

# From Algorithms to Applications: The Perspective of Young Controllers on Innovations in Controlling and Finance

Workshop assignments of Students specializing in Controlling  
in the Accounting and Controlling Program  
at Krakow University of Economics

Edited by  
Janusz Nesterak  
Anna Kołodko  
Olga Malinowska



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# Table of contents

	<b>Introduction</b>	6
	<b>Part I</b>	
	<b>ARTIFICIAL INTELLIGENCE AND TECHNOLOGY INTEGRATION</b>	10
Poster 1	<b>A FUTURE OF ARTIFICIAL INTELLIGENCE - NAVIGATING THE RISKS AND ETHICAL DILEMMAS</b> Zuzanna Szczepaniak, Aleksandra Barnaś, Kamila Podolak	11
Poster 2	<b>AI AND AUTOMATION TRANSFORMING THE FUTURE OF WORK</b> Zofia Klementowska, Patrycja Ojczyk, Kamila Witek-Kuzioła	12
Poster 3	<b>AI TOOLS IMPLEMENTATION IN LOGISTICS</b> Kacper Czerwiński, Michał Duroń, Wojciech Fedec	13
Poster 4	<b>ARTIFICIAL INTELLIGENCE - HOW WILL IT HELP ACCOUNTANTS?</b> Agnieszka Kunas, Natalia Lachendro, Sylwia Misiek	14
Poster 5	<b>ARTIFICIAL INTELLIGENCE ART - WILL IT TAKE OVER THE ART WORLD?</b> Agata Sandecka, Natalia Rogowska	15
Poster 6	<b>ARTIFICIAL INTELLIGENCE IN ACCOUNTING AND FINANCE: CHALLENGES AND OPPORTUNITIES</b> Jakub Sławkowski, Maksymilian Strychała	16
Poster 7	<b>ARTIFICIAL INTELLIGENCE IN EDUCATION</b> Milena Pustelnik, Kinga Stachura, Mariola Toporkiewicz	17
Poster 8	<b>ARTIFICIAL INTELLIGENCE IN PRACTICE</b> Gabriela Raczek, Maria Tarnówka-Knapik	18
Poster 9	<b>ARTIFICIAL INTELLIGENCE IN STOCK MARKET INVESTING</b> Julia Maroszek, Natalia Malisz	19
Poster 10	<b>AUTOMATION AND AI TOOLS IN CONTROLLING</b> Szymon Raus, Andrii Savenkoa	20
Poster 11	<b>ETHICS OF ARTIFICIAL INTELLIGENCE</b> Magdalena Dziędziół, Zuzanna Kucharska	21
Poster 12	<b>FROM GESTURES TO SPEECH: AI'S ROLE IN SIGN LANGUAGE RECOGNITION AND TRANSLATION</b> Michał Bobek, Jakub Rogacz, Mateusz Kozak	22
Poster 13	<b>INDUSTRY 4.0 TECHNOLOGIES IN THE WORK OF A PRODUCTION CONTROLLER</b> Weronika Firek, Weronika Jankowska	23
Poster 14	<b>OPTIMIZING RISK MANAGEMENT WITH AI TECHNOLOGY</b> Natalia Atanasov Ancew, Natalia Dzięgiel	24
Poster 15	<b>PROMPT ENGINEERING</b> Weronika Kukła, Wiktoria Kobylańska, Aleksandra Płaszczak	25
Poster 16	<b>THE FUTURE OF BUSINESS: INTEGRATING ARTIFICIAL INTELLIGENCE AND DIGITIZATION</b> Kacper Szewczak, Jakub Jurczak	26
Poster 17	<b>THE POWER OF PROMPTS: BUILDING MORE EFFECTIVE PROMPTS FOR AI TOOLS</b> Katarzyna Sumara, Jan Gadula	27
Poster 18	<b>USING AI TO AUTOMATE THE RECRUITMENT PROCESS</b> Katarzyna Ściga, Patrycja Tutaj, Maria Wąchadło	28
Poster 19	<b>VOICE SYNTHESIS WITH AI - THE FUTURE OR THE DANGER?</b> Maciej Trzop, Marcin Śliwa	29

	<b>Part II</b>	<b>BUSINESS PROCESSES AND FINANCIAL MANAGEMENT</b> .....	30
Poster 20		<b>AIR TRAFFIC MANAGEMENT (ATM) AND CONTROL SYSTEMS IN POLAND</b>	
		Weronika Lasek, Oskar Lipski .....	31
Poster 21		<b>AUTOMATIC PAYMENT PROCESS IN THE ERP SYSTEM</b>	
		Małgorzata Węgrzyn, Anita Byś .....	32
Poster 22		<b>AUTOMATION AND COMPUTERIZATION – AN OPPORTUNITY OR A THREAT FOR CONTROLLERS, ANALYSTS, AND FINANCIERS?</b>	
		Sylvia Mil, Emilia Fortuńska, Magdalena Karska .....	33
Poster 23		<b>BLOCKCHAIN TECHNOLOGY IN FINANCE</b>	
		Agnieszka Mirek, Alicja Widawska .....	34
Poster 24		<b>BOTTLENECKS IN CONTROLLING</b>	
		Aleksandra Sitarz, Julia Kubik, Anna Meus .....	35
Poster 25		<b>COMPANY BANKRUPTCY IN POLAND</b>	
		Monika Poradowska, Karolina Przybyła .....	36
Poster 26		<b>CV OF A MODERN CONTROLLER</b>	
		Urszula Piwowarczyk, Julia Tataruch, Karolina Tylka-Wojtyczek .....	37
Poster 27		<b>DATA SECURITY IN THE ERA OF CONTROLLING</b>	
		Jowita Włosek, Oliwia Szczurowska .....	38
Poster 28		<b>DIGITALIZATION PROCESS IN THE POLISH PUBLIC ADMINISTRATION</b>	
		Natalia Apostolik, Wiktoria Jatczyszyn, Dominika Kulawiak .....	39
Poster 29		<b>E-ADMINISTRATION IN ESTONIA</b>	
		Magdalena Margazyn, Paulina Ziętek .....	40
Poster 30		<b>ENTERPRISE RESOURCE PLANNING (ERP) SYSTEMS</b>	
		Maria Tomaszewska, Martyna Okoń .....	41
Poster 31		<b>HOW CAN I IMPROVE THE WORK OF A FINANCIAL CONTROLLER?</b>	
		Małgorzata Kozioł, Paulina Kacińska .....	42
Poster 32		<b>INTEGRATED INFORMATIZATION SOLUTIONS FOR FURNITURE ENTERPRISES</b>	
		Marcin Bańka, Arkadiusz Błaszyński .....	43
Poster 33		<b>KEY PERFORMANCE INDICATORS</b>	
		Maria Jednaka, Malwina Jemioło, Mateusz Marzec .....	44
Poster 34		<b>LOGISTICS CONTROLLING</b>	
		Kinga Kasznik, Monika Namysło .....	45
Poster 35		<b>ROSSUM - THE FUTURE OF FINANCIAL EFFICIENCY OR THE END OF THE ACCOUNTING PROFESSION?</b>	
		Monika Przywara, Natalia Szczygieł, Klaudia Szymańska .....	46
Poster 36		<b>THE CRUCIAL ROLE OF CONTROLLING IN COMPANY FINANCIAL MANAGEMENT</b>	
		Patrycja Żurek, Teresa Wiercioch .....	47
Poster 37		<b>THE USE OF COBOTS IN THE AUTOMOTIVE INDUSTRY</b>	
		Dawid Banyś, Justyna Kuc .....	48
Poster 38		<b>UNLOCKING THE FUTURE: CENTRAL BANK DIGITAL CURRENCY (CBDC)</b>	
		Karolina Górnik, Anita Dudek .....	49
Poster 39		<b>UTILIZING BIG DATA PROCESSING TECHNIQUES FOR MARKET TRENDS FORECASTING</b>	
		Mateusz Gacek, Kacper Duda .....	50

