MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
UKRAINIAN-AMERICAN CONCORDIA UNIVERSITY

Faculty of Management and Business
Department of International Economic Relations, Business & Management

Bachelor's Qualification Work
"Effective Management of AI-Powered Innovations for Small and Medium-Sized Businesses"
(based on **ТОВ СП "СОЛОМІЯ"** case)

Bachelor student of the 4th year of study

Field of Study 07 – Management
and Administration

Specialty 073 – Management

Educational program – IT Management

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Research supervisor

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Ph.D. in Economics

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Abstract

The thesis investigates the effective management of AI-powered innovations for small and medium-sized enterprises (SMEs), using the case study of ТОВ СП "СОЛОМІЯ", a prominent player in Ukraine's tea industry. The research explores the current state of AI adoption, awareness, and readiness among SMEs, identifying practical applications and benefits of AI technologies in areas like operational efficiency, customer engagement, and product/service innovation. It examines the challenges and obstacles SMEs face when integrating AI, such as organizational, financial, and technological barriers. The study develops a strategic framework to guide SMEs in effectively managing and applying AI technology, considering factors like market dynamics, industry, and company size. It also assesses the impact of AI adoption on SMEs' overall performance, competitiveness, and growth potential by evaluating how AI influences business outcomes.

The research methodology involved a comprehensive literature review, drawing from academic papers, industry reports, and scholarly journals and financial data of the researched company to ensure a well-rounded analysis. The findings highlight the transformative potential of AI for SMEs while underscoring the need for a bespoke approach that aligns AI strategies with unique business contexts, operational capabilities, workforce dynamics, and market conditions.

Keywords: Artificial Intelligence (AI), Small and Medium Enterprises (SME), Small and Medium-sized Business (SMB), Innovation Management, Operational Efficiency, Strategic Framework

Анотація

Ця бакалаврська робота досліджує ефективне управління інноваціями на основі штучного інтелекту (ШІ) для малих та середніх підприємств (МСП) на прикладі ТОВ СП "СОЛОМІЯ", провідного гравця на українському ринку чаю. Дослідження вивчає поточний стан впровадження ШІ, обізнаність та готовність МСП, визначаючи практичні застосування та переваги технологій ШІ у сферах операційної ефективності, залучення клієнтів та інновацій продуктів/послуг. Воно розглядає виклики та перешкоди, з якими стикаються МСП при інтеграції ШІ, такі як організаційні, фінансові та технологічні бар'єри. У дослідженні розробляється стратегічна рамка для керівництва МСП щодо ефективного управління та застосування технології ШІ з урахуванням факторів, таких як динаміка ринку, галузь та розмір компанії. Також оцінюється вплив впровадження ШІ на загальну продуктивність, конкурентоспроможність та потенціал зростання МСП шляхом оцінки того, як ШІ впливає на результати бізнесу.

Методологія дослідження включала ґрунтовний огляд літератури з використанням наукових статей, галузевих звітів, наукових журналів та фінансові показники досліджуваної компанії для забезпечення всебічного аналізу. Результати підкреслюють трансформаційний потенціал ШІ для МСП, водночас наголошуючи на необхідності індивідуального підходу, який узгоджує стратегії ШІ з унікальними бізнес-контекстами, операційними можливостями, динамікою робочої сили та ринковими умовами.

Ключові слова: штучний інтелект (AI), малі та середні підприємства (SME), малий та середній бізнес (SMB), управління інноваціями, операційна ефективність, стратегічна структура

PHEE-institute «Ukrainian-American Concordia University»

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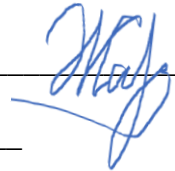**Department of International Economic Relations, Business and Management**

Educational level: **Bachelor's degree**
Specialty   **073 "Management"**
Educational program   **"IT Management"**
"

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APPROVED
Head of Department _____

__**Prof. Zharova L.V.**_____
May 10, 2024

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TASK
FOR BACHELOR'S QUALIFICATION WORK OF STUDENT

Yaroslav Sydoriuk

1. Topic of the bachelor's qualification work - **"Effective Management of AI-Powered Innovations for Small and Medium-Sized Businesses" (based on ТОВ СП "СОЛОМІЯ" case)**

Supervisor of the bachelor's qualification work   **Lesya Leshchii, Ph.D. in Economics**,

Which approved by Order of University from **"25" September 2023** № 25-09/2023-5к
2. Deadline for bachelor's qualification work submission "**25"** **April 2024.**

3. Data-out to the bachelor's qualification work: This paper is based on a comprehensive literature review examining management practices and innovation at SMEs. Sources included academic papers, industry reports, business reviews from the past four to five years and actual data of ТОВ СП «СОЛОМІЯ» obtained during the internship, its financial statements, statistics and other documents. Data was checked for relevance and reliability, with a systematic analysis identifying key themes and insights.

4. Contents of the explanatory note (list of issues to be developed):

Achieving the objectives of this study involves addressing the following tasks:

- To explore the role and various types of innovations in business, particularly those driven by artificial intelligence (AI).

- To analyze the integration and impact of AI-driven innovations in small and medium-sized enterprises (SMEs), using ТОВ СП «СОЛОМІЯ» as a case study.

- To investigate how AI technologies can enhance management and operational efficiencies in SMEs, including specific applications in production, customer service, and strategic decision-making.

- To assess common challenges and barriers faced by SMEs in adopting AI, with insights derived from the case of ТОВ СП «СОЛОМІЯ».

- To evaluate the strategic integration of AI with IT for enhancing competitiveness in SMEs, recommending actionable strategies based on findings from ТОВ СП «СОЛОМІЯ».

5. List of graphic material (with exact indication of any mandatory drawings):

The paper consists of 73 pages including 12 figures and 7 tables with information.

6. Date of issue of the assignment

Time Schedule

№	The title of the parts of the qualification paper (work)	Deadlines	Notes
1.	I part of bachelor thesis	*10.12.2023*	In-time
2.	II part of bachelor thesis	*27.02.2024*	In-time
3.	Introduction, conclusions, summary	*25.04.2024*	In-time
4.	Pre-defense of the thesis	*29.04.2024*	In-time

Student

(signature)

Supervisor

Conclusions (*general description of the work; participation in scientific conferences/ prepared scientific article; what grade does the student deserve*):

The work presented by the student on "Effective Management of AI-Powered Innovations for Small and Medium-Sized Businesses," based on the case study of ТОВ СП «СОЛОМІЯ», is detailed and well-researched. The student has effectively used a variety of sources, including literature and data gathered during an internship. Throughout the semester, the student was diligent, considered all suggestions from the supervisor, met all deadlines, and submitted an article for journal. Overall, the thesis meets the required academic standards and shows a good understanding of how AI innovations impacts small and medium-sized businesses. Therefore, the work deserves an "Excellent" grade and should be approved for defense.

Supervisor

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INTRODUCTION

Artificial Intelligence (AI) is poised to become the defining technology of the 21st century. It's no wonder that investors worldwide have set their sights on AI companies, particularly AI-related startups. In 2019 alone, AI companies attracted a staggering $26 billion in investments. Both private and governmental programs have exponentially increased their investments in this technology over the past decade. AI's generative and adaptable nature has enabled entrepreneurs and innovators to identify potential applications across various domains. While the hype surrounding AI is not new, digitization is increasingly driving its potential to new heights within the broader digital transformation phenomenon.

The integration of AI into business operations could be a pivotal step forward for Small and Medium-sized Enterprises (SMEs), promising significant gains in efficiency, innovation, and competitiveness. My Bachelor's Thesis, titled "Effective Management of AI-Powered Innovations for Small and Medium-Sized Businesses," explores this transformative potential, using the case of ТОВ СП "СОЛОМІЯ" as an example to demonstrate how AI can empower SMEs. Formerly confined to the realms of science fiction and scholarly research, artificial intelligence has now become a practical tool for business transformation. AI technologies, such as robotics, machine learning, and natural language processing, are rapidly evolving and present new opportunities for companies to enhance customer experiences, streamline operations, and develop cutting-edge products and services. For SMEs, adopting AI is not only a strategic necessity to stay competitive in the ever-evolving global market but also a technological imperative. AI can automate repetitive tasks, provide SMEs with data-driven insights, and facilitate more intelligent decision-making. However, implementing AI in the workplace can be challenging, particularly in situations with limited resources, inexperience, and concerns about return on investment.

This thesis delves into the pivotal role of Artificial Intelligence (AI) in fostering innovation and enhancing the operational efficiency of Small and Medium-Sized

Enterprises (SMEs), with a particular focus on the Ukrainian tea company, ТОВ СП "СОЛОМІЯ". The research is structured to explore the theoretical underpinnings of AI in business, analyze the practical application of AI-powered innovations in SMEs, and provide strategic recommendations for effective AI management within these enterprises. **The goal of the research** is to discover how AI can serve as a catalyst for business development and competitive advantage in the context of SMEs.

The thesis is organized into three main chapters, each addressing a distinct aspect of AI integration in SMEs. The first chapter lays the theoretical foundation, discussing the role and types of innovations in business, with a special emphasis on those generated by AI. It explores AI's position in the global market and provides examples of AI-powered innovations across various industries. The second chapter presents a case study of ТОВ СП "СОЛОМІЯ", examining the company's background, the definition of an SME, the benefits and challenges of AI implementation, and the key performance indicators for AI success. The third chapter focuses on strategic integration, offering insights into the synergy between human intuition and AI analytical skills, and concludes with recommendations for implementing AI innovation management in SMEs like ТОВ СП "СОЛОМІЯ".

The **relevance** of this work is underscored by the rapid advancement of AI technologies and their transformative potential for SMEs. By providing a comprehensive analysis of AI's impact on business operations, this thesis aims to contribute to the understanding of how SMEs can leverage AI to navigate the complexities of the modern business landscape.

The primary objective of this bachelor's thesis is to investigate the effective management of AI-powered innovations in SMEs and to demonstrate, through the case study of ТОВ СП "СОЛОМІЯ", how AI can empower these businesses to achieve greater efficiency, innovation, and competitiveness. To achieve this aim, the research sets out **several tasks**:

- To explore the role of AI in driving business innovation and its significance in the global market.

- To assess the current state of AI adoption among SMEs, including the barriers and drivers influencing their AI integration efforts.

- To explore the practical applications and benefits of AI for SMEs, with a focus on operational efficiency and customer engagement.

- To identify the challenges SMEs face in incorporating AI into their business models and to propose strategies for overcoming these obstacles.

- To evaluate the impact of AI adoption on the performance and growth potential of SMEs.

The **methodological foundation** of this thesis is built upon a comprehensive literature review, supplemented by a case study analysis of ТОВ СП "СОЛОМІЯ". This approach ensures a balanced examination of both theoretical perspectives and practical insights into AI implementation in SMEs.

The research objects of this thesis are AI-powered innovations and their management within the context of SMEs. The subject of the research is the strategic and operational approaches to leveraging AI for business development and competitive advantage, as exemplified by the case study of ТОВ СП "СОЛОМІЯ".

This bachelor thesis comprises an introduction, three chapters, a conclusion and a list of references. The paper consists of 73 pages including 12 figures and 7 tables, providing a comprehensive exploration of the effective management of AI-powered innovations in SMEs.

RESEARCH FOUNDATION AND METHODOLOGICAL APPROACH

This paper is based on a comprehensive literature review study examining the management practices and level of innovation implementation at ТОВ СП «СОЛОМІЯ», a small-to-medium enterprise (SME). The research methodology employed a multi-pronged approach to data collection, drawing from a diverse array of authoritative and credible sources to ensure a well-rounded and thorough analysis. The primary data sources comprised academic research papers, case studies, online reports from industry bodies and think tanks, scholarly journals, and business reviews. Particular emphasis was placed on recent publications and surveys from the past four to five years to capture the latest trends,

insights, and best practices concerning SME management and innovation regarding AI. While the available data specific to the given topic of this paper was limited, concerted efforts were made to curate a wide-ranging and versatile collection of sources to mitigate potential biases and knowledge gaps.

The collected data underwent a rigorous vetting process to ensure relevance, reliability, and objectivity. Sources were critically evaluated based on factors such as the reputation of the author or publishing entity, the robustness of the research methodology employed, and the presence of empirical evidence or well-substantiated arguments. The analysis of the collated data involved a systematic and iterative process of identifying recurring themes, patterns, and insights pertaining to the research objectives. Qualitative and quantitative data were synthesized to uncover key factors influencing SME performance, pinpoint prevalent barriers to innovation adoption, and elucidate successful management approaches and strategies. The findings of this literature review study serve as a foundation for informing evidence-based recommendations and best practices for SMEs seeking to enhance their competitiveness and long-term sustainability through the judicious implementation of AI-powered innovations.

CHAPTER 1: The Role And Types of Innovations in Business, Features of Innovations Generated by AI

1.1 The Role of Innovation in Business

When used in the context of business and economics, innovation is the act of introducing novel concepts, procedures, goods, or services. It includes a wide variety of tasks, such as creating a new product or technology tool or implementing a new business procedure. Innovation may also entail making current goods, services, or procedures more valuable or effective. It's not always about coming up with something completely new, but about improvements sometimes. Innovations are crucial for businesses for several reasons, for example innovations allow companies to differentiate themselves from their competitors or rivals. This is particularly vital in industries where competition is intense and rapid technological change is common. Innovative companies can better meet customer needs and stay ahead of competitors. Also, as any business owner knows, markets and consumer preferences are constantly evolving. Through innovation, companies can adapt and respond effectively to these changes, thereby securing their market position. On top of that, innovation in processes and operations can lead to significant improvements in efficiency and productivity, reducing costs, and increasing profitability. And after that innovative products and services can open up new markets or expand existing ones, driving business growth. In the end, companies that are seen as innovative attract more investments, as innovation is often linked with potential for growth and profitability.

Overall, innovation can take many different forms within a business. Understanding the various categories of innovation is important for developing effective strategies. And to delve deeper into the context of the topic, here are some key types of innovations:

Table 1.1: Types of Innovation and Their Descriptions (Source: Compiled by the author.)

Type of Innovation	Description
Product Innovation	Involves creating new products or significantly enhancing existing ones. This may include using new materials or components, or altering the design or functionality. For example, Amazon transformed the way people shop by introducing online marketplaces and one-click ordering.
Process Innovation	Refers to developing new or improved methods for making or delivering products and services. It focuses on enhancing production processes, logistics, and distribution channels, such as automating a previously manual manufacturing process. Once again, Amazon implemented the use of drones for delivery, automating the delivery process and reducing delivery times.
Business Model Innovation	Changes the core way a company operates and delivers value to its customers. This could involve restructuring key business aspects like revenue streams, value propositions, or go-to-market approaches. For instance, Netflix could successfully transition from DVD rentals to streaming, changing the way company operates.
Organizational Innovation	Involves creating or modifying management structures, workplace practices, and cultural norms to improve performance. It includes adopting innovative work policies or switching to a flat hierarchy from a top-down one. For instance, Zappos implemented a customer service-focused culture, which has led to high customer satisfaction and loyalty
Marketing Innovation	Includes the development of new marketing strategies that utilize different sales channels or novel ways of promoting products and services. An example is the early use of influencer marketing on social media. A perfect example is Coca-Cola that introduced the Share a Coke campaign, which personalized their bottles and cans with people's names, increasing engagement and sales

In today's competitive market, each of these forms of innovation is essential to the expansion and sustainability of businesses. Understanding and Innovation can take many different forms within a business. Understanding the various categories of innovation is crucial for developing effective strategies, especially for SMEs such as ТОВ СП "СОЛОМІЯ" to gain substantial competitive advantages and secure long-term prosperity.

