JÖNKÖPING UNIVERSITY
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Adoption of AI in Digital Design

A qualitative study about the effects on the profession

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Abstract

The development of new technology plays a major role in today's society and several different industries. While some technologies have more or less an impact upon the whole working sector, one of the more recent and controversial technologies is Artificial Intelligence (AI). In recent years, this technology has evolved continuously and is spreading across several different industries. As it is clear that AI is reshaping the workplace, it is relevant to examine how and to what extent it is affecting the digital design profession.

Purpose

The purpose of this study is to gain insight into the current state of adoption of AI within digital design, including graphic design and web design. Furthermore, to explore the effects of AI on the nature of the profession, from the perspectives of professionals in the industry. While focusing on the creative process and the development of digital products, it investigates how the industry is experiencing the effects of AI in daily tasks and workflows. Furthermore, it examines if the implementation of AI has lead to the development of new work processes, or if traditional tasks remain but are carried out with AI tools as assistance.

Method

The research method is qualitative. Through literature reviews and by carrying out interviews with relevant designers currently working in the industry, the appropriate data is collected and analyzed. The interviews focus on understanding the participant's perspective on the topic, their experiences of AI and what effect it has on their work. Through the interviews, the study identifies to what extent AI is used in creative processes, and sheds light on the general feelings towards AI, including expectations and concerns.

Conclusions

The findings show that the overall awareness surrounding AI is rather divided. AI is already implemented in various design processes and software, whether the designer is aware of it or not. It can thus be concluded that AI has affected the nature of the digital design profession. However, the effects vary depending on the specific role and the related tasks. Most are interested in learning more about it but natural skepticism and lack of knowledge about the technology remain an obstacle for implementing more AI in companies.

Keywords

Artificial Intelligence (AI), Digital Design, Graphic Design, Web Design, Machine Learning

Acknowledgements

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1   Introduction

The development of technology and digital tools has had a major impact on society and our behavior in multiple ways. From a business perspective, it has opened up new job opportunities and made workflows and production processes more effective. The latest significant revolution within technology is the initialization of Artificial Intelligence (AI), the smart computer that has the ability to learn, make predictions and solve problems (Russell & Norvig, 2016). The expectation is that AI will have a great impact on most industries and create value for businesses unlike anything witnessed before (Kolbjørnsrud, Amico & Thomas, 2016).

As the use of AI is becoming increasingly widespread in one industry after the other, there is reason to investigate its potential to aid in creative professions as well. The purpose of this thesis is to gain insight into the adoption of AI within the field of digital design, including graphic and web design, and investigate its effects on the profession. The term adoption is defined by Oxford Dictionary (2020) as the action of accepting and starting to use a particular method or agree to a certain idea. In the context of this study, it entails how companies and designers in the digital design industry choose to implement AI in their work practices. Another relevant term within the context is adaptation, defined by Oxford Dictionary (2020) as the action or process of changing something to suit a new purpose or situation. In this study, that refers to the possible changes in behavior, work methods and approach to tasks associated with the digital design profession. The collected data is thus scrutinized in relation to both terms, yet the focus is put on adoption.

This research revolves around the technological phenomenon of AI, defined as the study and development of computer systems that can copy intelligent human behavior (Oxford Dictionary, 2020). However, the definition varies slightly as the concept and understanding of it evolve. The concept includes different aspects regarding thought processes, reasoning, behavior, and ideal performance. A computer can thus be described as smart if it can think and act humanly and rationally. (Russell & Norvig, 2016) Commonly used terms within the area are Machine Learning (ML), Deep Learning (DL) and Artificial Neural Networks (ANN), which are subfields of AI. Machine learning can be described as the ability of a program to detect patterns, adapt to new circumstances and make predictions. Artificial neural networks comprise of algorithms inspired by biological neural networks found in the human brain. These are capable of modeling and processing non-linear relationships and learn from input data. Deep learning is a set of machine learning techniques that uses artificial to transform data through multiple layers, which can be utilized to solve more complex problems. (Castrounis, n.d.)

1.1 Background

As a result of digitalization, most industries have experienced a change in the work procedure. The nature of many professions, referring to the essential characteristics of the role, is thus evolving. For graphic design, this meant going from a handicraft with printed media to a computer-based form of design. Likewise, the area of web design has experienced a shift from pure coding to the use of preset templates. These job titles are part of the broader concept of digital design, which is highly digitalized by nature. Technological advancements have been implemented as the development of them progresses, to simplify the design process and remain competitive. (Tselentis, 2017) As technological development continues, the new inevitable change and challenge for these professions is the initialization of AI.

Companies within the industrial and financial sectors have been early adopters of utilizing AI. The implementation has proven to be successful as it helps to solve business challenges and makes the production processes more effective. The expectations of AI's potential are high amongst business executives and managers around the world. While aware of the risks, they see it as a strategic opportunity that will allow their companies to move into new businesses, reduce costs and remain competitive. The biggest effects are expected in information technology, operations, manufacturing, supply chain management, as well as customer-facing activities. Although AI could be considered a threat to jobs and careers in its current form, the belief is

that it will not be the cause of layoffs. Instead, the assumption is that AI will automate many tasks considered tedious, which in turn will lead to a breakthrough in new activities. However, the adoption of AI in businesses is still at an early stage. For the implementation to be successful a lot is required of the organization and there are many hurdles for companies to overcome. Most companies need to develop a well-thought-out integration plan, which addresses how humans and machines can collaborate. Not only are there a lot of costs involved in the process, but it requires great knowledge, training, and access to privileged data. It also requires a culture change regarding the organizational structure and a willingness amongst the workforce to be flexible and learn new skills. (Ransbotham, Kiron, Gerbert & Reeves, 2017) To remain competitive in the new era of AI diverse teams are needed, with both creative and social skills, as well as an understanding of the organization's context and history (Kolbjørnsrud, et. al, 2016).

1.1.1   AI in design tools

When it comes to AI concerning design, the term Artificial Design Intelligence (ADI) is occurring. Through machine learning, ADI technologies are capable of understanding design rules and concepts, recognize design trends and generate personalized designs. Thus, the user works with a design assistant technology instead of a human designer. (O'Brien, 2019) Several companies have made efforts in developing AI systems for graphic and web design over the last decade, some more successful than others. There are systems aimed at both novice users as well as professionals, to be used in both the ideation as well as the creation process. A visual search engine utilized by both categories just mentioned is Pinterest. The system can be described as an everyday, accessible version of AI. The platform enables the users to discover, save and categorize ideas on different boards and suggests new visuals based on previous searches. Deep learning is being utilized to understand the intention behind the searches, follow the user behavior and develop a path of discovery. The system is thus capable of delivering personalized recommendations with visually or thematically similar images. It furthermore uses image recognition that allows for image search by taking a photo and receiving results based on the detected object, color themes, and visual pattern. (Wired Insider, n.d.)

AI is already embedded in some of the most popular programs used within digital design and can make creative decisions that are autonomous or semi-autonomous, thus eliminating many steps in the creation process. The leading software actor within this field is Adobe, who utilizes AI in multiple ways. Adobe Sensei is the technology that brings the power of AI and machine learning across all Adobe products. The framework is embedded in their Adobe Creative Cloud software, in Photoshop, InDesign, Illustrator, and more. It is described to deepen insights, enhance creative expression, accelerate tasks and workflows, and drive real-time decisions. The system helps to reduce manual processes and automate mundane or tedious tasks. With its optimization capabilities, it can be used in areas within analytics, marketing, creativity, and advertising. (Adobe Sensei, 2020) With the ability to quickly analyze large sets of data, AI-powered tools make the decision process easier and more informed, resulting in deeper insights and better decisions. The Adobe team speaks about releasing the magic of AI and amplifying human creativity. The aim is not to replace human intelligence, but to provide technologies that can become partners with creative professionals and help them do their job in a better and faster way. Furthermore, it opens up for new ways to experiment and learn from customers, which enables the creation of more creative, strategic and personalized solutions. The CEO of Adobe, Shantanu Narayen, believes that machine learning will change every aspect of technology, but no machine will be able to mimic the creative ability of the human mind. AI is thus utilized as a tool to help deliver the art of creativity and the science of data. (Adobe Enterprise Content Team, 2019)

A website builder that managed to create incredible buzz was The Grid, founded in 2010 with support of numerous investments through crowdfunding. With the assistance of the AI system called Molly, the promise was to have websites that design themselves. After years of effort, developing and trails, the company only managed to disappoint its customers. The main issue was the lack of control and the possibility to edit the solutions if dissatisfied with the generated result. As the program used AI for all aspects of the product it could only handle minimal user input. Since 2017 the public has been waiting for the latest update, though there is still no

indication of a release anytime soon. (Westfall, 2019) Similar software was simultaneously developed by PageCloud. However, with the difference that AI is only part of the solution, meaning that designers are still involved and the users can decide elements and control the content. Perhaps it is just human nature to not settle for the first solution presented, no matter how perfect or who the designer is. Human influence and the ability to revise and customize thus appear to be important factors in successful design processes. (Ouellette, 2015)

Furthermore, the development platform Wix ADI was launched in 2016 to eliminate the main challenges of building websites, which include time, design, and content creation. The system is programmed to design tailored websites to meet the users' needs and make it easy for anyone to create a stunning online presence. It operates by gathering content from the user, their business, and relevant content from across the web, which is then matched with tasteful aesthetics. The result is an optimal and unique design, supposedly easy to customize if desired. (Korfias, 2016) Another company on the market is Firedrop, offering AI solutions to help design teams enhance the creative process and eliminate repetitive tasks. Their automated design engine performs all kinds of graphic design by combining machine learning and optimization algorithms. It learns by analyzing previous design solutions and cluster data based on similar aesthetic properties. It is also able to generate optimized layout designs as it can detect boundaries and utilize the space accordingly. (Firedrop, n.d) While these companies offer slightly different solutions, most of them still require active participation and human input, serving as a helping tool rather than operating independently.

Replacing an advertising agency with an AI system was reportedly done by the lingerie company Cosabella. Starting in 2016, the platform by Adgorithms named Albert was assigned to execute their digital marketing. Successfully this increased the brand's revenue from social media and delivered results supposedly far better than if it was run by a human. If assigned with sufficient input and relevant content, the system can detect micro-patterns and optimize campaigns. With some time to test and experiment it can also learn to create designs on its own. Additionally, Albert proved to master the tasks of conducting competitor analyses and detecting when concepts are fatiguing. The success aside, AI platforms are designed to be extremely specialized and are rarely good for multiple uses. For that reason, traditional advertising agencies still fill a function within marketing. (Tan, 2017)

In the discussion about adopting AI in design, AI is being described as a new design material, meaning that the technology will be available as open recourse to designers as well as non-designers. In the planning and development process, the designer would need to know exactly what the specific AI tool is capable of. By using machine learning in the development process, the system can learn and develop a capability that was not initially designed into the system, which makes it difficult for the designer to follow the AI's thought process. (Holmquist, 2017) This is one of the recognized issues related to the use of AI. The systems have been described as opaque or as black boxes because of the difficulty to interpret the decisions they make. This makes it hard for humans to collaborate with them and edit certain parts of a solution and to explain it to a client. (Burgess, n.d)

1.1.2   AI in creative professions

Speculations about how AI will affect the future of creative professions are flourishing amongst people within design industries. Some critics believe that many jobs will be lost to automatization, while others see the possible positive outcomes. The implementation of AI in the art of design is not as clear and indisputable compared to other industries. As the design profession has always required creativity and social intelligence, the scenario is more complex. The concern revolves around the nature of AI, meaning that it is artificial. Some argue that it would intrude the field of art, which is all about the human soul and emotion, by trying to steal the essence of being human. (Kwon, 2017) There is also an ongoing debate about whether or not it is possible to automate tasks such as the ones of creativity and ideation. If not, these professions might be in the safe-zone. But since the advances in AI are so rapid, that is likely to change. Ideally, creatives could benefit from AI as other industries. That being, optimizing workflow and making processes more effective to lessen the time spent on drudgery. The

released time could be used to explore new opportunities and let the creativity blossom more widely. (Shaughnessy, 2017)

The website 'Will robots take my job?' pinpoints the issue at hand. The website invites people to discuss the future of the job market and to cast a vote on the likeliness of AI to take over different professions. In the comments section for the graphic design occupation, the potential of using AI as a digital assistant is recurring in comments made during 2019. Most of the commenters see the profession as relatively safe but believe basic tasks will be taken over by computers. The result of increased productivity and more effective workflows could potentially mean less work for designers, which in turn means a decreased need for employees within the industry. Some set the hypothesis that graphic design will be a niche market in the future and that professionals will need an extended skillset beyond plain design. They recognize the ability of AI systems to create cheap solutions that might out-concur costly designers. They also see how templates are already being offered for use by non-designers, resulting in a decreased demand for designers. However, many still believe that great design comes from slightly bending the rules and challenging the norms. They withhold that traits such as subjectivity, artistic sensitiveness, and creativity cannot be automated. (Will robots take my job?, 2020) If the creation process can be simulated by a computer, it is vital for designers to focus on the right things, that humans do best.

