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STRATEGIC DEVELOPMENT, ETHICAL AND LEGAL INTEGRATION OF AI IN
RECRUITMENT: A CASE STUDY OF JOBMATCH IN THE GERMAN GIG ECONOMY

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*The Imperative for Government Protective Measures - European laws to combat the
dangers of AI*

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Abstract

This thesis explores the ever-changing nature of artificial intelligence and how this has created potential dangers that have outpaced regulatory frameworks'. The study scrutinizes European laws addressing AI risks and their implications, emphasizing the EU's forefront role in implementing regulations. Furthermore, Germany's unique regulatory landscape and implications for start-ups are discussed. With a lens on JobMatch, an AI-driven recruitment platform, the study explores the intersection of government measures and startup dynamics. This concept is intended to serve as a guide for AI-centric companies to integrate AI ethically, considering regulatory compliance and ethical standards in their business models for future success.

Group Abstract

This paper explores JobMatch, an AI startup operating in the recruitment sector in Germany. It covers three key aspects: applying the Business Model Canvas for AI startups, analyzing the evolving EU legal landscape for AI, and building a business case for JobMatch. This work focuses on AI-powered recruitment optimization for Generation Y/Z in the gig economy, ensuring compliance with regulations and ethics. This concept is intended to serve as a guide for AI-centric companies to integrate AI ethically, considering regulatory compliance and ethical standards in their business models for future success.

Keywords

Artificial Intelligence, Biases and Discrimination, Data Protection, Data Privacy, Ethics, EU, European Commission, European Parliament, GDPR, Germany, Governance, Innovation, Job Displacement, Law, Legislation, Liability and Accountability, Regulations, Start-up, Security Risk

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Abbreviations

AI	Artificial intelligence
EU	European Union
GDPR	General Data Protection Regulation
DSA	Digital Services Act
DMA	Digital Markets Act
FAICP	Framework for AI Cybersecurity Practices
ENISA	European Union Agency for Cybersecurity
OECD	Organisation for Economic Co-operation and Development
CCGAI	Coordinating Committee for the Governance of Artificial Intelligence
GPAI	Global Partnership for AI
PAI	Partnership on AI
ISO	International Organization for Standardization
IEEE	Institute of Electrical and Electronics Engineers
IEC	International Electrotechnical Commission
BMWK	Bundesministerium für Wirtschaft und Klimaschutz
BDSG	Bundesdatenschutzgesetz
BfDI	Bundesbeauftragte für den Datenschutz und die Informationsfreiheit
BSI	Bundesamt für Sicherheit in der Informationstechnik
DMPA	Deutsche Patent- und Markenamt
MDR	Medical Device Regulation
SME	Small and medium-sized enterprises
DPO	Data Protection Officer
DPIA	Data Protection Impact Assessments

1. Introduction

1.1. Motivation

From chatbots to robotics and cyber security: Artificial intelligence (AI) is already being used by companies and organizations around the world to optimize processes or gain economic advantages (Wuttke, 2023). Although the history of artificial intelligence dates back well into the last century, AI applications did not reach people's everyday lives until around 2011, for example with voice assistants such as Apple's 'Siri' (Bosch Global, 2018). Since then, scientists have continued to work on the development of artificial intelligence and only recently showed what is possible with the help of the technology. With ChatGPT, the US startup OpenAI has triggered a real hype since its launch in November 2022 (Lenssen, 2023). The chatbot is applicable through voice or text and is especially useful for interactive applications, serving as a wellspring of ideas, inspiration, or assistance in organizing texts beforehand (brisant.de, 2023). In coming years, however, the use of AI systems will not be limited to dialog management: experts are convinced that the intelligent analysis of high volumes of data will lead to innovative and lucrative business models. They also believe that AI will have an important impact on many industries and influence business models (Lenssen, 2023). In order to remain competitive, companies must therefore familiarize themselves with the technology. It can be assumed that technological developments will continue to have a major impact on society - also with regard to the world of work. This strong development in terms of ongoing digitalization - particularly in the environment of work - presents new challenges for employers. The correct and well-founded use of new technologies is proving to be an important factor in being a successful employer (Petry & Jäger, 2021). Conversely, employees must have certain digital skills to be able to assert themselves on the labor market. It is crucial for companies that their employees are able to work with AI-based tools (Chichester & Giffen, 2019). This ongoing digitalization means that companies no longer only use the "classic" analogue application

process when recruiting staff. The "classic" application process consists of application documents in paper form and a personal interview. The suitability of the candidate is determined on the basis of this personal interview. Today, most companies use the digital application process by accepting applications exclusively by e-mail or via forms in their own applicant management system. Applicant management systems are software applications with which the application process can be handled efficiently and in a process-optimized manner (Verhoeven & Goldmann, 2020, p. 9). The higher acceptance of digital applications is due to the cost and time savings for both companies and applicants. The postal route of several days is spared and costs for paper and postage are saved. It is clear that digital applications have already established themselves in most companies (Petry, 2018). This trend towards digitalization goes hand in hand with the increased use of AI in business and working life (Verhoeven & Goldmann, 2020, p. 9). There is an ongoing change in digital communication. Chatbots are already being used on a large number of websites to respond to applicant inquiries. CVs can be read by AI-based systems and entered into applicant management systems. For the "human" recruiter, all that often remains is the final selection of suitable candidates (Petry, 2018, p. 51). Nevertheless, there are always drawbacks to such benefits. These include bias and discrimination in the application process and issues with the use of private data. Hence the legal landscape is trying to ensure safe usage of AI systems. This thesis will explore these instances in more depth.

1.2. Problem Statement

The problem of the time-consuming application process, especially for mini-jobs and temporary work, can be reduced by using AI in innovative software solutions. With the increasing popularity of part-time and mini-jobs in Germany, simplifying the recruitment process is becoming increasingly important (Rabe, 2022). Many people are looking for flexible work for a better work-life balance or as an entry into the labor market (McKinsey Global Institute,

2016). AI integrated into the recruitment process can efficiently match candidate profiles with job offers, provide personalized recommendations, and speed up the hiring process. This technology has the potential to quickly and accurately match numerous vacancies with applicants' needs and qualifications. Considering the legal changes related to mini-jobs, AI-powered job matching can support compliance with fair pay and social protection legislation (Fagan et al., 2014). Startups using AI can optimize the application process and ensure fair pay and social protection for workers, which is crucial in the expanding gig economy in Germany. AI plays an important role in simplifying the recruitment process for short-term, project-based jobs or freelance work that is offered via online platforms and apps.

Following the COVID-19 pandemic, companies are focusing on cost-effective hiring by moving away from face-to-face interviews and on-site assessments due to cost and time constraints (Cox, 2020). This has led to a digital transformation in recruitment and an increasing use of AI to assess applicants (Statista, 2020, Appendix 1). Filling positions quickly is particularly important, especially given the increasing demand for mini-jobs and temporary positions in Germany (Statista, 2022a). Lengthy recruitment processes could trigger or accelerate an economic recession by increasing the number of unfilled vacancies (Statista, 2022b). Sectors such as transportation services, delivery services and the creative industries are particularly affected.

Many people in Germany use online job platforms and apps for temporary work (Deloitte, 2023; Pew Research Center, 2021), where AI simplifies the application process. Workers are looking for diverse work opportunities that meet their needs, contributing to the projected gross volume of the gig economy, which is expected to reach 455.2 billion US dollars in 2023 (Statista, 2022; Appendix 2). This trend allows individuals to have more control over their schedules and sources of income, while employers can manage fluctuations and participate in special projects. To meet the demands of employers and employees in the gig economy, application processes

need to be optimized. AI-based platforms can efficiently match job seekers with temporary positions and thus contribute to a faster matching of supply and demand (Baethge et al., 2019). Studies confirm the continuous increase in online job searches and the use of platforms (Zils, 2014; Statista, 2021, Appendix 3).

The main goal is to simplify the connection between job seekers and companies, especially for temporary work, as manual job searches and applications via multiple channels can be time-consuming. In Germany, despite the widespread use of smartphones for job searches, few apply directly via mobile devices, indicating untapped market demand. Statista (2020) shows that over 90% of job seekers prefer to search for vacancies on mobile devices (96.4% in other companies and 94.1% in IT companies), with over 88% intending to apply via mobile devices (91.1% in other companies and 88.2% in IT companies) (Statista, 2020). The development of mobile-first applications with AI integration could significantly increase efficiency.

In addition to the challenges associated with the integration of artificial intelligence (AI) in recruitment processes AI startups face specific challenges regarding their business models. The Business Model Canvas, a proven tool for visualizing business models, can also be applied to AI startups. However, it is important to note that while the Business Model Canvas can serve as a tool for developing and analyzing business models for various startups, applying it to AI startups requires certain adaptations (Shevnina, 2022). The various segments that lead to business success for AI startups are primarily characterized by digital services, customers and the possibilities offered by the technology. The application of AI decisively shapes the business model of startups. Startups must therefore precisely take into account the unique challenges of AI integration, including data management, model development and ethical considerations. This ensures a targeted analysis and development of successful business models in the context of AI compared to conventional startups.

However, the increasing integration of AI in various areas of our society not only brings

numerous benefits, but also poses significant legal risks and ethical concerns. The application of AI systems is not only used in human resources, but in a wide range of other areas such as healthcare, finance, law and other sectors, leading to challenges in terms of data protection, discrimination, liability and transparency (Barton & Pöppelbuß, 2022).

The use of AI algorithms can lead to unpredictable outcomes that raise legal liability issues. If decisions are made on the basis of AI-based predictions or analyses, liability in the event of errors or biases in the algorithms could present a complex legal issue (Oletzky & Reinhardt, 2022). In this context, there is a risk of violating data protection regulations if AI systems collect and process sensitive personal data without taking appropriate security safeguards. This could lead to non-compliance with data protection laws and potentially result in legal consequences (Vogel, 2022). Another significant risk is the potential for discrimination by AI algorithms. If they are trained on historical data that reflects pre-existing prejudices or inequalities, they could reinforce or reproduce these prejudices and thus lead to discriminatory decisions (Wachter, Mittelstadt et. al., 2021). The above-mentioned legal risks and ethical concerns related to the use of AI technologies are not limited to specific sectors but affect a wide range of applications and services. These challenges urgently require clear and comprehensive regulations to minimize the risks and ensure the responsible use of AI (van Giffen, Borth et. Al, 2020).

To return to the context of recruitment and the labor market, the integration of AI in recruitment processes further exacerbates these challenges. The use of AI for candidate assessment and selection could lead to potentially discriminatory decisions that contradict legal requirements and ethical principles. These dangers emphasize the need for increased regulation, monitoring and further development of AI applications in recruitment to ensure that they are effective, fair, transparent and ethical (Carstensen & Ganz, 2023). Due to the ever changing nature of AI, legal bodies are having issues in keeping up with integrating laws as efficiently hence leading to an increasing gap between legislations and AI ethical usage. Nevertheless, international

government bodies like the EU are working thoroughly on creating a safe legal framework (de Almeida et al., 2021). For example, the EU is proposing an AI Act and Germany wants to integrate specific regulations for their “AI made in Germany” certificate.

Further analysis will focus on how AI startups successfully design their business models using the Business Model Canvas and which unique factors are crucial for success in this industry. The research will highlight the specific requirements and challenges that differentiate AI startups from other industries and how these companies can successfully operate in the fast-paced and innovation-driven AI landscape. Ultimately, further research is needed on all the topics mentioned to be able to assess the impact of such innovations on the labor market and develop them successfully.

2. Objectives

This thesis focuses on the development of a solid business plan for a startup based on AI. The focus is on an in-depth examination of various aspects that highlight the opportunities and potential risks of the widespread use of AI in companies.

The paper starts with a thorough analysis of the opportunities and risks in the widespread use of AI. It then explains the distinct considerations in developing a successful business plan for AI startups versus non-AI companies, highlighting key differences. The Business Model Canvas is used as a tool to outline the practical application at JobMatch.

The following section pays particular attention to managing these risks and the necessary regulatory measures at national and European level. Topics such as unclear liability issues in AI system decisions, data protection issues in sensitive data processing, algorithmic bias and the need for clear legal standards and ethical principles for AI deployment are explored. Ensuring accountability, privacy, fairness and regulatory compliance is critical to increasing trust in AI technologies and minimizing potential legal conflicts. This analysis predicts

potential developments in regulations and laws and their impact on JobMatch's business idea.

