FUTURE DEVELOPMENT OF MUNICIPAL WORKFORCE: INTEGRATION OF GENERATIVE ARTIFICIAL INTELLIGENCE

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Chapter 1: Introduction

1.1 Context and Background

Since the release of ChatGPT in November 2022, the adoption of generative AI has surged at an extraordinary pace, fundamentally changing how artificial intelligence is used in both professional and administrative settings. In just a short time, ChatGPT attracted over 200 million active users, showcasing how quickly AI tools can become embedded in everyday workflows and decision-making processes (Brown & Leopold, 2024). This widespread adoption raises important questions for governmental institutions, such as: Are workers using such tools to perform their jobs? How soon will the use of these tools become standard in organizational operations? And what steps are needed to ensure the responsible and effective integration of this technology?

These questions drive the central focus of this study, which examines how Amsterdam's municipal workforce can be effectively prepared to navigate the integration of generative AI. Research suggests that generative AI can revolutionize municipal operations by optimizing workflows, improving citizen services, and driving data-informed policy decisions (Brown & Leopold, 2024; Kochan et al., 2024). However, realizing these benefits depends also on addressing significant challenges, including workforce skill gaps, ethical concerns, and regulatory compliance.

Amsterdam emerges as a pioneering case study in this context. The municipality has already begun integrating generative AI into its operational landscape, as evidenced in its *Tech Radar Edition 2024* report (Municipality of Amsterdam, 2024). Their initiatives include leveraging AI tools for public service optimization, enhancing communication channels with citizens, and managing urban infrastructure more efficiently. Establishing their Urban AI Working Group demonstrates Amsterdam's commitment to developing comprehensive AI literacy programs, ethical usage guidelines, and cross-departmental collaboration frameworks (Municipality of Amsterdam, 2024).

This scenario reflects a smaller-scale example of the broader transformation faced by municipalities worldwide. The adoption of generative AI in Amsterdam is not merely about deploying advanced tools; it represents a fundamental shift in workforce dynamics. Employees are increasingly experimenting with AI technologies in their daily tasks, placing pressure on leadership to establish clear guidelines, invest in ongoing training programs, and address critical ethical considerations such as algorithmic bias, transparency, and data privacy (Kochan et al., 2024).

The findings from this scenario drive the central focus of this thesis: understanding how municipalities can prepare their workforce, strategically and operationally, to harness the benefits of generative AI while mitigating potential risks. By studying this case, this research aims to provide actionable insights and a replicable framework for (similar) municipalities seeking to navigate the complexities of generative AI adoption.

1.2 Generative AI Competence and Skills

Integrating generative AI into public administration requires a nuanced inventory of the necessary expertise and competence to manage AI-driven environments effectively. These expertise and competence include the (foundational), technical, and adaptive competence, such as Digital literacy, best described as "a set of competencies that enables individuals to critically evaluate AI technologies" (Long and Magerko, 2020). It also " Allows us to engage in informed discussions about AI technologies and understand their impact." (Long and Magerko, 2020). However, this can also "Lead to misconceptions and uninformed decisions, hindering effective participation in AI-driven

environments." (Long and Magerko, 2020) As the concept of generative AI literacy is not fully established, this study considers the following definition: "Concept introduced and loosely defined as the proficiency in understanding, interacting with, and critically evaluating generative AI technologies, which entails not only knowing how to use AI-driven tools but also understanding the ethical considerations, biases, and limitations inherent in such systems" (Bozkurt, 2023). The European Centre for the Development of Vocational Training (Cedefop) has defined digital literacy as the necessary competence to effectively adopt and use generative AI technology. Also considered crucial as competence is critical thinking, which refers to the ability to carefully think about a subject or idea without allowing feelings or opinions to affect you (Cambridge University Press. n.d.). It can also be seen as " a step-by-step process approached to critically evaluate information and arguments" The University of Manchester. (n.d.).

Lastly, competence adaptability is further considered as *essential*, which definition according to the American Psychological Association, refers to "the ability to rapidly adjust to changing circumstances and the capacity to make appropriate responses to changed situations*" (*American Psychological Association. n.d.). These are further considered in the Cedefop skills survey (2024) as enablers for reducing *skill mismatches* and ensuring *responsible AI management* (Cedefop, 2024ab). These competencies are in this case assumed relevant for municipal employees who engage directly with citizens and or make decisions that impact public services.

Differences between competence and skills

Competence and skills are not the same thing, although their distinct differences are that competence consists of "broader attributes that refer to an ability to use knowledge, skills social and/or methodological abilities in work or study situations and professional and personal development. Competence is not limited to the cognitive area; it also encompasses functional/technical areas, interpersonal skills, and values" (Joint Research Centre, n.d.). Competence refers to "the ability to do something effectively and efficiently encompassing the elements of knowledge, skills and attitude and character traits" (IGI Global, n.d.; AG5, n.d.).

Skills on the other hand are: "the ability to apply knowledge and use know-how to complete tasks and solve useful problems, typically in the workplace" (Joint Research Centre, n.d.). Skills can be defined as "a specific, learned ability or expertise that enables a person to perform a task. It involves "the ability to act to create a desired result. Skills are often technical or task-oriented, like coding, data analysis, public speaking, or project management" (TalentGuard, n.d.).

The Cedefop European Skills and Jobs Survey (2024) identifies as necessary the skills of problem-solving, creativity, and adaptability as vital for employees in AI-enhanced roles. These skills are believed to enable workforces to navigate AI's complexities, address ethical challenges, and align AI initiatives with organizational goals. Additionally, if we involve the perspectives of a broader range of actors, such as private corporations, we see examples such as Microsoft's Future of Work Report (2023) which underscores that digital fluency, the skill of prompt engineering, and data literacy are foundational skills to effectively manage AI applications while maintaining public trust in augmented services. There are also reports such as Accenture's Work Can Become (2023b) report, that emphasize a human-centred approach to AI adoption, which involves advocating for continuous learning and adaptability to address the evolving skill demands. Also, ongoing reskilling and professional development are highlighted as key strategies for ensuring that employees remain prepared for dynamic AI environments.

Institutions like the International Monetary Fund (IMF) report about generative AI and the Future of Work (2024) by demonstrating how generative AI can complement human roles in facilitating complex problem-solving and strategic decision-making. The study provides a little understanding of the corporate perspectives on skills for the future of work, as this seems appropriate because these reports also show that the technology sector often drives innovation and shapes labour market demands. It seems relevant to underscore that "addressing skills imbalances relies on having good information on current and future skill needs" (ILO & OECD, 2018). Together, these insights converge on the critical need for developing skills, such as critical, analytical thinking and ethical reasoning (McGuiness et al. 2024). Additionally, reports like the KPMG's From Promise to Practice (2021), also identify essential technical governance skills, such as AI monitoring, data quality control, and performance evaluation. as foundational for understanding the necessary competence to use generative AI on the job.

1.3 Significance

The integration of generative AI in public sector governance presents both challenges and opportunities. The goal of this study is to contribute to a comprehensive understanding and investigation of how Amsterdam's municipal workforce can be prepared to navigate AI adoption. The study focuses on skill development to obtain competence while considering ethical governance, and alignment with regulatory standards to construct organizational strategies. By addressing these factors, the research contributes to a broader understanding of workforce readiness in an AI-driven public sector.

A distinguishing feature of this study is its bottom-up approach, which emphasizes the use of strategies tailored to the municipal level rather than relying solely on top-down policy directives. The study assumes that the proximity to the municipality services to the public provides a more practical and tailored approach to governance compared to top-down policy directives. The study approach introduces a new conceptual *Four Pillars Framework*, that aims to guide municipalities through the adoption process of generative AI for the workforce. It does so by conducting an analysis focussing on four pillars: the pilar of competence, the pilar of skills, the pilar of regulations and compliance, and the pilar of organizational strategies. Each pillar reflects relevant dimensions, critical to workforce readiness and elements that support Amsterdam's strategic initiatives included in the Digital City Agenda 2023–2026 and the Amsterdam Vision on AI (2024)(Municipality Amsterdam, 2023a). Through the lens provided by the four-pillar framework, the study explores the foundational competence required for the use of AI, the specific skills needed to achieve the required competence, and the regulatory and compliance standards that support organizational strategies for skills development. The framework aims to provide a structured set of principles and considerations for integrating AI into public services.

1.4 Research Questions

The central research question of this study is:

How can the municipality of Amsterdam address the preparation of its workforce for the integration of generative Artificial Intelligence?

To comprehensively address this question, the research is divided into four specific sub-questions. These sub-questions aim to support the overarching research objective, providing a comprehensive flow for understanding workforce readiness in the context of generative AI integration.

1. **What foundational competence is necessary for the use of generative Artificial Intelligence?**
2. **What technical and adaptive skills are required to achieve competence in the use of artificial intelligence?**
3. **What ethical principles and regulatory policies guide the integration of generative artificial intelligence?**
4. **What organizational strategies support skills and competence development in artificial intelligence-enhanced public services?**

Chapter 2: Theoretical Framework

This chapter is guided by four key research questions. First, what foundational competence is required for integrating generative AI in municipal governance? Second, what specific skills must employees develop to achieve these competence? Third, how do regulatory compliance and ethical principles influence workforce readiness for AI integration? Finally, what organizational strategies best support skill and competence development in AI-enhanced public services? The answers to these questions form the theoretical basis for understanding workforce readiness in an AI-driven public sector. Integrating generative AI into public services, presents both opportunities and challenges. To understand how these opportunities and challenges are structured, this chapter examines theoretical foundations that are relevant for the integration of AI in public administration, particularly in workforce contexts. First the chapter provides an understanding of the process of integrating digital technologies into aspects of organizational operations, culture and strategies. This integration is often referred to as the *digital transformation*, and proofs relevant because it describes the "organization-wide strategy aimed at leveraging digital technologies to modernize key business processes and to introduce new services that better engage customers, **support employees,** improve operations, and drive business value to the bottom line" (Columbus, 2023). In light of the case study, the scenario presented in the introduction section shows how the municipality of Amsterdam is undergoing the process of a digital transformation. The strategies involved to harness the benefits of the generative AI technology are outlined in the municipality *Digital agenda 2023-2026* and the 2024 edition of the municipality *Tech radar* (Municipality Amsterdam, 2023a; Municipality Amsterdam, 2023b).

Secondly, the chapter identifies important aspects of governance and regulatory compliance in digital transformations (Artificial Intelligence Act, n.d.). The selection starts with introducing a European type of regulation, that captures obligations, guides opportunities for AI implementation and also affect European municipalities (Living-in.EU, n.d.). The chapter proceeds with an explanation of relevant corporate governance models that provide structures to operationalize the regulatory standards. The models presented, are designed to help organizations embed compliance into their governance structure and show enough flexibility to tailor to local government needs (KPMG, 2021; World Economic Forum, 2024). The chapter does not present an extended view on all the limitations of the regulatory frameworks, but it considers that their principles are rooted in corporate governance principles, which may not always align with the public sector principles. Because of this limitation, the models are presented in a relevance limitation way, by only showing their alignment to this case study, using the principles of the European regulatory standards and the AI vision of the municipality of Amsterdam. To address the limitations the chapter introduces a strategic framework that helps demonstrates what governance in the public sector requires to create public value, assuming that this helps with the alignment and translations of corporate government principles to public governance (Moore, 1995).

Thirdly, the chapter explains ethical considerations in AI integration, by presenting a foundational approach through a framework for ethical AI governance (Binns, 2018). These considerations are assumed to be relevant for the integration of technology because they guide crucial considerations, such as human rights, bias mitigation, responsible use and legal compliance. These considerations aim ensuring that AI systems serve the public interest while upholding democratic values and individual rights (OECD, 2024). In addition to the ethical, fairness, accountability, and transparency (FAT) considerations presented, the chapter also explains a theory that considers the *human role* in the use of technology. This enriches the understanding of the effect of technology on human capabilities (Accenture, 2023a; 2023c). One assumption of this study is that AI technology possibly enhances human capabilities, but only if the use of the technology considers and accounts for the previous

mentioned set of considerations and principles. Yet, if we also assume that enhancing human capabilities is related to human adaptability to technology, it becomes important to understand adaptability. In the case of this study, adaptability is explored through the lens of concepts for continuous and lifelong learning (Cedefop, 2022a; (Deloitte, 2023). These concepts present actionable efforts that affect the development of the workforce in organizations, by explaining what enables individuals to adapt to changing demands in their jobs (Cedefop, 2022a; (Deloitte, 2023).

Lastly, to bridge the gap between the theoretical understanding and practical application of concepts and considerations, the chapter proposes the four pillar frame work. The proposed Four Pillars Framework integrates diverse theoretical perspectives to provide a clear and strong foundation for AI integration. The framework aims to offers a holistic approach to generative AI integration, combining theoretical insights with actionable focus pillars. The theoretical insights that are synthesized into the Four Pillars Framework, are further explained in this chapter, the framework represents a conceptual tool that tries to demonstrates how these elements interconnect to support effective AI integration.

2.1 Digital Transformation as fuelling

Digital transformation represents a fundamental restructuring of organizational processes, culture, and strategies, enabled by advanced technologies such as generative AI, big data, elastic cloud computing, and the Internet of Things (IoT) (Siebel, 2019). In municipal governance, these technologies are not isolated tools but interconnected enablers that improve decision-making, optimize resource allocation, and enhance citizen engagement. However, these technologies do not operate in a vacuum; their successful implementation depends on a workforce equipped with technical competence, adaptability, and ethical awareness (Olmstead, 2024).

The foundational drivers of digital transformation, as identified by Siebel (2019), emphasize the importance of workforce capabilities in navigating the integration of AI and related technologies. For example, big data empowers municipalities to derive actionable insights from vast datasets, yet this potential remains unrealized without employees trained in data analysis, interpretation, and visualization. Similarly, elastic cloud computing supports scalable and secure platforms, requiring employees to develop proficiency in cloud technologies and cybersecurity protocols. IoT devices further complicate the digital landscape by introducing real-time data streams that demand systems-thinking capabilities for effective integration into governance processes (Siebel, 2019).

In parallel, Rogers' (2016) strategic domains of digital transformation provide a roadmap for aligning technological adoption with organizational goals. As it emphasizes "that digital transformation extends beyond the simple adoption of technology; it requires a fundamental shift in organizational strategy to use the opportunities presented by the digital age" (Rogers, 2016). Roger's playbook identifies five strategic domains for organizations to consider: **customer focus, competition, data, innovation, and value.** Even though Rogers's (2016) insights primarily address the private sector, his framework offers valuable guidance for public institutions, like the municipality, as they work to align AI-driven services with citizen needs and public sector goals (Rogers, 2016). For example, in the domain of data, cities using generative AI for analyzing transportation data can identify patterns that improve traffic flow and reduce congestion, demonstrating clear benefits to the public (Rogers, 2016). In the domain of customer focus, the playbook explains that "Organizations need to "rethink" their relationships with customers and use digital tools to create more personalized, engaging, and responsive experiences (Rogers, 2016). At the same time, institutions like municipalities must prioritize citizen needs, ensuring that digital services are accessible, intuitive, and aligned with public expectations (Municipality Amsterdam, 2023a; Municipality Amsterdam, 2023b). For example, municipalities could use online

surveys, social media channels, or public forums to gather citizen input on digital services and incorporate this feedback into their service design. Another example is AI-driven chatbots, which can handle common citizen inquiries, such as questions about local regulations or service hours, making information accessible around the clock (Municipality Amsterdam, 2023a; Municipality Amsterdam, 2023b). As for the domain of innovation in a municipal context, this can take various forms, from pilot programs that test AI applications in specific departments to cross-departmental initiatives that leverage data for collaborative problem-solving. The playbook explains that "organizations must support adopting innovative practices by providing training, resources, and incentives that encourage agility" (Rogers, 2016). Lastly, the concept of value creation encourages public sector organizations to use digital transformation as a means of fostering public good and improving community life (Rogers, 2016). These principles underscore the importance of adaptive skills and enabling municipal employees to balance technical expertise with a nuanced understanding of societal needs.

Furthermore, Saldanha's (2019) Five-Stage Model for Sustainable Transformation offers a phased perspective on workforce development. This model emphasizes the importance of an incremental progress, starting from basic automation to becoming a digitally native organization, that mitigates risks and fosters sustainable change (Saldanha, 2019). This model seems particularly relevant for institutions like municipalities where gradual, strategic integration of generative AI and digital tools can ensure effective, responsible implementation (Municipality Amsterdam, 2023a; Municipality Amsterdam, 2023b). Each stage builds on the previous one, ensuring that foundational skills and processes are in place before advancing further, transforming resilience and adaptability (Saldanha, 2019). The first stage sets the groundwork for broader digital adoption by introducing digital tools that improve efficiency in routine processes. For municipalities, this might involve automating tasks such as data entry, scheduling, or basic citizen inquiries through chatbots and other AI-driven solutions. This stage requires employees to develop skills in process optimization and digital tool usage (Saldanha, 2019). The second stage involves extending digital capabilities across different departments and functions. In this phase, digital tools are standardized across the organization to create consistency, facilitate collaboration, and build a shared foundation for more advanced digital transformation efforts (Saldanha, 2019). In the context of municipal governance, systematic expansion may include deploying AI-driven tools for specific departments, such as using predictive analytics in urban planning or employing data analysis tools in public health initiatives. In the following stage, digital practices become embedded in the organization, encouraging interdepartmental collaboration, knowledge sharing, and skill alignment (Saldanha, 2019). For example, departments involved in public safety, transportation, and environmental monitoring might collaborate on AI-driven initiatives that improve urban sustainability and safety. At this stage, employees across departments require skills in communication, teamwork, and interdepartmental project management to work effectively toward shared digital goals (Municipality Amsterdam, 2023a; Municipality Amsterdam, 2023b). The next stage describes digital leadership and marks a shift in digital transformation toward strategic vision and governance. In this phase, digital literacy becomes important to guide AI projects effectively, making it essential for workers to develop a nuanced understanding of AI's potential, limitations, and ethical implications. Leaders at this stage should foster a culture of continuous learning, where employees are encouraged to expand their digital competencies as technology evolves (Saldanha, 2019). In the final phase, Digitally Native Organization, digital transformation is fully embedded within the organizational culture. At this stage, digital skills are not only commonplace but are integrated into the operational and strategic perspectives of the organization (Saldanha, 2019). For municipalities, becoming a digitally native organization means that generative AI and other digital tools are seamlessly incorporated into daily operations, public service delivery, and decision-making processes (Municipality Amsterdam, 2023a; Municipality Amsterdam, 2023b).

The five-stage model provides a roadmap to achieve sustainable digital transformation. Each stage emphasizes different skill requirements, guiding organizations in structuring processes that build digital competency gradually (Saldanha, 2019).

While these frameworks provide valuable insights, they often assume linear progression and resource abundance, which may not fully align with the realities of municipal operations. In Amsterdam, the fragmented adoption of digital tools and varying levels of digital literacy among municipal staff might present significant barriers (Municipality Amsterdam, 2023a; Municipality Amsterdam, 2023b). Despite these limitations, the frameworks collectively highlight that workforce readiness in digital transformation is not solely about technical proficiency but also about aligning technological tools with organizational objectives and societal values. This alignment ensures that the workforce remains capable of leveraging AI responsibly while contributing to broader municipal goals.

2.2 Role of regulatory compliance and governance

The successful integration of generative AI in public governance requires strong frameworks and adherence to regulatory standards that safeguard ethical principles and promote transparency (City of Amsterdam, 2024). These mechanisms are essential for ensuring public trust and aligning AI systems with societal values, particularly in municipalities where public services directly impact community welfare (European Commission, 2021; Moore, 1995). In this context, governance is not merely a technical exercise but a multidimensional approach that combines legal mandates, organizational structures, and cultural alignment to ensure responsible AI adoption (KPMG, 2021; World Economic Forum, 2024).

At the regulatory level, the European Union's Artificial Intelligence Act serves as a foundational guideline, establishing risk-based categories for AI systems and outlining clear requirements for transparency, data privacy, and bias mitigation (European Commission, 2021). As municipalities adopt AI technologies, regulatory compliance becomes a foundational component of governance (City of Amsterdam, 2024). Key provisions in the EU AI Act requires that AI systems meet high ethical standards, mandating accountability practices that address biases, transparency, and fairness (European Commission, 2021). We can assume that municipalities must have or develop capacity to provide the ethical oversight and ensure practices that support meeting these regulatory standards. The EU AI Act further outlines strict guidelines for data privacy, ensuring that citizens personal information is protected in AI applications as well as the classification of AI systems based on risk, from minimal risk to high risk, with stricter requirements for higher-risk applications (European Commission, 2021). We see a reflection of compliance to this regulation in the initiatives and scope for the use of AI of the municipality, these are outlined in their digital agenda 2023-2026 and tech radar 2024 (Municipality Amsterdam, 2023a; Municipality Amsterdam, 2023b). However, preliminary insights from this study indicate that municipal employees often face significant challenges in interpreting and applying these regulations effectively (HR Focus Group). The complexity of the guidelines, combined with varying levels of regulatory fluency among staff, highlights the need for targeted training programs. These insights and the implications they carry for municipal governance, will be discussed in greater detail in Chapter 4.

While regulatory compliance establishes the baseline for compliant AI integration, governance models can provide the operational structures and considerations necessary to implement these regulations effectively. KPMG's Layered Governance Model (KPMG, 2021) offers a robust framework that emphasizes three critical elements: technical reliability, ethical oversight, and organizational alignment. This model addresses layers of AI oversight required in complex environments, offering

guidance on the types of governance skills needed to effectively manage AI initiatives (KPMG, 2021). The technical layer focuses on ensuring the reliability, security, and accuracy of AI systems. For institutions like municipalities, this involves having the capacity of system verification, cybersecurity, and data accuracy to maintain high standards in AI applications (KPMG, 2021). The risk layer involves assessing and managing potential risks associated with AI. This requires competence in risk identification, ethical evaluation, and compliance monitoring to mitigate issues such as data biases, privacy risks, and operational impacts (KPMG, 2021). The organizational layer explains the integration of AI within the broader structure and culture of the organization. This layer requires governance skills, regulatory compliance, and strategic planning, for ensuring that AI initiatives align with organizational goals (KPMG, 2021).

Complementing KPMG's approach, the 360° Governance Framework proposed by the World Economic Forum (2024) introduces additional layers of considerations that consist of data transparency, public accountability, and risk management (World Economic Forum, 2024). These key components require competence in communicating about AI use and processes clearly to the public, ensuring that citizens understand how their data is used and how the use of AI impacts decision-making processes. Accountability practices, involve ensuring that AI tools are used in alignment with ethical standards and public interests and to pre-emptively address ethical or operational issues that could arise with AI use (World Economic Forum, 2024).

The principles outlined in this framework align closely with Amsterdam's Vision on AI (2024), which prioritizes human-centred decision-making and ethical transparency (City of Amsterdam, 2024). However, the vision suggests that persistent gaps in oversight practices remain a challenge (City of Amsterdam, 2024). While inconsistent governance protocols across departments might undermine the organizational broader AI strategies, the framework insights underscore the importance of developing unified governance standards that can be applied consistently across all organizational functions (World Economic Forum, 2024).

Moving on to other theoretical insights, the ones provided by Mark Moore's Strategic Triangle (Moore, 1995) help to contextualize the relationship between governance, regulatory compliance, and public trust. Moore identifies public value, operational capacity, and legitimacy as the three cornerstones of effective public administration (Moore, 1995). Public value ensures that AI initiatives align with societal needs and deliver measurable benefits to communities (Moore, 1995). Operational capacity highlights the organizational and technical resources required to sustain AI-driven operations effectively, while legitimacy emphasizes the importance of aligning public initiatives with societal expectations, reinforcing trust through transparency and ethical accountability (Moore, 1995). In the context of Amsterdam, legitimacy is particularly crucial, as public trust forms the backbone of any successful technology integration effort (Municipality of Amsterdam, 2024).

However, while these frameworks offer essential guidance, they are not without limitations. Regulatory frameworks such as the AI Act often rely on top-down compliance mechanisms, which may conflict with the adaptive, iterative approaches needed in municipal governance (European Commission, 2021; World Economic Forum, 2024). Additionally, translating high-level regulatory principles into practical, role-specific tasks remains a significant challenge, especially in environments where employees lack consistent and regulated access to training and support systems (Municipality of Amsterdam, 2024; KPMG, 2021).

To address these challenges, municipalities like Amsterdam can focus on building regulatory literacy among employees and create cross-departmental governance structures that promote shared accountability and transparency (Municipality of Amsterdam, 2024; World Economic Forum, 2024). This requires not only technical training but also organizational cultural shifts that emphasize ethical responsibility and interdepartmental collaboration (Moore, 1995; KPMG, 2021).

Incorporating the insights provided by these regulatory and governance frameworks can provide Amsterdam a set of considerations and principles to navigate the complexities of AI integration. To do so, the organization must have the competence of bridging legal mandates, organize operational governance models, and create ethical oversight. The theories show that integration requires the creation of governance ecosystems that are both resilient and adaptable (European Commission, 2021; Moore, 1995; KPMG, 2021). In a way that an integrated approach not only satisfies legal obligations but also ensures that AI systems contribute to public value, foster organizational trust, and align with the broader societal goals of transparency, and accountability (World Economic Forum, 2024; Municipality of Amsterdam, 2024).

Detailed findings on governance gaps, employee readiness, and training needs will be further examined in Chapter 4, where empirical insights from interviews and focus groups will shed light on the practical challenges and opportunities for Amsterdam's municipal workforce in the realm of AI governance.