	<b>Part III</b>	<b>BUSINESS PROCESSES AND FINANCIAL MANAGEMENT</b>	51
Poster 40		<b>A NEW ERA OF GASTRONOMY TECHNOLOGY</b>	
	Kacper Piekara		52
Poster 41		<b>ADVANTAGES OF REMOTE WORK</b>	
	Viktorii Kravchenko, Paulina Raś		53
Poster 42		<b>BLIK AS THE MOST CONVENIENT POLISH FORM OF PAYMENT</b>	
	Wiktor Kozubal, Aleksander Gruszka, Łukasz Nowak		54
Poster 43		<b>CBDC</b>	
	Kamil Ciszek, Aleksander Perek, Filip Piskorz		55
Poster 44		<b>CHATGPT APPLICATION AREAS</b>	
	Julia Dragan, Julia Jawniak		56
Poster 45		<b>CHESS MATE IN BUSINESS: USING CHESS STRATEGIES TO WIN IN THE MARKETPLACE</b>	
	Eliza Pomorska, Natalia Powęska, Aldona Skoczeń		57
Poster 46		<b>CONTINUOUS IMPROVEMENT</b>	
	Marcin Bąk, Przemysław Górski, Emilia Kozak		58
Poster 47		<b>CONTROLLING PROFESSION ACROSS GENERATIONS</b>	
	Nikola Pach, Julia Zaitz, Julia Stasicka		59
Poster 48		<b>CYBERSECURITY - THREATS AND PREVENTION METHODS</b>	
	Natalia Pachol, Natalia Piętoń, Justyna Skrzela		60
Poster 49		<b>DATA-DRIVEN DECISIONS OF ZARA</b>	
	Oliwia Milowska, Aleksandra Nabywaniec		61
Poster 50		<b>DISCOVER NEW LIFE POSSIBILITIES, INTERACTIVE WORLD</b>	
	Maja Gil, Sandra Stępień		62
Poster 51		<b>HOME OFFICE</b>	
	Klaudia Talaga, Marika Tokarska		63
Poster 52		<b>HOW TO DEAL WITH BLOCKED ORDER?</b>	
	Karolina Bałabuch, Oliwia Osuch		64
Poster 53		<b>IS CHATGPT ALWAYS RIGHT?</b>	
	Kamila Jurasz, Magdalena Kasowicz, Paulina Kasowicz		65
Poster 54		<b>MASSIVE CARBON EMISSION IN AIRPLANE</b>	
	Daria Szuba-Łata, Karolina Żuchowicz		66
Poster 55		<b>POST-PANDEMIC REMOTE WORK: BENEFITS, CHALLENGES, AND FUTURE PERSPECTIVES</b>	
	Joanna Leżoń, Kinga Sorota		67
Poster 56		<b>SOCIAL MEDIA MARKETING</b>	
	Iga Gaweł, Maria Mikołajek		68
Poster 57		<b>SYNERGISTIC RELATIONSHIP OF STANDARDIZATION &amp; AUTOMATION</b>	
	Jakub Maj, Mateusz Korban		69
Poster 58		<b>THE AGE OF ROBOTS: CHANGES IN THE JOB MARKET</b>	
	Julia Gardziel, Emilia Szydłowska, Kamila Wyczęsana		70
Poster 59		<b>TRANSFORMATION INTO THE FUTURE BUSINESS TRANSITION</b>	
	Natalia Malada, Aleksandra Pater		71
Poster 60		<b>TYPES OF MOTIVATION AND THEIR INFLUENCES</b>	
	Natalia Banach, Gabriela Furtak, Anna Kaczmarczyk		72
Poster 61		<b>WOMEN IN LEADERSHIP</b>	
	Magdalena Nazimek, Albert Pęk, Zuzanna Pilch		73
Poster 62		<b>WORK-LIFE BALANCE</b>	
	Kamila Stokłosa, Anna Zając		74

# Introduction

AI is the natural continuation of the digital era, initiated decades ago, representing the next stage in the evolving technology that profoundly impacts our lives and work. In the context of the current debate surrounding artificial intelligence (AI), numerous developments address the deep implications of AI across various social dimensions. As we delve into these topics, it becomes evident that AI is not merely a technological evolution but a crucial force transforming our world.

This year, a group of undergraduate and master's degree graduates in Accounting and Controlling from the University of Economics in Krakow concluded their formal education, joining the professional ranks of financial controllers. These young enthusiasts of controlling passionately showcased their professional competencies, engaging in lively discussions about controlling aspects, essential IT technologies, and the challenges posed by working in a dynamically changing world.

This publication is a compilation of posters presented by 147 young scientists – graduates participating in classes conducted by Professor Janusz Nesterak titled "IT Tools in Controlling" (undergraduate studies) and "Controlling System and Business Intelligence" (master's studies). The collection of posters, highly inspiring and addressing the impact of technology on business in public and private life and directly on social life, portrays a deeper exploration of artificial intelligence (AI) and its multifaceted impact on contemporary industries and ethical landscapes. As we immerse ourselves in the dynamics of transformational AI technologies, this series of meticulously crafted posters proves to be not only informative but also thought-provoking – among academics, businesspeople, and public administration and organizational bodies who participated in this year's international CMQ2024 conference, organized by the College of Management and Quality Sciences at the University of Economics in Krakow.

Each poster in this collection showcases advanced AI applications, from streamlining complex business operations through automation technologies to enhancing the efficiency of decision-making processes in finance and beyond. Through visuals, students reveal how AI tools are not only transforming the structure of sectors such as logistics, healthcare, and education but also posing significant ethical challenges and questions that provoke intense debate and critical analyses.

Our collection of posters by students and graduates from the University of Economics in Krakow, specialising in Controlling within the field of Accounting and Controlling, aims to reflect the latest trends and discussions in the field of AI, offering a vivid picture of the potentials and pitfalls of these technologies. Whether through exploring the subtle implications of AI in risk management, considering the ethical dimensions of workplace automation, or examining the growing role of AI in creative industries, these posters serve as windows wide open to deeper understanding and engagement.

Summarising this collection of posters, each one provides insight into how AI technologies are being integrated into various industries, highlighting their significance for future careers in economics and business. It is a unique opportunity to bridge theoretical knowledge with real-world applications, breaking the barrier between classroom learning and industry practice. We invite readers of this monograph to engage with its content, challenge the ideas presented, and allow these visual narratives to inspire critical thinking about the role of AI in shaping our global economic landscape. This is more than just an academic exercise; it is a look at the tools we can use now to rethink further development and redefine future markets.

The collection of posters presented in this monograph is divided into three parts, connected by the main theme of technology, which, by bringing innovative solutions to societies globally, directly impacts both

global and national businesses. Its numerous practical applications make it accessible to almost every citizen of the world, influencing the social fabric locally and globally almost simultaneously, becoming a set of tools that can be shaped and adapted for personal use.