The third section focuses on the use of AI in the field of recruitment. The innovative business idea of JobMatch is presented, which aims to solve long-lasting recruitment processes. A detailed business plan will be developed, outlining potential solutions to this problem and highlighting the prospects of success through the implementation of this idea. In particular, the recruitment processes for short-term jobs in the German gig economy are analyzed to show how targeted AI approaches can make the application processes more efficient for companies and workers, which could ultimately lead to time and cost savings. This comprehensive investigation considers different perspectives and hypotheses to provide a comprehensive insight into possible solutions and to explore the scope of these innovations.

In recent years, the labor market in Germany has increasingly focused on flexible forms of employment such as mini-jobs and part-time work. This development is reflected in forecasts that show a growing interest in short-term work opportunities and a growing gig economy in Germany (Statista, 2022). Studies by the German Federal Statistical Office indicate robust growth in the app market of around 6.34% (CAGR 2022-2027), which points to continuous expansion and growing demand for innovative work solutions. As early as 2022, mobile apps in Germany generated total sales of around EUR 3.06 billion in 2021. In 2022, this figure rose to 3.43 billion (Statista, 2022). Against this background, the following hypothesis is made:

“The market entry of JobMatch in Germany against the current flourishing labor market and increasing demand for flexible working conditions holds considerable growth potential for the short-term employment sector.”

The hypothesis is based on the assessment that the German market represents a promising environment for the introduction of JobMatch. By targeting mini-jobs, part-time work and the

gig economy, in combination with a thriving app market, it is assumed that JobMatch can make a significant contribution to closing the gap between job seekers and companies. A detailed investigation of this market and the specific needs of the target groups could help to further clarify and validate the market entry and growth potential of JobMatch.

Moreover, the attraction of flexibility in work and the increased interest in short-term and part-time employment, especially among young jobseekers, is now more recognizable than ever (Denzel, 2023). Generations Y and Z are known for their increased affinity for mobile solutions, especially with regard to job search, which is why the following hypothesis can be put forward (Karácsony, Izsák, et al., 2020):

„ Given the attraction of flexibility and the support of Generation Y and Z for mobile job search solutions, JobMatch is expected to experience rapid acceptance and adaptation among young jobseekers and companies in Germany. ”

Given the trend towards temporary and flexible employment opportunities, as well as the increasing importance of mobile applications for job search, the study of user acceptance and adoption of JobMatch is of great importance to gain insights into the potential effectiveness and relevance of this platform in today's labor market. Through this analysis, potential trends, challenges and opportunities for the platform can be uncovered. This can not only deepen the understanding of the effectiveness of JobMatch, but also provide valuable insights for future developments and the optimization of similar platforms.

The integration of artificial intelligence (AI) into the recruitment process is also having a significant impact on the way employees and companies work. It is becoming evident that traditional recruitment methods no longer meet requirements in view of the increasing need for flexibility and adaptability (Dijkkamp, 2019). The following hypothesis has therefore been

formulated:

„The integration of AI in recruitment processes has a significant impact on the way workers and companies work, their flexibility and employment patterns. “

The premise of this hypothesis is based on the observation that the integration of AI into recruitment processes holds enormous potential by increasing the speed, accuracy, and personalization of job placements. In particular, the growing "gig economy" and the trend towards short-term, project-based employment relationships as well as the increasing use of online platforms for job offers underline the need for efficient and agile job placement (Kuhn, Meijerink, et. Al., 2021). It is expected that investigating this hypothesis will not only provide insights into the effectiveness of AI in recruitment, but also highlight potential impacts on the employment landscape and working patterns (Mukherjee & Krishnan, 2022). By analyzing the impact of AI-enabled recruitment technologies on workforce flexibility as well as on the adaptability of companies, a deeper understanding of changes in the labor market could be gained. This could help to develop more effective strategies to improve the recruitment process and enable a more accurate matching of supply and demand in the labor market.

The increasing integration of AI technologies in general is a promising innovation without a doubt. However, it also poses legal and ethical challenges, especially in terms of compliance with laws and regulations (Beck, 2020). Hence, a comprehensive overview and understanding of the current laws and regulations established at the EU level and German national level, with a specific focus on those directly linked to the perils of AI The following hypothesis therefore requires thorough investigation:

„The increasing regulation and governance of AI in the recruitment industry will be a challenge for JobMatch, but at the same time requires the creation of ethical guidelines and compliance measures. “

Given that JobMatch will be founded in Germany, this goal ensures a thorough understanding of the specific legal framework related to AI perils, filling a current gap in available resources. This is critical to ensure that the platform is not only efficient and user-friendly, but also meets ethical guidelines and complies with legal requirements. The hypothesis provides an anchor point for research by pointing out potential problem areas and creating a foundational understanding of the regulatory landscape within the European Union and Germany. It encourages an investigation into the dangers of AI in general and the necessary governmental safeguards and European legislation already in place to understand how JobMatch can meet these requirements while providing innovative solutions for the recruitment sector.

A deep exploration of this hypothesis can also help develop best practices and recommendations for other companies or platforms facing similar recruitment challenges using AI. Ergo, generating a comprehensive report that serves as a blueprint for AI startups and entrepreneurs, outlining all pertinent AI-related regulations and considerations during the founding phase, especially those related to the perils of AI. This aspect is of great importance as it could not only improve the performance and success of JobMatch, but could also contribute to the development of industry standards that promote the acceptance and application of AI in the recruitment sector.

To summarize, this thesis describes the strategic foundation for JobMatch, an innovative AI-driven startup in the German recruitment industry. It navigates the opportunities and risks of AI and outlines a unique business plan. The study predicts significant growth potential within the evolving German labor market, tapping into the technological preferences of Generations

Y and Z. The thesis emphasizes the transformative impact of AI on recruitment and highlights the need for compliance with evolving regulations and ethical standards. It is intended not only to serve as a guide for JobMatch, but also to provide a blueprint for AI-centric companies that promote ethical integration of AI into recruitment. This work not only outlines JobMatch's journey, but provides a course for conscientious AI innovation in recruitment and is a crucial step towards thoughtful and impactful AI integration in the industry.

3. An introduction to the literature

As mentioned above the rapid evolution of AI has ushered in a new era of technological advancement, particularly in the realm of startups. This brief literature review showcases our most important topics which are crucial aspects shaping the success of AI startups, encompassing the adaptation of the business model canvas, pertinent European and German regulations, and their implications on emerging ventures. By navigating these intricacies, we aim to construct a comprehensive business plan for the AI startup JobMatch.

Success Factors of AI Startups: Understanding the success factors inherent in startups and AI startups is paramount for sustained growth and innovation. Literature suggests there are nine main building blocks for the Business Model Canvas which encompass: the value proposition, customer segments, channels, customer relationship, revenue streams, key resources, key activities, key partnerships and cost structure (Osterwalder et al., 2010). The ability to navigate these elements is crucial for AI startups to thrive in a dynamic and competitive landscape. Key literature documents include reports on proven success factors of startups and in depth analysis of the business model canvas.

Adaptation of Business Model Canvas for AI Startups: Traditional business models provide

a framework for success, yet the unique nature of AI startups necessitates adaptation. Drawing on the literature, this thesis explores how elements of the business model canvas, such as value proposition, customer segments, and revenue streams, are uniquely tailored to suit the dynamics of AI enterprises. Special attention is given to considerations like data acquisition, customer knowledge, and the intricacies of delivering AI-driven value.

European and German Regulations on AI with regard to AI dangers: As AI technology advances, so do the regulatory frameworks governing its deployment. European regulations, notably in Germany, play a pivotal role in shaping the ethical and legal landscape for AI startups (Campbell, 2019). This section reviews existing laws, with a focus on GDPR implications, ethical guidelines, and other pertinent regulations shaping the responsible use of AI. Key literature resources include legal documents and proposals by the European Union, European Commission, European Parliament and the Bundesregierung.

Implications of Regulations for AI Startups: While regulations aim to ensure responsible AI practices, they also pose challenges for startups. Given strict data protection and liability laws, startups must exercise caution from the outset, as breaches of these regulations can incur high costs. The literature review delves into the potential implications of these regulations on the operations and strategic directions of AI startups such as JobMatch.

JobMatch - An AI Startup: JobMatch is introduced to ground the exploration, positioning itself to navigate the complex landscape under discussion. By applying insights from the extensive literature review, an examination is conducted to assess how JobMatch aligns with identified success factors and legal considerations, providing a practical lens through which to comprehend theoretical concepts.

JobMatch Business Plan: Building on the insights gained, a concise business plan for JobMatch is constructed. This includes considerations of its unique value proposition, revenue model, target market, customer journey and strategies for compliance with relevant regulations. The business plan serves as a tangible application of the theoretical insights garnered from the literature review. Furthermore, it serves as a blueprint for other AI startups in the future.

This literature review synthesizes current knowledge on the success factors of AI startups, the adaptation of the business model canvas, and the regulatory landscape in Europe and Germany. By applying these insights to a real-world scenario with JobMatch, we bridge the gap between theory and practice, providing a comprehensive foundation for understanding and navigating the multifaceted challenges and opportunities in the AI startup ecosystem.

4. Methodology

The methodology used in this thesis includes a comprehensive and extensive search of various academic databases, legal documents, and market analyses. The primary objective is to discern the success factors, potential perils and legal dimensions associated with artificial intelligence (AI), with the ultimate goal of formulating a robust business plan for the AI startup, JobMatch. This investigative approach involves a conscientious examination of existing literature, industry reports, and legal frameworks to extract valuable insights crucial for guiding the strategic development of the AI venture.

The research design is anchored in the synthesis and analysis of existing studies conducted by scholars and experts in the AI field. By aggregating and scrutinizing this knowledge, the thesis aims to make a meaningful contribution to the existing body of research, fostering a comprehensive and holistic understanding of the current state of AI knowledge. Through this process, the research endeavors to identify key trends, challenges, and opportunities that will

inform the strategic decision-making processes crucial for the success of JobMatch in the dynamic landscape of artificial intelligence. The search strategy utilized for this work includes the following keywords and search terms: “Artificial Intelligence”, “Business Model Canvas”, “Success Factors”, “Legislation”, “Law”, “Germany”, “EU”, “Europe”, “European Parliament”, “European Commission”, “GDPR”, “Data Protection”, “Regulations”, “Biases and “Discrimination”, “Liability and Accountability”, Security, “Ethics”, “Risk”, “Governance”, “Financial Forecast”, “Entrepreneurship”, “Forecast”, “Future of work”, “Digital business”, “New product development”, “Financial Viability”

4.1. Selection Criteria

Selection criteria for relevant literature are explicitly defined, encompassing research articles, market analyses, surveys, and legal documents focusing on AI. Specific inclusion and exclusion criteria are established to ensure the quality, importance and relevance of the selected literature. The inclusion criteria consist of up-to-date articles encompassing a broad range of AI topics to formulate a comprehensive view to answer the above mentioned hypotheses. Specifically for legal documents, an inclusion criterion is that the articles considered should not be older than five years. Similarly, the data used for the market analyses for the potential of JobMatch is not older than five years to assure accuracy. This criterion is implemented to uphold the accuracy of the provided data and ensure the relevance of the contributions made. Exclusion criteria are studies that did not focus on AI, startups, or current digital legislations.

4.2. Primary method of data collection

The primary method of data collection involves a thorough review and analysis of existing studies, surveys, and documents pertaining to AI success, challenges, and implications for startups with regard to legal significance. These include research from the European Parliament, European Commission, McKinsey, Statista, and analysts in the artificial intelligence field. The literature is systematically categorized into themes such as success factors for AI startups,

European laws to combat the dangers of AI and the business plan of the startup JobMatch. Utilizing a qualitative synthesis approach, such as thematic analysis and content analysis, this study aims to identify patterns, trends and contribute new findings and recommendations to the existing body of research.

The findings have been synthesized and structured by subtopic to provide a comprehensive overview of the present research status regarding the subject. takes into account investigations from diverse research fields, including economics, psychology, sociology, computer science, and management.

4.3. Ethical Consideration

Ethical considerations are paramount throughout the review process, emphasizing the responsibility to accurately represent and cite the work of other researchers. Proper citation and referencing are integrated into the literature review to uphold academic integrity. To strengthen the validity of the findings, a triangulation approach is applied, such as cross-verifying information from different sources. This method allows for the identification of areas of consensus and divergence within the existing literature

Reflection on the implications of the synthesized findings for the AI industry and the establishment of a startup is integral to the methodology. This includes considerations of how legal insights derived from existing research can be applied to the strategic and operational aspects of the startup venture JobMatch. Furthermore, the insights gained from identifying success factors will not only establish foundational objectives for any AI startup but will be particularly crucial for optimizing Job Match's launch.

In conclusion, the methodology underscores the importance of a rigorous literature review process, providing a foundation for understanding AI success, challenges, legal considerations and creating a prosperous business plan.

