



A workshop organised by:



FONDEN TEKNOLOGI RÅDET
DANISH BOARD OF
TECHNOLOGY FOUNDATION



Authors:

Lise Bitsch, Sita Ramchandra Kotnis and Aske Palsberg, the Danish Board of Technology Foundation

Contributing authors:

Nicklas Bang Badum, Marie Louise Jørgensen and Lars Klüver, the Danish Board of Technology Foundation.

Special thanks to:

Simi Akintoye, Lecturer in Law, De Montfort Law School

Jesper Balslev, PhD fellow Roskilde University and senior lecturer at the Copenhagen School of design and Technology

Ladan, Davarzani, Accenture Research, Thought Leadership Senior Principal

Manuel Guerrero, Uppsala University, Karolinska Institutet, University of Chile

Rikke Frank Jørgensen, Senior Researcher, Danish Institute for Human Rights

Sven Kolstrup, Mio Management

Catharina Nes, The Norwegian Data Protection Authority

Henrik Schoeneberg, CEO at Schøneberg Filosofi og Praksis and associate of Arbejdsmiljøgruppen (Arbejdsmiljøgruppen)

While every caution has been taken to represent the views of the participants in the workshop this newsletter accurately, the final representation remains the responsibility of the author(s). The views and opinions expressed in this report may not be taken as those of the HBP or the European Commission.

The report may be freely distributed to the interested parties. Citation may only occur with proper referencing and including a link to www.tekno.dk

This project/research has received funding from the European Union's Horizon 2020 Framework Programme for Research and Innovation under the Specific Grant Agreement No. 785907 (Human Brain Project SGA2)



**TABLE OF CONTENT**

1	INTRODUCTION	4
1.1	Why should we discuss AI and its implications?	4
1.2	The Copenhagen AI 360 workshop	4
2	EXPERT RECOMMENDATIONS AND OVERVIEW OF ISSUES	6
3	BACKGROUND AND METHODOLOGY OF THE WORKSHOP	12
3.1	The idea behind AI 360 COPENHAGEN	12
3.2	The AI 360 COPENHAGEN tool	12
3.3	The AI 360 COPENHAGEN method	13
4	OVERVIEW OF RESULTS	15
5	OVERVIEW OF CHALLENGES AND UNCERTAINTIES	17
5.1	Political implications of AI	17
5.1.1	Transparency and trust	17
5.1.2	Political culture and distribution of power	18
5.1.3	Equality and fairness	19
5.2	Justice and ethics	20
5.2.1	Legal framework and good data governance	21
5.2.2	Transparency, Social and moral responsibility and legal options of enforcement	21
5.2.3	privacy, self-determination and equality	22
5.3	Economy	23
5.3.1	Expenses for business and private life and conditions of competition	23
5.3.2	Access to data and advancement of research and innovation	24
5.3.3	Externalities and fair distribution of cost and benefits	25
5.4	Social Implications	26
5.4.1	AI and the future of labour	26
5.4.2	AI and the future of healthcare	27
5.4.3	AI and the future of education	28
6	CONCLUSIONS AND NEXT STEPS	29
6.1	Next steps	29
7	LITERATURE LIST	30
8	APPENDIX	



1 INTRODUCTION

The following reproduces the proceedings from the AI 360 COPENHAGEN workshop. This report is put together with the core recommendations from the invited experts as its main focus. Hence the structure of the report starting with a schematic presentation of the experts' recommendations for how to steer the development of AI technologies towards desirable applications and in societally beneficial directions. This is followed by a brief passage on the background of the workshop as well as an overview of the "360 method" and "360 tool" used to guide the discussions of the workshop. Finally, an overview of the challenges and uncertainties raised by AI technology in the various areas of society, as identified and debated by the workshop participants, is provided. Programme and elaboration of the five dimensions and key questions can be found in the appendix.

1.1 WHY SHOULD WE DISCUSS AI AND ITS IMPLICATIONS?

Easy access to vast amounts of data, fast data processing, pattern recognition and sophisticated learning algorithms are tools that herald incredible possibilities for effectiveness, accuracy, abundance and potentially revolutionary changes to society. However, as mind blowing the possibility for improvement in almost all conceivable aspects of private and public life is, as worrying is it that AI technologies also have obvious capacities for abuse of power, for overruling existing norms and agreements regarding rights and integrities, and for downright malign and adverse application. Some compare the development to a train with no conductor. The question, of course, is: Can we adapt our uptake of technology in the present to influence its direction and impact in the future? By acting precautionary now, in advance, might we be able to have a say about which kind of future we want? Can we fix AI-related societal bugs before they happen? If we want to try, we need to move fast – because AI technology certainly does. However, in society at large, how AI can and will contribute to causing and solving real-world problems is still a somewhat downplayed question. What seems to be lacking in the popular debate about AI is the readiness to bring the discussion to an action-oriented level, rid of lofty visions of far-fetched futures (whether these be utopian or dystopian in character). It is this challenge the AI 360 COPENHAGEN initiative intends to address.

1.2 THE COPENHAGEN AI 360 WORKSHOP

Much is currently written on the topic of artificial intelligence from an ethical perspective; what it is, what to expect and how we should deal with it. For example, the recent recommendations formulated by the Danish Expert Group on Data Ethics (<https://eng.em.dk/media/12190/dataethics-v2.pdf>) is a very informative such source of information and reflection. Problems related to AI are also defined in and spilling over from related fields, such as for example the field of robotics. A good site for acquainting oneself with this could be Alan Winfield's weblog: <http://alanwinfield.blogspot.com/2019/04/an-updated-round-up-of-ethical.html>. This intellectual landscape is very much the context in which the AI 360 COPENHAGEN initiative hatched. The main contributions of AI 360 COPENHAGEN in relation to the way artificial intelligence is currently debated and envisioned elsewhere is, on the one hand, to provide an all-around perspective (360 degrees) where various trade-offs related to different choices, developments and implementations may be considered



against each other. On the other hand, the aspiration of AI 360 COPENHAGEN is to 'go one step further' than most other debates and analyses of artificial intelligence and put an explicit emphasis on concrete *solutions* to the identified challenges posed by AI technological developments.

The workshop, designed and organised by the Danish Board of Technology, took place in Copenhagen, Denmark, in the spring of 2019 with the aim to encourage the engagement of stakeholders and experts on the topic of AI in thorough deliberations about the prospects of future developments. In utilizing the *AI 360 facilitation tool*, the workshop participants were prompted to deal with the topic of AI in a *multi-criterial and action-oriented manner* (elaborated in the Methodology chapter). The participants' deliberations on the future implications of AI was organised in what was preliminarily defined as five 'dimensions': Political implications, Rights and Ethics, Legal framework, Economy, and Societal implications. Below, the main recommendations are schematised.



2 EXPERT RECOMMENDATIONS AND OVERVIEW OF ISSUES

Issues on future impact of AI	Recommendations for going forward
<p>Policy implications</p> <ul style="list-style-type: none"> • Opaque how decisions are made. • Who decides what information is good information? • How to check decision-making processes? • Built-in bias and its consequences. • Security of data storage and management. • Accuracy of data collection. • The potential for abuse and manipulation. • Robustness of democratic institutions. • Distribution of power. • Future political system. • Future of international and global alliances. • Distribution of power and access to communication between private and public actors. • AI driven by data collection, and access to data will drive access to (good quality) AI. • Application of AI in government and welfare: who should be monitored? • What safeguards should be implemented for AI applications in government administration? • Increase or decrease in extremism. • Uncertainty if better oversight on issues of debate. 	<ul style="list-style-type: none"> • Open science, open innovation basic principles. • RRI Fairness, AI to support a better, open and fair political culture. • EUs algorithmic governance use should improve. • Skills for AI should be part of fundamental human rights. • A quality mark for companies to show they work in compliance with principles of compliance to openness of trust. • Trust and trustworthiness built through judges; an AI ombudsperson could be implemented in the system. • Get inspired by recommendations from the High-Level Expert Group on Artificial Intelligence (AI HLEG). • Labelling is needed, together with an agency that checks labels, government and companies.



	<ul style="list-style-type: none"> • Protection of individual rights. • Quality and access to public dialogue and debate. • Overview of data collection practices. • Quality of AI systems and applications. 	
<p>Legal framework, Rights and Ethics</p>	<ul style="list-style-type: none"> • Lack of overview/data use accountability deficit. • Data-spread and use will intensify. • Biased and wrongful profiling. • GDPR is easily circumvented due to inadequate regulatory power/resources. • Anonymity, informed consent and personal security is challenged. • Holding data platforms and companies accountable for involvement in criminal acts, social division, undermining democracies (elections, debates, tax). • IP laws and proprietary rights regulation protect companies and disadvantage consumers, which makes transparency and informed decision making difficult. • Changing conditions for and meanings of ‘privacy’. • Cost saving exercises promoted as improvement of e.g. healthcare. • Increased surveillance. • Social framework for technology use. • Discrimination and stigmatization. • Misuse of data by companies. 	<ul style="list-style-type: none"> • Ensure digital and online anonymity by default. • Establish a national system for handling consent related to data, so algorithms only have access to the data there is consent for, and so citizens can give/revoke consent online and control the use of their data. • Implement an IT-architecture in front of the databases, which allows algorithms to utilize anonymised data, but without data leaving the database. • Implement certification or approval of algorithms on case-by-case basis. Inspiration can be found in legislation on chemicals and gene-tech. • Establish rules and institutions that, in special instances, can allow direct access



	<ul style="list-style-type: none"> • Problems with implementation and execution of GDPR. • Involuntary voluntariness (opting out of social media use an actual option?) • Lack of understanding on being good data-citizen/data-citizenship. 	<p>to data, when necessary. And which can approve de-anonymization, when it is in the interest of citizens.</p> <ul style="list-style-type: none"> • Implement required routine tests for bias in algorithms, along with mandatory revision on tests and reporting in annual reports.
<p>Economy</p>	<ul style="list-style-type: none"> • High costs associated with a wide implementation of AI-enabling infrastructures in society. • Securing good conditions of competition. • Improved access to data for research institutions and companies will stimulate R&I, but how do we share and use data, without forcing unnecessary burdens on individuals (in terms of GDPR rules etc.)? • There is an imbalance between the public and private sectors' access to data. • Fear that AI could bring a jaded and subjective spin on R&I and the meaning and quality of data. • Future AI developments are in need of a more multi-disciplinary approach. • The future will bring a challenge to include qualitative measures and not just settle for the quantitative when measuring economic 	<p>Direct and indirect costs</p> <ul style="list-style-type: none"> • Political prioritization: To obtain the real potential of AI and the related economical potential, we need to shift some public investments from physical infrastructure to AI-enabling infrastructure. This can only be done through political dialogue and reprioritization of funds. <p>Research and innovation</p> <ul style="list-style-type: none"> • Dynamic consent: Dynamic consent is a more advanced form of consent, which empower and protect individual data contributors better than the baseline



	<p>growth.</p> <ul style="list-style-type: none"> • It is undeniable that productivity in an AI future will increase, however the salaries might not. • The type of requested labour might change. 	<p>(i.e. Informed consent).</p> <p>Externalities</p> <ul style="list-style-type: none"> • AI-framework: A framework for developing responsible AI with parameters for: Transparent AI, Reversible AI, Coachable AI, Explainable AI and Interpretable AI. • Proof of sustainability: A roadmap of sustainable AI technology must include ethical and responsible considerations. Example: Proof of sustainability. For a company to get access to a market they must provide a sustainable product under an agile regulation regime: Code of conducts, Standards etc. • Education: Retraining of workers/citizens, e.g. where every citizen gets a number of tokens that can be traded for reskilling and education. <p>Distribution of costs and benefits</p> <ul style="list-style-type: none"> • New tax regulation: The company tax
--	--	--



		<p>should be on the turnover in EU to ensuring tax is paid.</p> <ul style="list-style-type: none"> • Solving a democratic problem: Method 1: Broad public debate should be stimulated. Method 2: A cultivation project on public awareness of fair distribution of costs and benefits. (This should not be a political left vs. right discussion.)
<p>Societal implications</p>	<ul style="list-style-type: none"> • Safeguarding labour. • Creation of labour and meaningfulness in labour. • The human cost of an AI influenced job-market. • People might end up working for a metric instead of experiencing meaningfulness in relation to work. • Interpreting data correctly and achieving the necessary skills to operate AI based machines (e.g. for radiologists) as well as ensuring a high level of education. • Feeding AI with correct and adequate data. • Standardisation might exclude groups of patients with orphan diseases. • Coming to terms with the fact that in the health system, AI will 	<ul style="list-style-type: none"> • Education in IT, coding and knowledge of IT and social conditions as an investment, because it points to better and more responsible IT and AI • We need to (collectively, politically) compile a list of nice to haves and need to haves for health and education applications and develop legal guidelines that help achieve desired applications



work in some areas but not in others. If there's not an adequate understanding of the disease, AI will not do any good.