To examine the possibility for a computer to perform acts of creativity, the concepts of intelligence and creativity need to be unraveled. Creativity is considered to be one of several components that signifies human intelligence, which should make it possible for AI systems to be creative. (Ramalho, 2017) However, the term creativity is ambiguous and paradoxical. Some call it an act of intuition, some call it insight or divine inspiration, and some would even entitle it a mystery (Dartnall, 1994). Others oppose the view of creativity as something mysterious and imply that it can indeed be simulated by a computer (Colton, Mántaras & Stock, 2009). There is also a discussion about whether or not awareness should be a factor of creativity, which could point to a computer's inability to be creative. Lexico (2020) defines creativity as the use of imagination or original ideas to create something, in other words, inventiveness. Some would also add the necessity to be valuable and relevant for its purpose. Assuming that, the AI systems would need to master the act of judgment and self-criticism, to not randomize or replicate previous solutions. To accomplish this, the program would need to be provided with knowledge and experience. However, the systems can only do this to a certain extent at present. A notable difference between a human and a machine might thus be imagination, in combination with intention and desire. (Ramalho, 2017)

1.2 Problem statement

Innovations such as digital platforms and automation are changing the fundamental nature of work. The new digitalized world brings new needs, which demands new ways of working. In recent years there has been a change in the user habits of digital interfaces. As mobile technology has advanced, the use of mobile devices has increased compared to desktop computers. From a developer perspective, this has led to a more complex design process. As mobile devices are so diverse, it requires designing for many different platforms and screen sizes. To not let the usability suffer, new ways of designing effectively are necessary. (Grady & Hare, 2008) In an industry where speed and quality are paramount, the adoption of AI within the field of design could be part of the solution and help meet user needs.

The development of AI is ever ongoing, given that all users of digital interfaces keep feeding the system with data. A procedure carried out by many software programs is to collect user data as a way of gaining feedback on user experience. These product improvement programs are observing the users' every move while using an application; the shortcuts being used, the sequence of creation and the overall behavior in the design development process. The data is supposedly used to improve the products and help in the development of new features. But what it also does is feeding the machine learning-based design systems with knowledge. The act of observation could soon lead to replication and then automation, as the systems use the gained knowledge to teach themselves how to create. (Burgoyne, 2017) Trying to counteract AI is thus not an option, but it is about embracing it as a new colleague and learning how to master it.

Since the birth of the revolutionary idea that is AI, speculations about its effects on society and the labor market have been constant. The reality is that most occupations will change and people will have to learn to collaborate with machines (Manyika, 2017). Utilizing AI technologies is not uncommon within the digital design industry today, but it is still in an exploratory phase. In the previous section of the thesis, several examples testify the increased ability of computer systems to simulate the creation process and provide more or less autonomous designs. What is still under debate is where the new technology best fills a purpose and adds value. The traditional work practice for digital designers includes time-consuming processes, with trail, error, and iteration. Advancement in AI development is challenging conventional ideas and brings the promise of higher productivity and increased efficiencies. But it also demands ongoing adaptation and transition by workers. It is clear that AI is reshaping the workplace and traditional design processes, but the question is how and to what extent.

1.3 Purpose and research questions

When an industry is changing it is of great importance to evolve with it. Companies that do not keep up-to-date regarding new development are in the risk-zone of being outcompeted. An understanding of the effects of AI hence serves practical value for both current and aspiring digital designers, as well as the industry as a whole. Previous research has been made on the implementation and effects of AI on other professions, however, research about AI within the field of digital design is currently lacking. This study thus aims to fill that gap and initiate continuous research on the topic. The knowledge gained from the research could generate a better allocation of resources, as for people in the profession to not become outsmarted by technology.

This study investigates AI technologies within the digital design industry, including graphic and web design. The purpose of the research is to examine the current state of adoption of AI within this field, from the perspective of companies and people in the profession. It investigates if the industry is experiencing the effects of AI yet, with a focus on the creative process and development of digital products. On a deeper level, it looks into the adoption process, how it has progressed and within what areas it has had the most substantial influence. This includes exploring if the implementation of AI has lead to new ways of working and opened up for new possibilities, or if the traditional tasks remain but are being performed with AI as an aid. Furthermore, the study sheds light on other possible effects on the industry as a result of external factors, perhaps changes in client behavior and requests, making the adoption of AI inevitable.

Research Questions:
Is the nature of the digital design profession changing as a consequence of AI development? If so, how?

The adoption level of AI within the industry is strongly connected with the potential effects on the profession as a whole. If the adoption level is high, it is expected to affect the approach to the profession and the work practices in one way or another. The nature of the digital design profession refers to the inherent character and basic constitution of the role, including the associated skills and tasks. Changes related to the nature of the profession would thus result in new essential characteristics connected to the role, which in turn would change the perception of the occupation as well as the requirements to successfully perform the job.

1.4 Scope and delimitations

The research question is approached by bringing clarity to the topic based on reality and provide rich narratives from people with first-hand experience. A total of seven interviews are thus carried out with professionals in the areas of digital design, including graphic design, web design, User Interface (UI) and User Experience (UX) design, concept development, photography, and videography. The scope of the research is fairly broad when it comes to the

target group from which the interviewees are selected. The work experience of the professionals ranges between a minimum of three years to many years. The type of interview is adjusted to each participant, to broaden the reach and enable participation despite distant location or busy schedules. The majority of the interviews are conducted within Sweden, however, designers from all over the world were welcomed to add diversity and give a broad sense of the situation.

As the topic is still relatively new and not widely researched there are a lot of knowledge gaps to fill. However, some delimitations had to be made to ensure quality and focus. A few other relevant research questions are touched upon as they are closely intertwined with the stated purpose, being what specific tasks are predicted to be automated and what new skills will be required for future professionals. Nonetheless, they are not in the spotlight of this thesis but proposed as further research. The main focus lies in gaining comprehension of the awareness, experience, and opinions about AI in the specific work field of the interviewee. Consequently, there is not any kind of development of guidelines or rules concerning the adoption of AI in the design industry.

2   Theoretical framework

The theoretical framework is the scientific foundation of the study and outlines the link between research questions and theory. This study is led in the boundaries of one specific area of a larger phenomenon, happening in countless different professions. Considering that, it adds to the importance of defining the theoretical background and the fundamental ideas this study represents. The theory helps to identify the appropriate research methods, and explain the meaning and challenges associated with the examination of the phenomenon. The philosophical worldview is established to serve as orientation about the nature of the research and guide the research process. Rather than being used as a point of reference or comparison in the analyzing phase, it is the lens through which knowledge is gained, and the data is collected and interpreted. The worldviews proposed to this study are the ones of constructivism and interpretivism, theories that focus on the meaning of individuals' experiences and aim to create a richer understanding of the situation. The following figure presents how the different approaches are interconnected.

FIGURE 1
Creswell, 2014

A Framework for Research -
The Interconnection of Worldviews, Design and Research Methods

Philosophical Worldviews

Postpositivist
Constructivist
Transformative
Pragmatic

Research Approach

Qualitative
Quantitative
Mixed Methods

Design

Quantitative (e.g., Experiments)
Qualitative (e.g., Ethnographies)
Mixed Methods
(e.g. Explanatory Sequential

Research Method

Questions
Data Collection
Data Analysis
Interpretation
Validation

2.1 Philosophical worldviews

This study researches a topic that is, in its core very technical but has a social relevance when looked at from a different angle. The research question does not ask for specific numbers, for example, how many jobs will be lost through the evolving AI technologies or how long it will take until AI can design creatively just like a human. But the study is exploratory, seeking comprehension of where AI stands in the digital design profession, how relevant it is to design processes and how much it influences the industry. Consequently, the study intends to gain knowledge through collecting and interpreting the experiences and opinions of relevant individuals who currently work in the industry. Trying to discover this knowledge through theory or possibly coincidental results of experiments would be insufficient in this case.

Other worldviews, such as positivism and pragmatism, are considered less suitable to serve as guidance in this study. Unlike the constructivist, the positivist focuses on collecting knowledge that is unaffected by human opinion and interpretation. The aim is to work with observable and measurable facts and numbers as well as to generate law-like generalizations through quantitative analysis methods. Since this study does not aim to generate any statistics, the

positivism worldview would be inappropriate. Although, positivists use those created generalizations to help make predictions on future behavior in companies. This study will in a similar manner speculate about the future of AI in design processes. However, their methods on how to collect the necessary data do not correspond with this philosophical theory. In positivistic research, the researcher is completely detached during the study. As far as that is the goal for this research, in interviews, it is partially necessary to involve own judgments to select relevant questions and possibly follow up questions to get as high-quality knowledge as possible. (Saunders, Lewis, Thornhill & Bristow, 2019)

The pragmatist approach would be suitable in the way that it focuses on the problem which is researched. It originates out of certain actions and situations and takes the liberty to use all available approaches to get behind the meaning of a problem. This is particularly used in mixed methods approaches which makes use of both, quantitative and qualitative research. Since this study aims to gain a general understanding of the current adoption of AI within digital design and does not mean to generate one definite conclusion, it opens up the opportunity to research more broadly. Due to the scope and the limited time frame for this study, the pragmatist approach turns out to be too broad and unstructured to function as a guide to this particular study. (Creswell, 2014)

2.1.1   Constructivism

Introduced by Berger and Luckmann (1967) and Lincoln and Guba (1985) a definition of the basic idea of constructivism is that rather than coincidentally discovering new knowledge and the meaning of features of the world, an individual invents those meanings through experiences they go through in life. These meanings can be complex and vary depending on each individual and usually happen through social exchange. (Kukla, 2013) The constructivist worldview influences this research in the way in that it reminds to focus on the knowledge collected through experiences in the industry and reflect on the data which has been collected so far. Since this field of research is fairly new, it makes it possible to set new rules and guidelines. Nevertheless, it also prompts that the knowledge of an individual is constructed by them through their experiences, and some individual experiences might completely fall out of the pattern and act as confusion to the overall analysis of the collected knowledge. It makes it important to closely take account of the individual's professional, cultural and social background.