5. Definitions

This chapter serves to clarify and define basic terms in order to create a basis for a coherent understanding in the following chapters. It aims to create a standardized understanding of key concepts that will enable the reader to have a consistent understanding in the following sections.

5.1. Artificial Intelligence

Although AI has emerged as a hot topic in all areas of society and the economy in recent years, there is still no standardized or generally applicable definition for the term. However, there are many definitions that are intended to illustrate AI. One of the first definitions stems from John McCarthy, who is considered one of the pioneers of artificial intelligence and in 1955 described AI as the goal of developing machines that act as if they possessed intelligence (Ertel, 2016, p. 1).

This is where the component of comparability and approximation to human intelligence comes into play. A special feature of human intelligence is the ability to adapt to environmental conditions by learning and adapting behavior. This ability distinguishes human intelligence significantly from machine intelligence (Ertel, 2016, p. 2). Machine learning, as a sub-area of AI, will also be discussed later in this section. Basically, it is about understanding the mechanisms of thinking and intelligent behavior and implementing this ability in machines. The model for the development of intelligent systems is human decision-making and rational action (Castro & New, 2016).

Another pioneer in this field is the mathematician Alan Turing, who developed the Turing test in the 1950s. This test was designed to check whether a machine was able to think independently by having a test person communicate in writing with a human and a machine. The test person then had to judge which chat partner they thought was the human. The machine passed the test if at least 30 percent of the test subjects thought the machine was the human chat partner. To date, no program has successfully passed this test. So if the Turing test is used as

the basis for defining intelligent behavior of systems behavior of systems, it should be noted that there is still no machine that is on par with human thinking ability (Ertel, 2016, pp. 4–8).

Stanford University's definition, which describes AI as a scientific field and computer technology inspired by how humans use their own nervous system and body for perception, learning, reasoning, and performing actions, also tends in this direction (Stone et al., 2016).

The research and further development of intelligent processes and neural networks draws on knowledge from brain research and cognitive science (Ertel, 2016, p. 3).

5.1.1. Differentiations within Artificial Intelligence

One of the most common differentiations focuses on the following three types of artificial intelligence, also based on human intelligence (Kreutzer & Sirrenberg, 2019, p. 20):

1. Weak artificial intelligence
2. Strong artificial intelligence
3. Super artificial intelligence

Weak AI is constrained to executing a task, reaching at least a human-level proficiency, like engaging in chess, furnishing customer information, or real-time analysis of several data records. The emphasis lies not in mimicking human capabilities but in addressing complex problems. Problem solving goes beyond human cognition and physical capabilities. Strong artificial intelligence, on the other hand, enables technology to optimize and overtake human capabilities. Above all, the ability to self-learn means that the trend is increasingly moving towards strong intelligence. This ability to learn by itself means that a system can grow its knowledge without outside help, using experience data, its own observations, and conclusions. This enhances its ability to solve problems. This skill is expected to lead to a super artificial intelligence that goes beyond the limits of human thought, emotion and action. The human brain would undergo significant improvement, greatly boosting human performance. Linked to this progress is the concept of transhumanism, which involves extending human biology with the assistance of computers. One example of this is the use of prostheses, which enable the

augmentation of impaired body parts and the replacement of destroyed functions using neurotechnological implants. To date, the majority of intelligent systems can be classified as weak intelligence (Kreutzer & Sirrenberg, 2019, p. 20).

5.1.2. Performance components of artificial intelligence

Kreutzer defines the areas AI, neural networks, machine learning and deep learning as performance components of AI (Kreutzer & Sirrenberg, 2019, p. 21).

5.1.2.1. *Neural network*

In order to understand AI, it is essential to deal with one of the most important elements of AI, neural networks. Neural networks consist of three different components, the training data, a model and an algorithm. Hence, the algorithm is able to train the model to eventually decode the patterns in the data. The aim is to imitate the function of a biological system. The term comes from neuroscience, where a neural network is seen as a link between neurons that serve specific functions within the nervous system (Kreutzer & Sirrenberg, 2019, p. 4). Artificial neural networks are based on the organizational principles and processes of biological neural networks and model them using mathematical formulas. Both biological and artificial neurons have the task of receiving, processing and forwarding information (Petry & Jäger, 2021, p. 226). A key feature of neural networks is that information processing is not linear. By connecting the neurons and the special function of processing, parallel processing takes place. Enabling the depiction of complex relationships within the original information, it becomes crucial for neural networks to independently acquire an understanding of these connections. Facilitated by experiential data, commonly referred to as training data, the systems are nourished. A neural network consists of several layers, whereby only the input layer contains raw data. Each subsequent layer is fed with the output from the preceding layer rather than the original data. The AI system gains insights from each transition between layers. The final year, known as the output layer, produces the result's output. The system therefore trains itself in the course of using the original data and rules. This process is known as machine learning (Kreutzer

& Sirrenberg, 2019, p. 4).

5.1.2.2. *Machine Learning and Deep Learning*

Learning algorithms are the base of AI. Machine learning therefore involves the use of algorithms (so-called self-adaptive algorithms) that are capable of self-improvement and are therefore able to learn independently without further configuration by programmers. This requires high volumes of data (so-called big data) that is of high quality and serves as training material. The learning process takes place using training data that is fed into the system. Input data is then used to review and improve the basis for decision-making. Feedback data should enable a further improvement in performance with regard to experience already gained (Kreutzer & Sirrenberg, 2019, p. 6). The more training data there is, the better it is. For example, facial recognition software optimizes itself when thousands of faces are presented from different angles with different facial expressions. The system arrives at increasingly reliable statements and each new input is an additional learning factor (Petry & Jäger, 2021, p. 228). Deep learning refers to a special form of neural networks and is to be understood as a subset of machine learning. AI systems have the capacity to handle a more extensive array of data resources, diminishing the requirement for substantial initial data preparation by humans. Moreover, frequently, more precise outcomes can be provided compared to traditional machine learning procedures. “Deep” indicates the significant number of layers in the neural network. (Kreutzer & Sirrenberg, 2019, p. 5).

In the process of deep learning, specific networks are established to capture extensive input data and analyze it through multiple layers. Optimization occurs through even more expansive internal structures within the neural networks, identifying deep patterns and deep patterns and connections that tie together the present data points. The AI system learns from its own encounters and has the capability to associate fresh input data with the already existing data. The machine progressively learns to construct complex concepts from more simple components. (Kreutzer & Sirrenberg, 2019, p. 8).

5.2. Recruitment

Recruitment is the process of actively identifying, attracting, evaluating and hiring qualified individuals for open positions in a company. It includes various steps aimed at finding, screening, interviewing and selecting candidates who have the necessary skills, qualifications and characteristics to fulfill specific roles within the company. Types of recruitment include:

- **Internal recruitment:** this involves filling vacancies with people already working in the company. This can include promotions, transfers or lateral hires.
- **External recruitment:** Focuses on sourcing candidates from outside the company. This includes methods such as advertising vacancies, using recruitment agencies, job fairs and employee referrals (Sarwary, Faizi; et. al., 2022).
- **Online recruitment:** This type of recruitment uses the internet and digital technologies to attract and hire candidates (Hangartner, Kopp; et. al. 2021). It includes various strategies, such as:
 - **Job boards:** Platforms where companies advertise vacancies and individuals can apply directly online. Examples include Indeed, LinkedIn, Monster and Glassdoor (Zhao, von Delft; et. al., 2020).
 - **Company websites:** Companies often advertise vacancies on their websites and allow applicants to apply directly via the careers page of the website
 - **Social media:** Use of social platforms such as LinkedIn, Facebook, Twitter and Instagram for job postings, networking and contact with potential applicants.
 - **Online networking:** Integration into professional networks and forums to find suitable candidates and advertise vacancies.
 - **Applicant Tracking Systems (ATS):** Software used by companies to manage the hiring process, including receiving applications, reviewing resumes and tracking candidate progress (Kroll, Veit; et. al., 2021).

Online recruitment has revolutionized the hiring process by making it more accessible, efficient and cost-effective. It allows employers to reach a larger pool of applicants, facilitates faster communication between recruiters and candidates, and streamlines the application and selection process. Finally, recruitment methods can vary depending on the needs of the company, the industry and the resources available. Employers often use a combination of internal and external recruitment methods and use online platforms to target and engage with potential candidates (Piwowar-Sulej, Wawak; et. al., 2023).

5.3. Gig-economy

The gig economy is the essence of a modern working world in which short-term, flexible working relationships take center stage. In this environment, individuals - called gig workers - perform temporary or project-based jobs that are largely facilitated by digital platforms or mobile applications. These platforms act as facilitators, matching these workers with clients or customers looking for specific services or tasks (Konrad & Pekruhl, 2017).

One of the most important aspects is the incomparable flexibility it offers. Gig workers can set their own schedules and choose jobs that suit their preferences and lifestyle, allowing for a better work-life balance (Zölch, Oertig; et. al., 2023). Technology is at the heart of the gig economy: digital platforms such as Uber, Airbnb, Upwork and TaskRabbit play a central role by seamlessly bringing service providers and consumers together. These platforms streamline transactions and communication, creating a streamlined way to get work done. Gig workers are typically classified as independent contractors or freelancers, which means they are responsible for their own taxes, insurance and benefits. However, they often do not have the traditional benefits of employment such as health insurance, retirement plans or paid vacation (Plöger & Keuneke, 2021). The gig economy encompasses a wide range of services, from transportation services (e.g. ride-sharing) and food delivery to freelance work in areas such as writing, graphic design, programming and consulting. These jobs are often offered on an on-demand basis to

meet immediate needs and provide convenience to consumers. This phenomenon is not limited by geographic boundaries. It is global and allows individuals to work across borders and organize work remotely. This opens up the possibility for companies to access a larger talent pool and provides opportunities for remote working (Crouch, 2019).

Nevertheless, the gig economy faces criticism and challenges. Gig workers are often affected by job insecurity as they do not have stable, long-term employment. They often do not enjoy the benefits and protection that regular employees enjoy. Critics also argue that the lack of labor protections in this model could lead to worker exploitation. The impact of the gig economy is profound. It is changing traditional work structures and giving rise to discussions about labor regulations and social protections in response to the rapidly changing nature of work (Behl, Rajagopal; et. al., 2022).

5.4. Startups

Startups are innovative and dynamic companies that strive to bring groundbreaking solutions, products or services to the market. They are characterized by their affinity for disruptive innovation and aim to address specific market gaps or unmet needs in unconventional ways. These companies embody the entrepreneurial spirit and are driven by the passion and vision of their founders to make a difference in their respective industries (Horne & Fichter, 2022).

5.4.1. Key characteristics of startups

As innovative companies, startups have certain characteristics that make them stand out in the corporate landscape. These defining characteristics include their operational style and their approach to creating transformative solutions. Understanding these key attributes provides insights into the dynamic nature and unique essence of startups on the road to success.

Innovation and problem-solving form the basis of every startup. They thrive on new ideas and unconventional strategies that aim to overcome existing challenges or fulfill unmet needs. This relentless pursuit of innovation drives startups to offer unique, innovative solutions that

outshine existing alternatives. Agile working and adaptability are the foundation of startups. In a fast-moving, constantly evolving ecosystem, startups show remarkable flexibility (Cuntz & Peuckert, 2023). They respond quickly to market feedback, adapt to change and overcome unforeseen obstacles. This agility allows them to change their strategies or adapt their offering in real time to changing market demands. Risk and uncertainty play a major role in the startup landscape. These companies operate in a terrain full of uncertainties, including aspects such as market acceptance, revenue generation, competition and scalability. Success depends on the ability of founders and teams to take calculated risks while effectively managing and mitigating these inherent uncertainties. Entrepreneurial leadership is a hallmark of startups. Visionary entrepreneurs are at the head of these ventures (Weber, Beutter; et. al., 2022).

5.4.2. Operational aspects and cultural dynamics

Operational aspects play a fundamental role in the development of startups and determine their path to success and their resilience in competition. One of the most important aspects for startups is securing initial funding. This financial support, which comes through various channels such as personal savings, angel investors, venture capitalists or crowdfunding platforms, is the lifeblood that fuels growth, facilitates product development, enables talent acquisition and facilitates the expansion of market reach (Sreenivasan & Suresh, 2023). Equally crucial is the emphasis on scalability and efficiency in startups. Smart startups strategically develop their business models with scalability in mind and aim for rapid expansion while skillfully managing their resources. By leveraging technology and pioneering processes, these companies organize their operations to scale efficiently and avoid disproportionate cost increases despite significant growth (Joseph, Aboobaker & KA, 2023).