- Becoming overly focused on funding AI solutions at the expense of low-tech solutions (such as interpersonal communication) although these may provide better or equally preferable results.
- Relying heavily on AI diagnostics, not realizing that correct and adequate data is the pre-condition for successful utilisation of AI in diagnosis.
- Increasing commercialisation of the education system.
- High focus on monetary value of education.
- A fundamental misunderstanding between successful integration of digital tools and the improvement of education, teaching and learning.
- Breakdown of social structures for managing learning and teaching environments.
- Breakdown of hierarchical structures and failing to prepare students for social and work life.
- Reinforcement of existing inequalities.
- Learning how to manoeuvre in an abundance of information.



3 BACKGROUND AND METHODOLOGY OF THE WORKSHOP

3.1 THE IDEA BEHIND AI 360 COPENHAGEN

AI 360 COPENHAGEN was established in the belief that it is indeed possible to influence how technology and related societal phenomena should develop. AI entails big hope, big hype and big risk, and an obvious place to begin is to form an overview of where the true hotspots are and what we can do about them. This is where the 360 degrees perspective comes in: In all modesty we set out to reach an inclusive, systematic and comprehensive overview. To do so, we invited experts in the areas of AI related rights and ethics, economy, legal/judicial matters, political significance and societal implications. Their task was, in a structured process, to put their insights and ideas into words, for others, further down the line, to be able to put these words into action.

The name '360' refers to the aim of an all-encompassing approach to the topic of AI; an ambition to achieve "a 360 degrees overview". The methodological inspiration for this task came from the DESSI project (<http://securitydecisions.org/>) a 2013 EU-funded project developing a process and decision support system aimed at end users of security investments. The DESSI method features a decision-making tool allowing for comprehensive assessment of the potential and consequences of various security dispositions. By analysing these in a systematic and structured manner, the method contributes to a much clearer overview and allows for a transparent and participatory decision-making accounting for context and societal multi-dimensionality in choosing the right investments. The 360 tool invented for and featured in the 360 COPENHAGEN workshop was lifted from the DESSI tool, but much redesigned and adapted to the specificities of AI as a technological and societal phenomenon.

The mission of AI 360 COPENHAGEN is to create an overview of hotspots and possible actions. The 360 COPENHAGEN workshop was the starting point of this endeavour but does not stand alone. The results of the workshop will inform and feed into a European citizen consultation in the summer and autumn of 2019, in which citizens all over Europe will provide their assessment of how society should deal with the AI future. The material they will be discussing are coming straight out of the 360 COPENHAGEN workshop.

3.2 THE AI 360 COPENHAGEN TOOL

At the core of the AI 360 method is the 360 tool, which was developed exclusively for the workshop. However, the tool certainly has potential to cover similar evaluations of technological impact and development in other areas, where thorough technological assessment is on the agenda.

The 360 tool is the materialization of a walk-through method for decision support. The tool enables a versatile assessment process of complex societal dimensions of prospective future technological development; here of AI development and implementation in industry, defence, civil society and

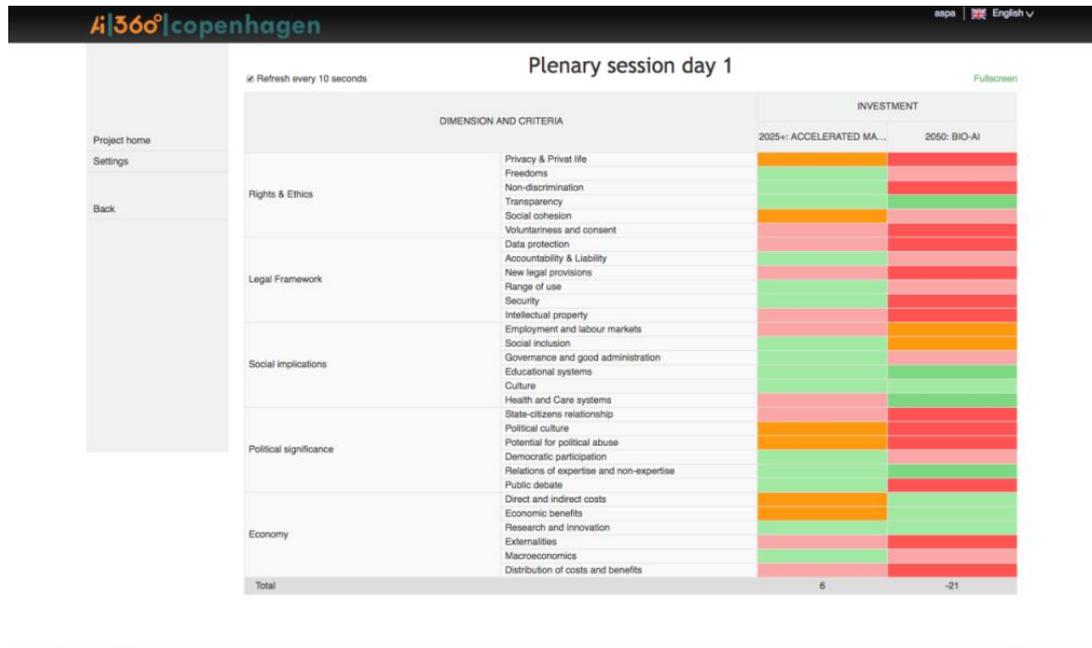


administration as well as other spheres of political and social life. The 360 tool makes it possible for the user to visualize, address and evaluate different technological futures in a structured yet creative manner. The exercise consisted of looking into several dimensions: impact on rights and ethics, legal frameworks, social implications, political significance, and economy. For each of these dimensions a set of criteria were pre-selected in order to focus the discussion (see appendix for further details). The aim of this framework is exactly to achieve the beforementioned 360 degrees overview, to avoid the limited scope of much AI popular discourse: When visualizing AI tech futures and advantages of potential smart solutions, the advantages of automation and outsourcing of societal and repetitive tasks and day-to-day decision making often overshadows other important aspects of social and political life, such as e.g. individual rights, autonomy, problems of surveillance, privacy, transparency and equality, freedom from discrimination as well as other significant social, political and economic implications. Debating and assessing a given technology according to the 360 degrees method may certainly affect the thinking and framing of various societal and practical domains such as transport, public space, health care etc. in terms of the way the future of such institutions is imagined.

3.3 THE AI 360 COPENHAGEN METHOD

The format for of the workshop was a 1 ½ day event, where 28 experts from various disciplines and areas of expertise took part. For the 360 degrees method to work, it is important that the participants, while being experts on the technology at hand, at the same time represent multidisciplinary approaches, so as to create a proper foundation for the assessment of the technology on multiple criteria – thus creating the 360 degrees analysis of the technology. The multi-disciplinarity of AI 360 was represented by the overall areas of: Rights and Ethics, Legal Framework, Political Significance, Economy and Social Implications. (These areas were also developed based on the original DESSI framework.)

To generate the 360 degrees analysis, the technology in question (here AI) is addressed from a set of *dimensions* which each have a range of specific *criteria* to guide the assessment. The experts are thus divided along the lines of these dimensions. (See the appendix for an overview of dimensions and criteria). Before and after discussing the implications of AI technology on a number of criteria, the invited experts *rate* these on a scale ranging from 1-5, where 1 represents a very good impact, 3 the threshold, and 5 a very negative impact. In practice, during the workshop sessions the 360 tool is exhibited on a central screen, where the participants can follow the creation of their own assessments in the making; as their predictions and evaluations are displayed in real time. The idea behind providing this overview is twofold; everybody has access to all information as soon as evaluations are made and at the same time, a total picture is constantly coming into being providing an overview of ‘the state of the AI situation’; how ‘good’ (green) it is (if the rating is primarily positive) or the opposite, the rating is dominated by negative evaluations and thus colouring the matrix red. See the example below for the visual impression:



At the workshop, AI technology was presented as a subject of discussion and the debates about it organized in two scenarios: one near future and one mid-far future. Each of these scenarios present an extrapolation of the technology in terms of the technological development, what the technology can do and examples of how it is applied. (See the appendix for further elaboration). The experts' discussions took place within these technological scenarios. In the figure beneath, the structure and process of the discussions is illustrated:

<p>First step: Ranking and elaborate impact on dimension criteria</p>	<p>The participants are divided into expert-groups according to their disciplines, to give a mono-disciplinary assessment and elaboration on assessment of the technology</p>	<p>First step is ranking the impact of the technology on each of the criteria of the dimensions, and subsequently discuss and potentially adjust the initial rating</p>
<p>Second step: Multidisciplinary discussion of the rankings and the elaborations</p>	<p>The participants are divided into multidisciplinary groups, where they discuss the rating and elaborations of the expert groups (one dimension for each group)</p>	<p>Criticism and multidisciplinary perspectives are added to the elaborations. A new rating is given by the multidisciplinary groups</p>
<p>Third step: Multi-disciplinary solution development</p>	<p>The participants focus on providing solutions to the challenges identified in the previous</p>	<p>The purpose is to come up with as many concrete solutions as possible</p>



The workshop was structured as follows: Day 1 started out with expert groups debating the subject areas of their core competencies and formulating the status quo of a given dimension as seen from within. Hereafter panels of participants with mixed areas of expertise took over, problematizing and giving perspective to the characteristic of the dimension from multiple angles. On day 2, panels of participants with mixed areas of expertise spent the remainder of the workshop coming up with solutions to the problems identified and rating how well these solutions would actually solve the problems. In between these main sessions were rounds of presentations, discussions in plenary and various opportunities to give feedback and refine the rating. This progressive structure provided much depth to the workshop, its discussions and suggestions.

4 OVERVIEW OF RESULTS

The inputs and solutions provided by the workshop participants are presented in a detailed fashion in the appendix. However, the overall sum of ratings in the two scenarios also tells a story. It is particularly interesting to observe how the overall rating moved from relatively negative (red) in the first expert round rating towards relatively neutral/slightly positive in the last solution round:

Overview of results from round 1 Expert round

DIMENSION AND CRITERIA		ALTERNATIVE	
		2025+: ACCELERATED MA...	2050: BIO-AI
Rights & Ethics	Privacy & Privat life	Red	Orange
	Freedoms	Red	Orange
	Non-discrimination	Orange	Green
	Transparency	Red	Green
	Social cohesion	Red	Green
	Voluntariness and consent	Red	Green
Legal Framework	Data protection	Red	Red
	Accountability & Liability	Green	Green
	New legal provisions	Red	Red
	Range of use	Red	Red
	Security	Red	Green
	Intellectual property	Red	Green
Social implications	Employment and labour markets	Red	Red
	Social inclusion	Red	Red
	Governance and good administration	Red	Red
	Educational systems	Red	Red
	Culture	Red	Red
	Health and Care systems	Orange	Orange
Political significance	State-citizens relationship	Orange	Orange
	Political culture	Red	Red
	Potential for political abuse	Red	Red
	Democratic participation	Orange	Orange
	Relations of expertise and non-expertise	Green	Green
	Public debate	Orange	Orange
Economy	Direct and indirect costs	Orange	Green
	Economic benefits	Green	Green
	Research and innovation	Green	Green
	Externalities	Red	Red
	Macroeconomics	Green	Green
	Distribution of costs and benefits	Red	Red
Total		1	9



Overview of results from round 1Solution round

DIMENSION AND CRITERIA		ALTERNATIVE	
		2025+: ACCELERATED MA...	2050: BIO-AI
Rights & Ethics	Privacy & Privat life		
	Freedoms		
	Non-discrimination		
	Transparency		
	Social cohesion		
	Voluntariness and consent		
Legal Framework	Data protection		
	Accountability & Liability		
	New legal provisions		
	Range of use		
	Security		
	Intellectual property		
Social implications	Employment and labour markets		
	Social inclusion		
	Governance and good administration		
	Educational systems		
	Culture		
	Health and Care systems		
Political significance	State-citizens relationship		
	Political culture		
	Potential for political abuse		
	Democratic participation		
	Relations of expertise and non-expertise		
	Public debate		
Economy	Direct and indirect costs		
	Economic benefits		
	Research and innovation		
	Externalities		
	Macroeconomics		
	Distribution of costs and benefits		
Total		7	13



5 OVERVIEW OF CHALLENGES AND UNCERTAINTIES

The following section provides an overview of the different challenges and uncertainties as they were discussed by the experts in the five sessions of the workshop.

