DEMOLA

CURRENT STATE ANALYSIS

PROJECT: AI-based Business Disruption

CURRENT STATE

The increasing use of Artificial Intelligence (AI) is rapidly changing the way businesses operate. This technology is causing significant disruptions in the political, economic, social, technological, legal, and environmental spheres. In the political arena, the use of AI is leading to concerns about privacy and data protection, as well as issues surrounding the regulation and governance of AI systems. Economically, AI is impacting the workforce, with concerns about job displacement and the need for reskilling and upskilling of workers. Socially, AI is affecting how we interact with technology, as well as our perceptions of privacy and surveillance. Technologically, AI is changing the way we approach data analysis and decision-making. Legally, AI is raising questions about liability and accountability for the actions of AI systems. Finally, from an environmental perspective, AI is being used to address sustainability issues, but also has potential negative consequences such as increased energy consumption. As such, the widespread adoption of AI will continue to have far-reaching impacts on businesses, society, and the environment. To effectively navigate these changes, it will be crucial for stakeholders in the business world to take a proactive and collaborative approach to ensure that AI is used responsibly and ethically.

CHANGE FORCES

The change forces driving AI disruption are complex and multifaceted, requiring stakeholders to adopt a comprehensive and collaborative approach to navigating this transformative technology. While AI holds enormous potential for driving innovation, productivity, and growth across various industries, its development and deployment must be guided by ethical and inclusive principles. As we continue to grapple with the challenges and opportunities presented by AI, it is crucial that we remain proactive in our efforts to ensure that it is harnessed for the benefit of all members of society. Ultimately, the success of AI will depend on the ability of stakeholders to work together to develop a shared understanding of its capabilities and limitations and to foster a culture of responsible and sustainable innovation. The change forces driving AI disruption highlight the need for a multidisciplinary approach to understanding and managing this technology, one that draws on expertise from fields as diverse as engineering, law, economics, and social sciences.

P	# POLITICAL *These factors are all about how and to what degree a government intervenes in the economy or a certain industry. Basically all the influences that a government has on topic/phenomena/market/industry/business could be classified here. This can include government policy, political stability or instability, corruption, foreign trade policy, tax policy, labour law, environmental law and trade restrictions. Furthermore, the government may have a profound impact on a nation's education system, infrastructure and health regulations.*
	Controlling AI by laws: AI has so much potential in so many ways it's probably hard to understand it yet. Among all the good and positive things, there are many threats too. That's why it's important to have regulations of its use cases. For example in health care it's really important to use only methods that have been tested thoroughly and with that are proven to be effective.
	IMPACT OF THE FACTORS **FACTOR** / **IMPACT (-3 TO +3)** Controlling AI by laws / +2

E	# ECONOMIC *Economic factors are determinants of a certain economy's performance. Factors include economic growth, exchange rates, inflation rates, interest rates, business sector investments, disposable income of consumers and unemployment rates. These factors may have a direct or indirect long term impact on the topic, since it affects the purchasing power of consumers or could possibly change demand/supply models in the economy or certain business area. Consequently it also affects the way companies price their products and services.*
	Impact on a job market: With the rise of AI used everywhere it certainly has a huge impact to job market. It will introduce a lot of new jobs around the whole artificial intelligence field. Also it improves efficiency and could help workers to focus other important tasks. On the downside AI could and will replace a bunch of different jobs that can be automated. This could have a huge impact to many peoples lives all around the world when they would need to retrain for new career.

	IMPACT OF THE FACTORS **FACTOR** / **IMPACT (-3 TO +3)** Impact on a job market: +1

S	# SOCIAL *This dimension of the general environment represents the demographic characteristics, norms, customs and values of the population or selected stakeholders. This inlcudes population trends such as the population growth rate, age distribution, income distribution, career attitudes, safety emphasis, health consciousness, lifestyle attitudes, consumption preferences and cultural barriers.*
	AI in everyday use: There are a lot of applications AI could be used in everyday life to improve life quality and even safety. For example it could be used to manage traffic, monitor health, introduce new useful and enjoyable things and help to make more sustainable decisions. The downside in services that make unique suggestions based on information collected might cause this sort of bubble view in some topics. In other words you could see only positive things about a certain thing while sort of hiding the negative ones. This could have an alternating picture to some topics which might cause polarization on a larger scale.
	IMPACT OF THE FACTORS **FACTOR** / **IMPACT (-3 TO +3)** AI in everyday use: +2

T TECHNOLOGICAL

These factors pertain to innovations in technology that may affect the operations of the industry and the market favorably or unfavorably. This refers to technology incentives, the level of innovation, automation, research and development (R&D) activity, technological change and the amount of technological awareness that a market possesses. These factors may indicate the technology acceptance and adoption of consumers or influence on business decisions.