Also, the cultural dynamics are a fundamental part of the startup ecosystem. Startups cultivate a vibrant and distinctive corporate culture that emphasizes innovation, collaboration, flexibility and a penchant for challenging traditional norms. These companies often operate as close-knit teams that share a common culture (Cockayne, 2019)

5.4.3. Challenges and potential outcome

Startups, despite their promise of innovation and growth, face significant challenges on their path to success (Trautwein, 2021). These challenges come in various forms: strong competition, financial constraints, market saturation, complex regulations and the constant need to present their value proposition. While a few startups manage to rise and become pioneers in their industry, a significant number of them struggle to achieve sustainable growth or profitability. Generally, startups stand for innovation, agility and risk-taking with the aim of revolutionizing industries and tackling critical problems. Their journey is characterized by resilience, adaptability and the pursuit of breakthrough ideas that have the potential to redefine the market landscape (Wiesenberg, Godulla, et al., 2020). These challenges underscore the dynamic and demanding environment in which startups operate, shaping their strategies and resilience as they strive for success.

6. The Imperative for Government Protective Measures - European laws to combat the dangers of AI

By Antonia Lara Beiss

As mentioned before, artificial intelligence has become a life-changing force in various areas, transforming industries, enhancing efficiency, and enabling innovations previously considered the realm of science fiction. However, alongside these unprecedented opportunities, AI also presents a multitude of potential dangers that demand diligent oversight and regulation. The progression of AI technology has outpaced the formulation of comprehensive, global regulatory frameworks, hence, there is an increasing gap between laws/regulations and AI advancements (de Almeida et al., 2021). Governments worldwide have recognized these perils and have taken measures to safeguard society, uphold ethical standards, and ensure the responsible development of AI. Addressing the dangers of AI through laws and regulations involves a mix of international, national, and regional efforts. The European Union (EU) has been at the forefront of AI regulation and has implemented various laws to address the challenges and concerns associated with AI. Here are some key regulations and initiatives in Europe related to AI perils.

6.1.1. Job Displacement, Loss of Human Skill, and Economic Impact

Even though AI has the potential to increase economic growth, productivity, and efficiency one of the foremost concerns pertains to its capacity to automate tasks traditionally performed by humans, resulting in the displacement of jobs (Moradi & Levy, 2020). A study by the McKinsey Global Institute concluded that up to 800 million jobs may be displaced due to AI and ML automation by 2030 (Manyika et al., 2017). Many companies cut costs by using virtual assistants and AI chatbots which can handle routine customer inquiries (Dr. Varsha, 2023). This can lead to workforce disruptions and unemployment in certain industries. Additionally, this causes economic losses and harms social and psychological well-being, leading to long-term

earnings decline, lower job quality, and negative effects on mental and physical health, social relationships, and family stability (Brand, 2015). Reemployment helps alleviate, but doesn't eliminate, these issues. Moreover, the use of AI may lead to a change in workplace culture, the essence of job roles, and with jobs becoming more complex, higher-level skills are demanded, consequently leading to a shift in the types of jobs available in the market (Tiwari, 2023). Leading to another danger of AI: dependency and the loss of human skills. Relying solely on AI can harm critical thinking, as people might accept AI-generated results without questioning their accuracy or validity. (Mahendra, 2023). As AI assumes roles traditionally held by humans, such as human resource management, customer service, and medical diagnostics there is a valid concern that human proficiency and empathy in these domains could deteriorate (Bankins & Formosa, 2023). The absence of human involvement can result in a breakdown of trust and human connections in vital areas, including law enforcement, medical care, and education (Mohamed, 2023). There are no current laws to combat this issue, however, governments could decide to put a panel on which jobs should be allowed to be “taken over” by AI technologies. Concluding, governments are tasked with implementing protective measures to mitigate economic impacts, such as job retraining programs, and social safety nets through public benefit programs and unemployment insurance (Moradi & Levy, 2020). It is vital to mention that labour and employment laws do already regulate the influence and use of AI in the workspace setting such as min. wage and unemployment protection (Europa Parlament, 2023)

6.1.2. Bias and Discrimination

Furthermore, AI systems can inadvertently show biases ingrained in their training data, causing discriminatory outcomes in areas like hiring, sales, advertising, and consumer choice. Biases arise due to many factors including, wrong data input, technological flaws, and data transparency. AI learning tool models such as artificial neural networks where outcomes are not justified correctly cause black box problems (P.S., 2023). Black box problems are defined as the difficulty in understanding AI data processing models and how they generate decisions

and predictions (Rawashdeh, 2023). These black box problems raise risks to not only firms but also society because they are not easily explainable and further develop biases in the AI system (Roselli et al., 2019). Moreover, research by IBM has found that “the number of biased AI systems and algorithms is expected to increase in the next five years” (IBM, 2018). One of the biggest areas targeted by biases and discrimination is within human resource management. As mentioned earlier, many companies use AI as a tool to help find the best possible candidates within the selection process. However, investigations have shown that there is an underrepresentation in the workplace regarding demographic factors such as race and gender (P.S., 2023). Some companies such as Amazon have recognized issues within their hiring process, such as gender proxies on candidate’s CVs which discriminated against female applicants and have now completely abandoned the development of an AI-based recruitment process (Dastin, 2018). While there are no global laws specifically addressing bias and discrimination in AI, there are international discussions and guidelines on AI ethics. Meaning, governments recognize the gravity of this issue and strive to establish regulations that encourage fairness, transparency, and accountability in AI systems (Mikalef et al., 2022). It is important to mention that there are laws that protect people from discrimination in employment such as the EU Article 21 of the Charter of Fundamental Rights or the US Title VII of the Civil Rights Act, however, these do not explicitly protect against discrimination caused by AI (Hunkenschroer & Luetge, 2022). Rawashdeh (2023) specified two different approaches to regulate biases and discrimination from AI. One is to identify clearly what risks there are and to slow down or even stop the use of AI in certain areas. The European Union is working on creating a comprehensive regulatory framework named the AI Act. Its objective is to ensure AI is developed and used in a safe way that respects fundamental rights (European Parliament, 2023). The AI Act classifies AI systems into different risk levels and demands various requirements, including transparency and conformity assessments for high-risk AI applications (Siegmann & Anderljung, 2022). The

act shall be passed before the end of 2023 (European Parliament, 2023). Please see Appendixes 4 and 5 for more information. This framework would restrict the use of deep learning systems in high-risk areas, while permitting their use in less critical applications (Benjamin et al., 2021). As shown in Appendix 4, risks of biases and discrimination fall into the high-risk category. As per the current EU Government, high-risk systems would face many requirements, encompassing “human oversight, transparency, cybersecurity, risk management, data quality, monitoring, and reporting obligations” (European Parliament, 2023). Additionally, all high-risk AI systems will undergo assessment both before being put on the market and throughout their lifecycle (Benjamin et al., 2021). Generative AI must comply with transparency requirements such as disclosing that the content was generated by AI, implementing safeguards against illegal content and publishing summaries of copyrighted data used for training (European Parliament, 2023). Please see Appendix 5. The second approach Rawashdeh (2023) mentions is a so-called “explainable AI” which entails making deep learning more transparent, and so accountable and fixable. Organizations like the United Nations and the OECD have released recommendations on AI ethics that member countries can use as a basis for national regulation. Please see Appendix 6 for examples. Biases and discrimination are especially important when looking at startups such as JobMatch that use AI for hiring and job matching.

6.1.3. Ethical Dilemmas

The deployment of AI in ethically contentious domains, such as fake news, people manipulation, espionage, or deepfake content, raises moral questions about the responsible use of AI. In some cases, reports have found that employers use technology for power augmentation. This is done by closely monitoring workers, to typically reduce wages and erode work quality. Hence, governments are increasingly engaged in discussions about the ethical use of AI and are formulating protective measures to curb the misuse of these technologies. These laws support the advancement of new technological means by defining and upholding employers' rights to collect, process, and manage workplace data. (Rogers, 2019). As seen in

Appendix 4 ethical dilemmas would be classified as an unacceptable risk AI system. The European Commission has devised the Digital Services Act (DSA) and Digital Markets Act (DMA) to tackle ethical dilemmas. These proposed regulations address issues related to online platforms, digital services, and competition. The DMA aims to create an equitable business environment for all digital enterprises, irrespective of their size. These regulations have a clear list of do's and don'ts and are designed to foster innovation, expansion, and competitiveness, ultimately empowering smaller businesses and startups such as JobMatch to compete with the industry giants (European Parliament, 2023). The DSA empowers users with more control over their online experience. It provides enhanced transparency for content recommendations, allows users to opt out of profiling, and prohibits targeted ads for minors. Moreover, sensitive data use, like sexual orientation or religion, is restricted. The Act improves the swift removal of illegal content, addresses harmful but not necessarily illegal content, and bolsters freedom of speech protection. It also ensures the safety and quality of products sold online, offering users more information about product sellers (European Parliament, 2023). While not AI-targeted, they have implications for the use of AI in digital services and may address issues like content moderation and algorithmic transparency. Additionally, the European Commission has published guidelines on the ethics and trustworthiness of AI. Please see Appendix 7 for the entire list. These guidelines promote transparency, accountability, and respect fundamental rights. While not legally binding, they provide a framework for responsible AI development and aim to build a universal consensus on the ethics of AI.

6.1.4. Privacy Concerns and Data Protection

Another major concern is the collection, processing, and storage of personal data by AI applications since they raise serious privacy concerns. Data breaches and the misuse of sensitive information are significant risks to individuals, companies, and governments. A current example of how major companies use AI that risks privacy is algorithmic timekeeping and scheduling. This includes software's that track when employees clock-in and clock-out,

calculates their net hours per pay period, interfaces with payroll-processing companies and, algorithms to schedule workers for their shifts (Tippett et al., 2017). A real life example of this is the “inactivity reports” for Amazons warehouse workers which track when workers temporarily stop moving (Bauwens, 2015). Resulting in high pressure, inadequate breaks including for bathrooms and religious needs, mental and physical health issues and a serious breach in privacy concerns and data protection (Lieber, 2019). This worker supervision and tracking is solely handled by AI driven systems (Lecher, 2019). Not only do platforms such as Amazon use AI systems to track workers effort and efficiency but also companies such as Uber that “nudge” drivers to profit maximization or customer facing service jobs that use AI systems to track behavioral alignments such as tone of voice or customer interaction (Levy & Barocas, 2018). Causing a fine line between monitoring for profit and exploitation of workers mental and physical capacities, in addition, to eroding their trust, dignity and sense of privacy and autonomy at work. It is imperative to ensure workers and individuals privacy and data protection thereby protecting the quality of work. (Moradi,2020)

Another example of privacy and data protection breach is the use of AI surveillance technologies which are used in a wide range of applications such as facial recognition and predictive analytics to social media monitoring and location tracking (Ergashev, 2023). By means of this, raising questions about fundamental human rights such as the right to privacy and freedom of speech (Ergashev, 2023). In case information is leaked or misused it can have severe consequences for an individual.

Privacy and data protection can also be closely linked to a topic touched on before: the risk of biases and discrimination. AI systems use data that may or may not have been acceptable to use in processes such as a hiring process. Many AI systems conduct background checks and use surveillance technologies to screen and assess the applicant (Thompson, 2020). While this may be more efficient for a company it is a breach against data privacy.

Data protection laws are meant to protect people's privacy, autonomy, identity, and reputation but are currently failing to protect individuals from current AI analytics (Wachter & Mittelstadt, 2018). To address these concerns, governments have enacted strict data protection laws such as the European Union's (EU) GDPR, reinforcing the importance of individual privacy. The GDPR is the most stringent privacy and security law in the world (GDPR, 2020). Although it was drafted and passed by the EU, it imposes obligations and standards onto organizations worldwide, so long as they collect, process, and store personal data from people in the EU (GDPR, 2020). The GDPR imposes severe fines against those who violate its privacy and security standards, with penalties reaching into the tens of millions of euros (GDPR, 2020). Please find the list of GDPR principles in Appendix 8. In addition to the stringent GDPR, the European Commission is working on current proposals for updated e-privacy regulations. E-Privacy regulations, centered on electronic communications data, will consequently influence AI applications (European Commission, 2023). Ergashev (2023) mentions that maintaining awareness of data collection and the utilization of AI requires obtaining informed consent from individuals whose data is being collected, implementing robust encryption measures to safeguard data confidentiality, and adhering to stringent retention periods. Establishing clear policies and regulations to govern the use of AI is crucial, ensuring that individuals retain the right to access and control their own data. Regarding Appendixes 4 and 5 the violation of the data-governance provisions and the use of prohibited AI technologies when using high-risk systems will incur the largest potential fines (Benjamin et al., 2021). Ergashev (2023) suggests that GDPR should continuously be updated as AI is evolving quickly. Next to the GDPR and ePrivacy Regulations, the EU has accepted the proposed Data Strategy and Data Governance Act which entered into application in Sept. 2023. This regulation creates a European data ecosystem that governs data usage in various sectors, introducing a new approach to data governance centered on increasing trust in data sharing. (European Commission, 2023). Since

AI heavily relies on data, these regulations have implications for AI applications to enhance trust, ethical data, and privacy.

