Henry Alexander Wittke

Artificial Intelligence

An Approach to Assess the Impact on the Information Economy

Tectum

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Foreword

The fact that democracies are changing during the process of digitalization is undisputed today. The political handling of these changes will be decisive for the (our) future. Minor challenges arise in those (few) areas in which current trends can simply be extrapolated. However, major political and social challenges arise from "black swans", events that divide the course of time into a "before" and an "after". Artificial intelligence (AI) is both, a minor and a major political challenge: On the one hand, usage of weak AI leads to rapid but anticipatable developments. On the other hand, the development of strong AI is a "black swan", an "event horizon", beyond which serious (political) analysis is impossible.

During his time in Hamburg, Henry Wittke and I have often debated about artificial intelligence. Our discussions at the time - especially on AI's impact on the economy - marked the starting point of a long line of dialogues he had with cutting-edge experts in the US, particularly at Harvard University. The insights and findings are documented in this monograph.

Which impact will AI have on the Information Economy and on society within the next 10-15 years? Will political systems be able to support the beneficial uses of AI while softening the malicious side effects? Henry Wittke addresses these issues in a rigorous and very thoughtful manner. His insights are important for decision makers as well as citizens: During the next five years, he predicts merely a minor transformation of the character of human-machine interaction at work, but not a fundamental change in the structure of the economy. No reason to worry, then? Certainly not, since according to Wittke, things will look different in 15 years' time: widespread use of strong AI will have significantly reduced the number and importance of human-machine tandems at work. More jobs will have been destroyed than new ones created - even in the information sector. This may lead to social upheavals and unrest, unparalleled in the recent history of western democracies.

So, it's high time to talk about the political and social side-effects of AI. This book is a timely and thoughtful offer to start this endeavor.

Gary S. Schaal

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1. Introduction

1.1. Relevance and "Problem Puzzle"

An ongoing and seemingly unstoppable digital transformation brings about new options, opportunities but also challenges to individuals, organizations, companies and societies alike. The everyday gets more and more influenced by drivers like the creation of gigantic amounts of data. Now the total amount of data being produced doubles every year. In 2016 the world produced as much data as in the entire history of humankind through 2015. It is estimated, that in ten years, the available amount of data will double every twelve hours (cf. Helbing et al. 2017: 2). In the wake of exponentially rising data, also the field of Artificial Intelligence (AI), is developing significantly. The increasing availability of a vast amount of data is therefore helping the growth and applications of so-called AI. Recent breakthroughs in the field of neural networks and deep learning algorithms as a part of machine learning, increase AI's potential to disrupt the world's largest industries. For example, in the business sector, AI is poised to have a transformational impact. Although it is already in use in most companies around the globe, most big opportunities for AI deployment have not yet been tapped. Current developments in the field of AI alarm governments, seeing the potential consequences on the workforce and thus societal change while also being seemingly helpless against uncontrollable and powerful digital players such as Google or Facebook. They are increasingly penetrating the so-called real economic sectors, also using more and more AI-applications and transforming the rules and fabric how actors engage in socio-economic relationships.

From a scientific perspective, there are different perceptions of AI, which will be categorized and also simplified within this thesis into weak and strong AI. It is assumed that weak AI-driven automation is already transforming the way in which societies and economies are organized. But the impact and transformation caused by the beginning of strong AI and its deep learning algorithms could be much more profound than changes origination from weak AI. As with any profound change, there will be players winning from this transformation but also losers. Vast transformation processes are not new. But the difference this time under strong AI is that most observers feel that job losses in established sectors will occur at an unpreceded level, while only relatively few new jobs will be suitable or created for the same work staff at all. It is further

being argued that another difference to previous technical transformation is as follows: Technological advancement destroys low-skilled jobs. Higher education would secure new jobs in different sectors. However, this time, it could not be the case. Even the highest skilled employees could end up with machines and systems doing their work. Instead of „transformation", i.e. a switch from resources from one sector to the other, there will just be: idle human resources, further caused by a huge skill gap. And this on a massive scale. An imaginable scenario like this caused by strong AI will strongly influence the so-called information society, basic principles of capitalism and the foundations of today's societies.

However, looking at the current research, a consensus or clear-cut definition what might constitute AI precisely as a base for such a conceptual framework is missing. Further, only a little research has been conducted; understandingly given the relatively recent occurrence of digitalization using AI and the few available results vary strongly. On the one hand, differentiation between strong and weak AI are done weakly or not at all, using general perceptions of Computerization or Digitalization. On the other hand, warnings on the effects of strong AI are being often made without intending to provide detailed insights into the precise effects. Possibly, only once we have understood and developed a concept of AI separating AI from other digitalization trends can we estimate the impact of AI on workplaces, economies, and societies and provide recommendations to cope (or not to cope) with the effects of AI. Concerning the technology assessment of AI and the aforementioned technological upheavals, the identified research gap seems to be essential to be filled.
The main problem with AI is the lack of measurability of change. Based on the literature and the complexity of AI itself, it can be seen that there are no quantitative measuring methods, instruments or indices for both the current state of the art and the possible uses of strong AI.

> "Without the relevant data for reasoning about the state of AI technology, we are essentially "flying blind" in our conversations and decision-making related to AI." (AI100 2017: 54).

This research gap has to be closed in the future. The need has already been identified, but against the background of the exponential character of AI, other Big Data-based technologies are often described as increas-