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The Impact of OpenAI on the Work Environment located in Finland

Thesis Autumn 2023 Bachelor of Business Administration, International Business



SEINÄJOKI UNIVERSITY OF APPLIED SCIENCES

Thesis abstract

Degree Programme: International Business

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Title of thesis: The Impact of OpenAI on the Finnish Work Environment

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Year:2023 Number of pages: 64 Number of appendices:2

In the modern era, technology has undergone a rapid transformation that touches every aspect of our lives. At the forefront of this transformation stands artificial intelligence (AI), a field rapidly evolving through groundbreaking innovations, and OpenAI's tools represent the pinnacle of this evolution. Exploring and comprehending these tools is essential not just for technological enthusiasts but for anyone seeking to understand the potential applications and limitations of AI in the real world. It allows individuals and businesses to adapt, innovate, and leverage these tools to their fullest potential in a rapidly evolving digital landscape.

This thesis studied OpenAI's impact on the work environment in Finland. The study researched how professionals use OpenAI tools in their working life and what kinds of ethical issues there are regarding AI's role in working life. We researched different types of AI, and its components, to fully understand how AI is used in OpenAI's tools. We also studied what regulations Finnish government have for data protection, and what kinds of ethicality issues OpenAI's tools currently face.

We used a qualitative approach and prepared a semi-structured interview with five different IT professionals. Their job titles were very different, but all the participants worked in the same field, information technology. They ranged from CTO all the way to the game developer, which allowed us to collect rich data regarding their usage and opinions about GPT programs. The interviewees were asked 14 questions, based on which we were able to make thematic analysis. The thematic questions were related to the objectives of the thesis and helped us answer our research question.

We learned that the interviewees were optimistic about GPT in the future. It is already helping people at work, and it is expected to keep improving in the future, providing more support, and enhancing overall productivity in the workplace. Along the way, we learned a lot from these experts, which helped us understand more about how AI can be used in work environments in Finland. While this thesis shows how AI is changing work and what it means for everyone, it is still a mystery how OpenAI will impact things in the future.

SEINÄJOEN AMMATTIKORKEAKOULU

Opinnäytetyön tiivistelmä

Tutkinto-ohjelma: International Business

Tekijä: Jerry Laiho, Krista Varttila

Työn nimi: OpenAI:n vaikutus suomalaiseen työympäristöön

Ohjaaja: Nicolas Martinez

Vuosi:2023 Sivumaara: 64 Liitteiden lukumaa	uosi:2023	Sivumäärä: 64	Liitteiden lukumäärä:2
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Teknologia on kokenut nopean muutoksen, joka koskettaa jokaisen työarkea. Tämän muutoksen kärjessä on tekoäly (AI), mullistavien innovaatioiden kautta nopeasti kehittyvä alue, ja OpenAI:n työkalut edustavat tämän kehityksen huippua. Näiden työkalujen tutkiminen ja ymmärtäminen on olennaista ei ainoastaan teknologiaharrastajille vaan jokaiselle, joka haluaa ymmärtää tekoälyn sovellusmahdollisuudet ja rajoitukset todellisuudessa. Se mahdollistaa yksilöille ja yrityksille sopeutumisen, innovoinnin ja näiden työkalujen täyden potentiaalin hyödyntämisen nopeasti muuttuvassa digitaalisessa ympäristössä.

Opinnäytetyössä tutkittiin OpenAI:n vaikutusta työympäristöön Suomessa. Tutkimuksessa selvitettiin, miten ammattilaiset käyttävät OpenAI:n työkaluja työssään ja millaisia eettisiä kysymyksiä liittyy tekoälyn rooliin työelämässä. Työssä tutkittiin erilaisia tekoälyn tyyppejä ja niiden osia tavoitteena ymmärtää, miten tekoälyä käytetään OpenAI:n työkaluissa sekä millaista sääntelyä Suomen viranomaisilla on tietosuojan suhteen ja millaisia eettisiä kysymyksiä OpenAI:n työkaluihin liittyy tällä hetkellä.

Työssä käytettiin laadullista tutkimusotetta, joka toteutettiin viiden eri IT-ammattilaisen puolistrukturoidulla haastattelulla. Haastateltavien työnimikkeet vaihtelivat suuresti, mutta kaikki työskentelivät samalla alalla, eli tietotekniikassa. Heidän tehtävänsä vaihtelivat teknologiajohtajasta aina pelinkehittäjään, mikä mahdollisti monipuolisen tiedonkeruun heidän GPT-ohjelmistojen käytöstään ja asiaan liittyvistä mielipiteistään. Haastateltaville esitettiin 14 kysymystä, joiden avulla tehtiin teema-analyysi. Teemakysymykset liittyivät opinnäytetyön tavoitteisiin ja auttoivat vastaamaan tutkimuskysymykseen.

Tuloksista selvisi, että haastateltavat olivat optimistisia GPT:n suhteen tulevaisuudessa. Se auttaa jo nyt ihmisiä heidän työssään, ja sen odotetaan kehittyvän edelleen tulevaisuudessa, tarjoten enemmän tukea ja parantaen kokonaistuottavuutta työpaikoilla. Opinnäyteprosessin asiantuntijoilta saatiin paljon tietoa, joka auttoi ymmärtämään, kuinka tekoälyä voidaan hyödyntää työelämässä. Vaikka tämä tutkimus osoittaa, miten tekoäly muuttaa työtä ja mitä se tarkoittaa kaikille, on yhä arvoitus, miten OpenAI vaikuttaa asioihin tulevaisuudessa.

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Terms and Abbreviations

AI	Artificial Intelligence
AGI	Artificial General Intelligence
ANI	Artificial Narrow Intelligence
API	Application Programming Interface
ASI	Application Super Intelligence
BMC	Business Model Canvas
DL	Deep Learning
GDPR	General Data Protection Regulation
GPT	Generative Pretrained Transformer
IT	Information Technology
ML	Machine Learning
RAM	Random-Access Memory
SSO	Single Sign-on

1 INTRODUCTION

Artificial Intelligence (AI) has generated both enthusiasm and anxiety regarding its impact on employment and ethical considerations. This thesis aims to study OpenAI as a whole and what tools it has to offer currently. To fully understand the impact of in the Work Environment located in Finland, this thesis digs deeper into its ethical considerations, data protection, and digitalization. These details help us to research how OpenAI works as a tool to improve and optimize work procedures when done with human engagement. OpenAI has emerged as a tool assumed to shape the future of working life, which reflects both its advantages and its potential drawbacks. As this potent tool steadily finds its way into diverse professional fields, it is important to clear up misunderstandings about how it works.

A primary objective of this thesis is to look at how OpenAI's programs are used as a tool currently by professionals in their working environment and debunk any beliefs that AI will completely take over jobs. Instead, the intent is to study how OpenAI's tools can be used to augment and facilitate work processes, rather than replacing human involvement. By explaining the different ways of adding OpenAI's tools to one's professional skills, people can understand its role as a helper that works together with human creativity. Considering all these factors, OpenAI's tools can improve work tasks and keep the uniqueness of each person's input intact.

1.1 Background of the topic

According to Hashemi-Pour (2023), OpenAI is a research laboratory that enhances human creativity with the help of artificial intelligence. It was founded in 2015 by Elon Musk and Sam Altman for video games as an AI and machine learning tool. Later in the development they made DALL-E, which is AI that can produce pictures from simple text prompts delivered by humans (op. cit.).

OpenAl's most known product is ChatGPT. In 2022, the Chat Generative Pretrained Transformer (ChatGPT) was released (Hashemi-Pour, 2023). Having undergone training on extensive datasets, it is capable of producing answers to a seemingly infinite range of topics in a humanized manner (op. cit.).

1.2 Research problem

The research problem of this thesis revolves around integrating OpenAI into working life. Specifically, this thesis aims to study how companies in the IT industry adapt to and utilize OpenAI, as well as addressing misconceptions related to AI. Interviews will be held among employees in the IT industry to study how they are using and taking advantage of OpenAI's tools currently. Academic sources such as journal articles and books, videos and social media will be used for more research about the topic.

1.3 Objectives of thesis

This thesis aims to study how OpenAI and its tools manage, utilize, and safeguard data in the context of the Finnish regulatory framework. The objective is to raise awareness of OpenAI's tools, analyze its usage, and study how ethical issues are addressed. This research will contribute to academic discourse, under the category of descriptive work.

The primary objective of this thesis aims to provide a comprehensive understanding to employees, workers, and the academic community how OpenAI is shaping the working landscape and what tools it has to offer for information technology companies within Finland.