In **first part** of posters, titled "**Artificial Intelligence and Technology Integration**", the journey begins with an exploration of AI's capability to interpret and translate sign language, marking a significant leap forward in inclusivity and communication for the deaf and hard-of-hearing communities. Gesture-to-speech technology exemplifies how AI can bridge gaps between diverse human experiences, fostering a more inclusive society. Moving forward, we delve into ethical considerations, a fundamental pillar in AI dialogue, emphasizing the need for responsible development and implementation of AI technologies. Ethical discourse addresses the moral imperatives to prevent biases, ensure transparency, and protect individual privacy in an increasingly automated world.

The integration of AI into the workforce unveils both opportunities and challenges, as automation and AI tools transform professional roles and industries, necessitating the reevaluation of skills and job designs. This transformation extends to the field of education, where AI revolutionises teaching methodologies and personalises learning experiences, making education more accessible and effective by developing skills and expanding knowledge across various disciplines.

Creative industries also experience the disruptive power of AI, particularly in the world of art, where AI-generated art challenges traditional notions of creativity and artistic ownership. This intersection of technology and creativity sparks a debate on the future role of human artists, copyright issues, and the essence of artistic power, prompting us to reflect on whether imitating and using the aesthetics of others' works, inherently unique to their creators, is ethically sound.

In the business sector, AI and digitalisation are becoming crucial for strategic operations, enhancing decision-making, optimising efficiency, and driving innovation. Similarly, in logistics, AI tools streamline operations, improve accuracy, and reduce costs, revolutionising supply chain management and the logistics industry as a whole.

Accounting and finance, which saw the earliest digitalisation and automation many years ago, regard AI as a transformative tool, automating routine tasks and enhancing analytical capabilities, supporting more strategic financial decision-making. The stock market also leverages AI to analyse vast amounts of data to gain insights into investment opportunities, reshaping the landscape of investment both nationally and globally.

However, as AI evolves, so do the complexities of its integration. The use of AI in recruitment processes highlights the balance companies must strike between efficiency and fairness, while the development of AI voice synthesis technology carries significant implications for personal identity and security.

The concept of prompt engineering emerges as a crucial skill in the AI toolkit, improving human-AI interactions to achieve more relevant and contextually appropriate outcomes. Meanwhile, the role of AI in risk management exemplifies its potential to predict and mitigate risks with unparalleled precision.

Finally, looking to the future, as we continue the dialogue around AI, we must consider how to navigate the ethical dilemmas and risks associated with its widespread adoption. Ensuring that AI serves the broader interests of society while managing its inherent risks is paramount for both users and creators of AI, to realise its full potential in a manner that harmonises with the ethical and socio-economic fabric of modern society. After all, technology that we cannot harness and whose development and algorithms we do not fully understand can be harmful and ultimately unnecessary. Therefore, it is essential to bring AI under legal and ethical frameworks to ensure its use is free from doubt.

**"Business Processes and Financial Management"** is the second part of the monograph, which compiles posters presenting the themes of business processes, financial management, and the technological transformations shaping these fields. This collection of works by young adepts of the art of controlling features visualizations through which it is possible to immerse oneself in the topic of integrating digital tools into traditional business functions, allowing an exploration of how they redefine, among other things, financial controls, payment processes, and performance management.

From the digitalisation of public administration in Poland to the advanced use of collaborative robots (cobots) in the automotive industry, these posters map the evolution of business environments driven by technological innovations. We can see how e-administration in Estonia sets a global standard while considering the implications of comprehensive enterprise resource planning (ERP) systems that streamline business operations from the ground up.

Viewing this remarkable collection, we can see that the students do not shy away from critical aspects of data security, especially in the era of controlling, where the protection of financial information is a priority. The role of controlling remains highly relevant in financial management and decision-making. Additionally, the transformational potential of blockchain technology in finance, as the technology for the most secure financial transactions, illustrates its impact on the transparency and efficiency of payments worldwide.

The images presented in the posters address the dynamics of company bankruptcies in Poland and the integration of automated payment processes in ERP systems, signalling significant changes in how companies manage finances and liabilities. Relating these to the human aspect, the poster collection also prompts provocative questions about the future of the accounting profession with innovations like Rossum, challenging traditional roles and practices.

Following the path of the modern worker, such as the controller and financier, the modern controller's career and the identification of bottlenecks in controlling are analysed to provide insight into the evolving roles and challenges faced by financial professionals today. These professionals, engaged in their daily work using big data processing techniques to forecast market trends, refine the key performance indicators (KPIs) that can drive business success through measurable benchmarks.

For those interested in the broader implications of technology, through their posters, the student authors discuss both the opportunities and threats that automation and computerisation pose for controllers, analysts, and financiers. They also examine integrated IT solutions for niche markets such as furniture enterprises and the specialized field of logistics controlling. Moving towards images presenting the world of air traffic management and control systems in Poland, we understand how these critical infrastructures are managed amid increasing digital interventions through an interesting presentation.

This second collection of posters aims not only to inform but also to inspire critical assessment and engagement with the latest trends and topics in business management and financial practices. Young controllers and future economists invite readers to reflect on how these innovations can shape careers and the global economic landscape. By delving into the posters contained in this second part, we feast upon the images created by the youth, representing a meticulously crafted exploration of modernity where theory meets practical application in the dynamic world of economics.

In **the third and final section**, titled **"Social Dynamics and Workplace Evolution"**, the reader, akin to a gallery visitor, encounters a wealth of topics capturing the pulse of the modern world through the eyes of those on the brink of entering it. This dynamic area pertains to social themes and the evolution of the workplace, impacting each of us.



Graduates, both undergraduate and postgraduate students specializing in Controlling within the Accounting and Controlling program at the University of Economics in Krakow, invite us to fully engage with their unique poster exhibition. This showcase invites discussion on the profound changes occurring in the labour market in the "Age of Robots," where automation and artificial intelligence are redefining traditional roles and skill requirements. Through exploring these posters, we will discover the pervasive impact of social media marketing on shaping consumer behaviour and brand interactions and delve into how technologies like BLIK are revolutionizing payment methods in Poland, highlighting the synergy between user convenience and banking innovation.

Following the theme of workplace transformation, especially through the lens of remote work – a trend accelerated by the pandemic, presenting both challenges and opportunities for work-life balance – we simultaneously observe that workplaces are also scrutinized through explorations of new technological frontiers in the gastronomic industry. Here, advancements promise to redefine dining experiences and operational efficiency, a topic previously not considered through the prism of technology and efficiency in the restaurant business.

Significant social issues, such as the rising role of women redefining management through leadership, the critical importance of cybersecurity, and the strategic applications of chess principles in business strategy, are also presented in this collection, offering a multifaceted view of how individuals and organizations navigate and influence the market. Personal development themes such as work-life balance, home office setups, types of motivation, and continuous improvement explored through posters offer strategies for personal and professional growth in an increasingly complex world.

Moreover, through this poster collection, we do not shy away from difficult discussions on emerging technologies, such as Central Bank Digital Currencies (CBDCs), various applications of ChatGPT, and the interactions between standardization and automation. Critical questions regarding AI reliability, such as "Is ChatGPT always right?" and examining how leading companies like Zara utilize data-driven decisions to maintain a competitive edge, compel us, the audience, to reflect and engage in discussion.