In my research, I came across an insightful article by Distanont, A. (2018): *The role of innovation in creating a competitive advantage.* This paper presents an interesting model illustrating the framework of innovation in the development of a business:
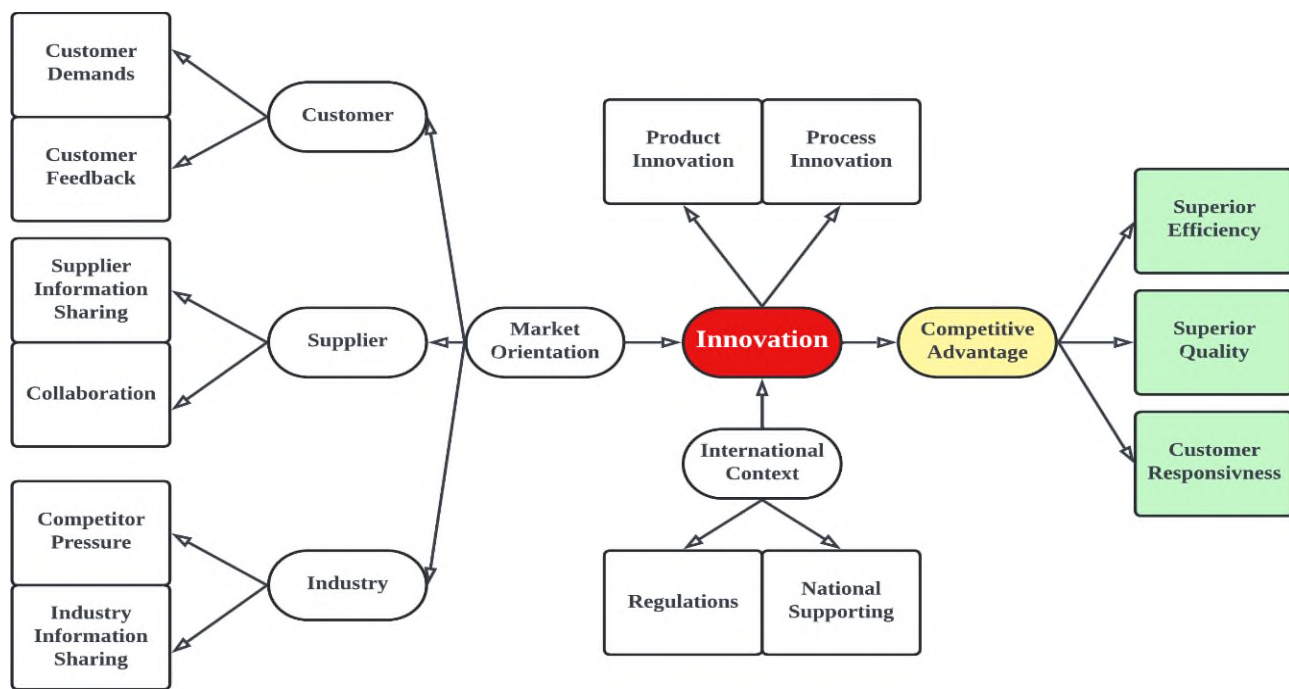
Fig. 1.1: A conceptual model illustrating the relationship between market orientation, innovation, and competitive advantage. (Source: Distanont, A. (2018). The role of innovation in creating a competitive advantage.)

This figure presents a strategic framework illustrating how competitive advantage can be cultivated through innovation. The left side of the framework shows market orientation influenced by customer, supplier, and industry components. Central to the model is, obviously, 'Innovation,' highlighted as the core element that transforms market insights into tangible outcomes—specifically product and process innovation. On the right, the outcome of effective innovation is depicted as a competitive advantage, which manifests in superior efficiency, quality, and customer responsiveness.

1.2 AI Insights and Position in the World's Market

Artificial Intelligence (AI) is a significant aspect of Industry 4.0, which promises a new era of industrial production characterized by flexibility, user-friendliness, and predictability, often through condition monitoring. AI is anticipated to play a part in achieving potential productivity gains ranging from 15% to 40% compared to previous generations of the technology—an amount that would roughly double as AI spreads

more diffusely across the global workplace (McKinsey Global Institute 2023). There is an ambiguity surrounding the term AI, noting that despite its frequent use, there is no concrete, universally accepted definition of intelligence, let alone artificial intelligence. We should understand AI not as an imitation or optimization of human intelligence but as a means to improve processes' effectiveness and efficiency using modern technologies.

As *Markets and Markets (2023)* have claimed, it's forecasted that the AI Market over the world may grow drastically in the next years as shown in the graph below:
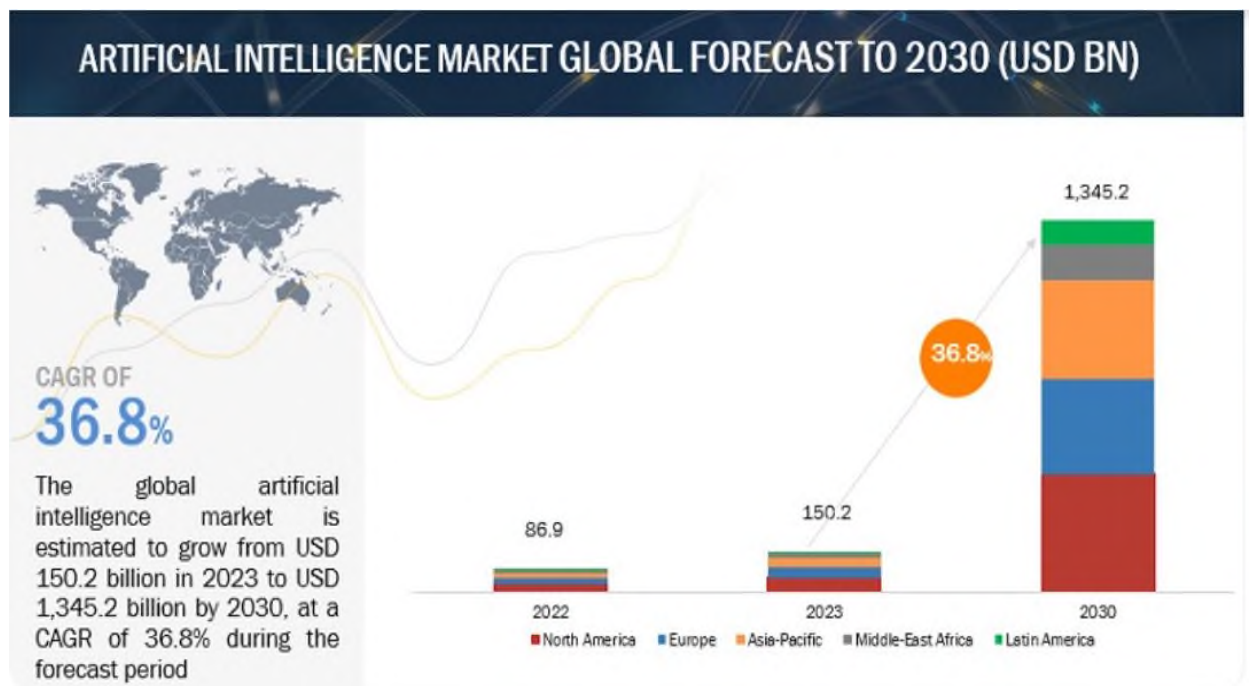
Fig.1.2: Estimated Forecast for Global Market of AI from 2023 to 2030(USD Billion). (Source: Markets and Markets. (2023), AI Market by Offering.)

However, the document titled "Why It is Hard to Find AI in SMEs: A Survey from the Practice and How to Promote It" provides critical insights into the adoption and significance of AI in SMEs, especially within the manufacturing sector. The study's findings are based on interviews conducted with 411 individuals from 68 companies, with an emphasis on the practical applications and perceptions of AI in production environments (Bunte, A., Richter, F., & Diovisalvi, R., 2021). They emphasized that it is up to managers to understand the feasibility and benefits of adopting AI solutions. Nevertheless, only 18% of them state that their companies have

a clear strategy in place to collect data and use AI. Lack of strategy is, together with the lack of competencies, lack of a governance model for implementation, and lack of constrained end-to-end AI solutions, the most critical barrier towards AI adoption (McKinsey, 2018). These barriers are more challenging for SMEs (Jabłońska & Pólkowski, 2017) because AI solutions require investments and resources or/and AI-based implementations need to work on well-prepared data from credible sources.

SMEs usually lack both of these elements. However, due to the high relevance of SMEs in the world economy, a two-speed transformation that leaves them behind is not affordable. Currently, SMEs are particularly slow in integrating digital technologies. For example, only one out of five SMEs in the EU is highly digitized, although SMEs represent over 99% of all businesses in Europe, they account for two out of every three jobs and for 56.4 % of value-added within the EU non-financial business economy (European Commission, 2020).

1.3 Examples of AI-powered innovations in various industries

We can now move to AI and explore tangible examples of how AI-powered innovations are being implemented in various industries. These real-world cases illustrate the diverse and impactful ways in which AI is being leveraged, especially by small and medium-sized enterprises (SMEs), to enhance efficiency and maintain competitive advantage:

Retail (E-commerce): Platforms like **Shopify** utilize AI algorithms to recommend products to customers, enhancing the shopping experience and boosting sales through personalization.

Healthcare (Biotech SMEs): **Atomwise** represents a breakthrough in drug discovery, leveraging AI to predict the structure of protein compounds and accelerate the development of new medications.

Manufacturing (Equipment SMEs): Companies such as **Big River Steel** implement AI to optimize steel manufacturing, analyzing sensor data to improve process efficiency and reduce energy usage.

Agriculture (Agri-tech SMEs): Innovations by firms like **Blue River Technology** show AI's role in precision agriculture, identifying weeds and precisely targeting herbicide application to minimize chemical use.

Finance (Fintech SMEs): Upstart, a fintech company, uses AI to revolutionize the loan approval process by analyzing a plethora of data points to assess credit risk more accurately, benefiting both lenders and borrowers.

Customer Service (Service SMEs): AI chatbots, developed by companies like **Drift**, enhance customer engagement on websites by providing immediate, automated responses to common inquiries.

Marketing (Digital Marketing SMEs): Tools such as **Crayon leverage AI** for tracking market trends, aiding SMEs in adapting their marketing strategies based on real-time competitive intelligence.

Supply Chain Management (Logistics SMEs): Startups like **ClearMetal** use AI for predictive logistics, improving supply chain visibility and forecasting transportation delays.

Cybersecurity (Security SMEs): Darktrace uses AI to detect and respond to cyber threats in real-time, learning normal user behavior to flag potential security breaches.

Energy (Cleantech SMEs): SMEs like **Stem** are revolutionizing energy management in commercial buildings with AI-driven intelligent energy storage systems, optimizing energy use and reducing environmental impact.

CHAPTER 2: AI-Driven Innovation and Transformation in SMEs

2.1 Case study of ТОВ СП «СОЛОМІЯ». Company Background and Market Position

The case study for this research, ТОВ СП «СОЛОМІЯ», established in the early 90s, holds a significant 8% share in the Ukrainian tea market. The company's core activities center around the production and distribution of tea, with an annual capacity of over 8500 tons. Additionally, ТОВ СП «СОЛОМІЯ» diversifies into coffee and pasta production, showcasing a broad product portfolio of diverse production.

The ownership of the company is divided among several key shareholders, each holding a specific percentage of shares in the company. This distribution of ownership shares is pivotal in shaping the enterprise's management and governance. The combined ownership of these shareholders represents the entirety of the company's ownership structure. This diverse group of stakeholders plays an integral role in the decision-making processes, strategic direction, and governance of ТОВ СП «СОЛОМІЯ». To provide a comprehensive overview of the ownership structure, refer to the following table for a breakdown of the ownership:

Table 2.1: The ownership structure of ТОВ СП «СОЛОМІЯ» and corresponding share volumes in UAH. (Source: Compiled by the author on the basis of ТОВ СП «СОЛОМІЯ»'s data)

№	The founders	Share (UAH)	Share (%)
1	Company (CONVERY INVESTMENTS LIMITED)	45 463 973,51	87,396%
2	Ukrainian citizen Zhanna Gotska	1 056 499,71	2,031%
3	Limited Liability Company "ASSET MANAGEMENT COMPANY REAL CAPITAL MANAGEMENT"	5 500 000,78	10,573%
	Total	**52 020 474,00**	**100%**

As for the insights in Ukrainian Tea market and ТОВ СП «СОЛОМІЯ»'s competitors,

refer to the bar chart below as it represents the Tea Market and its competitiveness in Ukraine as a whole.

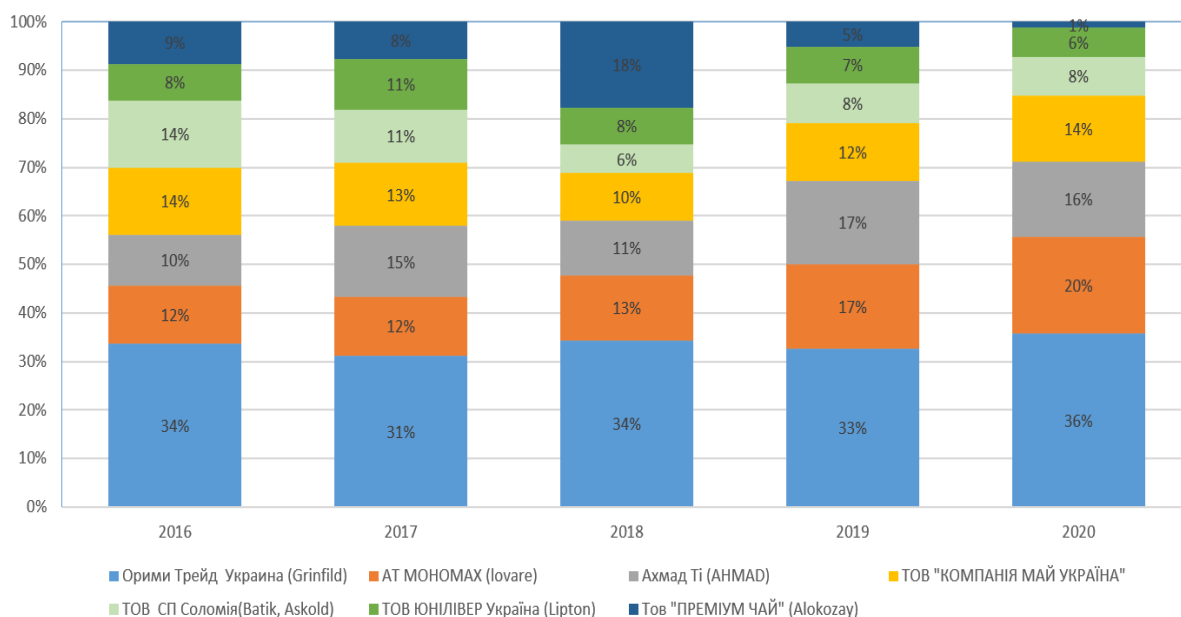Fig. 2.1: Dynamic of Tea Market in Ukraine by company 2016-2020 in % (Source: Compiled by the author on the basis of ТОВ СП «СОЛОМІЯ»'s data)

So, when talking about core aspects of the ТОВ СП «СОЛОМІЯ» it would be right to begin with Quality Standards and Regulatory Compliance. ТОВ СП «СОЛОМІЯ» adheres to stringent quality standards, including ДСТУ ISO 9001:2009 and ДСТУ ISO 22000:2007, ensuring product safety and quality. This commitment to high standards is vital for maintaining consumer trust and competitive edge in the market.

Moving on to the Planning and Economic Department, it plays a critical role in ТОВ СП «СОЛОМІЯ»'s financial management, encompassing budgeting, forecasting, and risk management. This structured approach is crucial for the company's financial stability and growth. Then, in Human Resource, despite a small team, the dedicated HR department effectively manages various aspects of human resource management, including recruitment, payroll, and employee relations. The workforce's diversity and skills are pivotal for the company's success in the competitive tea industry. The company recognizes the importance of continuous training and development for its employees, which is key to sustaining innovation and competitive advantage. ТОВ СП

«СОЛОМІЯ» fosters a positive work culture that encourages employee engagement and innovation.

