

Strategizing Management Education in Response to Artificial Intelligence

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ABSTRACT

This review informs the positioning of management education in a much changed global socio-economic context. The authors relied on scholarly articles and intellectual trusts found among the leaders of competitive industries. We set the stage where the impact of Artificial Intelligence on human agency plays out. Attention is drawn to information knowledge management and learning; the probable extinction of managers and finally, shifts in the futures of providers of management education.

KEY WORDS: Artificial Intelligence (AI), management education, business schools

INTRODUCTION

Scenarios on the impact of Artificial Intelligence (AI) on the global economy and society is hotly debated. At the core we find the ability of humans to retain their authority within a dynamic, disruptive environment. Of concern is whether humans are subject to the illusion of having substantial control of their lives, assuming that managerial roles are too creative or smart to become redundant. We attend identifying ways in which managers' learning can optimise artificial intelligence. So, motives behind competitive data assimilation and the advancement of robotics is examined. Moving to the future of management education, the roles of managers in the Fourth Industrial Revolution and the function and form of traditional business schools is considered.

RESEARCH METHOD

The authors relied on scholarly articles and

leaders' views of competitive industries. Info was extracted mined using Leximancer 4 text-mining software.

REVIEW

Human Nature

In *Thinking, Fast and Slow* (2011) Daniel Kahneman posits that humans tend to base decisions on what exists. Thus, humans neglect relevant phenomena on which information does not exist. Kahneman argues that humans tend to ignore the role of chance in complex change and assumes that the future will mirror the past. The question arises whether humans continuously consider the impact of computers to outperform humans in thinking statistically. Emergent is that humans falsely believe in having substantial control of their lives.

Enter Artificial Intelligence

Narratives on the impact of AI has entered the public stage 1968 when Stanley Kubrick produced the movie *2001: A Space Odyssey*, an existentialistic science fiction movie which explores the interface between humans and AI in the context of extra-terrestrial life. Public fascination was rekindled by George Lucas who released *Star Wars* in 1977, a space opera about the adventures of diverse species habituating galactic ecosystems. In 1999, the Wachowskis directed *The Matrix* about a simulated reality created by intelligent machines. Here, humans are subdued to extract body heat and electrical activity as a source of energy. The hero "Neo" learns of this and leads a rebellion against the machines. These and other movies broadened horizons shifting our perceptions from the simplicity of "little

green men” to accept limitless possibilities. Moreover, robot movie stars introduced a humanoid dimension rendering AI as varied characters ranging from revengeful to loveable.

Reality Check

What is happening in our recognisable environment? Fact is that AI is significant in quietly changing our day-to-day lives. AI helps us to take perfect pictures, to safely park our cars and being annoyed by automated answering services. These and other examples stress the overarching need to understand how quickly and to what extent forms of AI will evolve. Gottfredson (1997) states that “there is now a large and robust body of evidence indicating that one's level of intelligence strongly influence's one's prospects in life... The rising complexity of everyday life has escalated the value of intelligence in realising life outcomes.”

Carr (2014) in *The Glass Cage* on “Automation and Us” writes that “a more automated world result in the atrophying of important skills.” Linking to Kahneman’s perspectives, Carr concludes that since “higher” cognitive functions and holistic understanding typically draw on hands-on physical or social interaction with the world, it is folly to expect to automate only the “lower,” unimportant cognitive aspects of a domain.

Elon Musk and Stephen Hawking substantiates these concerns with possible applications of AI in the military. Hod Lipson, a leading robotics Professor at Cornell University's Creative Machines Lab states that “robots that create and are creative” has succeeded in automating scientific discovery. Lipson cautions that “the solution is not to hold back on innovation, but we have a new problem to innovate around: how do you keep people engaged when AI can do most things better than most people? I don’t know what the solution is, but it’s a new kind of grand challenge for engineers.”

A further risk AI poses is that existing inequalities may be increased by the rich and powerful arguing in favour of “the scarcity of time and resources” (Brundage, 2015), reminding one of the counterarguments posed in *Capital in the 21st Century* by Thomas Piketty (2014). The MIT Technology Review of June 2015 speculates that the 2007–2009 recession may have sped up the automation of well-paid white and blue colour jobs performing repetitive tasks. Siu (2015) estimated routine jobs to account for 50% of employment in the USA with a “harsh affect on people in their 20s, many of whom seem to have simply stopped looking for work.” In *The Great Divide* economist Joseph Stiglitz (2015) argues that these global challenges are caused by a lack of liberating policy frameworks.

