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Lost people - *how national AI-strategies pay attention to users*

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Abstract. This study focused on how major national strategies call attention to the human dimensions of artificial intelligence (AI). All intelligent technologies using AI are constructed for people as either active users or as relatively passive target persons. Thus, human properties and human research should have an important role in developing future AI systems.

In these development strategies, it is interesting to pay attention to the underlying intuitive assumptions and tacit commitments. This issue is especially interesting when we think about what governmental working groups say about people and their changing lives in their strategies.

The traditional stances adopted in writing national strategies, in which technology development is seen as a purely technical issue, should be challenged. In the end, by putting human dimensions aside, societies cannot prepare themselves for the transformation risks. It is also probable that this stance makes communication between technical and human research more difficult.

Keywords: AI-strategies · Human Factors · Social Transformation

1 Introduction

The presence of artificial intelligence (AI) in our everyday life is increasing. It is often invisible but present. When typing a text, numerous AI programs make the task easier. These programs pick up typographical errors or can underline grammatical errors. Kitchens have invisible apps and other pieces of code, which make using stoves, vacuum cleaners, and refrigerators more fluent and more economical to use. Of course, mobile phones and computers with their massive sets of apps are full of AI. Thus, AI is here to stay and is expanding well enough to be integrated in our everyday lives [1].

However, it is not easy to find a clear definition of AI. In this study, we relied on Marvin Minsky's (1967) [2] classical idea of defining AI on the ground of performance capacity. This classic idea was that AI takes care of different tasks, which require intelligence from people. One can see that behind this definition is Turing's [3]

well-known idea that machines can think like people. AI applications can do the same tasks as people, but sameness is defined on the ground of performance capacity, not on the ground of similarity of processing.

The importance of AI can be seen in the fact that practically all of the major industrial countries have made AI explicit in their organizational strategies. For this research we have studied the strategies of the European Union (EU), Finland, India, France, Germany, Lithuania, Estonia, the United Kingdom, Japan, South-Korea, China, and United States.

In general, organizational strategies are documents expressing what one should do during the next several years. These strategies are used to plan allocation of resources. Strategies define the goals of organizational action and the major action needed to achieve the goal. Thus, analysis of strategies is a way to learn how organizations are thinking. Such an analysis defines what organizations consider as important tasks to do and what they see as issues of lesser value.

National strategies are vital because they influence how research development and educational money is directed to support national actions developing future AI society. They are also important as they express how governments define the importance of different kinds of expertise in designing and developing AI and intelligent society. Practically all of the important industrial countries have developed their own AI strategy documents [4].

The national strategies we studied mention some human-related categories, such as a description of a desirable society, public engagement, adaptation of labor/livelihood, impacts on the Universal Development of Human Rights (UDHR), assessing environmental impact, adaptation of educational system, universal design (including social inclusion), and promotion of user experience point-of-view, but as a whole they vaguely address issues, such as usability, user experience, values, and laws, implying these concepts have less value within a country. National strategies also pay too little attention to how intelligent technologies can influence the transformation processes or structures of the future societies.

2 Analysis of the National AI Strategies

We identified three multilayered entities related to human factors that the governmental working groups should consider in their strategies to prepare for a future in which the role of AI technologies is pervasive. We classified the entities as *socio-technical*, *usability*, and *user experience* aspects of AI development. The socio-technical aspects can be further sub-divided to consider the description of the pursued society (desirable society), engaging the larger public's anticipations and desires in the designing processes of AI, adaptation of people's livelihood, human rights impact and environmental impact assessments, and adaptation of educational systems [5–13]

Our method for analyzing the strategies was philosophical text analysis. Argumentation analysis to be more precise. This means, we analyzed the strategies on their argumentative level and compared their arguments to the framework of acknowledged human factors [14]. With this methodology, we built a matrix (table 1) that presents how the working groups responsible for assembling the national strategies consider

the aforementioned human factors in their final presentations of national strategies. X indicates that the considered subject was taken into account.

The argumentation analysis was proven to be a valid method for analyzing these strategies. Human factors are abstract constructs, which is why one might be able to refer to them on a heading level but miss their vital elements or actions when attempting to realize them. In such cases, mentioning human factors resembles whitewashing actions. We noted whitewashing actions by leaving the column blank (meaning the issue has not been considered) in our matrix.