2.3 Ethical considerations in AI integration

As mentioned in previous theories, ethical principles are fundamental to the responsible integration of technology (generative AI) in public governance, it aims to ensure that AI systems align with societal values while addressing challenges such as bias, accountability, and transparency (Binns, 2018; Accenture, 2023a). Municipalities integrating AI must navigate these ethical considerations to maintain public trust and ensure equitable outcomes for all citizens (Municipality of Amsterdam, 2024). In this regard, ethical AI governance is not merely a technical requirement but a foundational element of sustainable AI integration, deeply intertwined with public trust and institutional legitimacy.

The Fairness, Accountability, and Transparency (FAT) framework proposed by Binns (2018) provides a foundational approach to ethical AI adoption. Fairness emphasizes the prevention of discriminatory outcomes by identifying and addressing biases embedded in algorithmic decision-making processes (Binns 2018). Accountability is about establishing oversight mechanisms, and ensuring that AI-driven decisions remain traceable, explainable, and justifiable to stakeholders (Binns 2018). Transparency is about focusing on making AI systems and their outputs understandable and accessible, as well as encouraging public engagement and trust in organizational governance structures (Binns 2018). These principles resonate strongly with Amsterdam's Vision on AI (2024), which advocates for human-centred AI systems designed to complement human decision-making processes rather than replace them (City of Amsterdam, 2024).

Despite the clear ethical and other imperatives outlined by frameworks such as Moore's strategic triangle and the FAT framework, there can be several limitations when these are applied to the integration of AI technologies. Mostly because they do not explicitly address the complex challenges posed by AI as a dynamic emerging technology. While it considers foundational requirements, it may not fully capture the nuanced ethical considerations required for integration. Meaning that the frameworks may struggle to keep pace with the rapid evolution of AI technologies. In the context of AI governance, the frameworks may not adequately represent the diverse range of stakeholders affected

by AI implementation (Lähteenmäki-Smith et al., 2022). This could lead to overlooking important perspectives in the decision-making process. Additionally, all the elements can be challenging to navigate, especially when dealing with the multifaceted implications of AI in public administration, the frameworks and theories may not fully capture the need for ongoing monitoring and adjustment of AI systems, which are assumed essential for maintaining ethical standards and public trust over time (PreLounge, n.d.)

Other theories, like the Human-Centred AI Theory proposed by Accenture (2023a) emphasize the importance of designing AI systems that enhance human capabilities rather than replacing them. This theory underscores the necessity of maintaining human oversight across all stages of AI integration, ensuring that AI remains a collaborative tool rather than an autonomous decision-maker (Accenture, 2023a; 2023c). In regards to this case study, the established AI vision (2024) of the city of Amsterdam emphasizes the importance of retaining a human in the loop for use, interpretability, and control over AI-driven decisions (City of Amsterdam, 2024). The vision explains the importance of interpreting AI outputs, adjusting parameters when necessary, and, most importantly, taking responsibility for final decisions influenced by AI systems (City of Amsterdam, 2024). These perspectives are further aligned with previous theoretical insights about transparency and public accountability (World Economic Forum, 2024; Municipality of Amsterdam, 2024).

The different frameworks and theories show that there are principles and considerations that cannot be treated as secondary concerns but rather as integral foundational components for the integration of technology. The different approaches not only try to mitigate the risks associated with AI use but also position standards of consideration to use AI as a tool for equitable, transparent, and accountable public service delivery. Ethical AI integration, therefore, becomes a cornerstone for achieving operational excellence and delivering public value in the rapidly evolving landscape of municipal governance.

Further empirical insights into the challenges and opportunities of ethical AI integration will be explored in Chapter 4, where findings from focus groups and interviews will provide a nuanced understanding of how ethical principles are being implemented—and where gaps persist—within Amsterdam's municipal workforce.

2.4 Adaptability and skill development

As municipalities integrate AI into public services, the capacity to navigate within the evolving technological landscapes, address ethical challenges, and align AI tools with community objectives becomes a critical factor for success (City of Amsterdam, 2024). Building this capacity appeals to the workforce as the main resource for integration within the organization (Cedefop, 2022b). The theory shows that technology integration requires a structured approach and organizational strategies that consider foundational principles, such as ethics, fairness, accountability, and transparency (Binns, 2018; Accenture, 2023b).

Public institutions on the European level underscore that workforce capacity is a crucial resource in digital transformation. For this reason, they have developed models that help equip the workforce with the necessary skills (Cedefop, 2022a). The Cedefop models of continuous and lifelong learning (Cedefop, 2022a) aim to provide a strong foundation for fostering workforce adaptability. Continuous learning emphasizes ongoing professional development through workshops, specialized training sessions, and certifications in AI technologies. This approach ensures that employees remain current with emerging tools and practices, enabling them to respond effectively to technological

advancements (Cedefop, 2022a). On the other hand, lifelong learning extends this concept beyond isolated training initiatives, by promoting a sustained culture of skill acquisition and knowledge sharing throughout an employee's career. Such an approach aims to foster resilience, ensuring that the organizational workforce can proactively address the challenges posed by technology (AI) integration while adapting to shifting organizational priorities (Cedefop, 2022a).

Complementing these public models, we can also see how on the corporate side there is acknowledgment for necessary workforce development. A good example of this is Deloitte's Agile Workforce Development Framework (Deloitte, 2023) which advocates for flexibility, adaptability, and cross-departmental collaboration. The framework emphasizes that agile workforce structures are good enablers for employees to move dynamically across projects and roles because they prove helpful in breaking down silos and promoting interdisciplinary cooperation (Deloitte, 2023). In the context of generative AI integration, agility aims to ensure that employees are not confined to rigid job descriptions but are instead empowered to respond swiftly to evolving technological and operational requirements (Deloitte, 2023).

From a strategic governance perspective, Moore's Strategic Triangle reinforces the importance of operational capacity as a cornerstone for successful AI integration (Moore, 1995). According to this theory, operational capacity is not merely about technical expertise but also about fostering a workforce culture that values adaptability, continuous improvement, and knowledge sharing (Moore, 1995). Moore's theory emphasizes that an organization's capacity to deliver public value hinges on the skills and readiness of its workforce. In Amsterdam, these principles are listed in municipal governance as essential, for this equipping employees with the competence needed to implement AI systems responsibly and effectively is foundational (City of Amsterdam, 2024).

However, while these theoretical frameworks offer valuable insights, they often assume consistent access to resources, stable training environments, and uniform digital literacy levels across organizations (Cedefop, 2022a; Deloitte, 2023). In reality, municipal governance structures might frequently face fragmentation, inconsistent training efforts, and uneven digital proficiency among employees (Municipality of Amsterdam, 2023b). To overcome these obstacles, structured training programs can offer a solution, these can focus on role-specific skill development, technical proficiency, and ethical reasoning. Additionally, the benefit of adopting agile workforce models can help foster collaboration across organizational departments, ensuring that employees are not only technically skilled but also adaptable and capable of navigating the evolving responsibilities associated with AI adoption (Deloitte, 2023).

For Amsterdam, building a culture of continuous and lifelong learning might not simply be a response to technological change—it can also serve as a strategic imperative for ensuring long-term resilience in public service delivery. The assumption here is that institutionalizing professional development initiatives, promoting cross-departmental knowledge sharing, and embedding ethical principles into training programs, can help the municipality of Amsterdam cultivate a workforce that is not only capable of managing AI tools but is also assumed prepared to address the societal implications of AI integration.

Understanding frameworks such as Cedefop's continuous and lifelong learning models, Deloitte's Agile Workforce Framework, and Moore's Strategic Triangle, can help municipalities move beyond fragmented training efforts towards a cohesive workforce development strategy. This approach is assumed to position employees as active agents of technological change, that are equipped with the technical skills, ethical reasoning, and adaptability needed to leverage AI responsibly in the service of public value.

The challenges and opportunities related to workforce adaptability, including employee readiness, training gaps, and resource constraints, will be explored further in Chapter 4, where empirical findings will provide a deeper understanding of the practical realities faced by Amsterdam's municipal workforce.

2.5 Proposing the Four Pillars Framework

A review of related reports and literature consistently highlights that the successful integration of generative AI in municipal governance necessitates a multifaceted approach addressing technical, ethical, regulatory, and organizational dimensions (European Commission, 2021; Moore, 1995; Binns, 2018; Deloitte, 2023; World Economic Forum, 2024). Assuming that these dimensions are deeply interconnected, a structured framework is proposed to navigate the complexities of AI integration in municipal organizations.

To conceptualize these interdependent elements, this study proposes the Four Pillars Framework, which aims to serve as a theoretical and practical tool for examining the challenges of workforce development in municipal governance. The framework synthesizes key theoretical insights from diverse perspectives, it includes digital transformation (Rogers, 2016; Siebel, 2019), workforce adaptability and skill development (Cedefop, 2022a; Deloitte, 2023), governance and regulatory compliance (European Commission, 2021; KPMG, 2021), and ethical, fair, accountable and transparent AI integration (Binns, 2018; Accenture, 2023b; Saldanha, 2019).

The four pillars framework integrates these previous perspectives into a cohesive structure, aiming to identify the critical components of AI integration while emphasizing their interconnected and cyclical relationships. The objective is to offer municipalities a comprehensive guide for organizational readiness, foundational considerations, and principles needed to develop organizational strategies in the face of rapid AI advancements.

In the proposed four pillars framework, each pillar draws from established theoretical models, combining them into a dynamic and interdependent framework for addressing municipal AI integration. The arrows of interconnection depicted in Figure 1 highlight the cyclical and iterative relationships between the pillars, emphasizing their mutual dependence in assessing the development of the workforce for AI integration.

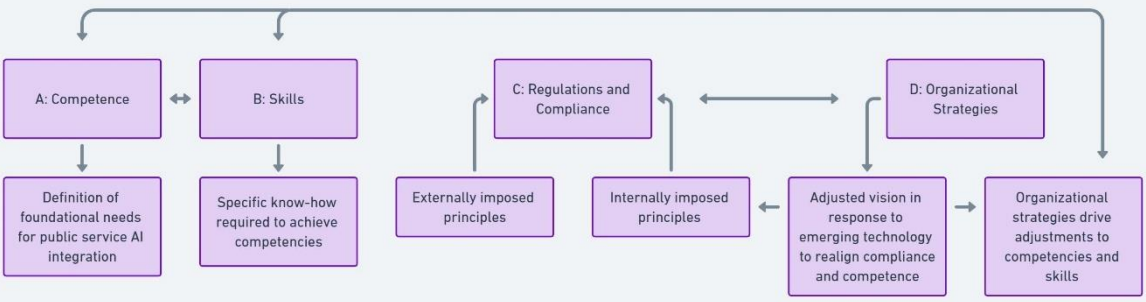

Figure 1
Four Pillars Framework: Aligning Competence, Skills, Regulations and Compliance, and Organizational Strategies for Municipal AI Integration. Created by the author using Whimsical, December 2024.

2.5.1 Theoretical foundations of the four pillars

The specific theoretical contributions to the four-pillar framework, aim to provide both conceptual clarity and practical insights for workforce readiness in the context of municipal AI adoption.

1. **Pillar A- AI Competence:** This pillar aims to define the foundational knowledge and digital literacy required for AI integration in public governance (Olmstead, 2024). The principles of Cedefop (2022a) continuous learning are considered here as these emphasize the importance of digital competence as a baseline for AI readiness in the workforce (Cedefop (2022a). Additional considerations come from, Moore's (1995) operational capacity dimension that reinforces the need for workforce preparedness to achieve organizational objectives effectively (Moore, 1995).

2. **Pillar B- AI Skills:** Moving beyond foundational knowledge, this pillar aims to explore specialized technical proficiency and adaptability that enable competence in the use of AI technology. The principles of Deloitte's Agile Workforce Development Framework (2023) are considered here because they advocate for flexible, skill-based approaches that allow municipal employees to adapt rapidly to changing and emerging technological landscapes. Another theory consideration is Saldanha's (2019) Five-Stage Model, which in this stage provides a phased understanding of workforce maturity in AI integration (Saldanha, 2019).

3. **Pillar C- AI Regulations and Compliance:** This pillar aims to underscore the importance of regulatory oversight, ethical accountability, and transparency. The EU Artificial Intelligence Act (2021) serves as a regulatory benchmark for ensuring AI systems align with societal and legal standards. Ethical dimensions from the FAT principles (Binns, 2018) and Accenture's Human-Centred AI Theory (2023a) are further considered in this pillar to strengthen the pillar in providing mechanisms to identify compliance efforts and mitigate ethical risks.

4. **Pillar D- AI Organizational Strategies:** This final pillar considers the 360° Governance Framework (World Economic Forum, 2024) and Rogers' Five Domains of Digital Transformation (2016) to help provide the foundation on what to consider as important in creating adaptive organizational structures capable of responding to evolving technological landscapes.

While each pillar draws from distinct theoretical foundations, they are considered inherently interconnected and have relationships that reflect both cyclical dependencies and iterative feedback loops.

2.5.2 Interconnections between the four pillars

It is important to note that the interrelationships among the four pillars are not linear but cyclical and considered mutually reinforcing, as illustrated by the arrows in Figure 1. Each pillar informs, supports, and evolves in tandem with the others, creating a dynamic ecosystem of the considerations and steps in AI integration in municipal governance.

The Relationship between AI Competence (Pillar A) and AI Skills (Pillar B):

Competence forms the foundation upon which advanced skills are built. Foundational knowledge aims to provide employees with the digital literacy required to develop specialized technical proficiencies. However, skills (specific know-how) also feed into competence by informing updates to competence frameworks based on evolving technological needs. For example, as AI technologies advance, new skills such as prompt engineering or algorithm auditing, may redefine foundational competence digital literacy requirements (Cedefop, 2022a; Deloitte, 2023).

The Relationship between AI Skills (Pillar B) and AI Regulations and Compliance (Pillar C):

Technical proficiency and adaptability are considered essential for operationalizing regulatory standards and ethical frameworks. Employees must possess the skills to understand, interpret, and apply regulatory guidelines effectively while ensuring compliance with principles such as fairness, accountability, and transparency (Binns, 2018; European Commission, 2021). At the same time, regulatory requirements often drive updates in skill development programs, creating a feedback loop between these two pillars.

The Relationship between AI Regulations and Compliance (Pillar C) and AI Organizational Strategies (Pillar D):

Organizational strategies provide the structural and cultural foundation for embedding regulatory principles into municipal workflows. When developing organizational strategies, leadership vision, cross-departmental collaboration, and adaptive governance structures help ensure that compliance is not treated as a box-ticking exercise but that it is integrated into routine practices (World Economic Forum, 2024; Moore, 1995). Conversely, compliance requirements often necessitate strategic adjustments to ensure alignment with the organization's structures and the evolving regulations and ethical benchmarks.

The Relationship between AI Organizational Strategies (Pillar D) and AI Competence (Pillar A):

The consideration here is that organizational strategic choices shape the direction of workforce competence by identifying emerging technological and societal priorities, that in turn help define the competence needed to achieve them. Strategic initiatives help define the foundational needs for AI integration because they tend to establish clear competence expectations across department initiatives. Simultaneously, competence contributes to shaping organizational strategies by ensuring that workforce readiness aligns with strategic objectives (Rogers, 2016; Moore, 1995).

These relationships demonstrate an interrelated and continuous feedback loop, where each pillar supports and informs t others in an iterative cycle. Understanding these interrelationships allows for the development of an integration process that goes beyond an isolated analysis of each pillar. The model proposed here explores the cyclical and iterative relationships among the four pillars, showcasing how they collectively contribute to AI integration readiness.

1. AI competence drives AI skill development, forming the foundational layer for AI adoption.
2. AI skills operationalize AI strategies and regulatory standards, ensuring compliance and accountability.
3. AI regulations and compliance guide AI organizational strategies, embedding ethical and legal principles into municipal workflows and structures.
4. AI organizational strategies refine AI competence frameworks, creating a feedback loop that ensures workforce readiness evolves with strategic objectives.

This cyclical structure ensures that gaps in one pillar trigger responses in others, it aims to create a resilient, adaptive governance integration ecosystem. The conceptual illustration in Figure 1 visualizes these relationships, accounting for the theoretical grounding of each pillar and the dynamic, interconnected nature of their interactions. The proposed Four Pillars Framework aims to serve as both a diagnostic tool and a strategic guide, enabling municipalities to identify gaps, allocate efforts and resources effectively, and establish targeted interventions for workforce development. For Amsterdam, this model aims to represent a practical contribution to aligning technological integration

with workforce readiness, ethical accountability, and public trust. The empirical findings in Chapter 4 will further analyse these interconnections, exploring how they manifest in practice within Amsterdam's municipal governance structures.

Chapter 3: Research Design

3.1 Introduction

This chapter outlines the research design employed to investigate how the municipality of Amsterdam can address the preparation of their workforce for the integration of generative Artificial Intelligence. The study adopts a qualitative case study methodology, complemented by quantitative data insights, ensuring a comprehensive approach to address the central research question.

At the core of this study is the Four Pillars Framework, introduced in Chapter 2, which serves as both a theoretical lens and a structural guide for the research design. Drawing from established theoretical contributions such as Saldanha's Five-Stage Model (2019), Cedefop's Skills Framework (2022a), the FAT Principles (Binns, 2018), and Moore's Strategic Triangle (1995), the framework combines these theoretical concepts with empirical methods to ensure consistency across the research process.

This chapter begins with an overview of the research entity and a short case introduction, followed by a detailed explanation of the data collection methods, including semi-structured interviews, focus groups, archival analysis, and validation sessions. It then elaborates on the purpose of the mixed-method approach, thematic analysis methods, and how findings are linked back to the theoretical models. Finally, the chapter concludes with an outline of ethical considerations, research limitations, and a summary of the design.

3.2 Research entity and case introduction

The Municipality of Amsterdam serves as the research entity for this study. As one of Europe's leading cities in digital transformation and AI adoption, Amsterdam provides a rich context for examining workforce readiness, governance structures, and skill development strategies for generative AI integration (Municipality Amsterdam, 2023a; Municipality Amsterdam, 2023b). Initiatives outlined in the Digital City Agenda (2023–2026) and Amsterdam Vision on AI (2024) demonstrate the city's proactive stance on ethical AI governance and human-centred AI adoption (City of Amsterdam, 2024).

However, despite these strategic initiatives, Amsterdam faces challenges in aligning workforce competence, ethical oversight, and cross-departmental collaboration with AI integration goals (Municipality Amsterdam, 2023a; Municipality Amsterdam, 2023b). This study seeks to address these challenges by applying the proposed Four Pillars Framework as both an analytical tool and a practical roadmap to address municipal workforce development.

Amsterdam's commitment to AI integration and digital transformation is articulated in key policy documents, including the Digital City Agenda (2023–2026) and Amsterdam Vision on AI (2024). These policies emphasize the ethical, transparent, and inclusive adoption of AI systems to enhance public services while ensuring accountability and public trust (Municipality Amsterdam, 2023a; Municipality Amsterdam, 2023b). Despite clear strategic objectives, challenges remain in operationalizing and creating the capacity for this adherence to these principles at the workforce level.

Existing governance and training structures possibly lack systematic alignment with emerging AI demands, potentially creating gaps in employee competence, technical skills, and regulatory compliance readiness. This study aims to bridge these gaps by examining the dynamics within

Amsterdam's municipal context through the Four Pillars Framework, aiming to provide actionable insights for aligning organizational strategies and policies with workforce realities and development.

Considerations of the framework:

1. The Competence pillar aims to support Amsterdam's focus on digital literacy and ethical reasoning, ensuring employees can interpret and manage AI systems responsibly;
2. The Skills pillar aims to align with the city's emphasis on reskilling municipal staff to meet AI-related demands, such as data analysis and prompt engineering;
3. The Governance and Compliance pillar aims to reflect Amsterdam's adherence to the EU AI Act, bias mitigation and fairness, accountability and transparency in AI applications;
4. The Organizational Strategies pillar reinforces the need for interdisciplinary collaboration and leadership-driven adaptability, both central to Amsterdam's Vision of AI.

3.3 Data collection methods

The data collection process in this study was carefully designed to address the research question: "How can the municipalities of Amsterdam address the preparation of their workforce for the integration of generative Artificial Intelligence? Guided by the proposed Four Pillars Framework introduced in Chapter 2, the approach combines qualitative and quantitative data sources to ensure a comprehensive exploration of foundational, technical, ethical, regulatory, and organizational dimensions associated with AI integration (Cedefop, 2022a; Binns, 2018; Moore, 1995; Deloitte, 2023).

The study employs a mixed-methods approach, by integrating semi-structured interviews, sessions with focus groups, an archival analysis, and validation sessions. Each method is strategically aligned with one or more pillars of the Four Pillars Framework by a thematic structure, to ensure that data collection directly contributed to answering the study's core research questions. This alignment provides depth to the findings, enabling a nuanced understanding of the interconnected pillars of competence, skills, governance, and organizational strategies.

The research design acknowledges that workforce development for generative AI integration in municipal governance cannot be understood through a singular lens. Therefore, data sources were carefully selected to capture individual-level perspectives, organizational dynamics, and policy-level directives, aiming to reflect the multi-dimensional nature of the research problem.

3.4 Research questions, data sources, and the four pillars

The alignment between research questions, data sources, and theoretical pillars is considered important to the coherence and clarity of this study. Each pillar is rooted in the theoretical models discussed in Chapter 2 and directly linked to specific data collection methods.

The first research question explores the foundational competence necessary for the use of generative AI by the municipal workforce. This question corresponds to the A: Competence pillar of the Four Pillars Framework, which draws on insights from Cedefop's Skills Framework (2022a) and Moore's Operational Capacity Dimension (1995). Semi-structured interviews provided an opportunity to gather detailed insights into the digital literacy, ethical reasoning, and foundational knowledge gaps among municipal employees. Archival analysis of municipal policies, such as the *Amsterdam Vision on AI (2024)* and the *Digital City Agenda (2023–2026)*, validated these findings by aligning them with the organizational strategic priorities.

The second research question investigates what technical and adaptive skills are required for competence in AI integration. Aligned with the B: Skills Pillar, this question builds on Deloitte's Agile Workforce Framework (2023) and Saldanha's Five-Stage Model (2019). The semi-structured interviews with municipal HR specialists and technical staff provided insights into the skills required, such as prompt engineering, algorithm management, and cross-functional collaboration. Additionally, focus groups with HR teams further explored the training needs and existing skill gaps, while the validation sessions helped refine the understanding of actionable skill development strategies.

The third research question addresses how regulatory policies and ethical principles guide AI integration in municipal governance. This question is aligned with the C: Governance and Compliance Pillar and incorporates theoretical perspectives from the EU Artificial Intelligence Act (2021), the FAT Principles (Binns, 2018), and Accenture's Human-Centred AI Theory (2023a). The semi-structured interviews with policymakers and compliance officers provided critical insights into the interpretation and application of regulatory standards, additionally, archival analysis of policy documents ensured the evaluation of alignment with ethical guidelines and transparency mandates. Validation sessions with governance experts refined these insights further, emphasizing the importance of bias detection, accountability mechanisms, and transparency protocols.

The fourth research question explores the strategies that support skills and competence development in artificial intelligence-enhanced public services. Corresponding to the D: Organizational Strategies Pillar, this question integrates insights from Moore's strategic triangle (1995), the Five Domains of Digital Transformation (Rogers, 2016), and the 360° Governance Framework (World Economic Forum, 2024). Additionally, focus group sessions with leadership teams provided reflections on structural and cultural barriers to collaboration, while archival analysis highlighted organizational strategies embedded in municipal policy documents. Validation sessions further contextualized these insights, aligning them with real-world leadership challenges in the Amsterdam municipality.

This structured mapping ensured that each research question was systematically addressed through appropriate data sources, directly supporting the theoretical constructs outlined in Chapter 2.

3.4.1 Semi-Structured Interviews

Semi-structured interviews formed an important qualitative data collection process because they offered the flexibility to probe the selected themes while maintaining alignment with the Four Pillars Framework. In total seven interviews were conducted with municipal employees, HR specialists, policymakers, and external consultants between September 2024 and December 2024. Questions were carefully designed to address each pillar in the following way:

1. **AI Competence:** Explored digital literacy, ethical reasoning, and foundational AI knowledge (Cedefop, 2022a).
2. **AI Skills:** Examined technical proficiency, adaptability, and problem-solving abilities (Deloitte, 2023).
3. **AI Governance and Compliance:** Investigated transparency, accountability, and ethical oversight (Binns, 2018; European Commission, 2021).
4. **AI Organizational Strategies:** Discussed leadership roles, strategic alignment, and collaboration barriers (Moore, 1995).

The interview data provided rich insights into individual and organizational challenges associated with AI integration while aligning thematic sections with key theoretical themes identified in Chapter 2.

3.4.2 Focus Groups

Three distinct focus groups complemented the interview findings by creating a space for collaborative discussions among stakeholders. Between April and December 2024, participants of three focus groups were divided, each focusing on key dimensions of the Four Pillars Framework.

1. **Focus group 1: Strategic HR Teams:** collaborative discussions on the future of own work, AI and organizational development, collaboration on skills, and data-driven initiatives. Alignment with theory on addressing training needs professional development gaps and workforce readiness for AI integration (Cedefop, 2022a). Total of three sessions in October, November and December 2024.

2. **Focus group 2: Socratic Design Dialogues on the Vision of AI:** collaborative discussion on the municipal vision of AI, collaborative initiatives, and community building. Alignment with ethical concerns and societal values (Binns, 2018; Municipality of Amsterdam, 2024; Moore, 1995). Total of five sessions in April, May, September, and November 2024.