1.4 Limitations of thesis

When analyzing the present landscape of OpenAI's influence on the working landscape, it is important to acknowledge the limitations of this study. This Thesis is limited to a specific time of OpenAI's development, offering us a snapshot of a dynamic and rapidly evolving area. This limitation results in a somewhat limited perspective, as we are unable to fully grasp the broader future trajectories of OpenAI's impact.

Moreover, our study is bound by the inability to measure long-term impact. When researching OpenAI's current role in the IT -industry, the findings of this study, while valuable for the present, may only provide a miniscule picture into the ongoing development of OpenAI's innovations in the workforce, technology, and society at large.

1.5 Structure of the thesis

The structure of this thesis consists of five main parts. Introduction and methodology, literature review, data research, results, and conclusion.

Introduction and methodology summarize the research context, objectives, and the significance of the study. It also introduces the central research question and outlines the subsequent chapters. In literature review, academic sources such as existing scholarly works, theories and other literature are collected and analyzed. The purpose is to highlight key concepts of the study. Data research is used for analyzing and gathering data. All of this is put together and is extracted from the data collected and analyzed. The results are presented in a clear structure, including key points from the interviewees. In the conclusion part, the findings are examined in-depth. This section provides valuable insights, suggestions, and a more complete view of the importance of the study.

2 METHODOLOGY

According to Jansen and Warren (2023), research methodology merely refers to the practical "how" of a research study. More specifically, it pertains to the methodical process by which a researcher designs a study to guarantee valid and trustworthy findings that address the goals, objectives, and research questions of the study (op. cit.).

As indicated by Indeed Editorial Team (2023), research methodology lends credibility to the study and delivers reliable scientific results. The process is made simple, efficient, and manageable by the detailed plan it offers to keep researchers on course. The reader can comprehend the strategy and procedures used to arrive at conclusions by understanding the researcher's methodology (op. cit.).

2.1 Research approach

This study adopts a qualitative research approach to explore and understand the subjective experiences, perceptions, and implications of OpenAI in the context of working life.

Qualitative research is chosen because it allows for a deep exploration of human experiences and the social and ethical dimensions of technology adoption (Denzin & Lincoln, 2018). Qualitative research techniques are made to reveal how a target audience behaves and views a particular subject, states (Bhat, n.d.).

2.2 Data collection method

Interviews are conducted in a semi-structured format. According to Barclay (2018), a semistructured interview is an interview where the guide is created and used by the interviewer. This is a list of open-ended questions and topics that must be addressed during the conversation, typically in a specific order. As stated by Dovetail Editorial Team (2023), a semistructured interview is a qualitative research approach that is used to acquire an in-depth understanding of a respondent's sentiments and views about a given topic. The interviewer can change the order of the questions, skip any that are unnecessary, or invent new ones as they prepare them ahead of time. Furthermore, the interviewer should be prepared to ask follow-up questions and explore for additional information (op. cit.). Semi-structured interviews will be conducted with experts in the field of artificial intelligence and automation. These interviews will be designed to elicit rich narratives about participants' experiences with OpenAI technologies in their workplace, focusing on the following key areas:

- Their interactions with OpenAI tools and systems.
 - Perceived changes in job roles and responsibilities.
 - Ethical and moral considerations related to AI usage.
 - Data protection concerns regarding the use of OpenAI's tools.
 - How has OpenAI/GPT impacted one's productivity.
 - The most promising use cases of OpenAI's tools.
 - The concerns or challenges associated with using OpenAI's tools.
 - If there are any skills or knowledge areas that IT-professionals should develop.

Document Analysis: Content analysis will be employed to examine documents such as company reports, news articles, and academic literature related to the implementation of OpenAI in the workplace. This will provide insights into the broader discourse and societal implications of OpenAI adoption.

2.3 Research environment

The research environment encompasses the settings, context, and conditions under which the data collection process will take place. It is crucial to consider the environment to ensure that data collection is conducted in a manner that is conducive to obtaining rich and relevant insights into the impact of OpenAI on working life. Our primary focus is on Information Technology (IT) companies based in Finland.

3 ARTIFICIAL INTELLIGENCE

According to Burns (2022) the simulation of human intelligence processes by machines, particularly computer systems, is known as artificial intelligence. Expert systems, natural language processing, speech recognition, and machine vision are a few specific uses of AI (op. cit.).

Al programming is a multifaceted discipline that revolves around a set of cognitive skills (Burns, 2022). These skills include learning, reasoning, self-correction, and creativity (op. cit.).



Figure 1. Types of AI (Regona et. al., 2022).

Learning in AI programming involves the process of acquiring data and then formulating rules, known as algorithms, to transform that data into actionable information (Burns, 2022).

According to Boucher (2020, p. 1) Artificial Intelligence scans the possibilities and limitations to decide its task using autonomous actions and intelligent behavior. Considering these factors, Artificial Intelligence can reach the desired goals (op. cit., p. 1).

Creativity is a fascinating dimension of AI programming (Burns, 2022). It leverages various techniques, including neural networks, rules-based systems, statistical methods, and other AI

approaches, to generate entirely new content. This creativity extends to the generation of fresh images, text, music, and innovative ideas (op. cit.).

3.1 Types of Al

Artificial intelligence (AI) can be divided into three competency types: artificial narrow intelligence, artificial general intelligence, and artificial superintelligence (Betz, 2023). These classifications are based on how AI learns and how far it can apply its knowledge.

According to Fourtané (2019), Artificial Narrow Intelligence (ANI) is the only kind of AI that is now in use and is restricted to a specific task, like image identification, medical diagnosis, or natural language processing.

ANI presents advantages such as heightened accuracy and speed in processing data, leading to reduced errors and increased efficiency, along with potential cost savings by automating tasks (Krishna, 2023). However, its limitations include the inability to adapt or learn new tasks, reliance on biased or incomplete data leading to potentially biased decisions, inflexibility in handling variations, high computational requirements hindering widespread adoption, and ethical concerns necessitating regulations to ensure responsible use (op. cit.).

Artificial General Intelligence (AGI) is a new kind of AI that seeks to match human capabilities, but it is still constrained by our incomplete knowledge of the structure and operations of the human brain (Fourtané, 2019).

According to Bell (2023), AGI is predicted to be created at the earliest of 2030 to 2050. However, some researchers believe it is impossible to create AI that matches human capabilities (op. cit.).

The hypothetical AI known as Artificial Super Intelligence (ASI) is said to be superior to humans in all areas, including the arts, decision-making, and interpersonal interactions. As such, it may present ethical and existential problems for humanity (Fourtané, 2019).

According to Kanade (2022), the development of AI is heavily focused on ANI, and the use of ASI will stay as a possibility, rather than as a reality.

3.2 Components of AI

Artificial intelligence refers to a technological advancement that uses intelligent systems to perform tasks that often need human intelligence (SOCI, n.d.). The four primary components of AI technology are perception, problem solving, reasoning and decision making, and learning (op. cit.).

Learning

As stated in SOCi (n.d.) Al in the form of machine learning and deep learning allows computers to learn from data without direct programming. For algorithms to identify patterns and generate predictions or judgments, they must be trained on huge datasets. A wide range of applications, including natural language processing, recommendation systems, picture, and speech recognition, use machine learning (op. cit.).

According to SAS (n.d.), large data sets, quick, repeated processing, and clever algorithms are used in artificial intelligence (AI) software to enable it to automatically learn from patterns or features in the data. It uncovers hidden insights in data by utilizing techniques from neural networks, statistics, operations research, and physics without explicitly being trained for what to look for or what to conclude. A neural network is a kind of machine learning consisting of interconnected units, like neurons, that process data by responding to outside inputs and sharing data among themselves. Several iterations of the method are necessary to identify patterns and extrapolate meaning from undefined data. Utilizing massive neural networks with numerous layers of processing units, deep learning makes use of enhanced training methods and increased processing power to solve complex patterns in massive volumes of data. Recognition of speech and images are common uses (op. cit.).

Reasoning and Decision Making

According to SOCi (n.d.), reasoning and decision making is a major component of AI. AI systems can predict conclusions and make judgments with probabilistic models, algorithms, and logical rules. AI models tend to use reasoning to produce consistent outcomes when confronted with challenges or issues. As an illustration, a writing tool such as Grammarly is aware of when to use commas and other punctuation (op. cit.).

Problem Solving

As explained by SOCi (n.d.) in the previous text, problem solving is comparable to reasoning and decision making. Al systems receive input, process it, and then apply their findings to provide a solution that addresses a particular issue. For example, Al in a chess game analyzes the movements made by its opponent and then chooses the optimal move based on the game's rules and forecasts the moves and results of the future (op. cit.).