2.1.2   Interpretivism

The views of Interpretivism are relevant to this study because interpretivists study the meaning humans create of the world. Similar to Constructivism, interpretivists believe that through their different cultural backgrounds and different experiences in life, individuals form their reality which is worth interpreting individually without defining universal laws and rules. To consider the interpretivists approach to research is especially pertinent to this study since its main purpose is to create new and richer understandings of social phenomena. For this study, it is important to understand how the profession is changing due to AI from different perspectives to gain an overview of the situation which means to not set too many boundaries when it comes to recruitment. (Saunders et. al, 2019)

3   Methodology

In order to undertake a structured and most proficient study, a suitable research method is vital. Based on the exploratory nature of the research question in this study, a qualitative method was chosen. This method serves the purpose of gaining understanding and opening up for more detailed findings, compared to other methods of collecting data. It perceives reality from human perspectives and gathers data that cannot be easily measured (Creswell & Creswell, 2018). To fulfill the research goal, an implementation plan has been developed, including the strategy for data analysis and interpretation. The phenomenological research approach was chosen and the data was collected through interviews. This will further be described and explained in the following section.

3.1   Research approach

This study investigates how AI technologies effect design processes in the digital design industry in a qualitative manner. The constructivist worldview is a typical approach to qualitative research and most appropriate to this topic, since the main goal of this research is to gain insight into the current situation concerning the adoption of AI and collecting knowledge first hand from companies in the profession (Creswell & Creswell, 2018). Looking at some of the characteristics of qualitative research shows why it is suitable for this subject.

In qualitative research, the researcher focuses on the participant's meanings rather than on their own previous opinions and knowledge or the information of other literature. The social constructivist believes that individuals interpret their world and give certain objects meaning through their personal experiences with it. Consequently, those interpretations can be quite complex and layered which makes it essential to focus on the individual's views and opinions on the specific situation which is studied. In qualitative research, it is typical that the researcher collects data at the source where participants deal with the situation and talk to them directly. (Creswell & Creswell, 2018) Hence, it is an efficient way of understanding how AI is currently influencing design processes, to question and interpret the experience of active designers and learning from people who have the knowledge and interest to contribute to this topic.

In qualitative studies the researchers typically work inductively, which means going back and forth between the collected data and the established themes, to find patterns and make sense of the situation (Creswell & Creswell, 2018). This is another indicator that the qualitative approach fits this research well. The strategy of finding patterns in the experiences of digital designers is a continuous occurrence in this study, all through data collection and analysis. Since the process of qualitative research is emergent, the initial research plan is ever-changing and being adjusted in the phase of data collection, which is also typical for qualitative research. When starting to develop a deeper understanding of the topic and learning more about it, questions might change and angles might be altered, which is the case for this study as well. (Creswell & Creswell, 2018)

3.2   Research design

In qualitative research, there are several different approaches to choose from when it comes to research design. AI has been described as a global, technical phenomenon that influences our modern society as well as businesses and the economy (Szczepański, 2019). In social research, naturally produced human intelligence is regarded as a social phenomenon. Although AI technologies are designed to reproduce natural intelligence to be able to make decisions and socially interact with humans, it can be argued that not every AI technology existent to date fulfills that condition. Nevertheless, the understanding of science, including AI technologies, is acknowledged in social research and can, therefore, be regarded as a social phenomenon as well. (Schwartz, 1989) Consequently, this study was designed through the phenomenological approach to research. According to Creswell & Creswell (2018), a phenomenological research

strategy is a design of inquiry where the focus lies on the lived experiences of an individual surrounding a specific phenomenon as they are described by the participant. It involves questioning a small number of individuals in a more comprehensive way.

One commonly used method of collecting data in qualitative research, especially when researching a phenomenon, are interviews with individuals who are relevant to the study. Conducting interviews with professionals in the industry of graphic design and web design is an opportunity to gain the most up-to-date and first-hand research data. Another characteristic of qualitative data is that the researcher is the key instrument. She or he collects and interprets data themselves through for example interviews with self-developed questions without relying on other researcher's tools. (Creswell & Creswell, 2018) Since there has not been a great amount of research in this area yet, reaching to already existing questionnaires or surveys and finding fitting questions is quite unlikely.

3.3   Data collection

A literature review has been conducted as a starting point of the study, exploring the field of topic and related studies to establish the research gap. The collected secondary data serve as an introduction and background to the research, consisting of peer-reviewed papers, online articles, blog posts, and books. However, the novelty of the topic is evident in the absence of existing literature, which provides a great opportunity to freely explore the topic. The primary data collection and recording procedure has been carefully planned through setting boundaries, establishing protocols and identifying factors such as type of collecting method, setting and participants. Considering that the study approach is qualitative and the research design is phenomenological, it lies near to conduct interviews. This method is typically used in both approaches and especially fitting to achieve the research goal. Interviews have the benefit of letting the participant provide historical information, useful when participants cannot be directly observed. However, the provided information is filtered through the views of the interviewees, and not all participants may be equally articulate and perceptive, which can be a limitation. The sample size for phenomenological research usually range from three to ten participants, which was the aim for this study as well. (Creswell & Creswell, 2018)

3.3.1   Recruitment of participants

The selection of participants has been made by their relevance to the topic, which acts in the realm of digital design. The recruitment was thus aimed at active professionals from design companies, including agencies within advertising, media communication and IT, branding, web design, UX/UI design, and product design. The goal was to get a broad spectrum of participants, both male and female, in a variety of ages, with both long experience but also those relatively new in the profession. To open up for the ability to detect possible differences, a range of professionals with different main tasks and titles was preferable. The broad target group enables a wide understanding and a proper overview of the industry as a whole. The job roles are also closely intertwined and some professionals inherit multiple job titles or functions within the creative field, which made it reasonable not to narrow the target group more.

Participants were mainly recruited via e-mail, as well as through design-related Facebook groups where the target group is active, in which the recruitment message was posted. The message covered brief information about the research topic and purpose and invited the recipient to participate. Companies in Jönköping, Sweden were contacted primarily, to enable face-to-face interviews. One recruitment was also made from Latvia. In addition to that, companies in Germany were contacted, due to the German background of one of the interviewers. Other countries were also reached through Facebook, which opened up for participation from a professional in the Netherlands. The wide recruitment enhanced the chance of finding relevant participants who seek to make a high-quality contribution to the study. Furthermore, it helped to give a broader perspective and perhaps point to differences of experience depending on location and surroundings.

3.3.2   Execution of interviews

The particular interview method depended on the participant's preference, based on what they felt most comfortable with and best suited their schedule. Alternatives have been given to do it face-to-face, through video conversation or in writing. Location is also a factor, where face-to-face interviews were only possible within the area of Jönköping, Sweden. Text correspondence proved most convenient for participants in other regions. The interviews are semi-structured, which enables for thorough preparation of the questions, while they are still open for new leads if something interesting was to come up or if the participant wished to add anything (Creswell & Creswell, 2018).

One-on-one interviews have the advantage of creating a connection with the interviewee through body language and creating an elaborate conversation, setting a specific tone and circumstance. However, a disadvantage is the possibility of digressing off-topic when both interviewer and interviewee are especially interested in the topic. The presence of the researcher could also bias the interviewee's response. This is where the alternative methods of collecting data for this study is of advantage, and provide a certain balance and flexibility. (Creswell & Creswell, 2018) To create an environment as comfortable as possible to the interviewee, the interviews are held at their company's facilities. To ensure that both interviewer and interviewee are on the same level of understanding certain key elements, a summary of the research topic, the aim of the study, as well as the definition of AI is explained. The interview follows by covering some basic information about the participant and continues by focusing on the participant's opinions, experiences, and related meanings. This includes clarifying any vague statements or surprising information.

In cases where interviews are conducted without the interviewer being present, the preparation process is slightly different to ensure the collection of high-qualitative data. In e-mail interviews, the interview questions are described more thoroughly, with added notes to lead the participant in the right direction and avoid misunderstandings. The questions are sent out in a word document, in which the participant can write their answers and return. Although the questions are sent out in English, the participants can decide to answer in English or Swedish. This alternative is given since it might make it easier for them to participate and allow for more descriptive answers if they can use their mother language, which would heighten the data quality. This is possible since one of the interviewers has a Swedish background, which makes the problem of translation insignificant. However, all participants chose to answer in English. The fact that none of them answered in their native language could have a slightly negative effect on the result since this might make the answers shorter and less detailed. Some follow-up questions were sent to the participant afterward, for clarification and to gain a deeper understanding.

The advantage of conducting the interviews in writing is that it gives the participant the possibility to take as much time as necessary to contemplate and phrase their answers most accurately. However, the possible disadvantages of this method are acknowledged. As the interviewer and interviewee are in a way detached from one another, it is difficult to create a connection or develop a specific tone for the interview. Follow-up questions cannot be asked spontaneously in a conversation but involve a certain delay, resulting in answers that are not as in-depth and detailed compared to other methods. (Creswell & Creswell, 2018) Nevertheless, these complications can be avoided to a large extent, through planning, adjusting the interview questions and descriptions, as well as creating an interview protocol (See Appendix 1) that consistently leads the interview.

3.3.3   Interview questions

To carry out a structured and most efficient interview a list of questions has been developed. These questions help to stay in the boundaries of the research topic and guide both interviewer and interviewee through the interview to gain relevant data and make the experience as pleasant as possible.

The questions are narrowed down to a few important ones, both closed-ended and open-ended, formulated to cover the topic and answer the research question effectively. Upon that, the participant is asked to explain their statement, by answering how and why certain answers are given. More questions could also be developed and added during the interview situation if the given information is opening up for a new interesting lead.

The questions 1-5 serves to give some background information about the participant, to add context and comprehension of the experiences and opinions about to be uncovered.

1. **What is your job title?**
2. **How old are you?**
3. **How long have you been working in this profession?**
4. **What are your daily tasks?**
5. **What software programs do you use?**

The most important query for the study is question number 6. It has the highest probability to bring clarity to the research, as it aims to uncover the current level of adoption of AI within the profession. It also has several follow up questions. The question brings up the possible effect of AI on the profession, the general awareness within the industry, covers the implementation process, and opens up for possible struggles or hesitations regarding this. It also specifies what software programs with AI-framework are being used, which gives a fuller view of the situation and enables a closer look at those specific programs.

6. **Are you aware of any AI technologies in your profession/daily tasks?**
   - **If yes: Do you use it actively? In what way? What software programs? How was it implemented/introduced in your work? Have you experienced any resistance towards adopting AI in your profession?**
   - **If no: What is your knowledge about AI? Is it an active decision not to use it? Is the topic being discussed at all at your company/amongst colleagues/design community?**

Question number 7 aims to investigate the effect of AI on the profession, including if it has affected the creative process, the approach to projects and the overall work processes. In combination with the previous question, it is expected to generate data to fulfill the objectives of the study. Learning about the possible changes in different work practices and processes gives an idea of how the nature of the profession is changing.

7. **Has AI changed the way you work? The creative process/the way you approach a project? Has it opened up for new possibilities? Or do the traditional tasks remain but being performed with AI as an aid?**

Question number 8 aims to uncover other effects of AI on the industry. It might be a change in requests or an increased ability for clients to create designs themself with AI-powered tools. Supposing that experience and knowledge about AI is currently absent, the participant might have noticed changes in their surroundings due to the development, resulting in indirect effects on the profession, even if the adoption process is lagging. It might also force the implementation, even if it was not initially desired.

8. **Have you noticed any change in the past few years when it comes to client behavior, due to AI development?**

Question number 9 is focusing on the feelings of the participant, uncovering if they feel negative or positive towards AI. Negativism might be due to skepticism regarding AI's abilities, worries about losing the job to a computer, or similar. Positivism could point to general excitement about technological development, or the support AI can bring to time-consuming iteration processes, and opening up for new opportunities. This is expected to be uncovered by asking the participant to elaborate on their answers.

9. **Do you feel positive or negative towards AI?**

Question number 10 aims to give a more objective view of the value AI could generate, focusing on the actual potential benefits rather than feelings. If the belief is that AI could add value, then people might be more inclined to implement it, which should speed up the adoption process.