3. **Focus group 3: Strategic Leadership Groups:** collaborative discussion about vision on inclusive leadership, vision on governance and emerging technologies, and the future of work. Alignment with theory on organizational strategies and leadership adaptability (World Economic Forum, 2024). Total of three sessions in June, November and December 2024.

The focus group discussions allowed for the cross-pollination of ideas, validating and expanding on interview findings while emphasizing collective stakeholder perspectives.

3.4.3 Archival Analysis

The archival analysis provided contextual depth to the study by aligning qualitative findings with municipal and policy documents. Key sources included *Amsterdam's Digital City Agenda (2023–2026), the Amsterdam Vision on AI (2024), and the European AI Act (2021).* This analysis ensured that the findings remained grounded in organizational policy priorities and broader regulatory mandates, aiming to bridge the theoretical concepts with real-world applications.

3.4.4 Validation Sessions

Three validation sessions were held in September, November, and December 2024. The focus for discussion was the future of work, the session played a crucial role in refining insights and ensuring alignment with municipal realities. These sessions involved HR leaders, municipal executives, and external consultants, offering a platform for feedback on key findings of the study and exploring theories. Validation sessions were considered instrumental in confirming the applicability of the Four Pillars Framework to municipal governance and highlighting practical challenges and opportunities for AI integration. The analysis of the validation sessions is summarized in a thematic way that shows the points of validation and their alignment with the four pillars by themes.

3.4.5 Conclusion

The integration of interviews, focus groups, archival analysis, and validation sessions aims to ensure a triangulated perspective on workforce readiness for AI integration. While the interviews and focus groups captured individual and collective stakeholder insights, archival analysis and validation sessions provided insights on organizational policy alignment and practical refinements. This multi-layered approach ensures that the study addressed the technical, ethical, regulatory, and organizational dimensions embedded in the Four Pillars Framework, creating a robust foundation for the thematic

analysis in the following chapter. The next section shows a visual overview of the research design, see figure 2.

Figure 2
Research Design Visualization. Created by the author using Whimsical, December 2024.

3.5 Ethical considerations

The research adhered to strict ethical principles to ensure the integrity and credibility of the study.

- ✓ **Informed Consent**: Participants were briefed on the study's objectives and voluntarily consented to participate.
- ✓ **Anonymization**: Data was anonymized to protect participant identities.
- ✓ **Data Security**: Secure storage and restricted access safeguarded the confidentiality of the data.

These measures ensured compliance with ethical research standards and reinforced trust among participants.

3.5.1 Limitations of the research design

While this study provides valuable insights into workforce competence, skills, governance, and organizational strategies for integrating generative AI into municipal governance, it is essential to acknowledge its methodological and contextual limitations. Recognizing these constraints not only enhances the transparency and academic integrity of the research but also provides pathways for future research and practical improvements.

3.5.2 Context-specific focus on Amsterdam

This study is centred on the Municipality of Amsterdam, which serves as a single-case study. While Amsterdam represents a leading European city in digital transformation and AI integration, the findings may not be directly generalizable to other municipalities with differing governance structures, resource availability, and cultural contexts.

Proposed Solution: The Four Pillars Framework was intentionally designed to be scalable and adaptable. Municipalities in other contexts can adopt this framework while making contextual adjustments based on their unique governance models, regulatory requirements, and resource capacities. Future research could extend this study by conducting comparative analyses across multiple municipalities in diverse geographic and socio-political contexts to enhance transferability and external validity.

3.5.3 Potential interpretative bias

As with any qualitative research, interpretative bias may arise during data collection, thematic analysis, and result interpretation. Researcher perspectives, participant subjectivity, and organizational hierarchies may have influenced the insights derived from interviews, focus groups, and validation sessions.

Proposed Solution: The study employed methodological triangulation through the integration of semi-structured interviews, focus groups, archival analysis, and validation sessions to mitigate bias. Additionally, validation sessions with municipal leaders and HR specialists served as a cross-referencing mechanism, ensuring that interpretations remained accurate and contextually grounded. Future studies could further reduce interpretative bias by employing external auditors or third-party reviewers to validate key findings.

3.5.4 Rapid technological changes

The AI landscape is rapidly evolving, with frequent advancements in technology, ethical guidelines, and regulatory frameworks. As a result, some findings and recommendations presented in this study may become partially outdated over time as newer AI tools and governance models emerge.

Proposed Solution: To address this limitation, municipalities could adopt a dynamic and iterative approach to AI governance, embedding ongoing evaluation and periodic reassessments into their strategic planning cycles. Municipal AI task forces should regularly review and update AI adoption frameworks, training programs, and governance protocols to ensure alignment with the latest technological and regulatory developments. Additionally, longitudinal studies could track the evolution of workforce competence and governance strategies over time, offering ongoing insights into emerging challenges and opportunities.

3.5.5 Dependence on self-reported data

The reliance on self-reported data from interviews and focus groups may have introduced response biases, such as social desirability bias or selective reporting by participants.

Proposed Solution: The inclusion of archival analysis helped cross-validate participant responses with official documents and policy frameworks, reducing the impact of self-reported bias. Future studies could incorporate observational methods or on-the-job ethnographic studies to gain unfiltered insights into workforce behaviours and organizational practices related to AI integration.

3.6 Summary of research design

This chapter outlined the research design employed to investigate how the municipality of Amsterdam can prepare its workforce for the integration of generative Artificial Intelligence (AI). Anchored in the Four Pillars Framework, the study adopted a qualitative case study methodology complemented by quantitative insights, ensuring a comprehensive and multi-dimensional approach.

The research entity and case introduction established Amsterdam as an exemplary context for examining workforce readiness for AI integration, highlighting its Digital City Agenda (2023–2026) and Amsterdam Vision on AI (2024). While Amsterdam demonstrates a proactive stance on AI adoption, challenges remain in aligning workforce competence, ethical oversight, and governance structures with strategic AI objectives. The Four Pillars Framework served as both an analytical and practical tool for addressing these challenges, with each pillar—Competence, Skills, Governance and Compliance, and Organizational Strategies—providing a distinct focus.

The data collection methods combined semi-structured interviews, focus groups, archival analysis, and validation sessions, each strategically aligned with the Four Pillars Framework. Interviews provided in-depth individual perspectives, focus groups facilitated collaborative discussions among stakeholders, and archival analysis ensured alignment with municipal policies and regulatory mandates. Validation sessions served as a final checkpoint, refining findings and ensuring practical alignment with real-world governance dynamics.

The research questions, data sources, and Four Pillars alignment were systematically mapped to ensure clarity and coherence. Each pillar was paired with specific data collection methods and theoretical foundations, such as Cedefop's Skills Framework (2022a), Moore's Strategic Triangle (1995), and Binns' FAT Principles (2018). This alignment ensured that data collection directly addressed the core research questions, enabling a nuanced exploration of foundational competence, essential skills, regulatory compliance, and organizational strategies for AI integration.

Ethical considerations were meticulously followed, including informed consent, anonymization of data, and secure storage protocols, ensuring compliance with research integrity standards. The chapter also acknowledged key limitations, including a context-specific focus on Amsterdam, interpretative bias, rapid technological changes, and reliance on self-reported data. Strategies to address these limitations, such as methodological triangulation, dynamic AI governance approaches, and cross-validation through archival analysis, were outlined to enhance the robustness of the findings.

In conclusion, this chapter provided a structure for investigating workforce preparedness for AI integration through the Four Pillars Framework. The integration of diverse data collection methods, ethical adherence, and critical reflection on limitations establishes a strong methodological foundation for the analysis and discussion presented in subsequent chapters.

4. Analysis and Discussion

This chapter presents the results of a mixed-methods analysis, combining qualitative insights from semi-structured interviews, focus group sessions, and validation sessions with supportive quantitative data from the European Survey on AI Skills (Cedefop, 2024a). The Cedefop AI skills survey, conducted in the spring of 2024, serves as a data source for understanding skill requirements for AI integration across EU municipalities. Although The Netherlands was not included in the survey, the data offers valuable insights into how AI technologies are being integrated into European workplaces, directly aligning with the objectives of this research (Cedefop, 2024a).

The chapter aims to address the central research question: How can the municipality of Amsterdam address the preparation of their workforce for the integration of generative Artificial Intelligence (AI)? The findings follow the logic structured according to the Four Pillars Framework proposed in this research, following the logic of foundational Competence necessary for AI use, the specific skills needed to achieve this competence, and the considerations of Ethical Standards and regulatory compliance, for organizational strategies that support AI integration.

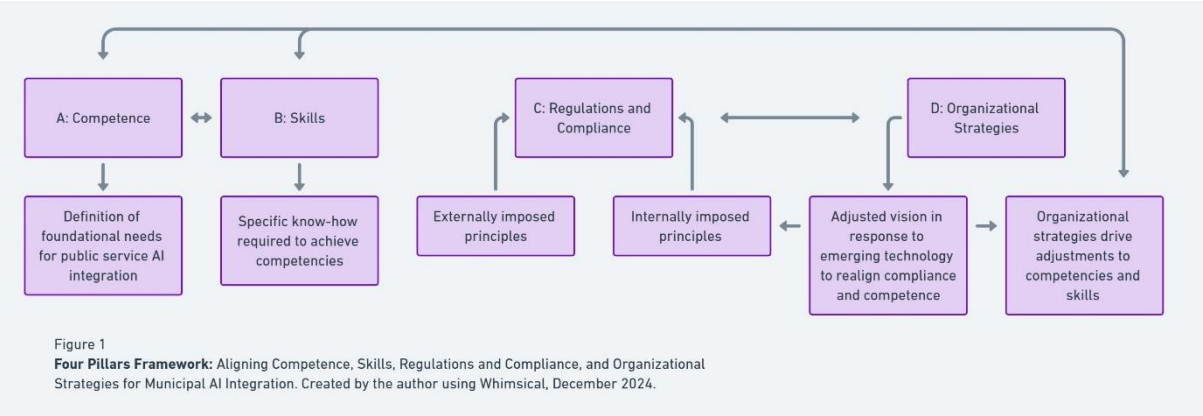

Figure 1
Four Pillars Framework: Aligning Competence, Skills, Regulations and Compliance, and Organizational Strategies for Municipal AI Integration. Created by the author using Whimsical, December 2024.

4.1 Foundational AI-Competence and organizational strategies

Competence represents the foundational knowledge, expertise, and behavioural attributes necessary for effectively integrating AI into municipal operations. Across the qualitative data, several recurring themes emerged. Participants mentioned gaps in digital literacy, employee readiness, and disparities in the allocation of resources (interview 1, December 2024). These gaps were believed to necessitate inclusive organizational strategies to be able to benefit from technological advancements (interview 4, December 2024). Additionally, organizational dynamics and collaboration between departments were mentioned as key considerations for supportive organizational strategies (Interview 1, December 2024; Interview 5, December 2024). “organizational strategies should involve dialogues and creating a shared vision of the future” (Interview 2, December 2024; Interview 7, December 2024).). Participants also mentioned that “organizational strategies should move away from rigid and function-based structures, toward task-oriented and multidisciplinary approach” (Interview 2, December 2024; Interview 5, December 2024). To address this, theories mention that “organizations must support adopting innovative practices by providing training, resources, and incentives that encourage agility” (Rogers, 2016). Yet, according to the interview findings, there can be the limitation of resistance to transformation by individuals (Interview 2, 2024). In 2024, almost 15% of European workers fear job loss due to AI (Pouliakas & Becuwe, 2024). We can assume that there is at least some resistance attached to AI use if this means losing job security. Coming back to the importance and considerations of organizational strategies that support AI use, it is interesting to see that municipal employees underscore the need for inclusive strategies (Interview 1, December 2024) and also have questions

about job displacement (Interview 2, December 2024). In trends, we see that 44% of European workers think it is unlikely their company or organization will provide training to workers to deal with AI (Pouliakas & Becuwe, 2024). The question remains if this sentiment has something to do with the emerging dynamics of the technology or perhaps with the uncertainty that the technology has on job displacement expectations (Interview 2, December 2024). What we can state as a finding is that "there is a need for thoughtful integration of technology in public and private sectors and that these should ensure to support employee competence and promote equitable opportunities"(Interview 2, December 2024).

The findings also explain that employees should possess the competence to critically evaluate AI outputs and understand the mechanics behind AI tools to be able to use them responsibly. There were examples given of inaccuracy in the use of AI that exemplified the need for an "expert in the loop" to mitigate the risk of misinformation (Interview 3, December 2024). Other examples illustrated how AI is already reshaping workflows, such as urban planning. However, participants also noticed that AI-generated outputs often reflect bias inherent in their dataset, underscoring the need for human expertise and oversight (Interview 3, December 2024; Interview 5, December 2024). The assumption here is that this human expertise and oversight are part of the foundational competence that is necessary for AI use. If we look at broader insights, 42% of surveyed European workers reported regularly using AI-powered tools to recognize, translate, transcribe, or generate text. Frequent to constant use was reported by 22% of European workers (Pouliakas & Becuwe, 2024). The qualitative insights, listed competence in awareness, adaptability, and self-management as essential for the use of AI (Interview 2, Dec 2024). These refer to being conscious or knowledgeable about AI, being able to adjust to changing circumstances, and having the ability to regulate your actions, emotions, and behaviours (Interview 2, Dec 2024). Findings show that these considerations enable employees to navigate the rapidly changing AI landscape while maintaining ethical responsibility (Interview 2, Dec 2024; Interview 5, December 2024). Additionally, the level of AI competence becomes more relevant if we consider that 28% of workers in Europe regularly use AI-powered tools to recognize patterns in data, using algorithms and make predictions to help their work decisions, while 15% of European workers do this frequent to constant (Cedefop, 2024b). Focus group participants also connected competence to strategic organizational goals, and the discussions considered the of importance aligning employee capabilities with broader municipal objectives (HR Session 1, Oct 2024). Competence such as curiosity, was referred to as an enabler of critical thinking. Trust was seen as a value that has a strong relationship with organizational culture, focus group participants noted that trust is about the belief in the integrity and reliability of a person and that because of that, it can also be cultivated as a foundational competence for supportive leadership (HR Session 1, Oct 2024).

Connectedness was defined as the ability to build and sustain meaningful relationships, in this study it is considered a competence because it is assumed to be multifaceted, in a way that it involves the ability to relate to others and the development and use of social skills that enable interactions with others. This competence is identified as an organizational cultural enabler of AI competence (Socratic Design Session 1, Apr 2024; (Interview 5, December 2024).). The connectedness is considered a key finding in this research highlighted by the structure of the four-pillar framework, which emphasizes the interconnections between pillars. Also of particular interest, is that quantitative data shows that while 64% of the European workers use AI to do their job, only 5% of workers are involved in the development of AI tools (Pouliakas & Becuwe, 2024). This divergence can have a direct impact on the level of competence if we consider that understanding how the tool works contributes to a high level of competence. Looking at the competence of connectedness, in light of the quantitative findings, the divergence can be assumed underscoring the need for more connectedness between users and developers of AI tools. Additionally, the quantitative data shows that while 64% of European workers

use AI to do their jobs, 41% suspect the use of AI by coworkers, a question emerges from this divergence: can and are workers open about their use of the technology? Mostly because cedefop survey (2024) findings also show that 17% of the workers experience less control over their jobs and tasks (Pouliakas & Becuwe, 2024; Cedefop, 2024b). In summary, foundational competence that serves the use of AI involves; digital literacy, multi-disciplinary collaboration, human expertise and oversight to critically evaluate and understand mechanisms in the use of AI, user awareness, adaptability, self-management, trust, and connectedness. Supportive to the development of the necessary competence are flexible organizational strategies, that involve dialogues and the definition of a shared vision for the future. As well as ensuring the support to the development of competence of employees and the promotion of equitable opportunities.

4.2 AI Skills and organizational support for competence

The integration of generative AI into municipal operations demands a workforce equipped with foundational competence. The four-pillar framework proposes that to equip the workforce with the necessary competence, the development of required skills is crucial. The findings of the research, outlined in the previous section, suggest that necessary AI competence consists of: digital literacy, multidisciplinary collaboration, human expertise and oversight, awareness, adaptability, self-management, trust, and connectedness. If we consider the interconnections of the four-pillar framework, the skills pillar suggests that to have competence we must define specific skills that lead to the necessary competence level. Participants of the research believed that skills involved with digital literacy consist of learning how to use specific or relevant digital tools to do their jobs effectively, while considering that the tools are no replacement for human interaction (Interview 4, December 2024). Findings further noted that skills to critically evaluate the output created by tools and fact-checking should be trained, adding that “the use of AI tools should enrich meaningful aspects of people's work rather than replace” (Interview 6, December 2024). Developing these skills should involve training in creating digital content and managing digital presence responsibly (Focus group HR session 3, 2024). According to participants “focus should be bridging the gap between generic and specific training to ensure that employees can fully utilize AI tools in their work” (Interview 4, December 2024; Interview 7, December 2024).

As for multidisciplinary collaboration, the findings show that enhanced communication, ability to listen, cultural competence, teamwork, and problem-solving skills are noted as required skills to develop competence (Interview 2, December 2024; Interview 4, December 2024; Interview 5, December 2024). Marking that “the use of tools should not mean a reduction of in-person connections” (Interview 4, December 2024). Some participants also suggested specific ways to support the development of skills, “pairing junior employees with experienced colleagues and AI tools, which can facilitate co-creation and collaborative learning” (Interview 4, December 2024). Participants also highlighted that siloed operations often hinder cohesive AI strategies, with one focus group participant remarking, “AI initiatives often stall because departments fail to coordinate their efforts” (Focus group HR session 3, 2024).

Developing critical thinking, ethical decision-making, self-control, contextual understanding, and the ability to manage complex systems effectively, were mentioned as specific skills to develop competence in human oversight (Interview 3, December 2024; Interview 4, December 2024; Interview 5, December 2024). Ethical oversight is another critical skill area, encompassing skills such as bias detection, explainability, and responsible AI usage. Findings indicate that municipal employees often struggle to identify and mitigate algorithmic biases, potentially undermining inclusivity and fairness in

public service delivery. For example, one policymaker shared, “Biases embedded in AI systems can unintentionally perpetuate inequalities, and we lack the tools to detect or address them effectively” (Interview 5, December 2024). This aligns with the FAT (Fairness, Accountability, and Transparency) framework, which emphasizes the importance of equipping employees to uphold societal values in AI applications (Binns, 2018).

Skills required for competence in adaptability, consist of a specific combination of organizational efforts in helping employees to stay informed in their field of work and actively involving these employees in setting stretched goals to build resilience (Interview 4, December 2024; Interview 7, December 2024). These findings assume that these efforts combined help employees be more equipped to deal with changes in their work created by the use of technology. Self-management or agility skill development was additionally noted as requiring leadership skills, “leadership skills play a crucial role and should facilitate experimentation and openness about the use of AI, while also considering compliance to regulations” (Interview 4, December 2024; Interview 7, December 2024). As for trust and connectedness, the skills required to develop competence include; building interpersonal communication skills, empathy, and the ability to foster meaningful relationships in professional contexts (Interview 5, December 2024; Interview 6, December 2024).

4.3 AI Regulations and Compliance require leadership

Effective governance to adhere to compliance is required for the responsible integration of generative AI in municipal operations. Regulatory frameworks, such as the European Union’s Artificial Intelligence Act (2021), establish that transparency, accountability, and bias mitigation are key principles for the AI-use workforce (European Commission, 2021). However, findings from this study reveal challenges in aligning these regulatory requirements with operational realities in Amsterdam’s municipal (Interview 1, December 2024; Interview 6, December 2024).

Participants consistently highlighted difficulties in interpreting and operationalizing the EU AI Act’s provisions, particularly its risk-based classification of AI systems. For instance, municipal employees reported a lack of clear protocols for categorizing AI systems and assessing their compliance with legal standards. One policymaker noted, “While the regulations are detailed, there’s a gap between theoretical requirements and the tools we need to apply them effectively.” (Interview 1, December 2024). This underscores the need for better organizational and resource alignment to support regulatory compliance (Focus Group Strategic leadership-digital Transformation December 2024).

Additionally, focus group discussions revealed gaps in accountability practices (Focus group strategic leadership-digital transformation December 2024; Focus group HR thematic sessions, December 2024). Employees expressed concerns about their ability to monitor AI systems for fairness and transparency (Interview 1, December 2024; Interview 3, December 2024; Interview 5, December 2024). The absence of standardized practices across departments further magnifies this issue, as one HR manager remarked, “Without unified guidelines, departments are left to interpret compliance requirements independently, leading to organizational inconsistencies” (Focus Group HR, December 2024).

However, the municipality of Amsterdam has established a solid regulatory foundation of the EU AI Act through its Vision on AI (2024). Findings suggest the need to enhance institutional capacity by developing clearer internal guidelines and legal expertise to support compliance at the municipal level (Focus Group HR, December 2024). Participants emphasized a current lack of adequate funding for training resources to equip employees with skills, such as algorithmic auditing and bias detection.

Additionally, investments in compliance training were noted as supportive in bridging the gap between competence and use, as noted “Budget limitations are a recurring theme that hampers innovation" (Focus group HR validation sessions, 2024). Besides the allocation of resources, the findings underscore that effective implementation of compliance frameworks requires strong cross-departmental collaborative practices. These findings revealed that siloed operations hinder the consistent application of governance principles across municipal functions (Interview 6, December 2024; Interview 1, December 2024; Validation session 1, 2024). Participants stressed the importance of ongoing feedback mechanisms of collaboration to refine compliance strategies. For example, validation session participants noted as important that the use of AI should also include routine evaluations of AI outputs to ensure they meet transparency and fairness standards (Validation session 1, 2024). Also mentioned as supportive of AI integration is leadership, as noted “Supportive leadership that values innovation creates the space employees need to explore new technologies” (Interview 4, December 2024). According to the participants, it took a specific type of leadership to establish the AI vision of Amsterdam (Interview 5, December 2024). The type of leadership was further described as “taking people as the starting point” (Interview 5, December 2024), and “the use of technology should have public value” (Focus Group Strategic Leadership, 2024).

Amsterdam’s Vision on AI aims to align with public value by accounting for the organizational sustainability focus and emphasizing ethical, human-centered AI practices (Focus Group Strategic Leadership, 2024). However, findings suggest that long-term success will depend on embedding compliance processes into everyday operations considering interrelated impact (Focus group Socratic design, 2024). Participants noted the importance of engaging citizens in compliance discussions to build trust and legitimacy. In this way, public feedback can be used to inform and structure AI policy (adjustments), ensuring alignment with community values (Focus Group Strategic Leadership- Digital Transformation, 2024; Focus Group Socratic Design, 2024).

Further findings revealed that employees often lack clarity on who is accountable for monitoring AI systems, leading to fragmented governance and uncertainty in the use by employees (Interview 1, December 2024; Interview 6, December 2024). Findings of validation sessions noted that ensuring consistent oversight of AI applications across departments is a way to support the integration of AI (Validation session 2, 2024). However, it is important to note that for all of the supportive approaches, there is a dependency on leadership to bring initiatives further and or facilitate implementation (Interview 4, December 2024). This notion highlights a key finding of this study, namely that leadership skills play a crucial role in facilitating the development of the workforce for AI competence. This facilitation consists of creating a future vision and developing organizational strategies that support dialogues about innovations, openness about AI use for better collaboration and co-creation, and room to experiment and grow alongside the technology.

4.4 Additional finding: Public Engagement

Public engagement plays a critical role in ensuring trust and legitimacy in municipal AI systems findings indicate that public participation is essential to establishing credibility and ensuring equitable access to the benefits of AI integration (Interview 1, December 2024; Interview 6, December 2024). Participants emphasized the importance of transparency campaigns to demystify AI technologies and engage citizens actively in decision-making processes. For example, suggestions included hosting community dialogues, creating accessible informational content, and incorporating citizen feedback into AI policy design (Interview 5, December 2024). This emphasis aligns closely with Moore's (1995) strategic triangle, which underscores the importance of aligning public initiatives with community values to sustain trust and acceptance. Findings suggest that by involving citizens through participatory mechanisms, municipalities not only enhance transparency but also reinforce the accountability of AI systems (Interview 5, December 2024).

Furthermore, these findings resonate with broader trends in participatory AI governance. Reports like Accenture's Work Can Become (2023b), highlight that proactive engagement can foster public confidence, can help reduce resistance to technological adoption, and aims to ensure that AI applications reflect diverse societal needs (Accenture, 2023c).

4.5 Chapter Summary

This chapter analysed and discussed the findings of this study using the Four Pillars Framework, which provided a structured approach to examining workforce preparedness for the integration of generative Artificial Intelligence (AI) in the municipality of Amsterdam. The analysis combined qualitative insights from interviews, focus groups, and validation sessions with quantitative data from the European Survey on AI Skills (Cedefop, 2024a). Each pillar: Foundational Competence, AI Skills, Regulations and Compliance, and Organizational Strategies, offered distinct but interconnected perspectives on the challenges and opportunities associated with AI adoption.

The first pillar, Foundational AI-Competence, revealed that effective AI integration requires a foundation of digital literacy, multidisciplinary collaboration, human oversight, adaptability, self-management, trust, and connectedness. Participants emphasized the need for inclusive organizational strategies that foster collaboration, promote shared visions, and address workforce concerns such as job displacement and digital literacy gaps (Pouliakas & Becuwe, 2024). Trust and connectedness were identified as organizational cultural enablers, fostering resilience and openness in municipal operations (Interview 5, December 2024).