Perception

According to SOCi (n.d.) perception is the final component of AI. AI that makes use of various natural or artificial sense organs is referred to as perception. The AI system can process data, recognize things that are proposed, and comprehend the physical relationship (such as distance) between those objects. Picture identification, object detection, picture segmentation, and video analysis are frequently involved in perception. As an example of AI in use, self-driving cars initially gather visual data to map roads, lanes, and obstacles (op. cit.).



Picture 1. Perception in Self Driving Cars (Sandeep, 2021).

3.3 AI-Assisted Decision-Making

Al can be completely automated in specific circumstances provided its output and any actions that follow (the decision) are carried out without human intervention or supervision (Information Commissioner's Office, n.d., p .5).

Fully automated AI

Figure 2. Automated AI without supervision (Information Commissioner's Office, n.d., p. 5).

The outputs can be included into a wider process where a human acts (makes a choice) after considering the AI model's output together with other information at their disposal. It is common to call this having a "human in the loop" (op. cit, p. 5.).



Figure 3. Al-assisted decision (Information Commissioner's Office, n.d., p. 6).

As stated by ICO (n.d. p. 6), there is one major difference where choice between a decision made by an AI system and one where none has been used. When a choice is made directly by a human, it is obvious to the person making it who they can ask for clarification on their decision-making process. It may be unclear who is ultimately responsible for a decision when an AI system is involved. When decisions are made mostly by humans rather than exclusively with the assistance of an AI system, people should not forget their accountability and rely fully on AI. People should demand an explanation from those in charge of an AI system, not from a human, in situations where they would expect one from a person (op. cit.).

Cost and Time Efficiency

According to Calciano (2023), the potential for cost savings and better efficiency is one of the biggest benefits of implementing AI in the workplace. AI can lower operating expenses by up

to 30% and increase corporate efficiency by up to 40%. All may free up employee time by automating monotonous jobs and optimizing company procedures, allowing them to concentrate on more strategic and creative work. All can also assist companies in making datadriven decisions that lower risk and result in more precise forecasts (op. cit.).

Business Implications

The study by Yadav and Dwivedi (2023, p. 3) states that the potential of AI in enhancing businesses' competitive edge has gained significant attention. However, successful AI implementation in businesses demands significant infrastructure resources, including funding, data hardware, software, and technical support (op. cit.).

Yadav and Dwivedi (2023, pp. 3–5) state in their study the different uses of AI in the areas of finance, HR management, employee engagement and recruitment. AI-powered solutions can enhance talent acquisition, streamline administrative tasks, facilitate real-time decision-making, and automate processes, leading to productivity (op. cit.).

As stated by Yadav and Dwivedi (2023, pp. 3–5), potential future applications of AI are in high demand, such as content creation, user experience enhancement, and forecasting in sales and marketing. Businesses use AI to interact with consumers, analyze data, and make strategic decisions (op. cit.).

4 WHAT IS OPENAI?

According to Hashemi-Pour (2023) OpenAI is a research laboratory for Artificial Intelligence that was first launched in 2015 as a non-profit organization, but later in 2019 changed to a profit-driven organization. The goal of the company is to research and launch the first working safe artificial general intelligence (AGI). During the years OpenAI has launched many remarkable programs such as ChatGPT and DALL-E. Both programs use generative pretrained transformer, a neural network machine learning model by OpenAI (op. cit.)

With an emphasis on creating AI and machine learning tools for many applications, OpenAI was established in 2015 (Coursera, 2023). Its initial product, OpenAI Gym, an open-source framework for creating reinforcement learning algorithms, led it to concentrate on AI research for broader applications.

The idea of a Generative Pre-trained Transformer (GPT), a neural network (a machine learning model) that mimics the human brain and is trained on data sets, was introduced by OpenAI in 2018 (Coursera, 2023). DALL-E, an image-based ChatGPT version where users can instruct the generative AI model to generate graphics, was published in 2021. After its introduction in November 2022, ChatGPT quickly rose to prominence as the most widely used generative AI and chatbot tool for creating resumes, survey questions, and chatbot responses.



Figure 4. Timeline of OpenAI (TechTarget Hashemi-Pour, 2023).

4.1 Generative Pre-Trained Transformer (GPT)

According to Yenduri et al. (2023, p. 2) GPT is a deep learning model, that is trained with extensive pre-training on large text databases which can be utilized for various tasks such as text classification, sentiment analysis, machine translation, language modeling, and language synthesis. High-quality language output can be produced using the GPT model, deep learning (DL) model that pre-trains vast volumes of text data through self-supervised learning. The constant training of the GPT model and the growing availability of resources are responsible for the latest developments. The continuing developments have produced better, more potent GPT models, which can now execute a greater variety of natural language processing (NLP) tasks with previously unobtainable accuracy and fluency (op. cit.). According to Fawad (2023), GPT-1 is the first model released by OpenAI in 2018 using the Transformer architecture with 117 million parameters. With a mix of the Common Crawl and BookCorpus datasets, it performed exceptionally well in producing logical language. Despite these advantages, GPT-1 had trouble with long-term dependencies, complicated reasoning, repeated text generation, and cohesiveness in longer paragraphs.

As stated by Fawad (2023), GPT-2 is OpenAI's second model and was released in 2019. Trained on the Common Crawl and WebText datasets, GPT-2 was designed to produce more realistic and cohesive text than GPT-1, with 1.5 billion parameters. It performed well when creating brief texts, but it had trouble with larger passages' complicated reasoning and coherence.

GPT-3 was released in 2020 with a major advancement of 175 billion parameters—more than a hundred times greater than GPT-1 and ten times larger than GPT-2 (Fawad, 2023). After being trained on a variety of datasets, such as Wikipedia, Common Crawl, and BookCorpus, GPT-3 showed remarkable language production abilities. It demonstrated gains in the comprehension of context, the production of cohesive language, coding, and artistic expression. But because of its large training data set, it continued to have problems with biases, errors, and sometimes producing irrelevant results.

As stated by Lubbard (2023), one indicator of a language model's capability and complexity is its number of parameters; larger models can provide replies that are more human-like and outperform smaller models on a range of language tasks. On the other hand, longer training times and greater processing resources are also needed because of the higher parameters (op. cit.).

Lubbard (2023) states how GPT versions parameters has been significantly increased:

- GPT-1: 117 million parameters
- GPT-2: 1.5 billion parameters
- GPT-3: 175 billion parameters
- GPT-4: 1.76 trillion parameters

As Lubbard (2023) states, GPT-4 is superior to GPT-3, it contains more factors, and the language generation is more accurate. GPT-4 is more adaptable and flexible when performing tasks like language translation and text summarization. GPT-3 can produce roughly 3000 words at once, making GPT-4 eight times faster with capability of producing up to 25 000 words. The multimodal model GPT-4 can analyze and produce outputs for inputs that are either texts or images. By receiving prompt accordingly, GPT-4's wide general knowledge and problem-solving skills enable it to tackle challenging issues and produce more accurate results. Thanks to these improvements, GPT-4 is now a more potent tool than GPT-3 for jobs involving natural language processing (op. cit.).

DALL-E

According to OpenAI (2021), DALL-E is an OpenAI artificial intelligence GPT -tool that is trained to generate images from text captions for a variety of topics that can be expressed in natural language.

Using a dataset of text-image pairs, DALL-E, a 12-billion parameter version of GPT-3, is trained to produce images from text descriptions (OpenAI, 2021). It can do a wide range of tasks, including human looking animals and objects, putting seemingly unconnected ideas together in logical ways, displaying text, and altering already-existing images.



Picture 2. "An illustration of a baby daikon radish in a tutu walking a dog" created with DALL-E (1) (OpenAI, 2021).

In January 2022, DALL-E 2 was introduced with higher resolution, better understanding, and new skills such as in-painting. DALL-E 2 was also capable of creating different variations of a picture with different angles and styles. This update was able to be done through deep

learning where DALL-E was taught various images and texts. It made DALL-E 2 to understand multiple objects and not focus on single object in a picture. DALL-E 2 was able to use human creativity and merge objects in a picture into something we have never seen or created before (OpenAI, n.d.).



Picture 3. An astronaut riding a horse in photorealistic style." created with DALL-E 2 (OpenAI, n.d.-a).

According to Metz (2023), DALL-E 3 release marks a "leap forward" in artificial intelligencegenerated graphics. Better detail and more reliable text rendering are features of DALL-E 3. Illustrators' concerns that a computer program may replace them and replicate their work have also been heightened by this development (op. cit.).