5.1 POLITICAL IMPLICATIONS OF AI

In their discussion on the political implications of AI, the experts elaborated on issues of: transparency and trust; political culture and distribution of power; and equality and fairness.

5.1.1 TRANSPARENCY AND TRUST

The challenge to ensure and enforce transparency was central to the political experts. They argued for a close connection between trust and transparency (another perspective of trust as ‘knowing/vetting by others’ was also introduced). AI could provide a challenge to transparency if it becomes difficult to follow how decisions are made, or to protest decisions based on AI or where AI technologies have been used in a decision-making process.

Information-sharing is an essential part of creating transparency. The question is what role AI-based technologies would play in information generation and sharing in the future. For information to support a trusting relationship it must be correct and not misleading information. The hard question is who decides what information is misinformation, and what is good information?

A related problem pertains to the issue of bias. The question is whether AI can deal with biases (make them visible) or rather reinforce bias? In designing AI technologies, we must decide which biases to introduce, and so there will always be an unfair component involved when asking a technology to optimize towards a target. Humans and human society are biased, and therefore the technology will be as well.

Finally, trust is also related to security. As the experts argued, any breaches in data security can ruin trust.

Challenges and uncertainties related to transparency and trust include:

- Non-transparency on:
 - How decisions are made
 - Who decides what information is good information
 - How to check decision-making processes
 - Built-in bias and its consequences
 - Security of data storage and management
 - Accuracy of data collection



5.1.2 POLITICAL CULTURE AND DISTRIBUTION OF POWER

There are two major unknown factors, which could influence the implications of AI for Western political culture and the distribution of power between state, government, citizens and public and private actors: The political system and the status of international and global alliances (e.g. the European Union, United Nations, trade agreements). In their discussion the experts decided to assume representative democracy as the future model of governance, and to assume a continued international collaboration structure with nation states as members of the European Union. The experts agreed on those two conditions as important for the implication of AI on political culture and power, but also that the way they will develop in the future is highly uncertain.

The potential for abuse and manipulation (election, misinformation, alienation, loss of empathy) was flagged by the experts as a major concern and uncertainty. Particularly worrisome is how people can be influenced and manipulated by and through AI technologies. Microtargeting techniques could become increasingly opaque, making it impossible for voters to judge the coherence of policies, positions of political parties, politicians and arguments. Also, techniques for fostering a division between societal groups, e.g. by pushing specific messages about one social group to another, could become more widespread. To illustrate their concern, the experts pointed to the present political culture. They described it as irrational and not functioning well. Voters need tools to alert them about manipulation; otherwise informed and rational choices become very hard to make for voters. Again, the question is who has access to the technology.

The robustness of democratic institutions is a key factor for realising the positive potential of AI in developing our political culture and safeguarding the fair(er) distribution of power. The experts described the necessity of having distributed and well-supported systems of power. In addition, implementation of AI would need to be supported by insights from behavioural science. The experts also argued that AI powered simulations of our societies could change the way politics is done in a positive way. It could e.g. be possible to do resource management based on those simulations. According to the experts, it is an open question how AI technologies will influence political culture. However, Social Media already influences how politics is done, has (re)enforced particular political practices, and introduced an increased need for controlling and checking information. The experts warned that at its core, AI is not a democratic tool – but also added that it could be.

Even the role of politicians and politics could change as a result of the implementation of AI-based technologies. Some of the experts argued that governance by algorithms could be a likely future scenario. It is an open question how the power distribution between public state powers and private actors will develop. The same uncertainty applies to the powers upon which the rule of law will be based. Already, the experts argued, we see a switch of power from public power to private actors in the political space. Private actors control the channels for how information is provided, and in some sense decide on the freedom of speech. Presently those channels are in the hands of very few powerful players. The question asked by the experts was whether states should begin to take back (some) of the control over the provision of information. The experts argued that it is very unclear who will steward future developments.



Additional concerns included the quality of public debate in the future. The experts disagreed in their assessments about whether AI technologies would contribute to a better public debate. On the one hand, they pointed to what they named “Trump-democracy”, and how Social Media tools are used to short-circuit democratic debate. They warned about how we were positive about the democratic potential of social media in the beginning, but that its development has showed it to also be a tool for abuse and manipulation. Other experts were optimistic about the potential of AI technologies, but cautioned that realisation of the positive impacts would depend on the approach taken to develop AI over the next years. Governments would need to take responsibility, and there was some uncertainty as to if governments would be able to take that responsibility upon themselves.

Finally, the experts also talked about AI in relation to terrorism and cyberwarfare. The uncertainties and challenges identified in this area refer to the potential for manipulation and abuse. It is essential to have open and trustworthy channels of communication between states as well as internationally to maintain trust in case the spread of misinformation intensifies. The experts were also concerned about cyberwarfare. The question is how the security of data and data infrastructures of nation states can be safeguarded in the future. Another concern is the use of AI weapons such as countless miniature drones targeting specific individuals, in worst case without human oversight. Such concerns must be dealt with taking inspiration from how we have dealt with biological and chemical weapons, as well as landmines.

Challenges and uncertainties related to political culture and the distribution of power include:

- The potential for abuse and manipulation
- Robustness of democratic institutions
- Distribution of power
- Future political system
- Future of international and global alliances
- Distribution of power and access to communication between private and public actors

5.1.3 EQUALITY AND FAIRNESS

The experts also discussed particular societal applications of AI-based technologies. They agreed that there was much potential for abuse in the short as well as in the long-term. They discussed possible applications e.g. implementing a rating system to warn on signs of child abuse, or using AI systems to hold the elite and those in power responsible e.g. using AI to provide e.g. state budget transparency. The experts warned that there could be a danger of slowing down governance with checkpoints of transparency and accountability. The point of contention is what kind of safeguards should be built into such a system to guard misuse and the balance between, on the one hand, those checks and balances and, on the other, the trust afforded to e.g. judges and politicians. There is a potential for abuse from countries outside of the EU towards the EU. Is



there a potential to identify political abuse and would it help to add layers of bureaucracy to stop e.g. abuse, or to limit the decision space of people in power, or to introduce more checks and balances?

A major point in the 'solutions' discussion about how AI could contribute to more equal and fair societies concerned who would have access to AI solutions. Obviously, those with access to most data will be able to build the better AI applications. The experts debated whether it would be possible for e.g. the EU to opt for 'single person AI', instead of optimizing for a systems solution. Individuals would then have their own AI to protect them along with their freedoms. At present smartphones act as a prototype for that type of individual AI system. The experts suggested that future leaders would be the ones able to buy the best algorithms, which in turn could exacerbate existing inequalities. A form of open source system or codified AI system could add to transparency, but possibly not be enough to solve issues of inequality.

The experts furthermore discussed whether AI could entail a degree of citizen empowerment. It is possible that citizens would gain 1) an increased ownership and control of data, 2) an increased insight into topics, and 3) better options for participation in debates. The questions, according to the experts, would be whether such an increase would lead to more or less extremism. New places to meet could emerge, but also new ways of avoiding meetings could come into being. According to the experts, there is some indication that staging dialogue between groups with differing opinions could increase disagreement and polarisation. A danger that can already be observed within social media is vicious self-enforcing circles of extremism and extreme content. Filters have begun to be implemented on social media for filtering out extreme content. With AI, the question would also be to identify who produces extreme content: People or an algorithm, and would we be able to differentiate between the two?

Challenges and uncertainties related to equality and fairness include:

- AI driven by data collection, and access to data will drive access to (good quality) AI
- Application of AI in government and welfare: who should be monitored?
- What safeguards should be implemented for AI application in government administration?
- Increase or decrease in extremism
- Uncertainty if better oversight on issues of debate
- Protection of individual rights
- Quality and access to public dialogue and debate
- Overview of data collection practices
- Quality of AI systems and applications

5.2 JUSTICE AND ETHICS

In their discussion on the legal and ethical implications of AI, the experts elaborated on issues of: legal framework and good data governance; transparency, social and moral responsibility and legal options of enforcement; privacy, self-determination and equality.



5.2.1 LEGAL FRAMEWORK AND GOOD DATA GOVERNANCE

In their discussion on the challenges to legal frameworks and justice, the experts first and foremost pointed to the lack of overview on what is happening in the data collection and data processing spheres. They argued that systems are essentially designed as one-way mirrors, where we can always be identified but never know what data about us is being used for. This is fundamentally dangerous, as it compromises anonymity, informed consent and security and does not engender trust.

A central challenge of AI based systems is that they depend on data collection. Data is everywhere, and seemingly disparate data can be combined to paint very clear pictures of groups and individuals. Whoever has access and power to process the most data will have the power in the future. Looking to the future, the experts argued, we will only see an intensification of this situation. Data will be everywhere, data collection will be even more widespread, data will be more available, uncontrollable and the range of use will be expanded as well as revolutionized. As an example, the experts discussed cases where people are wrongfully profiled. Biased or wrongful data processing can have life-changing consequences for individuals¹.

One of the issues, presently, is that the General Data Protection Regulation (GDPR), entering into force May 25, 2018, is already outdated and unable to deal with these types of cases. Article 22 of the GDPR set out the right not to be profiled by automated decision-making processes. However, if human intervention is part of the process, the law does not apply. Such a provision makes it easy to circumvent article 22.

Challenges and uncertainties related to legal frameworks and good data governance include:

- Lack of overview
- Data spread and use will intensify
- Biased and wrongful profiling
- GDPR is easily circumvented
- Anonymity, informed consent and personal security is challenged

5.2.2 TRANSPARENCY, SOCIAL AND MORAL RESPONSIBILITY AND LEGAL OPTIONS OF ENFORCEMENT

Additional legal challenges include difficulties of assessing and prosecuting e.g. social media platforms for involvement in crime, discrimination, bullying, spread and production of misinformation, extremism, terrorism, influencing elections and for playing an active role in ethnic conflicts, like for example the

¹ E.g. in June 2019, news broke in Denmark of a system error in the processing of mobile geolocation data used in criminal court since 2012. In the worst case, and as a consequence of that error, innocent people are now in prison. Source (in Danish): "10.000 straffesager skal gennemgås for mangelfulde teledata – og hvad så?" [online] <https://www.dr.dk/nyheder/indland/10000-straffesager-skal-gennemgaas-mangelfulde-teledata-og-hvad-saa> - last accessed June 26, 2019.



Myanmar genocide on Rohingya². In addition, the experts also pointed to challenges with tax evasion of such platforms and companies hosting and developing them.

As the experts explained; search engines are currently being protected by IP laws and proprietary rights regulation, and this enables them to affect democratic institutions without accountability. Present day legal frameworks are tailored to handle traditional societal infrastructure development, with a transparent development process and power structure. Increasingly privately owned and commercially developed infrastructures are becoming essential societally infrastructure - with no democratic or political accountability or oversight.

A number of factors make it difficult to legally target social media platforms e.g. intellectual property rights (IP) and trade-secrets are obstacles to enhance transparency, and the software is proprietary. You can demand transparency, but then you are automatically asking for trade-secrets, and asking for access and insight will necessarily require accessing IP. In effect that also allows companies to be opaque about their collection, use, storage and reuse of data. The central culprit is too large an emphasis on protection of intellectual property rights. In essence, present day legal frameworks protect companies, but not users, data subjects or citizens.

Challenges and uncertainties related to transparency, social and moral responsibility and legal options of enforcement include:

- Holding data platforms and companies accountable for involvement in criminal acts, social division, undermining democracies (elections, debates, tax)
- IP laws and proprietary rights regulation protects companies

5.2.3 PRIVACY, SELF-DETERMINATION AND EQUALITY

Debating rights and ethics, the expert group focused on increased use of surveillance technologies, changing conditions for and meanings of 'privacy' as such, the future of personal freedom as well as privatisation and marketization.

The experts pointed out that currently a growing use of privacy enhancing tech is taking place. This has good as well as bad consequences, but this tendency will most likely be overwritten by the increased privacy violating behavior of big tech, which are increasingly harvesting all data about all aspects of our lives. Surveillance is increasing, transparency is not in place, and interference into private life by interrelated systems is on the rise, which is particularly worrisome.