The second pillar, AI Skills, focuses on the specific skill sets required to support foundational competence. Skills such as digital proficiency, critical evaluation of AI outputs, ethical oversight, adaptability, and self-management emerged as essential for workforce readiness. Participants highlighted the importance of bridging generic and job-specific AI training, enhancing collaboration across departments, and fostering leadership that encourages openness and experimentation (Focus group HR session 3, 2024; Interview 7, December 2024).

The third pillar, Regulations and Compliance, examined the alignment of municipal operations with the EU AI Act (European Commission, 2021). Findings revealed challenges in interpreting and operationalizing compliance requirements, with inconsistent practices across departments and gaps in algorithmic accountability (Focus Group Strategic leadership-digital transformation, December 2024). Leadership emerged as a key driver in addressing these gaps, promoting transparency, cross-departmental coordination, and accountability structures. Investments in training and resource

allocation were also highlighted as critical to bridging compliance and workforce readiness (Validation session 1, 2024).

The fourth pillar, organizational strategies, underscored the role of public engagement, transparency, community participation, and citizen feedback in fostering trust and legitimacy in AI initiatives. Strategies such as public dialogues, accessible informational campaigns, and participatory mechanisms were suggested to ensure that AI policies align with community values and address societal needs (Interview 5, December 2024). This approach aligns with Moore's (1995) theory of the strategic triangle of value, which highlights the importance of public trust and accountability.

In conclusion, the Four Pillars Framework provided a cohesive lens for analysing workforce preparedness for AI integration. The findings highlight that successful AI adoption in Amsterdam's municipal operations relies on a holistic approach combining foundational competence, targeted skills development, regulatory compliance, strong leadership, and meaningful public engagement. These interconnected elements form the basis for building an ethical, resilient, and adaptive municipal workforce capable of navigating the opportunities and challenges presented by generative AI technologies.

Chapter 5: Conclusion and recommendations

5.1 Introduction

This chapter presents the conclusions and recommendations drawn from the analysis and discussion conducted in Chapter 4, which utilized the Four Pillars Framework to examine workforce preparedness for the integration of generative Artificial Intelligence (AI) in the municipality of Amsterdam. These conclusions are directly linked to qualitative insights from semi-structured interviews, focus groups, and validation sessions, as well as quantitative data from the European Survey on AI Skills (Cedefop, 2024a) and archival policy documents. The recommendations are structured around the Four Pillars: Foundational Competence, AI Skills, Regulations and Compliance, and Organizational Strategies, and address the specific gaps and opportunities identified in the findings. Additionally, this chapter reflects on the practical implications, and limitations of the study, and makes some suggestions for future research to ensure a holistic perspective on the outcomes.

5.2 Summary of key findings

This research aimed to address the central question: "How can the municipality of Amsterdam address the preparation of their workforce for the integration of generative Artificial Intelligence (AI)?" Using the Four Pillars Framework, the following key findings emerged.

1. Foundational AI-Competence

Employees face **gaps in digital literacy, readiness, and ethical reasoning**, limiting their ability to effectively utilize AI tools (Interview 1, December 2024; Interview 4, December 2024).

Resistance to AI adoption stems from **job insecurity and a lack of clear organizational strategies** to address workforce concerns (Pouliakas & Becuwe, 2024; Interview 2, December 2024).

Human oversight remains critical in mitigating **biases and inaccuracies in AI outputs**, reinforcing the need for an **"expert-in-the-loop"** approach (Interview 3, December 2024; Interview 5, December 2024).

Trust and **connectedness** emerged as core cultural enablers for fostering resilience, adaptability, and ethical responsibility in AI use (HR Session 1, Oct 2024; Socratic Design Session 1, Apr 2024).

2. AI Skills

Key **skills include** the use of digital tools while having **the ability to critically evaluate the output and online information,** to build **interpersonal communication skills, cultural competence, teamwork,** and **problem-solving skills. Active listening and adaptability staying informed** in own field, and setting stretch **goals to build resilience** were listed as **required skills for competence** (Focus group HR session 3, 2024; Interview 4, December 2024).

Organizational silos were identified as barriers to skill development, with **poor interdepartmental collaboration hindering cohesive AI strategies** (Focus group HR session 3, 2024).

Participants emphasized the need for **modular, job-specific training programs** that balance technical and ethical dimensions (Interview 7, December 2024).

3. AI Regulations and compliance

The **EU AI Act (2021)** serves as a guiding regulatory framework, but **operationalizing its provisions remains challenging** due to limited internal expertise and unclear compliance protocols (Interview 1, December 2024; Focus group strategic leadership-digital transformation, December 2024).

Cross-departmental inconsistencies and limited accountability mechanisms further complicate regulatory alignment (Focus group HR thematic sessions, December 2024).

Leadership was identified as a crucial driver for **compliance, transparency, and long-term adherence to governance principles** (Validation session 1, 2024; Focus group strategic leadership, 2024).

4. AI Organizational strategies

Effective organizational strategies require **centralized coordination, collaborative leadership, and cross-departmental communication** (Interview 4, December 2024; Interview 5, December 2024).

Municipal leadership must establish **clear visions and strategic dialogues** to align workforce objectives with AI goals (Interview 5, December 2024; Focus group strategic leadership, 2024).

Public engagement was highlighted as essential for **transparency, trust-building, and citizen participation** in shaping AI policies (Interview 5, December 2024; Socratic Design Session 1, Apr 2024).

These findings underscore the **interconnected nature of the Four Pillars Framework**, emphasizing that workforce preparedness for AI requires a balanced approach across foundational competence, skill development, regulatory alignment, and organizational strategies.

5.3 Actionable recommendations

Based on the findings, the following recommendations are proposed to address workforce preparedness for AI integration in the municipality of Amsterdam.

Recommendation 1: Strengthen foundational AI-Competence

Implement comprehensive digital literacy and ethical reasoning training programs tailored to municipal roles.

Develop trust-building initiatives to address resistance, such as open forums, transparent communication campaigns, and internal dialogues.

Encourage **human oversight mechanisms** by formalizing the role of subject matter experts in AI evaluation and decision-making processes.

Foster an organizational culture centred on **trust, connectedness, and cross-departmental collaboration** to break down silos and align strategic goals.

Recommendation 2: Enhance AI Skills development

Design role-specific, modular training programs that address both technical (e.g., data analysis, bias detection) and soft skills (e.g., adaptability, critical thinking).

Introduce **mentorship programs or experiments** pairing experienced staff with junior employees and AI tools for collaborative learning on AI applications.

Develop **cross-functional teams** to address skill gaps collectively and reduce fragmented approaches to AI adoption.

Recommendation 3: Improve regulatory compliance mechanisms

Establish **internal regulatory task forces** to interpret and operationalize existing and emerging regulations such as the **EU AI Act** guidelines.

Provide **targeted compliance training programs** to ensure staff understand governance, transparency, and accountability requirements.

Create **feedback loops and routine compliance evaluations** to ensure AI tools meet legal and ethical standards.

Recommendation 4: Centralize organizational strategies

Form a **dedicated AI leadership task force** responsible for aligning AI strategies across municipal departments.

Encourage cross-departmental communication and knowledge-sharing platforms to reduce operational silos.

Foster leadership styles that promote and facilitate dialogues on innovation, openness, and strategic experimentation with AI tools.

Recommendation 5: Enhance public engagement and transparency

Host **citizen dialogues, workshops, and educational campaigns** to build transparency and public trust in AI systems.

Establish **advisory committees** to incorporate citizen feedback into AI governance policies.

Develop **accessible information resources** to demystify AI technologies for the public.

These recommendations are set to align with the findings from interviews, focus groups, validation sessions, and archival analysis, and aim providing actionable pathways for addressing workforce readiness for AI integration.

5.4 Practical implications and considerations

Leadership Endorsement: Strong municipal leadership is crucial for driving AI initiatives, fostering collaboration, and maintaining transparency.

Resource Allocation: Adequate financial and infrastructural resources are required to support training, oversight mechanisms, and citizen engagement.

Cultural Adaptation: Organizational and cultural shifts are necessary to overcome resistance and align workforce attitudes with AI objectives.

Long-Term Sustainability: AI initiatives must be embedded into daily municipal operations, with periodic evaluations and continuous refinement.

5.5 Study Limitations

Context-Specific Focus: Findings are rooted in Amsterdam's municipal structure and may require adaptation in other cities.

Cross-Sectional Data: The study provides a snapshot and lacks longitudinal insights into AI adoption.

Self-Reported Data Bias: Insights may reflect participant subjectivity, mitigated through data triangulation.

5.6 Directions for Future Research

Validate the **Four Pillars Framework** in diverse municipal contexts.

Conduct **longitudinal studies** to track workforce adaptation over time.

Explore **public engagement mechanisms** for inclusive AI governance.

Investigate **informal cultural dynamics** in AI adoption processes.

5.7 Final Reflections

This study highlights that preparing the municipal workforce for AI integration is not merely a technical challenge but a **multi-dimensional transformation** requiring strategic leadership, cross-functional collaboration, regulatory alignment, and meaningful citizen engagement.

The **Four Pillars Framework** serves as a **practical roadmap** for navigating these challenges, offering a structured approach to municipal governance in the AI era. Moving forward, municipalities must embrace adaptability, prioritize inclusivity, and foster trust to ensure that **AI becomes an enabler of public value rather than a source of disruption**.

This research lays the groundwork for ongoing dialogue, urging municipalities to adopt a **human-centred approach** to AI integration that balances innovation with ethical responsibility and societal well-being.

Appendix

This appendix serves as a repository for supplementary materials that support the research but are not central to the main body of the thesis. It includes, detailed raw data, summaries, supporting documents and materials that are too detailed or bulky to be included in the main text.

Appendix 1: Interview questions

Full transcripts of the interviews (anonymized as necessary).

Interview & qualitative structure for data collection

Introduction (5 Minutes)

1. Purpose of the Interview:
   - ✓ Briefly explain the research focus on workforce competence for generative AI integration in municipal governance.
   - ✓ Reassure participants about confidentiality and the voluntary nature of participation.
   - ✓ Request permission to record the interview (if applicable).
2. Background Information:
   - ✓ Can you describe your role within the municipality and how it relates to digital transformation or AI integration?

Section 1: Competence for Generative AI Integration (Sub-Question 1)

Objective: Understand the broad competence required for municipal employees working with AI.

1. What do you think are the most important competence municipal employees need to effectively work with generative AI tools?
2. How do you perceive the current level of readiness among employees to handle AI-related tasks?
3. Have you noticed any significant changes in the types of skills employees need due to AI integration?

Section 2: Specific Skills for Developing Competence (Sub-Question 2)

Objective: Identify the technical, regulatory, and adaptive skills necessary for building the required competence.

1. In your view, what specific technical skills (e.g., data literacy, prompt engineering) are essential for integrating AI into daily municipal tasks?
2. How important are adaptive skills, such as problem-solving or flexibility, in supporting employees during AI adoption?
3. Are there any skills related to ethical or regulatory compliance that employees must develop to use AI responsibly?

Section 3: Principles and External Factors (Sub-Question 3)

Objective: Explore the contextual factors that influence skill development and competency acquisition.

1. What principles or guidelines (e.g., ethical, regulatory) do you think most affect how employees acquire skills for AI integration?
2. How does the organizational culture within the municipality impact employees' ability to adapt to AI-driven changes?
3. Are there external factors, such as EU regulations or citizen expectations, that significantly shape how AI is adopted and skills are developed?

Section 4: Organizational Changes to Support Development (Sub-Question 4)

Objective: Examine institutional strategies that enable skill and competency development.

1. How has the municipality's HR department or leadership prepared employees for AI integration (e.g., training programs, workshops)?
2. What organizational changes (e.g., new roles, revised workflows) have been implemented to support AI-related competence?
3. Do you think existing training initiatives are sufficient, or are there areas that need more attention?

Wrap-Up (5 Minutes)

1. Do you have any additional insights or thoughts on how municipalities can better prepare their workforce for AI integration?
2. Is there anything you'd like to add that we haven't covered?

Thanking participants: for the importance of their input and explaining the next steps on how the findings will be used.

Key notes about application

- **Tailoring Questions:** Adjustments depending on the participant's role (e.g., policymakers might focus more on regulations, while HR personnel might focus on training).
- **Flexibility:** Allowing participants to expand on topics they feel are most relevant to their experiences.
- **Recording and transcription:** all responses are recorded and transcript accurately and capture in thematic analysis.

Appendix 1.1: Interview transcripts [December 2024]

Interview: 1

The conversation began with a discussion about managing work-life balance, particularly given the challenges of full-time work. The speaker noted that while they tried to allocate time for relaxation and personal commitments, their current environment wasn't particularly conducive to unwinding. They mentioned taking deliberate steps to spend quality time with their partner, recognizing the importance of maintaining equilibrium in their busy schedule.

The topic then shifted to the speaker's research, where they had just completed a draft of their thesis. Their focus was on how individuals and organizations interact with emerging technologies, specifically large language models like Generative AI. They aimed to explore questions people have about these

technologies, their willingness to engage with them, and how such tools are integrated into professional settings. Combining their expertise in HR and organizational development, the speaker underscored the importance of proactive strategies for technological adoption, particularly as these tools become more ubiquitous in daily work.

The speaker elaborated on their research framework, which examined competence, skills, frameworks, regulations, and organizational strategies. They highlighted the distinction between competence (a broader concept encompassing knowledge and expertise) and skills (practical abilities). The research aimed to identify how these elements could be integrated to facilitate the adoption of Generative AI in the workplace. They noted the impact of regulatory frameworks like the EU Act and organizational strategies addressing themes like social security and inclusion.

The discussion then turned to practical applications of Generative AI. The speaker shared that they occasionally used such tools in their personal and professional lives, always taking care to avoid inputting sensitive data. They emphasized the importance of critically evaluating the output of AI tools and maintaining a "human in the loop" approach to ensure quality and reliability. They also acknowledged the need for awareness and training around data privacy and ethical considerations, suggesting that organizations could better support employees by offering targeted training.

Drawing from their research, the speaker observed gaps in readiness across various sectors. They noted disparities in digital literacy and access to resources, which could exacerbate inequalities in the workplace. They emphasized the need for inclusive strategies to ensure that everyone, regardless of their background, could benefit from technological advancements. The speaker shared anecdotes about their experiences and interactions, which illustrated the diverse levels of understanding and engagement with technology across different communities.

The conversation moved to internal organizational dynamics. The speaker described their role in facilitating collaboration between different departments, particularly around the theme of the future of work. They highlighted the importance of integrating external visions with internal strategies to foster trust and transparency. This integration, they suggested, could be achieved through dialogues and initiatives aimed at bridging gaps between employees and organizational goals.

The session concluded with reflections on the rapid pace of technological change and the speaker’s hope for increased collaboration between departments. They expressed enthusiasm for their ongoing research and its potential to contribute to more effective strategies for technological adoption. As they prepared to return to their work, they shared their excitement about the opportunities for innovation within their organization. **End of Session**

Interview: 2

The interviewee began by reflecting on their professional framework, which is built around three core elements: awareness, judgment, and movement. These components guide their approach to work and form the basis for much of their content and strategy. They described their belief in the power of imagery and how our world is increasingly shaped by experiences—both economic and emotional. The interviewee highlighted the use of recognizable and evocative visuals, such as in an Expo project, to connect people with their past, present, and potential futures.

Through these visual cues, they aim to evoke a sense of warmth and confidence. For example, showing historical black-and-white images fosters nostalgia and reminds viewers of the progress they've made, instilling a sense of resilience and trust in navigating future uncertainties. This process, they explained, encourages dialogue about what lies ahead, even when the future seems unclear or daunting.

The interviewee touched on the challenges of change within organizations, especially in sectors like public administration, healthcare, and finance. These environments often involve individuals who feel secure in their roles but may resist transformation. They explained their methodology for helping teams evaluate their roles and tasks, using tools like the "work quadrant," which categorizes tasks based on their relevance and vulnerability to change. Drawing inspiration from thinkers like Kai-Fu Lee, they use workshops to guide individuals and teams in assessing how their work might evolve in response to emerging technologies like artificial intelligence.

The conversation shifted to the importance of adaptability and skills development. The interviewee emphasized that in a rapidly changing world, adaptability is a crucial competency. They differentiated between "hard" competence, such as analytical skills and technical proficiency, and "soft" competence, like collaboration, creativity, and empathy. For them, strengthening these skills is critical for individuals to thrive in increasingly automated and system-driven work environments.

They shared anecdotes from their workshops, including those with administrative and front-office staff. They highlighted the shift from traditional, people-facing roles to more back-office, tech-driven tasks, such as fraud detection. This transition, they observed, requires not only technical upskilling but also a cultural shift to embrace new ways of working. For many, this change is met with fear or skepticism, particularly when they perceive technology as a replacement rather than a tool.

To illustrate the impact of automation and AI, they offered examples from various industries. From parking enforcement to radiology, the interviewee noted how technology is making processes more efficient but also raising questions about job displacement. They recounted the transformation of parking enforcement in Amsterdam, where license plate recognition technology drastically reduced the need for human intervention, and reflected on how similar shifts are occurring across other domains.

The interviewee also discussed how organizations can better prepare for these changes. They stressed the importance of facilitating dialogue and creating shared visions of the future. They described how their use of imagery—sometimes generated through tools like generative AI—can evoke both nostalgia and forward-thinking perspectives. For example, they recounted using AI-generated visuals to illustrate the future of work in security and safety, which helped spark meaningful discussions among participants.

Throughout the conversation, the interviewee emphasized the need for organizations to move away from rigid, function-based structures toward more task-oriented and multidisciplinary approaches. They advocated for creating environments where knowledge-sharing and collaboration are prioritized, allowing teams to address complex challenges collectively. This, they argued, not only enhances problem-solving but also maintains the human element in increasingly automated systems.

Finally, the interviewee reflected on the broader implications of digital transformation. They spoke about the need for thoughtful integration of technology in public and private sectors, ensuring that frameworks are built to support employees' competence and promote equitable opportunities. They expressed optimism about leveraging insights from research and collaboration to develop actionable strategies, while also acknowledging the challenges posed by organizational inertia and fragmented efforts.

In closing, they reiterated their belief in the power of imagery and dialogue as tools for navigating change. By connecting the past, present, and future, they hope to help individuals and organizations embrace the opportunities of transformation while addressing the accompanying challenges with creativity and resilience.

End of Session

Interview: 3

The conversation began with the interviewer asking about competence employees might need to effectively integrate AI tools into their work. They explored broad principles such as ethics, organizational change, and practical skills. To set the stage, the interviewer referenced a podcast created from a shared document, asking about the skills involved in producing such content and its implications for future workflows.

The respondent explained that while the podcast provided an accessible overview of a vision document, inaccuracies were present. This highlighted the importance of having an “expert in the loop” to verify content. They emphasized the risk of misinformation when non-experts use such tools without adequate checks. Junior staff, for example, may rely heavily on AI without fully understanding its limitations, which can result in errors requiring senior-level corrections. This raised concerns about how juniors develop expertise when cognitive work is bypassed.

They discussed the necessity of investing time to build foundational knowledge, balancing the efficiency offered by AI with the risk of quality deterioration. The respondent reflected on the current readiness of employees, noting that many lack the competence needed to responsibly use AI. They likened the situation to outdated metaphors of control, emphasizing the need for open conversations about real AI usage and strategies for proper integration.

The discussion moved to organizational support for AI adoption. The respondent identified a gap between what is officially sanctioned and how employees actually use AI tools. They highlighted the importance of providing guidelines and cultivate a supportive culture, where employees feel comfortable experimenting and learning without fear of replacement or reprimand.

The conversation also touched on specific use cases, such as large language models assisting with drafting strategies or generating creative ideas. The respondent stressed the importance of understanding the limits of AI, verifying generated content, and aligning usage with organizational principles. They pointed out that AI should augment rather than replace human creativity and expertise, maintaining a "human-in-the-loop" model.

Examples from various fields illustrated how AI is reshaping workflows, such as urban planning and public engagement. In one case, tools were used to generate design prompts for urban development, enabling broader participation from residents. However, the respondent noted that AI-generated outputs often reflect biases inherent in their datasets, underscoring the need for localized expertise and oversight.

The respondent expressed concerns about job displacement but framed it as an opportunity to reevaluate workflows. They advocated for keeping creativity and human interaction central to processes, rather than letting technology dominate. They cited the “efficiency paradox,” where technological advances promise to free up time but often lead to more time spent managing the technology itself.

When discussing organizational culture, the respondent highlighted the importance of dialogue and reflection. They described how the municipality is beginning to experiment with AI integration, focusing on politically safe areas such as service optimization and public engagement. However, they acknowledged challenges in coordinating across departments and creating a unified strategy, especially under time and capacity constraints.

The interview concluded with a philosophical reflection on AI's broader societal impact. The respondent emphasized the importance of considering the long-term effects of AI as a system-level technology, drawing parallels to past innovations like the automobile. They advocated for thoughtful integration, where automation complements rather than replaces human interaction, and stressed the need for ongoing dialogue and ethical considerations in AI adoption.

Finally, the respondent provided a brief overview of their role. They are responsible for managing the municipality's AI vision and agenda, translating strategic goals into actionable initiatives. They also work on a program focused on "new narratives" to help integrate AI into municipal work processes.

End of Session

Interview: 4

Interviewer: Thank you for taking the time to conduct this interview with me. We have already discussed the purpose of this interview. You are also part of the focus group of the HR club, with which I have conducted several conversations about the importance of the topic, the ongoing initiatives within the municipality, and the strategies devised for this purpose, which you are partly responsible for.

Can we start by introducing you? Can you briefly tell me what you do? Who you are is actually not of importance, but what you do, because it is an entirely anonymous processing of what we are discussing.

Respondent: Yes, of course. What I do is contribute to the development of AI within the municipality. I mainly conduct research from the HR side and identify what is necessary to shape the adoption in the next phase. I have already set up and completed a focus area in terms of scope and approach, specifically to conduct research on the pilots of generative AI (Gen AI) within Amsterdam. Initially, I focus on the employee perspective, and starting in Q1 and Q2 of 2025, I will also look at the management perspective on new AI assistance.

Interviewer: So, what you just said is what you are going to do in terms of perspective?

Respondent: Yes.

Interviewer: And then especially the translation of the trends of what is already happening in the outside world, outside the municipality, and the experiences and research already conducted in the field of GPT and Gen AI tools to focus on what is valuable to investigate locally.

Respondent: Exactly.

Interviewer: We have spoken several times during focus group sessions and our respective roles, mine within Digital and Engagement (D&E) and yours within HR, where there is overlap and opportunities for collaboration. Today, I would like to focus on insights regarding competence necessary for the introduction of generative AI in municipal roles.

Respondent: Absolutely.

Interviewer: Suppose that starting tomorrow, you and your colleagues can work with generative AI. What do you think is the most important competence—skills, knowledge, and attitude—that will help you use this tool effectively?

Respondent: To work effectively with generative AI tools like GPT, critical thinking, analytical ability, creativity, and especially the ability to intervene are essential. Depending on your existing profile, one of these might stand out more. But collectively, these form the core set of skills required for effective usage.

Interviewer: That's an insightful set of skills. Zooming out further to the concept of competence, how do these fit into the broader framework of the future of work?

Respondent: When we consider the future of work, self-management and intrapersonal skills are foundational. You also need interpersonal skills and competence that enhance interaction and collaboration between colleagues. Generative AI can impact team dynamics by altering the way people connect and work together.

Interviewer: What impact does AI have on connection within teams?

Respondent: Research indicates that connection within teams often arises from collaborative work toward shared goals. However, with AI tools like GPT, there's a risk that some individuals might overly rely on AI outputs without engaging in peer review or discussion. This can erode the team-building aspect that comes from collegial consultation and reflection. Maintaining team connections requires intentional strategies from employers to preserve and augment human interaction.

Interviewer: Do you see this as something the municipality is actively addressing?

Respondent: Some principles, such as collaboration and trust, are already embedded in the organization. However, as hybrid work and remote interactions increase, the natural impetus for in-person connections is reduced. Organizations must foster intrinsic motivation for maintaining interpersonal connections, particularly in environments influenced by generative AI.

Interviewer: How does this relate to critical capacities like fact-checking and quality assurance when working with AI tools?

Respondent: AI-generated insights often skip intermediate steps, making it harder for users to trace the origins of information. This necessitates thorough fact-checking, which relies on competence like expertise, responsibility, and critical thinking. Without these, there's a risk of accepting AI outputs uncritically, especially among less experienced professionals.

Interviewer: What's the current level of readiness among employees to handle these tasks effectively?

Respondent: Research shows that young professionals or those new to a field often lack the experience to critically evaluate AI outputs. This underscores the importance of incorporating "experts in the loop" in workflows and setting clear organizational expectations. Employees need support to develop the skills required to verify and contextualize AI outputs.

Interviewer: How do you see adaptive skills fitting into this picture? For instance, can AI tools themselves help develop knowledge or mitigate skill gaps?

Respondent: Definitely. For example, pairing junior employees with experienced colleagues and AI tools can facilitate co-creation and collaborative learning. This team-based approach combines expertise, mentorship, and technology to enhance outcomes. Additionally, productivity gains from AI could allow employees to focus more on enriching and meaningful aspects of their work.

Interviewer: That's a great perspective. Do you think organizations are currently equipped to leverage this potential?

Respondent: We're at the beginning stages. While there are programs aimed at general upskilling, specific initiatives to integrate AI into roles meaningfully are still evolving. We need to focus on bridging the gap between generic and specific training to ensure employees can fully utilize AI tools in their work.

Interviewer: How does the organizational culture influence this adaptation process?