AI as a tool to improve efficiency: Many things in business world are tasks that can be automated or make decisions when certain criteria is accomplished automatically. This will improve efficiency and profit of the business. Also, AI can be used as an actual tool to improve other tasks. For example in software development AI could give a template that could be modified with little effort to match wanted outcome. On top of that it could mitigate security holes by helping in development and testing.

AI in marketing: With the power of fast computers AI can process huge amounts of data and with that information it's able to advertise all the things you would like or need at the specific time. Also, it is used in many social media platforms which try to feed you content you like and with that keep you using their service as much as possible. Overall these methods seem to improve marketing and/or usage of the service significantly.

On the other hand, this means a lot of information is being collected from you, processed and combined. This could be a big concern from privacy and safety perspectives. This rises questions how data is processed, how it is used and kept.

AI as a service (AIaaS): Making a working AI model for a specific use case is expensive and time consuming. That's why a new area of business is rising. Companies specify in making AI applications and sell them to customers varying from companies to regular people. This obviously lowers costs, improves scalability and usability.

Most of the AI models are kept well hidden. This has an important job to try mitigate misuse and overall harmful things one could possibly to with the power of AI. On the downside the lack of transparency might cause questions of the reliance of the model itself. Data used in training the model could be more or less unclean or otherwise untrustworthy. Also it could be used to force specific opinions from specific topics if in wrong hands. Of course depending of the applications the model is for this might be more or less obsolete.

IMPACT OF THE FACTORS

FACTOR	IMPACT (-3 TO +3)
AI as a tool to improve efficiency	+2

	AI in marketing	+1	
	AI as a service	+3	

L	# LEGAL *Although these factors may have some overlap with the political factors, they include more specific laws such as discrimination laws, antitrust laws, employment laws, consumer protection laws, copyright and patent laws, and health and safety laws. It is clear that companies need to know what is and what is not legal in order to trade successfully and ethically. You can also identify legislative trends and developments related to the phenomenon under exporation..*
	AI Act of the European Union The AI Act is the first proposed European law on artificial intelligence. The law assigns applications of AI to three risk categories: those that cause unacceptable risk (government-run scoring system as in China) are banned, high-risk applications (CV-scanning tool to rank job applicants) are subject to specific legal requirement and lastly applications not explicitly banned or listed as high-risk are left unregulated. The proposed law contains several loopholes and exceptions, for example, currently facial recognition by the police is banned unless certain criteria is fulfilled. In other words, the law needs to be improved and made more flexible. **Privacy and data protection** The rash development of AI technology raises important ethical questions about the use of personal data and the potential for distortions in AI systems. Organisations should ensure their transparency in the use of AI and that they have the necessary consent from individuals for the processing of their personal data. There is also the issue with automated decision-making, which has been covered in the General Data Protection Regulation (GDPR) in the EU. It provides individuals the right not to be subject to a decision based only on automated processing, which for organisations means that they must not be making decisions without adequate human oversight. However, data protection should not be used as an excuse to slow down innovation and progress of AI but rather it should be seen as a way to ensure that AI is used in an ethical, fair and respectful way towards individual rights. One way to avoid data protection becoming a limiting factor is to use synthetic data, i.e. data generated by algorithms rather than being collected from real individuals. **Legislation as a driving force for AI** Proper and efficient legislation can provide stability to for AI developers, investors and users, and this can speed up the willingness to invest, research and develop AI. Laws can set standards for ethical and responsible AI, thus helping to build trust in the technology among the public and businesses. With legislation, funding and support can be provided for research and development of AI, as well as for education and training workers to acquire the skills needed to work with AI technologies. Legislation can also enable and encourage the collaboration among different stakeholders in the AI ecosystem, such as researchers, industry, government and civil society.

IMPACT OF THE FACTORS

FACTOR	IMPACT (-3 TO +3)
AI Act of the European Union	-1
Privacy and data protection	-1
Legislation as a driving force for AI	+1

E ENVIRONMENTAL

Environmental factors have come to the forefront only relatively recently. They have become important due to the increasing scarcity of raw materials, polution targets and carbon footprint targets set by governments. These factors include ecological and environmental aspects such as weather, climate, environmental offsets and climate change which may especially affect industries such as tourism, farming, agriculture and insurance. Furthermore, growing awareness of the potential impacts of climate change is affecting how industries and public sector operate and the products and services they offer.

Fighting climate change with AI

AI can offer informing, near real-time analysis of complex datasets and predictions on multiple factors, such as C02 atmospheric concentration, changes in glacier mass and sea level rise. With artificial intelligence it's more reliable to monitor methane emissions to reduce them in order to limit the impacts of climate warming. AI can also track air quality and measure environmental footprints, as well as help us identify risk factors and develop plans to mitigate them.