6.1.5. Security Risks

Trusting AI in cybersecurity is a double-edged sword (Taddeo et al., 2019). Meaning that in the advancing landscape of AI, both cybersecurity teams and hackers are using AI to their advantage. On one hand, cybercriminals use AI to carry out refined attacks, from deepfakes to data poisoning while on the other hand, cybersecurity organizations increasingly depend on AI to detect threats and flag suspicious data (Morgan Stanley, 2023). Consequently, AI is emerging as a crucial tool in combating cybercrime (Ravichandran, 2023). BlackBerry (2023) reports that "82% of IT decision-makers intend to invest in AI-driven cybersecurity within the next two years, with nearly half (48%) planning to do so by the end of 2023.". The rise of this trend can be attributed to the growing necessity to analyze vast amounts of data to detect and counter cyber threats, among various other factors. Notably, connected devices alone are expected to produce a staggering 79 zettabytes of data by 2025, a quantity far too big for manual human analysis (Columbus, 2021). Hence, Governments must bolster cybersecurity regulations to protect against these risks. The EU Cybersecurity Act is a regulation that establishes a framework for a uniform European certification of cybersecurity products, including those that may use AI (BSI, 2022 and European Parliament, 2023). These are to be certified according to various criteria and assigned the predefined security levels of 'low', 'medium' and 'high'. The Framework for AI Cybersecurity Practices (FAICP), introduced by the European Union Agency for Cybersecurity (ENISA) in response to the EU Artificial Intelligence Act, is a comprehensive set of guidelines for securing AI systems throughout their life cycle (Lekatis, 2023). Please see an explanation of the framework in Appendix 9.

6.1.6. Liability and Legal Ambiguity

Determining liability in cases of AI-related harm is fraught with complexity. As mentioned above AI systems are Black Box problems hence, they are opaque, and decisions made by AI

are not easily traceable and understandable. Another critical factor regarding liability placement with AI systems is the varying levels of knowledge about risks among different stakeholders, including developers, users, affected individuals, legislators, and judges (Zech, 2021).

Governments are working to establish legal frameworks that address the ambiguity surrounding AI-related accidents and assign responsibility when harm occurs. Discussions at forums like the United Nations and G20 can help shape common principles for AI regulation.

Some practitioners propose AI regulations that are based on contractual and extracontractual liability. These liability models behave similarly to strict liability models and distribute responsibility among designers, regulators, and users. An alternative approach involves holding technological systems accountable for their actions by granting a legal identity to each unit (de Almeida et al., 2021). Cerka et al. (2017) argue that “if parties in a contractual relationship may be legally represented by another entity, then so can systems”. However, given the impossibility of seeking damages from a tech system, it cannot be held liable.

Moreover, the dynamic development of AI technologies creates knowledge asymmetries that are essentially the key problem for the development of the legal framework. Currently, national liability rules are put in place since there is not yet one standardized set of rules for the EU for AI liability. National Liability rules revolve around 3 different types: 1) negligence liability, 2) strict liability, and 3) Producer Liability (Zech, 2021). Negligence liability also known as fault-based liability is the default principle world-wide (Zech, 2021). Fault-based liability encourages (third parties or even users) to take precautions to prevent harm themselves. Meaning that in situations where manufacturers and operators fulfill their obligations and are, therefore, not held liable, potential damages become the responsibility of the individual. However, this is not effective in most cases involving new technologies, where the average affected person lacks knowledge about the associated risks. This issue is worsened when there are no opportunities for avoidance, as seen in ubiquitous systems that one cannot escape in everyday life.

To confront the legal difficulties posed by artificial intelligence and contemporary digital systems, there are ongoing discussions about the potential implementation of strict liability regulations, particularly for high risk AI systems (Spindler 2019). Strict liability places the financial burden on the party causing harm, irrespective of whether their actions were deliberate or negligent (Bieber, 2022). This concept was adopted by the European Parliament yet is still constantly being reevaluated. A positive effect of strict liability is societal acceptance. Complete risk internalisation led to an increased public acceptance of the technology. On one hand liability regulations facilitate the development of novel technologies while on the other hand, there are still arguments that say that strict liability inhibits innovation (Zech, 2021). A major drawback of strict liability is the black box problem as cases may appear where distant contributors cannot be detected. In such cases, an immediate causal person acting in accordance with duties might be held liable, while a more distant contributor breaching duties is not (Lohsse et al., 2019 and European Commission 2018). In such scenarios, consideration must go beyond strict liability.

Producer liability may be attributed to commercial actors but not to consumers due to a lack of control. (Zech, 2021). Recently, the European Parliament put forward a "Regulation on liability for the operation of Artificial Intelligence systems" that includes a stringent liability framework for operators (Zech, 2021).

In September 2022, the European Commission unveiled a proposal for the AI Liability Directive, aiming to adapt civil liability rules for AI. This directive, part of the EU's effort to modernize liability frameworks, introduces specialized regulations for AI-induced damages. Its objective is to reduce legal uncertainty and to provide the same level of protection to those harmed by AI systems as those affected by other technologies in the EU (European Parliament, 2022). Key features include a rebuttable 'presumption of causality' to simplify proof of damage by AI, and the authority for national courts to demand evidence disclosure for high-risk AI

systems (European Parliament, 2022). Before its introduction, national liability rules caused uncertainties due to the challenges of identifying liable parties and proving claims for AI-induced harm. However, it follows a minimum harmonization approach, allowing claimants to invoke favorable national laws (European Parliament, 2022). Nonetheless, concerns arise regarding the directive's adequacy, coherence with the ongoing Artificial Intelligence Act negotiations, potential impact on innovation, and the interaction between EU and national regulations.

Lastly, transparency obligations are often considered a crucial component of responsible AI development, as they promote accountability, encourage ethical practices, and facilitate a better understanding of AI technologies by both users and the broader society. Transparency is a widely endorsed approach in AI strategies, emphasizing openness in the production process, including decision-making rules, methods, and training data (Buiten, 2019; Butterworth, 2018; Tutt, 2017). However, achieving complete transparency may be challenging, even with open AI algorithms, as understanding all potential effects goes beyond merely viewing the code (de Almeida et al., 2021).

6.1.7. International and Global Governance

Given AI's global reach, governments are collaborating on international forums to harmonize approaches to AI regulation. The United Nations, G20, World Economic Forum, European Union and other international bodies are facilitating discussions and collaboration to address the cross-border implications of AI and to agree on AI governance and standards. Some benefits of global governance include increased trust among states, advancing AI systems and reducing global risk (Cihon, 2019). The report "Roadmap for Digital Cooperation" 2020 provided recommendations on global AI cooperation emphasizing the need for AI to be "trustworthy, human-rights based, safe, and sustainable, and promotes peace" (United Nations, 2020). The UN brings international leaders from the legal community, public and private sectors, and civil society together to discuss the governance of Data and AI (Pizzi, 2020). A great benefit of the

UN is its size and global authority which gives it power to promote common goals, hence making the governance of AI more successful (Butcher & Beridze, 2019). Another important pioneer is the European Commission. In 2020 the Commission published a White Paper on AI which works as a preparatory step for forthcoming legislative proposals on AI (European Commission, 2021). The European Commission is poised to be the first major jurisdiction globally to establish a binding legal framework for AI (Schmitt, 2021). Policymakers characterize this approach as being "centered on humanity," "guided by ethics," and "reliable." When this approach is eventually translated into enforceable legal regulations, it is expected to have far-reaching consequences, much like the global impact witnessed by the EU's GDPR, which extended beyond the EU's immediate jurisdiction (Schmitt, 2021). Another prominent international organization actively involved in AI-related governance matters is the Organisation for Economic Co-operation and Development (OECD). In May 2019, they founded the "OECD Principles on AI," which were thought of as the "initial collection of policy guidelines on AI" and used by multiple governments (OECD, 2019). It's worth noting that the OECD lacks any regulatory or legislative authority over AI policy. Yet, they shape the world of AI governance greatly through knowledge authority, the ability to bring parties together, and shaping norms and agendas (Schmitt, 2021). The G20 has asserted its central role in the realm of global AI governance by forming a dedicated "G20 Coordinating Committee for the Governance of Artificial Intelligence" (CCGAI) (G20, 2023). This committee, comprising members from G20 nations, aims to strategically plan and coordinate multilaterally in addressing and mitigating the risks associated with AI technology (G20, 2023). Recognizing the importance of inclusive centrality, the G20 is driven by the need to counteract the fragmentation often observed within the existing complex framework of cyber regimes (Jelinek et al., 2020). The central role the G20 plays is critical in ensuring the effective coordination of efforts to manage AI-related risks on a global scale.

The Global Partnership for AI (GPAI) was launched in June 2020, comprising a total of 15 founding members. GPAI's stated objective, rooted in principles of human rights, innovation, inclusivity, diversity, and economic advancement, is to drive the responsible development and utilization of AI (GPAI, 2023). By bringing together experts from various sectors including industry, government, civil society, and academia, GPAI aims to promote international cooperation and serve as a global point of reference for addressing specific AI-related concerns. In contrast to its government-driven counterpart, GPAI, the Partnership on AI (PAI) has its origins in a coalition of non-governmental entities, particularly prominent American tech companies such as Apple, Amazon, DeepMind, Google, Facebook, IBM, and Microsoft that are leading the way in AI advancement (Veale et al., 2023). This business-centric model was expanded to include six nonprofit board members, transforming PAI into a multi-stakeholder organization that now boasts a membership of over 50 organizations (PAI, 2023). PAI is actively engaged in supporting research on a variety of pressing matters related to AI ethics and governance (Schmitt, 2021)

Analysts mention two international standard associations that are currently developing AI standards: the ISO (International Organization for Standardization) and the IEEE Standards Association (Institute of Electrical and Electronics Engineers). The ISO formed a joint committee with the IEC (International Electrotechnical Commission) to develop standards for digital technology addressing everything from programming languages, character renderings, file formats including JPEG, distributed computing architecture, and data security procedures (Rajchel, 2012). Major multinational corporations have embraced these standards. For instance, leading cloud computing providers like Alibaba, Amazon, Apple, Google, and Microsoft have adopted the ISO data security standards. (Veale et al., 2023). The IEEE SA develops standards in various domains, such as software engineering management and the design of autonomous systems, hence it plays a role in standardizing AI-related processes (IEEE, 2023). These

standards include methodologies to address algorithmic bias in the development of AI systems (IEEE, 2023). Please see Appendixes 10 and 11 for a detailed overview of international standards for AI development.

6.2. German AI Regulations

As a member of the EU, Germany follows the EU's general regulations and directives related to AI, data privacy, and technology. However, Germany, like other EU member states, can implement additional regulations and guidelines specific to its national context. These may complement or further specify EU regulations. Germany has its own AI strategy which was put in place in 2018 (Daly et al., 2020). The German government's strategy provides an exhaustive framework for the further development and application of AI called the *Strategie Künstliche Intelligenz der Bundesregierung*. The goal is to make Germany and Europe global leaders in the development and use of AI, strengthening Germany by making it a research hub for AI. Hereby, Germany is one of the leading countries in terms of AI investments closely following the United States (Matthews, 2023) (See Appendix 12). Furthermore, safeguarding the responsible development and use of AI, promoting its application in the economy, especially in SME's, encouraging diverse uses of AI for societal progress, and the benefit of citizens are in the foreground of Germanys AI strategy (Campbell, 2019). The strategy emphasizes integrating AI in society in legal, ethical, cultural and corporate terms and placing the benefits for individuals and the environment at the forefront by enhancing dialogue on AI with all segments of society (BMWK, 2018). Next, to the German AI strategy, there are some laws regarding AI that complement the existing EU AI legislations:

Federal Data Protection Act (BDSG): Germany, like other EU countries, adheres to the GDPR, which sets standards for data privacy and protection. Additionally, Germany has the Federal Data Protection Act (Bundesdatenschutzgesetz or BDSG), which complements the GDPR and provides further guidance on data protection on a national level. Additions include appointing

a data protection officer (DPO) in case organizations process personal data with the involvement of more than twenty individuals, and stricter regulations in the employment field giving employees more data protection rights (Oladimeji, 2023 and Bundesministerium der Justiz, 2023).

