Sociotechnical Approaches in the era of Data Science and AI: A research agenda

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Keywords: AI, Sociotechnical approach, Actor Network Theory, Big Data, Data Science, AI-applications, AI-enabled business

Over the last few years, interest and investment in AI applications in organisations have witnessed exponential growth. Many organisations are experimenting with different AI-enabled technology and applications. The AI technology covers a broad areas from voice recognition, process automation, predictive analytics. The techniques used in enabling AI technology vary and include autonomous or unsupervised machine learning (ML), supervised machine learning and deep learning among others.

While AI-enabled technology and applications do vary in their function, reasoning approach and involvement of humans in the loop, the current rhetoric in popular press and some writing about AI in organisations and society is dominated by a technological deterministic view. This view favours technology and see it as a sweeping guiding and ruling force that is capable of replacing humans, organising their life and enforcing order of a machine choice! I argue that these views have been behind the "wow and fear" of machines and computers since their introduction [1]. Every technology and machine has been surrounded by this "technomagic" thinking whether it is utopian or dystopian [1]. For example, think of the introduction of the Bicycles in the 1890s and the controversy surrounding it, even considering it a moral threat to society; a vehicle for segregation and a method of exclusion [2]. So many examples could be found from the introduction of computers to the introduction of machinery I coal mining. The utopian technomagic thinking typically finds machine to be capable of ruling everything replacing humans and enforcing order to disorderly humans' life for good; where it brings prosperity, efficiency and unprecedented advancements. The dystopian technomagic thinking threatens that AI will replace humans making them not only of little value but generally helpless on front of powerful machines. Think about AI in organisation and you can recognise both views. Of course the popular press has propelled a dystopian view of AI based on Sci-fi Hollywood-style thinking. And the utopian view is also seen in many statements like this one by Nobel Laurette Daniel Kahneman: "You should replace humans by algorithms whenever possible ...Even when the algorithms don't do very well, humans do so poorly and are so noisy that just removing

Proceedings of the 6th International Workshop on Socio-Technical Perspective in IS Development (STPIS 2020), June 8-9, 2020, Grenoble, France

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the noise you can do better than people. We're narrow thinking, we're noisy thinkers, it's very easy to improve upon us, and I don't think there is very much that we can do that computers will not eventually be programmed to do" [3].

In this talk, I explore many examples of these two extreme views and argue that an academic discourse on AI and sociotechnical change needs to be developed and organised. sociotechnical approach could provide a valuable critical evaluation of AI-enabled technology in organisations. Bijker in 1997 provides an insightful work into the sociotechnical change associated with different technologies [4]. Mumford's work in the sociotechnical change associated with the introduction of computing systems in organisation [5, 6] and the detailed studies of the Tavistock Institute should give us inspiration [7, 8, 9, 10]. We have a long history and tradition of applying sociotechnical approaches in our field, in fact it is our field [11] and the STPIS community has created a good opportunity to advance the thinking in this regard.

AI Technology and its application in organisations are moving fast [12]. We see them in HR, predictive policing, Radiology and healthcare, Education, Banking, Finance and Accounting and many other domains. The time is ripe for sociotechnical studies on AI and Data Science. The tradition of sociotechnical thinking in IS is largely empirical based on detailed analysis of associated sociotechnical changes well beyond the "technomagic" thinking. There are different sociotechnical approaches that could be adopted. We have Affordances and Fit/misfit theories [13, 14], Structural appropriation [15], Interaction approaches based on Actor network Theory [16, 17, 18, 19] and sociomateriality [20], Systems Thinking and design thinking [21, 22]. In AI-enabled applications in organisations, there are several areas of concerns that demand sociotechnical consideration. The interaction between people and models and the influence on decision making, the interaction between individuals and AI-enabled technology, the development and interpretation of machine learning models, organizational readiness for different AI applications, revision of decision-making theories in the context of AI are all green fields in need for sociotechnical conceptualization and understanding. I will go through many of these areas in details.

In conclusion, sociotechnical approaches have a key role to play in studying AI and Data Science-enabled applications in organisations.

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