Secondly, I want to emphasize on Marketing Plan Analysis and Logistics Management. he marketing plan for Solomiya is designed to achieve the company's goals, which include expanding market share, diversifying product offerings, and increasing profitability. The validity of the marketing plan is analyzed by comparing actual results against set targets. This analysis helps to identify areas of success and those that require improvement, informing future planning and decision-making. As for the logistics, in the Ukrainian tea market, logistics management is a significant factor due to the 100% import-dependence. Logistics costs, particularly for bulkier commodities like tea, significantly impact the cost structure. As a result, import strategies tend to favor premium brands, which seek to minimize transportation costs. As part ТОВ СП «СОЛОМІЯ»'s logistics management, the company has established regional warehouses throughout Ukraine. This strategy allows the company to efficiently distribute its products across all sales channels, ensuring a steady supply to meet customer demand. Products are supplied through all sales channels from the regional warehouses of partners. This pie chart below shows structure of sales for ТОВ СП «СОЛОМІЯ»:
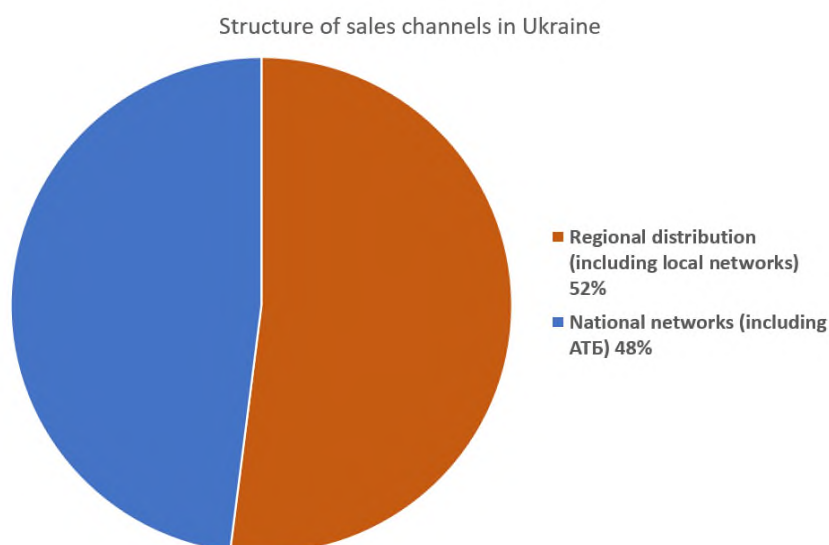
Structure of sales channels in Ukraine

- Regional distribution (including local networks) 52%
- National networks (including АТБ) 48%

Fig.2.2: Structure of sales channels in Ukraine for ТОВ СП «СОЛОМІЯ» (Source: Compiled by the author on the basis of ТОВ СП «СОЛОМІЯ»'s data)

As the topic of this research is related to Information Technologies and Industry 4.0, let's discuss company's IT Management and Digital Infrastructure. ТОВ СП «СОЛОМІЯ» acknowledges that its IT infrastructure is in the process of development. In a small retail company, IT is often a work in progress, driven by the need for efficiency and cost-effectiveness. The company utilizes various applications and web services to support its daily operations, from inventory management to customer relationship management. Small retail enterprises often rely on off-the-shelf software solutions and web services to meet their IT needs. ТОВ СП «СОЛОМІЯ» is no exception, leveraging various tools to manage inventory, track sales, and engage with customers. Researching and selecting the right tools are critical steps in IT management. Overall, ТОВ СП «СОЛОМІЯ» is in the process of integrating more advanced IT solutions to streamline operations and improve efficiency. The adoption of digital technologies presents both challenges and opportunities, especially in enhancing operational efficiency and customer engagement.

It is believed that the company must assess the quality and reliability of its information systems regularly. Downtime or system failures can disrupt operations and

impact customer satisfaction. Therefore, ТОВ СП «СОЛОМІЯ» should conduct periodic evaluations of its IT infrastructure, including software and hardware components. Furthermore, the company considers backup and disaster recovery solutions to safeguard critical data and ensure business continuity in the event of IT-related issues.

A third point of this discussion is related to Strategic Management and Market Expansion together with Innovation and Product Development in ТОВ СП «СОЛОМІЯ». So, ТОВ СП «СОЛОМІЯ» as any other growing company, aims to increase production and market share, guided by a comprehensive SWOT analysis. The company's mission emphasizes quality, innovation, and market responsiveness, essential for its strategic positioning in the Ukrainian tea market. Therefore, ТОВ СП «СОЛОМІЯ» places a strong emphasis on innovation, both in product development and operational processes. This focus on innovation is critical for staying competitive in the fast-paced tea industry. The company actively explores new tea blends and seeks to improve manufacturing techniques, demonstrating its commitment to continuous improvement and market adaptability.

Despite its focus on innovation, ТОВ СП «СОЛОМІЯ» faces challenges in consistently implementing innovative strategies, often due to resource constraints. This highlights the importance of effective resource management and strategic investment in innovation to maintain a competitive edge. The company engages in thorough risk assessment processes to identify and mitigate potential business risks, including market fluctuations and supply chain disruptions. This structured approach to risk management is crucial for making informed strategic decisions and navigating business challenges successfully.

In conclusion, ТОВ СП «СОЛОМІЯ» is well-positioned to explore and integrate AI-powered innovations, given its strong market presence, commitment to quality, and strategic approach to management. The adoption of AI technologies could further enhance operational efficiencies, product development, customer engagement, and overall market competitiveness. This makes ТОВ СП «СОЛОМІЯ» an excellent case study for the research on "Effective Management of AI-Powered Innovations for

Small and Medium-Sized Businesses," providing valuable insights into the practical application of AI in SMEs.

A Financial Analysis of ТОВ СОЛОМІЯ: Adapting to Changing Business Landscapes:

Table 2.2: Key financial indicators in ТОВ СП «СОЛОМІЯ» 2021-2023(Q1)(In thousands UAH)(vfinancial indicators)

Year	Current Assets	Non-Current Assets	Equity Capital	Long-term Liabilities	Short-term Liabilities	Revenue	Profit
2023 (Q1)	153 225	3096	61 020	55 648	44 907	18 143	2290
2022	152 921	4373	75 781	59 071	43 466	58 203	-20,669
2021	130 344	31 450	61 020	51 806	34 207	133 087	81

Key Findings:

Current Assets Increase (2021-2022): In 2022, ТОВ СОЛОМІЯ witnessed a substantial increase in its current assets, soaring from ₴130,344,000 to ₴152,921,000. This increment suggests a strategic response to the volatile economic environment, with the company allocating resources to short-term assets to maintain liquidity during the conflict. The surge in current assets may be attributed to increased inventory levels and the need for operational flexibility in uncertain times.

Equity Capital Growth (2021-2022): ТОВ СОЛОМІЯ exhibited a robust growth in equity capital, surging from ₴61,020,000 in 2021 to ₴75,781,000 in 2022. This expansion of equity capital points towards the company's proactive efforts to bolster its financial foundation amid the Russia-Ukraine conflict. The infusion of additional capital has been a strategic move to enhance financial resilience and facilitate day-to-day operations, serving as a buffer against external disruptions.

Revenue Decline (2021-2022): The company encountered a substantial decrease in its revenue, plummeting from ₴133,087,000 in 2021 to ₴58,203,000 in 2022. This sharp revenue decline is a direct consequence of the Russia-Ukraine conflict, which severely disrupted business operations, both domestically and internationally. The decrease in revenue reflects the challenges of operating within a conflict zone, impacting the company's sales and distribution channels.

Profit Reduction (2021-2022): In tandem with declining revenue, ТОВ СОЛОМІЯ experienced a notable reduction in its profit, dwindling from ₴29,767,000 in 2021 to ₴17,873,000 in 2022. The decline in profitability mirrors the adverse effects of the Russia-Ukraine war on the company's financial performance. Management's efforts to maintain financial stability in these turbulent times contributed to this reduction, with a focus on preserving resources and operational continuity.

Stabilization in 2023 (1st Quarter): Encouragingly, the company displayed signs of financial stabilization in the first quarter of 2023. Both revenue and profit showed improvement compared to the challenging year of 2022. This suggests the company's resilience and adaptability in navigating a complex and adverse economic environment. The ability to rebound in such a challenging context signifies ТОВ СОЛОМІЯ's determination to sustain its market position and rebuild its financial strength.

The impact of Russian-Ukrainian conflict on company's business and strategy:

In March 2022, ТОВ СП «СОЛОМІЯ» was significantly impacted by the hostilities, leading to the destruction of the majority of its assets. Despite these challenges, the company initiated a strategic pivot in June-July 2022, commencing the sale of imported goods from Poland. This move marked the beginning of a recovery and adaptation phase for ТОВ СП «СОЛОМІЯ». During this phase, by August 2022, the company resumed the sale of tea under its own brands, although predominantly on a contractual basis. This adaptation involved outsourcing production to other Ukrainian producers for some of their product lines. Additionally, ТОВ СП «СОЛОМІЯ» reestablished partnerships with major retail chains, including ATB, Silpo, FORA, VARUS, and others, indicating a strategic recovery in its distribution channels.

The ongoing conflict has had a considerable impact on sales volumes, with significant reductions attributed to the temporary occupation of large areas and continuous conflict zones. Despite these challenges, ТОВ СП «СОЛОМІЯ» has maintained its supplier relationships, with all transactions requiring prepayment, indicating a shift towards a more cautious financial strategy. The war has also altered the competitive landscape within the Ukrainian tea market. The exit of major players with Russian assets, such as Lipton and Orimi Trade, due to seizures, alongside the

seizure of May Tea, has created new market niches. ТОВ СП «СОЛОМІЯ» capitalized on these opportunities by launching coffee under its own brand and introducing new tea lines.

2.2 How to define an SME? The case of EU, Ukraine and The World

According to estimates by the Organization for Economic Co-operation and Development (OECD), small and medium enterprises (SMEs) constitute a staggering 90% of businesses worldwide, employing a substantial 63% of the global workforce (Munro, 2013). However, despite their overwhelming presence and significance, there exists a perplexing lack of consensus regarding the precise definition of what constitutes an SME. The arbitrary nature with which SMEs are defined across various institutions, statistical agencies, and countries is a testament to the complexity of establishing a universal standard. While some rely primarily on numerical thresholds, such as employee count or revenue, others incorporate a multitude of factors, leading to a cacophony of conflicting definitions.

Economists tend to classify SMEs based on quantitative, measurable indicators, with the number of employees being the most commonly used criterion to distinguish between large and small businesses. While academics, policymakers, international institutions, and statistical agencies primarily rely on quantitative criteria when defining SMEs, there is a lack of consensus on the specific thresholds or measures to be used. This absence of a universal definition highlights the complexity of capturing the diverse nature of SMEs across different sectors, regions, and economies. To address this challenge, the World Bank has established a widely recognized definition and set of criteria for classifying SMEs. The World Bank's definition is important because it provides a consistent framework for identifying and supporting SMEs globally, facilitating data collection, analysis, and policymaking efforts.

The table below outlines the specific quantitative thresholds used by the World Bank to categorize businesses as small, medium, or large enterprises based on factors such as the number of employees, total annual assets and total assets:

Table 2.3: Definition of Small and Medium Enterprises by World Bank standards. (Source: World Bank)

Enterprise indicators	Number of employees	Total assets	*Total annual sales*
Medium	> 50; < 300	> $3,000,000; ≤ $15,000,000	*> $3,000,000; ≤ $15,000,000*
Small	> 10; ≤ 50	> $100,000; ≤ $3,000,000	*> $100,000; ≤ $3,000,000*
Micro	≤ 10	≤ $100,000	*≤ $100,000*

Another influential definition comes from the European Union (EU). The EU has developed specific quantitative criteria to classify enterprises as micro, small and medium-sized based on factors such as the number of employees and financial indicators. These criteria were determined by the Commission Recommendation 2003/361/EC. The data is presented in Table 4 below:

Table 2.4: Definition of Small and Medium Enterprises with European Union standards. (Source: Compiled by the author on the basis of EU legislation)

Enterprise category	Headcount: Annual Work Unit (AWU)	Annual turnover	Annual balance sheet total
Medium-sized	< 250	≤ €50 million	≤ €50 million
Small	< 50	≤ €10 million	≤ €10 million
Micro	< 10	≤ €2 million	≤ €2 million

Despite the abundance of indicators that may be applied to every business, **the number of employees** remains the primary and most widely used criterion for determining whether a business qualifies as a MICRO, small, medium-sized, or large enterprise. The number for employees the business can have to be considered an SME vary across the world as it is presented in the Table 5:

Table 2.5: Distribution of firms by number of employees in different countries (Source: Compiled by the author)

Country/Region	Micro	Small	Medium	SME	Large
EU countries, Iceland, Norway, and Switzerland	1-9	10-49	50 - 249	1 - 249	250+
Australia	0 - 9	10-49	50 - 199	0 - 199	200+

Canada	0 - 9	10-49	50 - 499	0 - 499	500+
Japan	4-9	10-49	50 - 249	1 - 249	250+
Korea	5-9	10-49	50 - 199	5 - 199	200+
Mexico	0-10	11-50	51 - 250	1 - 250	251+
New Zealand	1-9	10-49	50 - 99	0 - 99	100+
Turkey	1-19	20-49	50 - 249	1 - 249	250+
United States	1-19	10-99	100 - 499	1 - 499	500+

At the same time, in the United States, the definition and criteria for classifying enterprises as SME are determined by the Small Business Administration (SBA). The criteria include size standards in millions of US dollars and number of employees as shown in the table below:

Table 2.6: Summary of Small Business Size Standards regarding to SBA regulations. (Source: U.S. Small Business Administration. (2023). Table of Small Business Size Standards Matched to North American Industry Classification System Codes.)

General Industry	Size Standards in Millions of Dollars (Range)	Size Standards in Number of Employees (Range)
Agriculture, Forestry, Fishing and Hunting	$2.25 to $34.0	Up to 500
Mining, Quarrying, and Oil and Gas	Up to $47.0	1,250 to 1,500
Utilities	$25.0 to $47.0	Up to 1,150
Construction	Up to $45.0	N/A
Manufacturing	$500 to $1,500	500 to 1,500
Wholesale Trade	$100 to $250	500
Retail Trade	$9.0 to $47.0	500
Transportation and Warehousing	$14.0 to $47.0	500 to 1,500
Information	$22.5 to $47.0	1,000 to 1,500
Finance and Insurance	Up to $47.0	N/A (Asset-based)
Real Estate and Rental and Leasing	$9.0 to $47.0	N/A
Professional, Scientific, and Technical Services	$9.0 to $47.0	N/A
Management of Companies and Enterprises	N/A	N/A (Revenue-based)
Administrative and Support, Waste Management and Remediation Services	$17.5 to $47.0	N/A
Educational Services	$10.0 to $47.0	N/A
Health Care and Social Assistance	$10.0 to $47.0	N/A
Arts, Entertainment, and Recreation	$9.0 to $47.0	N/A

Accommodation and Food Services	$9.0 to $47.0	N/A
Other Services	$9.0 to $47.0	N/A

After all, I think we have to delve a little deeper in Ukrainian regulations of SME criteria to acquire a better understanding of the case study of ТОВ СП «СОЛОМІЯ». In Ukraine, the definition and criteria for classifying enterprises as micro, small, and medium-sized (SMEs) are determined by the Law of Ukraine "On Accounting and Financial Reporting in Ukraine". To be classified into this specific category, a company must meet at least two of the criteria set by the Law of Ukraine "On Accounting and Financial Reporting in Ukraine", reported United Nations Development Programme (2024):

■ Micro-enterprise: balance sheet assets valued at− up to EUR 350,000; annual turnover of up to EUR 700,000; and a maximum of up to 10 employees.

■ Small enterprise: balance sheet assets valued at up to EUR 4 million; annual turnover of up to EUR 8 million; and − a maximum of 50 employees.

■ Medium-sized enterprise: balance sheet assets valued at up to EUR 20 million; annual turnover of up to EUR 40 million; and a maximum of−250 employees .

Overall, despite the differences in criteria nad definition of SMEs across the globe, there is a feature they all share: SMEs have fewer resources, such as financial capital, data, and technological infrastructure, which can limit their ability to compete and innovate effectively. This is why AI, as a tool, can help level the playing field by providing SMEs with advanced capabilities and insights that were previously only accessible to larger enterprises.