Federal Data Protection Authority (BfDI): The Federal Commissioner for Data Protection and Freedom of Information (BfDI) is the independent federal authority responsible for ensuring compliance with data protection laws in Germany. The BfDI often hold symposiums about the newest developments in AI, ranging from topics of AI and business, public acceptance, the current use of data and how to make AI more data compliant whilst expanding (BfDI, 2019). The focus is on promoting research related to the control and traceability of algorithmic forecasting and decision systems, along with efforts toward consumer protection and privacy (Bundesregierung, 2023).

Federal Office for Information Security (BSI): Together with partners, the BSI is developing foundations for the comprehensive examination of the robustness, security, reliability, integrity, explainability, interpretability, and fairness of AI systems (Bundesregierung, 2023). Furthermore, the German Government in a joint project with DIN (German Institute for Standardization), has initiated the process of developing a roadmap for standards and norms in the field of AI. The goal of the standardization roadmap is to identify the needs for standardization and norms in the field of AI (Bundesregierung, 2023).

Federal Network Agency (Bundesnetzagentur): This agency oversees telecommunications and has a role in regulating aspects of AI, especially concerning telecommunications and network infrastructure. The Bundesnetzagentur wants to foster AI in regulated sectors such as telecommunications, post, energy, and railways, showcasing its potential to enhance operations. However, the implementation of AI in these areas is not without challenges, particularly in critical infrastructures where unique sector-specific issues arise. Hence, the Bundesnetzagentur

plays a proactive role in addressing the complexities of AI integration. Actively involved in fostering a dialogue on AI, the Bundesnetzagentur conducts consultations and workshops. These initiatives aim to gain insights into the potentials and challenges associated with AI applications in regulated sectors. By engaging with industry stakeholders, the agency contributes to the development of strategies that ensure the responsible and effective deployment of AI technologies (Bundesnetzagentur, 2021).

Federal Cartel Office (Bundeskartellamt): This agency enforces competition law in Germany and has taken an interest in regulating digital markets, including those where AI plays a significant role. Germany enforces competition laws that aim to prevent anti-competitive practices in the technology sector, including issues related to big tech companies and their market dominance. Andreas Mundt (2023), President of the Bundeskartellamt, mentions that it is hard to oversee the direct bargaining power of AI Companies or companies that use AI, due to the large data network, hence they are currently monitoring the market closely to ensure the competition to reduce the risk of an oligopoly or monopoly (Schröter, 2023).

German Ethics Guidelines for AI: In addition to EU guidelines, Germany has issued its own ethical guidelines for AI. These guidelines are non-binding but provide a framework for responsible AI development and usage. Germany has recognized the shift of jobs and job displacement due to AI hence they provide training and other schooling. Additionally, they want to make adjustments to labor law and employee data protection laws. However, their focus is to train people in AI to ensure further understanding, trust, and development. Next, to the advanced data regulations mentioned above, they want to create a legally secure framework for AI actors and most importantly introduce the “AI – made in Germany” which is an international trademark representing advanced and secure AI applications dedicated to promoting the common good in alignment with Europe's fundamental values (Bundesregierung, 2023).

Industry-Specific Regulations: Depending on the sector, there may be specific regulations or

standards that apply to AI applications in Germany. For example, in healthcare, the Medical Device Regulation (MDR) can impact the use of AI in medical devices. If the gig economy grows there will likely be more regulations on the recruitment process too.

Research and Innovation Funding: Germany is planning to invest 500 Million in 2024 into AI funding, research and development (Oladimeji, 2023). In addition, Germany has dedicated programs and funding initiatives to support AI research and innovation. These may come with certain requirements or guidelines for projects in order to secure funding. For more information see Appendix 13.

German Patent and Trademark Office (DPMA): As Germany is supporting the creation of AI startups and the use of AI in companies it is important for these to know the Deutsches Patent und Markenamt (DPMA). The DPMA is responsible for granting and administering intellectual property rights in Germany, including patents and trademarks, which are relevant to AI inventions (DMPA, 2023).

Germany is known for its robust approach to data privacy and protection, and it often goes beyond the minimum requirements set by the EU. As such, businesses operating in Germany need to be especially mindful of data privacy and security considerations. Additionally, Germany plays a crucial role in shaping and implementing EU regulations, particularly in areas related to technology and data protection (Gavas & Koch, 2021). Therefore, staying informed about both EU and German-specific regulations is crucial for businesses and organizations operating within the country.

6.3. Implications for Startups such as JobMatch

For any startup in Germany, it's important to be aware of both EU regulations and national regulations. Compliance with both sets of regulations is often necessary. As JobMatch will be founded in Germany it can be lucky that Germany has its own AI strategy and is willing to greatly promote and support startups in their founding dynamics through funding programs

such as EXIST and venture capitals (Bundesregierung, 2023). Additionally, the KI Bundesverband are there to support and help the launch of AI startups and SMEs, further fostering the sustainable development of AI. They are pushing the European Parliament to establish a regulatory framework that eliminates legal uncertainties and bureaucratic complications for startups (Bienert et al., 2023).

At the beginning of every AI startup or organization's AI journey, a complete AI risk-management program should be established, next to staff training, data compliance, transparency, monitoring and a model development life cycle (Baquero et al., 2020). Risk management should include an inventory of all AI systems used by the startup, a risk-classification system, risk-mitigation measures, clear reporting structures, data-risk-management processes, and an AI governance (Benjamin et al., 2021). Yet, to avoid complications startups in the EU and especially in Germany should comply with the ethics guidelines for trustworthy AI. If the startup complies with the trustworthy AI guidelines it is acting lawfully (Larsson, 2020). According to these guidelines, AI should embody legality by complying with all relevant laws and regulations, ethicality by respecting ethical principles and values, and robustness by ensuring both technical soundness and consideration of its social context (European Commission, 2019). The Guidelines include seven key requirements for trustworthy AI (European Commission, 2019):

Human Agency and Oversight: Startups using AI should comply with oversight obligations that should be checked by humans. Moreover, AI should empower human decision-making, incorporating oversight mechanisms through human monitored, and human directed approaches (European Commission, 2019). Hereby, ensuring that these systems are understandable, transparent, and maintain consistent performance over their operational lifespan (Benjamin et al., 2021).

Consumer Protection and Labor Laws: Companies using AI and AI startups must comply with

regulations aimed at protecting consumers from deceptive or harmful products. Additionally, startups that use AI for workforce management or employee decision-making should be aware of potential legal issues related to discrimination, employee rights, and privacy.

Technical Robustness and Safety: AI systems must be resilient, secure, and equipped with fallback plans. Accuracy, reliability, and reproducibility are vital to minimize unintentional harm such as caused by cyber risks. Hence, establishing an organization-wide cyber risk management practice to counter attacks on AI systems is essential (Benjamin et al., 2021). Moreover, the continuous use of conformity assessments is vital. Conformity assessments involve algorithmic impact evaluations that assess datasets, biases, user interactions, and the overall design and monitoring of system outputs (Benjamin et al., 2021). To ensure that the startup is working in accordance with EU AI standardization policies it can look at the ISO and the IEEE recommendations.

Privacy, Data Governance and Transparency: AI startups must fully respect privacy and data regulations and have sound data governance that oversees data quality and integrity. Hereby, complying with data protection laws such as the EU's GDPR, and Germany's BDSG and BfDI. To comply with these the startup should show accountability this may be done by appointing a DPO or data protection impact assessments (DPIA) (European Commission, 2023). As mentioned earlier, in the case of JobMatch a DPO is necessary since they will be processing the personal data of more than twenty individuals. Next, it should also adhere to the code of conduct from the EU and adhere to a certification mechanism such as the "AI – made in Germany". Specific implications for startups and companies that use AI are: designating data protection responsibilities to your team and training your staff, having Data Processing Agreement contracts in place with third parties, implementing technical and organizational security measures, maintaining detailed documentation of collected data including storage, and utilization, and which employee is responsible for it (GDPR, 2023). Moreover, startups should

employ traceability mechanisms to ensure transparency in data, systems, and their AI business models. Ergo, being able to explain AI decisions appropriately to stakeholders.

Diversity, Non-discrimination, and Fairness: As mentioned above, there's a growing focus on fairness, transparency, and accountability in AI systems. Certain regions are formulating guidelines and recommended practices for AI developers to address biases and prevent discriminatory outcomes in AI applications. Hence, for startups to be successful they should mitigate unfair bias to prevent negative consequences, ensuring accessibility to AI systems for all, fostering diversity, and involving relevant stakeholders. For a more detailed overview please look at Appendix 14.

Accountability: As mentioned above legal frameworks for determining liability in cases of AI-related harm are still evolving. Nevertheless, startups should establish mechanisms for responsibility, accountability, auditability and ensure accessible remedies for adverse outcomes. Startups should be aware of the legal implications and potential liability for AI systems that cause harm and consider obtaining appropriate insurance coverage.

Intellectual Property Rights: AI startups often develop unique algorithms, software, or models. Understanding intellectual property rights and protections is crucial for safeguarding their innovations. This includes patents for inventions, copyrights for software code, and trade secrets for proprietary algorithms.

Societal and Environmental Well-being: AI should benefit humanity, considering sustainability, environmental impact, and societal well-being, including future generation.

7. Limitations

There are various limitations that restrict the work. The first of these is the limited availability of literature that relates exclusively to artificial intelligence in the context of startups. A wider range of literature was found when referring to digital startups. This can lead to a lack of clarity, as it was partly inferred from digital startups to AI.

Furthermore, it is difficult to generalize success factors for AI startups because there are always individual challenges and circumstances that can only be applied to different contexts to a limited extent. In addition, the complexity of technologies and markets makes it difficult to generate a standardized solution approach.

Another relevant aspect is that some parts of this study are solely based on German literature, as the German market is the focus of the investigation. This could limit the transferability of the results to international contexts. The identification of success factors for AI startups should therefore be viewed with caution, especially if the aim is to apply them to other countries or more global markets. Generalizing the results could be challenging due to the specific circumstances and dynamics in different markets.

While there exists a rich and rapidly expanding body of scholarship on AI, the scarcity of literature focused on European AI governance explicitly Germanys AI policies pose limitations in the research. Most importantly due to the ever evolving nature of AI, it is challenging for policies and legislations to keep up, thus finding the most recent laws passed is strenuous. Consequently, this means that after this thesis is published existing laws might have changed or there might be new legislations in place.

Developing the business plan for JobMatch presented unique challenges. One primary limitation was Market Predictability. The fluctuating nature of the gig economy, coupled with rapid AI advancements, makes it difficult to forecast market trends reliably. This volatility directly impacts our ability to accurately predict user behavior and demand, which are critical

for strategizing market entry and expansion. In terms of Financial Projections, estimating revenue, costs, and profitability is inherently uncertain, especially for startups and new ventures. These projections are based on assumptions that might not hold true, leading to financial discrepancies. Understanding and aligning with Customer Needs and Expectations is also challenging. The target market for JobMatch – employers and gig workers in Germany – has diverse and evolving needs. Ensuring that our platform meets these varying requirements demands ongoing market research and user feedback in the future. Predicting how quickly JobMatch could scale in a competitive and dynamic market required a delicate balance between ambitious growth goals and the practicalities of market dynamics. These challenges highlight the need for a dynamic and adaptable business strategy, one that could evolve alongside market trends, technological shifts, and user preferences.

This thesis recognizes both the existing gap in research and the potential biases and limitations within the current literature. The discussion of limitations addresses how these factors may impact the generalizability of the findings.

8. Conclusion

As we approach the conclusion of our comprehensive study, it is imperative to reflect on the journey undertaken through this research. This paper has methodically explored the “strategic development, ethical and legal integration of AI in recruitment: A case study of JobMatch in the German gig economy”, delving into various dimensions and intricacies that define this field. Our investigation was driven by the aim to strategically apply AI in recruitment, when aligned with ethical standards and compliance with evolving EU legal regulations, will significantly enhance the efficiency and market appeal of JobMatch in the German gig economy, particularly among generations Y and Z, leading to considerable growth and competitive advantage in the sector, and through rigorous analysis and experimentation, we have gathered insights that not

only answer these queries but also contribute significantly to the broader understanding of gig economy dynamics, digital recruitment technologies, AI application in business, market strategy, consumer behavior adaptation, data privacy and regulation in the realm of AI.

The following conclusion section summarizes the key findings, discusses their implications, and situates them within the wider landscape of AI in the recruitment space. We propose recommendations based on our findings, aiming to provide actionable insights. As we summarize our key contributions, it is important to consider these results as both a culmination of our current understanding and a stepping stone for further explorations in this dynamic and ever-evolving field.