According to OpenAI (n.d.-a), DALL-E 3 allowed photos to be generated from ChatGPT text. This feature requires Plus and Enterprise subscription -license. Give ChatGPT a description of your idea such as website design or business logo, and it will come to life by presenting you with a range of images that you may edit and improve. Any edits you want to make to the photo can be done be made directly in the chat (op. cit.). DALL-E 3 is a great tool for sketching, designing, and creating images for background when needed in, for example in a presentation. Companies can leverage DALL-E 3 for branding, content creation, marketing, and product visualization. It allows for innovative approaches to engage customers and create unique visual assets.

As a customer it can be utilized when wanting to get specific products from manufacturer such as a tattoo, furniture, or shoes. It is also a great tool when you want to follow a specific theme in a project, which DALL-E 3 can do. DALL-E 3 is best utilized when it collaborates with the imagination of humans and can enhance work duties while maintaining the individuality of each person's contribution.





ChatGPT

According to Hetler (2023) ChatGPT is one type of Generative Pre-trainer Transformer, that provides users with human-like text, photos, and videos via chat. The language model may write emails, articles, essays, code, social media postings, and other textual content in addition to responding to prompts (op. cit.).

Because users can ask questions and get clarifications on responses from ChatGPT, it resembles the automated chat services available on customer support websites. Generative Pre-trained Transformer (GPT) describes how ChatGPT responds to queries and constructs answers. Reward models that rate the best answers and human input are used to train ChatGPT using reinforcement learning. By adding machine learning to ChatGPT, this input helps make future responses even better by specialized algorithms, ChatGPT's Generative Pre-Trained Transformer identifies patterns in data sequences (op. cit.).

According to Rogers (2023) OpenAI made a significant change to ChatGPT that allows customers who subscribe to the company's \$20/month ChatGPT Plus plan can now use the Bing search engine through ChatGPT to access the internet. ChatGPT new feature is called "Browse with Bing", and it is a valuable tool when for example comparing web page texts, focusing on a single source, gathering new ideas such as what international events has happened this weekend or comparing different between two sources.

TD	Can you tell me what person/movie won the oscar for these categories?		
	 Best Actor Best soundtrack Best picture Best supporting actor And then come up with a poem linking them together 		
\$	Finished browsing ∧ Q. Searched: "Oscar winners Best Actor Best Soundtrack Best Picture Best Supporting Actor" Image: Clicked on: Image: Ima		
	"Everything Everywhere All at Once" took the stage, Winning Best Picture, a triumph for this age, With Ke Huy Quan in a supporting role, His performance captured our hearts, our very soul. So here's to the winners, to the stories they've spun, To the music, the acting, the battles they've won, For in the world of cinema, they've made their mark, Leaving an imprint, a flame, a lasting spark.		

Picture 5. ChatGPT browsing internet (OpenAI, 2023).

According to OpenAI (n.d.-b) they also offer Enterprise -plan for businesses that require more capacity and other kinds of tools such as:

• Better protection for your company data, where models are not trained using user input or data and with better data encryption.

- Tools for scalable deployment: easy bulk member maintenance, a dedicated admin console, SSO and a domain verification analytics dashboard to track usage.
- Rapid, uncapped GPT-4: Infinite, lightning-fast access to Advanced Data Analysis and GPT-4, with 32k token context windows supporting 4X longer inputs and RAM.
- Chat templates that are shareable so that employees may work together.

There are currently two ChatGPT plans available for regular users, free version which uses GPT-3.5 and provides you with unlimited messages, interactions, and history. The paid version gives you access to GPT-4 and other OpenAI's tools such as DALL-E 3. GPT-4 allows users to easily make use of DALL-E 3 and browsing functions within a single interface, from the chat with its (all tools) -option. GPT-4 currently offers plugins to customize ChatGPT according to your preferences.



Picture 6. ChatGPT plugins (OpenAI, 2023a).

Plugins enable ChatGPT to obtain the most recent data, do calculations, and make use of external services.

You can also build your own GPT and modify it for specific tasks such as formatting your produced code. You can add plugins into your own instance of GPT.

K New GPT	Save 🗸
Create Configure GPT Builder Hil I'll help you build a new GPT. You can say something like, "make a creative who helps generate visuals for new products" or "make a software engineer who helps format my code." What would you like to make?	Preview
Message GPT Builder_	Message GPT

Picture 7. Creating a new GPT (OpenAI, 2023b).

Flaws of GPT

Study by Jakesch et al. (2022) studied how GPT-3 manages to make a self-description of themselves.

The study by Jakesch, et al. (2022, pp. 2–6) discovered characteristics in AI-generated selfpresentations that humans might be able to recognize. In a different labeling experiment, we asked participants to identify which self-presentations were repetitive or nonsensical, and they were able to correctly classify language created by AI as more nonsensical and repetitive. If participants had just relied on these heuristics to identify language generated by AI, they would have obtained a 59% accuracy rate (op. cit.).

GPT is revolutionary but it still has its flaws and cannot be relied on fully. Some of the flaws can be lack of information after knowledge update and the text that ChatGPT produces does not always sound human. As stated in chapter 4.1, GPT is a deep learning (DL) model that uses self-supervised learning to pre-train large amounts of text data, which makes GPT vulnerable to misinformation. In chapter 4.1.2 GPT has evolved massively and many of the flaws have been fixed with the new GPT-4 platform, but some new flaws occur such as the likelihood of producing biased material, and high energy usage because of demanding computing needs.

4.2 Skill Requirements for OpenAl's tools

It is required to have some knowledge of GPT, to be able to get the most out of the products from OpenAI. They follow given prompts and the more specific they are, the better the results will be.

Collison (2023) states in the article five tips how to get the most out of Chat GPT:

- 1. Provide answers to questions in natural language, plain English.
- 2. Giving Chat GPT context and details helps it to produce more accurate responses.
- 3. To ensure that the answers provided by Chat GPT are accurate, it's critical to compare them to information from other sources.
- 4. Curiosity and trying out different questions are great ways to discover fresh information.
- 5. Saving the chat history creates a knowledge bank which is useful for future studies.

4.3 OpenAl's Business Model

According to Varma (2021), Business Model Canvas (BMC) is a visual tool for understanding the business model of an organization. It shows the essential components of a business's success as well as a its goals. BMC is a great tool to view the organization's internal operations, but it also helps in explaining to others how the company is run and what elements make the company unique and successful.

It is great as a tool if you want to quickly develop ideas and analyze different aspects of the company (Varma, 2021). It can be used as a strategic planning tool for upcoming business ideas or to assess and improve current business models.

Varma (2021) states that the Business Model Canvas can be used to create a detailed business plan that will evaluate how the company will make a profit. Planning and calculations with BMC are used to measure success. This helps funders and investors evaluate the choice they make about the company before funding.



OpenAI - Business Model Canvas

Figure 5. OpenAl Business Model (Pereira, 2023).

Value Propositions

According to Pereira (2023) OpenAI's value propositions are: revolutionary AI technologies, including GPT, Codex, and DALL-E. Creativity and innovation, which OpenAI tools support in a variety of sectors. And enhanced productivity and efficiency where individuals and organizations can benefit from increased productivity and efficiency because of the tools provided by OpenAI.

Customer Segments

As stated by Pereira (2023) Customer Segments of OpenAI consists of:

- 1. Researchers Individual researchers and institutions focused on advancing AI.
- 2. Enterprises Businesses utilizing AI solutions for improved operations and customer experiences.
- Developers Individuals building intelligent applications and image recognition systems.

4. Governments and non-governmental organizations - Organizations addressing social challenges using AI, such as healthcare and education.

Customer Relationships

According to Pereira (2023) customer relationships are customer support for governments, supporting AI development by promoting and participating in AI practices, services for consulting and training, and Collaboration & Partnership by collaborations with organizations to promote growth and innovation on both sides.

Channels

OpenAl communicates through channels (Pereira, 2023)

- OpenAI Blog: Sharing insights, updates, and knowledge.
- OpenAI Newsletter: Distributing curated content and announcements.
- Social Media Platforms: Engaging the community and sharing information.
- OpenAI Forum: Encouraging discussions and collaboration among users.

Key Resources

Key Resources that OpenAI uses are AI models such as GPT, Codex and DALL-E (Pereira, 2023). Tools which are the main resources for AI development and integration Skilled experts who have expertise in AI research and development. Research Infrastructure which consists of facilities and resources that support AI research, development, and innovation.

Key Activities

OpenAl's key activities in the company are research and development in Al with constant innovation in the field of AI, developing, refining, and creating AI models, API, and tool development for designing tools and interfaces for AI integration and lastly Public Engagement with engaging with people through various channels to discuss AI-related topics, gather feedback and raise awareness (Pereira, 2023).