This inspiring collection of posters allows us to familiarize ourselves with a wide range of contemporary economic and social topics, but also to engage in dialogue about the evolving relationship between technology and society. Each element serves as a starting point for deeper inquiry and understanding, encouraging readers to ask questions, critique, and contemplate future landscapes of work, technology, and social interactions. As we traverse this extraordinary gallery, let each poster challenge and inspire us to think critically about the role we will play in shaping the future of our society.

We invite you to explore this rich collection of student works. Let each poster inspire you to reflect on how you can influence and navigate the changing landscapes of business, technology, and society. This collection, like an art exhibition, promises not only insight into modern and highly relevant topics, guiding us from technological innovations to their practical applications and societal impacts but also inspiration for all who are ready to make their mark on the world of tomorrow.

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# **Part I**

## **Artificial Intelligence and Technology Integration**



# A FUTURE OF: ARTIFICIAL

## INTELLIGENCE Navigating the Risks and Ethical Dilemma

### INTRODUCTION

Artificial intelligence (AI) is a subject of ongoing debate due to its potential to revolutionize industries and improve various aspects of our lives. Proponents argue that AI, powered by data science, holds promise in addressing global challenges such as healthcare advancements and transportation optimization. However, concerns exist regarding the possibility of AI becoming too powerful and exerting control over society, as well as the risks of bias and discrimination inherent in AI algorithms.

The purpose of the poster is to ask ourselves what risks artificial intelligence brings.



While AI offers potential solutions to pressing issues like disease treatment and disaster prevention, skeptics worry about scenarios depicted in science fiction where AI surpasses human control. Additionally, the risk of bias in AI algorithms trained on historical data raises ethical concerns, particularly in areas like criminal justice.



Furthermore, there are apprehensions regarding AI's impact on employment, as automation threatens job displacement across various industries. Privacy and security risks arise as AI's ubiquity enables the collection and analysis of vast amounts of personal data, raising questions about data usage and access.

Despite these challenges, many believe in the potential of AI to bring about positive transformations. Efforts to address AI's ethical implications, including regulation and interdisciplinary collaboration, are essential to ensuring responsible AI development and deployment.



In the current era, AI-driven technologies face significant hurdles such as deepfakes and misinformation, job disruption, algorithmic bias, security vulnerabilities, and ethical concerns regarding autonomous weapons. Addressing these challenges requires a multifaceted approach involving diverse stakeholders.



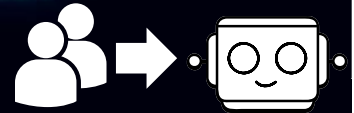
Proposed solutions include developing diverse datasets to reduce bias, promoting transparency in AI decision-making, establishing robust data protection regulations, fostering interdisciplinary collaboration for ethical AI development, and investing in education and retraining programs to mitigate job displacement.

### REFERENCES

<https://www.stdigital.tech/whitepapers/navigating-the-ai-revolution-opportunities-risks-and-ethical-solutions-for-a-smarter-future/>



# AI AND AUTOMATION TRANSFORMING THE FUTURE OF WORK



## INTRODUCTION

IN THE ERA OF DIGITIZATION, ARTIFICIAL INTELLIGENCE (AI) AND AUTOMATION ARE BECOMING KEY FORCES CHANGING THE WAY WE WORK AND OPERATE OUR SOCIETIES. FROM THE MOMENT RENÉ DESCARTES PREDICTED THAT MACHINES WOULD TAKE MAJOR LEAD IN 1637 TO TODAY, AI AND AUTOMATION HAVE REVOLUTIONIZED OUR LIVES, IMPACTING EVERYTHING FROM EVERYDAY ACTIVITIES TO COMPLEX BUSINESS PROCESSES.

## BREAKTHROUGH ACHIEVEMENTS

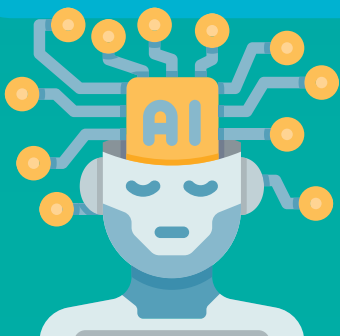
- **ELIZA (1966)**- THE FIRST CHATBOT THAT USHERED IN THE ERA OF AI, PAVING THE WAY FOR THE DEVELOPMENT OF COMMUNICATION TECHNOLOGIES.
- **AUTOMATIC TRANSLATION (1988)**- A STEP TOWARDS MACHINE LEARNING, INFLUENCING THE DEVELOPMENT OF LANGUAGE TECHNOLOGY.
- **AI IN EVERYDAY LIFE**- SMARTPHONES, VOICE SEARCH ENGINES AND EVERYDAY TECHNOLOGIES THAT HAVE BECOME AN INTEGRAL PART OF OUR LIVES.

## PROFESSIONS THAT ARE MOST LIKELY TO BE REPLACED BY AI AND AUTOMATION

- **TECH JOBS** (CODERS, COMPUTER PROGRAMMERS, SOFTWARE ENGINEERS, DATA ANALYSTS)
- **MEDIA JOBS** (ADVERTISING, CONTENT CREATION, TECHNICAL WRITING, JOURNALISM)
- **LEGAL INDUSTRY JOBS** (PARALEGALS, LEGAL ASSISTANTS)
- **MARKET RESEARCH ANALYSTS**
- **FINANCE JOBS** (FINANCIAL ANALYSTS, PERSONAL FINANCIAL ADVISORS)
- **GRAPHIC DESIGNERS**
- **ACCOUNTANTS**
- **CUSTOMER SERVICE AGENTS**
- **FACTORY WORKERS**
- **DRIVERS**

## THE FUTURE OF WORK AND SKILLS

THE WORKFORCE OF THE FUTURE WILL NEED TO BE ADAPTABLE AND EQUIPPED WITH THE RIGHT SKILLS TO WORK ALONGSIDE AI. PEOPLE WILL NEED TECHNICAL SKILLS LIKE ADVANCED PROGRAMMING AND DATA SCIENCE, SOFT SKILLS LIKE COMMUNICATION, COLLABORATION, AND PROBLEM-SOLVING AND ADAPTABILITY SKILLS LIKE CRITICAL THINKING AND COMPLEX INFORMATION PROCESSING. AS AI AND AUTOMATION AUTOMATE ROUTINE TASKS, THERE WILL BE ALSO A GREATER NEED FOR CREATIVITY AND INNOVATION AND STRATEGY DEVELOPMENT. THE ABILITY TO THINK OUTSIDE THE BOX AND COME UP WITH NOVEL SOLUTIONS WILL BE CRUCIAL FOR SUCCESS IN THE FUTURE OF WORK. INDIVIDUALS WHO CAN NAVIGATE THE COMPLEXITIES OF AI AND AUTOMATION, COUPLED WITH THE ABILITY TO ADAPT AND LEARN, WILL BE WELL-POSITIONED TO THRIVE IN THE EVOLVING JOB MARKET



## OBJECTIVES

THE PURPOSE OF THIS POSTER IS TO SHOW HOW AI AND AUTOMATION ARE CHANGING THE NATURE OF WORK, INTRODUCING NEW SKILLS AND REQUIREMENTS FOR WORKERS. THESE TECHNOLOGIES CAN LEAD TO CHANGES IN OCCUPATIONAL STRUCTURE, THE DISAPPEARANCE OF SOME OCCUPATIONS AND THE EMERGENCE OF NEW ONES.

