SURE THE EMPLOYER IS ASKING THIS: CAN THIS PERSON ADD VALUE EVERY HOUR, EVERY DAY - MORE THAN A WORKER IN INDIA, A ROBOT OR A COMPUTER? CAN HE OR SHE HELP MY COMPANY ADAPT BY NOT ONLY DOING THE JOB TODAY BUT ALSO REINVENTING THE JOB FOR TOMORROW?"

~THOMAS FRIEDMAN

The current workplace focus on automation is largely inspired by the work of Marvin Minsky, Professor at MIT whose seminal Artificial Intelligence (AI) paper "Steps Towards Artificial Intelligence" defined a discipline in it's infancy, and is still influencing the way AI is entering the workplace today. He theorised that AI relying solely on computers would increasingly become the norm within organisations. Using robots and algorithms to automate data-oriented tasks, factory jobs and replace call-handling agents has produced massive savings in labour costs over the last decade. However, the severe costs to humanity if this model is taken to it's logical conclusion, should give us food for thought. There are other models present in other spheres that could prove more beneficial in a true hybrid workforce.

The work of J.C.R. Licklider offers a model of human-machine symbiosis, which would open another path entirely. He advocates for machines to amplify the intelligence of humans through co-operation. By taking tasks humans do not excel at and assigning them to machines, we can allow humans to focus on their areas of strength. Surely this is a more sustainable, rewarding model to pursue?

We see many examples of this at work - one of my favourite examples is the citizen science project fold.it. An online video game that allows non-specialist players to visually fold proteins, whilst in the background a computer is assessing the viability of the fold. Using this collaboration between human and machine, the game has demonstrated that the combination of man and machine outperforms the brute force of artificial intelligence relying solely on computers, even those programmed for machine learning. When applied to the real world, the output of the game (knowing the structure of a protein) is key to understanding how it works and to targeting it with drugs. It is easy to see the benefits in terms of resources, innovation, speed and agility to this hybrid approach.

Implementing either of these two models presents some serious challenges for management.

Minsky's model, combined with the current prevailing predisposition towards a Tayloristic management methodology, presents a particularly worrying possibility. A focus on management by numbers (based on Frederic Taylor's Principles of Scientific Management, which have remained largely unchallenged (even in companies dominated by knowledge workers) means that managements role will be easily subsumed by robots or algorithms - a severe disservice to the true role of management within an organisation.

Using Licklider's model however, we are more likely to see the separation of management into two distinct disciplines, one focused on planning, estimating time and resources and crunching big data sets to achieve optimum results. And the role of coach, mentor and leader being championed by humans. After all, neither robots nor humans are flawless, but through this type of symbiosis we can build a workforce in which all works play to their strengths.

Challenge 2: Managing Performance & Amplifying Human Intelligence

“ANYTHING THAT COULD GIVE RISE TO SMARTER-THAN-HUMAN INTELLIGENCE - IN THE FORM OF ARTIFICIAL INTELLIGENCE, BRAIN-COMPUTER INTERFACES, OR NEUROSCIENCE-BASED HUMAN INTELLIGENCE ENHANCEMENT - WINS HANDS DOWN BEYOND CONTEST AS DOING THE MOST TO CHANGE THE WORLD. NOTHING ELSE IS EVEN IN THE SAME LEAGUE.”

~ELIEZER YUDKOWSKY

Our continuing quest for ever-higher levels of productivity have lead us to a place where hyper-efficient management models are also required for businesses to succeed. Turning to how humans and machines can come together to address this, we again see two extreme models emerging: one where companies deploy artificial intelligence and algorithms to make business decisions based purely on data; and, another where self-managing teams supported by data crunching and collaborative technologies seek to innovate and outperform.