10. Do you believe that AI is adding/can add value to your profession?

The last question wraps-up the interview by speculating about the future of AI within creative professions. This takes into account the perception of the current situation and the knowledge about the topic. It covers questions such as where AI fills the best function, and what is reasonable to expect of AI within the design industry. It also includes ideas and opinions about what sets humans apart from computers, and if certain characteristics can be simulated. The question can also be connected to the notion of the likeliness that AI systems can replace them and perform their job.

11. Do you think AI technologies have a future when it comes to creative work?

3.4 Data analysis

As the research approach is qualitative, the data analysis was done simultaneously with the data collection and write-up, to exercise effective time-management. As the interviews took place at the participant's convenience, time was released in between the different occasions. This method also let the report grow organically as it opened up the possibility to revise the research questions midway if they were found to be problematic or not benefiting the research effectively enough. Furthermore, the collected data is delimited to what is relevant. Meaning that some parts of the interviews were omitted in the thesis if considered excessive or unnecessary to answer the study's purpose.

The relatively small amount of interviews enables a good overview of the collected data and the findings. The analysis is structured according to advice from Creswell & Creswell (2018) and is divided into multiple stages. The interpretation of the data was made with the theoretical framework as guidance, securing focus on the individual perception of the situation. The first step of the analysis method is organizing and preparing the data for scrutiny, which entails transcribing the interviews, optically scanning the material, typing up field notes and organizing the data. Secondly, the data is read through to get a general sense of the findings and the meanings, including reflection of the overall tone, depth, and credibility. The setting and participants are thereafter described to give context to the results. Major findings or themes elaborated by locating patterns in the participant's statements, are also identified and used as a structure when describing the collected data. The last step includes interpreting the findings and includes summarizing the results, comparing to literature, discussion of a personal view of the findings and stating the limitations of the study. Further research is also suggested based on questions that came up through the analysis.

3.5 Credibility, validity and reliability

Trustworthiness, authenticity, and credibility are vital factors for the quality and value of the thesis, established by utilizing a combination of different strategies suggested by Creswell (2014). First of all, the method, interview situation, and relevant circumstances are described in a clear and transparent manner. All steps of the data collection process are documented and available for review, revealing all factors that could affect the outcome. Furthermore, member checking is used to determine the accuracy of the findings from the face-to-face interviews. This entails giving the participants a chance to read through the collected data, give feedback, and validate the interpretation of the stated facts and quotes, to ensure the correctness of the conclusions. The researcher bias is also addressed by reflecting on all possible ways in which the study could have been affected by factors such as background, culture, and socioeconomic origin.

Furthermore, in line with recommendations from Creswell (2014), ethical considerations were anticipated and reflected throughout the research process. Issues related to personal disclosure, credibility, and authenticity are actively addressed in the research plan. During the data collection focus was on trust-building and assuring the comfort of the participant. This was done by showing respect for both the participant and the setting, if conducted at their facility. At the beginning of the interview, the purpose of the study and the definition of AI was explained. The voluntary nature of the study was clarified, and the possibility to neglect certain questions was given, if they felt at all uncomfortable or unwilling to answer. Questions were asked with as little bias as possible, assuring the participant there is no right or wrong answer. Issues related to leading questions and sharing personal impressions are not considered immensely important in this research, since it is not experimental nor aims to unravel hidden truths. Instead, trust is established by discussing the topic openly, which allows for going off the interview protocol slightly if considered appropriate. It is also welcomed to share personal experiences if it helps to set a friendly and more open environment, making the participant more prone to share their own experiences. In the analysis, the privacy and anonymity of the participants are respected. Thus, any information that could be harmful to the participant or the company is not disclosed. The aim is to provide a complete and clear understanding of the situation, which includes reporting negative or discrepant information if necessary. All perspectives and contrary findings are thus reported clearly and straightforwardly, using appropriate and unbiased language. Lastly, the raw data is kept for a reasonable amount of time, no longer than five years, and thereafter discarded.

4   Analysis

As stated previously, the purpose of the study is to research the current adoption of AI within the digital design profession and answer if and how the nature of the profession is changing as a consequence of AI development. The analysis is structured around the interview questions and the main themes and patterns found in the results.

The insights are based on first-hand data from a total of seven professionals that shared their experiences and opinions. See Appendix 2 for the complete interviews with answers. The majority is working for agencies that would go under the category content, communication, and digital design. On top of that, some are freelancing. A summary of their daily tasks includes concept creation, ideation, art direction, motion graphics, web and app design, illustration, animation, branding, print work, UI components and UX concepts, and lastly design mentoring. To enable referring to different participants and make a distinction between different answers in the analysis, their identities are narrowed down to a job title. The title was assigned by themselves in the interviews, though in some cases several titles were mentioned. The participants are presented in the table below.

Title	Age	Country	Company	Work experience
Digital designer	28 years	Sweden	Strategic and creative full service agency	4 years
Visual designer (+ art director)	28 years	Netherlands	Game studio + freelance	10 years
Frontend developer (+ digital designer)	25 years	Sweden	Digital agency + freelance	4 years designer + 2 years developer
Senior designer	30 years	Latvia	Digital agency for digital products + advertising	9 years
Web developer (+ web designer)	28 years	Sweden	Media agency	3,5 years
UX designer	50 years	Sweden	Strategic and creative full service agency	18 years
Art director	27 years	Sweden	Advertising agency	4 years

Interview participants

Table 1

4.1   Awareness and knowledge of AI

The case narratives point to a generally widespread awareness of AI. The digital designer mentions that her company recently had a lecture about AI, bringing up both the dystopian version as well as the more applicable and realistic version of the phenomenon. The lecture supposedly covered how AI could be used to create smarter experiences for the clients. An example was web shops that suggest products based on previous purchases. The web developer agrees to awareness of AI but reports that it is not something he comes across daily since it is still so new. He adds that very few of his clients use it nor desire it for their websites. The art director declares that they talk a lot about AI at her agency. They are very curious as a company and interested in learning new things and new technologies. Their CEO is known to embrace new ideas and new thinking, leading to the belief that they will only learn more about AI in the future, through lectures and similar.

A couple of participants state to be are aware of AI in many programs they use, such as the Adobe software. But they also acknowledge the possibility to be using AI in more ways than they

might be aware of, embedded in tools they utilize without their knowledge. The senior designer states that the focus lies on what the program or tool can help them with, not the technological side of them. The frontend developer agrees to awareness of AI within the profession but explains that she does not utilize it, the reason being that it lacks the capability of performing her job. However, she mentions prototyping tools that she uses, such as Sketch and InVision, which in fact have AI-features.

Despite the general awareness, the results point to an uneven awareness of AI within the digital design profession. The unawareness of which software programs have embedded AI is noteworthy. The majority utilize Adobe software such as XD, Illustrator, InDesign, and Photoshop, but only some of them know of the AI-powered features. The digital designer is one example, working mainly with Adobe software but states not to use AI technologies. She also expresses the belief that no other designer within her company has implemented AI in any project yet. Statements as such indicates a lack of knowledge of how AI works and can be utilized. Another example of this is the art director, who agrees to be uninformed about AI within Adobe tools. However, she works mainly with idea creation and suggests the lack of experience could be due to that.

A couple of the participants are working for the same company and mention having had discussions about how to introduce AI in their solutions. One of them confirms that the employees have AI on their minds and working with AI is desired. However, the participant puts the responsibility to implement it on the developers, instead of the designers, mentioning that they are not there yet. The other stresses that they are just dipping their toes in actual implementation, where only very basic, novelty based solutions are created still.

4.2 Effects of AI on work processes

Many participants state that AI has not affected their work processes as of yet. The digital designer believes that initiated use of AI would not have a notable effect on the way they work either, at least not at first, but it will rather be something extra to offer. The web developer agrees that he could work with it more, but it has not changed much for him yet. He works with Wordpress 95% of the time, but hope to start building more in a CMS (Content Manager System) called Kirby. He believes that greater effects are awaiting in the future, where the coding part probably will be done with AI at large. But as of today, he believes that tools like Adobe Dreamweaver and other site builders are too weak. However, he approves of the page builders inside Wordpress. He adds that he often uses a page builder called Elementor to certain clients if they have a small budget and want a quick solution.

The UX designer has the longest experience with 18 years in the profession and claims to work in the same way as 10 years ago. Despite believing that AI has not affected the workflow, he gives a couple of examples of AI tools that he uses, including the Adobe Creative Cloud software. Another one is a website that generates fake faces with the help of AI (thispersondoesnotexist.com), to generate portraits of people when creating example data in UX-artifacts. He also mentions having been part of creating requirements for chatbots, but believes that such solutions provide subpar UX in comparison to what they replace.

Furthermore, the visual designer states to use AI embedded in layout and color palette tools to speed up workflow. He mentions that it is mainly supportive now, but it greatly increased testing and removed repetitive tasks, creating more room for actual designing. He describes that when in the mindset of thinking up new AI's to simplify tasks, the freedom to be creative goes up and raising awareness of the process a bit more. The art director mentions Pinterest as an example of an AI-powered platform she uses extensively. She believes Pinterest is learning how she thinks and serves as a great help, since it provides suggestions based on previous searches. She further proposes a hypothesis for the future, where AI in the form of a robot could be used as an assistant. It could help with the daily tasks and function as a colleague for her to collaborate with. As robots might be superior when it comes to logical thinking, they could be involved in the decision process. Perhaps utilized to lead the company in the right direction, and make better decisions regarding commercial ideas and similar.

A couple of participants, both the web developer and the senior designer, mentions to use an isolation tool to get the background of images, called remove.bg. One states that it is not perfect, but a decent quick fix. The senior designer also mentions the use of Colormind, a color palette generator that uses deep learning. He states to use these tools in the explorational and experimental phase, to loosen up the ideation process in a playful way. However, he points out that he sees no pattern of use. He believes that there is an amount of AI in software and plugins that are being used seamlessly in the daily workflow. He adds that he has not experienced any resistance towards AI within the agency, as they are open to various kinds of technologies and experimental tools. They are always looking for new ways to automate and speed up repetitive processes and embrace tools that deliver with precision and help to get the job done. This is especially true in web and UI design, where plugins help to automate processes that were previously repetitive or manual. The tools can also be used to simply play around and get some inspiration. He also mentions that AI is not just helpful in the design process, but also useful for communication between designer and developer through collaborative software.

As the senior designer has been active in the profession for 9 years, he has witnessed the development of technologies. He expresses that he is astonished about how tools have developed and improved to help automate processes that previously would have been repetitive and time-consuming. He mentions how software such as Adobe Photoshop and AfterEffects has improved and manipulation of photography and video footage has become faster and easier. He states that in a way design and creativity follow the software and there are things only made possible by the developing technology. He shares that the agency's creative director has been playing around with technology regarding deepfakes as well as Spark AR Studio (platform that creates augmented reality effects for mobile cameras) filters for Instagram and that they have completed projects for clients using the technology.

The art director expresses the difficulty of coming up with ideas involving AI without full knowledge about it. If the customers are equally uninformed and have an absent developing team to push the implementation, the difficulty is enhanced. Both the company as well as the client could drive the development of AI. Since the future is unknown, it is important to stay up-to-date regarding new technologies, to survive on the market and to stay attractive to customers. If the clients were to do more development with AI, the agency could come up with innovative ideas for campaigns based on it. As a design studio, being specialists in film, photography, communication, concept, and branding, they are in authority to lead towards new grounds and teach the clients. The agency could likewise stand behind the clients and give support in their development. Perhaps that could open up for more jobs as well, if the customers develop new techniques and products. However, she believes that they are not there yet. Especially her personally, in her role as an art director. Even so, she mentions that her colleagues could be more involved and might have another perception, having more technologically oriented roles within the company.