Variables which have triggering the global economic downturn prompted the Davos 2016 World Economic Forum deliberation on whether humanity is on the cusp of a Fourth Industrial Revolution. In essence, recognising the rise of an era of uncertainty. Says Marc Benioff, founder, chairman and CEO of Salesforce (a cloud computing company), “As a society, we are entering uncharted territory.” Less clear, however, is the impact this revolution will have on entire industries, regions and societies around the world. Will it be a force for good or evil? Will it provide new opportunities for all, or will it exacerbate inequalities? Former US Vice-President Joe Biden confirmed, saying “I believe, on balance, these transformations are changes for the good. But they come with real peril, and they require us to be proactive. For how will the warehouse worker who used to ship your order, or the salesman who used to take it, now make a living when he or she is no longer needed in that venture? On the other hand, many domains have already been suggested as either urgently in need of AI and robotics innovations (such as elder care,

manufacturing, and sustainability) and others have been portrayed by many as areas to avoid automating (such as the decision to use deadly force in warfare). These examples hint at the hidden complexity of the seemingly simple question: what should humans do and what should machines do?"

Human Agency

Davos 2016 explored the dearth of human agency over the future and that understanding of AI drivers would be beneficial in consciously steering the future distribution of cognition between humans and machines. Moreover, that future operations will probably be run by AI controlling all supply chains with human contribution. Humans, however, would not run the whole show.

At the 2015 Association for the Advancement of Artificial Intelligence, Miles Brundage (2015) states in *Economic Possibilities for Our Children: Artificial Intelligence and the Future of Work, Education, and Leisure* that "clarity is urgently needed with regard to the susceptibility of jobs to automation." Brundage (2015) argues that "it is highly important to monitor and theorize the rate of development and what is causing it." In reviewing theoretical progress, Brundage (2015) conceives a global meta-theoretical construct aimed at alternatives to dramatically change the world economy with economic projections, alternative scenarios and plausible science fiction, public engagement on progress in AI, and anticipating policy options such as government funding across AI research domains.

In a fascinating article on the *Evolution and Revolution in Artificial Intelligence in Education* Roll and Wylie (2016) sketched scenarios by means of 47 papers published in 1994, 2004, and 2014 in the International Journal of Artificial Intelligence in Education. Two parallel strands identified the evolution of

education and a revolutionary process embedding technologies within students' everyday lives.

Thus, human agency in the evolution of AI seems mostly restricted to academia often treasuring the perception of being the most intelligent beings on earth. Following, the strides made by the brain trust of the Steve Jobses and Larry Pages in the world will be explored.

Who owns the data?

Smartphones feed location and other info back to their mobile carrier and device makers. This development affects all continents, e.g. Sub-Saharan Africa mobile networks are as common as they are in the USA (PewResearchCenter, 2015).

Besides the transfer of personal information we are aware of, data is also gathered about our state of health, our choice of transport, our taxes, the value attached to essential and luxury goods and services, email, social media, video images, photos, traffic lights, weather services, public and leisure venues and events. All sourced and stored in someone's cloud.

About a decade ago data flowed freely into car radios. Now, General Motors, BMW and Audi are rapidly enhancing digitally enabling their cars. Google and Apple are aggressively experimenting with Android Auto, self-driving cars, and Apple Car Play. All aiming to capitalise on high-speed wireless connectivity. Data therefore glues automotive innovations and shows why data ownership is fiercely competitive. Moreover, executives need to attend to what data their companies share, with whom, and who will claim ownership of that info. But, "*Competing for the connected customer – perspectives on the opportunities created by car connectivity and automation*," reports that customers are less concerned with data ownership than the automakers think they are (McKinsey & Co., 2015). This reminds of

the Kahneman warning that humans assume they have substantial control of their lives. Robots function on the algorithms derived from big data analytics which may well in the longer term challenge us for most of our jobs.

Flow of Information and Knowledge

Research on developments in information management reported an emerging shift in information knowledge management since the 1980s (Macevičiūtė & Wilson, 2002), shifting from re-writing existing knowledge towards speeding up answering complicated questions. Sebastian Thrun (the mind behind Google Glass and the self-driving car) confirms, saying: “It’s crazy, no doubt about it. But what gets me is that today, a billionaire or head of state on their smartphone has the same direct access to information as a homeless person has on a smartphone, or a person in Bangladesh or Papua New Guinea” (Catlin, 2015). The infosphere (Floridi, 2014) has indeed become immersed in AI and more tools are now required to help individuals cope with this heightened level of complexity.

Future Professors

Will Professors either adapt their approach to the shifting flow of knowledge and information, or become extinct? We may have not yet seen humanoid robots acting as teachers, but many examples of software products and services now assist students and teachers to optimise educational experiences. AI already automates basic education e.g. grading, thereby freeing up time to interact with students, to prepare for class, or professional development. AI already facilitates individualized learning through simulations, identifies room for improvement, tutoring - though not yet as good as human tutors in facilitating higher-order innovation. The Generalized Intelligent Framework for Tutoring (GIFT) has emerged as a standard for authoring, deploying, managing, and evaluating.