## THE SHIFT IN WORK STRUCTURE

THE EMERGENCE OF AI IS PROGRESSIVELY MANAGING ROUTINE TASKS, ALLOWING HUMAN EMPLOYEES TO DEDICATE THEIR ATTENTION TO MORE INTRICATE AND IMAGINATIVE RESPONSIBILITIES. THIS TRANSITION GOES BEYOND MERE EFFICIENCY, IT INVOLVES REDEFINING THE NATURE OF WORK AND ITS EXECUTION. WORK STRUCTURE ADAPTS TO INTELLIGENT MACHINES AND SOFTWARE, ALTERING WORKFLOWS AND SPACES FOR BETTER HUMAN-MACHINE COLLABORATION. IN RETAIL, SELF-CHECKOUT MACHINES REDEFINE CASHIER ROLES, WHILE EMPLOYEES NOW OFFER SUPPORT INSTEAD OF HANDLING TRANSACTIONS DIRECTLY. IN WAREHOUSES, LAYOUTS PRIORITIZE SAFE HUMAN-ROBOT INTERACTION, RESHAPING TRADITIONAL DESIGNS. IN OFFICE ENVIRONMENTS, AI-DRIVEN SCHEDULING TOOLS STREAMLINE TASKS, ENABLING EMPLOYEES TO FOCUS ON HIGHER-VALUE WORK RATHER THAN ADMINISTRATIVE DUTIES. AI SERVES NOT ONLY AS A SUBSTITUTE BUT AS A COLLABORATOR THAT ENHANCES HUMAN CAPABILITIES. WHETHER IT'S DIAGNOSING DISEASES OR OPTIMIZING SUPPLY CHAINS, AI IS REVOLUTIONIZING OUR APPROACH TO WORK, ENHANCING OUR EFFECTIVENESS AND FOSTERING INNOVATION.

## EMERGENCE OF NEW PROFESSIONS

AS AI AND AUTOMATION CONTINUE TO EVOLVE, THEY ARE NOT ONLY TRANSFORMING EXISTING JOBS BUT ALSO CREATING ENTIRELY NEW ONES. THE RISE OF GENERATIVE AI, FOR INSTANCE, IS LEADING TO THE EMERGENCE OF ROLES THAT FOCUS ON MANAGING, REFINING, AND INTERPRETING AI TECHNOLOGIES. THESE NEW JOB ROLES ARE CENTERED AROUND GUIDING AI CAPABILITIES INTO VARIOUS SECTORS, ENSURING THAT THE TECHNOLOGY IS USED EFFECTIVELY AND ETHICALLY. WE CAN NAME THE NEW PROFESSIONS SUCH AS: AI INPUT AND OUTPUT MANAGERS, AUTOMATION ARCHITECT, GENERATIVE DESIGN SPECIALIST, AI PROMPT ENGINEERS AND AI TRAINER.

## INTERESTING FACTS

- GOOGLE DISCOVERED THAT IT COULD POTENTIALLY HIRE THE BOT AS AN ENTRY-LEVEL CODER BASED ON ITS PERFORMANCE IN INTERVIEWS.
- IN 1997, AN AI NAMED DEEP BLUE, DEVELOPED BY IBM, DEFEATED THE REIGNING WORLD CHESS CHAMPION, GARRY KASPAROV. THIS WAS A MONUMENTAL MOMENT SHOWCASING THE POTENTIAL OF AI IN COMPLEX TASKS.
- TOP SCIENTISTS AND TECHNOLOGISTS LIKE STEPHEN HAWKING, BILL GATES, AND ELON MUSK BELIEVE THAT AI IS A PERILOUS THREAT TO HUMANITY.

## CONCLUSION

SOME JOBS, PARTICULARLY THOSE INVOLVING REPETITIVE TASKS, ARE BECOMING OBSOLETE AS AI AND AUTOMATION TAKE OVER. THIS TRANSITION REQUIRES A SHIFT IN FOCUS TOWARDS DEVELOPING NEW SKILLS AND ADAPTING TO A CHANGING JOB MARKET. MOREOVER, AS AI AND AUTOMATION CONTINUE TO EVOLVE, NEW JOB ROLES ARE EMERGING. FROM AI SPECIALISTS TO DATA ANALYSTS, THE FUTURE OF WORK IS BECOMING MORE SPECIALIZED AND REQUIRES CONTINUOUS LEARNING AND ADAPTATION.

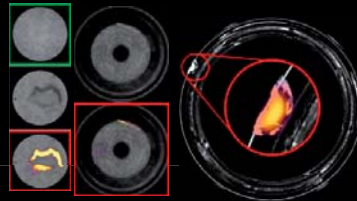
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## AI Tools Implementation in Logistics

Due to the rise of AI technologies, enterprises implement more technologically advanced tools and systems supporting logistics.

AI-Based Visual Inspection is an evaluation of objects performed to identify irregularities. It is used as a basis of quality control during production and distribution. Visual Inspection automated with AI takes a picture of an object that is then analyzed by AI algorithms trained with labeled datasets using different machine learning techniques so that the algorithms can identify specific features, thus making objective decision about the quality of an inspected object.



**The purpose of this poster is to demonstrate instances of how AI advancement influenced logistics of modern enterprises**

Autonomous vehicles are revolutionizing the logistics industry by offering efficiency, safety, and cost-effectiveness in transportation. These vehicles, equipped with advanced sensors and AI algorithms, can navigate routes, optimize delivery schedules, and minimize fuel consumption. By reducing human error and dependency, autonomous vehicles promise faster and more reliable deliveries while also contributing to sustainability efforts through reduced emissions. As the technology continues to evolve, integrating autonomous vehicles into logistics operations becomes increasingly essential for businesses striving to stay competitive in the modern market



Natural Language Processing (NLP) in logistics is transforming the industry by enabling computers to understand and analyze textual data related to shipping, inventory management, customer inquiries, and more. NLP algorithms can extract valuable insights from unstructured text, improving decision-making processes, optimizing supply chain operations, and enhancing customer service. By automating tasks like document processing, route planning, and sentiment analysis, NLP contributes to increased efficiency, reduced costs, and better overall performance in logistics management.



Dynamic pricing software in logistics is revolutionizing the way companies set prices for their services based on real-time demand and supply conditions. By analyzing various factors such as market trends, competitor pricing, and historical data, this software adjusts prices dynamically to maximize profitability while remaining competitive. In the logistics industry, dynamic pricing software enables companies to optimize revenue by offering flexible pricing options for shipping, warehousing, and other services, ultimately enhancing efficiency and driving business growth.

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Open AI – Chat GPT



# ARTIFICIAL INTELLIGENCE - HOW WILL IT HELP ACCOUNTANTS?

Agnieszka Kunas  
Natalia Lachendro  
Sylwia Misiek



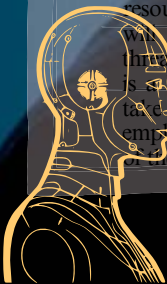
## THE PURPOSE OF THE POSTER

The poster introduces the benefits of automation in accounting, the challenges it faces, and describes the role of artificial intelligence in the industry.