4.3 Feelings towards AI

The general feeling amongst the participants regarding AI is positive, as all participants expressed more or less positivism. In design, motion and creative fields, it is believed to open up more possibilities that a lot of people can benefit from. Resistance in the form of worries or similar is split between the participants. Most can see the benefits brought by AI, but also recognize possible issues. The majority state to have experienced little or no resistance toward adopting AI within their companies. The web developer, however, points out that it has to be helpful and making the workflow better. He states to feel positive about AI but believes that his role as a developer will be less needed. Adding that the coding part could and probably should be created by AI and not by hand. The art director expresses that it would be fun to learn more about AI, as she is very interested in it. The visual designer who is working for a game studio, adds that his business is quite technically oriented, where adapting to new technologies and pushing the boundaries lies in the nature of the profession. Believing that this might be why he has not experienced any resistance towards AI in his profession. However, he mentions that he knows of designers who are worried about it, but they are usually just uninformed and see

threats instead of possibilities. He adds that this is more typical for graphic designers that are less into the technical side.

Furthermore, using AI technologies in design projects seems to be a matter of how large the budget is, as well as how extensive the knowledge is. The digital designer declares to be hesitant to suggest ideas involving AI because of it. She also states to be a bit reluctant towards AI, as she believes that a healthy amount of skepticism is good when new things emerge, since we have no idea how it will affect society. Being very passionate about ethical design, she believes that it is extremely important for the clients to know what data is taken from them and make sure they feel in control. She further believes that the implementation process needs to be mindful and done carefully. Similar worries are expressed by the senior designer, who feels somewhat anxious towards AI regarding information, media, and risks towards democracy.

The art director expresses that AI in a way could be a threat to them as an agency, at least in its current form. They still work a lot with printing and if AI development leads towards a retail market with fewer physical stores, less print work would be needed. However, she also suggests that AI could be utilized to keep the stores alive if they can figure out how to implement it in communication and enhance the customer experience. Traditional stores require something new to attract customers, which is a topic being discussed a lot at the agency. Despite general positivism regarding AI development, she expresses worries about the indirect effects. She has read about jobs expected to disappear in the future, one being the role of a photo model. If virtual humans can be created, they could instead be used as models. Even if such a scenario feels like science fiction at the moment, it might not be the slightest peculiar in 20 years. If it were to come true, she wonders how a film production or a photoshoot would be realized, having to direct a virtual human. She also mentions effects on social media and influencers. She finds it interesting to think about, but a bit frightening to envision working with robots instead of humans.

4.4 External factors

Most participants have not noticed effects on the profession due to external factors, such as changes in client behavior or a shift in requests. The web developer mentions that very few of their clients use AI, or even want it implemented in their websites since it is still quite new to them. The digital designer believes that their clients are afraid of AI, not knowing what it is and the benefits it could bring. Her company works with larger companies, where they see little change in requests and behavior as of today. However, believing that smaller companies are utilizing self-design sites to a greater extent now, compared to a few years ago. The art director agrees that customers can manage Wordpress by themselves, and sees that many smaller companies do not come to them for help, perhaps due to budget restraints. The agency usually works with clients for a long period of time, developing the whole company and the whole strategy. This could make them unable to get full insight into changes in client behavior connected to specific technologies, such as self-design sites and other AI tools.

The visual designer declares that there are always clients who require editable designs and to some degree, designing is also made possible by the CMS, but he has not noticed a changed pattern in their agency as they take on projects that can be tailormade. However, he believes client behavior will change as the software becomes increasingly collaborative, intuitive and easy to use. The visual designer expresses that AI is more of a buzzword more than anything still. People are aware of it but have little knowledge about what it does. He also sees that more people are creating their own designs, which is good for smaller companies and startups. But adds that designers are still needed for design as AI is pretty generic and not aimed towards providing a specific goal or message. The UX designer agrees to not have experienced changes in client requests, mentioning that it could be due to the lack of authenticity and personality in the results.

The frontend developer believes that Wordpress developers might worry about self-design sites such as Wix, but claims to be doing more difficult things within her company. The web developer admits that his company cannot compete with the flexibility of Wix and PageCloud. But page builders come with some problems. He explains that they tend to slow down pages a

lot, and speed is key nowadays when it comes to websites. Another downside with page builders is that the client has too much freedom, according to him. He gives an example of designing a nice website for a client. If it ends up in the wrong hands when handed over, the client could easily destroy it. If they are not designers themselves, they may change colors, use the wrong font family or font size. He adds that quite a lot of flexibility can be built-in content and images, but the visual part should be limited.

4.5   Expectations of AI

It is expected that AI can add value to the profession by providing answers and help like no other technology can. Users want things to be smooth, helpful and easy, and the belief is that AI is beneficial that way. Several participants mentioned that AI technologies can add value by speeding up processes and eliminate time-consuming and rather dull processes, which would leave more time for creativity. However, the senior designer points to the risk of speeding up the processes too much and being a mere operator of the technology. He believes that AI can be used wisely, thus helping in value creation. He also conveys the possibility of developing creative powered solutions per se and letting the AI be the core of value creation. The art director believes that if used as an assistant, AI could bring value in the form of more efficiency and reduced stress. A robot is never sick and can work around the clock without rest. From that perspective, it could be very interesting to have a robot as an employee at the company. Even so, she stresses the fact that such a scenario is very far away.

The UX designer believes that AI is adding value and enhancing creative performance by augmenting creative output. He refers to these elements of surprise as happy accidents, that could be introduced into the creative processes. Thus creating design ideas that designers could not anticipate or think of themselves. Furthermore, the visual designer expects machine learning to make user experiences more personal. Adding that AI has a big potential to unlock more creativity, speed, and improvements to design and systems in general. The belief expressed by the web developer is using AI when creating websites could enable him to just design and not code. The result would be a cheaper product, which is added value for the client but not for the designer and the company. When it comes to design he is a bit more skeptic regarding the possible value brought by AI. He has watched a lot about AI on Youtube and gives an example of a TED Talk where a robot was given instructions to perform different tasks. However, it went horribly wrong, due to insufficient knowledge about how to behave and make decisions like a human.

4.6   AI within creative work

The general belief amongst the participants is that AI has a future when it comes to creative work and that the world will only see more of it. The digital designer mentions the possibility to create better experiences for users. Without knowing how it would be done, AI is believed to play a part in the creation process. The visual designer brings up the difficulty of defining creativity. He believes that computers can be smart, and mimic creativity, but are not creative on their own. He thinks design will always be a human job and AI will be of great help. It might alter how we look at design, but it is not likely that computers are going to start designing themselves. Ideas still needs to be initiated by humans. As robots are lacking the social ability of humans, the art director believes that they cannot take over her job. She recognizes that they might be able to learn feelings, but it will take a long time. She further believes the AI systems can be taught creativity to some extent, and in combination with logical thinking that could be beneficial for the company. However, acknowledging possible damage if AI or robots are taught too much.

Only one of the participants, the frontend developer, completely rejects the idea of AI within creative work. She does not believe AI has a future within creativity, with the reason being that there is no right or wrong in design. A side note is that further explanations of this statement were desired, but follow-up questions were left unanswered. She may have a more nuanced perception, however it did not come across in the answer. The web developer, on the other hand,

expects great things from AI in the future and believes that it will be used a lot. This is especially true for coding, as he believes that AI could make the coding part of web development disappear. However, he mentions that the designing part will be more complex. He acknowledges the possibility for AI to enter the design field eventually but stresses the difficulty.

The senior designer believes that computers can be creative enough for some cases and apt enough for simple visual design. However, he is doubting AI's potential in complex and large scale projects, where the lack of human insight and research applicable for every problem could be a constrain. He still believes that AI and automation will be increasingly implemented in digital design and micro-tasks, but it will be subject to creative human individuals with ideas and insights. Furthermore, the UX designer believes that AI technologies will serve as a creative tool to introduce elements of surprise into a creative process. But that it needs to be heavily curated by human designers. As all parts of the process can be managed inside the digital domain, he sees a future where AI is extrapolating design concepts into actual implementation, thus automating some of the heavy lifting in digital design. He further mentions that he expect AI to unite digital design and UI development. He believes that it could generate a Graphical User Interface (GUI) code based on the design output, suggesting that it might merge the digital designer and frontend-developer into one profession.

5   Discussion

The data gained through responses from the participants is evaluated under the scope of the research question. The aim is to shed light on the effects of AI on the digital design profession, including possible changes to the work process, through the examination of the adoption of AI within the industry.

The results suggest that there are a couple of obstacles to implementing AI within the digital design industry, being knowledge, demand and financial assets. The main obstacle seems to be the lack of knowledge about different kinds of AI technologies that both the designer and clients face. Clients might reject implementing AI in their projects since they are unsure of what it will do, hence the demand for it is currently low. The natural skepticism towards new things, especially new technologies is playing a large role as well. If there is a lack of comprehension and uncertainty regarding the consequences of something, humans are less likely to adopt it. There also seems to be a conflict between the different operating sections at an agency. The digital designer is of the opinion that the responsibility of implementing AI should be one of the developers, but also knowing that the developer will not implement something that was not requested by the designer. This might only be the case in larger agencies where the employees do not work as closely compared to smaller agencies, since other participants mention a close collaboration with their colleagues. But this is still a possible factor making the implementation of AI in design agencies more complicated. Another question to unravel is if the responsibility to initiate research and implementation lies with the design agencies or the clients. The suggested idea was if the client has a deeper knowledge of AI technologies than the design agency, it would push the designers to generate innovative ideas to communicate the client's product or concept. This can also work conversely, if the designers have a deeper understanding of AI, they have the opportunity to educate the client about various technologies and approaches toward their projects.

What becomes clear is that skepticism towards AI mainly appears because of a lack of knowledge. Some are uninformed about how AI is already implemented in the programs daily used in their profession. Some of them look quite far ahead and have a diverse understanding of AI, mentioning robots as employees in their agency and worrying about how AI will change society. This indicates expectations might be too high, leading to less attention paid to the everyday, accessible version of AI. Many of the participants are unable to see changes in the work processes due to AI development. The possible reason being that AI tools are already somewhat of normality, implemented before they entered the field. The participants with 9 and 10 years in the profession states to have witnessed the development of technologies and acknowledge the effects of AI on their work practices. The participant with the most extensive experience, with 18 years in the profession, however, claims to be unaffected. This could point to other vital factors that affect the adoption, such as personality, general interest, demographics, the company they work for, or other job-related circumstances. The location could be a factor here, being that the latter is located in Sweden while the others are located abroad. The generational factor is also taken into consideration, as the participant with the longest experience is notably older than the others, with an age difference of 20 years or more. This might lead to differences in approach to new technologies, where adoption comes more or less naturally. Nevertheless, the most probable reason is different interpretations of the interview question itself. A possibility is that the one claiming no effects simply means that the workflow still follows the same sequence of proceedings as a decade ago. The same programs could still be used, but has seamlessly augmented since. This does not necessarily rule out the possibility for increased speed, a smoother process, and less needed effort. As the participant stated to use Adobe software, AI should have had more or less effects on the work process.

Noteworthy is that awareness regarding AI is somewhat divided amongst the participants. Several mentioned that they suspect using more AI than they are aware of but cannot say for certain. In many cases, AI is embedded in such a way where it is not noticed explicitly. This indicates that designers are generally aware of the phenomenon and know it is being implemented more frequently, perhaps as a result of the increased interest in the topic by society in general, repeatedly being mentioned in media. But it is not necessarily obvious as to where and how AI is used, even to the experts working with such programs regularly. Nonetheless, evident is that most designers and their companies are generally interested in

learning more about new technologies including AI and want to educate themselves further. Either through inviting experts to the companies to host presentations about AI or undertake in-house projects just for the sake of experimenting with new tools together.