2.3 Technology Insights and Benefits of AI Implementation for Managing and Operating the Company based on the case of the ТОВ СП «СОЛОМІЯ»

Back in the days when the concept of Industry 4.0 was just emerging, it was predicted that technologies driven by artificial intelligence would improve sustainability in manufacturing and production systems of various industries. However, until today, they were at the initial stage. AI technology in the form of robots was placed in 1.3 million industrial robots in various organizations as of 2018 only. It has been proven that the use of technologies supported by AI will allow organizations to improve their sustainability in production and production processes in an environmentally friendly, smart and flexible way. The primary scope of artificial intelligence for SMEs is trying to gain a strategic advantage in business, human capital, operations, market research, customer relationships, accounting and finance, sales, marketing, etc. Cloud computing, the Internet of Things (IoT), big data, data science, artificial intelligence (AI) and blockchain are emerging technologies that could create winners and losers around the world. Some of these technologies have been around for at least two and a half decades, but have not been mainstream or commercially viable. However, over the past few years, the situation has changed dramatically, and today almost every industry uses one or more of these technologies.

Statistics collected by Precedence Research- a worldwide market research and consulting organization predict that the global artificial intelligence (AI) in manufacturing market size that was reached at USD 3.8 billion in 2022 and expected to hit around USD 68.36 billion by 2032:
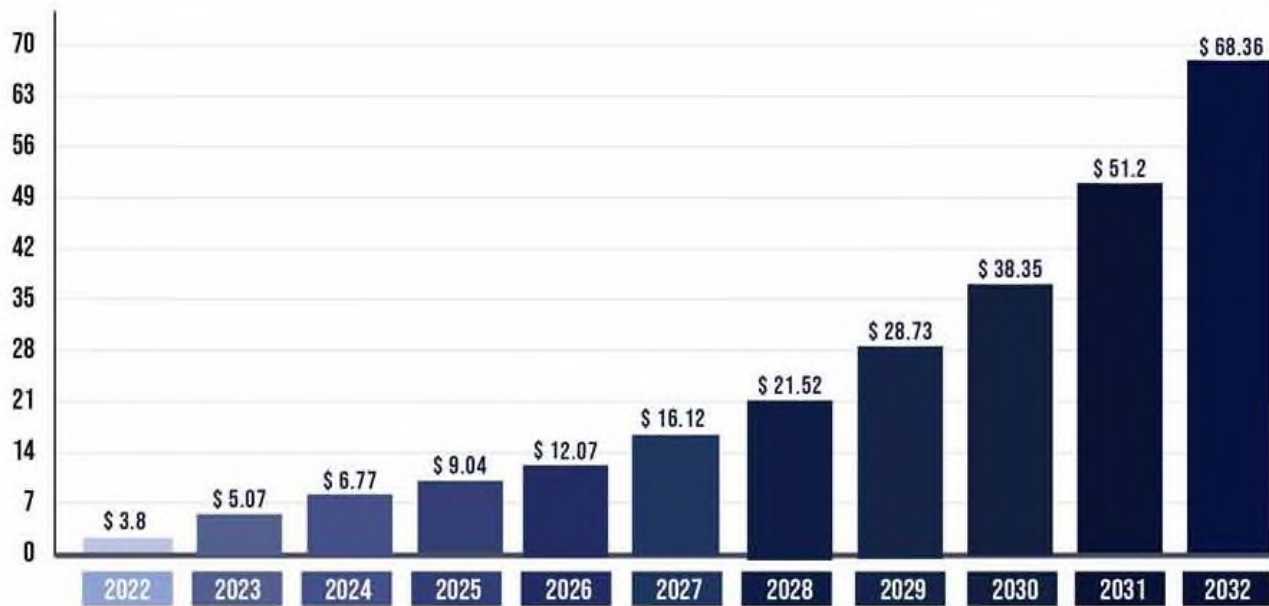
Fig. 2.3: AI Market Size from 2020 to 2032 (USD Billion).(Source: Precedence Research. (2023). Artificial intelligence in the manufacturing market.)

In manufacturing industries, AI advances are related to the strengthening of Industry 4.0. Through the adoption of different technologies, such as IoT, big data, cloud computing, and cyber-physical systems (CPS), these industries gain the ability to make decisions within a highly volatile and dynamic environment in a more effective way, going beyond the simple automation of processes (Ahuett Garza Kurfess, 2018). With machine learning capabilities, these technologies become important allies in decision-making and the emergence of new manufacturing models, including networking.

The recent Confidence Index survey in Q2 of 2023 disclosed that 33% of CEOs said their organizations were not actively using or testing AI, while 43% were either currently using or testing it. Moreover, the survey of Vistage showed that 13.6% of SMEs are already leveraging the benefits of AI in various areas of their business (Vistage 2023) as shown in the chart below where you can see that AI's capabilities and benefits that business can extract are diverse:
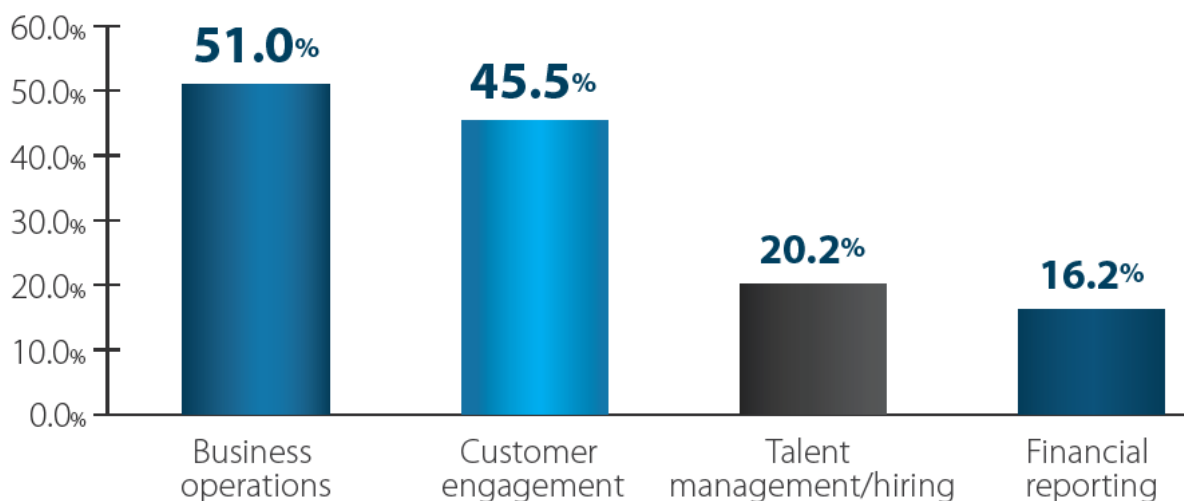
Fig. 2.4: How SMBs are currently using AI across different areas and functions. (Source: Vistage Worldwide Inc. (2018). Artificial intelligence for small and midsize businesses: Getting started with practical applications of AI.)

Now let's shift to SMEs, particularly to this research case study company -ТОВ СП «СОЛОМІЯ», and discover how AI may be beneficial for SMEs (especially in the manufacturing industry) and to what results it may lead to analyzing some cases.

First and foremost, there is *Automation* including Production and Supply Chain. AI can automate crucial aspects of the production line and supply chain management, leading to enhanced efficiency and reduced errors, particularly in the retail sector. The application of AI-based solutions revolutionizes this domain by offering more efficient tracking and management of inventory. AI enables SMEs to streamline their procurement processes, ensuring timely and cost-effective material acquisition. In warehousing, AI technologies facilitate smarter storage solutions, enhancing space utilization and reducing waste. Additionally, AI's predictive capabilities aid in maintaining optimal stock levels, preventing both overstocking and stockouts. This leads to significant improvements in productivity, as AI-driven systems can anticipate demand patterns and adjust inventory accordingly. Furthermore, AI enhances the maintenance of stock by providing real-time monitoring and analytics, enabling businesses to respond swiftly to any changes in demand or supply chain disruptions. For instance, AI systems can manage inventory levels, forecast demand, and optimize logistics, ensuring timely delivery of products of the company manufacture.

On top of that, *Customer Service* may be enhanced through AI. AI-driven chatbots or virtual assistants can provide round-the-clock customer support, handling inquiries, and resolving issues swiftly, thus improving customer satisfaction. AI-powered automated chat is making it easier and more efficient for SMEs to interact with their customers. AI technologies are helping SMEs comprehend client needs, ascertain customer purchasing patterns, and provide a range of pertinent incentives and features. Using a database of customer perceptions, artificial intelligence can thoroughly respond to customer inquiries. In this way, AI enhances customer satisfaction and boosts revenue for SMEs by enabling them to respond to customer inquiries quickly and efficiently. (It may not always be applicable for B2B SMEs, but it's effective and very profitable for B2C SMEs)

Secondly, AI directly influences *Decision-Making* processes. For example, AI tools can analyze market trends, consumer behavior, and competitor activities, offering valuable insights for strategic planning. This data-driven approach can assist "СОЛОМІЯ" in identifying growth opportunities, understanding customer preferences, and making informed decisions about product development and marketing strategies. Furthermore, AI can enhance financial decision-making by analyzing historical data, predicting future trends, and identifying potential risks. This includes budget optimization, revenue forecasting, and investment analysis.

A very promising, yet risky field for AI implementation is Human Resources Management. It's seen that SMEs frequently find it challenging to handle the components of human resource management that deal with acquiring employees, development, and retention. The majority of SMEs are not able to set up and maintain an HR department. Customized AI solutions are assisting small businesses in automating tasks like finding and screening qualified candidates, analyzing CV letters and resumes, setting up different training sessions, managing schedules/agendas, overseeing employee performance, and even managing benefits and wages through the company's accounting systems. The HR department (or its substitute) greatly benefits from AI-based solutions in avoiding human errors like prejudice, subjectivity,

and discrimination (however, it is not true in some cases that will be discussed later in this research).

For ТОВ СП "СОЛОМІЯ", a small business in the retail sector, AI-based inventory management can be transformative. Utilizing AI, "СОЛОМІЯ" can enhance its procurement processes, ensuring efficient and cost-effective material acquisition. AI's predictive analytics help maintain optimal stock levels, crucial for balancing supply and demand.

For SMEs like ТОВ СП "СОЛОМІЯ", adopting digital technologies significantly enhances productivity. This is achieved by reducing downtime, improving quality, minimizing waste, and better utilizing data. Training and developing competencies aligned with digital transformation are also crucial for operational productivity. In operations management (OM), for instance, simplified monitoring is another key benefit of digital technology. It facilitates more agile monitoring, increasing trust between partners and managers. AI can centralize and simplify monitoring in OM across projects, scheduling, planning, quality control, and fault diagnosis. For ТОВ СП "СОЛОМІЯ", these improvements can lead to more efficient operations, better quality control, and enhanced stakeholder trust.

The integration of AI into SME operations, exemplified by companies like ТОВ СП "СОЛОМІЯ", presents numerous benefits. AI enhances inventory management, streamlines procurement, and optimizes warehousing. It significantly boosts productivity by reducing downtime, improving quality, and minimizing waste. AI also simplifies operational monitoring, fostering trust and efficiency in project and quality management. This technological adoption positions SMEs for improved operational efficiency, competitiveness, and long-term growth in an increasingly digital marketplace.

2.4 Common challenges and barriers to the implementation of AI for SMEs based on the Survey Insights and case of ТОВ СП «СОЛОМІЯ»

Artificial intelligence-based technological solutions are used for a variety of business functions, including social media, data mining, customer growth, engaging

consumers more effectively, collecting data and segregating relevant data for further decision-making, enhancing activities of logistics, and increasing efficiencies of various functions of the business (Bhalerao, Kumar, Kumar, & Pujari, 2022). In a Vistage survey of 1,467 SME leaders, 13.6% of respondents said that they are currently leveraging AI in their business, with 6.9% using it for business operations and 6.1% for customer engagement. Nearly one-third (29.5%) of respondents say they believe AI is among the technologies that will have the greatest impact on their business in the next year (Vistage 2018). However, the cost of adopting AI technologies and big data and the requirement of skilled human resources are significant obstacles for small and medium enterprises. In addition to it, there are many other barriers and challenges average SME meets on the way for implementation AI in its daily operations and business processes. This section is aimed on providing deep analysis of these issues and explain prepare business for problems they may encounter.

For instance, based on the survey conducted by Andreas Bunte, Frank Richter and Rosanna Diovisalvi in their research "Why It is Hard to Find AI in SMEs: A Survey from the Practice and How to Promote It" (2021), only 4% of the managers/owners of SMEs stated that they have personal experience with AI. Only 5% stated that they are currently using AI in manufacturing. On the other hand, 67% of the interviewees believe that AI has - respectively would have - a positive economic impact. 24% of the interviewees stated, that their company is too small for AI. 5% stated that there is not enough potential for improvement by using AI (Bunte et al. 2022).

DO YOU THINK THAT AI IN MANUFACTURING WOULD HAVE/HAS A POSITIVE ECONOMIC IMPACT ON YOUR COMPANY?

DON'T REALLY KNOW
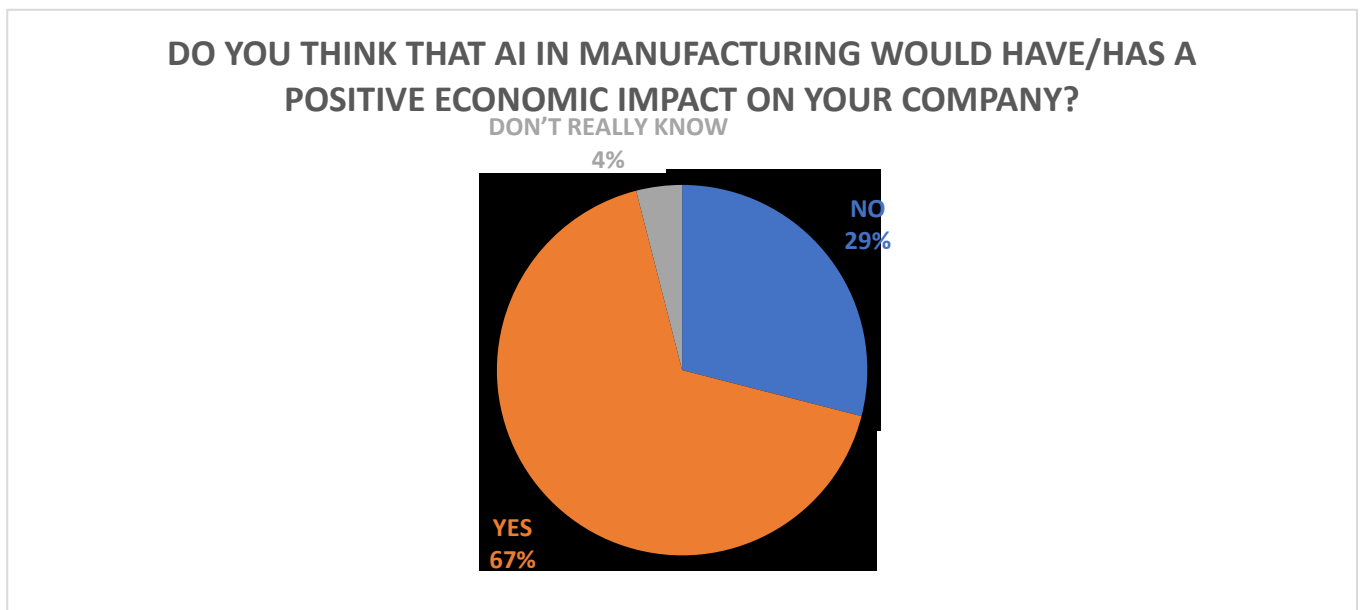4%

NO
29%

YES
67%

Fig. 2.5: Results of a Survey; Source: Bunte, A., Richter, F., & Diovisalvi, R. (2021)

According to the same survey, the biggest obstacles to SMEs adopting AI are: lack of experience, initial costs and time investments, infrastructure, resources, and company size (see Fig. 2.6). This explains the phenomenon why AI's adoption in SMEs remains relatively low.