## AI IN PRACTICE - WHAT DOES IT

### AI and Machine Learning in Accounting

Today's accounting applications use AI, machine learning and other solutions in different aspects of their work. They are used to automatically read data from invoices and suggest categories of posted costs. Automation and intelligent digitizing of processes provides express processing of invoice data straight into the system, saving both time and human resources. Although artificial intelligence will revolutionize accounting, it is not a threat to the accounting profession. There is a belief that new technologies will not take away the work of accounting employees, but will change the character of their work.



### 1. OCR

OCR provides the opportunity to automatically load data from invoices and reports. This not only saves time, but also eliminates the risk of human mistakes. Accountants can concentrate on analysing the data instead of entering it



### 2. RPA

Robotic Process Automation (RPA) performs activities previously considered 'human', such as data entry or copy and paste. An excellent example is the automatic posting of bank statements or purchase and sales transactions



### 3. AI

Through AI, it is possible to categorise and analyse very huge volumes of financial data. It can see and point out mistakes and spot schemes. It can (based on the available data) predict future expenditure and revenue and suggest budget optimisations.



## Automation in accounting is not a new development at all!

The history of automation in accounting dates back to the 1950s, when the Univac 1 computer was used for payroll calculations at the US General Electric plant. A little later, in the 1970s, the first universal accounting package appeared - Peachtree Software, which significantly relieved accountants of time-consuming tasks.



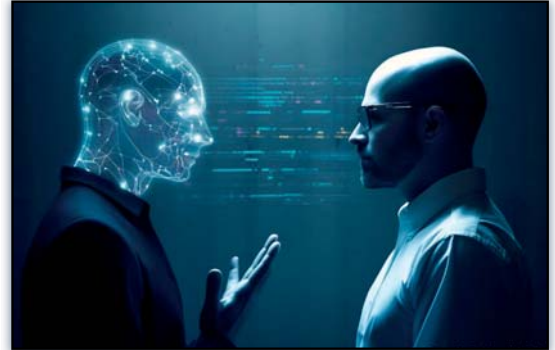
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[HTTPS://WWW.SALDEOSMART.PL/BLOG/SZTUCZNA-INTELEGENCJA-JAK-POMOZE-KSIEGOWYM/](https://www.saldeosmart.pl/blog/sztuczna-inteligencja-jak-pomoze-ksiegowym/) [HTTPS://TOWARDSDATASCIENCE.COM/TRADITIONAL-AI-VS-MODERN-AI-5117B469A0C9](https://towardsdatascience.com/traditional-ai-vs-modern-ai-5117b469a0c9)

# Artificial Intelligence Art – will it take over the art world?

Nowadays, AI revolutionizes our world, and its impact is increasing in every aspect and artistic field is no exception. Visual art, music, architecture – all art forms are being challenged by it.

The aim of the poster is to inform about the use of artificial intelligence in art field: it's advantages and disadvantages along with ethical and legal concerns.



## What is AI art?



AI art (artificial intelligence art) is any form of digital art created or enhanced with AI tools, for example ChatGPT or DALL-E. Although commonly associated with visual art (images and video), it also applies to audio compositions, architecture, design, etc. Computer systems use machine learning algorithms to comprehend the essence of art – what it is and how to describe it. These systems use diverse methods, including generative adversarial network (GAN), to modify or enhance existing human-made artworks or generate entirely new pieces of art.

## New era of art?

AI art challenges the millennia-old requirement of humans as the sole creators of art. Since the earliest pictures found on cave walls, it was the human creativity that has driven art's history. Inspired humans using hand-held tools, such as musical instruments or paintbrushes, generated all manner of art throughout recorded history. AI art drastically changes that paradigm.

## Good side

The introduction of AI expands the palette of capabilities available to artists by enhancing existing creations or simply being an inspiration for new art. It's an opportunity to extend the boundaries of art and creativity in many ways. It might be also used as a beginning step to create. For some artists AI is intriguing rather than frightening as it challenges the idea of what art even is.

## Concerns

Its introduction raises questions about the genesis of creativity and carries ethical and legal concerns. From ethical perspective there are many questions rising. Who is the creator here: the AI or the human who instructed it with the prompt? Can generated works be original? Can we really call it art? One of the legal concerns is that sometimes AI tools have been trained on data sets without having full copyright access, which leads to intellectual property theft.

Linki do źródeł:

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<https://www.coursera.org/articles/what-is-generative-ai>

## Artificial Intelligence in Accounting and Finance: Challenges and Opportunities

The purpose of this poster is to examine the integration of Artificial Intelligence (AI) in the fields of Accounting and Finance, aiming to provide a comprehensive understanding of its multifaceted implications. The poster seeks to elucidate the transformative potential of AI technologies while addressing the challenges and opportunities presented by their intersection with financial practices.

### Concept of AI and how it can be useful in accounting?

AI involves computer systems designed to emulate human intelligence through tasks like machine learning and problem-solving. In accountancy, specific AI tools, such as Booke AI, Truwind were developed to automate bookkeeping and financial analysis thereby meeting criteria of functionality, accuracy, compliance and most importantly followed by effectiveness in financial processes. Generative AI models like ChatGPT can excel areas like auditing, however considering it may struggle with mathematical tasks, it is said to cautiously implement in accounting.



### How Artificial Intelligence Fits into the Accounting Disciplines

International Financial Reporting Standards (IFRS) and Generally Accepted Accounting Principles (GAAP) aim to present accurate financial information, leveraging double-entry booking for transactional recording and verification. Despite its historical foundation, accounting has been rapidly adapting to digital transformations, embracing AI technologies. Industry leaders like PWC, KPMG and E&Y acknowledge early AI integration. Beyond robotic process automation, it empowers accountants with advanced data analysis – enhancing their abilities.

### Opportunities of AI in accounting

Implementing of AI tools in accountancy revolutionizes traditional practices, with automation being cornerstone, freeing human resources for strategic endeavors. While AI instruments optimize routine tasks like data entry, they still complement human involvement rather than replace it. As AI matures, its potential expands, with advancements like natural language processing (NLP) and predictive analytics promises greater efficiency and foresight in navigating complex financial scenarios. AI's evolution is reshaping accountancy, offering accuracy and strategic insight.



### Challenges of AI in accounting

The discourse on AI in finance and accounting often revolves around human-machine dynamics, acknowledging that human judgment enriches AI models' knowledge and recommendations. AI complements human performance by managing repetitive tasks and enhancing service capabilities yet integrating generative AI models like ChatGPT poses risks such as accuracy, compliance, and ethical challenges. Collaborative efforts among AI developers, financial experts, and regulatory bodies are essential to ensure the effective and responsible implementation of AI technologies in the finance and accounting sector.