As with most new or evolving technology, there is always some kind of hesitation or cautiousness present, but also curiosity. The analysis shows that several of the participants see AI as an aid to their work processes, which can only improve and evolve. Many believe that AI can automate repetitive tasks, speed up processes and make workflows more smooth, which would allow for more time to focus on idea creation and creative work. When discussing the matter in a future scenario, one mentions the help of AI in decision-making processes, presuming computers are better at logical thinking compared to humans. Another expectation is that AI could add elements of surprise in design projects, by introducing ideas that the professionals could not have envisioned themselves. In such ways, AI could add value to the profession, unlike any other technology. Nevertheless, humans are believed to continue pursuing the role of the main ideator.

Furthermore, some AI-powered software is available to the end-user directly, while other programs are developed to be used by people in the profession, for them to create designs for their clients. While the programs for professionals are changing their daily work practice, the software for novice users competes with designer's livelihood from another angle. If clients can hire an AI system to be in charge of their marketing activities or build their website, the designer might not even get hired in the first place. This is especially true if the AI system can perform the same tasks just as good, or even better than a human, at a lower cost. However, some participants mentioned the lack of authenticity and personality in such solutions and claims to not have experienced such external effects. Perhaps due to the relative size of their agencies, this might be an issue more applicable to smaller businesses or freelancers. It could also be an arising issue still being invisible, but will only grow as the systems excel. Presumably, such systems will also affect some roles more than others, assuming a decreased need for manual coding in web development in the future.

6   Conclusions

The findings of the study enables comprehension of the effects of AI development on the digital design profession. The nature of the profession is evolving as the next generation of tools are entering the market. Digital design as an umbrella term is, however, diverse. The title digital designer is technologically oriented by nature, thus utilizing the available technology is practically expected. Nevertheless, the role of a graphic designer is a bit more versatile. Even if the role is technical at large nowadays, it can be niched in a way where AI tools might not be as applicable. The same goes for an art director, as the role is more focused on creativity and ideation, rather than on technology. When it comes to creative work such as art and design, people will always have their preferred processes and use different methods to accomplish the desired result. If viewed as an art form, it would be reasonable to let the decision making regarding the work method to the individual or the company. However, for the sake of effectiveness and ability to meet market demands, utilizing AI tools would be helpful to stay relevant and attractive on the market.

This study contributes to the existing literature by introducing a new perspective of AI within the workplace, as previous research has only been done on AI within other industries. There is an evident dissonance in the opinions and experience related to the effects of AI on the digital design profession, with the main reason being varying knowledge of AI's versatility. The results suggest underlying causes in the form of differing industry experience, but also alternative explanations, such as interest in the topic, personality, demographics, as well as the particular workplace and work tasks. Nonetheless, solely based on the fact that many of the software used by the participants has AI-powered features, it can be concluded that AI has indeed changed the work processes, whether recognized or not. It made designers more effective by speeding up processes that would otherwise be highly time-consuming, which in turn enables more creativity and opens up for more exploration and experimentation of different design solutions. As monotone and repetitive tasks are automated, the designer can focus on the aspects humans do best, and create beyond their own limitations. Lack of extensive knowledge about AI is not necessarily an issue. However, knowledge is key to power and enables utilizing the systems full potential and profit from it to the largest possible extent.

The case narratives indicate that some designers are thrilled to adopt the new technology, while others might have simply adapted to it without knowledge nor desire to do so. Also suggesting that the effects are more or less noticeable and of varying importance depending on the specific role and the related tasks the designer obtains. The ones with more coding oriented tasks, typical of the web developer and UX designer, generally experience a more substantial shift compared to the ones with a greater focus on creativity and ideation, as for the art director. If the designer's primary tasks are not particularly tech-heavy, and the designer does not work closely with a technologically oriented colleague, they might not develop an interest in AI naturally either. The likelihood is that AI will only expand and excel, and the effects on the profession are expected to grow persistently. Staying receptive to new advancements, having a wide skill set, and learning to master the art of collaborating with computers will thus be highly valuable.

7   Limitations and further research

The size and scope of this study makes for a natural limitation, resulting in fragmentary coverage of the situation. In addition to that, the fact that the matter was only researched qualitatively makes for difficulty to generalize the result. The findings can only hint towards similar experiences and opinions amongst other professionals within the industry. Furthermore, all but one of the interviews were conducted via text correspondence, resulting in a more shallow understanding of the situation. Follow-up questions were asked but left unanswered in one of the cases. Another limitation is the risk of misinterpretation due to the language barrier.

Moreover, the selection of participants is somewhat uneven when it comes to working experience. Most participants have been active in the profession for less than five years, meaning that they have not been around long enough to witness the major shifts within the industry. This includes experiencing the effects of digitalization on the profession, and also the initialization of AI within many design software, such as the ones of Adobe. The participants' lack of experience and previous knowledge about AI's capabilities also lead to an incomplete understanding of its actual effects.

The area of study is still very unexplored, with a lot of knowledge gaps to fill. Thus, this study acts as an introduction to understanding the changes in the profession, indicating that further research should explore this more. It would be beneficial for researchers to complement this study by investigating the matter with a quantitative approach as well, to get a broader perspective and a more generalizable result. A deeper dig into the nature of the profession pre-AI would also enable a fuller understanding of the changes. Furthermore, it would be of practical value for professionals within the industry to acquire a deeper knowledge of specific effects and gain insight into the proceedings of the adoption process. This would include focusing on the shift in requirements, the need for new skills and knowledge within this new era of design creation. Further research should also look into external factors more thoroughly, as this study only touched upon such effects on the nature of the profession.

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Appendices
Appendix 1

Interview Protocol

Interview Protocol Project: The Adoption of AI in Digital Design

Time of interview:

Date:

Place:

Interviewer:

Interviewee:

Position of Interviewee:

(Briefly describe project as stated in recruitment email:)

Ask for consent to audio record the interview:

Interview Questions:

Introduction questions:

- What is your job title?
- How old are you?
- How long have you been working in this profession?
- What are your daily tasks?
- What software programs do you use?

Main questions:

- Are you aware of any AI technologies in your profession/daily tasks/industry?

    If yes: Do you use it actively? In what way? What software programs? How was it implemented in your work? Have you experienced any resistance towards adopting AI in your profession?

    If no: What is your knowledge about AI? Is it an active decision not to use it?

- Has AI changed the way you work? (E.g. the creative process/the way you approach a project) Has it opened up for new possibilities? Or do the traditional tasks remain but being performed with AI as an aid?

- Have you noticed any change in the past few years when it comes to client behaviour, due to AI development? (E.g. change in requests or increased ability to create design themselves with sites such as PageCloud and Wix)

- Do you feel positive or negative towards AI? (Describe why)

- Do you believe that AI is adding/can add value to your profession? (Describe how/why)

- Do you think AI technologies have a future when it comes to creative work? In what way? (Reflect on computers ability to be creative. Could a computer take over your job or will AI only serve as a mere tool?)

End of the Interview

Ask if the interviewee has questions in return:

Thank the individual for participating in this interview. Assure him or her of confidentiality or responses.

Appendix 2

Interview - Participant no. 1 (text correspondence)

Country: Sweden

<u>**Intro questions:**</u>

What is your job title?
Digital designer. I work with UI (and some UX design), as well other types of graphic design, illustration and animation.

How old are you?
28

Are you working for a company or self-employed? What company?
I work full time for (…) a strategic and creative full service agency.

How long have you been working in this profession?
I've worked with various types of graphic design for a total of around 4 years, but I've been in UI/UX for close to 2 years.

What are your daily tasks?
I design everything from websites, apps, ads, social media posts, layout and print work as well as make illustrations, 2d-animation and branding for products and companies.

What software programs do you normally use to create design?
Adobe XD, illustrator, photoshop, indesign, after effects, keynote - in that order.

<u>**Main questions:**</u>

Are you aware of any AI technologies in your profession/daily tasks?
    If yes: Do you use it actively? In what way? What software programs? How was it implemented?
    If no: What it your knowledge of AI? Is it an active decision not to use it?

We recently had a lecture at work about AI. It was mostly about the different types of AI ("normal" AI vs the "I will kill humanity"-kind) and how we could start using different kinds to create smarter experiences for our users, such as web shops that suggest products based on what you have bought.

As of yet, I don't think us designers have implemented this in any project, but it's definitely in our minds. Personally I feel like I put the responsibility of implementing this on the developer, but I also know that they won't do it unless the feature is requested by the UX/UI department. I have no idea what kind of software programs is used to implement AI, I'll leave that to the tech heads :)

Has AI changed the way you work? The creative process? The way you approach a project?
Not yet, I don't feel. I definitely have ideas for websites that include small parts of AI but due to budget restraints I rarely put them out there as ideas, or in some cases I just think of things I would like the website to do, not knowing that it requires AI technology.

Follow-up: Do you think that the use of AI would lead to changed work methods? Would it open up for new opportunities? Or would you perform the same tasks as now, but with AI as help?
The latter, I think. It would probably be something extra that one offers, not something that changes the way of working. At least not at first.

Have you noticed any change in the past few years when it comes to client behavior, due to AI development? *(E.g. change in requests or the ability to create designs themselves with AI tools)*

I think clients are afraid of AI and don't really know what it is or how it could benefit their website or product. I haven't heard of anyone at my agency who has gotten a request for an AI feature from a client.

Follow-up: Is your experience that people are doing more design themselves now *(e.g. using programs such as PageCloud or Wix)* **instead of coming to you for help?**

We work with slightly larger companies and organizations, so I have not seen any increased use of self-design sites here. I think it is more common for small business owners to do so. There I think it is much more common now than 5 years ago.

Do you feel positive or negative towards AI? *(Describe why)*

I feel hesitant. Working in the digital field, I am obviously curious about new technology and ways of giving the users a beautiful experience, but I think a healthy amount of scepticism is always good when new things emerge, due to the fact that we have no idea how it will affect our society. Like all new things that we put users through, I believe that it is extremely important that we design things in a way so that the users know what data we take from them, and that we make them feel like they are in control. I think this is a big part of ethical design, of which I am very passionate about.

Do you believe that AI is adding/can add value to your profession? *(Describe how/why)*

In some way, yes. AI can provide answers and help that no other technology can, and users want things to be smooth, helpful and easy. We just need to be mindful when implementing it and careful of when it becomes a norm.

Do you think AI technologies has a future when it comes to creative work? *(Describe why)*

Yes, I think it can create better experiences for users. It might also help us, the ones working with creating these experiences, if implemented in the software's that we use (Adobe for example). I don't know enough about it to say exactly how, but I think we will see it more in the future. Hopefully we can master it ethically.

Interview - Participant no. 2 (text correspondence)

Country: Netherlands

Intro questions:

What is your job title?
Visual designer / Art Director.

How old are you?
28.

Are you working for a company or self-employed? What company?
Both, I work for a big European game studio and freelance together with some other people.

How long have you been working in this profession?
Around 10 years total.

What are your daily tasks?
Creating concepts, visual directions, art direction and creation of multiple types of design, like interface design, motion graphics, 3D, technical art, etc.

What software programs do you use?
Too many to list really, the main ones would be Adobe Suite, Cinema4D, Office, Unity, prototyping tools. I see software as mere tools, so I use what fits the job best.

Main questions:

Are you aware of any AI technologies in your profession/daily tasks/industry?
> *If yes: Do you use it actively? In what way? In what software programs? How was it introduced/implemented in your work?*
> *If no: What it your knowledge of AI? Is it an active decision not to use it? Is the topic being discussed at all at your company/amongst colleagues/design community?*

Yes, it's already in a lot of software that most people use anyway, but it might not be noticed explicitly. We also develop our own AI systems to validate, test, and automate certain tasks / tests / processes. Design wise, there are also AI layout tools, colour palette tools, etc. that I use to speed up my workflow.

Follow-up: Have you experienced any resistance towards adopting AI in your profession? Any obstacles/worries?
Hmm not really, but that might be because the whole gaming business has always been adapting new technologies rather fast and in some areas pushes the boundaries. I know some designers who are sort of worried about it, but they are usually just uninformed about it and only see threats instead of possibilities. Those are more the typical graphic designers that are less into the technical side btw.