Respondent: Leadership plays a crucial role in creating a culture of experimentation and openness. Supportive leadership that values innovation creates the space employees need to explore new technologies. Without this, there's a risk of alienation, where employees feel disconnected from organizational goals or constrained in their ability to adapt.

Interviewer: Finally, do you have any additional insights or recommendations based on your experience?

Respondent: We need to embrace the reality of "parallel worlds" during this transition—different parts of the organization may adopt AI at varying paces. Respecting this diversity and facilitating inclusive strategies is key to ensuring that everyone can participate in the transformation at their own pace.

Interviewer: Thank you so much for your time and insights. The data will be fully anonymized, and I'll ensure you receive a copy of the research once completed.

Respondent: Thank you. Best of luck with the transformation!

End of Session

Interview: 5

The interview began with the interviewer thanking the respondent for their time and willingness to participate. The respondent described their current role, focusing on developing strategies to involve citizens in municipal processes, particularly how they can contribute to shaping the vision and strategy for the city.

The respondent explained that their work involves organizing dialogues with residents to explore what makes a city liveable and the impact of technology on people's lives. These dialogues delve into themes such as quality of life, the role of technology, and the balance between its benefits and potential harms.

When asked about the structure of these dialogues, the respondent reflected on both past and future approaches. They emphasized the importance of taking people as the starting point, examining fundamental questions about humanity, and determining how technology fits within those frameworks. A key focus is understanding whether technology contributes to or detracts from the human experience.

The respondent shared a particularly impactful insight from a student during one dialogue. The student remarked that doing homework manually helped him grow as a person, whereas relying on AI removed that growth, challenging his core humanity. This sparked a broader discussion about whether technology supports personal development or diminishes it by automating tasks that facilitate learning and creativity.

The interviewer explored the context-specific nature of technology's impact, such as its use in education versus the workplace. The respondent noted that while tools like generative AI can be useful, they also raise questions about dependence and personal growth. For example, using AI to complete tasks might save time but could lead to a loss of critical thinking and creativity.

The discussion turned to broader applications of AI, like language learning tools or automated writing systems. The respondent drew distinctions between contexts where AI can complement human effort, such as gamified learning platforms, versus situations where it may replace meaningful engagement, such as writing assignments. They highlighted the importance of understanding when and how to use AI responsibly, based on individual and societal needs.

The conversation shifted to the ethical and societal implications of AI, including its environmental impact. The respondent described how AI systems require significant energy and resources, often resulting in unseen costs such as data centers consuming water in resource-scarce regions. They labelled this phenomenon as a form of "digital colonialism," where the benefits of technology are enjoyed by some at the expense of others.

The respondent underscored the importance of recognizing these global dynamics, even when technology use feels disconnected from its broader implications. They advocated for greater awareness and critical thinking about the environmental and social consequences of technology, particularly for public-sector employees who work with public funds.

The interview delved into organizational culture and its role in shaping responsible technology use. The respondent emphasized the need for institutions to foster a culture of reflection, where employees feel empowered to question norms and prioritize ethical considerations. They stressed the importance of leaders setting examples and creating spaces for dialogue about values and purpose.

The interviewer asked about potential institutional changes to support skill development and adaptation. The respondent highlighted the importance of providing time, resources, and knowledge-sharing opportunities to facilitate critical thinking and ethical decision-making. They noted that organizations often focus on KPIs and efficiency, which can hinder deeper engagement with values and long-term goals.

As the discussion drew to a close, the respondent reflected on the broader societal implications of generative AI, such as its potential to displace jobs. They shared concerns about a lack of solidarity and support for individuals whose roles are affected by automation. They advocated for proactive measures to address these challenges, emphasizing the importance of maintaining humanity and creativity in an increasingly automated world.

The interview concluded with the respondent reiterating the importance of facilitating dialogue, strengthen critical thinking, and ethical awareness in both individual and organizational contexts.

End of Session

Interview: 6

The interview began with the respondent discussing their role in the organization and their focus on competence development in relation to emerging technologies, particularly generative AI. They emphasized that competence involves a combination of knowledge and skills and reflected on how these might evolve as AI becomes more integrated into workplace practices.

The respondent noted their interest in exploring the skills needed to effectively utilize generative AI in municipal work. They acknowledged a general assumption that municipal employees already use AI tools informally. This aligns with broader organizational initiatives and strategies that integrate AI technologies across various domains.

When asked about hypothetical AI use in their work, the respondent reflected on how AI might augment tasks without replacing human input. For example, they highlighted how generative AI could streamline source referencing in reports, retrieving precise quotations from reputable documents like IPCC or United Nations reports. This, they argued, could save time and improve efficiency, provided the user has a strong foundational knowledge of the topic to critically assess the AI's outputs.

However, the respondent expressed skepticism about generative AI's reliability, citing its probabilistic nature. They pointed out that the same query might yield different results, which underscores the importance of verifying the outputs. They suggested that employees would need strong filtering skills and the ability to validate AI-generated information against credible sources.

The discussion moved to potential risks of over-reliance on AI. The respondent warned against a scenario where trust in AI outputs becomes too automatic, diminishing human oversight. They highlighted the importance of maintaining scepticism, particularly in high-stakes applications like fraud detection, where AI models provide probabilities but require human judgment to interpret and act upon them responsibly.

The respondent suggested that strengthening critical thinking and scepticism could be achieved through methods like Socratic Design. They referenced lessons from previous policy failures to illustrate the dangers of uncritical acceptance of technological outputs and emphasized the need for ongoing human involvement in decision-making processes.

The conversation shifted to the role of organizational culture in shaping attitudes toward technology. The respondent described a fast-paced culture in government, where quick decisions and deliverables often take precedence over deliberative processes. They praised the AI vision initiative for taking a more thoughtful, resident-centric approach, contrasting it with the typical rush to produce results within political timelines.

When asked about the role of HR in supporting employees' adaptation to AI, the respondent noted limited capacity and resources within the HR department. They described HR's traditional focus on administrative functions like recruitment and policy implementation,

suggesting that more emphasis could be placed on organizational development and preparing employees for technological transitions.

The interview touched on broader issues, such as the interplay between local initiatives and overarching regulatory frameworks like the AI Act. The respondent emphasized the importance of tailoring regulations to local contexts and involving residents in decision-making processes. They advocated for a bottom-up approach, where the municipality validates and supplements broader regulations based on local needs and priorities.

The respondent concluded by reflecting on the fundamental skills and values needed to navigate the integration of AI into municipal work. They emphasized the importance of maintaining humanity and strengthen trust, collaboration, and deliberation among employees and residents. This, they argued, is essential for ensuring that technology serves the public good while respecting democratic principles.

The interview closed with expressions of gratitude and a shared commitment to continuing the conversation on these important topics.

End of Session

Interview: 7

The discussion opened with a brief overview of the agenda roles and interview, focusing on the primary topics: the use of applications and contributions to the ongoing research. The interviewer sought the respondent's input on both topics and an update on relevant developments.

Regarding the use of **applications**, the respondent mentioned recent interactions with colleagues, who were asked to review its content and assist in presenting it to relevant decision-makers. They highlighted their efforts to engage stakeholders and noted enthusiasm among participants. They expressed optimism about the project's progress and its potential as a valuable experiment to explore the intersection of technology and public administration.

The respondent emphasized the importance of framing the us of application as an experiment, which would allow stakeholders to assess its benefits and limitations in comparison to current practices. They discussed themes such as collaboration across departments and the need for support in translating these ideas into administrative advice strategies.

The discussion transitioned to the purpose of the research, which examines the integration of AI into municipal operations. They outlined and explored their analytical frameworks, including references to HR expertise, external studies, and various theoretical models like the FAIR principles and the Strategic Value Triangle. The interview explores competence and skills necessary for AI integration, drawing from thematic analyses and case studies.

The respondent identified a critical challenge: the tension between employees' use of AI tools and existing guidelines restricting their application. They discussed competence essential for effective AI integration, such as the ability to evaluate technology's impact on human-machine interaction and the reinforcement of human behaviours. This underscored the importance of facilitating critical thinking to assess AI outputs and distinguish between helpful and unhelpful technology applications.

The conversation also touched on organizational **facilitation and dialogue**. The respondent stressed the need for structured conversations to guide AI usage, emphasizing experimentation and participatory decision-making as essential methods. It was suggested that incorporating public input into technology initiatives should be a standard process rather than an additional step.

The respondent noted several challenges, including language limitations in AI models, resource constraints, and ethical considerations like energy usage and bias. It was suggested that organizations must balance efficiency with inclusivity by enabling parallel processes that incorporate public engagement without delaying operational goals.

As the interview concluded, the respondent highlighted the potential for further collaboration based on this research, particularly around ongoing projects related to the municipality's AI vision. They expressed a desire for intensive cooperation beginning in the new year, aligning with planned experiments and strategic document development.

The interview wrapped up on a positive note, with the respondent looking forward to future discussions and taking some much-needed rest before resuming work in January.

End of Session

Appendix 1.2: Thematic Summary: Interviews

Summary of semi structured interviews (anonymized)

The participants emphasized the importance of both technical and adaptive skills in navigating the integration of generative AI into municipal governance. Technical skills, such as data literacy, machine learning, and prompt engineering, were repeatedly identified as critical competence. One participant stressed the necessity of understanding how AI tools generate outputs and evaluating their reliability to make informed decisions. Adaptive competence, including flexibility, problem-solving, and cross-departmental collaboration, were also highlighted as essential for successful AI implementation. According to one respondent, cross-functional teams must work together to ensure that AI-driven solutions align with public interests.

Ethical considerations emerged as a significant focus, with participants highlighting the potential for bias in AI systems and the importance of maintaining transparency. Concerns were raised about the risk of perpetuating inequalities in service delivery if proper oversight mechanisms are not in place. One participant shared their view that transparency in AI decision-making processes is crucial for maintaining public trust, stating that citizens need to understand how and why AI is used in municipal decisions.

The discussions also touched on the organizational support required to enable workforce readiness for AI integration. Participants noted that existing training programs are insufficient to equip employees with the necessary skills. One respondent suggested that mandatory workshops on AI ethics and technical skills would be a meaningful step forward. Additionally, the role of leadership in setting clear guidelines and articulating a vision for AI adoption was frequently mentioned. As one participant explained, senior management needs to communicate effectively to ensure that employees understand the strategic goals of AI implementation.

Challenges in implementing AI were also a recurring theme. Resource constraints, including limited budgets and infrastructure, were seen as significant barriers to realizing AI's full potential. One participant observed that without adequate funding, it would be impossible to achieve meaningful integration. Cultural resistance to change within departments was another concern. Some employees remain sceptical about using AI, viewing it as a potential threat to their roles, which complicates efforts to promote adoption.

Finally, participants highlighted the importance of public engagement and inclusivity in AI-related decision-making. Several respondents emphasized the need to involve citizens in shaping how AI is used to address community needs. One participant stressed that AI applications must prioritize inclusivity and serve all groups equally, particularly marginalized communities, to ensure equitable outcomes.

Thematic summary of in-depth interviews

Theme 1: Skills and Competence for AI integration Participants emphasized the importance of technical and adaptive skills to navigate generative AI integration into municipal governance.

Technical Skills: All participants identified data literacy, machine learning, and prompt engineering as essential. For instance, one participant highlighted, "Understanding how AI tools generate outputs and evaluating their reliability is critical for informed decision-making."

Adaptive Competence: Flexibility, problem-solving, and collaboration across departments were noted as vital. As one respondent explained, “Cross-functional teams need to work together to develop AI-driven solutions that align with public interests.”

Theme 2: Ethical Decision-Making and AI use Participants underscored the importance of ethical considerations when implementing AI systems. Several noted the potential for bias in AI outputs. One participant shared, “Without proper oversight, AI systems could perpetuate inequalities in service delivery.” Participants also emphasized transparency in AI decision-making processes to maintain public trust. A participant remarked, “Citizens need to understand how and why AI is used in municipal decisions.”

Theme 3: Organizational Support and Training

Training Programs: Participants agreed that existing training programs are insufficient for equipping the workforce with AI-related skills. One participant stated, “Workshops on AI ethics and technical skills should be mandatory for all employees involved in its implementation.”

Leadership and Guidance: A respondent highlighted the role of leadership: “Senior management needs to set clear guidelines and communicate a vision for AI integration.”

Theme 4: Challenges in AI Implementation

Resource Constraints: Many participants pointed to limited budgets and resources as barriers to effective AI integration. “We can’t fully realize AI’s potential if there isn’t enough funding for the necessary infrastructure,” one participant observed.

Cultural Resistance: Resistance to change within departments was also identified as a challenge. A participant explained, “Some employees are sceptical about using AI and see it as a threat to their roles.”

Theme 5: Public Engagement and Inclusivity Participants stressed the importance of involving citizens in AI-related decisions. A participant noted, “We need to ensure that AI applications address community needs and that citizens have a say in how AI is used.” Inclusivity was another key point. One participant remarked, “AI must serve all groups equally, especially marginalized communities.”

End of Session

Appendix 2: Focus Group HR [October- November- December 2024]

Transcript: HR Session 1 Collaborative Discussion on the future of own work

Facilitator: What are you working on currently?
Participant 1: I'm working on an administrative AI assignment. Seven main directives have been outlined for this.

Facilitator: Who is leading the effort?
Participant 2: Instructions are being provided by the lead, [Leader A]. They are guiding us along the outlined directives.

Participant 3: One of the lines in the assignment was passed to the Director of [Department X], who delegated it to [Team Lead B]. Another aspect is being handled by [Colleague C].

Participant 4: The project also includes [Participant 4] handling [specific task] and conducting an impact analysis to assess changes in work processes and competence.

Facilitator: How are you approaching the knowledge gaps?
Participant 1: We are focused on awareness-building in this phase and planning to address skill gaps in the following stages through targeted training and knowledge-sharing.

Participant 2: Yes, and [Team Member D] is spearheading the AI vision. They ensure alignment across our directives.

Participant 3: There's also collaboration with [Team Member E], who focuses on maintaining inclusivity and ethical AI practices. They've been great collaborators in the early stages of our impact analysis.

Participant 4: Pilots are underway, focusing on generative AI and its integration into workflows. These are in varying stages, but all involve the application of generative AI for better operational outcomes.

Facilitator: How do these efforts contribute to broader objectives?
Participant 1: Our aim is to develop a framework to assess the impact of emerging technologies, especially generative AI, on work processes and bureaucratic structures. The focus is on creating scalable strategies.

Participant 3: We're also considering input from external sources, like community feedback and European-level policies, which significantly shape local implementation.

Participant 4: The challenge is aligning all these elements—skills, technologies, ethical practices—into actionable insights for organizational transformation.

Facilitator: Have you faced any significant hurdles?
Participant 2: Coordination among various teams has been complex, especially when priorities differ. However, regular dialogues with key stakeholders have been instrumental in finding common ground.

Participant 3: Resistance to change is another challenge, particularly with teams unfamiliar with the implications of generative AI on their roles.

Participant 4: We're addressing these hurdles by emphasizing cross-departmental collaboration and cultivating a culture of adaptability and continuous learning.

Facilitator: What's the outlook for the project?
Participant 1: There's strong potential for creating impactful changes, especially if we maintain our focus on ethical considerations and inclusivity. We'll continue to iterate based on feedback and pilot outcomes.

End of Session

Transcript: HR session 2 Collaborative Discussion on AI and Organizational Development

Facilitator: What are the current objectives being addressed?
Participant 1: We're focusing on integrating AI into administrative workflows, guided by several key directives outlined for this initiative.

Facilitator: Who is managing these directives?
Participant 2: Leadership and coordination are being handled by [Project Leader]. Specific tasks have been delegated to team leads to ensure alignment with the broader goals.

Participant 3: For instance, one directive was assigned to the director of [Department Name], who then delegated it further to [Team Coordinator]. Another segment is being managed by [Colleague Name], focusing on a complementary aspect of the project.

Participant 4: I'm tasked with conducting an impact analysis, evaluating changes in work processes, and identifying necessary adjustments to employee competence.

Facilitator: How are gaps in knowledge or skills being addressed?
Participant 1: We are prioritizing awareness-building during this phase, with plans to address identified skill gaps through targeted training and knowledge-sharing initiatives in subsequent stages.

Participant 2: Additionally, [AI Vision Lead] is overseeing the alignment of our strategy with the organizational vision for AI integration.

Participant 3: Collaboration with [Ethical Practices Coordinator] has been crucial in ensuring inclusivity and ethical AI practices are maintained throughout the project.

Participant 4: We are also piloting several generative AI tools to integrate them into existing workflows. These pilots are in different stages and aim to refine operational efficiencies.

Facilitator: What is the expected impact of these efforts on the organization?
Participant 1: The overarching goal is to establish a scalable framework that evaluates the influence of emerging technologies, such as generative AI, on work processes and organizational structures.

Participant 3: We are integrating feedback from both internal teams and external policies, including European-level frameworks, to ensure the initiative aligns with broader regulatory and societal expectations.

Participant 4: The challenge lies in consolidating diverse elements—skills, technological solutions, ethical considerations—into actionable outcomes that drive organizational growth.

Facilitator: Have there been significant challenges in the process?
Participant 2: Yes, coordination across multiple teams has proven complex, particularly when balancing varying priorities. However, regular stakeholder engagements have helped bridge these gaps.

Participant 3: Resistance to change has also emerged as a hurdle, especially among teams less familiar with the transformative potential of generative AI on their roles.

Participant 4: To mitigate this, we've emphasized inter-departmental collaboration and fostered a culture of adaptability, underpinned by ongoing learning opportunities.

Facilitator: Looking ahead, what's the vision for the project?
Participant 1: The initiative holds significant promise for driving meaningful organizational change. By maintaining a focus on ethical practices and inclusivity, we aim to develop adaptable strategies that will be refined through iterative feedback and pilot results.

End of Session

Transcript: HR session 3 Collaboration on Skills and Data-driven Initiatives

Facilitator: Let's begin. Can you provide an update on your recent engagements?
Participant A: Sure. We've initiated contact with two universities—Twente and [Local University]—and had productive conversations there.

Facilitator: That's excellent progress. Have you explored the platform, Open Research?
Participant A: Yes, I've reviewed it briefly. While it offers useful resources, I haven't found material directly applicable to the scope of my current work.

Facilitator: That makes sense. Still, it could serve as a repository for sharing insights and updates from our projects. For instance, small, digestible posts about findings could foster engagement and collaboration.

Participant A: Absolutely. That's a possibility worth exploring.

Participant B: On a related note, the initial dataset analysis revealed critical gaps in administrative frameworks. For example, basic data like function descriptions or workforce details are often outdated or inaccessible.

Facilitator: That's a significant finding. It highlights the need for foundational improvements before scaling up digitization efforts.

Participant A: Exactly. We're often working with incomplete or inconsistent data, which undermines the potential of initiatives like the pilots we're discussing.

Facilitator: What are the implications for current projects, such as the pilot for [Initiative Name]?
Participant A: To ensure meaningful outcomes, we need a clear understanding of the groups involved. For example, validating their function assignments and ensuring alignment between roles and activities should be a prerequisite.

Participant B: Agreed. Without accurate baseline data, conclusions drawn from pilot outcomes will lack credibility.

Facilitator: It sounds like a cleanup action for foundational data is essential. Could this be integrated into the early phases of the pilot?
Participant A: That's an ideal scenario for a small, focused group. However, applying this across the entire organization would require significant resources.

Participant B: True, but even within a limited scope, aligning administrative data with actual roles could provide valuable insights and set a precedent for broader application.

Facilitator: Good point. Can you outline the specific focus groups you've identified?
Participant A: Certainly. The three primary groups are:

1. **Decision-makers:** Leaders shaping organizational direction.
2. **Policy professionals:** Advisors and managers in policy and program development.
3. **Technical specialists:** Engineers and AI experts involved in implementation.

Facilitator: Excellent categorization. These groups will benefit from tailored competence as we explore emerging technologies.

Participant B: On that note, how do you plan to incorporate findings into broader frameworks like the European principles on skills development?

Participant A: I've mapped these principles to align with emerging competence identified through research and initial field data. This provides a structured approach to designing relevant training and support mechanisms.

Facilitator: That's promising. What's the next step for integrating these principles into our organizational strategies?
Participant A: Collaboration with educational partners and leveraging available resources, such as those highlighted at the European level, will be critical. I'm already working on frameworks that can facilitate this process.

Facilitator: Participant B, do you have additional insights to share?
Participant B: From my perspective, the primary challenge is operationalizing these findings. For example, ensuring consistency in how data is managed across clusters and addressing discrepancies between reported and actual roles.

Facilitator: Agreed. Let's aim to document these observations in a concise, actionable format. Participant A, could you prepare a brief summary of your findings, including recommendations for addressing data gaps?
Participant A: Absolutely. I'll draft a document summarizing the administrative inconsistencies and proposing initial actions to enhance data reliability.

Facilitator: Excellent. Let's reconvene in two weeks to review progress and refine our strategies further.

Participant A: Sounds good. I'll also follow up on other pending items.

Facilitator: Thank you, everyone. Great discussion today. Let's keep the momentum going.

End of Session

Appendix 2.1: Thematic Summary: HR Focus Group on Workforce Readiness for AI Integration

Theme 1: Skills and Competence for AI integration the HR focus group emphasized the necessity of developing both technical and adaptive skills within the municipal workforce. Technical skills, such as data literacy, AI ethics comprehension, and machine learning basics, were highlighted as critical for equipping employees to handle AI-driven systems effectively. Adaptive skills, such as collaboration, creative problem-solving, and a proactive learning mindset, were seen as equally important. One participant noted, "We need a workforce that can not only understand AI systems but also anticipate their implications for public service." This theme underscores the importance of a dual focus on technical expertise and adaptability to address the evolving nature of public administration roles.

Theme 2: Ethical and Inclusive AI practices the focus group discussed the ethical dimensions of AI implementation, particularly the risks of bias and unequal access to AI-enhanced services. Ethical training for employees was identified as a cornerstone for maintaining public trust. One participant remarked, "Transparency in how AI decisions are made isn't just an ethical requirement, it's a way to build confidence among citizens and employees alike." Inclusivity was another focal point, with participants advocating for frameworks that ensure AI applications serve diverse community needs, particularly those of marginalized groups.

Theme 3: Organizational Change and leadership were highlighted as a critical driver of successful AI integration. Participants stressed the need for leaders to articulate a clear vision for AI use while addressing employee concerns about job security and role evolution. One participant explained, "Change management strategies are essential to easing the transition, without leadership buy-in, even the best AI tools will face resistance." The importance of aligning organizational strategies, such as concept sprints and pilot programs, with overarching goals for AI implementation was also emphasized.

Theme 4: Workforce development and training the need for comprehensive, ongoing training programs was a recurring theme. Participants agreed that existing training frameworks are insufficient for equipping employees with the skills required to manage and leverage AI technologies effectively. Recommendations included modular training programs focused on AI ethics, data analysis, and real-world applications of AI in public services. As one participant noted, "Training isn't a one-time event; it has to be continuous, keeping pace with the rapid evolution of AI tools and techniques."

Theme 5: Overcoming barriers to integration the HR group identified several challenges to AI integration, including resource constraints, fragmented HR systems, and cultural resistance to change. Fragmentation in data systems was seen as a significant barrier, making it difficult to standardize skills assessments and workforce planning. One participant remarked, "Without reliable data, it's like trying to build a house without blueprints." Cultural resistance, especially scepticism about AI's impact on job security, was also seen as a hurdle. Participants suggested targeted communication strategies and transparent discussions to address these concerns effectively.

Theme 6: Citizen engagement and Public Value alignment participants highlighted the importance of aligning AI initiatives with public expectations and community needs. Involving citizens in decision-making processes was seen as essential for strengthening trust and ensuring that AI technologies deliver equitable benefits. One participant observed, "AI must be a tool for the public good, not just an efficiency booster. We need to actively involve the community in shaping how AI is used."

End of Session

Appendix 3: Focus Group Socratic design [April- May- September- November 2024]

Transcript: Session 1 Focus Group Discussion Vision on AI

Facilitator: Let's begin with reflections. What do you think about the role of sharing knowledge and experiences in this context?

Participant A: Sharing experiences is crucial. It helps us move beyond preconceived ideas and adopt a broader perspective.

Participant B: Absolutely. By learning from others' experiences, we can improve our approaches and outcomes.

Facilitator: Great point. Now, let's talk about the values that emerged during the discussion. One recurring theme was curiosity.

Participant A: I found that surprising but fitting. It's wonderful that curiosity resonated with everyone.

Participant C: Yes, curiosity opens the door for exploration and growth. It connects to trust and expression, which were also significant themes.

Facilitator: Can someone elaborate on the concept of expression?

Participant B: Expression is multifaceted. It's about self-expression—being heard and acknowledged—but also about expressing oneself creatively, through art, music, language, and more.

Participant C: Exactly. It's tied to individuality and freedom.

Facilitator: And how does connectedness play into this?

Participant A: Connectedness relates to relationships and shared understanding. It's about finding common ground while allowing individuality to flourish.

Facilitator: Interesting. Trust was another key value discussed. Why is it so central?

Participant B: Trust underpins everything. It's the foundation for collaboration, experimentation, and community-building. Without trust, it's challenging to innovate or take meaningful risks.

Facilitator: That's insightful. How can these values—curiosity, trust, expression, and connectedness—inform how we integrate AI into municipal strategies?

Participant C: They can guide us in shaping AI practices that prioritize inclusivity and empowerment. For example, ensuring transparency in AI processes builds trust, while encouraging creative use fosters expression.