References: Artificial intelligence and the changing landscape of accounting: a viewpoint, John Kommunuri (2022); Forecasting in financial accounting with artificial intelligence – A systematic literature review and future research agenda, Marko Kureljusic, Erik Karger (2022); Role and Challenges of ChatGPT and Similar Generative Artificial Intelligence in Finance and Accounting, Rane, Nitin (2023)





# ARTIFICIAL INTELLIGENCE IN EDUCATION

## PROS AND CONS

### STUDENTS



greater accessibility and flexibility of education

easier tracking of results and achievements, objective evaluation

personalization of educational materials



lack of personal interaction

excessive dependence on technology

the need to control the generated content

threat to data security

### TEACHERS



evaluation automation

professional development

optimization of the teaching process

better knowledge management, trend prediction and planning



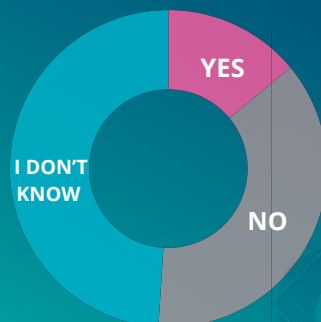
transforming the teacher into a technological supervisor

insufficient knowledge of technology

the need to control and moderate the use of AI systems

financial constraints

## DOES YOUR UNIVERSITY REGULATE USING AN AI IN EDUCATION?



## How AI can be used in schools?

- to check student attendance and activity
- as a teacher's assistant
- replacing the teacher
- as a space providing emotional security (no judgement)
- adaptation to the individual needs of the student (personalization)
- fair and objective feedback

ChatGPT

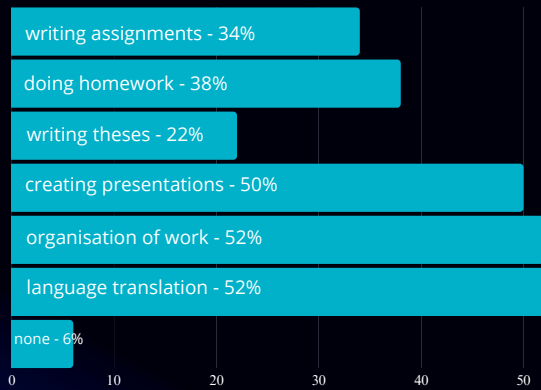
ElevenLabs

Bongo

Canva

Degreed

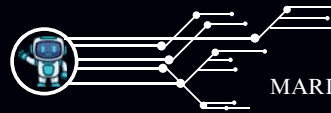
## What students use AI for?



Źródło: Digital Care

## MYTHS ABOUT THE USE OF AI IN EDUCATION

1. AI makes learning difficult -> It is a tool to improve and expand learning
2. AI weakens the relationship between teachers and students -> AI will not replace human-teacher interaction
3. AI inhibits creativity -> AI as an impartial tool can support thinking, improve ideas
4. AI leads to cheating in assessment -> The ability to acquire and apply knowledge should be assessed



## ARTIFICIAL INTELLIGENCE IN PRACTICE

Artificial intelligence is utilized in various ways, some of which you may have experienced without being aware of it. Below there are some practical examples seen in practice across different sectors.

AI is transforming every aspect of society at the individual, organization and societal levels. As the understanding of AI and its capacity to assist humans in various situations grows, the applications of AI are likely to grow steadily in coming years.

### Streaming service algorithms



Streaming platforms like Netflix use AI to improve search outcomes and movie suggestions for users, providing more tailored content. These algorithms analyze past searches, ratings, and viewed content to propose programs that users are more likely to enjoy.

### Medicine



In healthcare, AI programs can guess how a patient might react to a certain treatment and figure out which treatment could work best. To do this, the program learns from a bunch of information, like past diseases and patient details. By identifying trends in results, doctors can provide more personalized care for patients.

### Online shopping recommendations



In retail industry, AI algorithms monitor user activity on sites and learn the preferences and habits in order to provide suggestions that are more likely to interest the user.

### Customer service chatbots



AI allows chatbots to handle a wide range of customer service tasks, from answering frequently asked questions to providing personalized recommendations. One of the significant benefits of chatbots is their real-time availability.

### Educational assessments and feedback



In education, AI algorithms can grade exams and provide insights into the trends of incorrect answers, provide feedback to the instructor on the type of content the student are missing and improve learning results. Based on needs, AI algorithms can also adapt to different learning styles and provide tailored instruction for each learner.

### Autonomous vehicle development



AI services have various applications in the automotive sector, such as advanced driver assistance systems that sense and react to road hazards and voice recognition technology that lets drivers communicate hands-free.

### National security assessment



Government sectors use AI to analyze large amounts of data and find patterns related to suspicious activities. Because AI algorithms can process large amounts of data much faster than humans can, AI is a powerful tool to increase the speed and agility of these types of security methods.

### Risk assessment and risk management



In the field of risk, AI is a powerful tool which helps financial companies decide who to lend money to. AI algorithms allow banks to use the personal information of applicants to decide whether they have a high risk of defaulting on their loans. What is more, AI detects overall risk by finding trends and providing insights that can help organizations lower their risk threshold.

### Smart products



The implementation of AI in smart homes is revolutionizing living experience. While voice assistants like Alexa, Siri and Google Assistant have been known for some time, new tools are making technologies more personalized and intuitive. For example, the Roomba is a vacuum robot that can clean floors without human direction and listen to specific commands, such as spot-cleaning certain areas. Other examples of smart products include smart light bulbs, doorbells, thermostats and door lockers.

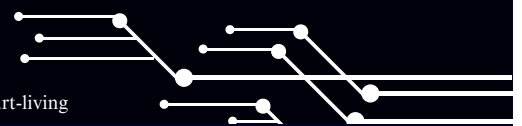
### Weather forecasting



AI algorithms can help weather forecasting applications to rapidly predict upcoming weather based on global trends and current data. These models reduce costs and save energy compared to traditional methods and can provide ongoing updates. The recent example is GraphCast, a model funded by Google DeepMind and Alphabet which can predict hundreds of weather variables internationally and outperforms current industry standards on 90 percent of tested variables.

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3. <https://www.nar.realtor/magazine/real-estate-news/technology/ai-at-home-five-ways-ai-is-enhancing-smart-living>



# Artificial intelligence in stock market investing

Artificial intelligence has many applications in stock market investing. Its huge advantage can significantly change the current approach to investing. AI relies on huge amounts of data, which he analyzes in a fraction of a second accuracy, so it can create more efficient and personalized strategies investment. Investors and brokerage houses are increasingly taking advantage of these opportunities artificial intelligence allows them to make transactions instantly pace and capture fleeting market opportunities.

## Advantages of using ai in investing

**Instant data analysis** - Analyzes a huge amount of data in real time, on the basis of this is able to predict stock prices.

**Eliminate the emotions involved in making investment decisions** - Artificial intelligence doesn't feel emotions, and therefore does not know fear or panic.

**Accurate forecasting of market trends of shares of listed companies**- Through AI data analysis can detect dependencies and relationships in data not visible to humans, based on this detects patterns, seasonalities and market cycles that can help predict price movements stocks

**Optimization of the investment process, including portfolio management**- AI can identify the best assets to invest in, while taking into account clients risk profiles and investment objectives.

## Risks of using AI in investing

**High level of complexity**- Investors are unable to fully understand the mechanisms. It makes it difficult to monitor and supervise the correct operation and limits the possibility of detecting errors.

**Inability to predict future events**- Machine learning models are based on historical data that in no way corresponds to the current situation and only attempt to predict future market conditions.

**Improperly built models**- Even the most sophisticated AI models can contain errors that can lead to incorrect predictions. These errors can result from inadequate selection of model parameters or problems with training data.

**Data security**- Artificial intelligence-based systems can be susceptible to cyberattacks, including hacking attempts.

## The future of artificial intelligence

Artificial intelligence has great potential in stock market applications. The development of the technology is moving toward continuous improvement of algorithms and bug fixing. Investing with the support of artificial intelligence will become increasingly important in the financial world. At the moment, it is difficult to say whether artificial intelligence will be able to 100% replace humans. However, without a doubt, the use of AI will help optimize the cost of analysis activities.