Probably the central difference between managers that are human, and those that are robots or algorithms, is the latter ability to be truly objective, free of mistakes and foibles. At first this does not sound too worrying from a performance management perspective - after all, who would not like to be judged on what they do, without the politics, inter-personal conflicts or mis-aligned goals? But as social creatures, humans naturally reach out to help others when they need, when they problem solve they are not always efficient but that can lead to innovation and any robot would see time spent experimenting with new ways to get things done as simply not completing your allotted tasks.

We see the consequences of this kind of automation and standardisation everywhere - from the periodic blocking of your bank card to check for fraudulent transactions, to the controversial continuous testing of children through standardised tests with no way for the teachers who know them best to have any input into the result.

At the other end of the spectrum, we have Toyota, one of the pioneers of replacing factory workers with automated robots, seeking to re-inject humans, more specifically master craftsmen (often referred to as 'Gods') back into the production line. After all, a machine can only perform the tasks it has been taught how to do, or predict events based on pre-existing algorithms. Even machines capable of machine-learning requires a programme language and predictive models to compute from. Change has become too constant for automation to be the standard for the factory floor, let alone the knowledge worker.

Challenge 3: Leadership versus management

**"WHAT ABOUT PASSION, DEDICATION, LOYALTY? CAN A ROBOT PROVIDE THOSE? NO! ON THE OTHER HAND, IT'S EASIER TO RETIRE A ROBOT WHEN ITS DAY IS DONE."
~STANLEY BING**

Crucially, there is emerging evidence that 'robotic' managers (those focused purely on the numbers, goals and targets) fail to win the hearts and minds of their workforce. We can hypothesise therefore, that robot managers may also fail to persuade their human workforce, lacking authority and enthusiasm for a joint mission (a key component of employee engagement). Interestingly, when the classic Milgram experiment was conducted with a robot-twist, the initial results indicated that humans would follow orders from a robot overseer even when told they could quit at anytime, and having voiced a desire to leave. The jury is out for the time being, although our next management challenge could also play a role in influencing whether or not robots could carry the authority needed to lead, rather than simply manage a team.

In it's current incarnation, an AI machine leader would function much like a sociopath - unable to empathise, compromise or have anything other than a cold, calculating nature. With human strengths centred around leveraging emotional intelligence, adaptive thinking and creativity will almost certainly bring about an early split of leadership from management - the latter being the perfect foil for robots and algorithm, and the former requiring nothing less than high-value, gap filling human skills.

Examples from the emerging field of big data give us perfect emergent examples of how human-machine symbiosis create a perfect management/leadership combination. At GE aviation, the data gathered from in-flight aircraft is mined in close to real-time (a feat not achievable by humans), and statistically significant data points are fed to human interpreters and leaders for decision-making.

Challenge 4: Social cues, processing tensions and can humans deal with robots being wrong?

**"THANK YOU... MOTION SENSOR HAND TOWEL MACHINE. YOU NEVER WORK, SO I JUST END UP LOOKING LIKE I'M WAVING HELLO TO A WALL ROBOT."
~ JIMMY FALLON**

One clear challenge of humans and machines working side by side, day by day is the inherent mismatch between the natural human need to: be face to face with colleagues; see body language; hear tone; and, see attentional focus in order to build a relationship, and the lack of these social cues in robots.

There have been suggestions that building visual broadcast cues into the interface of a robot would help remove this friction in a hybrid workplace. For example, robots could express fatigue when their batteries are low, excitement when they have new data to share or curiosity when they need more data to proceed. Collaborative cues are one way that the interface between robots and humans to be designed in order to reduce friction. Where neither the human, nor the machine is entirely autonomous, we need to replace the current tradition of human-centred design, or system-centred design with a human-machine system design, which allows a hybrid team to perform the overall task.

Although only at the experimental stage, there has been some work on social cues in commercial robots in research at Carnegie Mellon and Boston University, amongst many others. As we see more humanoid robots entering social and customer-orientated situations (such as the Japanese hotel reception 'manned' by humanoid robots), interface design and social cues through interaction design will need to invent a whole new paradigm.