WHAT ARE THE REASONS FOR NOT USING AI IN PRODUCTION

- Miscellaneous
- Amortization period is too long
- Company is too small for AI
- Capital expenditures are used for other projects
- No sufficient expertise in the company
- Not enough potential for improvement
- We are currently evaluating the potential use of AI
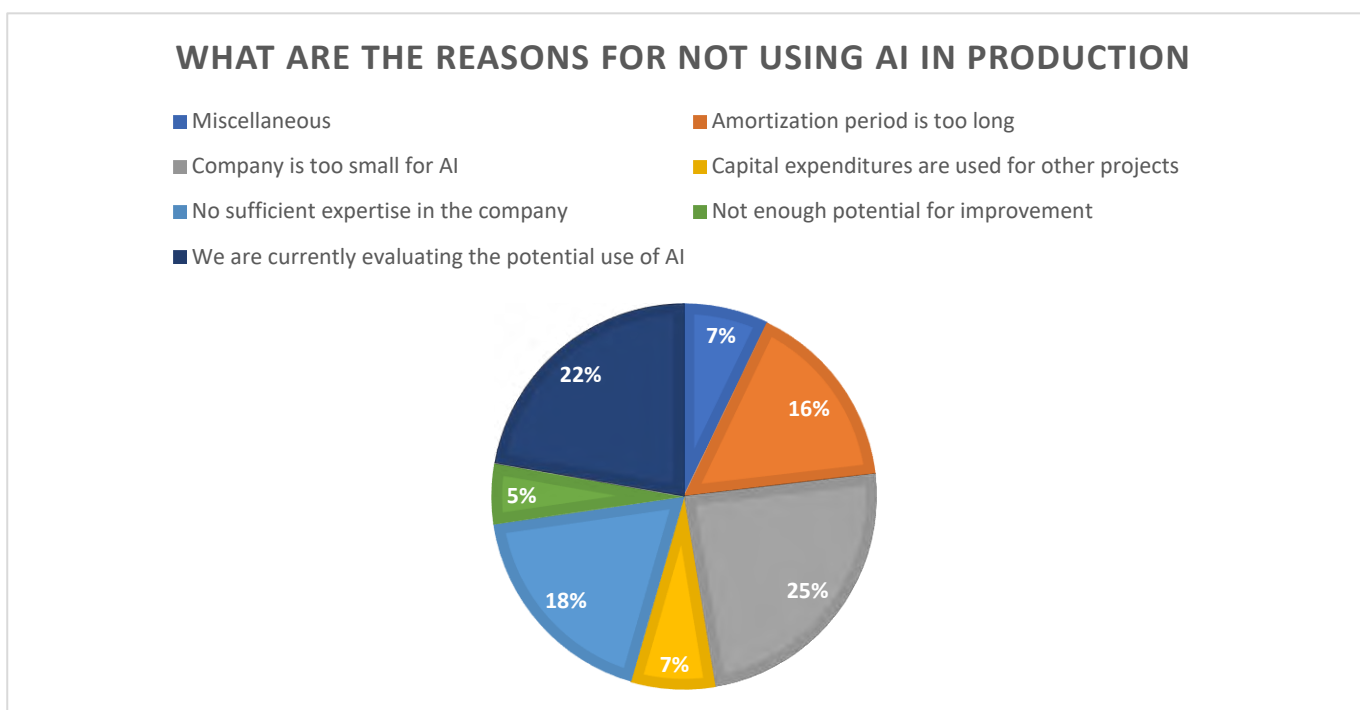
7%
16%
22%
5%
18%
7%
25%

Fig. 2.6: The results of interviews about AI with 411 people from 68 companies, most of those companies were SMEs. (Bunte, A., Richter, F., & Diovisalvi, R., 2021). Why it is hard to find AI in SMEs: A

survey from the practice and how to promote it. Institute for Industrial IT. Germany in cooperation with Swiss Global Investment Group AG, Hünenberg, Switzerland.

Turning back to the case study of ТОВ СП «СОЛОМІЯ», in these regards, we can notice that while ТОВ СП «СОЛОМІЯ» is strategically and organizationally prepared to explore the integration of Artificial Intelligence (AI) into its business operations, it also faces significant challenges in terms of technological capabilities and innovation frameworks necessary for this step, hence, belongs to the 18.2% of the companies that cannot implement AI at their current stage due to the lack of expertise. Meanwhile, the company's emphasis on expanding its market share and production demonstrates a forward-looking mindset that aligns well with the advantages AI can offer, particularly in enhancing decision-making processes and market analysis. However, despite having a strategic orientation and a solid organizational structure that supports talent development and workforce adaptation to new technologies, ТОВ СП «СОЛОМІЯ» still lacks the robust technological infrastructure and in-house expertise essential for adopting AI tools. Moreover, while the company shows an openness to new processes and strategies to stay competitive, it struggles with creating and implementing cutting-edge technological solutions, including AI. This innovation gap limits its ability to fully realize the operational efficiencies and product innovations that AI could facilitate. Although ТОВ СП «СОЛОМІЯ» has strong practices in market research and financial management which could benefit from AI through predictive analytics and financial forecasting, the existing technological barriers pose a considerable hurdle.

Finally, many scholars reckon that data, to be precise, big data is a major issue for SMEs and their implementation of AI. The key to an AI strategy is to establish the virtuous cycle of AI as depicted in Figure 2 below. Take Google, for example. It possesses vast amounts of data, enabling it to develop a highly accurate search engine as a product (A). This product, in turn, helps Google gain more users (B), who contribute even more data to the platform (C). As we understand by now, big data in the critical element in AI. Companies often try to implement AI without the necessary data foundation, which is similar to constructing a palace on quicksand. Data acquisition and a robust data infrastructure are crucial for transforming a business

model. Data collection is a huge challenge for most companies in all industries. Often, businesses simply do not have such a procedure, or a department responsible for working with data. Moreover, even companies that collect data often simply don't have enough data to train their AI. Companies must understand that the quantity and quality of data is directly related to the effectiveness of AI. Just as personnel cannot perform a task correctly without the correct instructions and skills, so AI cannot solve a given problem without sufficient data about it.
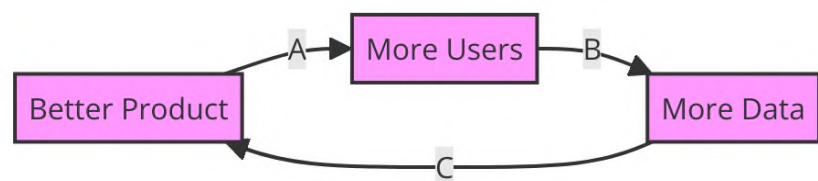

Fig. 2.7: The virtuous cycle of AI. Lee, J., Suh, T., Roy, D., & Baucus, M. (2019). Emerging technology and business model innovation: The case of artificial intelligence.

Another vital point and, at the same time, a significant issue for many companies implementing AI is the development of ethical frameworks that have become paramount to ensure that these technologies benefit society while mitigating potential risks. Let's shortly delve into the principles that should guide ethical AI innovation, with a focus on the implications for a specific case study: ТОВ СП "СОЛОМІЯ". The integration of AI into business processes presents a spectrum of ethical considerations and this is the reason why this problem must be addressed to prevent harm and promote trust among users and stakeholders. Firstly, key ethical principles include transparency, fairness, non-maleficence, responsibility, and privacy. These principles are crucial in fostering a technology landscape where AI systems are designed and implemented to act in the best interests of humans and avoid unintended consequences.

For instance, the principle of transparency requires that AI systems be understandable to users and that decisions made by these systems can be explained in a manner accessible to all stakeholders. This principle is vital for building trust, particularly in industries like that of ТОВ СП "СОЛОМІЯ", where the adoption of AI could significantly alter production processes, quality control, and customer interactions.

ТОВ СП "СОЛОМІЯ", a leading entity in Ukraine's tea market, is exploring the integration of AI to enhance its operational efficiency and product quality. For ТОВ СП "СОЛОМІЯ", implementing AI solutions in its manufacturing and distribution processes must include clear communication about how these technologies work and the basis on which decisions are made. This openness will be crucial when AI is used for critical functions such as predicting market trends or automating quality control. At the same time, the use of AI in ТОВ СП "СОЛОМІЯ" must ensure that all decisions are free of bias, particularly in HR management and marketing strategies. Recently it was found that historical datasets can contain past biases, which will be codified in the AI's decisions, (World Economic Forum, 2021). Models trained on data with fewer minority candidates can disadvantage those groups. For example, certain widely used AI screening tools discounted resumes containing words where men were disproportionately hired compared to equally qualified women applicants (World Economic Forum, 2021). Poor proxies, such as college names or years of experience, may inadvertently encode demographic biases. This leads to unfair assessments. For instance, AI models may look for proxies like gaps between jobs or analyze how candidates perform in a video interview, which may amplify bias toward specific cultural groups (Lawton, G., 2022). AI systems should be designed to avoid bias in hiring processes or in targeting marketing campaigns, thus ensuring equitable treatment of all customers and employees. Moreover, AI systems should not inadvertently harm the company's stakeholders and it requires rigorous testing and monitoring of the AI applications, particularly those that might impact the quality of products like tea, which is central to the company's business operations. ТОВ СП "СОЛОМІЯ" must also hold itself accountable for the outcomes of its AI systems. This includes having protocols in place to address any failures or negative impacts swiftly and effectively, ensuring that all personnel involved with AI deployment understand their ethical obligations. Finally, as AI systems often require substantial data, including potentially sensitive information, ТОВ СП "СОЛОМІЯ" must implement robust data protection measures to safeguard consumer and employee data against breaches and misuse.

The ethical integration of AI into businesses like ТОВ СП "СОЛОМІЯ" necessitates a careful balance between technological advancement and the core human values that sustain corporate integrity and social trust. By adhering to established ethical principles, ТОВ СП "СОЛОМІЯ" can harness AI's potential responsibly, fostering innovation while ensuring that these advancements benefit all stakeholders equitably always accounted for and that AI solutions align with human values.

Legal Considerations in AI Innovations

In exploring the legal considerations essential for small and medium-sized enterprises (SMEs) when implementing artificial intelligence (AI) technologies, a deeper understanding can be gained from recent substantial changes in international AI laws and regulatory frameworks. For instance, 2023 marked a pivotal year as public debate and AI deployment reached significant milestones, with legal frameworks evolving accordingly to address new challenges and risks. So, our case study, ТОВ СП "СОЛОМІЯ," must be particularly cognizant of these regulations and limitations when implementing AI, as the Ukrainian government is actively revising its national laws to align with EU standards in anticipation of joining the Union. This transition necessitates a strategic approach to compliance and risk management, especially given the sweeping changes and stringent requirements expected under the EU's legal frameworks for AI.

The European Union's AI Act, poised to become the first comprehensive AI law by 2024, showcases a proactive approach by directly regulating AI systems based on inherent risks. This regulation extends extraterritorially, affecting companies outside the EU that operate within its market. It imposes stringent requirements on AI systems categorized as high-risk, and explicitly prohibits certain uses of AI (Gibson Dunn, 2024). This necessitates that SMEs operating in or entering the European market, including those like ТОВ СП "СОЛОМІЯ," carefully evaluate their AI solutions against these new standards to ensure compliance and avoid severe penalties.

In contrast, the United States continues to adopt a sectoral, self-regulatory approach, though the landscape remains dynamic. Significant advancements have occurred, including a comprehensive executive order from the White House and the

emergence of recommended practices based on the National Institute of Standards and Technology's framework for managing risks associated with artificial intelligence (Krishan, N.,2023). This highlights the importance for SMEs to stay informed and agile, adapting to evolving regulatory expectations and integrating robust governance frameworks to manage risks effectively (Gibson Dunn, 2024). Furthermore, as AI technologies rapidly advance, the intersection with employment law becomes increasingly pertinent. The deployment of AI in hiring, performance evaluations, and other HR processes calls for SMEs to be vigilant in their adherence to employment laws and regulations, which are also evolving in response to AI's implications.

Adherence to established AI governance frameworks and standards, such as those outlined by the OECD, and new initiatives like those under development in the U.S., is crucial. These frameworks not only guide ethical AI usage but also enhance trust and reliability in AI applications among stakeholders and customers. By aligning AI strategies with these principles, SMEs can navigate the complex legal landscape more effectively, ensuring both compliance and ethical responsibility in their AI deployments (Gibson Dunn, 2024). Thus, as AI technologies continue to permeate every sector of the economy, the importance of a well-rounded, informed approach to legal compliance and strategic AI governance cannot be overstated for SMEs. This will not only mitigate legal risks but also position these enterprises at the forefront of innovation and ethical standards in an increasingly digital and AI-driven global market.

2.5 AI Maturity and Readiness Models for Businesses

This section is especially insightful for businesses that aim to include AI in their business processes because it analyzes the maturity and readiness model dimensions of such businesses for this implementation. This step is crucial to determine the stage your company is on and build an implementation plan. To begin with, maturity models are the general models that describe the main levels of maturity for all types of business or entrepreneurial activity. They are important to understand before delving into the readiness model dimensions that are based on them.

The major theory acknowledged by many researchers is ***Gartner's AI Maturity Model (2019)***, which categorizes companies into five maturity levels:

1. **Awareness:** Companies are in the early stages of AI interest, with a potential risk of overhyping.
2. **Active**: At this stage, companies experiment with AI, primarily within a data science context.
3. **Operational:** AI is actively used in production, contributing to process optimization and product/service innovation.
4. **Systemic:** AI usage is widespread, transforming digital processes, and supply chains, and fostering new digital business models.
5. **Transformational:** AI becomes an integral part of the business's DNA.

Alternatively, we may use **Altimeter's Maturity Model (2018),** which is based on industry expert interviews, Altimeter developed a four-stage maturity model:

1. **Exploring**: Companies are in the initial phase of exploring AI, engaging with experts and considering use cases without significant investment.
2. **Experimenting**: Organizations actively experiment with AI across various use cases, utilizing internal and external resources.
3. **Formalizing**: AI starts to become a formal element of corporate strategy. Data management becomes a core competency, with implementations moving beyond mere optimization.
4. **Integrating**: AI is embedded in the company's processes, products, and services, delivering value across the business.

These models collectively offer a roadmap for SMEs to assess and guide their AI adoption journey. From initial awareness and exploration to full integration and transformation, each stage represents a progression in AI maturity, reflecting an increasing depth of AI integration in business processes and strategy. This staged approach helps managers and directors understand where their companies stand in the AI journey and plan their path forward.

Finally, as we explored various maturity models that delineate the evolutionary stages organizations typically undergo in their journey toward AI integration. However,

while maturity models offer a broad overview of an organization's AI journey, they may not fully capture the specific, actionable dimensions critical for the readiness and successful deployment of AI technologies. This gap necessitates a deeper dive into readiness models, which complement maturity models by focusing on the precise attributes and conditions that an organization must cultivate to implement and leverage AI effectively.

So, let's delve into the core dimensions of readiness models as identified and described in recent research by M.A. Nortje and S.S. Grobbelaar, A Framework for the Implementation of Artificial Intelligence in Business Enterprises: A Readiness Model. As they defined, the core dimensions of AI implementation readiness include:

A. The Infrastructure Dimension

It covers the essential facilities, services, and organizational structures needed for successfully implementing and operating AI technology within a company. It encompasses several key elements:

- Infrastructure Platform: This involves identifying the required server infrastructure to support AI, such as GPU (graphics processing unit) performance/capabilities and storage needs for data and software. Companies must determine what infrastructure components are necessary, including relevant data sources. A key decision is whether to use cloud services like SaaS (software as a service), PaaS (platform as a service), IaaS (Infrastructure as a service), or manage all infrastructure in-house.

- Services: Companies must identify existing business services that could be impacted by incorporating AI. Mapping out processes helps visualize how AI can be integrated efficiently. Developing AI use cases for different services is also crucial.

- Information Networks: AI implementation affects the interconnected data, objects, groups and agents within a company's information networks. Businesses should examine how their large, complex information networks like social media, the web, and internal information flows will be involved with or changed by using AI.

- Communication Networks: With AI, companies must ensure their communication networks can handle new requirements like latency, bandwidth, security and reliability

across different technologies and architectures. The impacted parts of the communication infrastructure need to be addressed.

- Technological Sustainability: Companies should assess the longer-term viability and competitiveness of adopting AI through techniques like price-benefit positioning maps. This combines evaluating the technology's development, sustainable business impacts, and taking a dynamic systems approach.

In essence, the Infrastructure Dimension analyzes whether a company has the proper technological foundations and resources in place to successfully deploy and maintain AI capabilities aligned with its processes and strategy.