Has AI changed the way you work? The creative process? The way you approach a project?
Yes, it's mainly supportive for now but it greatly increased testing and taking away repetitive tasks to create more room for actual designing. When you're in the mindset of thinking up new AI's to simplify tasks, your freedom to be creative goes up and makes you aware of your process a bit more. Harness the power of AI!

Have you noticed any change in the past few years when it comes to client behavior, due to AI development? *(E.g. change in requests or increased ability to create design themselves with sites such as PageCloud and Wix)*
AI is more of a buzz word more than anything still. People know its going on, but usually have little clue what it actually does or means, so it helps to educate them. I see more people creating

their own stuff, which is mainly good for small companies and start-ups. Anything bigger, you'd still need people for design as AI is obviously aimed at being pretty generic and not aimed towards a specific goal / message.

Do you feel positive or negative towards AI? *(Describe why)*
Positive, it has a big potential to unlock more creativity, speed and improvements to design and systems in general. The same with Machine learning, I think user experience will become more personal the better AI and tech gets as it can adapt.

Do you believe that AI is adding/can add value to your profession? *(Describe how/why)*
Pretty much the same as above.

Do you think AI technologies have a future when it comes to creative work? *(Describe why)*
The same as above. It's already here, so the word 'future' is a bit deceptive. It'll only expand more.

Follow-up: Do you think that computers can be creative? Do you think that computers could take over your job, or will AI only be used as a helping tool?
Then you almost go into the territory of What is the definition of creativity? Which is kind of hard to answer. Computers can be smart, and mimic creativity, but aren't creative on their own I'd say. I think design will always be a human job, AI will be of great help. It might alter how we look at design, but it's not like computers are going to start designing themselves. ideas still need to be initiated.

Interview - Participant no. 3 (text correspondence)

Country: Sweden

Intro questions:

What is your job title?
Digital designer and frontend developer

How old are you?
25

Are you working for a company or self-employed? What company?
Both. Freelance with my own company and is full-time employed at (…)

How long have you been working in this profession?
As a designer 4 years and as a developer for two years.

What are your daily tasks?
Meetings, designing some webpages/application and developer web pages

What software programs do you use?
On a daily basis: sketch, VScode, invision, figma, fork

Main questions:

Are you aware of any AI technologies in your profession/daily tasks/industry?
If yes: Do you use it actively? In what way? What software programs? How was it implemented in your work? Have you experienced any resistance towards adopting AI in your profession?
If no: What is your knowledge of AI? Is it an active decision not to use it? Is the topic being discussed at all at your company/amongst colleagues/design community?

Yes. We don't use AI in our work

Has AI changed the way you work? *(E.g. the creative process/the way you approach a project)* **Has it opened up for new possibilities? Or do the traditional tasks remain but being performed with AI as an aid?**
No it haven't. It still doesn't do what we are doing.

Have you noticed any change in the past few years when it comes to client behavior, due to AI development? *(E.g. change in requests or increased ability to create design themselves with sites such as PageCloud and Wix)*
I totally agree if you are ex a Wordpress developer you are worried about pages like Wix but we do more difficult things that what they can offer :)

Do you feel positive or negative towards AI? *(Describe why)*
Good! I think a lot of people can benefit from it

Do you believe that AI is adding/can add value to your profession? *(Describe how/why)*
Working with AI would be great as an add-on

Do you think AI technologies has a future when it comes to creative work? In what way? *(Reflect on computers ability to be creative. Could a computer take your job or will AI only serve as a mere tool?)*
Not creative work. Because there is no wrong or right in design for example. So how would you program that for AI Is the question…

Follow-up questions:

You have answered that you know about AI in your profession. Where can it be found? How is it used? Any specific programs you know of?

You have replied that you do not use AI due to lack of capacity. Does this apply to any specific tasks? What does your work processes look like?

Would you let AI do your work if it could? Any specific work areas where you would like help from AI?

Do you use any Adobe software?

No answers to follow-up questions.

Interview - Participant no. 4 (text correspondence)

Country: Latvia

<u>**Intro questions:**</u>

What is your job title?
Senior Designer

How old are you?
30

How long have you been working in this profession?
9 years

What are your daily tasks?
Ideation, research and design of digital products (WEB pages, landing pages, web based mini games), art direction and graphic design for advertising. Design mentoring, overseeing and reviewing design projects.

What software programs do you use?
Figma, Adobe CC (mainly Ps, Ai, Ae), Sketch with considerable amount of 3rd party plugins

<u>**Main questions:**</u>

Are you aware of any AI technologies in your profession/daily tasks/industry?
I believe I may be implementing tools with at least some amount of AI more than I am aware of, as I use software and online tools mainly to get the job done without knowing the technological side of them. There are some online tools that help in micro tasks such as remove.bg, Colormind or in exploration and experimental stage helping to loosen up the ideation process in a playful way, but I can't say there is a pattern of use. I believe there is an amount of AI in software as well as plugins that are being used seamlessly in the daily workflow, as we're always looking for new ways to automate and speed up repetitive processes. I think there is no resistance to AI powered tools in the agency, we're open to various kinds of technologies and experimental tools if they help in getting the job done or simply in playing around and getting some inspiration.

Has AI changed the way you work? *(E.g. the creative process/the way you approach a project)* **Has it opened up for new possibilities? Or do the traditional tasks remain but being performed with AI as an aid?**
As I mentioned before we're embracing tools that help speeding up the process and deliver with precision, especially in WEB and UI design where various plugins help to automate processes that previously have been repetitive or manual. I have to say that the team and community of Figma has been doing a great job and more and more helpful plugins are introduced on a weekly or even daily basis. These help not only in the design process, but also in communication and handing off the design to developers - this being an issue that has dramatically improved by introduction of collaborative software.

When comparing the existing tools to those when I started my career 9 years ago I'm quite astonished how tools have developed and improved to help automate processes that previously would've been very repetitive and time consuming. The names that haven't changed - Adobe Photoshop, AfterEffects - also have improved and manipulation of photography and video footage has become faster and easier. In a way design and creativity follows the software and there are things only made possible by the developing technology - our creative director has been playing around with technology regarding deepfakes as well as Spark AR Instagram filters and we've also completed some projects for our clients using the technology.

Have you noticed any change in the past few years when it comes to client behavior, due to AI development? *(E.g. change in requests or increased ability to create design themselves with sites such as PageCloud and Wix ADI)*

Of course there are always clients who require editable designs and to some degree designing is also made possible by the CMS, but I haven't noticed a changed pattern in our agency as we take on projects that can be tailor made. I believe client behavior will change thou as the software becomes more and more collaborative, intuitive and easy to use.

Do you feel positive or negative towards AI? *(Describe why)*
I feel very positive of AI regarding design, motion and creative fields as it opens up possibilities for creative solutions, but somewhat anxious towards it regarding information, media and risks towards democracy.

Do you believe that AI is adding/can add value to your profession? *(Describe how/why)*
AI is helping to eliminate time consuming but rather dull processes leaving more time for the creative part, but in the meantime there is a risk of speeding and being a mere operator of the technology. AI can be used wisely thus helping in the value creation and there is also the possibility of developing creative AI powered solutions per se and letting the AI be the core of value creation.

Do you think AI technologies has a future when it comes to creative work? In what way? *(Reflect on computers ability to be creative. Could a computer take your job, or will AI only serve as a mere tool?)*
I believe computers can be creative enough for some cases and apt enough for simple visual design but I am doubting that the lack of human insight and research could be appropriate for every problem, especially in complex or large scale projects. I believe AI and automation will be more and more implemented in digital design and micro tasks, but it will still be subject to creative human individual with ideas and insights.

Interview - Participant nr. 5 (text correspondence)

Country: Sweden

Intro questions:

What is your job title?
I work as a web developer and a web designer. I do it all!

How old are you?
I'm 28 years old

How long have you been working in this profession?
I've been working at (…) since I left school. So I've worked in this field for 3,5 years now.

What are your daily tasks?
To help our current customers with updates and changes and also to develop new sites. I would say it's 60% updates and additions to live sites and 40% developing new sites.

What software programs do you use?
I use Wordpress 95% of the times but my hope is to start building more in a CMS called Kirby

Main questions:

Are you aware of any AI technologies in your profession/daily tasks/industry?
If yes: Do you use it actively? In what way? What software programs? How was it introduced/implemented in your work? Have you experienced any resistance towards adopting AI in your profession?
If no: What is your knowledge about AI? Is it an active decision not to use it? Is the topic being discussed at all at your company/amongst colleagues/design community?

I am aware of AI but it's not something I come across on a daily basis. We have a lot of different clients but AI is still quite new and very few of our clients use it or want if involved with their website.

I don't use it often, but I do use an isolating tool (to get backgrounds of images) which is really cool. A friend from school actually send me a link and I tried it out. I don't always use it, because it's not perfect, but if I want a quick fix its great! https://www.remove.bg/

I haven't felt any resistance against AI but it has to help you or make your workflow better. In the future I'm sure AI will be great and used a lot. Talking about resistance, I have a feeling that AI in the future could make the coding part of web development disappear.

Has AI changed the way you work? *(E.g. the creative process/the way you approach a project)* **Has it opened up for new possibilities? Or do the traditional tasks remain but being performed with AI as an aid?**
As I said in the first question, it hasn't really changed to much for me personally yet. I'm sure I could work with it more, but as of today it doesn't really change a lot for me.

Have you noticed any change in the past few years when it comes to client behavior, due to AI development? (E.g. change in requests or increased ability to create design themselves with sites such as PageCloud and Wix ADI)
This is a great question. We can't really compete with Wix and PageCloud and the flexibility they have. But with pagebuilders comes quite a few problems. They tend to slow down pages quite a lot, so you have more scripts and stuff loading and specially when it goes responsive (Mobile & Tablet). And speed is key nowadays when it comes to websites. The other thing with pagebuilders is that the client has too much freedom. If I build a website and then hand it over to the client they can fuck it up in minutes. If they are not a designer themselves they may

change colors, use the wrong font family or font size. A really nice website can be destroyed really fast with too much freedom for the wrong persons.
You can build in quite a lot of flexibility in content and images, but the visual part should be limited.

Do you feel positive or negative towards AI? *(Describe why)*
I feel positive, but I think it possibly could make me as a developer less needed. The coding part could and probably should be created by AI and not by hand. But as of today the tools like Adobe Dreamweaver and other sitebuilders are way too weak. Pagebuilds inside Wordpress itself is quite good though. I´ve used a pagebuilder called Elementor to certain clients. We use it often if clients have a small budget and want the site quick.

Do you believe that AI is adding/can add value to your profession? *(Describe how/why)*
Yes, it does. If I would be able to just design, not code, in the future I think websites would be cheaper. That's not good for me as a developer or for (…) as a company, but for clients it would.

When it comes to the design part, I'm a bit more sceptic. I've watched a lot about AI on Youtube. I actually saw a TED Talk about it the other day and there are some issues when you ask the AI a question and how it makes it real. I think it was a human shaped thing which they told to get from point A to B and it didn't run as humans do. It started rolling over like a freak instead because it didn't know how humans run. In the same episode they told the AI to come up with new names on colors and new flavours of ice cream. It went horribly wrong.

Do you think AI technologies has a future when it comes to creative work? In what way? (Reflect on computers ability to be creative. Could a computer take your job, or will AI only serve as a mere tool?)
I think I more or less answered this in the previous question. I think they can replace the coding part but the design part will be more complex. It could happen, but I think it's harder.