Overall, AI alters the manner in which humans find and interact with information without even noticing the scale at which AI delivers or offer a relatively judgment-free environment (D’Mello, Blanchard, Baker, Ocumpaugh & Brawner, 2014).

Online learning emerged as a strategic driver, evidenced by the number of universities ramping up online offerings. New entrants and new partnerships, e.g. Academic Partnerships (Dallas), partners on a global scale in expanding access to high-quality higher education. MIT has recently partnered with Harvard University in edX. Former Stanford Professors (Andrew Ng and Daphne Koller) have started Coursera, which now partners with several universities. Recent rapid expansion of online learning yielded many expensive lessons, such as the effectiveness of MOOCs which consist essentially of boring lectures posted on the Internet. Also, the success rate of students and actual assessment of whether intended learning outcomes were actually achieved. These shortfalls suggest that online education needs rethinking of how to optimise WWW potential as a teaching medium. Insightful developments now include Udacity, which shows a man hand writing on a whiteboard and then take students into the action zone where learning will be applied, followed by on-the-spot problem-solving. The major shift observed is from achieving grades to mastery in problem-solving.

Will Professors become redundant? What is clear, is that core teaching and learning has shifted towards the facilitating higher order learning and support, human interaction and hands-on student experiences, e.g. the “Flipped Classroom” (Newtonian Talk, Virtual BattleSpace, Virtual Medic, Sudoku).

Managers and Management Education

Managers believe that their roles are too creative or smart to become redundant. In “*How AI could eliminate (or reduce) the*

need for managers”, Guerrini (2015) quotes Devin Fidler (2015) who coined the term iCEO, a virtual management system that automates complex work by dragging-and-dropping assembly lines and run them from a dashboard. Fidler explains that they figured the possibility “to sit down at a laptop, launch an iCEO and ‘code’ the preparation of a project worthy of a Fortune 50 company into existence — without needing anyone to act as the project’s manager? The answer: “yes.” Fidler (2015) illuminates that current corporate structures have existed for around 200 years, designed on 18th century tools to maximize scale and minimizing transaction costs. “Now that structure is being disrupted by the advent of technologies which can accomplish many of the projects we associate with corporations. With traditional organizations no longer necessary to create many things at scale, they are likely to be challenged by a new generation of alternative technologies for getting things done. Senior executives must wake up to this inevitability and join the conversation on the future of work, which only seems to be taking place at the policy level” or “watch as their roles are automated out of existence” Fidler (2015).

Fifteen years ago, Harvard Business School professors argued that the disruption posed by ICT would affect leading business schools as much as any other organisation...” (Christenson & Overdorf, 2000). They posited that “business schools must fundamentally rethink their business models if they hope to thrive in the future” and asserted that the university “leaders must also vigilantly guard against their becoming more and more out of touch with the mainstream and therefore increasingly irrelevant (Christenson & Overdorf, 2000). While institutional missions will evoke a different response to this dilemma “the dilemma [must] be addressed by our nation’s leading colleges and universities.”

By 2015, the paradigm shift “driving a Darwinian-like evolution of economic models based on the provision of ICT services” shows that leading business schools are “turning to third parties to reuse their solutions rather than to lock valuable capital in sourcing hardware and software” – as predicted by Ashal (2013). In providing a comprehensive review of the business school ecosystem of the past, present and future, Thomas, Lorange and Sheth (2013) suggest what skills business schools should impart to their students and how they might accomplish this goal by emphasising the business model of business schools (sustained funding and its allocation) and the impact of a globalised world where management education has become localised. In reflecting on practical solutions, Thomas (et al., 2013) draws attention to distance education in emerging markets, the half-life of knowledge (estimated at five years) and preparing students to find solutions to contemporary management and associated social challenges at a global level. Also, to instil lifelong learning as a life skill. They conclude, stating “whether or not deans have the stomach and expertise to drive though reforms that are needed, remains a moot point. But the outcome will be crucial.”

CONCLUSION

The review fostered a broad understanding of opportunities and threats AI poses to management education and to society at large. These truths demonstrate that management education is shifting from an emphasis on the past and the present towards educating a responsible manager able to cope with disruptive change. The attributes for future-orientated providers of management education include: i) The contribution of global meta-theoretical construct of a dramatically changing world economy in terms of economic projections and scenarios, public engagement and government, and notably, policy directives across AI research domains; ii) a clear

value-proposition of programmes, services and knowledge production and iii) well-considered partnering with organisations beyond their traditional boundaries and in promoting their global reach.

REFERENCES

Available on request.