Where the negative impacts on privacy and private life that follow in the wake of increasing use of AI technologies seems to be prevalent at the moment, it was also discussed how AI is currently also giving rise

² Mozur, Paul (15 October 2018). "A Genocide Incited on Facebook, With Posts From Myanmar's Military" [online] <https://www.nytimes.com/2018/10/15/technology/myanmar-facebook-genocide.html>, last accessed June 26, 2019.



to a debate about our moral priorities. As societies we are now beginning to contemplate question like: what is good for us? What do we want in the light of new technology? Young generations grow up in a world where their privacy is challenged from the very beginning of their lives, but they may not know the implications of this. It may be not so much the tech that is the problem, but rather the social framework in which it unfolds. In addition, the experts were very clear on the position that 'if a technology exists - it will be used'. And this will also be the case for malign purposes/dual uses. The group thus considered law as a crucial remedy to steer the development.

Major themes related to rights and ethics in the AI field have to do with voluntariness and consent, as well as citizens' control over their own resources. Currently, there exists an (engineer-led) movement inside AI itself oriented towards dealing with non-discrimination. Technology is developed somewhat independently of the social systems/mechanisms that are supposed to handle it, which is a major problem. Therefore, it is crucial to inform and educate citizens to enable them to make their own decisions and support consumer responsibility and autonomy. In the case of (mis)use of data by private corporations for example, in theory at least it is always possible to just opt out. In practice, however, it is an open question whether it is really an option to leave social media, for example. This may be rather a case of involuntary voluntariness. It is crucial to focus on questions of 'power to the state vs. power to the consumer', find tools to put the consumer in the driving seat and make awareness and literacy of the people a major priority. From a regulatory point of view, GDPR is very powerful, but there may be problems regarding its execution, making the understanding of data-citizenship and what it implies to be a good data-citizen an important focus point.

Challenges and uncertainties related to privacy, self-determination and equality include:

- Changing conditions for and meanings of 'privacy'
- Cost saving exercises promoted as improvement of e.g. healthcare
- Increased surveillance
- Social framework for technology use
- Discrimination and stigmatization
- Misuse of data by companies
- Problems with implementation and execution of GDPR
- Involuntary voluntariness (opting out of social media use an actual option?)
- Lack of understanding on being good data-citizen/data-citizenship

5.3 ECONOMY

In the expert discussions on AI and related economic implications, the experts elaborated on issues of: expenses for business and private life and conditions of competition, access to data and advancement of research and innovation, and externalities and fair distribution of costs and benefits.

5.3.1 EXPENSES FOR BUSINESS AND PRIVATE LIFE AND CONDITIONS OF COMPETITION



The experts argued that undeniably there will be expenses for the public as well as for the private sectors involved in implementing AI infrastructures in society. However, as compared to the costs today, these expenses are not likely to increase and will most likely be absorbed by additional growth over time.

It is expected that we will see new services appear in the future. Also, some of the services, which are today priced, will become free services for businesses and private customers alike. We already have free access to many services like search engines, e-mail services etc. and in the near future, we may expect an increase of these zero marginal cost services in society. The experts also expect a decrease in costs for other and more traditional sectors and goods, due to e.g. more advanced AI-enhanced automation. This means that the challenge is not a question of *whether* economic benefits will be gained in business and private life; but more a question of a gain for *whom*?

According to the experts, efficiency and competition are also core challenges. AI technology will improve efficiency in general and cut down expenses in business and in private life. The challenges consist in securing that the economic benefits not only accrue the existing big tech-companies, as a deterioration of the conditions of competition could create a situation with monopolies. We have already experienced this, to some extent, in relation to The Big Five (Google, Facebook, Amazon, Apple and Microsoft).

Overall, the experts concluded that in most cases AI will ensure that expenses go down technology-wise, but we must be aware that this could also create a society where 'the winner takes it all'.

Challenges and uncertainties related to expenses, competition and consumer benefits:

- High costs associated with a wide implementation of AI-enabling infrastructures in society
- Securing good conditions of competition

5.3.2 ACCESS TO DATA AND ADVANCEMENT OF RESEARCH AND INNOVATION

The challenge to ensure access to data is crucial for research and innovation (R&I) and improved access to data for research institutions and companies will certainly stimulate R&I. In addition to huge amounts of data, AI technology in itself will also stimulate R&I e.g. due to new cost-effective technologies for simulation. The seemingly endless and cost-effective ways to simulate that the digital world offers could be bringing marginal costs (value-creation costs) to near zero. However, today an imbalance exists between the public and private sectors' access to data, leaning toward easier access for the private sector. This imbalance has restraining implications for R&I in the public sector. Whereas R&I in the private sector most definitely are stimulated. The question is how we can balance access without compromising e.g. GDPR and forcing unnecessary burdens (regarding responsibility for and management of privacy rights) on individuals?

During the discussions, concern was articulated that AI could bring a non-objective spin on R&I and its quality, which adversely could affect the quality of the research done. It is a prevalent methodological concern that data driven research bear the risk of deteriorating the quality of research, as it may become more consultancy-like. This is currently a widespread trend in science, and AI-generated research is probably



not different. Even in the AI research environment, an acknowledgement of the need for a more multi-disciplinary approach involving e.g. the humanities can be tracked. As an example, it is very important to understand and discriminate the difference between causality and correlation when analysing data generated machine and deep learning (this is in fact a second order instance of a classic problem). There is a real need to be aware of the validity and reliability of data, and it is a challenge for future AI development to enhance this awareness and understanding.

Challenges and uncertainties related to responsible research and innovation and the access to data include:

- Improved access to data for research institutions and companies would stimulate R&I, but how do we share and use data, without forcing unnecessary burdens on individuals?
- There is an imbalance between the public and private sectors' access to data.
- Fear that AI could bring a jaded and subjective spin on R&I and the meaning and quality of data.
- Future AI development is in need of a more multi-disciplinary approach

5.3.3 EXTERNALITIES AND FAIR DISTRIBUTION OF COST AND BENEFITS

In relation to the challenges of a fair distribution of cost and benefits, it is relevant to point out that the societal gap between the poorest and the richest is growing and that this has been a trend in the history of digitalized time. But at the same time, we are also all becoming richer. This means that even though the gap between rich and poor is getting bigger, all together a large portion of the world's poorest are raised out of poverty over time.

Economic inequality exists worldwide as well as within EU. Today's economic inequality is regulated by taxes and with tax we have the challenge to distribute our wealth by design. The question is how to design it? This is an ideological question in general. In the western world, jobs are the holy grail in the debate on costs and benefits distribution. A quintessential question in this regard is whether the dividend from the work of AI technology and robots go to workers or to the owners of the technology. E.g. today jobs exist that we would gladly give to robots. Although it is undeniable that productivity in an AI future will increase, the salary for labour, however, might not. This thus leads us to the question of who gains on this added efficiency and effectiveness.

The experts also elaborated on the challenges associated with the deeply rooted economic assumption that economic exponentiality can be gained through innovation. It is an open question whether AI fits into this economic assumption or whether it is a mistake *not* to assume that the AI technologies will transform our economy.

Furthermore, a problem with this assumption is the question of whether economic exponentiality is realistic in terms of climate and resource costs. There is nothing that proves that an exponential increase in economic benefits and gains can actually be made in terms of these. In addition to this argument, AI and the general digitalization of society require a vast amount of energy - with GHG-emission and climate change as an unavoidable externality. One of the great challenges is that currently climate change is transforming from



being an externality to becoming a real expense for businesses and in a very near future could turn into a real production restraint.

Our current economic system is based on scarcity, but how do we measure economic growth when traditional methods like GDP and traditional economic parameters are no longer adequate? The experts predicted that the future will generate a need for included qualitative measures, and not settle for just quantitative measurement.

Because of the above, the experts predict that AI technology can and will affect both the economy, the way we have organized today's society and the distribution of costs and benefits. (And mostly for the good.)

Challenges and uncertainties related to externalities and fair distribution of costs and benefits include:

- The future will bring a challenge to include qualitative measures and not just settle for the quantitative, when measuring economic growth
- It is undeniable that productivity in an AI future will increase; however, the salaries might not, and the nature of the needed labour might change
- A future of haves and super-haves will challenge us to find ways to a fair distribution of labour and wealth

5.4 SOCIAL IMPLICATIONS

The expert group debating the social implications of AI centred on the themes of the putative futures for labour and the job market in an AI mediated economy, the implications of an AI mediated healthcare system and the implications of an AI mediated educational system.

5.4.1 AI AND THE FUTURE OF LABOUR

As a starting point for the discussion it was established that labour as such should not be regarded as a stable entity, but rather as a socially constructed phenomenon. The experts then discussed how the application of AI could influence how we value and think about labour: Will it play a role in future job creation, and how then, will this unfold? Menial or routine labour that is not economically viable was one area where the experts pointed to a potential for AI. A possible downside, on the contrary, could be that AI represents a distinctly economic form of governance, which might ultimately lead to marginalisation. The essential issue, argued the experts, is that AI promoters are asking for a "change of mind-set" without really knowing what that would entail.

Instead of posing unclear demands that cause uncertainty, frustration and anxiety on the future of labour and the required skills, the experts argued it would be better to reflect on the value of having work and how citizens may be positively engaged in "constructing it". In that sense, the question of labour should be reconstructed and thought of as an existential matter.



In addition, the experts warned about valuation of creative jobs over e.g. more routine-based or menial labour jobs. They took for granted that a certain amount of jobs will be obliterated or transformed. A change of job-content will – for better or worse – matter to the people to whom this befalls. People are different, and not every individual is interested in working in the same way, or in the same type of jobs. Some attention should thus be given to issues of possible social or personality-related downsides of AI job creation. Like with the computing revolution, AI could cause, or reinforce, gendered labour issues. Interestingly, it seems that more “classical male jobs” than “classical female jobs” will be obliterated. Implicit in this may lie a need for a societal transformation of value.

Finally, increased use of automated processes and eventually AI based technologies could concentrate wealth with the privileged, the highly skilled, and with employers, who become less dependent on their human production capacity.

Challenges and uncertainties related to AI and the future of labour include:

- Safeguarding labour
- Creation and meaningfulness of labour
- The human cost of an AI influenced job-market

5.4.2 AI AND THE FUTURE OF HEALTHCARE

There seems to be obvious and immense benefits to gain from applying AI in the health and care sector. This goes for AI aided diagnosis as well as AI aided treatment (including personalized treatment), AI guided administration and so forth.

Challenges and uncertainties related to AI and the future of healthcare include:

- Interpreting data correctly and achieving the necessary skills to operate AI based machines (e.g. for radiologists) as well as ensuring a high level of education
- Feeding AI with correct and adequate data
- Standardisation might exclude huge groups of patients with orphan diseases
- Coming to terms with the fact that AI will work in some areas but not in others. If you do not have an adequate understanding of a given disease, AI will not do any good
- Ensuring that AI works in tandem with human
- Not becoming overly focused on funding AI solutions at the expense of low-tech solutions, such as interpersonal communication, to the extent that these provide better/equally preferable results
- AI has apparently become a semantic strategy for achieving funds. Putting an end to this development is also an ethical question. We need to (collectively and politically) compile a list of ‘nice to haves’ and ‘need to haves’ and manifest it in law.
- AI is not better than the data which is fed into the AI: Correct and adequate data is the pre-condition for successful utilisation of AI in diagnosis



The experts argue that the positive potentials of healthcare are immense (increased life expectancy, freeing up of resources and so forth) Yet, there are important conditions to be met: To use AI resourcefully a high level of professionalism is needed as is the need to recognise and include analogue (non-digital) skills.

5.4.3 AI AND THE FUTURE OF EDUCATION

The experts argued that we are presently witnessing the emergence of an educational environment that is averse to learning and teaching. Firstly, the education system is increasingly commercialised, which imply that education focuses primarily on the monetary value of education and less on the value of education in building societies and citizens. Secondly, politicians are committing a classical “innovation fallacy”, by equating the newness of a technology with its necessity and value. Thereby questions of actual usefulness and value in promoting better education are ignored.

Additional issues pointed out by the experts included that relying increasingly on digital or automated tools in teaching environments breaks down well-known (and well-functioning) social structures like e.g. teacher vs. student relationships. The individualisation of teaching (made possible by e.g. AI) puts hierarchy and authority in the background. However, this is not what the students meet in the real world.

Relying on AI and digital technologies in the educational system also run the risk of reinforcing existing inequalities. Gifted students continue to do better, and that is in part because they adapt more successfully to digital learning tools – and so similar social mechanisms may be predicted for AI based learning tools.

The experts were positive in pointing out that there could be a democratisation value in digital and AI driven learning tools. An example could be increased access to information and online resources. In order to realise such a potential, there would need to be put more attention to developing skills for manoeuvring large amounts of information.