Interview - Participant no. 6 (text correspondence)

Country: Sweden

Intro questions:

What is your job title?
UX Designer

How old are you?
50 years

How long have you been working in this profession?
18 years

What are your daily tasks?
- Managing UX-pattern libraries
- Managing Persona galleries
- Creating UI-component requirements
- Designing UX concepts
- Creating UX artifacts: User journeys, wireframes, prototypes

What software programs do you use?
- Adobe XD/Creative Cloud
- Excel
- Keynote/Powerpoint

Main questions:

Are you aware of any AI technologies in your profession/daily tasks/industry?
For helping designers in their daily tasks:
thispersondoesnotexist.com – I use it for generating portraits of people when creating example data in UX-artifacts. I learned about the resource through social media.

For the organisations we design solutions:
Chatbots – I´ve been part of creating requirements for chatbots. But I personally think this kind of solutions provides sub-par UX in comparison to what they replace.

(…), as an organisation, have had discussions on how to introduce AI in our solutions. But we are just dipping our toes in actual implementations. Still only very basic, novelty based, solutions created…

Has AI changed the way you work? *(E.g. the creative process/the way you approach a project)* **Has it opened up for new possibilities? Or do the traditional tasks remain but being performed with AI as an aid?**
Not yet, I work pretty much in the same way as 10 years ago.

Have you noticed any change in the past few years when it comes to client behavior, due to AI development? *(E.g. change in requests or increased ability to create design themselves with sites such as PageCloud and Wix ADI)*
Not really, maybe it is the lack of authenticity and personality in the results that shines through.

Do you feel positive or negative towards AI? *(Describe why)*
I´m generally positive to AI for analytics and to be used as part of a creative process. But I feel the introduction of AI in organisations for replacing human labour is the wrong way to go.

Do you believe that AI is adding/can add value to your profession? *(Describe how/why)*
Yes, for augmenting creative output. By using AI we can introduce "happy accidents" into our creative processes and create things we would never had been able to create on our own.

Do you think AI technologies has a future when it comes to creative work? In what way?
(Reflect on computers ability to be creative. Could a computer take your job, or will AI only serve as a mere tool?)
Yes, as a creative tool to introduce elements of surprise into a creative process. But still, it needs to be heavily curated by human designers.

The fact that we are talking about digital design lends us some unique opportunities. All parts of the process can be managed inside the digital domain. I could see a future where AI is extrapolating design concepts into actual implementation, thus automating some of the heavy lifting in digital design.

At some point I expect AI to bridge the gap between digital design and UI-development. I expect that the GUI code could be synthesized based on the design output. Maybe this will merge the digital designer and front-end-developer into one profession?

Interview - Participant no. 7 (face-to-face)

Summary of interview (edited according to participant's feedback)

Country: Sweden

Intro questions:

What is your job title?
Art director (previously graphic designer)

How old are you?
27 years old

How long have you been working in this profession?
4 years (3 years working for (…))

What are your daily tasks?
Concept and ideas, branding concept, identity concept, film and photography, styling, set design and motion design. I'm responsible for the design process and my role is to make sure that the colours, typography and layout has the right proportions and that the composition is correct. That it's all harmonizing together. In the end, it's about communicating the right message.

(…) has 38 employees. The size of the working teams varies, depending on project and the budget, could for example be between 3-10 people. The main team is always the product manager, copywriter and art director. Sometimes a motion designer, filmmaker and photographer.

What software programs do you use?
InDesign, Illustrator, Photoshop, Sketch (when working with web design), After Effects, Keynote (doing layouts in Keynote because you can export files, do movies, animations etc.)

Main questions:

Are you aware of any AI technologies in your profession/daily tasks/industry?
Not so much in my profession or in my daily tasks, because I work so much with concept and ideas. Does Pinterest count? I always use it in the beginning of a project, because I want to create mood boards and Pinterest is a good program because its based on the images that I've saved in my mood boards. It comes up with new ideas and suggestions. I think Pinterest is learning how I think.

Other than that, not so much. Maybe when I create some ads for social media. Together with the copywriter we have to figure out what kind of text and images are best for the ad. But not so much, I can't come up with any other ideas than that. I think our customers (Husqvarna) work with AI when they develop their products. And I think, if the customers do more development in AI, maybe we can come up with crazy ideas. Like how can we communicate this new product or this new service to your customers. But I don't think we're there yet.

Follow-up question: Do you think that the client needs to be pushing that a little?
Maybe. We as an agency could do that job too, but I think maybe it's hard to come up with those ideas if you don't know, or the customer don't have that developing team.

Is AI something that you talk about within the company or the industry?
Yes, often. (…) as a company is very curious and interested in learning new things and new technologies. And our CEO (…) is very curious as she always wants us to come up with new ideas and think in new ways. So, I think in the future I'm sure that we are going to learn more about AI, maybe go to some lecture or have some presentations from people in the business coming here, talking about AI. Because I think my colleagues and even I are very interested in learning AI.

Follow-up question: But you haven't really gotten there yet?
No, I haven't. Perhaps my colleagues. Like (…) who's a SEO specialist, working daily with social media, with keywords etc. But I'm not there yet in my role as an Art Director. Maybe in the future.

What is your knowledge about AI? How do you feel like it could help you?
I think in the future maybe it can help me as an assistant. You can have a robot or an AI helping an Art Director or some other people in their daily tasks. Let's say they're really good in logical thinking. So maybe if you have a commercial idea, it's better to ask the robot (or something with AI) if it's a good idea. Maybe they could help in making a better decision and decide what way to go. Sometimes creative persons don't have that kind of logical thinking.

I think that robots are not like humans, so they can't take over my job. I think because they are not so creative and don't have social ability. That's key for being a human. Maybe you can teach a robot feelings but it will take a long time. I think it will take a long time before robots can come up with ideas such as the epic-split for example. It takes a human brain to come up with those ideas I think, but maybe you can teach a robot to think and paint etc. I read about a Japanese company that hired a robot as a creative director. But I think if we can implement a robot or AI in our agency or this business, then maybe we can get help from the robot and we can cooperate and work closely together.

Follow-up question: Would you say AI would be mostly used to help in decision making?
Yes, and helping to be more efficient and maybe in the end it could reduce stress and so on.

Has AI changed the way you work? *(E.g. the creative process/the way you approach a project)* **Has it opened up for new possibilities? Or do the traditional tasks remain but being performed with AI as an aid?** *(E.g. AI is embedded in Adobe software, in many shortcuts functions and tools)*
I don't have a good answer to this. It might have affected the way I work, but I haven't thought about it so much. I didn't know that AI was embedded in Adobe software. I'm using the shortcuts and functions available in the software, but I haven't been thinking about it as AI. It's possible that using these functions saves time and opens up for more time to be creative.

Follow-up statement: It might be hard to see a change since you haven't been in the industry so long, perhaps it would be different if you would have been working for 20 years or so.
Yes, but I see in my colleague (…), who has been working here for 20 years (I think) and he is so fascinated about macros. Like macros in Photoshop and you can record if you're editing a video or editing an image, you can save all those steps you are going to do, and then you can play and you can just apply those edits to another image or another layout. I think you can even download those assets from internet. But not sure if that's AI.

Follow-up question: Would you say that you're open to learn more about it and try to implement more AI in your processes?
Yes, I'm very interested in AI, so it would be fun to learn more about it.

Have you experienced any resistance towards AI? Has someone expressed worries when discussing it amongst your colleagues?
We work a lot with business to consumers. For example the painting tool company (…), that have products in painting stores like Colorama, Happy homes etc. I think the more online retail and online shopping develops, you have to come up with new ideas with the physical store, like a customer experience more than a traditional store. Otherwise people will shop online. So, that's something we talk about very much. How can we do communication in the physical store to bring people there, so they don't go to the online shop. But I think if you can implement more AI, like 3D presentations, to see collections of clothes or stuff like that, maybe you can find something new in the physical store. So it can remain. Not in the same way it is today, but something new. So that's a threat to us as an agency because we do a lot of printing and most of our job is now based on digital projects, but we also do very much printing. So if the stores

disappears we don't need to do that anymore. So maybe we can implement AI to still have physical stores.

Since you haven't implemented AI yet within the company - Has that been an active decision not to do so? Or do you feel like you just haven't had the time to do it, or its still so new?
For me its still so new, and perhaps that is due to my role, where I don't do it so much. But looking at the web developers, they always try to create new kind of websites and implement new techniques. Maybe they work with it more, that I don't know of. Like my colleague (…), he is a web designer and he always strive to find new ways to create web sites. But I don't know if that's AI.

But I think maybe we can implement AI to one of our customers, as I talked about earlier. Because they are a B2C company and have so much products, but they don't have that online store. I'm not sure, but I think with the new techniques and if customers develop AI in their companies, maybe we can give some ideas and stand behind them and give them support to try more and help them with the things we can. Maybe it can open up for new jobs for us if our customers develop some new techniques and products.

Have you noticed any change when it comes to client behavior, due to AI development? Do people request other things? Have any clients brought up AI at all? Do you discuss different ideas with them? Or functionalities that they want, maybe not understanding it involves AI, but something they've seen somewhere else and want to implement in their project.
Yes, we discuss ideas. I'm not sure if my other colleagues have been discussing that with their customers. We are nine art directors here at (…) and we have different customers. I have my customers, like the company (…) who makes office furniture. And they're not there yet. But I think other companies, like Husqvarna, wants to implement it.

Have you noticed that clients can do more themselves now with the help of AI tools?
Yes, they can manage Wordpress by themselves. And I see that many smaller companies don't come here to (…) because they want to create the website themselves. Maybe it costs too much.

Follow-up statement: So maybe that has had more effect on the industry as a whole but not you as a company cause you work with bigger clients.
Yes, and when we start to work with a client, they might be here for more years than just one project. We develop the whole company - the customer journey, website, photography, product layout. We do so much more than just one thing. So I think the customers who come here want help with the whole strategy, and with more than just one project.

Do you just feel positive towards AI? Or do you have worries?
Not only positive. I've been thinking about one thing read, about what kind of jobs that will disappear in the future. Hopefully not my job. It's predicted that models within photography, and those kinds of jobs, will disappear in the future. Because we can create humans, digital humans who can be used as a model. I think about how that day will look, when I'm standing in the production, making a film production or photography and I have an artificial human. How will that be, when we don't work with real humans?

And influencers for example, how will that be? Many agencies/companies work closely with influencers. One of our customers work with an influencer for one of their projects. So how will that be in the future? Are we going to work with robots or humans? And how will the social media be affected by AI? Interesting to think about but a little bit scary.

What kind of value can AI add to your profession?
Saving time. Reduce stress if we have robots like an assistant in the future. It could be a good thing for the company. A robot is never sick, a robot is never tired. It can work 24 hours without any rest. So in that point its very interesting having a robot in the company as an employee. But I think it's so far away, I think the techniques are not there yet. But I think it could bring very much value.

For (…) as a company, with our curiosity and interest in this subject, maybe we have to develop more about this digital experience. I think many agencies have to learn about it to survive and stay attractive to our customers. Because we don't know what's happening in the future. We are a design studio; we are specialist in film, photography and ideas.And I think we can teach our customers to try and are willing to try new things, new commercial ideas. You don't have to do it in the traditional way, maybe you can come up with an idea that no-one could have thought about today.

Do you think AI technologies has a future when it comes to creative work?
I think you need humans to create AI, like web developers, scientists etc. So, you always need humans to create AI. But if you teach the AI or the robots too much, maybe that can ruin a lot. But I think we can teach them to be creative and with a logical thinking it could be very good for the company.

Afterthoughts:
About the smartphone. We don't need each other, we don't need to visit stores, we don't need this face to face contact. And what will happen with humans if AI develops in that kind of way? If it takes over too much, that's definitely a negative thing with AI. And that was the thought about the concept stores, maybe we can still have physical stores, but implement AI.

I think we have a big role there as an agency, to comes up with ideas like 3D. We are working very much with 3D renderings and instructions movies. And maybe we can try more, because we are very curious. We can do internal projects or for the customer. Sometimes we have ideas that we try on each other and stuff like that. Maybe this could be something that we can think about and try to figure out.