Key Partners

Key Partners of OpenAI are Technology Partners to leverage expertise, resources, and innovation (Pereira, 2023). Universities and research institutions for knowledge exchange, research projects, and promoting innovation. Government Agencies and Non-profits to address societal challenges using AI, and developers to engage and support developers in creating and implementing AI applications and solutions.

Cost structure

According to Pereira (2023) the cost structure of OpenAI includes research and development expenses such as investments. Administrative expenses consist of legal fees, utilities, and other essentials for the functioning of the organization. And the last expense of cost structure consists of salary.

Revenue Streams

OpenAI revenue streams are licensing, subscriptions, investments, and partnerships (Pereira, 2023).

5 DIGITALIZATION

As indicated by WalkMe (2023), digitalization is the process of transforming a business model by leveraging digital technologies to create new revenue streams and value-creating opportunities. This entails incorporating digital tools and systems into various aspects of a company's operations, such as management and communication, as well as production and customer service (op. cit.).

5.1 Digitalization: Key to competitive business advancement

As demonstrated by WalkMe (2023), digitalization has become critical for businesses to stay relevant and thrive in today's competitive landscape. It enables businesses to adapt to rapidly changing market conditions, meet customer expectations, and optimize processes for increased efficiency and productivity. Digitalization has become critical for businesses to stay relevant and thrive in today's competitive landscape. It enables businesses to adapt to rapidly changing market conditions, meet customer expectations, and optimize processes for increased efficiency and productivity landscape. It enables businesses to adapt to rapidly changing market conditions, meet customer expectations, and optimize processes for increased efficiency and productivity (op. cit.).

Digitalization in Finland

In the words of Kananoja (2023), the development of digitization in Finland has been rapid in recent decades. Finland is one of the world's leading digitization pioneers, and in many fields, Finland is ahead of other countries. This is partly the result of Finland's high technological competence and long-term investment in technological development. As stated by Valtioneuvosto (2022), Finnish people use the world's most efficient mobile data in their everyday life a lot and in various ways. Kananoja (2023) states that there has also been a huge investment in information technology training, and e.g., with the help of online trainings, training has been made more and more flexible. According to Finland Toolbox (2021), Finland's government agencies are currently integrating artificial intelligence (AI) and other innovative technologies to improve public services and smoothen government support tasks.

"According to the current digital barometer 2023 study", Finland secured the number one spot in the international digitalization rating (*Helsinki Times*, 2023). As indicated by Valtioneuvosto (2023), the digital barometer displays the country's "digital position" and changes in comparison to other countries. The barometer assesses the societal impact of digital technologies. The measuring is done on three levels: prerequisites, use, and impacts, and on three primary sectors: businesses, citizens, and government (op. cit.).

Finland has good starting points for success in the digital revolution, which are based on strong technological know-how in many digitalization and the core area of the data economy (Valtioneuvosto, 2022). High-quality, fast, and operationally reliable, and through them freely moving digital information, i.e. data, form the basis for the services and innovations of the technological breakthrough at hand.

As demonstrated by Valtioneuvosto (2022), the challenges, however, are a lack of productivity-boosting ICT investments, a shortage of skilled labor, marginalization, and the essential shift in operational culture and thinking model by digitalization. Finland must prioritize the varied development of individuals' skills, particularly the digital capacities of small and mediumsized businesses. Additional investments in know-how, research, development, and innovation, as well as recruiting investments, are required to effect change (op. cit.).

Advantages of digitalization

As indicated by SAP India (2022), the first and immediate benefit of digitalization is cost optimization (resource optimization) and cost savings. Companies are using digital transformation initiatives to increase efficiency and better utilize existing resources, which has a direct cost impact. Automation saves time and eliminates duplication and repetitiveness of tasks, resulting in cost savings (op. cit.).

Anjani and Nadira (n.d.) state that human workers can find high-volume, repetitive tasks tedious and stressful. Employees benefit from a smarter working environment as digitalization progresses. When the workload and stress of human workers are reduced, businesses have the opportunity to train and upskill their employees for higher-value-added work. According to Malak (2023), when procedures are automated, the possibility of human error drastically decreases. Anjani and Nadira (n.d.) state that employees will be more motivated and satisfied as the working environment improves. Malak (2023) indicates that automation ensures that each procedure is performed consistently, resulting in high-quality, expected output.

Digitalization reduces the environmental footprint and allows for remote work, while also reducing paper consumption and optimizing energy consumption. Furthermore, it can help companies monitor their supply chain and identify opportunities for long-term improvement (Podoba, 2023). According to Roy (2023), utilizing digital channels such as social media, email, and chatbots can assist organizations in reaching out to and connecting with customers and prospects.

As stated by Editorial Team (n.d.), because of the internet's ability to allow for remote work, digitalization has created a new world of job opportunities. There are now entirely new job roles, such as internet technology specialists, and anyone can start their own online business.

Disadvantages of digitalization

Blessing (2023) indicates that the digital divide is one of the disadvantages of the digital revolution. This refers to the disparity in information, communication, and opportunities between those who have access to digital technologies and those who do not. Because those without access to digital technologies may face limitations in education, employment, healthcare, and civic participation, the digital divide can exacerbate existing inequalities. Lack of internet access, for example, can impede access to online educational resources, job opportunities, and telehealth services, affecting individuals' ability to succeed in the digital age (op. cit.).

According to Blessing (2023), another drawback of the digital revolution is the possibility of increased social isolation and decreased face-to-face interactions. The widespread use of digital technologies like social media, online communication platforms, and video streaming services can result in fewer human interactions and social connections (op. cit.).

As demonstrated by Hubvela (2023), as the world accelerates into the digital age, many traditional methods of data storage are rapidly becoming obsolete. While technology can help to streamline processes and increase efficiency, it also has drawbacks when it comes to data security. Because of the increased use of digital technologies, our sensitive information has become vulnerable to hackers, malware, and other malicious attacks (op. cit.).

5.2 Why adapt technology

Harlem World (n.d.) states that adapting to technological innovations is no longer an option for firms seeking to achieve continuous growth and remain competitive in today's digital market, but rather a requirement. Technology has become a vital instrument for success, from improving operational efficiency and fulfilling consumer expectations to expanding market reach and fostering innovation. According to Grigoras (2023), adapting to technological developments is critical because it enables individuals and businesses to remain relevant and competitive in an ever-changing digital ecosystem.

According to Gupta (2018), technological innovations provide value to society by simplifying human existence, improving one's skill set, and encouraging work practices. Technological improvements are extremely beneficial in enabling differing cultures to collaborate more effectively. This strengthens the bonds between people and the organizations where they work (op. cit.).

5.3 Digital adoption

The act of implementing new digital tools and systems to better work processes and achieve goals is referred to as digital adoption. This includes utilizing technology such as software, hardware, and online platforms in numerous industries to optimize operations, improve communication, and foster innovation (WalkMe, 2023).

In the words of Digital Adoption Team (2022), a digital adoption strategy entails an agile, adaptable approach that is not only open to change but actively seeks the possibility of change at any moment. This approach has numerous advantages, including dealing constructively with technological and business revolution. This method is used by many firms to achieve successful digital adoption (op. cit.).

As stated by Warwick (2023), people want to live their daily lives and do their jobs as usual, but with the added convenience of staying at home and spending time with family and friends. This is a closed loop cycle: people are lured to digitalization, and businesses are spending more and more on digital adoption to capitalize on this. As a result, both are leaning toward digital adoption (op. cit.).

6 DATA PROTECTION AND ETHICS

"Data protection is the process of protecting sensitive information from damage, loss, or corruption" (Imperva, n.d.). As the amount of data created and saved continues to expand at extraordinary rates, the need for data protection grows. There is also minimal tolerance for downtime, which might make access to critical information impossible (Crocetti, 2021). As explained by V2 Cloud (n.d.), downtime is defined as the time when a computing device, such as a CPU (Central Processing Unit) or a server, or a software program, such as a website, is not functional, operational, or usable.

Rouse (2023) states that data protection should be applied to all types of data, whether personal or business. It is concerned with both the integrity of the data, protection against corruption or errors, and the privacy of the data, which is only accessible to those who have access privileges to it (op. cit.).

The European Union's (EU) General Data Protection Regulation (GDPR) has reinforced data protection standards for individuals within the European Union (EU) (Council of the European Union, 2022).

As stated by Council of the European Union (2022), the GDPR defines:

- Individuals' fundamental rights in the digital age.
- The responsibility of data.
- Obligations for businesses and organizations.
- Punishments for those who violate the rules.