Another issue as to why we chose argumentation analysis as our method was the ambiguous manner in which the human factor constructs were used. Therefore, understanding the strategies at an argumentation level is important. For example, we considered public engagement as the action of empowering the larger public to participate in the discourse of desirable development as a meaningful actor, as described in the responsible research and innovation RRI framework [9]. Therefore, we did not count actions of guiding public opinion to match with a presupposed outcome as public engagement. This type of action is evident in the strategy of the Chinese government [15].

Definitions. Due to the ambiguous nature of sociotechnical issues that we identified, some further clarification was added. By adaptation needs of labor, we mean adaptation needs caused by large scale use of AI technology and thereby modification or loss of jobs, not only adaptation needs to ensure competitive AI development.

Assessment of environmental impact should include both the use of AI technology to achieve green growth and assessment of environmental impact of the use of AI technology [9, 12, 16].

We interpreted the educational system to include basic and higher education in addition to continuous learning in work-life situations. By interdisciplinarity, we mean a combination of disciplines from science, technology, engineering, and mathematics (STEM) and natural sciences with disciplines from humanities and/or social sciences. We believe that expertise from humanities and social sciences are vital for allowing us to take human factors into consideration in AI development [13]. While important, we did not notice the combination of only technical disciplines as an interdisciplinary action in our analysis.

Table 1 illustrates how national strategies underestimate the complexity and importance of human factors. This emphasis could be changed in the future because technology will essentially change human lives.

Table 1. Comparison of acknowledged human factors in national strategies

Strategy	Socio-technical aspects						Usability	User experience
	Description of desirable society (including guiding principles)	Public engagement	Adaptation of labor/livelihood	Impacts on the UDHR	Assessing environmental impact	Adaptation of educational system (including interdisciplinarity)		
EU	x	x	x	x	x	x	x	x
Finland	x	x	x	x		x		x
India	x		x	x		x		
France	x	x	x	x	x	x	x	x
Germany	x	x	x	x		x		
Lithuania		x	x			x		
Estonia	x	x				x		
United Kingdom	x		x	x		x		
Japan	x	x					x	x
South-Korea	x	x	x	x		x		
China			x			x	x	
United States	x			x		x	x	x

[15, 17–29]

3 General discussion

National strategies are generally rather laconic in discussing human roles in developing intelligent technologies. These strategies are technologically driven but should try to be something more than just technologically driven. It can first be asked why human roles should be opened much more effectively at a strategic level and after that, what are the main issues that national strategies should address? The need for re-evaluation is evident in how implicit presumptions of technical progress and attainment of the described desirable societies are in conflict in the strategies.

AI, as with all technologies, has opened new possibilities to meet the challenges of nature and to organize human living in a new manner. New technical capacities enable people to get their living in a new way and thus live new kind of life. *Technology as emancipator* means the capacity of expanding the possibilities of life. Originally, emancipation has referred to as freeing one from oppressing social conditions [30–33].

The emancipatory role of technology has been one of the main triggers that have led many individuals and organizations to focus their efforts on creating technologies. Decreasing child mortality, illnesses, hunger, and violence, for example, has been possible with the help of technology [33]. While child mortality was very high 150 years ago even in developed countries, this mortality started to rapidly decrease at the end of the 19th century with improvements in medical understanding, hygiene, and technology. Emancipation in the context of the human–technology interactions (HTI) thus refers to the liberation of people by technological means from any circumstances that diminish the quality of their lives.

Missing human issues can be collected under three major HTI issues [1]: (1) strategies essentially do not pay attention to usability related themes. These themes would also include ergonomics, human factors, and human–computer interactions (HCI) themes. The ultimate question is whether people can use technologies. AI is a specific technology, and it may be closed behind the gates of digital divide for many people unless usability issues are taken seriously.

(2) these technologies do not pay sufficient attention to human interaction problems, such as user experience. User experience can also be called affective ergonomics, emotional usability, or kansei-engineering. The core issue is how people feel and how motivated they are in using intelligent technologies. Emotions are central in human information processing as people decide emotionally about the value of other things for themselves. Finally, AI strategists should pay attention to how technologies should be integrated with human life. This third perspective to human interaction with intelligent technologies is complex and versatile.

As a whole, one can summarize that national AI-strategies are mostly grounded in traditional natural scientific and engineering thinking. However, the technology itself should also be essentially devoted to different human aspects. This process would imply considering human AI-research and related research expertise actively when the next versions of strategies are written.

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