Facilitator: Excellent. Let's discuss how we translate these values into action. What are some practical steps?

Participant A: A critical step is defining a clear framework for how AI is applied. This includes identifying shared goals, prerequisites, and benchmarks for success.

Participant B: Agreed. It's also essential to outline what "enough" looks like—enough safety, enough transparency, enough accessibility—to ensure we meet diverse needs.

Facilitator: Great suggestions. Let's also think about habits and routines. How do they impact our ability to work effectively with AI?

Participant C: Habits bring clarity and structure, which reduces stress and confusion. Clear routines can support ethical and efficient AI use across departments.

Facilitator: That's valuable input. To conclude, let's focus on next steps. What should we prioritize in the coming weeks?

Participant A: We need to refine our vision document, integrating the values and prerequisites we've discussed today.

Participant B: And gather feedback on our approach from broader stakeholders. Testing these ideas in smaller groups could be a useful starting point.

Facilitator: Excellent. Thank you, everyone, for your contributions. Let's reconvene to review progress and further shape our strategy.

End of Session

Transcript: Session 2 Focus Group Discussion collaborative initiatives

Facilitator: Welcome, everyone. Let's start with introductions. Could you briefly share your name and your involvement in this initiative?

Participant A: I'm a representative from a community health project in Holendrecht. We're working on creating a new neighborhood, but based on principles different from the usual approach. Instead of starting with construction, we begin by asking residents how they want to live.

This approach is rooted in theory and practice, making it complex but also impactful. It's not just about random actions; it's legitimized through deep analysis and a structured methodology grounded in philosophy.

Participant B: That's an impressive initiative. It sounds like a significant step forward.

Participant A: It's challenging but rewarding. In Holendrecht, residents are actively involved in shaping their environment. This aligns with the concept of deliberative democracy, which goes beyond participation. Residents are encouraged to take responsibility, recognizing that both citizens and government need to shift their narratives.

Participant C: That's a powerful perspective. I'd love to discuss it further at another time.

Participant D: I'm actively involved in community projects in Southeast Amsterdam, supporting groups of residents and public servants who are already taking ownership of initiatives. It's inspiring to see this dynamic evolving.

Facilitator: Thank you all for sharing. Let's dive into today's session. The focus is on how deliberative democracy can address issues like polarization and isolation and use of technology.

Participant E: I find this concept fascinating. Deliberative democracy emphasizes dialogue and shared understanding, which seems crucial in addressing complex societal challenges.

Participant F: Yes, and it's not just about dialogue; it's also about creating a framework for collaboration and empowerment.

Facilitator: Precisely. Let's discuss practical applications. How can we implement these principles in our work?

Participant G: In Southeast Amsterdam, we've seen success by establishing neighborhood platforms. These platforms enable residents to take collective action, supported by guidelines from the local government.

Participant H: However, this approach requires a significant shift in how public servants and residents interact. Building trust and breaking down hierarchical patterns is essential.

Facilitator: Excellent points. We also want to explore the concept of unarmoring—shedding defensive habits to engage more authentically. How do you see this playing out in our discussions?

Participant E: Unarmoring can help us move beyond personal biases and focus on shared goals. It's about acknowledging our own limitations and opening up to new perspectives.

Participant F: Agreed. This ties directly into the dialogue process, where participants are encouraged to reflect on their assumptions before engaging in collective discussions.

Facilitator: That's a great segue into the structure of the session. We'll start with personal reflections, followed by smaller group dialogues. Moderators will guide the discussions to ensure everyone feels heard and included.

Participant G: It's essential to ensure that these dialogues are safe spaces where participants can express themselves without fear of judgment.

Facilitator: Absolutely. Let's also consider how we incorporate practical examples to ground our discussions. For instance, we've seen how community-based approaches in Holendrecht have fostered innovation and collaboration.

Participant H: That's inspiring. Sharing such examples can help participants understand the real-world impact of these concepts.

Facilitator: Thank you all for your input. We'll finalize the structure and follow up with the group. Looking forward to seeing you all in the next session.

End of Session

Transcript: Session 3 Focus Group Discussion Vision on AI

Facilitator: Welcome, everyone. Let's begin with an exploration of ideas inspired by David Bohm, a philosopher and scientist known for his work on dialogue. In his book *On Dialogue*, Bohm emphasizes the importance of rethinking our concepts of nature and intelligence, including how these ideas intersect with human interaction.

Participant A: Bohm's work is fascinating because it spans from personal insights, such as childhood experiences, to universal principles. His ideas resonate with themes of human connection and communication, as mentioned earlier by another participant.

Participant B: That's an excellent starting point. We need to question our assumptions about nature and intelligence. For example, we could explore the wisdom inherent in trees and ecosystems, as one participant suggested earlier.

Facilitator: Agreed. Today, we'll use a dialogue-based method to examine these themes. This method is unique because it avoids the traditional approach of debate—where ideas often clash—and instead fosters a collective exploration of questions.

Participant C: So, it's less about proving a point and more about discovering shared insights. That sounds promising.

Facilitator: Exactly. Dialogue creates a space where everyone's contributions are valued equally. It's not about production or quick solutions but about slowing down to reflect deeply on complex issues.

Participant D: That's refreshing. In many settings, there's pressure to produce immediate results, which can stifle genuine understanding.

Facilitator: Yes, and part of this process is to cultivate listening skills. For instance, you might be asked to repeat another person's point before responding, ensuring that everyone feels heard.

Participant E: That's a challenging but valuable exercise. It forces us to move beyond reactive thinking.

Facilitator: Let's put this into practice by collectively identifying a philosophical question to explore today. Everyone will propose a question, and we'll quickly choose one to guide our discussion.

Participants propose questions:

- "Can we trust AI in life-and-death decisions?"
- "What is intelligence?"
- "Are we mature enough to use AI responsibly?"
- "What problems does AI solve, and for whom?"
- "Can AI ever be free of bias?"
- "How do we encourage curiosity about AI?"

Facilitator: These are excellent questions. Let's focus on one: *What problems does AI solve, and for whom?* This question allows us to consider the broader implications of AI's role in society.

Participant F: A great choice. It frames AI as a tool whose value depends on the context and goals it serves.

Participant G: Agreed. In some cases, AI can excel—such as identifying patterns in large datasets—but it's limited in tasks requiring emotional intelligence or complex human judgment.

Participant H: That's a critical point. For example, generative AI can create text or images, but does it truly solve problems, or does it risk devaluing human creativity?

Participant I: It's also worth considering how AI interacts with societal issues, like inequality. If deployed poorly, it could exacerbate existing problems.

Facilitator: Let's break this question into sub-questions to deepen our exploration. For instance:

- What kinds of problems is AI best suited to address?
- How does AI influence human creativity and decision-making?
- What role does trust play in our adoption of AI?

Participant J: Trust is a key factor. AI's effectiveness depends on the quality of the data it's trained on, which in turn reflects societal biases.

Participant K: And trust isn't just about the technology—it's also about the intentions of those deploying it.

Facilitator: Excellent points. We'll continue this discussion after the break, focusing on potential dilemmas and values that should guide AI's development.

Participant L: Before we break, I'd like to highlight a practical example. In healthcare, AI chatbots can save time but risk losing the nuanced understanding a human doctor brings to patient interactions.

Facilitator: A valuable observation. This illustrates the balance we must strike between efficiency and empathy in AI applications.

Participant M: Yes, and it underscores the importance of context. AI is a powerful tool, but it's not a universal solution.

Facilitator: Thank you all for your thoughtful contributions. During the next session, we'll explore how AI aligns with our values and what steps we can take to address its challenges responsibly.

End of Session

Transcript: Session 4 Socratic Design and Community Development

Facilitator: Welcome, everyone. Today's session focuses on implementing Socratic Design principles in community projects, emphasizing deliberative democracy, self-organization, and collaboration between residents and government. Our case study will be Holendrecht, where a novel approach to urban development is being tested.

Opening Remarks

Participant 1: In Holendrecht, we are creating a neighbourhood based on principles that prioritize people's needs and values over traditional urban planning. This approach involves engaging residents in a deep dialogue about how they want to live. It's a shift towards residents organizing solutions themselves, while the government provides guidelines and oversight.

Participant 2: This approach challenges both residents and government institutions. It's about co-creating solutions and breaking away from the "government bad, resident good" narrative. For example, issues like bike safety go beyond infrastructure to include shared behavior and morality, which deliberative democracy can help address.

Participant 3: In Southeast Amsterdam, we see active resident participation in these methods. The focus is on supporting existing community efforts while aligning them with government initiatives for lasting impact.

Introductions

Participants introduced themselves, highlighting their roles in Socratic Design, community development, and their experiences in advancing resident-government collaboration. Some examples:

- **Participant 4:** Focused on innovative thinking models and experimenting with new ways of working in municipal operations.
- **Participant 5:** Conducting research on progress and improvement while observing and engaging in community development efforts.
- **Participant 6:** A coordinator for democratization and inclusivity, working to integrate deliberative democracy principles into broader municipal plans.

Session Goals

Facilitator: The purpose of today's session is to explore how deliberative democracy and Socratic Design can:

1. Transform governance and community relationships.
2. Address entrenched patterns of distrust or conflict in municipal-community interactions.
3. Enhance co-ownership of solutions.

The session will include:

1. An hour of presentations and discussions on existing practices.
2. A dialogue session focused on personal biases and collective insights.
3. A strategy-building segment for implementing these concepts in other contexts.

Discussion Themes

Deliberative Democracy in practice

- Participants explored how deliberative democracy fosters deeper collaboration and co-ownership compared to traditional participation methods.
- Examples from Holendrecht demonstrated successes and challenges in aligning resident-led initiatives with municipal frameworks.

Addressing Biases

- Personal biases and preconceptions were identified as barriers to effective collaboration. Participants agreed that reflecting on one's assumptions is a crucial step in building trust and facilitating dialogue.
- Several participants noted that addressing biases also helped reveal structural trust issues within municipal teams.

Overcoming organizational challenges

- A "camp mentality" within municipal teams was identified as a significant issue in Southeast Amsterdam. Participants discussed strategies to dismantle these patterns and encourage collaborative problem-solving.

Redefining the government Role

- The group emphasized the need for government institutions to act as enablers rather than controllers. This shift requires both residents and officials to embrace new ways of working together.

Outcomes and next steps

1. Personal Reflection Exercises:
   - Start dialogue sessions with personal narrative exercises to uncover and challenge biases, leading to more meaningful group discussions.
2. Structured Dialogue Facilitation:
   - Use trained moderators to ensure sessions remain focused and productive.
3. Expanding the Model:
   - Learn from the Holendrecht case to apply these principles on a larger scale, addressing broader societal challenges like polarization and extremism.

Facilitator: Thank you all for your contributions. We will follow up with specific action points and reconvene to discuss progress and lessons learned.

End of Session

Transcript: Session 5 Focus Group Discussion on Socratic Design and Community Development

Facilitator: Let's explore the nuances of integrating cultural elements and personal reflection into community initiatives.

Opening remarks

- **Participant 1:** The concept of “stripteases” was mentioned in a metaphorical sense, referring to peeling back layers to uncover core motivations or hidden truths. For example, a director of communication shared a personal breakthrough during such a reflective process, which inspired openness to deeper exploration.
- **Participant 2:** Various cultural practices shape how individuals perceive work, sacrifice, and self-discovery. For example, different religions or traditions frame daily life through rituals and moral teachings, which can have both constructive and destructive consequences.

Cultural perspectives and communication

- Participants reflected on how traditions like Catholicism and Judaism offer frameworks for lifelong learning and community integration. These traditions, while specific to their origins, share universal elements of human connection and understanding.
- **Participant 3:** There is an ongoing challenge in distinguishing between cultural practices that enrich community dynamics and those that perpetuate barriers.
- **Participant 4:** The importance of non-verbal communication was highlighted, such as how some cultures use dance, song, or silence to convey complex messages. For example, the Flamenco traditions or indigenous practices of communicating through movement illustrate this beautifully.

Logophilia: The love of words

- **Participant 5:** The group discussed "logophilia," or an excessive reliance on language, as a hindrance to deeper communication. Words, while useful, can sometimes limit the scope of understanding and overshadow more intuitive forms of interaction.
- **Participant 6:** Education systems often exacerbate this issue by prioritizing verbal and written expression over experiential or emotional learning. This focus can inhibit the holistic development of individuals and their ability to connect on a deeper level.

Connecting work, learning, and emotions

- The discussion shifted to the intersection of work, learning, and emotional intelligence. Participants agreed that work should transcend transactional purposes and incorporate elements of self-realization and community contribution.
- **Participant 7:** In an example from a housing project, young people expressed a preference for living arrangements that prioritized communal experiences over isolated spaces. This preference reflects the importance of addressing emotional and social needs in urban planning.

Broadening collective values

- Participants emphasized the need to integrate diverse cultural values into community initiatives. For example, ethnic intelligence, rooted in the unique wisdom of various cultural traditions, was identified as a critical component for creating richer, more inclusive environments.

- **Participant 8:** Incorporating pre-colonial philosophies and indigenous knowledge systems can significantly enhance collective problem-solving and value creation.

Challenges and opportunities in governance

- **Participant 9:** Highlighted the difficulty of reconciling bureaucratic systems with grassroots initiatives. For example, some governmental strategies fail to account for the emotional and social dimensions of the communities they aim to serve.
- **Participant 10:** Shared insights about a project where young people were empowered to design their own housing prototypes, which allowed them to address both practical needs and emotional well-being.

Conclusion

The group concluded by reiterating the importance of aligning physical architecture with the "mental architecture" of communities. This involves recognizing and addressing the emotional, social, and cultural dimensions of work and living environments.

Facilitator: Thank you all for a thought-provoking discussion. Let’s take these insights forward as we continue to explore innovative approaches to community development.

End of Session

Appendix 3.1: Thematic Summary: Focus Group Socratic design

Summary of Focus Groups (Socratic Design and AI Vision discussions- community building)

The focus groups collectively highlighted the crucial role of skills and competence in integrating AI into municipal governance effectively. Technical competence, such as data analysis and ethical usage of AI, were frequently discussed as essential. Participants stressed the importance of interpersonal skills, including active listening, describing good existence in regards to technology and collaboration, which are vital for cross-functional team dynamics. These skills were seen as foundational for aligning AI initiatives with broader societal goals.

A recurring theme in the discussions was the ethical deployment of AI and its implications for public trust. Transparency in AI processes was underscored as a critical factor, with participants emphasizing the need for having an understanding of own actions and way of thinking, having oversight mechanisms to address biases and ensure fairness. The dialogue often circled back to integrating community values into AI decision-making, aiming to foster inclusivity and societal trust.

Organizational culture and leadership emerged as significant factors in AI adoption. Participants expressed the need for strong leadership to guide AI integration, emphasizing clear vision-setting and effective communication. Cultivating a culture of adaptability and supporting employees through targeted training programs were identified as key steps for equipping the municipal workforce for AI-driven roles.

Challenges in implementing AI were also thoroughly discussed. Personal presuppositions, resource constraints, such as limited time, infrastructure and funding, were noted as primary barriers. Resistance to change within municipal teams and scepticism about AI's role in public service further complicates integration efforts. The complexity of AI systems and their potential unintended consequences were also highlighted as areas requiring careful attention.

Finally, public engagement and inclusivity were emphasized as integral to successful AI governance. Participants advocated for involving citizens through dialogue in shaping AI policies and decision-making processes, ensuring the technology reflects the diverse needs of the community. Special attention was drawn to marginalized groups, with calls for AI applications that promote equitable outcomes for all citizens.

Thematic summary of focus Groups (Socratic Design and AI Vision discussions)

Theme 1: Skills and Competence for AI Integration Participants highlighted the necessity of both technical and interpersonal competence for successful AI integration in public governance. Technical skills like data analysis, ethical AI usage, and problem-solving were identified as critical for aligning AI practices with societal needs. Interpersonal competence, such as communication and active listening, were emphasized as essential to strengthen collaboration across diverse teams.

Theme 2: Ethical Decision-Making and Public Trust Participants underscored the importance of ethical AI deployment, focusing on transparency and trust-building. Discussions included concerns about bias in AI systems and emphasized the necessity of strong oversight mechanisms. A recurring theme was the integration of community values into AI governance, ensuring inclusivity and fairness in decision-making.

Theme 3: Organizational Culture and Leadership Focus group participants emphasized that leadership plays a crucial role in navigating AI transformation. Clear vision-setting, open communication, and

support a culture of adaptability were seen as critical. Participants also called for tailored training programs to equip municipal employees with AI-specific skills and promote lifelong learning.

Theme 4: Challenges in Implementation Participants cited several barriers to AI adoption, including resistance to change, resource constraints, and the complexity of AI systems. Skepticism about AI's role in public governance, coupled with infrastructural limitations, were noted as significant hurdles.

Theme 5: Public Engagement and Inclusivity There was strong advocacy for engaging citizens in AI-related decision-making processes. Trust-building through transparency and involving marginalized communities to ensure inclusivity were frequently mentioned. Participants stressed the need for AI applications to reflect societal diversity.

End of Session

Appendix 4: Focus Group Strategic leadership [June- November- December 2024]

Transcript: Session 1 strategic leadership vision on Inclusive Leadership

Facilitator: Let's begin by discussing the dimensions of inclusive leadership, including connection and uniqueness in the workplace. These are measured by indicators such as justice and fairness, shared decision-making, encouraging diverse contributions, and developing unique talents.

Research overview

- **Presenter:** My interviews focused on these indicators to understand the core of inclusive leadership. Additionally, I explored self-efficacy (confidence in performing tasks) and public service motivation (dedication to public interest). Indicators for self-efficacy included past achievements, workplace experiences, formal recognition, and mood. Public service motivation was assessed based on interest in policy, dedication to public interest, compassion, and self-sacrifice.
- I linked these concepts: inclusive leadership in a digital context, and self-efficacy and public service motivation to their influence on inclusive leadership.

Preliminary findings

- **Presenter:** I conducted 20 interviews, transcribed, and coded the data. While I'm still analysing the deeper relationships, some patterns have emerged.
  - **Decision-Making:** A preference for shared decision-making was noted, but processes often remain top-down.
  - **Feedback Culture:** Responses were split—half appreciated positive feedback, while others felt feedback was lacking and desired improvement.
  - **Public Service Motivation:** Participants exhibited high motivation and alignment with serving the public interest.
- Regarding digital tools, participants primarily used them for personal tasks like AI-driven assistance. However, opinions diverged: some saw risks to inclusivity, while others viewed them as opportunities to enhance inclusivity.
- **Awareness:** A recurring theme was awareness—either of the need to be inclusive or the challenges in achieving inclusivity.

Differences between leaders

- **Presenter:** Formal leaders (e.g., managers and team leaders) generally considered themselves more inclusive compared to informal leaders (e.g., project leaders), who tended to be more critical. Background differences, such as gender or cultural diversity, influenced experiences and perceptions of inclusivity.
- Feedback varied across teams, with some being enthusiastic and others feeling neglected.

Analysis challenges

- **Participant:** How do you address socially desirable responses during analysis?

Presenter: I attempted to minimize this by summarizing responses and prompting further clarification during interviews. However, it remains a challenge to extract deeper insights from overly lengthy or socially influenced answers.

Next steps and support

- **Presenter:** I will continue analysis, submit a draft for feedback, and incorporate revisions. My concept version is due by June 23rd, with a final version completed by the deadline.
- I plan to present findings in an accessible advice report to ensure broader usability.
- **Participant:** How can we support you?
    - **Presenter:** I'm on schedule, but feedback from you and others is critical to refine the study and ensure consistency.

Closing remarks

- **Participant:** This research is innovative and integrates previously disconnected elements. I'll connect you with a group exploring administrative decision-making—it may complement your findings.
- **Facilitator:** Thank you for your time and insights. It's exciting to see how this will evolve.

End of Session

Transcript: Session 2 strategic leadership vision on Governance and Emerging Technologies

Facilitator: Let's begin with the current focus. We're working on core development and governance frameworks for safe use of generative AI. This includes regulation from start to finish—ensuring that AI is used responsibly and communicated effectively.

Key themes and challenges

1. Governance of Generative AI:
    - Emphasis on balancing quality with speed while ensuring all necessary safeguards are in place. This involves checkpoints to mitigate risks without hindering progress.
    - Collaboration across disciplines such as architecture, information management, and security to address risks, particularly regarding external systems like OpenAI and Microsoft.
2. Interdisciplinary vs. Multidisciplinary Approaches:
    - Teams are working to move from multidisciplinary (independent inputs) to interdisciplinary (integrative learning) approaches. Cross-disciplinary reliance is vital, especially for AI-related knowledge.
3. Skill Gaps:
    - Understanding AI's impact on various fields remains a challenge. Participants highlighted the need for better integration of technical and contextual expertise.

Future of work and skills development

Participant A: My research focuses on the impact of emerging technologies, including AI, on public sector bureaucracy and governance. I'm also exploring how to design a skillset to support transitions in the workplace. This involves:

- Identifying gaps in current skillsets for handling AI and other technologies.
- Balancing productivity, employee well-being, and inclusivity as AI reshapes roles and processes.

Participant B: I agree. It's critical to address not only technical skills but also the mindset needed to engage with technology positively. This includes mitigating risks and leveraging potential benefits effectively.

Current AI governance efforts

- Processes and compliance:
    - A structured "progress process" is in place to evaluate and procure AI tools, integrating compliance with information security, privacy, and architecture.
    - Low-risk tools may require a streamlined process, while high-risk tools undergo rigorous testing (e.g., DPIA, DTI).
- Procurement status:
    - Licenses for tools like Copilot have been purchased but remain under evaluation due to unresolved compliance issues. This delay highlights differing risk tolerance across organizations.

Collaborative opportunities

- **Participant A:** I'm working on governance-related research and connecting with stakeholders across fields. My focus is on practical applications of emerging technology governance, particularly the EU's AI Act. Collaboration with other municipalities (e.g., the G4 group) is underway to share best practices and align strategies.
- **Participant B:** That’s promising. I recommend tracking and documenting the activities and visions emerging from these collaborations to create a shared resource.

Next steps and follow-up

- Building a community:
    - Establishing a research platform for knowledge sharing, collaboration, and progress tracking is suggested.
    - Structuring regular check-ins to discuss findings and align ongoing efforts.
- Meeting schedule:
    - Proposed follow-ups every 4–6 weeks, with a preference for Thursdays or Fridays.

Closing remarks:
Facilitator: Thank you for the valuable insights. Let’s reconvene soon, potentially in person next time. Enjoy your summer plans, and I look forward to continuing the conversation.

Participants: Thank you. See you next time.

End of Session

Transcript: Session 3 strategic leadership vision on Inclusive Governance and Future of Work

Key themes

1. Focus areas for the organization:
- The emphasis is on creating an inclusive organization, embracing diversity, and adapting to technological advancements like AI. The session highlighted the need for observational insights to understand how emerging technologies are being integrated internally and externally.
2. Technological adaptation and human resilience:
- Discussions revolved around how technology impacts organizations, particularly AI. The primary concern is ensuring that individuals are equipped to engage with and adapt to these technologies responsibly.
- The goal is to strengthen human capacities to interact with technology effectively, promoting both ethical use and resilience against technological challenges.

Emerging technologies in public governance

Participant A: My research focuses on the impact of emerging technologies (e.g., generative AI, blockchain, IoT) on bureaucracy and governance in the public sector. I aim to examine:

- How these technologies influence organizational processes.
- The decisions that shape their adoption and use.

Facilitator: That's aligned with our ongoing work. It might be helpful to start with specific applications or cases rather than tackling the entire organization. For example:

- Interaction with citizens using AI tools like chatbots.
- Internal processes such as spatial planning and security.
- Technological frameworks and their human-centered counterparts.

Skill development and future of work

- Human-Centric frameworks:
- The conversation emphasized the need for human frameworks alongside technical frameworks to guide AI usage. Developing skills and capabilities is central to adapting effectively to these changes.
- A Socratic design approach can help define the educational and professional profiles necessary for future roles.
- Challenges and opportunities:
- Addressing sensitivities around change and ensuring alignment with organizational goals are key priorities.
- The importance of freeing individuals from rigid structures to foster innovation and self-development was highlighted.

Ongoing and future work

1. Practical Implementation of AI:

- Efforts are underway to establish technical standards for AI tools and define what employees need to work effectively with these technologies.
- Copilot, a tool being explored for its potential applications, was discussed. Collaboration with stakeholders is key to its success.

2. Research and Collaboration:
   - Suggestions were made to collaborate on future studies and to explore existing resources, such as AI vision documents and frameworks for interaction and implementation.
   - A platform for open research and collaboration was proposed to share insights and track progress across teams.

Next steps

1. Research design:
   - Exploring quantitative and experimental approaches to gather actionable insights.
   - Developing studies that are both academically rigorous and practically useful.
2. Follow-Up meetings:
   - Regular check-ins every three weeks were proposed to discuss progress and coordinate efforts.
   - A physical meeting was tentatively scheduled to align schedules and facilitate more in-depth discussions.

Closing remarks:
Facilitator: Thank you for your contributions and insights. Let's maintain momentum and align our efforts to drive meaningful outcomes.

Participants: Thank you. Looking forward to the next session.

End of Session

Appendix 4.1: Thematic Summary: Focus Group Strategic Leadership

Summary: 1 Strategic Leadership Group for Digital Transformation (Anonymized)

The Strategic Leadership Group for Digital Transformation emphasized the crucial role of workforce competence in navigating the rapid integration of advanced technologies, particularly AI and quantum computing. The participants discussed the need for technical proficiency in data analysis and AI programming, along with a forward-looking understanding of quantum computing. A senior participant remarked, "The speed of change demands not just skills but adaptability; our teams need to stay ahead of the curve." This dual focus on technical expertise and adaptability reflects the group's recognition of the evolving demands placed on public sector employees.