Challenges and uncertainties related to AI and the future of education include:

- Increasing commercialisation of the education system
- High focus on monetary value of education
- A fundamental misunderstanding between successful integration of digital tools and the improvement of education, teaching and learning
- Breaking down of social structures for managing learning and teaching environments
- Breaking down of hierarchical structures and failing to prepare students for social and work life
- Reinforcement of existing inequalities
- Learning how to manoeuvre in an abundance of information



6 CONCLUSIONS AND NEXT STEPS

The Copenhagen AI 360 workshop brought together a group of recognised experts for an assessment of the possible future impact of AI. Their assessment provided an overview of possible future impact for policy, legal frameworks, rights and ethics, the economy and our societies. The workshop also showed that if a number of recommendations are followed by action, the experts at the workshop were on the majority of the challenges discussed, convinced that the impact of AI in the future will be a positive one. However, a number of concerns remained. In particular, good solutions for the concern that AI will increase unequal distribution of costs and benefit in society were not found. For the political dimension, the experts remained concerned on the potential of AI as a tool furthering abuse or manipulation by those in power.

6.1 NEXT STEPS

The recommendations and overview of the AI 360 workshop form the foundation for a dialogue with European citizens on AI. In the course of September-November 2019, citizens all across Europe will debate solutions for steering AI towards societal benefit. Their recommendations, together with the present report, will be presented to the Human Brain Project for evaluation.



7 LITERATURE LIST

Danish Expert Group on Data Ethics: (<https://eng.em.dk/media/12190/dataethics-v2.pdf>)

The DESSI project (<http://securitydecisions.org/>)

Winfield, Alan (web-blog): <http://alanwinfield.blogspot.com/2019/04/an-updated-round-up-of-ethical.html>

8 Appendix

Overview of results

Overview of results from round 1Expert round

DIMENSION AND CRITERIA		ALTERNATIVE	
		2025+: ACCELERATED MA...	2050: BIO-AI
Rights & Ethics	Privacy & Privat life		
	Freedoms		
	Non-discrimination		
	Transparency		
	Social cohesion		
	Voluntariness and consent		
Legal Framework	Data protection		
	Accountability & Liability		
	New legal provisions		
	Range of use		
	Security		
	Intellectual property		
Social implications	Employment and labour markets		
	Social inclusion		
	Governance and good administration		
	Educational systems		
	Culture		
	Health and Care systems		
Political significance	State-citizens relationship		
	Political culture		
	Potential for political abuse		
	Democratic participation		
	Relations of expertise and non-expertise		
	Public debate		
Economy	Direct and indirect costs		
	Economic benefits		
	Research and innovation		
	Externalities		
	Macroeconomics		
	Distribution of costs and benefits		
Total		1	9

Overview of results from round 1Solution round

DIMENSION AND CRITERIA		ALTERNATIVE	
		2025+: ACCELERATED MA...	2050: BIO-AI
Rights & Ethics	Privacy & Privat life		
	Freedoms		
	Non-discrimination		
	Transparency		
	Social cohesion		
	Voluntariness and consent		
Legal Framework	Data protection		
	Accountability & Liability		
	New legal provisions		
	Range of use		
	Security		
	Intellectual property		
Social implications	Employment and labour markets		
	Social inclusion		
	Governance and good administration		
	Educational systems		
	Culture		
	Health and Care systems		
Political significance	State-citizens relationship		
	Political culture		
	Potential for political abuse		
	Democratic participation		
	Relations of expertise and non-expertise		
	Public debate		
Economy	Direct and indirect costs		
	Economic benefits		
	Research and innovation		
	Externalities		
	Macroeconomics		
	Distribution of costs and benefits		
Total		7	13

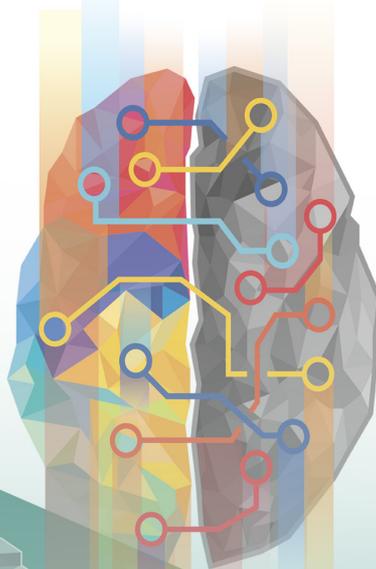


Human Brain Project

Ai|360°| copenhagen

March 21, 2019 11:30 AM → March 22, 2019 3:00 PM
Strandgade 6, st. 1401 Copenhagen

Workshop folder



FONDEN TEKNOLOGIRÅDET
DANISH BOARD OF TECHNOLOGY FOUNDATION

The research leading to this result has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 785907

Co-funded by
the European Union





DEAR WORKSHOP PARTICIPANT,

Welcome to **AI 360 COPENHAGEN**. We are looking very much forward to hosting you for our upcoming workshop at the beautiful premises of the Danish Authors' Society in the heart of Copenhagen. In this folder you will find further information about the event, a detailed program for the two days, maps and practicalities and some reading material we would like you to familiarize yourself with prior to the event.

SETTING THE SCENE	PAGE: 3
PROGRAM	PAGE: 4
WORKSHOP METHODOLOGY	PAGE: 5
A TECHNOLOGICAL PROGRESS TIMELINE	PAGE: 6
2025+, ACCELERATED MACHINE LEARNING	PAGE: 6
2050, BIO-AI	PAGE: 8
TRAVEL INFORMATION AND MAPS	PAGE: 9
AI EVALUATION CRITERIA (APPENDIX)	PAGE: 12



SETTING THE SCENE FOR AI FUTURES

Easy access to vast amounts of data, fast data processing, pattern recognition and sophisticated learning algorithms are tools that herald incredible possibilities for effectiveness, accuracy, abundance and potentially revolutionary changes to society. Concerned voices warn us. As mind blowing the possibility for improvement in almost all conceivable aspects of private and public life is, as worrying is it that AI technologies also have obvious capacities for abuse of power, for overruling existing norms and agreements regarding rights and integrities, and for downright malign and adverse application.

Some compare the development to a train with no conductor. The question, of course, is: Can we adapt our uptake of technology in the present to influence its direction and impact in the future? By acting precautionary now, in advance, might we be able to have a say about which kind of future we want? Can we fix AI-related societal bugs before they happen? If we want to try, we need to move fast – because AI technology certainly does.

AI 360 COPENHAGEN is established in the belief that we can influence how technology and related societal phenomena should develop. AI entails big hope, big hype and big risk, and an obvious place to start is to form an overview of where the true hotspots are and what we can do about them. This is where the 360 degrees perspective comes in: In all modesty we aim to reach an inclusive, systematic and comprehensive overview. This is why we have invited you, as experts on these matters, to put insights and ideas into words, in order for others, further down the line, to be able to put these words into action.

AI 360 COPENHAGEN has the mission to create an overview of hotspots and possible actions. The results will feed into a European citizen consultation in which citizens will provide their assessment of how society should deal with the AI future.

Welcome to AI 360 COPENHAGEN!

WORKSHOP PROGRAM:

Thursday March 21st, 2019

11.30-12.00	Workshop registration and lunch
12.00-12.25	Welcome to AI 360 COPENHAGEN Format of the workshop by Lars Klüver, deputy leader of Ethics & Society, Human Brain Project (HBP); director of the Danish Board of Technology
12.25-12.35	Presentation - tour de table
12.35-12.45	Individual round - rating impact on the criteria
12.45-14.45	Expert round - discussion and rating
14.45-15.00	Coffee break
15.00-16.45	Plenary session - introduction and methodology - multidisciplinary discussion and possibility of re-rating
16.45-17.00	Wrap-up by Lars Klüver
	Walk to restaurant The Standard, Havnegade 44, 1058 Copenhagen (This is a 10 min. walk passing Hotel Strand on the way)
17.30-18.30	Welcome drinks + ARTificial Intelligence by Cecilie Waagner Falkenstrøm
18.30 –	Dinner at The Standard (Havnegade 44, 1058 Copenhagen)

Friday March 22nd, 2019

08.30-9.00	Coffee and morning snacks available
09.00-09.15	Welcome and introduction to the day by Lars Klüver
09.15-10.45	Solutions round - finding solutions
10.45-11.00	Coffee break
11.00-12.30	Solutions round continued
12.30-13.15	Lunch
13.15-14.45	Plenary debate
14.45-15.00	Wrap-up and end of the workshop by Lars Klüver

WORKSHOP METHODOLOGY

During the workshop we will make a multi-criteria assessment of AI in the near and in the longer-term future. The futures are described on the next pages. The criteria we will use are described in the appendix and they are separated into 5 dimensions with 6 criteria in each.

There are three phases in the workshop:

- 1) Both futures are scored on all criteria. This will be done by 5 groups of experts on the 5 dimensions. The scoring will reflect if the future AI performs a) less than acceptably (red), b) acceptably/neutral (yellow), c) positively (green).
- 2) Other participants comment on the scoring. This will be done in three rounds of plenary sessions.
- 3) Based on the first scores and the comments, multidisciplinary groups design/describe solutions to those instances where criteria were scored under the acceptable or neutral (red or yellow), in order to improve the societal impact on the criterion – and the score is then re-assessed in the light of the solutions. The aim is to find solutions that can make the score green.

“Scoring” in this method is about a) discussing the futures’ performance on the criterion, b) describing the outcome of the discussion, c) make the scoring accordingly. So, there will be a qualitative as well as a semi-quantitative element in the scoring. All of this will be done using an IT tool.

After the workshop the results will be used for two purposes:

- The workshop will be reported in a briefing note, which will proceed into the AI discussions in the Human Brain Project and can be used in future debates by anyone.
- The results will be used to refine the futures and to select topics for a European citizen consultation, which will be carried out by the Human Brain Project during the rest of 2019. Again, the results of this will feed into the AI work of the Human Brain Project and be a contribution to the academic, public and political discourse on AI.

The workshop is also a piece of method development. The Danish Board of Technology developed a version of this method as coordinator of a project on Decision Support in Security Investments (DESSI) in 2013. And it worked very well. In the Human Brain Project, based on this previous work, we have set out to create a more generic method, called “360 Tool”, to be used for participatory societal multi-criteria assessments of technologies, scenarios or alternative solutions to a problem.

PRELUDE TO THE SCENARIOS: A TECHNOLOGICAL PROGRESS TIMELINE

In the following pages you will find two scenarios describing AI technological futures. These futures are condensed stories of technological developments, set in fictional time.

When considering AI historically, a progress in complexity and advancement of prevalent technological paradigms can be observed:

Neural networks (1950-1980);

Machine learning (1980-2010);

Deep learning (2010 -)

Along the timeline above, the nature of the algorithmic processes has dramatically changed. From being a set of fixed instructions only sparsely networked, they are currently “close-to-intelligent” processes, highly networked and learning/self-adapting as a consequence of the huge amounts of data they have access to.

The question is of course what comes next? One option is the introduction of “real intelligence” into machines by mimicking the computational principles in biological brains.

2025+: ACCELERATED MACHINE LEARNING

2025+ Accelerated machine-learning is playing out now and with acceleration 2025 onwards. This scenario, just a few years ahead, outlines what is already happening or possible now or soon with the technology presently available, and the difference from the present is that these technologies are being heavily implemented in 2025+.

Some of the key concepts that define IT development and AI in 2025+ are:

- Adaptable algorithms
- Self-organizing machines
- Immense data processing power
- Big Data
- Patterns recognition
- Machine learning
- Computational modelling and prediction
- Man-machine interfaces
- Robotics and drones
- Mimicking technologies

Inside this technological landscape a range of areas of application has opened up. Following the logic of the technological progress towards ever-increasing precision and particularization, self-organization and processing power, it appears that if AI continues along the developmental tracks outlined here, the following examples of contemporary applications and areas of use may be just the take-off ramp for AI application:

- Automatization of repetitive tasks and operations (e.g. in industry, production and the workplace)
- Fast and error-proof processing of routine tasks (e.g. medical screening)
- Surveillance in many forms
- Improved biometrics, (e.g. facial recognition on CCTV)
- Cross-referencing and amalgamation of registers using Big Data
- Decision making in administration
- Algorithmic mediated digital environments
- Social media info mining
- Personalized advertising and marketing
- Opinion formation/influencing and manipulation of political and consumer choices, including fake news production
- Increased quality of life and convenience in social and societal everyday tasks
- Forecasting/modelling (weather, expected no. of tourists/year, prime time of electrical outlet etc.)
- Smart systems (Smart homes/cities, energy systems etc.)
- Algorithm-mediated monocultures/'bubble culture'
- ePolicing and security applications
- Military operations, e.g. cyberwarfare

2050: Bio-AI

2050 Bio-AI, imagines the scientifically verified potential consequences of these same technologies, fully implemented, some 25+ years ahead. This scenario, however, also includes a qualitative technological leap into brain-inspired computing.