Al ethics and bias

As mentioned by Bodra (2022), biases in the data used to train AI systems are frequently replicated and amplified. This can have substantial ramifications, especially in domains such as criminal justice and employment, where biased decision-making can have serious effects for individuals. Addressing these biases requires ensuring that the data used to train AI systems is varied and representative, as well as periodically evaluating and testing AI system decisions to identify and fix any biases (op. cit.).

In the words of Xiaodong et al. (2023), due ChatGPT's training on huge text data including varied perspectives, including wrong ones, it is not immune to the problem of bias. Its outstanding capacity to construct extended, genuine sentences enables smooth communication with users (op. cit.).

Data Protection

As stated by Xiaodong et al. (2023), plainly in OpenAI's privacy policy, it is responsible for maintaining, organizing, and processing user data, providing them the power to share this information with third parties. However, ensuring that OpenAI conforms to strong data protection procedures and prevents any intentional or unintentional lapses in personal data confidentially offers considerable hurdles. Personal data could be held in unprotected data centers or shared with potentially untrustworthy industry partners (op. cit.).

In the words of Xiaodong et al. (2023), individuals are concerned about potential privacy infractions that are exacerbated by the lack of stringent standards or legislation enforcing transparency in data management. One problematic topic is the ownership of text generated by ChatGPT. ChatGPT, as opposed to simply duplicating data from its training set, can generate creative and natural-sounding content, confounding the identification of copyright ownership. This begs the question of whether ChatGPT's comments can be used for academic reasons such as homework, essays, or research papers, and whether ChatGPT should be attributed as a coauthor in such circumstances (op. cit.).

Finnish regulatory framework

According to Xiaodong (2023), in Finland data protection and privacy are governed by the European Union's General Data Protection Regulation (GDPR), which applies to all EU member states, including Finland. It's crucial for businesses in Finland that use AI to understand and comply with GDPR regulations to ensure the ethical and legal use of data in AI applications. Additionally, they should stay updated on any developments in Finnish data protection regulations specific to AI.

Given its training on huge text data including varied perspectives, including wrong ones, ChatGPT is not immune to the problem of bias. Its outstanding capacity to construct extended, genuine sentences enables it to communicate with users fluently (Xiaodong et al., 2023).

Ethical considerations

Xiaodong et al. (2023) states that artificial intelligence-controlled devices, such as automobiles and robots, can endanger human physical security and well-being. While AI was designed to help and improve people's lives, the possible safety dangers and privacy issues underscore the need for ongoing study and steps to prevent and address these challenges. It is critical to balance the benefits and risks of AI technology to ensure its appropriate and ethical deployment.

Clark (2023) explains that AI systems are not immune to biases in the data on which they are trained. Concerns have been raised concerning bias and discrimination in AI algorithms, as these systems can unintentionally reinforce existing societal biases. 3Cloud states that the resulting system may exhibit discriminatory behavior if the training data utilized to construct AI algorithms is biased or incomplete. Clark continues by saying that this has serious consequences for recruiting procedures, since AI-powered resume screening algorithms may unintentionally prejudice against specific populations. To ensure ethical and fair AI systems, extensive testing, review, and continual monitoring are required. Failure to address these concerns risks perpetuating social disparities and reinforcing job-market biases (op. cit.).

Frąckiewicz (2023) states that despite the potential benefits of OpenAI, numerous researchers are concerned about the technology's ethical consequences. They are concerned that technology could be used to manipulate people's emotions and sentiments, or for evil objectives, such as creating autonomous weaponry. Furthermore, they say that it will increase so-cial and economic inequality because those with access to technology will gain more than those without (op. cit.).

Misuse and manipulation

According to AIContentfy team (2023), there is a risk of malicious use or manipulation of AIgenerated content for spreading misinformation, creating fake news, or conducting social engineering attacks. Ensuring responsible use of AI is essential to prevent such misuse (op. cit.).



Picture 8. Fake movie poster of new James Bond -film, created with DALL-E 3 (2023).

AlContentfy team (2023) mentions that the lack of openness makes it difficult to identify and avoid potential privacy issues, leaving consumers unable to fully assess the privacy risks. When users choose ChatGPT, they are primarily guided by the privacy policy, but they may be unaware of the full degree of their personal data exposure until it is too late and the data has already been made public (op. cit.).

Xiaodong et al. (2023) tell that when users choose ChatGPT, they are primarily guided by the privacy policy, but they may be unaware of the full degree of their personal data exposure until it is too late and the data has already been made public. This lack of transparency and delayed understanding heightens users' concerns about their privacy and emphasizes the need for stronger data protection procedures and governmental monitoring to adequately safeguard individuals' personal information (op. cit.).

According to Kaczmarczyk (n.d.), certain potential risks are associated with data transmitted over OpenAI's API (Application Programming Interface). Data supplied via the API is retained by OpenAI for up to 30 days in order to monitor any misuse or abuse. As stated by Frye (n.d.), API is "a software intermediary that allows two applications to talk to each other."

Kaczmarczyk (n.d.) states that data is generally erased after 30 days unless OpenAI is required by law to do otherwise. This storage duration does create a window during which data could possibly be exposed to OpenAI staff, external subprocessors, and even the general public if a data leak occurs (op. cit.).

Xiaodong et al. (2023) state that the introduction of ChatGPT has given birth to various legal issues, owing mostly to the lack of defined legislation controlling content produced by non-human beings. One problematic topic is the ownership of text generated by ChatGPT. ChatGPT, as opposed to simply duplicating data from its training set, can generate creative and natural-sounding content, confounding the identification of copyright ownership (op. cit.).

As indicated by Kaczmarczyk (n.d.), the potential use of personal data without explicit consent is a major problem in GDPR (General Data Protection Regulation) compliance. When using OpenAI's services, enterprises must carefully evaluate this factor. GDPR requires businesses to demonstrate a legitimate interest or legal basis for processing personal data (op. cit.). Based on Council of the European Union (2022), GDPR outlines the data subject's rights, or the rights of individuals whose personal data is being processed. Individuals now have more control over their personal data thanks to these expanded rights (op. cit.).

Job Displacement and Economic Impact

While AI has unquestionable advantages, its dark side raises several concerns and challenges for both organizations and individuals (Clark, 2023). The adoption of AI in workplaces may lead to job displacement or changes in job roles. Addressing the ethical implications of these changes involves considerations of supporting affected workers and ensuring a just transition. Miller (2023) suggests that the A.I. models still produce wrong information on occasion and are more likely to assist workers than to replace them.

Clark (2023) states that AI technologies outperform humans in routine and repetitive work, leading to the automation of jobs in a variety of industries. Data entry, customer service, and basic analysis positions are particularly vulnerable. Chatbots and virtual assistants, for example, can handle consumer questions and support without requiring human intervention. Individuals affected by displacement face major obstacles, including unemployment and income insecurity (op. cit.).

Goldberg (2023) explains that when automation has resulted in job losses in the past, the economic impact has usually been countered by the creation of new ones. Al developers are focusing on the technology's potential for job creation, but many workers are facing severe disruptions as they struggle to train for and find new professions that are fulfilling (op. cit.).

"Workers in administrative and clerical support may have particular cause for concern about generative A.I., according to the Goldman research. And many of them are already expressing anxieties." (Goldberg, 2023).

7 INTERVIEWS

Interviews are held to acquire research data. The advantage of interview research is that material collection is flexible, and in an interview situation, material collection can be altered based on the responses. The interviewee can actively participate in research in an interview study. It is also possible to explain the responses received and ask additional questions during the interview research. According to Clements (2023), interview research allows the researcher to acquire original and unique data straight from a source in accordance with the study's specifications. It also allows samples to be controlled and it obtains reliable results quickly.

The starting point of this study is a qualitative research method. For data collection, we employed thematic interviews. According to Villegas (n.d.), thematic analysis is a qualitative data analysis process that involves reading over a set of data and looking for patterns in the meaning of the data to find themes.

The interviewees were approached by email. The interviewees were told that the interview was estimated to take approximately half an hour. Each interviewee agreed on a time that was convenient for them.

The semi-structured interviews took place on November 8th and 9th, as well as November 22nd and 23rd in the year 2023. The interviews were recorded. The meetings were held via Teams as well as via phone. The interviews were all conducted anonymously, and all interviewees agreed to this. All the interview material is deleted after the data has been analyzed. The only information we are disclosing regarding the interviewees is their job description. Only IT-professionals based in Finland were considered. Overall, five IT-professionals located in Finland were interviewed. The interviewees are referred to as 11-15. This keeps them anonymous while also allowing us to refer to them.