8.1. Market Entry and Growth Potential

The conclusion of the JobMatch business plan presents a compelling case for its strategic market entry and growth potential within Germany's promising short-term employment sector. The plan is aligned with the current vibrancy and growth of the German labor market, where there's an increasing reliance on flexible staffing solutions, making JobMatch a timely and relevant player. Its design specifically serves to the growing demand for flexible working conditions, including gig jobs and temporary positions, enhancing its appeal and potential for widespread acceptance.

A key aspect of the strategy is its focus on gig economy trends, recognizing and addressing the needs of a significant workforce engaged in gig jobs. This alignment with both employer and job seeker preferences in the gig economy augments the platform's attractiveness. Additionally, JobMatch employs a strategic geographic focus, initially concentrating on the Berlin metropolitan area to efficiently utilize resources, build partnerships, and collect user feedback, laying a strong foundation for future expansion to other major cities.

Another vital component of the strategy is leveraging network effects. By adopting a free entry model for employees and an attractive pricing strategy for employers, JobMatch aims to rapidly

build a substantial user base. This growing user base is expected to create a positive feedback loop through network effects, further enhancing the platform's value and driving sustained growth.

In conclusion, JobMatch is poised for significant growth in the German short-term employment market. Its entry strategy is not only timely but also intricately crafted to exploit the current labor market dynamics, with a keen focus on the flourishing labor market, adaptability to changing work conditions, tapping into gig economy trends, strategic geographic targeting, and harnessing network effects.

8.2. User Acceptance and Adaptation

The JobMatch business plan strongly supports the expectation of rapid acceptance and adaptation among young jobseekers and companies in Germany, thanks to its user-centric approach. Key to this acceptance is a targeted strategy aimed at young jobseekers, utilizing popular online platforms like Instagram, TikTok, and LinkedIn, which aligns with the digital habits of this demographic. The platform's free entry model for employees boosts its appeal, especially among young professionals seeking cost-effective job solutions.

Additionally, JobMatch offers attractively priced premium memberships, providing enhanced features such as boosted profiles and personalized job alerts, catering to the diverse needs of users. The importance of social media engagement is emphasized, using these platforms for effective brand awareness and user engagement. The business plan also highlights the significance of a user-friendly interface, akin to popular social apps, which enhances user experience and engagement.

Continuous feedback and iterative improvement are key strategies, with JobMatch forming strong partnerships for real-time user feedback, ensuring the platform remains adaptable and responsive. Furthermore, strategic hiring and talent acquisition, including the use of interns and working students, bring fresh perspectives and align with the platform's dynamic spirit.

In conclusion, JobMatch is poised for success in the German market, with its focus on user acceptance and adaptation evident in its targeted marketing, user-friendly design, and responsiveness to feedback. By aligning with the preferences of young jobseekers and offering a compelling value proposition, it is well-positioned for rapid acceptance and adaptation.

8.3. Impact of AI in Recruitment

The JobMatch business plan demonstrates the transformative impact of integrating artificial intelligence in recruitment. At its core, AI enhances job matching efficiency, ensuring precise connections between job seekers and opportunities with minimal manual intervention. Privacy is a key focus, with AI algorithms designed to protect sensitive user data, aligning with stringent data protection regulations like GDPR.

AI's role extends to adaptive optimization and user experience, allowing JobMatch to dynamically respond to user feedback and market shifts. This adaptability is crucial in the fast-evolving gig economy. In terms of security, AI strengthens the platform's defenses and ensures compliance with evolving legal standards, integrating measures like encryption and two-factor authentication.

Furthermore, AI-driven predictive analytics empower JobMatch with strategic foresight, enabling proactive adjustments to market and user behavior changes. This foresight is vital for navigating the gig economy landscape. Operational efficiency and scalability, enhanced by AI, ensure that JobMatch can swiftly adapt to user needs and market dynamics.

Finally, continuous AI-focused training for employees underscores the commitment to staying current with AI advancements and their applications in recruitment.

In summary, AI profoundly influences JobMatch, from improving job matching and maintaining privacy to predictive analytics and operational agility, positioning it as a technologically advanced solution in the recruitment sector.

8.4. Legal and Ethical Challenges

Considering the multifaceted dangers that AI presents, governments play a pivotal role in safeguarding their citizens, industries, and the ethical use of AI. It is a dynamic and ongoing process, as the regulatory landscape continues to evolve alongside the rapid progress of AI technology. Due to this everchanging nature, it is vital for JobMatch to always be up-to-date and comply with current and future regulations.

Hence, JobMatch's business plan thoroughly addresses the increasing legal and ethical challenges in the AI-driven recruitment industry. A core focus is on adherence to the GDPR, the Germany BDSG - Federal Data Protection Act and German labor laws, ensuring platform integrity and user protection in compliance with minimum wage and working time regulations. This commitment to legal compliance is fundamental in establishing trust in the gig economy. The plan also emphasizes the importance of clear terms of use and contracts with both employers and employees. This proactive measure is designed to create a transparent and accountable framework, delineating responsibilities and fostering fairness.

Moreover, JobMatch pledges to uphold non-discriminatory practices, aligning with the German General Equal Treatment Act. This commitment is reflected in the platform's design and operational strategies, contributing to an inclusive and equitable recruitment environment.

Data protection and security measures are another critical focus. Hence, to comply with the Federal Office for Information Security (BSI), the platform employs robust security protocols like SSL/TLS encryption, secure storage practices, and two-factor authentication. These measures ensure the privacy and protection of user data, a central concern in the digital recruitment process.

Additionally, JobMatch is committed to regular security checks, authorization management, appointing a DPO and continuous software maintenance, keeping the platform secure and up-

to-date. Regular training for employees on security policies and privacy laws is integral, ensuring organizational awareness and adherence to evolving legal standards.

The plan recognizes the dynamic nature of the regulatory landscape, underscoring the need to adapt compliance and security measures to evolving case law and legislation. This proactive stance positions JobMatch to respond effectively to current and future legal challenges.

Finally, ethical guidelines and privacy preservation are central to JobMatch's strategy. The platform is designed to prioritize user privacy, ensuring the ethical use of AI in the recruitment process.

In summary, JobMatch demonstrates a holistic and proactive approach to addressing legal and ethical challenges in the recruitment industry. By prioritizing compliance with data protection regulations, labor laws, and ethical standards, and adapting to legal changes, JobMatch positions itself as a responsible and forward-thinking player in the evolving gig economy.

9. Recommendations

The recommendations for future research highlight potential avenues for further exploration based on identified gaps in the existing literature and analysis of the changing market dynamics. There are a few main areas of interest that future research could dive into further. These include longitudinal studies, comparative analysis and global perspectives.

9.1. Following up on the Conclusion

These targeted recommendations aim to ensure that JobMatch not only capitalizes on its current market position but also evolves in a manner that is sustainable, user-focused, and compliant with legal and ethical standards.

Regarding **its market entry and growth potential**, JobMatch should strategically extend its reach beyond Berlin to other key German cities, guided by data-driven insights from market research and user feedback. Broadening the platform's job types and sectors will attract a more diverse range of gig workers and employers, enhancing its market appeal. Additionally, forming

partnerships with local businesses and educational institutions in these new regions will deepen JobMatch's market penetration, simultaneously boosting its visibility and credibility within these communities. This approach is vital for JobMatch's sustainable growth in the dynamic gig economy recruitment sector.

To enhance **user engagement** on JobMatch, a focus on gamification, AI-driven personalization, and community building is crucial. Implementing gamification elements like badges and points will encourage user participation and loyalty. Personalizing the user experience with AI, by offering tailored job suggestions, makes the platform more intuitive and user-friendly. Additionally, fostering a community through forums and events will not only enhance user interaction but also provide valuable feedback for platform improvement, thereby contributing significantly to JobMatch's growth and user retention.

For JobMatch, a sustained **focus on AI** research and development is crucial to maintain technological leadership and enhance job matching accuracy. Transparency in explaining how AI algorithms function will build user trust and understanding. Additionally, forming an AI ethics board is pivotal to ensure responsible AI usage, aligning the platform with societal values, especially in areas like data privacy and fairness. This approach will solidify JobMatch's position as a trusted, ethically conscious player in the AI-driven recruitment space.

To navigate **legal and ethical challenges**, JobMatch should focus on three key areas: conducting regular legal audits to stay abreast of the fast-evolving AI and gig economy regulations, enhancing data transparency and user control to build trust and comply with privacy laws, and providing continual legal and ethical training for staff. These measures will ensure JobMatch remains compliant, responsible, and trusted in the dynamic AI-driven recruitment landscape.

9.2. Research related

Longitudinal studies are long-term observations that track the changing natures of the same

individual or variable (Thomas, 2023). In this instance, longitudinal studies involving the tracking of performance and adaptations of AI startups over extended periods would provide valuable insights into the dynamic nature of the industry. Another longitudinal study could involve the progressive nature of European and German laws and regulations and how these will have an impact on AI startups and growing AI ventures.

A Comparative analysis between European and non-European AI startups can unveil region-specific challenges and opportunities. By comparing startups in different locations, it can also be identified how laws and regulations impact startups success. Hereby, highlighting the relationship between innovation and regulatory frameworks.

Even though global laws and regulations are briefly touched upon in this thesis it is imperative to formulate a **global perspective**, that considers cross-border collaborations and competition. Furthermore, if JobMatch will expand into other territories outside of the EU it is imperative for them to also understand the success factors and laws and regulations in those markets.

Any of the aforementioned topics should be a focus for future research to provide a comprehensive understanding of the industry

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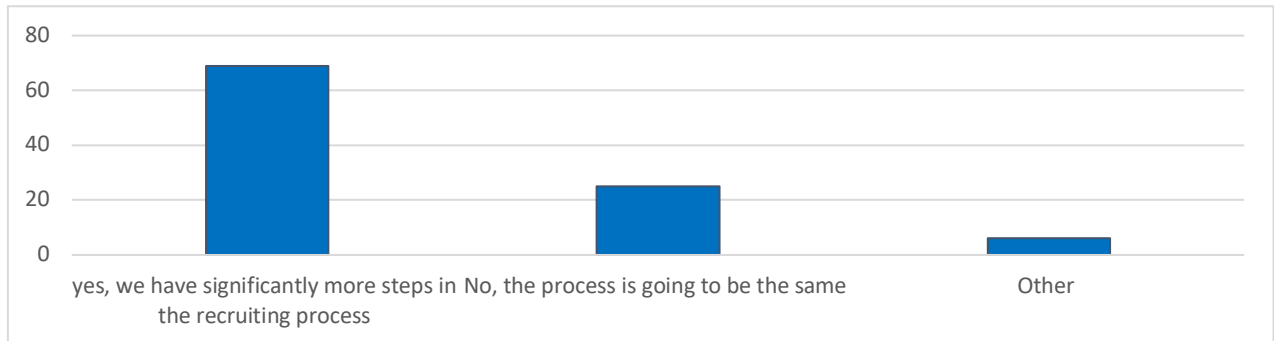
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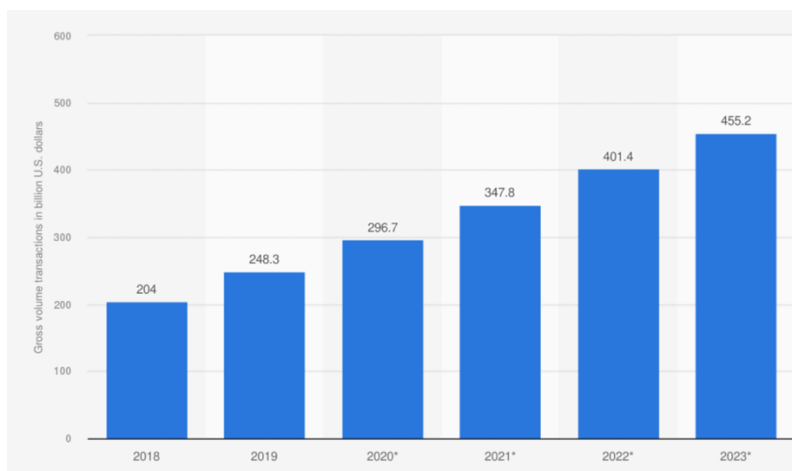
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11. Appendix