Ethical considerations formed a core part of the discussion, with participants stressing the importance of embedding transparency and accountability into AI-driven decisions. One leader warned, "If we aren't vigilant, AI could exacerbate existing inequalities instead of addressing them." This underscores the need for strong ethical frameworks that align technological deployment with public values. The discussion highlighted the potential for biases in AI and the critical importance of human oversight in mitigating these risks.

Collaboration across disciplines was another significant theme. Members agreed that creating interdisciplinary partnerships is key to successfully integrating complex technologies. "We need technical experts and policymakers to speak the same language," one participant explained, pointing out that misalignment can lead to inefficiencies or even project failures. Building shared understanding and trust among diverse stakeholders was seen as essential to overcoming silos and ensuring cohesive technological strategies.

Organizational readiness and experimentation were also emphasized. The group acknowledged that bureaucratic inertia often hinders innovation in public institutions. To counter this, they advocated for structured experimentation, such as concept sprints and pilot projects. One participant noted, "We've seen success when we adopt a trial-and-error mindset, experimenting helps us refine our strategies while minimizing risk." These insights reflect a willingness to engage with emerging technologies through iterative, small-scale testing rather than wholesale implementation.

Lastly, the group stressed the importance of public engagement in technological decision-making. Ensuring that citizens are involved in shaping AI applications was deemed critical for maintaining trust and relevance. One participant highlighted the public-centric approach by stating, "AI must serve societal needs first and foremost, it's not just about efficiency but equity." This aligns with broader calls for inclusive, transparent governance frameworks that prioritize public good over technological novelty.

This focus group demonstrated a deep understanding of the complexities surrounding the integration of advanced technologies in public governance, with actionable insights centered on skills development, ethical integrity, collaborative practices, and citizen involvement.

Thematic Summary: Strategic Leadership Group for Digital Transformation

Theme 1: Skills and Competence for managing AI The focus group highlighted the critical importance of enhancing workforce competence to manage emerging AI technologies. Participants underscored technical skills like data analysis, AI programming, and understanding of quantum computing concepts. A recurring observation was that these skills must be paired with adaptive and leadership abilities. As

one member noted, developing the workforce's ability to adapt to rapid technological changes is central to sustaining innovation within the public sector.

Theme 2: Ethical integration of technology Ethics emerged as a cornerstone of the discussion, with participants emphasizing the need for frameworks that prioritize transparency and accountability in AI usage. A leader pointed out that organizational decisions must not only comply with existing regulations but also align with public values. The challenge of mitigating biases and ensuring fairness in AI-driven decisions was another focal point, as one member articulated the risk of perpetuating inequalities if AI systems are not adequately supervised.

Theme 3: Creating collaboration across disciplines

The complexity of integrating technologies like AI and quantum computing necessitates strong interdisciplinary collaboration. Members stressed the need for creating bridges between technical experts and policymakers to align goals and maximize the utility of innovations. One participant described the need for "building overlapping knowledge," ensuring a shared understanding among professionals from diverse fields, which was seen as essential for project success.

Theme 4: Organizational preparedness and experimentation

The group acknowledged that governmental departments often face structural inertia when adopting new technologies. They proposed a dual approach: readiness for emerging tech like AI and incremental experimentation to understand its potential. Several participants shared examples of ongoing initiatives, such as concept sprints to test AI and quantum use cases, demonstrating the value of a trial-and-error approach.

Theme 5: Public-Centric technological deployment

Ensuring that technology serves the public good was a shared priority. Participants emphasized involving citizens in decision-making processes and aligning AI applications with societal needs. There was a call for frameworks that balance technological advancements with public trust, especially in contexts were AI decisions impact daily life, such as urban planning or service delivery.

End of Session

Appendix 5: Validation Session: 1 Future of work [September- November- December 2024]

Participant 1: Let me put it this way, I realize very well that not everything I want to know is sensible to do via a work device. Let me put it that way. That's one thing. And to be honest, I don't believe that many colleagues are aware of this. In the past, we accessed all kinds of inappropriate content online. That was 15 or 20 years ago, and eventually, there were cases where individuals got into trouble for it. Could they have known it wasn't allowed? Well, maybe.

Participant 2: Yes, and now the focus is on newer issues like the use of generative AI.

Participant 1: Exactly. For instance, in our organization, we are careful not to scan sensitive information, like letters about sensitive investigations. But on the other hand, I think the level of AI adoption is fascinating. I get numerous questions a day about AI tools.

Participant 3: How do you use it collaboratively? Do you prompt together or formulate questions as a team?

Participant 1: Prompts feel mythical to me. I'd love to take a course on it. It feels like learning to drive a car—basic skills are fine, but there's room for improvement.

Participant 3: I think this highlights the need for training, especially for knowledge-based roles like policy-making or research.

Participant 4: Yes, I'm triggered by how generative AI is evolving. The comparison to past internet use is apt, and now we're discussing how employees adopt these tools and the skills required for safe and effective usage.

Throughout the conversation, the participants reflect on their experiences with technology in the workplace, ranging from internet use to emerging AI tools. They discuss the challenges of integrating these tools effectively, highlighting organizational and individual skill gaps.

Participant 2: I've noticed that many employees lack foundational digital skills. For example, simple tasks like screen sharing during a virtual meeting still pose challenges.

Participant 5: Exactly, the transition to newer platforms like cloud-based systems often reveals a lack of digital literacy. This isn't just about managing systems; it's about ensuring employees are prepared for broader technological shifts.

The conversation moves to strategic considerations, including how to provide training and align organizational goals with employee capabilities. Participants also explore the challenges of creating inclusive spaces for dialogue and ensuring diverse perspectives are considered.

Participant 6: We need to address the organizational barriers that prevent effective collaboration and innovation. Often, existing structures hinder progress. For instance, decision-making processes can exclude important voices.

Participant 7: Agreed. Anonymity in discussions, facilitated by digital tools, could help level the playing field and foster more open dialogue.

The session concludes with a commitment to further exploring these themes and integrating feedback into actionable strategies for adopting and managing emerging technologies.

Appendix 5.1: Validation session 2: Future of work

The participants then discussed strategies for creating a more inclusive and supportive environment.

What do you think needs to change? How can organizations better support employees in situations like yours?

Participant 1: It starts with leadership. Leaders need to prioritize employee development and create clear paths for progression. There should also be better mechanisms for accountability—ensuring that commitments made to employees are followed through. And importantly, we need spaces where employees can share their experiences without fear of repercussions.

Participant 2: That's crucial. It's about building trust and transparency. Employees shouldn't feel like they're navigating these challenges alone or that they're being penalized for speaking up.

The conversation shifted toward broader organizational themes like the integration of new technologies and the development of skills to adapt to changing workplace demands.

Speaking of organizational change, how do you see the role of AI and other emerging technologies in addressing these issues? Do you think they could help or exacerbate them?

Participant 1: I think AI has a lot of potential to streamline processes and reduce bias in decision-making, but only if it's implemented thoughtfully. For example, using AI to identify skill gaps or to provide personalized development opportunities could be transformative. But we also need to ensure that it doesn't replace the human touch that's so critical in these processes.

Participant 2: Agreed. There's a balance to be struck between leveraging technology and maintaining the human element. That's something we need to consider carefully as we develop strategies for the future of work.

Shall we start outlining the key pillars for this vision? We've talked about "Human in the Loop", emphasizing the role of expertise and personal empowerment. What else should we include?

Participant 1: We could also focus on the economic and social benefits of skills development. How do we align the organization's goals with individual growth and technological advancement?

Participant 2: That's a great idea. Let's aim to develop a framework that integrates these elements. We can begin by gathering insights from different stakeholders and exploring best practices from other organizations.

The session concluded with a collaborative discussion on how to draft a vision for the future of work, incorporating themes of empowerment, skill-building, and inclusive leadership.

End of Session

Appendix 5.2: Validation Session FOW 3

In a vibrant discussion about innovation, leadership, and digital transformation within the city organization, participants gathered to share updates on their projects, challenges, and aspirations. The session showcased a mix of ambitious plans, practical insights, and a collaborative spirit.

The Foundation: A Multi-Year Digital Strategy

The session began with an outline of a bold multi-year strategy for digital transformation. One participant explained their vision to simplify, improve, and sustain the city's application landscape through 2030, with potential extensions to 2034. This initiative, tied closely to urban innovation tasks and AI integration, aims to enhance operational transparency and efficiency.

“This is about more than technology,” the presenter emphasized. “It’s about rethinking how we work and innovate together.”

The ambitious scope sparked a discussion about balancing technical advancements with the need for employee adaptation. While the framework promises significant benefits, navigating the intricate landscape of organizational priorities remains a challenge.

AI as a Catalyst for Social Security

Another participant introduced their innovative AI chatbot prototype, designed to address social security concerns within the organization. The chatbot is envisioned as a neutral, accessible platform where employees can seek guidance or report issues related to undesirable behaviour or integrity concerns.

The presenter shared a glimpse of the chatbot’s interaction: “If an employee feels unsure about a situation, they can turn to the chatbot for confidential advice or clarification on the next steps.”

The chatbot aims to create awareness and behavioural change, empowering employees to act in a socially safe and informed way. Plans to test the prototype through online sessions were met with enthusiasm, though the lengthy process of implementing AI tools into the organization—due to costs and bureaucracy—remains a significant hurdle.

Leadership, Inclusion, and Behavioural Change

Leadership and inclusion also took centre stage, with participants reflecting on how social dynamics shape organizational culture. One participant highlighted their work in organizing design sprint sessions to align diverse perspectives and drive behavioural change.

“It’s a journey that’s deeply tied to emotions and history,” they remarked, acknowledging the complexities of aligning leadership models with sustainability and inclusion.

The session touched on the challenges of navigating entrenched structures, such as the bureaucracy often associated with urban tasks. Yet, there was a shared belief in the potential for collaboration and co-creation to drive meaningful progress.

Bridging Innovation and Bureaucracy

The group explored the intersection of innovation and bureaucracy, particularly how generative AI might reshape processes and skill development. One participant expressed interest in studying the historical and current impacts of AI-driven initiatives within the organization.

They shared their research question: “How does the bureaucracy adapt to generative AI, and what essential skills emerge or evolve from its use?”

Suggestions included conducting case studies, exploring AI-driven pilots, and consulting experts to identify skill gaps and opportunities for reskilling and upskilling.

Navigating Challenges: Metrics and Collaboration

A recurring theme was the importance of meaningful metrics in evaluating initiatives like social security dashboards. Participants debated whether current metrics, such as the number of incident reports, truly reflect organizational safety or merely highlight gaps in trust and reporting mechanisms.

“The low reporting numbers don’t necessarily mean everything’s fine,” one participant argued. “They might just indicate employees don’t feel safe enough to report issues.”

The AI chatbot was proposed as a potential tool to generate richer, qualitative insights, complementing the existing metrics. Yet, concerns about bureaucracy and the pace of decision-making were acknowledged as barriers to widespread adoption.

Finding Common Ground

Amid the technical discussions, the conversation shifted to the importance of empathy and understanding in collaboration. One participant shared an anecdote about their child struggling to fit into a new group at school, using it as a metaphor for workplace dynamics.

“It’s not always about why things happen,” they reflected. “It’s about recognizing that they’re happening and finding ways to lead by example.”

This sentiment resonated with the group, emphasizing the human element in leadership and innovation.

Looking Ahead

As the session drew to a close, participants discussed next steps. Peer reviews of presentations and prototypes were proposed, along with outreach to experts for further refinement. Specific suggestions included engaging with Megan, a key figure in AI business case development, to align initiatives and ensure scalability.

“Let’s start small,” one participant urged. “Pilots are a great way to experiment safely and gather insights before scaling up.” The session ended on an optimistic note, with a shared commitment to collaboration, learning, and pushing the boundaries of innovation. **End of Session**

Appendix 5.3: Summary of Validation Sessions

The validation sessions provided a platform for reflecting on the integration of generative AI into municipal governance. Participants underlined the essential balance between technical expertise and adaptive competence needed in the workforce. Skills such as data literacy and interdisciplinary collaboration were highlighted as critical to navigating AI's complexity. A participant encapsulated this by stating, "The future workforce needs to be digitally literate and equipped to collaborate across traditional boundaries."

Ethical considerations were a recurring topic, with participants stressing the importance of mitigating bias in AI systems and ensuring transparency in decision-making processes. One participant remarked, "We must prioritize fairness and transparency, ensuring that our algorithms align with public values."

Leadership and training emerged as central themes in the discussion about organizational support. Participants called for consistent training programs and emphasized leadership's role in setting a clear vision for AI integration. "Leadership must not only guide but actively participate in building the infrastructure for AI adoption," noted one attendee.

Challenges such as budgetary limitations and resistance to change were also discussed extensively. A participant pointed out, "Without adequate funding and a willingness to adapt, our ambitions for AI will remain unfulfilled."

Lastly, the sessions underscored the importance of public engagement and inclusivity. Ensuring citizen involvement and addressing community-specific needs were deemed vital for maintaining public trust. As one participant articulated, "Inclusivity is not optional, it is fundamental to the success of any AI initiative."

Thematic Summary of Validation sessions

Theme 1: Skills and Competence for AI Integration The participants in the validation sessions identified the increasing need for digital and adaptive skills within the municipal workforce. It was noted that technical capabilities, such as data management and prompt engineering, must be complemented by collaborative skills. One participant emphasized, "The focus isn't just on technical ability but on developing a mindset open to interdisciplinary collaboration."

Theme 2: Ethical Decision-Making and AI Use Discussions centered on embedding ethical considerations into AI deployment. Participants acknowledged risks such as data biases and the challenges of aligning AI outputs with municipal values. A member remarked, "It's essential to ensure transparency in how algorithms operate, especially when decisions impact public welfare."

Theme 3: Organizational Support and Training Participants emphasized the role of leadership and structured training programs in overcoming workforce limitations. One participant shared, "Training on ethical AI use and technical implementation needs to be a continuous effort, not a one-time initiative."

Theme 4: Challenges in AI Implementation Resource constraints and institutional inertia were flagged as primary barriers. Participants highlighted, "Budget limitations are a recurring theme that hampers innovation," alongside concerns about resistance to AI within various departments.

Theme 5: Public Engagement and Inclusivity The sessions revealed a strong focus on involving citizens in AI-related decision-making processes. One participant noted, "Public trust hinges on how inclusive and transparent our AI strategies are." **End of Session**

Appendix 6: Quantitative survey dataset summary statistics from the European Skills survey 2024 (The Netherlands)

European Centre for the Development of Vocational Training

Artificial Intelligence in EU Workplaces: another great divide?

First insights from Cedefop's AI skills survey

16th Cedefop Brussels Seminar, 24 June 2024

BACKGROUNDER

Artificial intelligence in EU workplaces: a new Cedefop survey

The rapid proliferation of generative and other artificial intelligence (AI) technologies has raised hopes about a revival in productivity growth and competitiveness in many economic sectors of the European labour market. However, many express fears about the potential adverse consequences of AI and algorithmic work for employment and job quality.

While recent studies have alleviated fears of massive job destruction that could ensue due to the adoption of AI tools and systems at work, there is still scarce evidence about the actual use of AI tools and applications by European workers and their consequences for workers well-being.

Cedefop recently implemented its first **AI skills survey** to:

- obtain robust insights on the proliferation of work that uses algorithms powered by AI in European workplaces and associated AI skill gaps of adult workers,
- produce data-driven analysis to support policy recommendations on the best use of AI in labour markets

Cedefop's AI skills survey

At the heart of Cedefop's mission to provide informed skills intelligence, and crucial to analysing and informing skills policies, is the Cedefop European skills and jobs survey (ESJS). Regularly conducted [1], this survey provides a comprehensive assessment of the European Union's skills mismatch and jobs landscape. It systematically collects EU-wide

1 A second wave – ESJS2 - carried out in 2021 in all EU Member States, Iceland and Norway, building on the approach of the first 2014 survey. For more information see: https://www.cedefop.europa.eu/en/tools/european-skills-jobs-survey

data on skill requirements, digitalization, skill mismatches, and both initial and continuing education for adult workers in European labor markets.

In December 2023, Cedefop designed its first AI skills survey as a follow-up to the ESJS2, to collect rich information about advanced digital technologies, particularly AI, used from random samples of adult workers.

A total of 5342 employees from eleven EU countries: Belgium, Czechia, France, Germany, Greece, Ireland, Luxembourg, Poland, Portugal, Slovakia, Spain, were interviewed [2]during the period February-May 2024, and were asked the following questions:

- *How many European adult workers are using AI technologies as part of their work?*
- *What is the automation impact of AI technologies on jobs and tasks?*
- *What is the relationship between the use of AI technologies and workers' job performance and labour market outcomes?*
- *To what extent are European companies and organisations supporting the take-up of AI technologies?*
- *To what extent are European workers experiencing AI skill gaps and participating in training to mitigate them?*

For more information about the survey you may contact Cedefop expert Konstantinos Pouliakas: Konstantinos.Pouliakas@cedefop.europa.eu

Key findings of the Cedefop AI skills survey

Work using algorithms powered by AI and AI use in European workplaces

- About one in seven adult workers in European labour markets usually work with digital tools or applications that can automatically do some of their tasks, using algorithms.
- For instance, 22% of workers are always or often using such automatic digital tools to recognise, translate, transcribe or generate text.
- 28% of adult workers in the surveyed European labour markets either use AI technologies to do their job or their co-workers do so.

A great European AI divide?

2 The survey relied on probabilistic online panels (Verian Public Voice), employing robust questionnaire pre-testing, translation and fieldwork protocols. A target of 500 respondents were targeted in each country except Luxembourg where 250 adult workers were eventually interviewed. The target population are adults aged 16-64 in wage and salary employment (i.e. paid employees, excluding self-employed and family workers). A probability-based approach was used in all countries. Online interviews were conducted from 21/2/2024 to 8/5/2024 in all countries.

- While over on third of workers in Northern European countries (e.g. Luxembourg, Belgium, Germany, France) say that they or their colleagues use AI technologies at their workplace, this is true for less than one in four workers in Poland (24%), Greece (21%) and Spain (16%), respectively.
- There is a growing divergence in the frequency of use of AI technologies between leading and lagging European countries.

Job automation

- 15% of adult workers are afraid that they may completely lose their job due to AI technologies, although in some EU countries, such as Greece, Poland and Slovakia, about 1 in 5 workers express such concern.
- The risk of job automation is higher in routine and precarious jobs (i.e. those with limited job security) and in lower-skilled occupations. It is particularly prevalent in jobs in which workers use computerised machines to carry out their job tasks.
- As opposed to completely losing their job, a higher share of workers declare that AI has an impact on their job tasks. 20% of the adult workforce believe that AI can do more than half of their job tasks.
- While 30% of those who use AI technologies and tools to do their job experienced some task destruction, 41% had to do some new tasks. For 68% the main effect of AI technologies is to enable them to do their job tasks *faster*.

AI skill gap and upskilling

- 61% of European workers agree that it is fairly or very likely that they will need new knowledge and skills to cope with the impact of AI tools on their work in the next five years.
- But 44% think it is unlikely their company or organisation will provide training to their staff to deal with AI.
- Only 15% of adult European workers have participated in training to develop their knowledge and skills in using AI tools or systems in the past year.
- More than a half of European employees have a low level of AI competency.

What lessons for EU AI skills policy?

Cedefop's AI skills survey highlights the significant need for upskilling and reskilling of adult workers in European job markets, to cope with the transformation of their jobs due to AI technology.

Although there is marked potential of AI technologies to foster efficiency and productivity gains in jobs, for many workers (55%) there are yet limited productivity gains following AI take-up. Overcoming gender and age-segregation associated with the use of AI technologies in labour markets is crucial, given that females and older workers are less likely to deploy AI as part of their work.

Initial and continuing vocational education and training systems in Europe should aim to further strengthen the integration of AI competencies and skills into school curricula.

About Cedefop

Cedefop is the European Union agency undertaking research and policy analyses to boost our understanding of labour markets' rapidly changing skill needs, and of how vocational education and training (VET) is adapting to address them.

By convening a wide range of labour market stakeholders at national, regional, local and sectoral level, Cedefop identifies, analyses, synthesises and presents quantitative and qualitative information on skills and labour markets. This *skills intelligence* is an essential asset to capture and comprehensively anticipate labour market needs and skill trends.

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Cedefop focus
Artificial Intelligence

Survey of **random** samples of (~500) adult workers in 11 EU countries (Feb-May 2024; *n* = 5342)

Better measurement of

- AI use at work
- AI competency/skill gaps
- Automatability of jobs
- Organisational support
- AI outcomes

CEDEFOP

Cedefop focus
Artificial Intelligence

Cedefop AI skills survey

AI competency of adult workers

Job **skill needs**

AI tools and systems at work

AI **skill gaps & training**

Job routinisation
Organisational support
Worker representation

Automation
Upskilling/reskilling
Wages

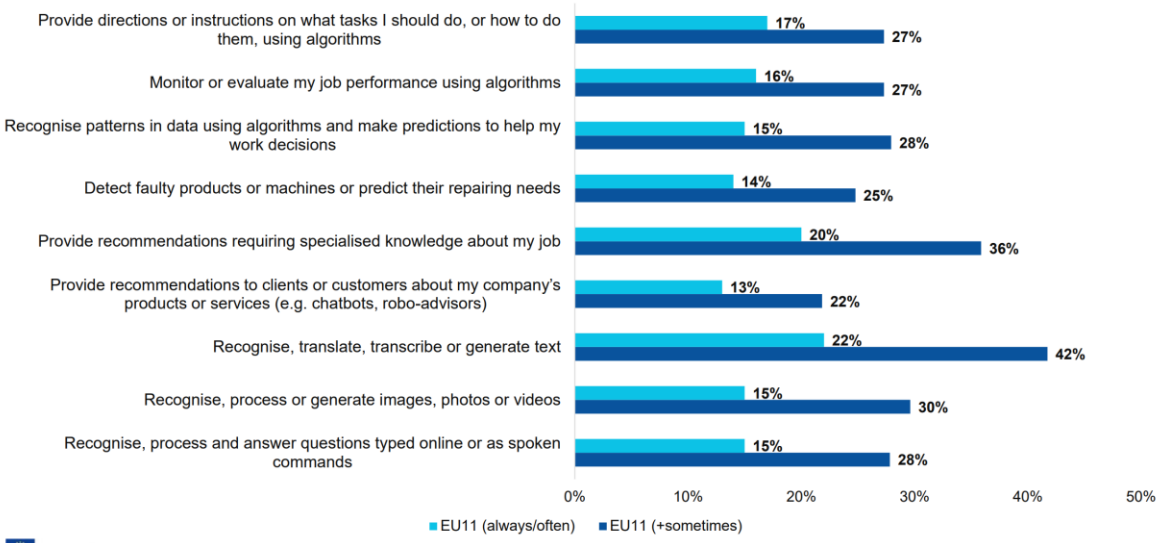
CEDEFOP

Algorithmic work powered by AI

About one in seven adult workers usually work with digital tools or apps that can automatically do some tasks, using algorithms.