Environmental footprint of AI

The downside of AI is of course the ICT emissions that come hand in hand with any technology. Emissions come from data centres that use energy for cooling and so-called e-waste is also a major concern, since only a fraction of electronical waste is recycled and disposed of in an environmentally friendly way. The storage of all the data needed to train AI algorithms consume a lot of energy, since the algorithms need millions of examples to process. For example a University of Massachusetts study shows that training an AI model to handle human language can lead to emissions of nearly 300 000 kg of carbon dioxide equivalent which is about five times the emissions of an average car in the USA, including its manufacturing. The environmental footprint is something we often fail to consider when talking about the progress of AI.

IMPACT OF THE FACTORS

FACTOR	IMPACT (-3 TO +3)
Fighting climate change with AI	+2

	Environmental footprint of AI	-2	

PERSONAL INTERPRETATIONS

O R Imon

As a software engineering student at Tampere University of Applied Sciences, I was fortunate to have the opportunity to explore the fascinating world of AI and machine learning. This field of study opened a whole new world of possibilities for me, and I quickly became enamored with the ways in which AI can be used to solve complex problems and create innovative solutions.

One of the things that stood out to me about AI work was its interdisciplinary nature. As a software engineering student, I was able to combine my knowledge of programming and computer science with insights from fields such as statistics, mathematics, and cognitive psychology. This allowed me to approach AI problems from multiple angles and to develop more effective and nuanced solutions.

One of the most exciting aspects of AI work was the sheer diversity of applications that it offered. Whether it was developing chatbots to improve customer service, using image recognition to identify objects in photos, or building predictive models to forecast market trends, there was always something new and interesting to work on.

Another thing that I appreciated about AI work was its potential to make a positive impact on society. From healthcare to transportation to finance, AI has the potential to revolutionize a wide range of industries and to make people's lives easier and more fulfilling. As a software engineering student, I felt privileged to be able to contribute to this exciting and rapidly evolving field, and to help shape the future of AI development.

Minna Mellajärvi

For me the rise of AI in my personal life came as a bit of a surprise. I hadn’t thought I’d have any use for it, but since starting my studies at TAMK I came to realize how wrong I was. So far I have been using ChatGPT to help me with my coding tasks and AI generated images to fulfill certain design purposes in classes.

This spring I have dived in the world of AI translating through my freelancer job, where I had a task to translate an administration website for an organization. I have been truly amazed of the level of translations that AI, such as DeepL translator and ChatGPT can provide in Finnish! Basically, my job has become proofreading the text that the AI has translated, and mostly just making the language more fluent and rich with the skills I have in Finnish language.

Some of the legal aspects that have come along AI have also been surprising, yet not unexpected. Criminals using AI voice cloning to make frauds, celebrities securing their digital personality in their wills and discussion about individual rights in the AI ecosystem are the tip of the iceberg. There clearly is a lot to take into notice and I'm sure the tide is going to be huge and long-lasting before a status quo can be achieved around the topic.

What worries me in the rise of AI is the environmental aspects. Of course it's clear that AI can be very useful and helpful in the handling of environmental issues, analysing huge amounts of data and making predictions based on that. With AI we can learn to reduce emissions on various areas of life, but the downside is that AI also causes a part of these emissions, by using huge amounts of data storing capacities and thus creating a large need for energy. Recycling, upcycling and disposing of technology is also worryingly low world-wide and something should be done to this problem too, since creation of new appliances is very rapid.

My background is in the Media and Arts field, and something tells me I should also feel slightly worried about that. AI is getting better and better at creating visual and musical compositions, so where is the need for artists in the future? Well, frankly I don't consider myself as much of an artist, so for me AI can provide some positive aspects to my work. Free-to-use template and original images for websites or ads, inspiration, base for further work – I see these as good things that AI can bring me. I don't want to work against AI nor fight it, I want to learn to harness it in my own fields of expertise, as I have done in my freelancer job as a translator. AI can make my work easier and I can't wait to see what are all the possibilities there is to achieve in the use of AI.

William Reima

I've always found technology quite interesting. After starting ICT engineering studies at TAMK I got my hands dirty with many amazing things. After choosing my major to software engineering I started to get into data analytics, machine learning and artificial intelligence significantly more in depth. The release of ChatGPT disrupted my view of AI in a really big way. Before that I had thought AI as a distant thing in the future. Apparently I was wrong. AI is part of todays life in so many ways and will increase a lot in the future. Even though the data analytics isn't necessary my biggest passion the overall machine learning and AI and their possible capabilities are really interesting.

During the years I've become more and more interested about online privacy and safety. I've started to look all the services through a different eyeglasses thinking about those things. Also it's already made me change my habits and things I use. For example I switched my main operating system to Linux based system and thinking about which things I would like to share to social media.

When I look at AI there are couple topics that rise to my mind initially. First is which kind of data is used to train and validate the model itself. How the data is collected and processed initially. Does it serve the purpose we want to achieve by this model. How much data there is. Could you train a trustworthy model with that amount of data. Is there any anomalies in the data which should be processed or cut off. Then of course the most fundamental question: Do we understand the data we have collected. What kind of phenomenon does it represent.