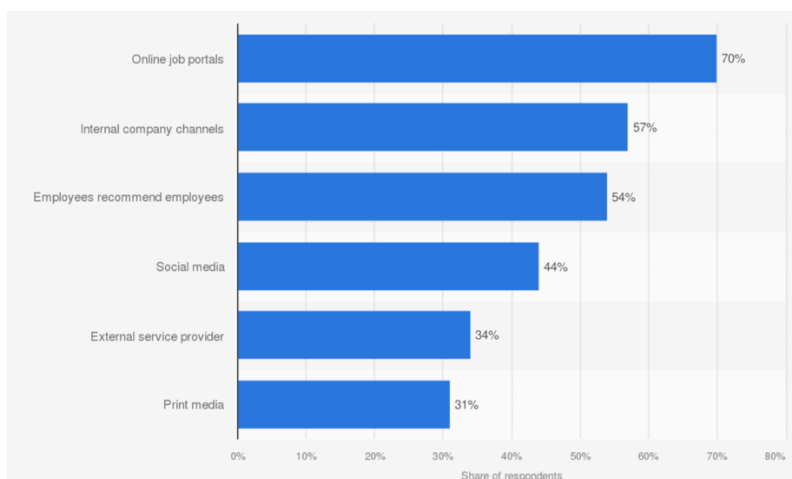
Appendix 1: Is the corona Crisis changing your recruiting process ? (Statista, 2020)



Appendix 2: Projected gross volume of the gig-economy from 2018 to 2023 (in billion U.S. dollars) (Statista, 2023)

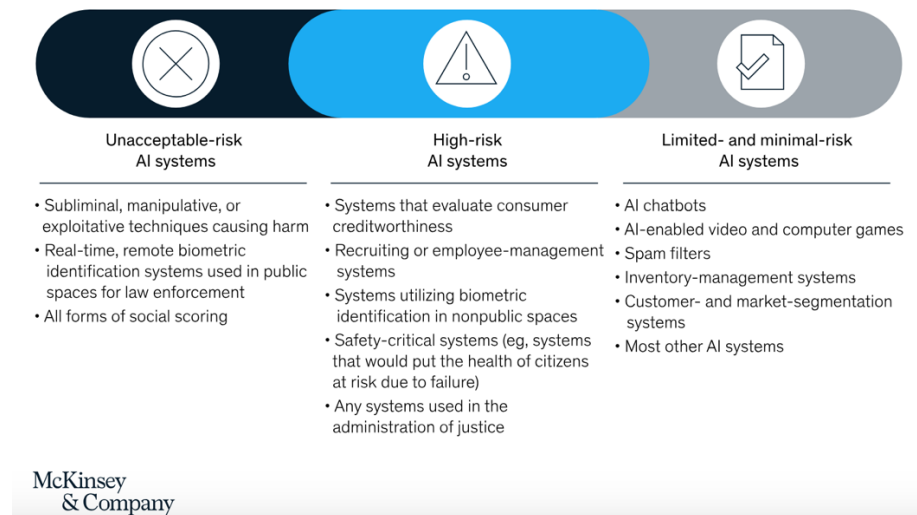


Appendix 3: Which recruiting channels do you use to hire new employees? (Statista, 2023)



11.1. The Imperative for Government Protective Measures - European laws to combat the dangers of AI

Appendix 4: The European Union's draft AI regulations classify AI systems into three risk categories (Benjamin et al., 2021)



Appendix 5: The draft EU AI regulations place several requirements on organizations providing or using high-risk AI systems (Benjamin et al., 2021)

- | | |
|--|--|
| ☒ Implementation of a risk-management system | ☒ Human oversight |
| ☒ Data governance and management | ☒ Accuracy, robustness, and cybersecurity |
| ☒ Technical documentation | ☒ Conformity assessment |
| ☒ Record keeping and logging | ☒ Registration with EU-member-state government |
| ☒ Transparency and provision of information to users | ☒ Postmarket monitoring system |

McKinsey
& Company

Appendix 6: Responsible AI factors (Mikalef et al., 2022)

Factors	Explanation	Measures are taken to address AI Bias
Fairness	AI devices validate the diversity inclusion and reduce the biases	IBM has taken the initiative to minimize bias by providing the open-source toolkit to evaluate, create a report and alleviate discrimination and bias through machine learning models (IBM AI Fairness, 360)
Transparency	AI systems must be more transparent with respect to processes and results in the firms	Accenture practices the responsible AI has a transparency in four pillars organizational, operational, technical and reputational to create company values and ethics. By understanding the sources of bias and developing the Accenture Algorithmic toolkit used to investigate errors and bring the fairness and transparency decisions by creating a new model (Accenture, 2021).
Accountability	AI systems must bring the accountability of their results with ethics	In Microsoft, people are accountable for the AI system's impact on the world due to a variety of models, data sets and new technology disruption. The company follows principles and guidelines to understand the customers through facial recognition and understanding and monitoring the errors in each stage to minimize the bias in the AI life cycle (Microsoft, 2022)
Robustness & Safety	AI systems should be created with precautionary measures taken to reduce the errors	Google is in adversarial learning while using the neural network by creating adversarial illustrations to fool a system in the network to detect the frauds (Google)
Privacy & Governance	Personal data is used to make decisions and privacy controls must be created to support technology ensure that personal data will be used for specific and fair purposes. AI Systems must follow the regulations related to international data privacy laws and standards	Cisco developed a privacy engineering practices into the Cisco Secure Development Lifecycle (CSDL). These practices help to assure that data privacy in the service offerings. Further, the company sets and follows the principles of the Global Personal Data Protection and Privacy Policy (Cisco, 2022).
Societal & Environmental Wellbeing	AI Systems bring the ethical and equitable AI as a comprehensive approach to society and environment well being	Intel is designed the AI lifecycle to reduce the risks by bringing the ethical principles and to maximize the benefits the society by using the right tools and enabling an inclusive and sustainable environment (Intel)

Appendix 7: European Commission's guidelines on the ethics and trustworthiness of AI (European Commission, 2021)

The guidelines list seven key requirements that AI systems should meet to be trustworthy:

- 1) Human agency & Oversight
- 2) Technical robustness and safety
- 3) Privacy and Data governance
- 4) Transparency
- 5) Diversity, non-discrimination, and fairness
- 6) Societal and environmental well-being
- 7) Accountability

Appendix 8: The GDPR's principles (GDPR, 2023)

- 1) Lawfulness, fairness and transparency
- 2) Purpose limitation
- 3) Data minimization
- 4) Accuracy
- 5) Storage limitation
- 6) Integrity and confidentiality
- 7) Accountability

Appendix 9: The Framework for AI Cybersecurity Practices (FAICP) (Lekatis, 2023)

The framework consists of three layers:

Layer I emphasizes the foundational principles of cybersecurity for AI systems, covering security management of the ICT infrastructure, cybersecurity certification, and relevant legislation and policies.

Layer II delves into AI-specific cybersecurity, addressing AI legislation, types of AI, threat assessment, ethical considerations, and related standards.

Layer III provides sector-specific cybersecurity practices tailored to various industries where AI is employed. This multilayered approach aims to ensure robust cybersecurity measures from the basic infrastructure to the specific needs of diverse economic sectors, fostering a secure and trustworthy AI environment.

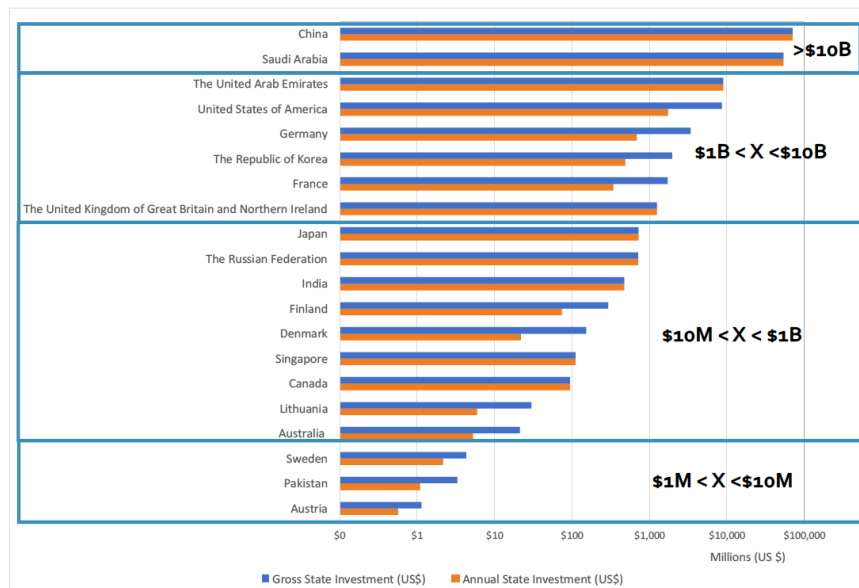
Appendix 10: An overview of the most important multitalented governance initiatives and actors in the AI domain (Schmitt, 2021)

	State-led	Non-state-led
Embedded in existing architecture	G7 G20 CCW Group of Governmental Experts on emerging technologies in the area of LAWS (GGE) Council of Europe (CoE)	United Nations (UN) European Commission Organisation for Economic Co-operation and Development (OECD) IEEE ISO/IEC
Establishing new instruments	Global Partnership on AI (GPAI) AI Partnership for Defense	Partnership on AI (PAI)

Appendix 11: International AI standards under development (Cihon, 2019)

Network - Product	Network - Process
- Foundational Standards: Concepts and terminology (SC 42 WD 22989), Framework for Artificial Intelligence Systems Using Machine Learning (SC 42 WD 23053) - Transparency of Autonomous Systems (defining levels of transparency for measurement) (IEEE P7001) - Personalized AI agent specification (IEEE P7006) - Ontologies at different levels of abstraction for ethical design (IEEE P7007) - Wellbeing metrics for ethical AI (IEEE P7010) - Machine Readable Personal Privacy Terms (IEEE P7012) - Benchmarking Accuracy of Facial Recognition systems (IEEE P7013)	- Model Process for Addressing Ethical Concerns During System Design (IEEE P7000) - Data Privacy Process (IEEE P7002) - Methodologies to address algorithmic bias in the development of AI systems (IEEE P7003). - Process of Identifying and Rating the Trustworthiness of News Sources (IEEE P7011)
Enforced - Product	Enforced - Process
- Certification for products and services in transparency, accountability, and algorithmic bias in systems (IEEE ECPAIS) - Fail-safe design for AI systems (IEEE P7009)	- Certification framework for child/student data governance (IEEE P7004) - Certification framework for employer data governance procedures based on GDPR (IEEE P7005) - Ethically Driven AI Nudging methodologies (IEEE P7008)

Appendix 12: AI investments by States for which government-sourced AI investments were identified. (Campbell, 2019)



Appendix 13: Germany's current AI funding Initiatives (Bundesregierung, 2023)

Currently they have programs that foster

- 1) faster transfer of research into concrete AI applications through test fields, real laboratories, model experiments, regional clusters, and innovative funding formats.
- 2) Improved access for companies to AI technologies, especially for SME's through the Mittelstand 4.0 Competence Centers.
- 3) Promotion of entrepreneurial dynamics for AI startups through funding programs (e.g., EXIST) and venture capital.
- 4) Creation of an AI map for applications and stakeholders; AI monitoring and networking of companies and institutions. Establishment of an agency for leap innovations with AI as one of the focal points.
- 5) Formation of a European innovation cluster for AI and the conduct of innovation competitions

Appendix 14: Bias is one important risk that can be mitigated by embedding controls into the model-development process (Baquero et al., 2020)

Illustrative example



Guidance and
checklists



Analytical methods
and data tools

Ideation	Data sourcing	Model development	Industrialization, monitoring, and maintenance
Determine the level of bias risk, given model use and context.	Detect and mitigate bias risk in data.	Find and reduce bias through modeling.	Continuously monitor and manage bias risk in production.
Bias and explainability risk assessment	Bias-detection techniques	Explainable AI techniques to explain root cause	Context monitoring - Regulatory changes - Legal changes - Company-policy changes - Usage appropriateness
How can we set up a team to reduce or mitigate risk of bias?	Fair-representation techniques	Counterfactual analysis	
Guidance on convening a diverse team	Evaluation of risk from the choice of data sets and collection methods	Review of underlying hypotheses	Model monitoring - Data drift - Model metrics - Bias metrics in outcomes
What legal and reputational constraints should we take into account?	Mitigation of risk in feature selection and engineering	Fairness-aware algorithms	
Scoping and regulatory guidance	Documentation with data sheets for data sets	Remediation with post-processing techniques on output	Model maintenance - Database of metrics and trend tracking - Updates of documentation
How will we measure bias for this use case in this usage context?		Documentation with model cards	
Creation of bias risk metrics			
What is the level of our analytics capabilities?	Execute development checks and controls to manage the risk of bias		
Capability context assessment	Monitor model for bias metrics		