Source: Cedefop AI skills survey (2024)

Algorithmic work powered by AI



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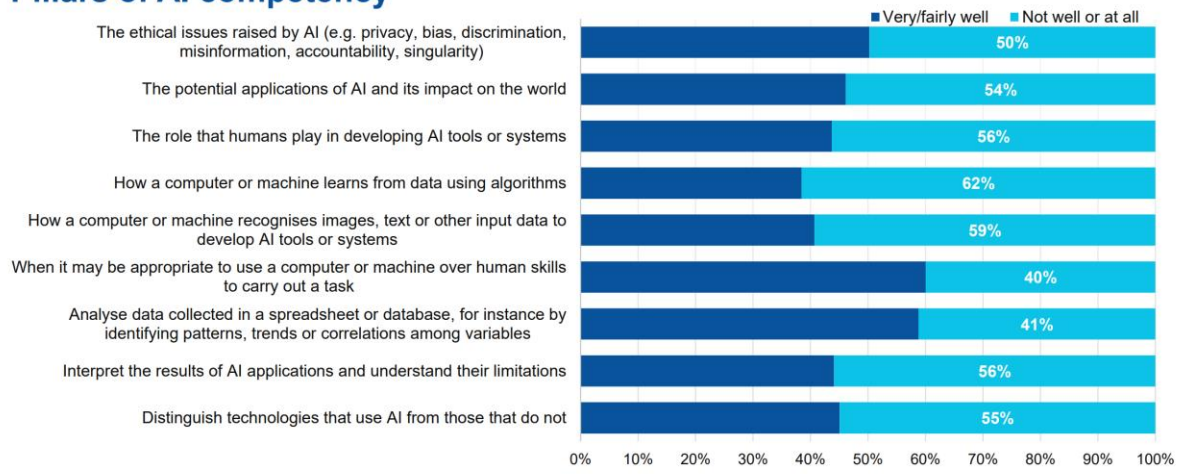
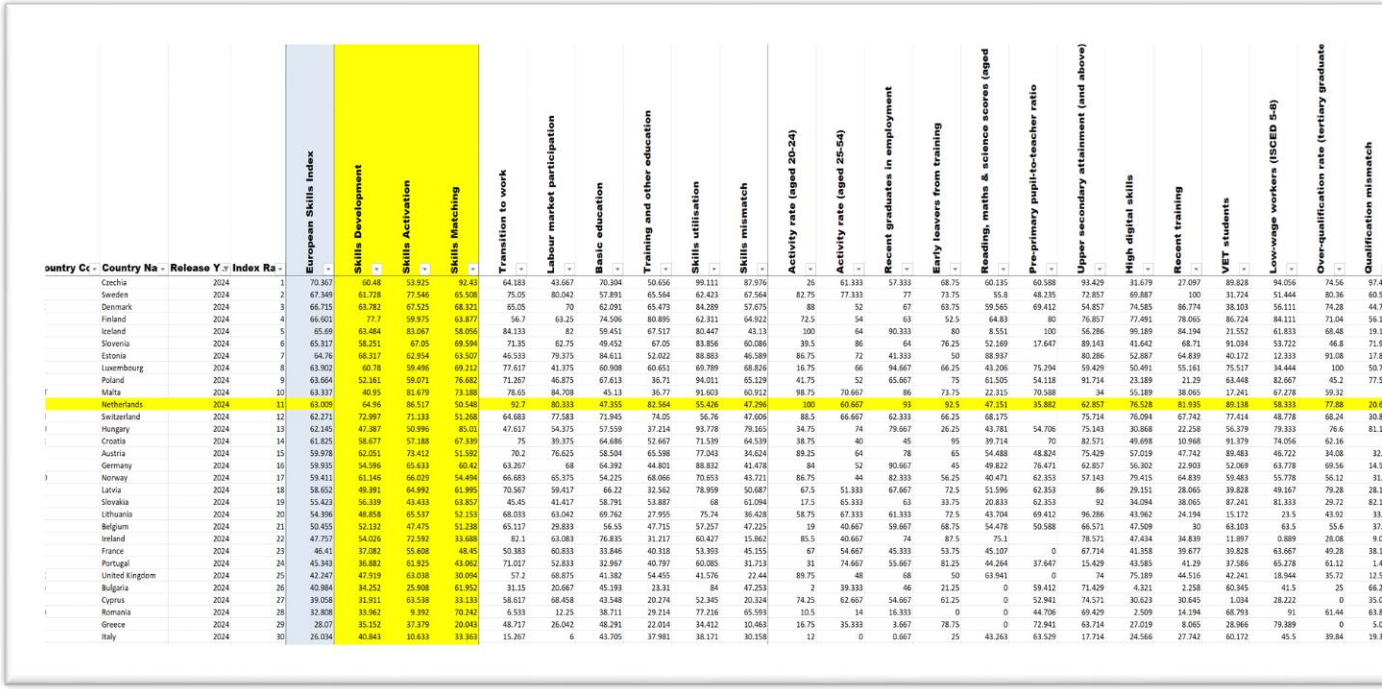
Prepared for the AI era?

Pillars of AI competency



Source: Cedefop AI skills survey (2024)

CEDEFOP



ountry Cc	Country Na	Release Y	Index Ra	European Skills Index	Skills Development	Skills Activation	Skills Matching	Transition to work	Labour market participation	Basic education	Training and other education	Skills utilisation	Skills mismatch	Activity rate (aged 20-24)	Activity rate (aged 25-54)	Recent graduates in employment	Early leavers from training	Reading, maths & science scores (aged	Pre-primary pupil-to-teacher ratio	Upper secondary attainment (and above)	High digital skills	Recent training	VET students	Low-wage workers (ISCED 5-8)	Over-qualification rate (tertiary graduate	Qualification mismatch
	Czechia	2024	1	70.367	60.48	53.925	92.43	64.183	43.667	70.304	50.656	99.111	87.976	26	61.333	57.333	68.75	60.135	60.588	93.429	31.679	27.097	89.828	94.056	74.56	97.4
	Sweden	2024	2	67.349	61.728	77.546	65.508	75.05	80.042	57.891	65.564	62.423	67.564	82.75	77.333	77	73.75	55.8	48.235	72.857	69.887	100	31.724	51.444	80.36	60.5
	Denmark	2024	3	66.715	63.782	67.525	68.321	65.05	70	62.091	65.473	84.289	57.675	88	52	67	63.75	59.565	69.412	54.857	74.585	86.774	38.103	56.111	74.28	44.7
	Finland	2024	4	66.601	77.7	59.975	63.877	56.7	63.25	74.506	80.895	62.311	64.922	72.5	54	63	52.5	64.83	80	76.857	77.491	78.065	86.724	84.111	71.04	56.1
	Iceland	2024	5	65.69	63.484	83.067	58.056	84.133	82	59.451	67.517	80.447	43.13	100	64	90.333	80	8.551	100	56.286	99.189	84.194	21.552	61.833	68.48	19.1
	Slovenia	2024	6	65.317	58.251	67.05	69.594	71.35	62.75	49.452	67.05	83.856	60.086	39.5	86	64	76.25	52.169	17.647	89.143	41.642	68.71	91.034	53.722	46.8	71.9
	Estonia	2024	7	64.76	68.317	62.954	63.507	46.533	79.375	84.611	52.022	88.883	46.589	86.75	72	41.333	50	88.937		80.286	52.887	64.839	40.172	12.333	91.08	17.8
	Luxembourg	2024	8	63.902	60.78	59.496	69.212	77.617	41.375	60.908	60.651	69.789	68.826	16.75	66	94.667	66.25	43.206	75.294	59.429	50.491	55.161	75.517	34.444	100	50.7
	Poland	2024	9	63.664	52.161	59.071	76.682	71.267	46.875	67.613	36.71	94.011	65.129	41.75	52	65.667	75	61.505	54.118	91.714	23.189	21.29	63.448	82.667	45.2	77.5
	Malta	2024	10	63.337	40.95	81.679	73.188	78.65	84.708	45.13	36.77	91.603	60.912	98.75	70.667	86	73.75	22.315	70.588	34	55.189	38.065	17.241	67.278	59.32	
	Netherlands	2024	11	63.009	64.96	86.517	50.548	92.7	80.333	47.355	82.564	55.426	47.296	100	60.667	93	92.5	47.151	35.882	62.857	76.528	81.935	89.138	58.333	77.88	20.6
	Switzerland	2024	12	62.271	72.997	71.133	51.268	64.683	77.583	71.945	74.05	56.76	47.606	88.5	66.667	62.333	66.25	68.175		75.714	76.094	67.742	77.414	48.778	68.24	30.8
	Hungary	2024	13	62.145	47.387	50.996	85.01	47.617	54.375	57.559	37.214	93.778	79.165	34.75	74	79.667	26.25	43.781	54.706	75.143	30.868	22.258	56.379	79.333	76.6	81.1
	Croatia	2024	14	61.825	58.677	57.188	67.339	75	39.375	64.686	52.667	71.539	64.539	38.75	40	45	95	39.714	70	82.571	49.698	10.968	91.379	74.056	62.16	
	Austria	2024	15	59.978	62.051	73.412	51.592	70.2	76.625	58.504	65.598	77.043	34.624	89.25	64	78	65	54.488	48.824	75.429	57.019	47.742	89.483	46.722	34.08	32.
	Germany	2024	16	59.935	54.596	65.633	60.42	63.267	68	64.392	44.801	88.832	41.478	84	52	90.667	45	49.822	76.471	62.857	56.302	22.903	52.069	63.778	69.56	14.5
	Norway	2024	17	59.411	61.146	66.029	54.494	66.683	65.375	54.225	68.066	70.653	43.721	86.75	44	82.333	56.25	40.471	62.353	57.143	79.415	64.839	59.483	55.778	56.12	31.
	Latvia	2024	18	58.652	49.391	64.992	61.995	70.567	59.417	66.22	32.562	78.959	50.687	67.5	51.333	67.667	72.5	51.596	62.353	86	29.151	28.065	39.828	49.167	79.28	28.1
	Slovakia	2024	19	55.423	56.339	43.433	63.857	45.45	41.417	58.791	53.887	68	61.094	17.5	65.333	63	33.75	20.833	62.353	92	34.094	38.065	87.241	81.333	29.72	82.1
	Lithuania	2024	20	54.396	48.858	65.537	52.153	68.033	63.042	69.762	27.955	75.74	36.428	58.75	67.333	61.333	72.5	43.704	69.412	96.286	43.962	24.194	15.172	23.5	43.92	33.
	Belgium	2024	21	50.455	52.132	47.475	51.238	65.117	29.833	56.55	47.715	57.257	47.225	19	40.667	59.667	68.75	54.478	50.588	66.571	47.509	30	63.103	63.5	55.6	37.
	Ireland	2024	22	47.757	54.026	72.592	33.688	82.1	63.083	76.835	31.217	60.427	15.862	85.5	40.667	74	87.5	75.1		78.571	47.434	34.839	11.897	0.889	28.08	9.0
	France	2024	23	46.41	37.082	55.608	48.45	50.383	60.833	33.846	40.318	53.393	45.155	67	54.667	45.333	53.75	45.107	0	67.714	41.358	39.677	39.828	63.667	49.28	38.1
	Portugal	2024	24	45.343	36.882	61.925	43.062	71.017	52.833	32.967	40.797	60.085	31.713	31	74.667	55.667	81.25	44.264	37.647	15.429	43.585	41.29	37.586	65.278	61.12	1.4
	United Kingdom	2024	25	42.247	47.919	63.038	30.094	57.2	68.875	41.382	54.455	41.576	22.44	89.75	48	68	50	63.941	0	74	75.189	44.516	42.241	18.944	35.72	12.5
	Bulgaria	2024	26	40.984	34.252	25.908	61.952	31.15	20.667	45.193	23.31	84	47.253	2	39.333	46	21.25	0	59.412	71.429	4.321	2.258	60.345	41.5	25	66.2
	Cyprus	2024	27	39.058	31.911	63.538	33.133	58.617	68.458	43.548	20.274	52.345	20.324	74.25	62.667	54.667	61.25	0	52.941	74.571	30.623	30.645	1.034	28.222	0	35.0
	Romania	2024	28	32.808	33.962	9.392	70.742	6.533	12.25	38.711	29.214	77.216	65.593	10.5	14	16.333	0	0	44.706	69.429	2.509	14.194	68.793	91	61.44	63.8
	Greece	2024	29	28.07	35.152	37.379	20.043	48.717	26.042	48.291	22.014	34.412	10.463	16.75	35.333	3.667	78.75	0	72.941	63.714	27.019	8.065	28.966	79.389	0	5.0
	Italy	2024	30	26.034	40.843	10.633	33.363	15.267	6	43.705	37.981	38.171	30.158	12	0	0.667	25	43.263	63.529	17.714	24.566	27.742	60.172	45.5	39.84	19.3

Figure 4. Dataset structure of the European Skills Index (Cedefop, 2024a).

Appendix 6.1: Graphs, tables, or visuals derived from this survey.

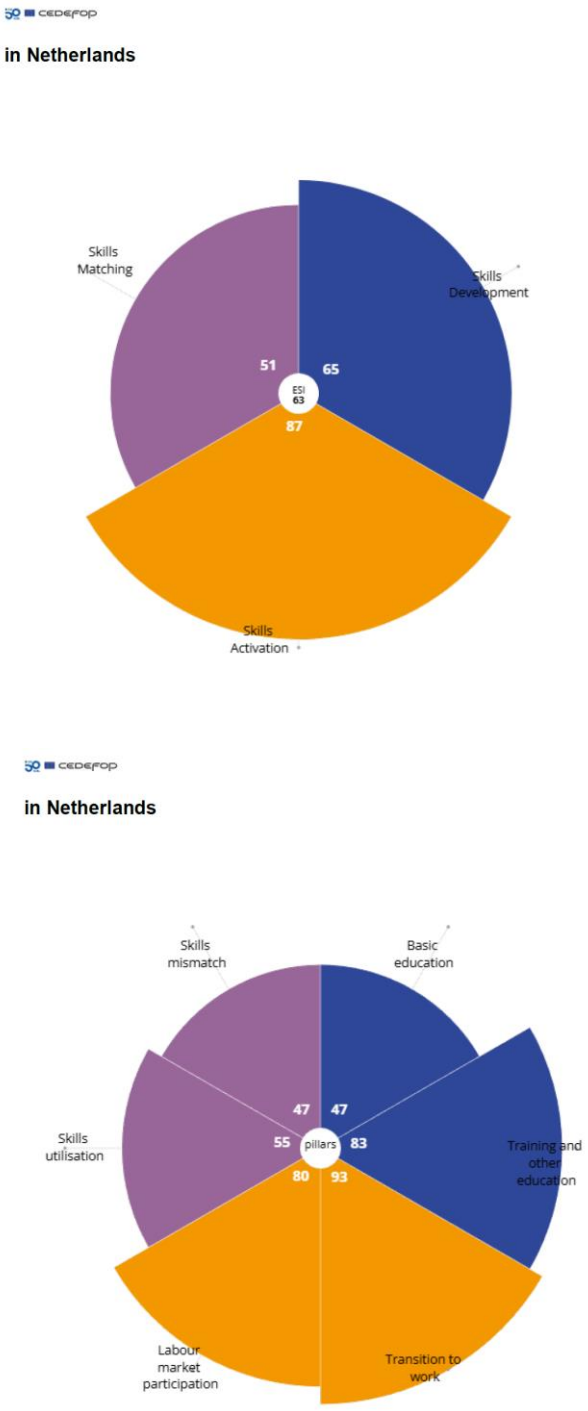
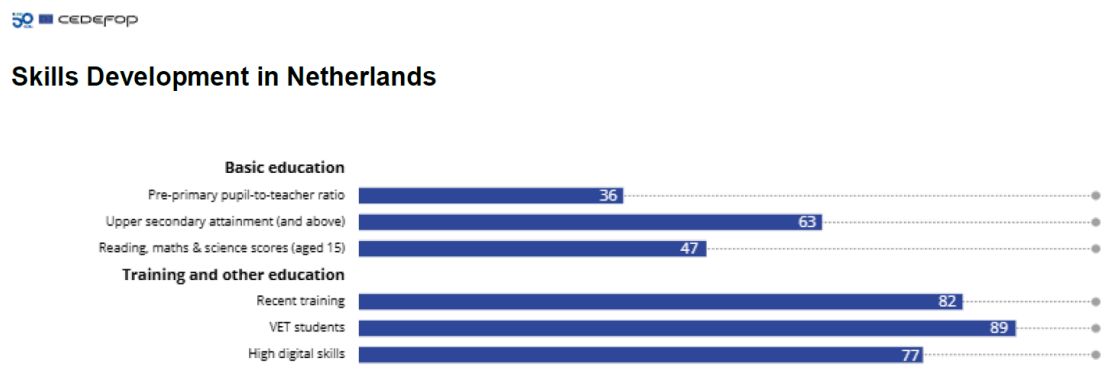
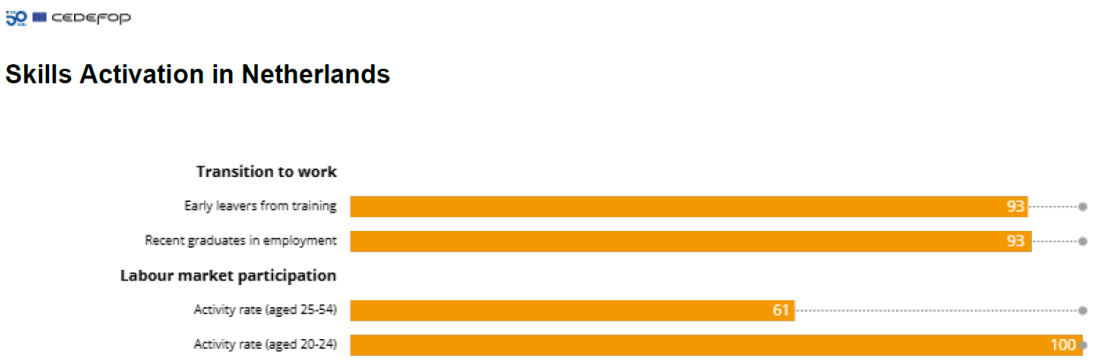


Figure 5. European Skills Index: 2024 scores for the Netherlands (Cedefop, 2024b).





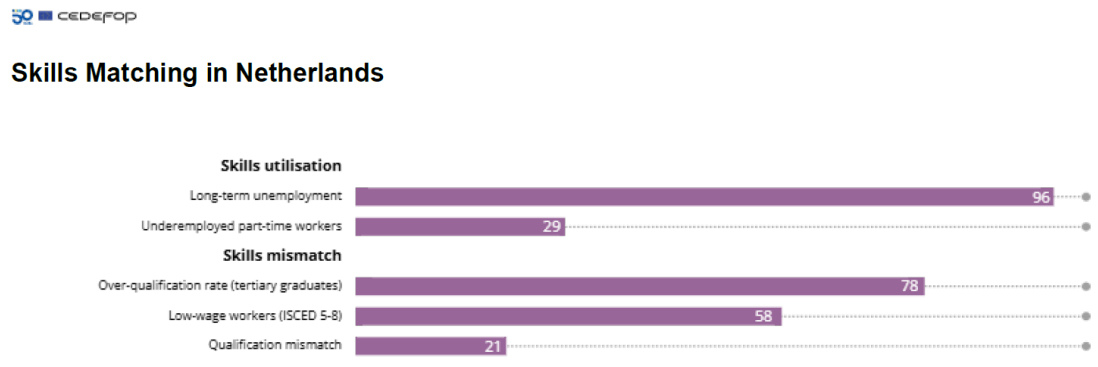


Figure 6. European Skills Index: 2024 scores for the Netherlands (Cedefop, 2024b).

References

Accenture. (2023). *Human-centered AI and public sector transformation*. Accenture Insights. https://www.accenture.com/us-en/insights/technology/technology-trends-2024

Accenture. (2023). *Work can become: Generative AI and the future of workforce skills*. Accenture Publications. https://www.accenture.com/us-en/insights/data-ai/embracing-gen-ai-work

Accenture. (2023). *Work, workforce, workers: Reinvented in the age of generative AI*. Accenture. https://www.accenture.com/us-en/insights/consulting/gen-ai-talent

AG5. (n.d.). *What are competences?* AG5 Skills Management. Retrieved June 25, 2024, from https://www.ag5.com/what-are-competences/

Artificial Intelligence Act. (n.d.). *Artificial Intelligence Act: Legal framework for trustworthy AI*. Retrieved June 25, 2024, from https://www.artificial-intelligence-act.com/
Binns, R. (2018). Fairness in machine learning: Lessons from political philosophy. In *Proceedings of the 2018 Conference on Fairness, Accountability, and Transparency* (pp. 149–159). https://doi.org/10.1145/3287560.3287583

Brown, P., & Leopold, T. (2024). *Leveraging generative AI for job augmentation and workforce productivity: Scenarios, case studies, and a framework for action*. World Economic Forum.

Cedefop. (2022a). *Lifelong learning: Insights and frameworks.* European Centre for the Development of Vocational Training. https://www.cedefop.europa.eu/en/tools/timeline-vet-policies-europe

Cedefop. (2022b). *Setting Europe on course for a human digital transition.* European Centre for the Development of Vocational Training. https://www.cedefop.europa.eu/en/publications/3092

Cedefop. (2024a). *European skills index report.* European Centre for the Development of Vocational Training. https://www.cedefop.europa.eu/en/tools/european-skills-index

Cedefop. (2024b). *European skills index: Country profile—Netherlands.* European Centre for the Development of Vocational Training. https://www.cedefop.europa.eu/en/tools/european-skills-index/country/netherlands?y=2024

Cedefop. (2024c). *Skills governance framework for public services.* European Centre for the Development of Vocational Training. https://www.cedefop.europa.eu/en/projects/assisting-eu-countries-skills-matching

Cedefop. (n.d.). *Assisting EU countries in skills matching.* European Centre for the Development of Vocational Training. Retrieved December 8, 2024, from https://www.cedefop.europa.eu/en/projects/assisting-eu-countries-skills-matching

City of Amsterdam, Department of Digitalization and Innovation. (2024, November). *Amsterdam's vision on AI.* City of Amsterdam Publication. https://www.amsterdamai.com/en/nieuws/AI%20Amsterdam,%20Amsterdamase%20Visie%20op%20AI,%20AI,%20ResposibleAI

Columbus, L. (2023). *What is digital transformation? A necessary disruption.* CIO. Retrieved June 25, 2024, from https://www.cio.com/article/230425/what-is-digital-transformation-a-necessary-disruption.html
Deloitte. (2023). *Agile workforce development in AI systems.* Deloitte AI Institute. https://www.deloitte.com/nl/en/services/risk-advisory
European Commission. (2021). *Proposal for a regulation laying down harmonized rules on artificial*

intelligence (Artificial Intelligence Act). European Union Publications. https://ec.europa.eu/digital-strategy/policies-standards/artificial-intelligence_en

IGI Global. (n.d.). *Conceptual framework.* In *Dictionary of Information Science and Technology.* Retrieved December 25, 2024, from https://www.igi-global.com/dictionary/conceptual-framework-assessment-higher-education/4804

International Monetary Fund. (2024). *Gen-AI and the future of work.* International Monetary Fund Reports. https://www.imf.org/en/Publications/Staff-Discussion-Notes/Issues/2024/01/14/Gen-AI-Artificial-Intelligence-and-the-Future-of-Work-542379

Joint Research Centre. (n.d.). *Defining skill and competence.* European Commission. Retrieved June 25, 2024, from https://joint-research-centre.ec.europa.eu/scientific-activities-z/skills-and-competences/defining-skill-and-competence_en

KPMG. (2021). *From promise to practice: Governance models for ethical AI.* KPMG Insights. https://assets.kpmg.com/content/dam/kpmg/uk/pdf/2023/08/from-promise-to-practice.pdf

KPMG. (2021). *The future of local government: Leading through transformation.* Retrieved June 25, 2024, from https://assets.kpmg.com/content/dam/kpmg/xx/pdf/2021/07/the-future-of-local-government.pdf

Lähteenmäki-Smith, K., Ahonen, P., Lonkila, K. M., Suominen, A., & Nieminen, M. (2022). Comprehensive, inclusive, institutionalized, and actionable framework for AI governance in public administration. *Frontiers in Human Dynamics, 4*, 858108. https://doi.org/10.3389/fhumd.2022.858108

Living-in.EU. (n.d.). *AI Act: What are the legal implications for cities, regions, and communities across the EU?* Retrieved June 25, 2024, from https://living-in.eu/news/ai-act-what-legal-implications-cities-regions-and-communities-across-eu

Long, D., & Magerko, B. (2020). What is AI literacy? Competencies and design considerations. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems.*

Microsoft. (2023). *The future of work: Skills for AI-driven roles.* Microsoft Publications. https://www.microsoft.com/en-us/research/publication/microsoft-new-future-of-work-report-2023/

Moore, M. H. (1995). *Creating public value: Strategic management in government.* Harvard University Press. https://www.hup.harvard.edu/books/9780674175587

Moore, M. H. (1995). *Creating public value: Strategic management in government.* Harvard University Press. Retrieved June 25, 2024, from https://www.hks.harvard.edu/publications/creating-public-value-core-idea-strategic-management-government

Municipality Amsterdam. (2023a). *Digital city agenda 2023–2026.* Amsterdam City Council. https://www.amsterdam.nl/innovatie/agenda-digitale-stad/

Municipality Amsterdam. (2023b). *Tech radar 2024: Emerging technologies and responsible digital transformation.* Amsterdam City Council. https://www.amsterdam.nl/innovatie/digitalisering-technologie/tech-radar/

Municipality of Amsterdam. (2024). *Tech Radar Edition 2024.* Amsterdam Digital City Initiative. Olmstead, L. (2024, June 25). How to successfully implement new technology in the workplace. *Whatfix.* https://whatfix.com/blog/implement-new-technology/

Organisation for Economic Co-operation and Development (OECD). (2024). *G7 toolkit for artificial intelligence in the public sector.* OECD Publishing. Retrieved June 25, 2024, from https://www.oecd.org/content/dam/oecd/en/publications/reports/2024/10/g7-toolkit-for-artificial-intelligence-in-the-public-sector_f93fb9fb/421c1244-en.pdf

Pouliakas, K., & Becuwe, N. (2024, June 24). *AI and the EU skilling challenge: First insights from Cedefop's AI skills survey* [Conference presentation]. 16th Cedefop Brussels Seminar, Brussels, Belgium.

PreLounge. (n.d.). *Strategic Public Triangle.* Retrieved December 30, 2024, from https://www.preplounge.com/en/case-interview-basics/business-concept-library/useful-business-analysis-tools/strategic-public-triangle

Rogers, D. L. (2016). *The digital transformation playbook: Rethink your business for the digital age.* Columbia Business School Publishing.

Saldanha, T. (2019). *Why digital transformations fail: The surprising disciplines of how to take off and stay ahead.* Berrett-Koehler Publishers.

Siebel, T. M. (2019). *Digital transformation: Survive and thrive in an era of mass extinction.* RosettaBooks.

TalentGuard. (n.d.). *What's the difference between skills and competencies?* Retrieved June 25, 2024, from https://www.talentguard.com/blog/whats-difference-skills-competencies

Critical thinking. (n.d.). In *Cambridge dictionary online.* Retrieved June 25, 2024, from https://dictionary.cambridge.org/dictionary/english/critical-thinking

World Economic Forum. (2024). *360° on AI regulations.* Retrieved June 25, 2024, from https://www.weforum.org/meetings/world-economic-forum-annual-meeting-2024/sessions/360-on-ai-regulations/

World Economic Forum. (2024). *Governance in the age of generative AI: A 360° framework for ethical oversight.* World Economic Forum Publications. https://www.weforum.org/publications/governance-in-the-age-of-generative-ai/