B. The Employee and Culture Dimension

The Employee and Culture Dimension examines how an organization's workforce views and accepts new technologies like AI. Employee perspectives are crucial, as negative attitudes can significantly hinder AI adoption within a company. This dimension aims to measure various perspectives employees may have towards AI implementation:

- Job Security: There may be concerns about AI automation replacing certain roles or responsibilities. Addressing job security fears is important.

- Perceived Usefulness: Do employees see AI as beneficial and improving efficiency/productivity in their work?

- Perceived Ease of Use: How intuitive and user-friendly will new AI systems/processes be for employees?

- Compatibility: Will using AI clash with the company's existing cultural values, norms and practices?

- Perceived Benefits: What upsides and advantages do employees associate with AI adoption?

- Organizational Acceptance: Is there overall openness and support for embracing AI at a company-wide level?

- Skills and Expertise: Do employees currently possess the necessary skills to work with and maximize AI capabilities?

- Trust in Technology: How much confidence and certainty do workers have in the reliability and performance of AI systems?

- Collaboration Willingness: Are employees prepared to actively engage and cooperate in efforts to implement and manage new AI solutions?

Fundamentally, this dimension evaluates the cultural readiness and attitudes employees have toward AI implementation. Proactively understanding and addressing workforce perspectives is vital for effective AI integration that minimizes internal resistance.

C. Technology Management

Technology Management is a crucial dimension that requires integrating numerous activities across different sectors of the organization for effective AI implementation.

- Technology Categorization & Planning: This involves providing a roadmap/guidelines for rolling out AI technologies, which is central to the information systems field. The focus is on assessing the company's progress in categorizing and planning for the specific AI technologies they aim to adopt. Proper planning lays the groundwork.

- Technology Requirement Handling: Requirement management is vital for handling the complex requirements associated with new AI technologies and how they integrate with existing systems/processes. Companies need formalized requirement structures like designated managers to determine multi-level requirements across the organization related to AI integration.

- Technology Investment & Capital Management: A key aspect is allocating sufficient investment resources and capital specifically towards AI adoption within the business. This covers aspects like AI infrastructure, talent, implementation projects, etc. Proper investment planning is critical.

- Cost Management: In a highly competitive landscape, intelligent cost management using advanced cost accounting systems is essential for tracking AI expenditures across multiple cost objects - processes, customers, products, activities, services, functions etc. This multi-dimensional cost focus is important.

- Competitor Analysis: Understanding competitors' AI capabilities through techniques like competitive analysis is crucial for formulating strategies to generate value from AI adoption. It helps identify potential opportunities and threats compared to industry peers.

- Cloud Resources: Cloud computing enables easier adoption and scalability of AI solutions. Key considerations include:

    1.   Selecting a cloud model (PaaS, IaaS, SaaS)

    2. Meeting requirements for the chosen model

    3. Picking a deployment model (public, private, hybrid)

    4. Facilitation needs for the deployment approach Cloud resources reduce
overhead and enhance AI usability.

- Network Connectivity: Companies must analyze and identify any upgrades or changes required to their network infrastructure and connectivity to support the demands of new AI systems and data flows. Ensuring robust connectivity is essential.

- Technology Risk Management: Implementing a comprehensive risk management framework focused on AI technologies is important for systematically managing risks around data confidentiality, system security, reliability, resilience and recovery. Thorough risk identification and mitigation practices are required.

- Quality Management: Relevant quality management structures and processes must be established to maintain a continuous level of excellence throughout all stages of AI implementation, operations, and future development/enhancements. This ensures AI integration adheres to proper quality standards.

- Human Resource Planning: This involves forecasting future human resource demands, factoring environmental changes, and ensuring the right people and skillsets are in place to achieve AI objectives. Data on goals is collected beforehand to properly allocate resources required to meet those targets related to AI capabilities.

The Technology Management Dimension analyzes whether an enterprise has robust governance practices, frameworks, and aligned activities across the organization to

facilitate the full technology lifecycle for AI - from planning to implementation to ongoing quality management.

D. Organizational Governance and Leadership Dimension for AI readiness

Implementing AI requires developing clear digitization goals and having the right leadership support across the organization. This dimension covers several key elements:

- Executive Support For AI initiatives to succeed, it is vital to have buy-in and active support from executives and top management. This includes providing strategic assistance, funding, cooperation, and championing AI as a priority across the business. High-level leadership engagement is crucial.

- Dedicated Budget A basic requirement is allocating a sufficient dedicated budget to cover all expenses associated with AI implementation, operations, and ongoing management. Funding must be earmarked for these AI-related costs.

- Business Opportunity Identification Early on, the organization should strategically identify market/customer needs and opportunities where leveraging AI can create superior value and differentiation. Pinpointing high-potential AI use cases is important.

- Strategic Leadership Once opportunities are identified, strategic leaders must provide direction by translating the AI strategy into actionable plans. They align the organization, develop required capabilities, and determine effective intervention points to drive the successful execution of the AI roadmap.

- Business Case Development Building comprehensive business cases is integral for evaluating and communicating the viability, costs, projected value/ROI, and justifications to stakeholders for pursuing specific AI initiatives and use cases within the organization.

In essence, this dimension analyzes whether an organization has the governance structures, leadership alignment, and strategic foresight required to shepherd the adoption of transformative AI capabilities from planning through execution in a cohesive manner.

E. Security

Security, especially cybersecurity, is an essential consideration when implementing AI systems that handle and process data. This dimension covers:

- Cybersecurity: Initially a technical discipline, cybersecurity has evolved into a broader strategic concern. Even at an operational level, it remains highly technical. Traditionally, cybersecurity issues were approached from just an IT perspective. However, recent research advocates comprehensive approaches that also account for business objectives, risk management, organizational behavior, and governance factors. Cybersecurity is fundamentally a knowledge management challenge given the volume of data, perishability, technology changes, and information involved.

F. Strategy

The Strategy dimension focuses on strategic readiness elements vital for planning and directing the organization's short and long-term goals around AI implementation, operations and management.

- Trial-ability: This refers to the ability to experiment with and test AI innovations on a limited basis before broader adoption. It facilitates proof-of-concept trials to deploy, assess and iteratively improve how AI integrates into business processes.

- Business Clarity: This element evaluates how clearly the organization understands AI's expected capabilities, requirements, goals and projected impacts within their specific business context.

- Observable Results: Organizations should identify measurable criteria like process time reduction or efficiency gains to demonstrate observable results when testing and implementing AI solutions. This aids proof-of-concept evaluations and iterative deployment.

- Technology Roadmaps/Scenarios: This encompasses systematic attempts to anticipate the potential rate, direction and effects of AI technology evolution. It focuses on innovation, invention, use and adoption. The emphasis is on whether AI-specific technology roadmaps and scenario planning methods have been developed.

- Technology Forecasting: This dimension examines if the organization has implemented techniques to forecast AI technology trends and developments relevant to their business.

- Agile Delivery: As AI requirements can be fluid, organizations should evaluate adopting agile development methodologies that respond to changing needs through iterative delivery of working AI/software in short cycles to drive continuous value.

In summary, the Strategy dimension analyzes whether strategic planning processes, experimentation methods, forecasting techniques and agile practices are in place to effectively guide the organization's AI implementation journey.

G. Knowledge and Information Management dimension:

This dimension covers the management of knowledge and information resources, which are critical for effectively implementing and operating AI systems.

- Management Information Systems (MIS) and Data Processing: Organizations should establish proper management structures and governance for information systems and data processing related to AI initiatives. This includes processes for collecting, integrating, and analyzing relevant data that will fuel AI models.

- Agent-Based Modeling: Agent-based modeling allows simulating the potential impacts and behaviors of autonomous AI "agents" interacting within dynamic business processes before actual deployment. This computational modeling can identify process improvements and areas requiring adjustment.

- Return on Investment (ROI) Analysis: Estimating AI's projected returns and value generation compared to required investments is vital for building a compelling business case to secure resources and leadership support for AI implementation.

- Enterprise Resource Planning (ERP) for Databases/Software: For larger-scale AI adoption, companies may need to develop an enterprise resource planning strategy governing the required databases, software integration, data flows and system interoperability for managing AI operations across the organization.

- AI Knowledge Management Strategy: In the knowledge economy, effective knowledge management around AI capabilities, best practices and insights becomes a key source

of competitive advantage. A defined strategy should promote AI knowledge sharing and transfer across teams.

- Technology Identification and Selection: When evaluating AI technologies to pursue, a thorough analysis of technology compatibility (with existing systems), projected impacts on business operations, and the maturity/readiness level of the AI solutions is needed to ensure effective integration.

In essence, this dimension examines whether an organization has strong information management practices, simulation capabilities, financial/ROI modeling, and a holistic knowledge management strategy in place to successfully deploy and continuously enhance AI throughout the enterprise. Finally, to understand the whole picture of the presented models and your business readiness, Intel Corporation's Data Center in their White Paper has suggested some question business has to ask themselves when using AI for the first time, the suggested questions are:

- *Is the scenario, use case or problem to be solved with AI clearly defined?*
- *Are priorities set around where AI will deliver the most business value?*
- *Is the planned infrastructure architecture clear and appropriate?*
- *Are all necessary data sources clearly understood and accessible?*
- *Can your chosen software packages deliver the AI solution end-to-end?*
- *Are sufficient skills and resources available (either in-house or externally)?*
- *Have expectations been set around training and learning times?*
- *Are measures in place to monitor business effectiveness of AI solutions?*
- *Is the architecture for AI provided as a platform, rather than as one-off solutions?*
- *Are lines of business fully engaged in how AI will affect their processes?*
- *Are the governance needs of the AI solution clearly understood?*
- *Is AI seen as a central pillar of an IT-enabled business strategy?*

In concluding this section, we've explored the structured approach of AI Maturity Models and Implementation Theories, which serve as essential guides for businesses at different stages of AI adoption. From understanding broad developmental phases to assessing specific readiness dimensions, these models provide the strategic framework necessary for businesses to navigate the complexities of AI integration. As companies reflect on their maturity level and readiness, they are better positioned to devise a

comprehensive AI implementation plan that aligns with their unique objectives and capacities.

2.6 Key performance indicators (KPIs) for AI success in Production Business

When it comes to assessing the success of Artificial Intelligence (AI) in business, Key Performance Indicators (KPIs) play a crucial role. KPIs help in quantifying the effectiveness of AI implementations and guide businesses in understanding the impact of their AI investments. Here are some key aspects to consider when defining KPIs for AI success:

Mean Squared Error (MSE):

MSE is a common metric in machine learning, highlighting the impact of outliers on machine efficiency. It's useful in the early stages of AI implementation to track improvements. However, MSE has limitations in measuring effectiveness over repeated learning iterations and in reducing small errors.

Mean Time to Repair (MTTR):

MTTR measures the time taken to fix a problem. It's crucial for AI projects to minimize downtime and improve response times.

First Contact Resolution Rate (FCRR):

FCRR indicates the percentage of issues resolved by basic support without needing escalation. An effective AI system can improve this rate by equipping first-level support with better problem-solving tools.

IT Support Tickets:

The number of tickets received by IT support is a tangible measure of how much AI is reducing the workload or improving efficiency.

Indirect Metrics:

Indirect metrics like customer satisfaction, net promoter scores, and total cost of ownership are derived from more direct metrics. While important, they should be based on direct, observable metrics.

ROI Measurement:

ROI for AI can be expressed in terms of time, money, or labor savings. It's best to use a metric that is directly observable and measurable, and then translate it to other metrics as necessary. For example, if an organization invests in AI and sees a 20% reduction in MTTR, translating this into cost savings can demonstrate a tangible ROI.

In summary, KPIs for AI success should be clear, measurable, and directly tied to business and IT outcomes. They should not only track technical performance like MSE but also business-oriented metrics like MTTR and FCRR. The ultimate goal is to ensure that AI success translates into overall success for the business, with measurable improvements in efficiency, cost savings, and customer satisfaction.

Methods for evaluating the ROI of AI innovations

Evaluating the Return on Investment (ROI) of AI innovations requires a methodical approach to determine the value AI brings to a business. Here's how to assess the ROI of AI projects:

Determine the Costs and Savings: Calculate the total investment in AI, including development, implementation, and maintenance costs. Assess cost savings due to AI, such as reduced labor costs, decreased error rates, and optimized resource utilization.

Measure Revenue Growth: Track the impact of AI on sales, customer acquisition, and customer lifetime values. AI can drive revenue growth by enhancing customer experiences and improving sales processes.

Assess Efficiency Gains: Evaluate how AI has improved operational efficiency. Metrics such as process cycle time, task completion time, and resource utilization rates are crucial for this assessment.

Analyze Customer Satisfaction: Use surveys, feedback analysis, and customer sentiment monitoring to measure how AI has impacted customer satisfaction.

Benchmark Against Competitors: Compare the AI implementation's success with competitors or industry standards to gauge relative performance.

Predictive Modeling for Future ROI: Use predictive modeling to forecast the potential ROI of AI projects. This involves leveraging historical data and machine learning algorithms to estimate future returns.

ROI Calculation: Calculate the ROI by comparing the net benefits of AI (revenue increase and cost savings) with the total AI investment. Express this as a percentage or a ratio.

Case Studies and Real-world Examples: Look at successful implementations of AI in similar industries or businesses for insights into potential ROI.

By following these methods, businesses can get a clearer picture of the ROI from their AI initiatives, helping to make informed decisions about future investments in AI technologies.

CHAPTER 3: AI Empowerment in Business Decision-Making: A Case Study of ТОВ СП 'СОЛОМІЯ'"

3.1 The Synergy of Human Intuition and AI Analytical Skills: Enhancing Creativity and Decision-Making in the Business Environment

With the appearance of AI, a new human-machine symbiosis is on the horizon, however, the main question remains: How can humans and new artificial intelligence be complementary in organizational decision-making and innovative processes? To address this question, let's delve into the distinction between analytical and intuitive decision-making and discuss potential enhancements in creativity and innovational processes. Furthermore, for the purposes of this discussion, I will focus on analytical AI applications and techniques that imitate and extend human reasoning and the way we conclude large amounts of information.

Researchers have found that managers and employees use two main approaches when processing information and making decisions at work - analytical and intuitive. By employing an analytical approach, individuals can engage in methodical, laborious information gathering and analysis, and develop alternative solutions. An analytical approach often involves analyzing knowledge through conscious reasoning and logical deliberation (Jarrahi M. H. 2018). The problem-solving ability of AI is more useful for supporting analytical rather than intuitive decision-making, as AI encompasses a broad range of applications and algorithms.

Oddly enough, a significant aspect of human cognition and decision-making is not deliberate information gathering and processing but rather emerges from the subconscious realm of intuition. Intuition, within the context of decision-making, is defined as the ability to generate direct knowledge or understanding and arrive at a decision without relying on rational thought or logical inference. Intuitive decision-making encompasses imagination, sensitivity, rumination, creativity, and what psychologists like Carl Jung considered intuitive intelligence: the human capacity to analyze alternatives with a deeper perception, transcending ordinary-level functioning based on simple rational thinking. Through an intuitive approach, the individual draws upon past embodied practices, experiences, and

judgments to react or decide without conscious attention (Jarrahi, M. H., 2018). In contrast, analytical approaches to decision-making rely heavily on depth of information, while intuitive approaches focus on breadth by engaging a problem with a holistic and abstract view. These two styles are not mutually exclusive and are employed as parallel systems of decision-making to more effectively address various contingencies. Although AI systems support an analytical decision-making approach, they are less capable of understanding common-sense situations, and compared to humans, they are less viable in uncertain or unpredictable environments—particularly outside of a predefined domain of knowledge (Guszcza et al., 2017). Despite this, Artificial Intelligence (AI) and other smart technologies can reshape how decisions are made, giving human decision-makers a significant boost through predictive analytics. This technology mainly helps uncover new insights about customers, assets, and operations. Leading consulting firms, such as Deloitte and McKinsey, have been pioneers in creating smart tools. These tools help organizations keep an eye on changes in their external environment, making it easier to plan strategies with a bit of automated help.

AI is particularly good at spotting things that don't look right, offering managers a real-time look at possible signs of trouble. This early warning system is invaluable—it means problems can be dealt with quickly before they grow. By using AI to predict what might happen next, companies can be more proactive, not just waiting for changes but getting ahead of them.