Many scientific actors are striving for a deep understanding of the computational functions of the brain. It is, for example, a core mission of the Human Brain Project to pave the way for such a quantum leap in brain and computer science, and to make the development available for innovation in “brain-inspired computing”. Theories are made, potent IT brain research infrastructures are being built, models are developed and tested, algorithms are developed, and neuro-morphic computers “neurons in silica” are at Version 2 or beyond.

Is this 2035, 2050 or autumn 2113? No-one can tell, but at some point in history AI will develop into becoming Bio-AI.

We can only speculate what the difference to the 2025+ scenario will be, and how drastically it will change our use of computing. But an educated guess on new and additional features could be:

- Some ability to analyse and generate meaning and symbols
 - Text analysis and artificial writing to a new level
 - Context, culture and individual sensitive translation
 - In the more sci-fi end, individualised AI production of culture experience and games
- Some associative capabilities
 - Foresighting, scenario building and choice of best-fit-scenario
 - Judgments/decisions from experience with little statistical background
- Pattern and form recognition in distorted or fragmented information
 - Seeing the needle in the haystack, or the face in a picture even if only an ear is visible
 - Identifying the single important/different piece of data, instead of the statistical pattern
- Hive-systems of computers, building upon eachothers’ “thoughts”

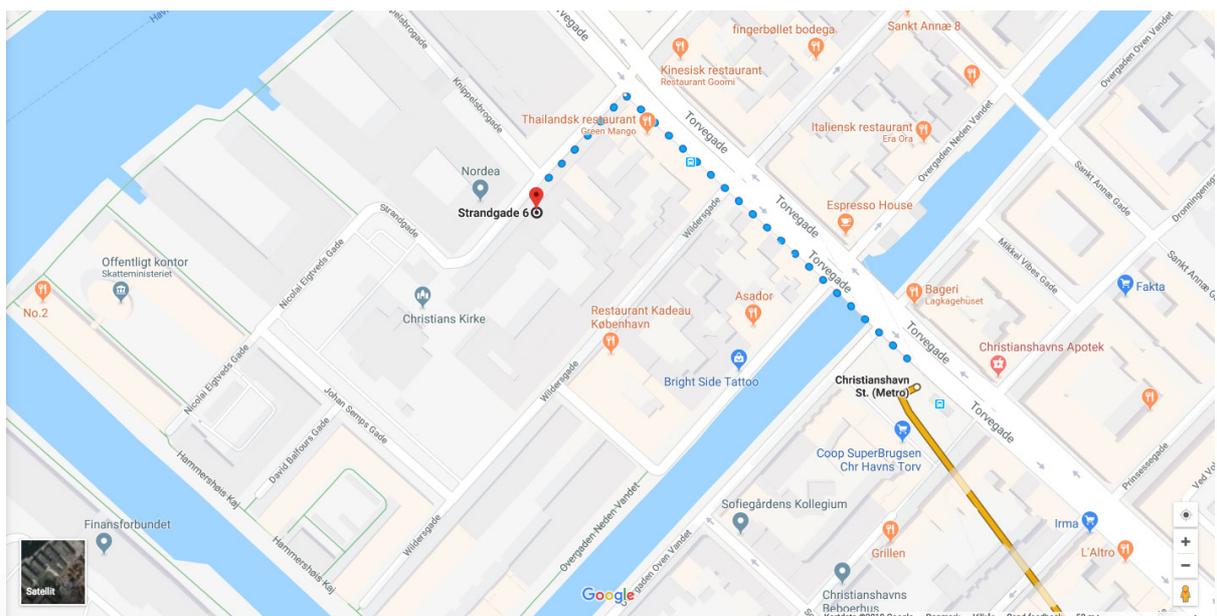
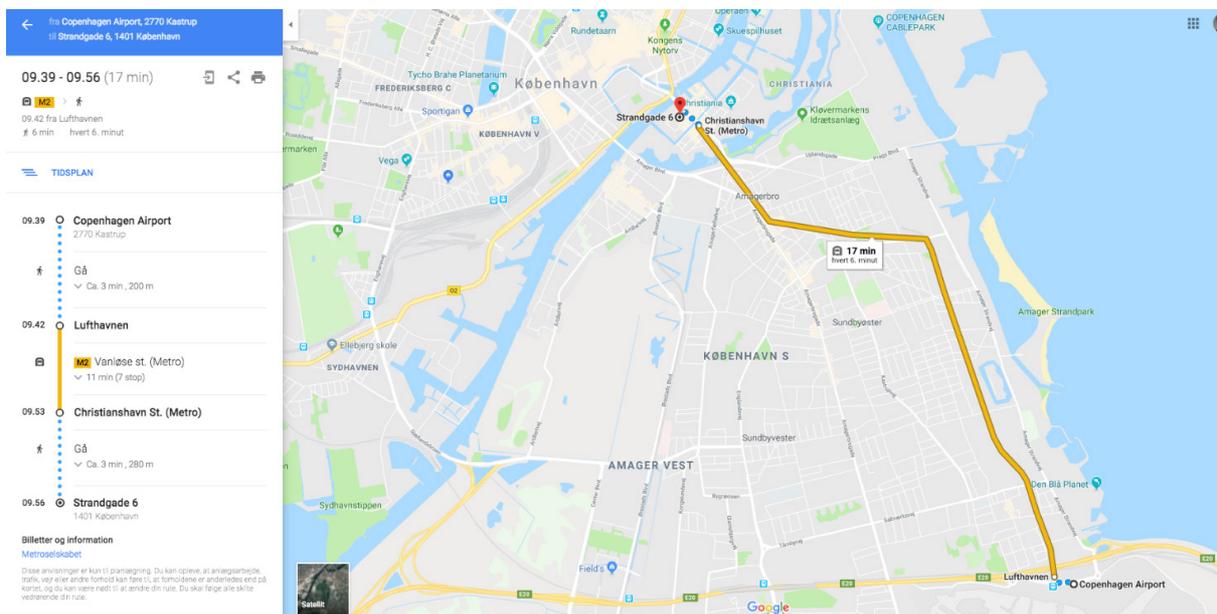
The difference between the 2025+ and the 2050 scenario may seem on the one hand insignificant: “What will the difference really be?” or on the other hand downright sci-fi: “Machines will never be able to think intelligently”. It is however important to notice that strong efforts are currently made to realize the Bio-AI vision and that significant improvements are made in this regard. Concerning the purpose and scope of AI 360 COPENHAGEN, we want you to pay particular attention to the qualitative addition in intensity, integration and possibilities of the 2050 scenario as compared to how far ‘2025+’ brought us, when biological intelligence is added to the equation.

TRAVEL INFORMATION AND MAPS

In the following pages we have put together some information on travelling in Copenhagen for your convenience.

Getting from Copenhagen airport to the The Danish Authors' Society (Strandgade 6):

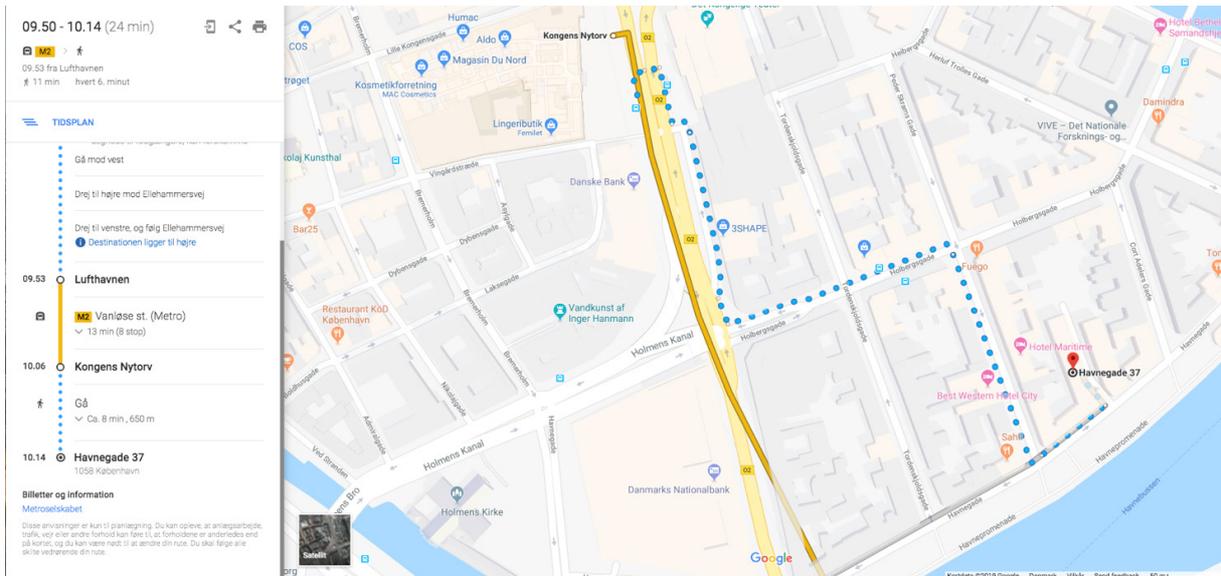
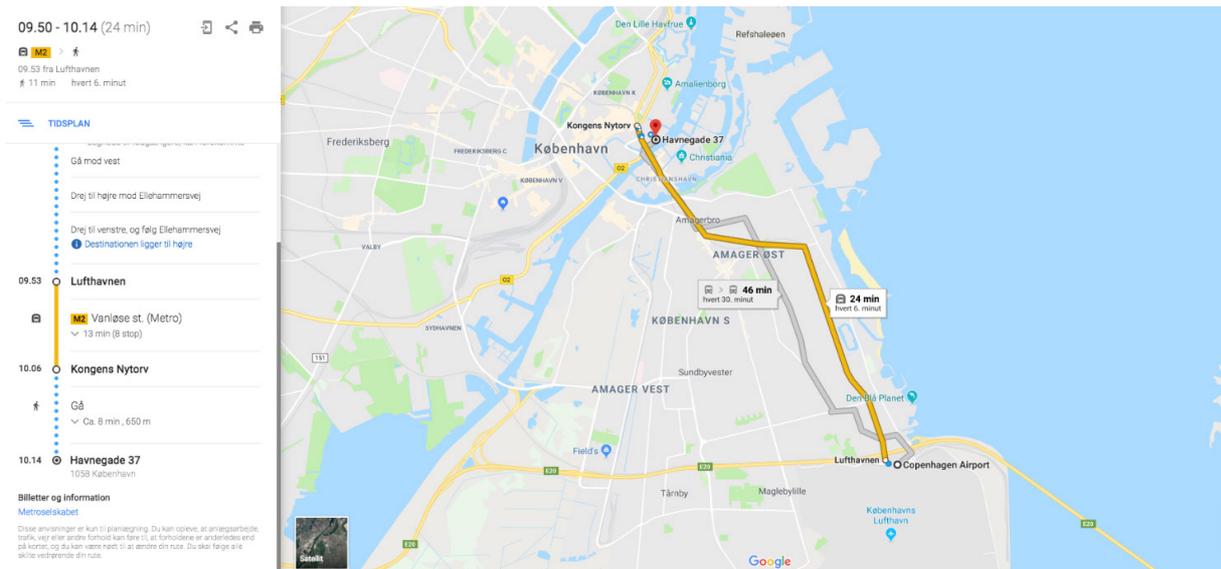
If you arrive at CPH airport, the most convenient way to get to the venue is by metro. The departure point is in the airport's arrival terminal and the nearest metro station to the venue is Christianshavns st. The metro from CPH airport to Christianshavns st. takes about 20 min. and from Christianshavns st. it is a 3 min. walk to the venue (see the maps below)



You can find more information on how to **purchase the tickets for the metro** at this [link](#):

Getting from Copenhagen airport to Hotel Strand (Havnegade 37):

If you arrive at CPH airport, the most convenient way to get to the Hotel Strand is by metro. The departure point is in the airport's arrival terminal and the nearest metro station to the hotel is Kongens Nytorv st., the metro from CPH airport to Kongens Nytorv st. takes about 25 min. and from Kongens Nytorv st. it is an 8 min. walk to the hotel (see the maps below)