Whilst researching some of the case studies for this essay, one of the most fascinating pieces of research I came across concerned discerning how humans would react to robots being wrong. With pre-conceived notions about the infallibility of robots and computers, coupled with an inability to be truly dynamic in the moment could lead to errors in safety and quality.

Challenge 5: Creating a co-operative workforce

"WHAT'S CASUAL FOR A ROBOT ISN'T NECESSARILY WHAT'S CASUAL FOR A HUMAN."

~ ALAN TUDYK

A truly co-operative workforce, where human and robots work as a seamless team, with the lowest possible friction each playing to their strengths as a hybrid unit will provide society with a need for

an almost total re-make of the economic model, societal conventions, business models and products amongst many other things.

However, it also offers the most exciting vision, where analytical, statistical and programming skills are key to maintaining a role in the hybrid workplace (talk about the geeks inheriting the earth!). But the hardest skills to recruit for and retain, will without a doubt be people capable of leading. Not just leading humans with compassion, empathy and interpersonal skills, but also the logic, analytical skills and ability to lead robots too.

I believe that the key challenge to a truly co-operative workforce lies with designers - not just interface designers, but also designers of organisations, teams and temporary workforce structures. Roles to coach and mentor the workforce will also be needed to ensure change and innovation are fast, iterative, agile processes embedded in every agent in the workforce's day to day work. An early model for these workforce coaches can be found in the agile coaches deployed in large, fast moving IT change programmes such as the UK's Government Digital Services (GDS).

We might also ponder what happens to the portions of today's workforce with no easy path to success in the new hybrid workforce. But this is a question not for management, but for society as a whole, economists, world leaders and national politicians.

Conclusion

Balancing this re-imagined workforce, building a positive future for humans, and for humans working with machines will be a key place for managers and leaders to prove that a beneficial approach is possible. Leaders and managers brave enough to engage and understand a strengths-based mode of hybrid workforce will need new models for change (making it constant, underpinning, small and iterative), new models for hybrid management and leadership.

Ensuring we, as humans, form a major guiding force in building the future hybrid workforce we need to build on the learning from the technological revolution of the last few decades:

- ▶ we need to move from knowledge-centric structures to learning-centric structures: with the amount of growth, innovation and change that will take place during the course of our careers, standing still in terms of capabilities will never again be an option.
- ▶ we need to focus on building career portfolios, not career paths: a single planned career path has always been a fallacy, but in a hybrid workforce, the best protection against obsolescence is a portfolio of roles that play to the strengths of humans, and human-machine interaction. These roles will be more fluid interns of employment models, moving more often between companies, partners, suppliers, etc.
- ▶ human-centric models of management will need to develop along human-machine system-centric models. Managers need to understand that they will no longer be the seat of

knowledge, but will take on new roles in defining the 'why' and the 'what' (the strategic elements).

- ▶ we need to consider how we can fulfil our true human potential: if many of the hands on, blue collar and white collar work has been automated, how can we grow into roles that are higher-value?

There will, of course, always be those who seek to prevent such a future using any tactics available to them. History has given us many examples, the most relevant of course were the Luddites, 19th century textile workers who sought to halt the progress of mechanical automation by machine-breaking and disrupting new technologies. To ensure a bright, productive future for a human-machine hybrid workforce, we must also guard against the natural human reaction to reject or pull back from seeking new ways to work when there are issues. Over the last decade, we have seen a number of accidents caused by workplace robots - but health, safety, quality and environment management has long been the purview of experts in engineering and heavy industry firms, and lessons learned when other technology has been introduced into the workplace will equally apply as we find out way in small, closely monitored interactions of change.

Managers and leaders can only establish a competitive future for their organisations by tackling the partnership between humans and machines early and often, pushing boundaries not only inside their organisations, but also in innovation centres such as Silicon Valley who also have the resources and budgets to set the agenda sooner rather than later.