As Jarrahi M. H. noted in his research "Artificial intelligence and the future of work: Human-AI symbiosis in organizational decision making", problems ranging from global crises to technical glitches can disrupt decisions and strategies made through the most information-centric, rational processes. Cognitive technologies can analyze probability-based decision contexts but are ill-equipped to tackle novel problems and situations. Unlike board games, in which the probability of the next action can be calculated, real-world decision-making is messy, and reliance on probabilistic, analytical thinking tends to be insufficient (Jarrahi M. H. 2018).

The value of human intuition is exemplified by Apple's approach to new product decisions. Steve Jobs was known for making quick, intuitive choices rather than relying

heavily on research and analysis. For instance, when designing the original iMac, Jobs immediately decided on releasing the computers in a range of candy-colored shells - a decision Jony Ive noted would typically "take months" but Jobs made "in a half-hour." This indicates Jobs' ingenuity and creativity did not necessarily stem from processing informational inputs or calculating probabilities of success, but from arriving at holistically sensible solutions based on his gut instincts. By doing so, Jobs shaped both the consumer technology market and customer tastes. Abstract thinking and an intuitive approach enable handling unconventional, creative decision-making situations that analytics may miss.

This inherent, inexplicable perception that comes from within is almost impossible for AI to replicate. Machines are mostly unable to capture the inner logic and subconscious patterns behind human intuition. As a result, AI struggles to mirror human problem-solving in areas that require vision and creativity. However, when it comes down to crunching numbers and deep analysis, AI's powerful ability to handle complex calculations and data analysis has outperformed human capabilities. Together with the vast amounts of data available today, AI's method of making decisions based on algorithms has opened new doors. It offers more efficient ways to provide human decision-makers with in-depth data analysis. AI excels because it can process and analyze large volumes of data quickly, simplifying complicated issues. The rise of deep learning has pushed this even further, allowing machines to learn directly from the data itself and improve as they access more information. and as was defined, one potential effective strategy to leverage both AI and human strengths is to merge AI's rapid data processing with the unique intuitive understanding and insight humans bring. This combination promises to enhance decision-making, blending the best of both worlds: AI's speed and humans' depth of judgment.

While machines excel at determining optimal decisions based on data analysis, they may struggle to effectively communicate and gain buy-in from diverse stakeholders. The objective, impartial approach of machines can clash with the subjective, emotion-driven, and context-sensitive nature of humans. Navigating such scenarios requires emotional and social intelligence, which forms the foundation for effective interpersonal skills. As a result, the partnership between human decision-makers and AI can manifest in two ways:

1. Humans and AI technologies can collaborate, dividing responsibilities to leverage their respective strengths, or 2. Even the most complex decisions, where AI holds a comparative advantage, may involve elements of uncertainty and ambiguity, necessitating human involvement. Consequently, for nearly all intricate decision-making processes, humans and AI will play complementary roles, as illustrated in the figure below.
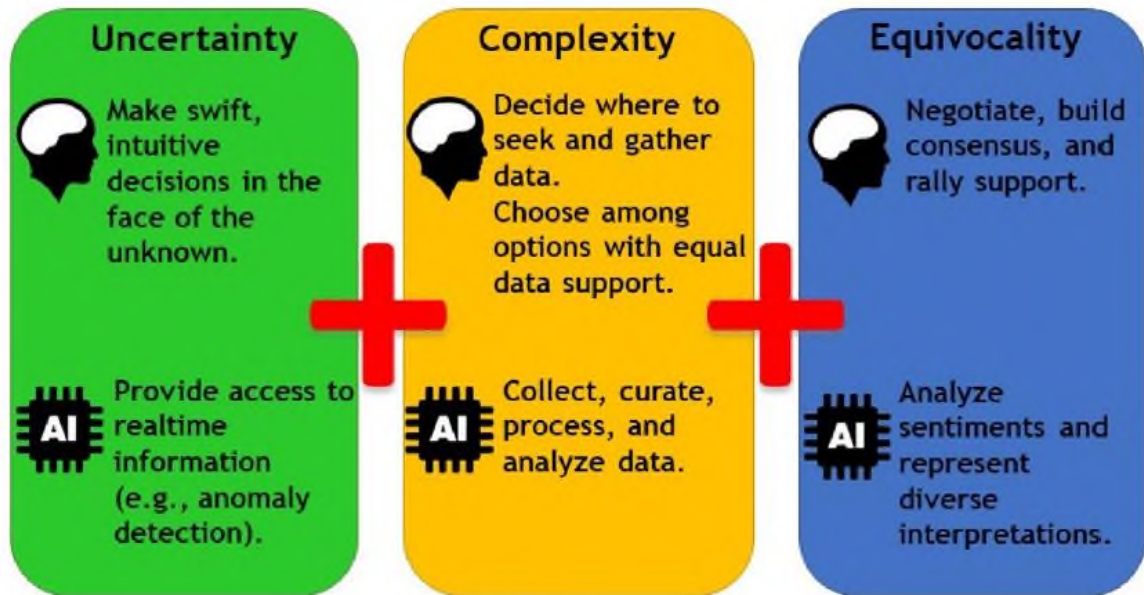

Fig. 3.1: Complementarity of human and AI's decision-making processes. (Source: Jarrahi, M. H. (2018). Artificial intelligence and the future of work: Human-AI symbiosis in organizational decision making.)

This vision calls for proactively identifying areas where AI can augment human decision-making, rather than simply replacing or algorithmically managing humans. Companies like Procter & Gamble and American Express have engaged with AI for years, not to automate processes or eliminate jobs, but to provide a tool for employees to work effectively. Human-AI symbiosis allows interactions where both parties become smarter over time. AI algorithms learn and improve with more data and human interaction, while humans develop nuanced understanding of cognitive machines. AI can support humans in developing analytical skills. As AI evolves, managers and employees must continuously adapt, updating their AI literacy and honing their comparative strengths like intuition and emotional intelligence. Crucially, understanding how AI reaches decisions builds trust for effective human-AI collaboration.

At the core of this AI transformation is also the way AI influences the innovation process. Traditionally, innovation management is a multi-stage journey that includes the generation, development, and selection of innovative ideas and solutions. Historically, this

process has leaned heavily on human creativity and out-of-the-box thinking, especially in the early stages of idea recognition and development. The integration of AI into this process is reshaping the role of human-organized innovation management, allowing companies to redefine their approach to exploring new initiatives.

As was said above, AI helps in overcoming two major barriers faced by innovation managers: constraint of human cognitive capacities and the tendency to rely on familiar knowledge domains, which often leads to incremental rather than groundbreaking innovations. AI, by contrast, can process information far beyond human capabilities and can explore solutions across diverse and unrelated knowledge fields, leading to more creative and innovative outcomes. After all, to profoundly use AI in innovation, it's important to understand where it can assist and even, sometimes, replace human decision-making. There are some key areas where AI can support human decision-making in innovation management:

1) Enhancing the development of ideas by breaking through the limitations of human cognitive processing.

2) Expanding the generation of ideas by leveraging its superior capacity to process information and recognize a broader array of problems, opportunities, and threats.

3) Enriching idea development by transcending conventional search routines and fostering the creation of more inventive concepts.

4) Broadening the ideation process by identifying and leveraging creative and exploratory avenues that may otherwise be overlooked.

Moreover, in the research of Haefner, N., Wincent, J., Parida, V., & Gassmann, O. (2021) there were defined two major barriers to innovations: Information processing constraints and Ineffective/local search routines. AI as a transformative tool in an innovational context provides solutions for how to overcome these barriers as shown in Figure 6 below:

INNOVATION PROCESS		
	Develop ideas	**Generate ideas**
Information processing constraints	**(1)** AI system is able to identify and evaluate *more* information that can then be used to develop ideas.	**(2)** AI system is able to recognize *more* problems, opportunities, and threats that may be used to generate new ideas.
Ineffective or local search routines	**(3)** AI system is able to identify and evaluate more *creative/exploratory* ideas.	**(4)** AI system is able to recognize and create more *creative/exploratory* problems, opportunities, and threats to generate new ideas.

Fig. 3.2: Application areas of AI in the innovation process. Source: Haefner, N., Wincent, J., Parida, V., & Gassmann, O. (2021). Artificial intelligence and innovation management.

This section underscores the complementary strengths of analytical AI and human intuition—a partnership that enhances our ability to navigate complex problems and drive forward innovative solutions. As we turn the page to a new chapter, it's clear that the future of organizational success lies in leveraging this dynamic collaboration, blending AI's computational power with human creativity and insight. This synergy not only addresses current challenges but also sets the stage for future advancements, marking a pivotal shift in how we approach decision-making and innovation in an ever-changing world.

3.2 Recommendations for Implementation of AI Innovation Management for ТОВ СП «СОЛОМІЯ»

One of the Vistage research projects showed that only 22% of small and medium-sized businesses (SMBs) have leaders dedicated to information technology (IT). Most of

these leaders are IT generalists rather than data scientists who know how to seamlessly integrate artificial intelligence (AI) into their businesses. Unfortunately, the company ТОВ СП «СОЛОМІЯ» is among the pioneers and amateurs in using AI and IT technologies for business operations. However, the good news is that the company doesn't need a team of data scientists to gain access to or benefit from AI. The basic principle of managing the company with the help of AI tools is that it doesn't matter what customer relationship management (CRM) systems you use, as these applications are all building AI and machine learning into their solutions. These solutions keep learning from the information entered into the system, so they can start to predict patterns. Manufacturing companies like ТОВ СП «СОЛОМІЯ» don't need to replace their old equipment to access AI or machine learning either. Instead, they can use instrumentation to upgrade that equipment and automate processes. Most manufacturing facilities contain equipment that's 10 to 40 years old, but they can apply instrumentation that will allow to automate processes. After some time of successful and effective utilization, the company can upgrade the automated system again, creating a continuous loop of improvement.

So, to begin using the benefits of AI tools, experts from Vistage recommend focusing on the steps in these four categories:

Strategy - Consider your strategy first. Instead of looking for ways to bring AI into your business, look for ways to use AI to execute the business strategy. The company management have to look at the strategy and say, 'How can the vendors or clients that I work with help me do the strategic things that will help me really grow? How do I use these applications to successfully execute my strategy?' (Vistage, 2018).

Small and medium-sized enterprises (SMEs) like ТОВ СП "СОЛОМІЯ" have limited budgets and typically lack technology expertise, as previously discussed in this research. SMEs also have other priorities competing for their money besides IT, such as marketing, equipment maintenance, salaries, and raw materials. When considering the large sums of their total budget that might go to IT and innovation activities, they want to make sure they spend it on something that will give them the best result and potential for growth. Seeing a direct connection between the investment strategy and the return is critical. For example, investing in new sales and marketing applications is usually a high

priority because the company knows that if they can do a better job of engaging prospects and working with clients, they can make more money (Vistage 2018). Following the same approach, ТОВ СП "СОЛОМІЯ" must define a strategic framework for utilizing AI solutions.

Data management - crucial component for companies looking to implement artificial intelligence technologies. Companies need to identify areas where they have accumulated large amounts of data. Without sufficient data, using AI is unlikely to be effective. The management team at ТОВ СП "СОЛОМІЯ" should also look for data-rich domains that would allow for integrating intelligence solutions.

For example, the company has a large database containing sales data across different regions of Ukraine over the years, including seasonal variations. They also have substantial data on sales of their products through various supermarket chains and retailers. Using this data, the company could effectively forecast demand and sales volumes by considering geopolitical, economic, and market factors. Existing AI tools can assist ТОВ СП "СОЛОМІЯ" in making these predictions by not only analyzing their own data but also data available online. This would be especially helpful when entering new foreign markets where the company lacks prior experience. AI could identify relevant trends and customer behavior specific to those new markets. The technology could also provide insights into potential competitors or rivals. Moreover, for manufacturers like ТОВ СП "СОЛОМІЯ", which mainly operates in the tea market, collecting relevant data is vital for informed decision-making. For instance, if unexpected weather events like cold waves occur due to climate change, or if there's an influenza pandemic, the demand for their products could fluctuate drastically. In such scenarios, leveraging AI technology to make timely decisions about meeting shifting demands and staying ahead of competitors becomes crucial for profitability and success.

In the end, ensuring data integrity is crucial when working with large datasets. Without a centralized customer relationship management (CRM) system, data often ends up scattered across different platforms like spreadsheets, emails, and marketing systems. ТОВ СП "СОЛОМІЯ" needs to consolidate and organize their data to create a solid foundation for AI applications. The company's management should acknowledge the

importance of having structured data before implementing new solutions to avoid perpetuating existing disorganization.

Technology and IT Management - ТОВ СП "СОЛОМІЯ" should also evaluate whether their current software applications and systems, or those they are considering investing in, already have integrated artificial intelligence capabilities. It's quite likely that software vendors have already developed new AI-powered tools based on the applications the company is using. Adopting these enhanced versions would be easier for employees since they are already familiar with the core functions.

The company should not hesitate to seek guidance from their software providers. ТОВ СП "СОЛОМІЯ" can inquire whether the vendors can advise if they are implementing the AI technology correctly or deviating from best practices. The providers can also assist with developing predictive and prescriptive models to anticipate future scenarios. Instead of allocating substantial resources for fundamental AI research, the company should first explore leveraging AI capabilities that can be embedded into their existing applications, as these may offer more immediate benefits.

Another crucial step is identifying repetitive, low-value tasks that can be automated. These are routine tasks that employees spend significant time on, presenting opportunities for optimization. ТОВ СП "СОЛОМІЯ" should evaluate whether applications could automate the execution of such tasks, alleviating time and frustration. If the existing departments lack the capability for such automation, the company could outsource the work or hire professionals temporarily to rebuild the systems.

Finally, considering upgrading outdated equipment with new sensors capable of gathering data analytics is also important. As discussed earlier, additional data can enhance market operations. Similarly, manufacturing processes could be accelerated and improved with data-driven insights. However, ТОВ СП "СОЛОМІЯ" must recognize that this process requires some level of customization, as there is no one-size-fits-all solution.

Expertise - a very important advice for ТОВ СП "СОЛОМІЯ" is to avoid attempting to build AI solutions entirely from scratch. Companies that try this often fail because they underestimate the complexity involved. There are many steps in the process: data preparation, gathering data from various sources, model creation using algorithms, scoring,

and integrating the AI into existing or new systems. It is much more challenging than most realize. Instead, ТОВ СП "СОЛОМІЯ" should consider bringing in an expert to help leverage AI for optimizing their business processes. A subject matter expert can ensure the company understands the data and decisions before relying on AI to make them. For a manufacturing company like ТОВ СП "СОЛОМІЯ", it is crucial to assess whether they have the necessary equipment to collect the data their teams need for AI solutions. The company might have the right equipment to run their plant operations, but not to capture data rapidly enough to solve technological problems.

Overall, while small and medium enterprises often face budgetary constraints and lack technological expertise, it is essential to establish a clear connection between investments in AI solutions and their potential returns. This is especially important when priorities like acquiring new equipment or hiring personnel are competing for the same resources.

Employee Education and Training in AI at ТОВ СП "СОЛОМІЯ"

First and foremost, before implementing any of Artificial Intelligence (AI) based technologies and solutions, the company must assure that its employees are well educated and familiar with the topic and usage of AI as a whole. Recent research by Jobs for the Future's Center for Artificial Intelligence & the Future of Work underscores a significant trend: a substantial portion of the workforce anticipates the need for new skills to navigate the evolving landscape shaped by artificial intelligence (AI) and highlights that over half of adults believe they need to upskill within the next year to cope with AI impacts. Both the workforce and learners are acknowledging the profound changes AI promises to bring, exhibiting a proactive approach in seeking training opportunities. Despite this enthusiasm, there is some skepticism about the support structures currently in place to facilitate this transition. This is a crucial juncture for organizations to prioritize educational initiatives to ensure no worker is left behind in the digital shift.