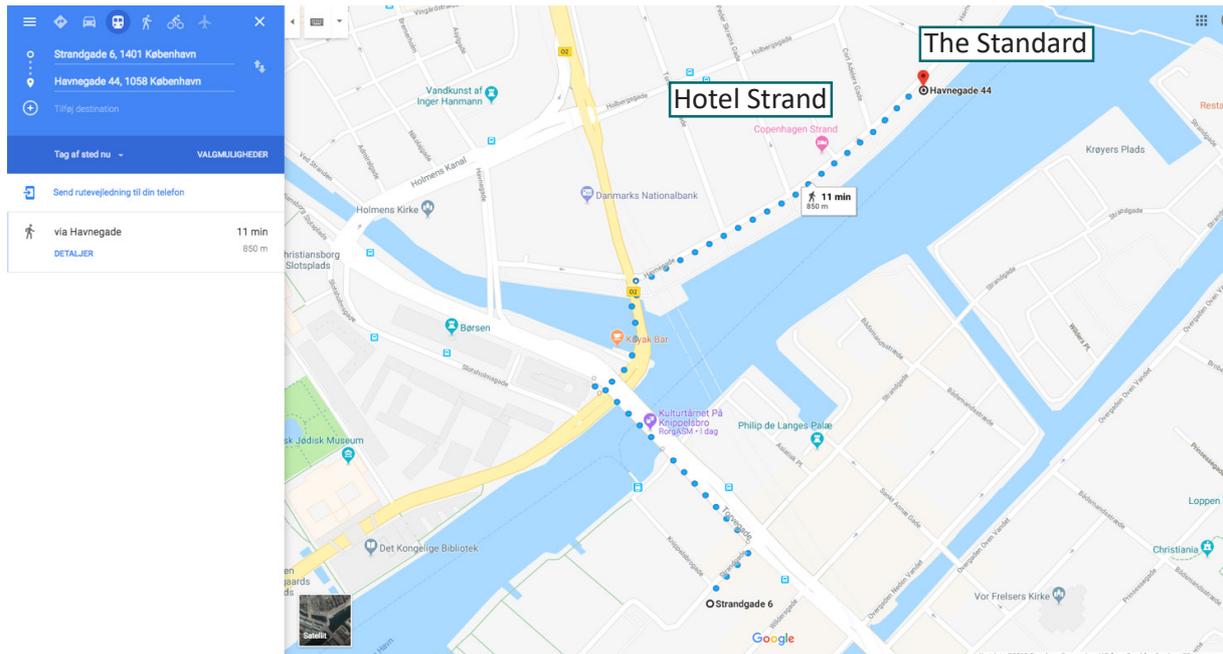


You can find more information on how to purchase the tickets for the metro at this [link](#):



Getting from The Danish Authors' Society to Hotel Strand and the dining venue

The Danish Authors' Society is located just within walking distance (approx. 10 min.) from Hotel Strand and the dining venue The Standard. (see the map below)



APPENDIX: AI EVALUATION CRITERIA

DIMENSION 1: RIGHTS AND ETHICS	PAGE: 13
DIMENSION 2: LEGAL FRAMEWORK	PAGE: 14
DIMENSION 3: SOCIAL IMPLICATIONS	PAGE: 15
DIMENSION 4: POLITICAL SIGNIFICANCE	PAGE: 16
DIMENSION 5: ECONOMY	PAGE: 17

OVERVIEW:

	1	2	3	4	5	6
Rights & ethics	Privacy and private life	Freedoms	Non-discrimination	Transparency	Social cohesion	Voluntariness and consent
Legal framework	Data protection	Accountability and liability	New legal provisions	Range of use	Security	Intellectual property
Social implication	Employment and labour markets	Social inclusion	Governance and good administration	Educational systems	Culture	Health and care system
Political significance	State-citizens relationship	Political culture	Potential for political abuse	Democratic participation	Relations of expertise and non-expertise	Public debate
Economic implications	Direct and indirect costs	Economic benefits	Research and innovation	Externalities	Macro-economics	Distribution of costs and benefits

DIMENSION 1: RIGHTS AND ETHICS

Criterion 1	Privacy and private life
Title	
Criterion 1	Private life e.g. private zones and the right to privacy is respected.
Statement	
Criterion 2	Freedoms
Title	
Criterion 2	Freedom of thought, conscience, religion, expression and information are positively affected.
Statement	
Criterion 3	Non-discrimination
Title	
Criterion 3	Diversity, equality and value-pluralism are positively affected.
Statement	
Criterion 4	Transparency
Title	
Criterion 4	Transparency and accessibility in terms of both inner workings and effects is always in place.
Statement	
Criterion 5	Social cohesion
Title	
Criterion 5	Culture of trust and cohesion in society is improved.
Statement	
Criterion 6	Voluntariness and consent
Title	
Criterion 6	Citizens' control of their resources (e.g. tissue and data, etc.) is improved.
Statement	

DIMENSION 2: LEGAL FRAMEWORK

Criterion 1	Data protection
Title	
Criterion 1	All relevant data protection regulations are considered and applied.
Statement	
Criterion 2	Accountability and liability
Title	
Criterion 2	Legal responsibility for the proper functioning and/or failures can be assigned.
Statement	
Criterion 3	New legal provisions
Title	
Criterion 3	Uses and procedures can be covered by existing laws.
Statement	
Criterion 4	Range of use
Title	
Criterion 4	The range of use and any extension (e.g. function creep etc.) is covered by existing regulations.
Statement	
Criterion 5	Security
Title	
Criterion 5	Security (e.g. personal security, infrastructure, hazards to environment, etc.) is improved.
Statement	
Criterion 6	Intellectual property
Title	
Criterion 6	Appropriate legal frameworks are in place and applicable.
Statement	

DIMENSION 3: SOCIAL IMPLICATIONS

Criterion 1 Title	Employment and labour markets
Criterion 1 Statement	Employment relations, labour markets and job quality is positively affected.
Criterion 2 Title	Social inclusion
Criterion 2 Statement	Social inclusion (e.g. greater equality, participation, cultural and linguistic diversity etc.) is improved.
Criterion 3 Title	Governance and good administration
Criterion 3 Statement	There is a positive effect on the involvement of stakeholders regarding issues of governance.
Criterion 4 Title	Educational systems
Criterion 4 Statement	There is a positive effect on literacy and educational systems.
Criterion 5 Title	Culture
Criterion 5 Statement	There is a positive impact on citizens' participation in cultural manifestations and their access to cultural resources.
Criterion 6 Title	Health and Care systems
Criterion 6 Statement	There is a positive effect on the financing, organization, access to and quality of social, health and care services.

DIMENSION 4: POLITICAL SIGNIFICANCE

Criterion 1	State-citizens relationship
Title	
Criterion 1	The relationship between state and citizens has changed for the better in terms of power relations or trust.
Statement	
Criterion 2	Political culture
Title	
Criterion 2	Political culture is improved in terms of openness, fairness, quality of dialogue, etc.
Statement	
Criterion 3	Potential for political abuse
Title	
Criterion 3	There is no increased potential for political abuse.
Statement	
Criterion 4	Democratic participation
Title	
Criterion 4	Democratic participation means of exercising political standpoints, or the free exchange of viewpoints are positively impacted.
Statement	
Criterion 5	Relations of expertise and non-expertise
Title	
Criterion 5	Exchange of viewpoints and interaction between experts and lay people in society is increased.
Statement	
Criterion 6	Public debate
Title	
Criterion 6	The character of public debate is positively impacted.
Statement	

DIMENSION 5: ECONOMY

Criterion 1	Direct and indirect costs
Title	
Criterion 1	Expenses for business and private life are not increased.
Statement	
Criterion 2	Economic benefits
Title	
Criterion 2	Economic benefits can be gained.
Statement	
Criterion 3	Research and innovation
Title	
Criterion 3	Research and innovation are stimulated.
Statement	
Criterion 4	Externalities
Title	
Criterion 4	Unintended negative effects are highly unlikely.
Statement	
Criterion 5	Macroeconomics
Title	
Criterion 5	Positive macroeconomic effects are induced.
Statement	
Criterion 6	Distribution of costs and benefits
Title	
Criterion 6	Fair distribution of costs and benefits is improved.
Statement	



Human Brain Project

Ai|360°| copenhagen

March 21, 2019 11:30 AM → March 22, 2019 3:00 PM
Strandgade 6, st. 1401 Copenhagen

Referent håndbog





AI 360 Copenhagen referent håndbog

Her en 101 i, hvordan du som referent slipper helskindet igennem workshoppen. Som referent er det din rolle at skrive noter til deltagernes diskussion i de respektive sessioner, du skal herudover skrive diktat af deres referat (summary), som bordformanden skal formulere på gruppens vegne, og du skal (sammen med bordformanden) sørge for at STYRE TIDEN. Vi skal nå meget og må ikke hænge i bremsen. Når du refererer diskussionen, er det centrale at få fat i meningen og pointerne. Der kan være mange ideer om, hvordan 'noget' skal skrives, men der bliver ikke tid til at diskutere for megen ordlyd. Det skal ikke være kunst, det er 'bare' noter. Så fokuser på at fange mening og pointer, ikke på at få det til at lyde flot.

General beskrivelse

Når du lander på forsiden af din dimension, finder du en liste over de kriterier, der er relateret til dimensionen i venstre side af skærmen.

For at gå til et givent kriterium 'klikker' du på det kriterium, du ønsker at gå til.

Hvert kriterium har en overskrift og et 'statement', der fungerer som udgangspunkt for diskussionen.

Du skal som referent tage noter fra denne diskussion og du kan blive præsenteret for forskellige noteformer.

Nedenfor kan du se hvilke noteformer, du kan blive præsenteret for:

1. Open discussion
2. Summary of the assessment
3. Rating
4. Title of the assessment

Ikke alle noteformer er repræsenteret i alle kriterierne.

Til hvert kriterium er der 2 scenarier. Når du 'klikker' dig ind på et givent kriterium, vil du automatisk være i scenarie 2025+. Når dette scenarie er gennemgået (**Husk at trykke 'save'**), vælger du det næste scenarie fra 'drop down' menuen. Dette fører dig til en side som er identisk med den, du netop har gennemgået i det første scenarie. Når alt er udfyldt for dette scenarie, er du klar til at gå videre til næste kriterium (**Husk at trykke 'save'**).

Dimension fordeling

Dimensionerne er fordelt mellem referenterne som følger:

Dimension 1	Rights and Ethics	Sita Kotnis
Dimension 2	Legal framework	Nicklas Bådum
Dimension 3	Social implications	Thomas Lindstrøm
Dimension 4	Political significance	Lise Bitsch
Dimension 5	Economy	Rasmus Nielsen





Sessions fordeling

360 tool'et er til denne workshop opdelt i 4 sessioner:

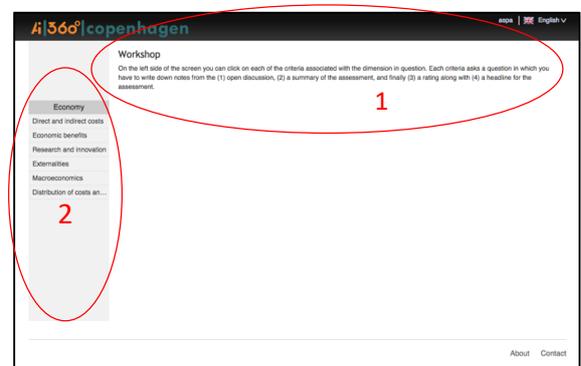
1. Expert round
2. Plenary session day 1
3. Solutions round
4. Plenary session day 2

I det følgende finder du en gennemgang af de enkelte sessioner.

1. Expert round

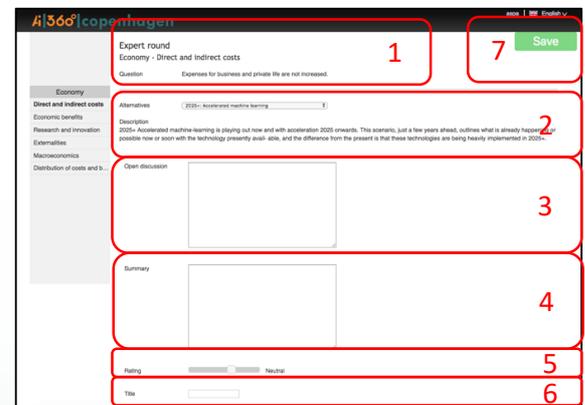
Startside:

1. Når linket åbnes, lander du på dimensionens forside. Her finder du en kort tekst, som beskriver fremgangsmåden for vurdering af kriterierne.
2. For at komme ind på et givent kriterium, trykkes der på kriteriets navn i venstre side.