The purpose of the study is to resolve the impact of OpenAI in the work environment located in Finland. The study investigates how professionals use OpenAI's technologies in their professional lives and what ethical challenges exist surrounding AI's position in the workplace. The goal is to address the following questions through research:

- Job description.
- How has OpenAI/ChatGPT affected your productivity?
- What are the most promising use cases of OpenAI's tools?
- Any concerns or challenges associated with using AI, such as job displacement or ethical considerations?
- Are there any skills or knowledge areas that IT-professionals should develop?

Theme question #1 Job description

The interviewees were asked about their job description. They are all IT professionals working in various jobs. We interviewed a CTO, game developer, software engineer and an ITconsultant.

"IT-Consultant." (I1)

"Versatile. At the moment, I solve tickets, that is, we act as second-level support for various companies. In addition to that, I act as the team's "support", i.e. I make sure that everything runs smoothly." (I2)

"A software developer in various projects and also some product owner stuff." (I3)

"CTO, and other administrative roles in various technology projects and companies." (I4)

"Game Developer." (I5)

Theme question #2 The Impact of OpenAI on the Work Environment in Finland

In this section, we researched the impact of OpenAI and how it has affected the Finnish Work Environment.

"Using ChatGPT has made certain things easier, for example writing codes. It gives such a "frame", but it cannot produce a completely finished product." (I1)

"In my opinion, ChatGPT has made it faster and easier with long and polite emails, especially when the working language is English, the language it works better with." (I2)

"GPT models speed up the work process. 3 steps in the core process of making software: design, coding, testing. All processes can be enhanced with GPT-based programs. The machine does the easy parts, and the human does the harder ones." (I4)

"Previously, you had to spend more time solving problems and hunting for new information through Google, and now you can search for the same information in a couple of minutes and get different answer options. Artificial intelligence has accelerated these processes considerably." (I5)

All the interviewees utilize the benefits of ChatGPT in their working life, each capitalizes on its distinct advantages in different ways. These different professions have embraced ChatGPT's adaptability and cleverness to improve their work across various domains. Whereas most participants stated that they use it to write scripts, one respondent stated that they use it to produce long and courteous responses via email to clients, and then structuring the answer in a more personal style. As a result, all participants believed that OpenAI's tools has considerably boosted their workplace productivity.

The interviewees emphasized how it must be considered that when using OpenAI tools, in this case ChatGPT, you can use it as a very useful tool, but it is crucial to know about the topic. ChatGPT, for example, can assist you in writing a script, but you must understand how the script works to fully utilize it.

One respondent described ChatGPT as a coworker in terms of how it helps in the workplace. It allows you to quickly and easily access information and even provides you with various options to pick from.

Theme question #3 Promising use cases of OpenAI's tools

It was stated that all the interview participants agreed that OpenAI's tools can be utilized as a helper that assists you in reaching your goal but does not necessarily perform the work for you. One of the respondents emphasized the need of knowing how to ask the correct questions of an OpenAI tool in the proper way. The better, shorter, and simpler you can formulate your question, the better the results will be.

"Search engines, scripting." (I1)

"It can be used versatilely. The code produced by ChatGPT cannot be trusted 100 % yet. It works as a tool that gives direction." (I2)

"It is good for short scripts, e.g., for small tools. Generating test cases because it knows how to make a base and a template. Mainly to make the beginning easier and faster. Can draw diagrams. It gets the document done with a small amount of work." (I3)

"It helps in code generation and productive work. During the sales event, it is possible to make use of old information. In the communication department, it is good for message generation/customer communication" (I4)

"Problem solving and quick information retrieval. Validating the code and generating it." (I5)

One of the interviewees specified that it can occasionally create good code and other times it is mostly ideation. It enables you to look into multiple options, all of which you can apply and/or employ. There are rarely truly ready-made answers, so you must always add your own personal touch by adjusting more or less. The interview participants described it as a direction-giving, time-saving tool, which, however, cannot be trusted blindly.

When it comes to the OpenAI's tools itself, all interviewees know about ChatGPT and most of them utilize its benefits more or less nearly on a daily basis. When it comes down to DALL-E, and its use in the work environment, one of the interviewees revealed using DALL-E on every day, two admitted using it occasionally, one has heard of it and one of the participants had never heard of DALL-E.

"I am familiar with DALL-E but have not used it in my professional life. But you could, for example, use PowerPoint to lighten the atmosphere, not really otherwise." (I3)

Theme question #4 Job displacement or ethical considerations related to OpenAl

It was stated that ethical considerations were extremely significant to all interview participants. However, only one of the five participants had gotten an "information package" concerning the use of OpenAI in professional life. "OpenAI has been welcomed with open arms. It was emphasized the most that e.g., customer data should not be entered there even by accident." (I1)

"Overall code quality goes down, more code generated. The speed increases, but the handprint is missing, which means the maintenance increases." (I3)

"A separate information package has been distributed. Using common sense as well. You can enter more data in a private cloud than in a public cloud." (I3)

Despite only one of the participants receiving the "information package", it was clear during the interviews that there was a general concern among participants regarding the optimal utilization of OpenAI. Interviewees expressed uncertainty about the prompt they should input to get the maximum benefit and desired result.

As IT experts, it was made obvious in this interview that being concerned about data protection issues is a foregone conclusion.

In every interview, we were able to demonstrate that the best of the specialists we questioned agreed that entering any type of client data into ChatGPT is entirely prohibited. The majority of participants emphasized the importance of common sense. One of the interviewees also said that you cannot unanimously trust the information created by ChatGPT when searching for information without familiarizing yourself with the topic first.

Only one of the interviewees said that they use ChatGPT Enterprise. They continued by telling that it is possible to enter more information there, even customer data, because all the information entered there stays in the organization's cloud environment. It enables the safe use of artificial intelligence for sensitive information such as customers, products, employees, and other related tasks.

None of the interviewees were concerned about losing their job. Every interviewee agreed that OpenAI was well-received at their workplace. During the interview, professional pride was not mentioned out loud, but it was noticeable. The interviewees do not believe that AI will completely take over jobs, instead, they believe how OpenAI's tools can be used to augment and facilitate work processes, rather than replacing human involvement.

Theme question #5 Skills or knowledge areas that IT-professionals should de-

velop

The interviewees were asked if there are any skills or knowledge areas that IT-professionals should develop regarding the use of OpenAI tools.

"Your skills in reading code, for example, must be experienced enough that you understand the end result. One cannot ignore one's own skills. I believe that you can get more productivity with OpenAI tools. Skills and mapping of own information. It affects what kind of help you can ask for.". (I1)

" The biggest barrier to use is the lack of certainty about what it can do. Many do not believe that it can solve puzzles. You should be braver with it and start experimenting." (I2)

" Interest in the subject, willingness to experiment. Learning prompting is temporary. The purpose of AI is to understand people better." (I3)

"If you can maintain a "sense of wondering", it brings emotions into the game and adds meaning to the work. The main work is done inside one's own head. Motivation is a 20-fold productivity factor." (I4)

It was obvious that mapping and maintaining one's own knowledge and skills were essential. The interviewees do not believe that OpenAI tools will have a negative impact on their work; rather, OpenAI's tools are considered as a coworker. The most important thing is to understand that OpenAI's tools do not do your work for you; rather, it assists you in achieving your goals. OpenAI's tools can assist you in starting your project by providing ideas and suggestions, but you must constantly be conscious of what the OpenAI tool you use is doing. Understanding the whole concept regarding your question is the key factor. For example, you can ask ChatGPT to do the code for you, but if you don't understand the end result, it will not be applicable in the working world especially. This is where your own professionalism becomes extremely important.

One of the participants described that both interest in the subject and a constant desire to experiment help you develop the best. According to two of the interviewees', learning prompting is only temporary. In the words of one interviewee, the goal of AI is to better comprehend people. You don't need to study certain terms to acquire the appropriate search result when you understand the individual better. "The models are still a bit rough," the interviewee added, "so they don't know everything." You can also save money by using a less expensive model if you know how to define the problem more explicitly.

8 **DISCUSSION**

In this part we share our own thoughts of the study by applying the knowledge of literature review and interviews. Our aim is to clarify the alignment between the research question and the obtained results, while assessing the reliability and depth of our study.

8.1 Interviews

The most important part of our study consisted of interviews with IT professionals. Interviews analyzed the impact of OpenAI, particularly ChatGPT, shared crucial insights into its practical use, ethical considerations, and the evolving dynamics between AI and human work in Finland.