As AI increasingly permeates various aspects of professional environments, a majority of workers (58%) show a willingness to engage in learning opportunities that enhance their AI capabilities at work, surpassing those concerned about job displacement (29%) or negative impacts on their companies (35%). Interestingly, individuals already

experiencing AI in their roles are twice as likely to view AI as beneficial rather than detrimental. However, the penetration of AI into daily operations remains low, with fewer than 10% of employees currently encountering AI in their jobs. Skepticism about AI's future implications persists, with 26% of adults doubtful about its impact on their personal and professional lives—indicative of a significant gap between AI's potential benefits and its perceived threats. This gap underscores the need for comprehensive training programs that not only educate but also build trust in AI technologies. For companies like ТОВ СП "СОЛОМІЯ", the development of targeted educational programs is essential. These programs should aim to demystify AI, highlight its practical benefits, and address common fears and misconceptions before its implementation into daily business operations. Such initiatives would not only prepare the workforce for imminent technological shifts but also foster an environment that embraces change. By investing in employee education, ТОВ СП "СОЛОМІЯ" can enhance its competitive edge, foster innovation, and ensure that its team is equipped to harness the full potential of AI technologies.

The integration of AI in business processes presents a challenge but also a valuable opportunity for innovation and growth. Gartner's concept of the hype cycle provides a useful framework for understanding the stages of adoption and acceptance of new technologies like AI. At ТОВ СП "СОЛОМІЯ", harnessing this model can strategically guide the rollout of AI training programs. Here's how the hype cycle stages apply to employee training in AI:

Innovation Trigger: AI technologies trigger new excitement within SME, echoing across various departments eager to explore potential enhancements to their workflows. This initial enthusiasm is the perfect catalyst for introducing foundational AI training programs.

Window of Opportunity: As excitement builds, SMEs like ТОВ СП "СОЛОМІЯ" have a critical window to educate its workforce before confusion or skepticism set in. Structured training sessions can demystify AI, showcasing its practical benefits and integrating AI tools seamlessly into daily tasks.

Trough of Disillusionment: It's natural for employees to experience setbacks as they begin to apply AI in their roles. Early failures may lead to disillusionment,

highlighting the need for supportive learning environments and iterative training approaches that encourage persistence and adjustment.

Slope of Enlightenment: Over time, as more AI tools become commercially viable and employees become more adept at leveraging AI, the collective understanding deepens. This phase is marked by an increase in effective applications and an ecosystem of support within the company.

Plateau of Productivity: AI technology becomes a mainstream element of the workflow at ТОВ СП "СОЛОМІЯ". Companies that invested early in comprehensive AI training are now experiencing heightened productivity, innovation, and a competitive edge in the market.

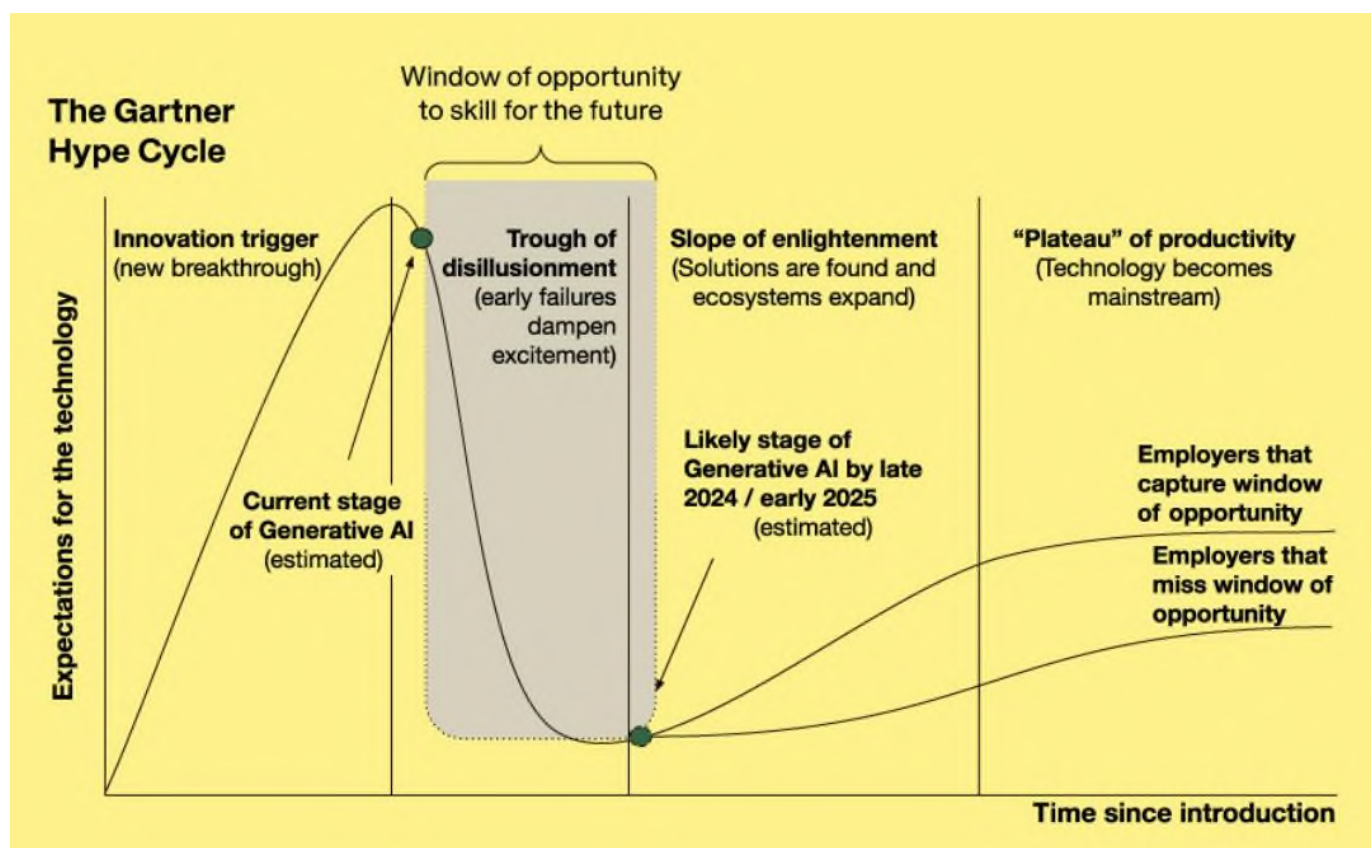The figure below depicts the Gartner's hype cycle concept visually:

Fig. 3.3: Gartner's hype cycle for Implementation of AI in business operations. Source: Guild Education (2024).

For ТОВ СП "СОЛОМІЯ", investing in AI training is not just about staying current with technological trends but about seizing a strategic opportunity to enhance overall business efficiency and competitiveness. Proper AI training equips frontline workers with tools that streamline their tasks, ultimately freeing up substantial amounts of time and

boosting productivity. Innovative employers recognize that AI training is not a one-size-fits-all solution. It's about aligning training initiatives with specific business goals and the unique desires of their workforce. ТОВ СП "СОЛОМІЯ" needs to assess its operational needs and employee roles to develop tailored AI training programs that address specific pain points and enhance their roles effectively. Moreover, the attitude of employers towards AI training plays a critical role in its acceptance and integration within the company. By promoting a culture that views AI as an empowering tool rather than a threat, ТОВ СП "СОЛОМІЯ" can foster a positive environment that encourages active participation and innovation among its employees. This approach can mitigate fears and build a more resilient and adaptive organization. Furthermore, recognizing that different employee groups within the company will have varying needs and impacts from AI is crucial. While leadership and executives might need strategic understanding of AI's potential and implications, frontline employees might require more practical and technical training. ТОВ СП "СОЛОМІЯ" should therefore offer diversified programs that cater to these distinct needs, ensuring all employees are equipped to contribute effectively in an AI-enhanced workplace.

The current year, 2024, presents an optimal moment for ТОВ СП "СОЛОМІЯ" to begin offering extensive AI training. By capitalizing on the present excitement around AI, the company can cultivate advanced skills that will become indispensable. The most forward-thinking companies are those that not only adapt to new technologies but also actively shape their implementation and integration strategies. By fostering a culture that embraces AI, ТОВ СП "СОЛОМІЯ" positions itself to lead in innovation and secure long-term success.

So, what should the company do?

For ТОВ СП "СОЛОМІЯ" to effectively harness AI, the company should adopt a structured yet flexible approach to employee training, focusing on skill adoption, engagement, and accessibility. ТОВ СП "СОЛОМІЯ" should identify the AI skills necessary across different departments and develop customized training that integrates into employees' personal development plans. This aligns their career goals with the company's strategic needs. For example, the company can foster a supportive environment by

educating employees about AI's benefits through internal campaigns, establishing regular feedback loops, and creating recognition programs that reward innovative use of AI. Also, ensuring all employees have access to AI training regardless of their location or schedule is crucial. The company could offer various learning platforms and a resource center for on-demand access to AI materials. The training should empower employees to direct their learning paths, enhance AI literacy to prevent workforce equity gaps, and focus on building durable skills like critical thinking and adaptability. The content should cover AI fundamentals, practical application, expert development, and strategic use for leaders.

Based on a recent study by EdX for business, less than a quarter of employees say they are using their company's AI-skills training programs and it's not for lack of interest, just because almost four in ten said they would leave their job for a place with better AI training. So, it's clear that for ТОВ СП "СОЛОМІЯ" to effectively implement AI training, they need to make sure it's relevant and addresses employees' needs and concerns. The study found that many employees feel corporate training programs are ineffective because they seem to benefit the company more than the employees themselves. At ТОВ СП "СОЛОМІЯ", they could change this perception by clearly explaining how AI training can make employees' daily tasks easier, help them advance their careers, and increase job security - focusing on the personal benefits along with how it helps the company. Additionally, many workers are worried that AI might replace their jobs. ТОВ СП "СОЛОМІЯ" should directly address these fears by being transparent about how AI is expected to impact different roles within the company. Openly communicating how AI will shape the future of work, and make it clear the company plans to use AI to complement human skills rather than replace people, can help reduce fears and build trust.

By focusing on these areas ТОВ СП "СОЛОМІЯ" can develop AI training that genuinely benefits and appeals to employees, leading to better engagement and more effective use of AI in the workplace.

Conclusion and Proposals

The conclusions drawn from this thesis reflect a deep understanding of the complexities involved in integrating AI-powered innovations within SMEs, particularly exemplified by the case of ТОВ СП "СОЛОМІЯ". This analysis underscores that while the potential of AI to transform business operations is significant, the pathway to successful integration is laden with strategic and operational challenges that require thoughtful navigation. The evidence presented suggests that AI can dramatically enhance operational efficiency, foster innovation, and sharpen competitive edges on market. However, these benefits are contingent upon an SME's ability to align AI strategies with its unique business context, including its operational capabilities, workforce dynamics, and market conditions. Moreover, the research highlights that SMEs face notable barriers when adopting AI, such as high implementation costs, technological complexity, and a pressing need for specialized skills among employees. For businesses like ТОВ СП "СОЛОМІЯ", these challenges are magnified by limited resources and the need for strategic prioritization. Effective AI adoption thus requires a bespoke approach that considers both the immediate benefits and the long-term implications of digital transformation. This approach should be flexible enough to adapt to new technologies and market dynamics while ensuring that the core business objectives are met.

It was found in this research, that SMEs must focus intensively on their internal capabilities, particularly in the realm of data management. Effective data governance is paramount as AI systems rely heavily on the quality and integrity of the data they process. This entails not merely the collection and storage of data but ensuring its accuracy, legality, and security. Robust data management strategies enable SMEs to leverage data as a strategic asset, driving more informed decision-making and yielding richer insights that can propel business growth and operational efficiency. Another critical aspect that SMEs must rigorously address is the ethical deployment of AI technologies. As the adoption of AI expands, the implications of its use must be considered carefully to avoid potential pitfalls related to privacy, bias, and transparency. SMEs like ТОВ СП "СОЛОМІЯ" need to establish and adhere to strict ethical guidelines and practices that govern AI usage. This

commitment should manifest in their operational procedures, reflecting a proactive approach to ethical concerns that could affect consumer trust and corporate reputation. Ensuring that AI is used responsibly also aligns with regulatory expectations and helps maintain compliance with global standards.

Moreover, the dynamic nature of technology, particularly AI, necessitates an ongoing commitment to learning and development within SMEs. As AI technologies evolve, the methodologies and tools at the disposal of businesses also change. To stay ahead, SMEs must invest in continuous training programs that not only upskill employees but also foster a culture of innovation and agility. This culture encourages the exploration of new ideas and solutions, thereby maintaining the business's competitive edge in a rapidly changing technological landscape.

These foundational elements—data governance, ethical practices, strategy and continuous learning—form the pillars upon which SMEs can build a robust strategy for AI integration. However, the actual implementation of AI should be approached with caution and strategic foresight. It is advisable for SMEs to adopt a phased approach to AI integration, starting with smaller, less critical areas of operation. This method allows businesses to test and learn from AI deployments in a controlled environment, minimizing potential disruptions and maximizing learning opportunities. By gradually scaling AI solutions across the business, SMEs can manage risks more effectively and refine their AI strategies based on real-world experiences and outcomes. This iterative process not only enhances the organization's understanding of AI's potential but also aligns technological initiatives with broader business objectives, ensuring that each step of integration delivers tangible value.

Overall, the journey toward effective AI integration in SMEs like ТОВ СП "СОЛОМІЯ" is multifaceted and requires a balanced approach that combines strategic external collaborations with strong internal capabilities and ethical practices. As we delve deeper into the specifics of AI deployment and the continuous improvement frameworks necessary for sustaining AI-driven innovations, it becomes clear that navigating the complexities of artificial intelligence (AI) adoption is as much about managing technological transformations as it is about adapting organizational structures and

processes to support these changes effectively. For SMEs like ТОВ СП "СОЛОМІЯ", the integration of AI presents unique opportunities to enhance operational efficiencies, but it also demands careful planning to ensure that the technology aligns with and supports the company's strategic objectives. As SMEs progressively integrate AI into their operations, it becomes imperative to establish a framework that supports iterative learning and adaptation. This approach ensures that AI technologies are not merely implemented, but are continuously evaluated and improved upon. This continuous improvement framework involves regular feedback loops, where data collected from AI systems is analyzed to understand its impact on business operations and outcomes. Such a strategy enables SMEs to make adjustments based on performance metrics and evolving business needs, thereby optimizing the benefits of AI over time. As AI becomes more embedded in the operational fabric of the company, SMEs must remain aware about the scalability and sustainability of these technologies. This includes ensuring that AI systems can scale with the growth of the business and continue to provide value as company needs evolve. Scalability challenges might involve data storage needs, processing power, and the integration of AI into increasingly complex operational processes. Addressing these challenges proactively can prevent potential bottlenecks and ensure that AI solutions enhance business agility rather than impede it.

Furthermore, the role of leadership and proper management in driving AI initiatives cannot be overstated. Effective management is crucial for championing AI integration within SMEs. Leaders must not only provide a clear vision and allocate resources for AI projects but also foster an organizational culture that embraces change and innovation. This involves leaders themselves becoming conversant with AI capabilities and potential impacts, which enables them to make informed decisions and guide their organizations through the digital transformation journey. To successfully manage and guide AI integration, SMEs should also focus on developing robust governance structures. These structures are designed to oversee the ethical use of AI, ensure compliance with regulations, and manage risks associated with AI technologies. Effective governance frameworks help in maintaining oversight of AI projects, ensuring that they remain aligned with the ethical standards and strategic goals of the organization. This is

particularly important as the use of AI can raise complex ethical and regulatory issues that require careful consideration and management.

Ultimately, the journey toward AI integration for SMEs like ТОВ СП "СОЛОМІЯ" is ongoing and dynamic. It requires a balanced approach that recognizes the potential of AI to drive innovation and efficiency, while also acknowledging the challenges and responsibilities that come with its adoption. By adopting a phased and thoughtful approach to AI integration, continuously learning and adapting to new information, and ensuring robust governance, SMEs can leverage AI to not only transform their operations but also to drive sustained growth and competitive advantage in the digital era. As this thesis concludes, it is clear that while the path to AI maturity involves various challenges, the strategic and thoughtful integration of AI within SMEs can lead to substantial benefits, transforming not just business processes but also enabling these companies to innovate and lead in an increasingly technology-driven marketplace.

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