Kriterium:

1. Når kriterie-siden åbner, ser du øverst på siden, hvilken runde du er i, hvilken dimension du er i, samt hvilket kriterium du er i, og endvidere ses det tilhørende spørgsmål/statement.
2. Derefter vises hvilket scenarie der skal vurderes i forhold til (2025+ eller 2050).
3. Det første felt, som skal udfyldes, er 'open discussion'. Her tager referenten noter til diskussionen omkring bordet. Prøv at skrive korte sætninger, så meningene i diskussionen kommer til udtryk.
4. Efter diskussionen beder referenten deltagerne om at opsummere diskussionen i et kort summary.
5. Der foretages en rating ift. udsagnet/statementet.
6. Til sidst gives diskussionen en titel (det kan være en kort sætning, et udsagn eller stikord).
7. Referenten trykker med jævne mellemrum på 'Save' for at gemme. Når kriteriet er gennemgået (trykkes der på save) og det næste scenarie vælges fra 'drop down menuen'.





2. Plenary session day 1

Plenum sessionen er opdelt i to parallelle spor som vist i figuren her:

Room 1 Facilitator: Lars Klüver	Room 2 Facilitator: Aske Palsberg
Political significance	Economy
Rights and Ethics	Social implications
Room 1 Facilitator: Lars Klüver Legal framework	

Referenterne følger med deres dimension.

Facilitatoren viser resultaterne fra ekspertdiskussionen på storskærm:

Project home | Settings | Back

Refresh every 10 seconds | Plenary session day 1 | Fullscreen

DIMENSION AND CRITERIA	INVESTMENT	
	2025+: ACCELERATED MA...	2050: BIO-AI
Rights & Ethics	Privacy & Privat life	
	Freedom	
	Non-discrimination	
	Transparency	
	Social cohesion	
Legal Framework	Voluntariness and consent	
	Data protection	
	Accountability & Liability	
	New legal provisions	
	Range of use	
Social implications	Security	
	Intellectual property	
	Employment and labour markets	
	Social inclusion	
	Governance and good administration	
Political significance	Educational systems	
	Culture	
	Health and Care systems	
	State-citizens relationship	
	Political culture	
Economy	Potential for political abuse	
	Democratic participation	
	Relations of expertise and non-expertise	
	Public debate	
	Direct and indirect costs	
Total	6	-21



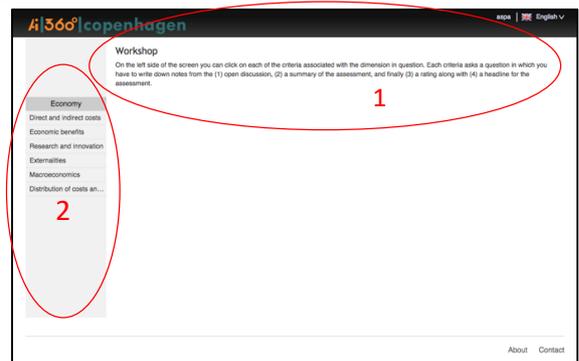


Dimensionens bordformand giver et kort referat af diskussionerne og ratingen af hvert kriterie i dimensionen.

Herefter starter diskussionen. Du gør følgende:

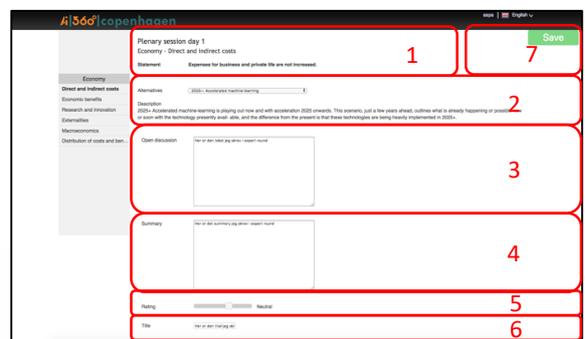
Startside:

1. Du åbner linket og lander på dimensionens forside. Her er en kort tekst, som beskriver fremgangsmåden for vurdering af kriterierne.
2. Hvis der er kommentarer til et givent kriterium, trykkes der på kriteriets navn i venstre side.



Kriterium:

1. Når kriterie-siden åbner, ser du øverst på siden, hvilken runde du er i, hvilken dimension du er i, samt hvilket kriterium du er i, og endvidere ses det tilhørende spørgsmål/statement.
2. Derefter vises hvilket scenarie, der skal vurderes i forhold til. Her skal du vælge scenarie i forhold til det, der kommenteres på.
3. Hvis det er generelle betragtninger, kan det indføres i 'open discussion'. Det kan også være ændringer ift. den eksisterende tekst.
4. Hvis ændringerne i 'open diskussion' er af en karakter, hvor det har indflydelse på referatet (summary), så noteres det i summary.
5. Hvis det ønskes, kan der også ændres i ratingen.
6. Titlen kan også ændres.
7. HUSK med jævne mellemrum at trykke på 'Save' for at gemme.

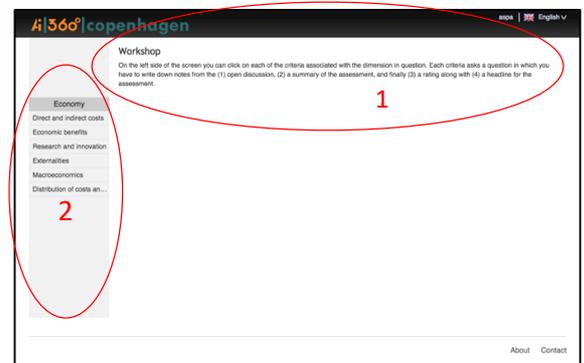




3. Solutions round

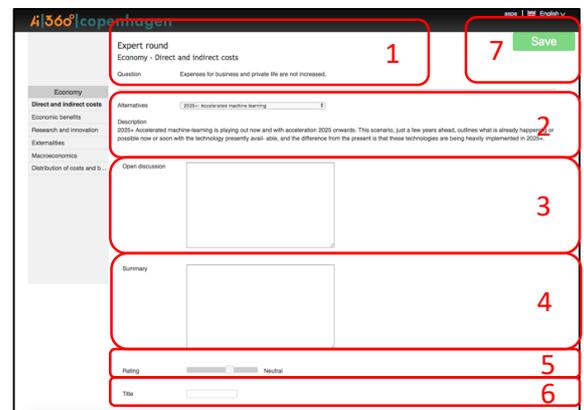
Startside:

1. Når linket åbnes, lander du på dimensionens forside. Her finder du en kort tekst, som beskriver fremgangsmåden for vurdering af kriterierne.
2. For at komme ind på et givent kriterium, trykkes der på kriteriets navn i venstre side.



Kriterium:

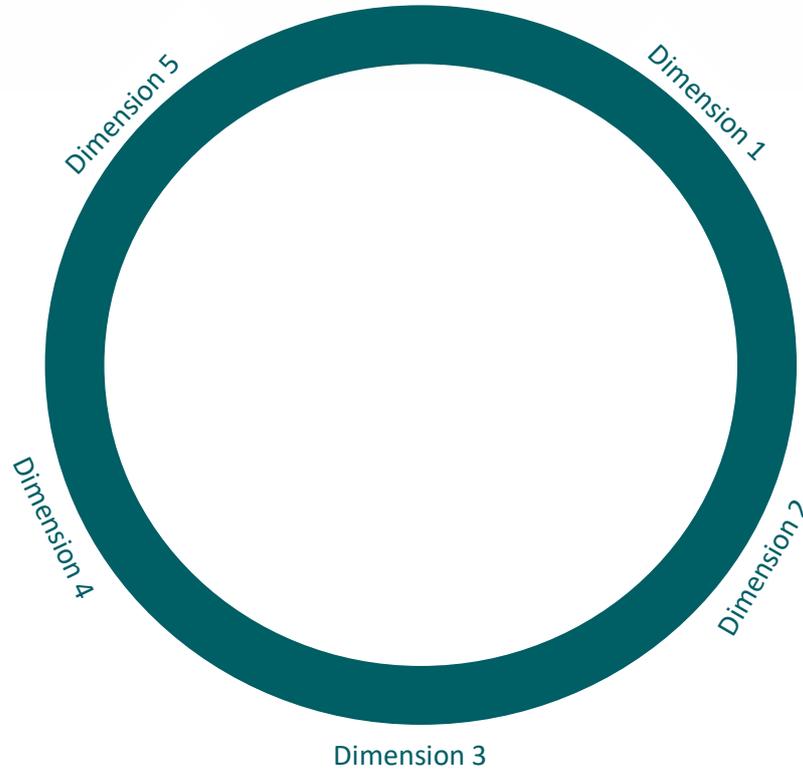
1. Når kriterie-siden åbner, ser du øverst på siden, hvilken runde du er i, hvilken dimension du er i, samt hvilket kriterium du er i, og endvidere ses det tilhørende spørgsmål/statement.
2. Derefter vises hvilket scenarie, der skal vurderes i forhold til.
3. Det første felt, som skal udfyldes, er 'open discussion'. Her tager referenten noter til diskussionen omkring bordet. Prøv at skrive korte sætninger, så meningene i diskussionen kommer til udtryk.
4. Efter diskussionen beder referenten deltagerne om at opsummere diskussionen i et kort summary.
5. Der foretages en rating ift. løsningens indflydelse (impact) på den tidligere rating samt udsagnet/statementet.
6. Til sidst gives løsningen en titel.
7. Referenten trykker med jævne mellemrum på 'Save' for at gemme. Når kriteriet er gennemgået (**trykkes der på save**) og det næste scenarie vælges fra 'drop down menuen'.





4. Plenary session day 2 (der er endnu ikke valgt referent til denne session)

Deltagerne i plenum sessionen sidder i en cirkel og er opdelt som vist i figuren nedenfor:



Facilitatoren (Lars) viser resultaterne fra løsningsrunden (solutions round) på storskærm:

DIMENSION AND CRITERIA		INVESTMENT	
		2025+: ACCELERATED MA...	2050: BIO-AI
Rights & Ethics	Privacy & Privat life		
	Freedoms		
	Non-discrimination		
	Transparency		
Legal Framework	Social cohesion		
	Voluntariness and consent		
	Data protection		
	Accountability & Liability		
Social implications	New legal provisions		
	Range of use		
	Security		
	Intellectual property		
Political significance	Employment and labour markets		
	Social inclusion		
	Governance and good administration		
	Educational systems		
Economy	Culture		
	Health and Care systems		
	State-citizens relationship		
	Political culture		
Total	Potential for political abuse		
	Democratic participation		
	Relations of expertise and non-expertise		
	Public debate		
	Direct and indirect costs		
	Economic benefits		
	Research and innovation		
	Externalities		
	Macroeconomics		
	Distribution of costs and benefits		
		7	-3

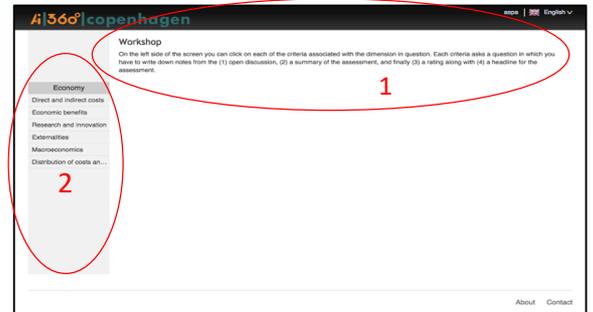
Dimensionernes bordformænd giver et kort referat af diskussionerne og ratingen fra hvert kriterium i dimensionen. Efter hvert referat er der en kort afsluttende plenumdiskussion af dimensionen.





Startside:

1. Når linket åbnes, lander du på dimensionens forside. Her finder du en kort tekst, som beskriver fremgangsmåden for vurdering af kriterierne.
2. Hvis der er kommentarer til et givent kriterium, trykkes der på kriteriets navn i venstre side.



Kriterium:

1. Når kriterie-siden åbner, ser du øverst på siden, hvilken runde du er i, hvilken dimension du er i, samt hvilket kriterium du er i, og endvidere ses det tilhørende spørgsmål/statement.
2. Derefter vises hvilket scenarie, der skal vurdere i forhold til. Her skal du vælge scenarie i forhold til det, der kommenteres på.
3. På siden vises noterne fra løsningsrunden (solutions round). Disse er ikke redigerbare.
4. Hvis det er generelle betragtninger, kan det indføres i 'open discussion'. Det kan også være ændringer ift. den eksisterende tekst.
5. Hvis det ønskes, kan der også ændres i ratingen
6. Titlen kan også ændres.
7. HUSK med jævne mellemrum at trykke på 'Save' for at gemme.