The interviews highlighted ChatGPT's adaptability as a supportive tool. Professionals emphasized the importance of understanding the tool's output, treating it as a guide rather than a solution. This reflects the necessity for users to understand its limitations, ensuring that human intervention and decision-making stays within work processes.

The adaptability in the use cases of ChatGPT, as highlighted by the participants, underscores the tool's potential to increase various aspects of software development. Its ability to generate code snippets, create test cases, and support communication processes demonstrates its adaptability, offering valuable assistance in diverse work scenarios. This emphasizes ChatGPT's role as a productivity booster in the work environment.

Ethical considerations appeared as a well-known concern among the interviewees. They emphasized the need to exercise caution when inputting sensitive data into GPT, advising for the use of common sense while utilizing GPT. This shows the importance of ethical guidelines and responsible AI utilization practices in professional environments.

The perception of GPT as a supportive tool rather than as a job-replacing robot resonates strongly among the interviewees. They foresee OpenAI, particularly ChatGPT and DALL-E, as an extension to human work rather than a complete replacement, indicating a seamless collaboration between AI and human labor.

8.2 Thematic analysis

As stated in chapter 7, a method analyzing qualitative data called thematic analysis is going through a set of data and searching for patterns in the meaning of the data to identify themes within research (Villegas, n.d.).

Thematic analysis plays a crucial role in our thesis when analyzing the data gathered from interviews. It offers a systematic approach to uncovering patterns, themes, and significant insights within qualitative data. We used thematic analysis, because it provides a framework for organizing and understanding the interviewees' perspectives on OpenAI's impact in the Finnish work environment.

The thematic analysis of the interviews reveals several recurring themes:

- Productivity Enhancement: Interviewees uniformly acknowledged OpenAl's tools as a booster for productivity enhancement across diverse professional roles. The tool's adaptability was highlighted as it streamlined tasks such as code generation, email composition, and software development, significantly improving work efficiency.
- 2. Adaptive Tool: A common theme emerged concerning the necessity to comprehend the tool's output and limitations. The interviewees emphasized the role of OpenAl's tools as an aid rather than a complete solution, underlining the importance of human intervention and decision-making in work processes.
- 3. Ethical Considerations: Ethical concerns related to data privacy and responsible use of OpenAI's tools were recurrently mentioned. Interviewees stressed the significance of exercising caution when inputting sensitive data into GPT platforms and reminded the use of common sense while leveraging GPT technologies in professional work environment.
- 4. Collaboration between AI and Human Work: The analysis demonstrated a consensus among interviewees regarding the collaborative potential of OpenAI's tools. They foresee GPT as a complementary force to human labor rather than a replacement. This perspective underscores the symbiotic relationship envisaged between AI and human expertise in the workplace.

5. **Continuous Professional Development**: Interviewees highlighted the need for continuous learning and skill development to effectively utilize OpenAI's tools. They emphasized that understanding the tool's capabilities and limitations is crucial for maximizing its potential in professional landscapes.

Thematic analysis provided a structured approach to analyze key insights from the interviews, offering a comprehensive understanding of OpenAI's influence on the Finnish work environment. The identified themes align with the experiences and perceptions of IT professionals, contributing and answering our research question about the impact of OpenAI in workplaces.

8.3 Research question

We examined the influence of OpenAI's tools, ChatGPT and DALL-E, in a professional work environment within the IT sector in Finland. We researched practical implications, ethical considerations, and evolving dynamics between AI and humans. Assessing the reliability of this thesis requires understanding of research questions, including research methodology, literature, and the credibility of the data collected from interviews.

We researched awareness of ethical considerations, particularly concerning data privacy and responsible AI usage. The importance of cautionary measures and the need for human oversight within AI processes underscores a strong approach towards the study's ethical implications.

The reliability of its findings is demonstrated by a well-structured methodology, alignment with existing literature, and in-depth qualitative analysis of interviews. To enhance reliability further, future research might benefit from larger sample sizes, incorporating quantitative measures, and exploring long-term implications of AI integration in professional environments. Benchmarks and surveys could be utilized as a larger sample size, to provide improved data.

9 CONCLUSION

Artificial Intelligence (AI) is fast adapting field that explores the development of systems capable of performing tasks that typically require human intelligence. Within AI, one of the groundbreaking areas is Natural Language Processing (NLP), which analyzes language understanding, generation, and interpretation. OpenAI, a leading research organization, has made various AI models, including ChatGPT and DALL-E, transforming the landscape of text and image generation using Generative Pre-trained Transformer (GPT) -technology.

OpenAI represents a significant leap in AI capabilities. Generative Pre-trained Transformer (GPT) is a flagship model by OpenAI, which can generate human-like text by predicting the next word in a sequence based on context. DALL-E, developed by OpenAI, specializes in generating images from textual prompts, showcasing the innovative advancements in AI's image generation capabilities.

The discussions with IT professionals in Finland provide a valuable understanding of OpenA-I's impact on workplace. ChatGPT emerges as a powerful productivity enhancer, demonstrating its utility across various job roles. Its adaptability as a supportive tool requires users' understanding of its outputs and limitations, emphasizing the importance of humans in decisionmaking processes.

Overall, the interviewees portray a future where AI works seamlessly with humans, augmenting capabilities rather than replacing them entirely. This highlights the importance of understanding AI's role and limitations, ethical considerations, and continuous professional development to understand AI's benefits effectively in professional landscapes.

During our study we came up with two further research topics. Semi-structured interviews brought up a topic surrounding one interviewee. They emphasized the importance of material produced by humans, rather than AI. This would make an interesting further research topic, to analyze further, does it matter whether the material is produced by AI or by humans?

Another further research topic would be to analyze how much AI has accelerated work processes and how does it show in their profit and loss statement. Benchmarks, bigger sample size and quantitative research method would be utilized to fully understand the benefits of AI.

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APPENDICES

Appendix 1. Questionnaire & Interview template

Appendix 2. Interview message

Appendix 1. Questionnaire & Interview template

Interview questions

- 1. What is your job description?
- 2. What OpenAI tools have you personally used in your work?
- 3. How familiar are you with OpenAI, such as GPT-3/4 and DALL-E?
- 4. How has it impacted your productivity or work processes?
- In what specific ways do you see OpenAI technology being applied in the IT industry today?
- 6. What are the most promising use cases of OpenAI in the IT field, in your opinion?
- 7. How do you envision the role of human workers evolving as AI like OpenAI becomes more integrated into IT tasks and projects?
- 8. Do you have any examples or case studies from your own experience where OpenAI technology has proven to be a game-changer in IT projects or solutions?
- 9. Are there any concerns or challenges associated with using AI, includingOpenAI, in IT work, such as job displacement or ethical considerations?
- 10. Are there specific data security measures or policies in place to safeguard sensitive information when using AI tools?
- 11. How does your organization address data protection and privacy concerns when using OpenAI or similar AI technologies in your work?

- 12. Are there any skills or knowledge areas that you believe IT-professionals should develop to effectively work with AI technologies like those developed by OpenAI?
- 13. What advice would you give to IT-professionals looking to leverageOpenAl or similar technologies in their work?

Appendix 2. Interview message

Dear xxxx,

I hope this email finds you well. We are two Bachelor of Business Administration, International Business -students from Seinäjoki University of Applied Sciences. We are in the process of conducting research for our thesis on the topic of "OpenAI as a working tool" and its impact on the professional world.

We are reaching out to you to find out if you or your company possibly have some expertise and experience with OpenAI, specifically, the use of ChatGPT, in your working life. Your insights and perspectives would be invaluable to our research.

The objective of our thesis is to explore how OpenAI is currently used in professional settings, debunk any misconceptions about it taking over jobs, and instead, understand how it can augment and facilitate work processes while preserving the uniqueness of human creativity.

Your experiences and thoughts can greatly contribute to this research, and I believe that your insights could provide a unique perspective on the subject. We are particularly interested in discussing topics such as the role of OpenAI in the Information Technology (IT) industry, benefits, and challenges you've encountered, and ethical considerations in the use of AI and data security.

The interview would take approximately 30 minutes, and it can be conducted at a time and method that is most convenient for you, whether in person, over the phone, or through a video call.

Your participation in this research would be highly appreciated, and your input will contribute to the academic discourse on this important subject. All interviews will be anonymous. Please let me know if you are available for an interview or if you have any questions or concerns. Thank you in advance for considering our request. We look forward to the possibility of speaking with you and learning from your valuable experiences.

Whether you are interested or not, please respond to this email, or reach out to us. This is important for us in order to stay on schedule with the thesis, and to get the desired number of interviewees.

Thank you for your time and consideration.

Sincerely,