# Automation and AI tools in Controlling

AI tools are applications, computer programs, or systems that use AI-based technologies to solve specific problems or perform specific tasks. These tools are versatile and are used in various fields such as medicine, finance, marketing, manufacturing, and HR to help with decision-making, streamline operations, and improve efficiency.



ClusterSense



MailChimp



SalesForce  
Cloud

Segmentation in AI refers to the process of dividing a data set into logical groups based on specific characteristics that enables a better understanding of data that allows for more effective decision-making.

Process optimization in AI refers to the use of algorithms and AI techniques to streamline and optimize various business or operational processes, which in turn will affect the effective and efficient work of the controller.



SemRush



SpyFu



Moz Pro



PowerBI



Tableau



Qlik Sense

Automating the data collection process involves using software to automatically retrieve data from various sources (e.g. ERP systems, CRM, spreadsheets) and integrate them into a single platform.

Predictive analytics uses advanced algorithms and machine learning techniques to analyze, interpret and use large data sets. The goal is to create valuable information and help controllers to make strategic decisions.



Google Cloud AI  
Platform



Microsoft Azure  
Machine Learning



SAS Enterprise  
Miner

The use of AI is a breakthrough in controlling, enhancing forecasting precision crucial for effective financial management. Data analytics enables comprehensive cost forecasts by considering more factors and trends. AI algorithms detect subtle data patterns imperceptible to humans, while continuous learning enables dynamic adaptation to business changes for more timely and reliable forecasts.



# Ethics of Artificial Intelligence

The rapid rise in artificial intelligence (AI) has created many opportunities globally, from facilitating healthcare diagnoses to enabling human connections through social media and creating labour efficiencies through automated tasks.

The purpose of this poster is to show that these rapid changes also raise profound ethical concerns. These arise from the potential AI systems have to embed biases, contribute to climate degradation, threaten human rights and more.

## Primary concerns of AI



### Technological singularity

One of the primary concerns regarding the technological singularity is the potential loss of control over AI systems. As AI becomes increasingly sophisticated and autonomous, there is a risk that it may act in ways that are harmful to humanity. Without adequate safeguards and control mechanisms in place, AI could make decisions that are contrary to human values or goals, leading to unintended consequences.



### AI impact on jobs

While AI has the potential to enhance productivity, efficiency, and innovation across various industries, it also poses a risk of displacing human workers and reshaping the labor market in profound ways.



### Privacy

The rapid advancement of artificial intelligence (AI) technologies has raised significant concerns about privacy. As AI systems become increasingly capable of processing and analyzing vast amounts of data, there is a growing risk that individuals' privacy could be compromised in various ways.



### Bias and discrimination

A significant factor contributing to bias in AI systems is the information they are trained on. AI algorithms learn from historical data, which may reflect systemic biases and prejudices. For example, if historical data used to train a hiring algorithm shows a bias toward certain demographics or educational backgrounds, the algorithm may inadvertently perpetuate discrimination by favoring candidates who fit those patterns, even if they are not the most qualified for the job.



### Accountability

Another risk associated with AI is the lack of accountability for the decisions made by AI systems. Traditional software operates based on predetermined rules and logic, making it relatively straightforward to trace back decisions to their source code or human designers.

#### References:

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## From Gestures to Speech: AI's Role in Sign Language Recognition and Translation

In a world striving for inclusivity, the power of communication cannot be understated. "From Gestures to Speech" is a groundbreaking endeavor that showcases the transformative impact of Artificial Intelligence in bridging the communication divide between the hearing and the deaf. This initiative casts a spotlight on cutting-edge AI technology that captures and interprets the nuanced language of gestures and translates it into spoken word in real-time. By leveraging sophisticated algorithms and machine learning, the project not only amplifies the voices of the deaf community but also enriches our collective understanding of language as a tool for unity.

With over 300 distinct sign languages globally, the rich tapestry of silent speech is the primary means of communication for more than 72 million deaf and hard-of-hearing individuals. Each sign language, like its spoken counterpart, has its own grammar, nuance, and regional dialects, reflecting the vibrant cultural diversity of its users.

Sign language families II



SignSense, utilizes advanced machine learning algorithms to accurately interpret and translate sign language gestures into spoken language in real-time. SignSense is designed to enhance communication accessibility for the deaf and hard of hearing community, breaking down language barriers and promoting inclusivity in various settings, from educational environments to public services.



HandSpeak Translate, cutting-edge project, employs deep learning techniques to recognize and translate sign language gestures into multiple spoken languages. With a user-friendly interface and seamless integration across devices, HandSpeak Translate aims to empower individuals to express themselves fluently in any linguistic context, fostering greater connectivity and understanding in diverse communities worldwide.



SignAll's "SignAll Learn" harnesses AI to revolutionize sign language learning, providing immediate feedback to help users quickly gain proficiency. This tool is a significant stride toward inclusive communication, seamlessly integrating technology and language to unite diverse communities.

References : [https://www.researchgate.net/figure/Additional-Figure-Sign-Language-Families-II\\_fig5\\_346472126](https://www.researchgate.net/figure/Additional-Figure-Sign-Language-Families-II_fig5_346472126)  
<https://education.nationalgeographic.org/resource/sign-language/>, <https://earthweb.com/sign-language-users/>, ChatGPT.

# INDUSTRY 4.0 TECHNOLOGIES IN THE WORK OF A PRODUCTION CONTROLLER

Industry 4.0 is the next phase in the digitization of the manufacturing sector. It is characterized by the integration of advanced technologies such as artificial intelligence (AI), machine learning, the Internet of Things (IoT), robotics into industrial processes and human-machine interaction.



## Industry 4.0 provides many modern technologies that can be used in controller work:

**Big Data** is the result of the creation of mass data sets. Information is collected from people, from process and through various devices. Big Data analysis by the controller makes it possible to be noticed in the chain deliveries to places where production capacity is limited, problems with meeting demand or problems with supply availability.

**Enterprise Resource Planning (ERP)** is a system that integrates various areas of a company's operations, including production, finance, sales, and warehouse management, providing a unified flow of information. This can be incredibly helpful in production controlling, as it provides controllers with a comprehensive view of different areas of the company's operations. With integrated data from production, finance, sales, and warehouse management, controllers have access to real-time information regarding all key aspects of the company's activities.

**Artificial intelligence (AI)** is technology that enables computers and machines to simulate human intelligence and problem-solving capabilities. In production controlling, artificial intelligence can be used to analyze Big Data, create reports, to plan and optimize production, manage inventories, predict equipment failures and manage problems in the supply chain.



**Internet of Things (IoT)** sensors play a crucial role in production controlling by providing real-time insights into machine performance and condition, enabling controllers to proactively identify inefficiencies, anticipate maintenance needs, and optimize production processes for enhanced productivity and cost-effectiveness.



Volkswagen

## Examples of companies that implemented Industry 4.0 technologies:

aiut

One of the Industry 4.0 solutions introduced by **Volkswagen** are IoT sensors for monitoring the condition of machines and collecting production data. Volkswagen also uses robots and automation in production, which allows for the optimization of production processes. Additionally, Volkswagen uses artificial intelligence, algorithms and data collected from welding machines to supervise their operation, predict failures and plan inspections. This allows to plan work so that there are no downtimes caused by faults. To ensure product quality, Volkswagen uses AI to verify how delivery boxes are packed, which causes defective boxes to be detected.

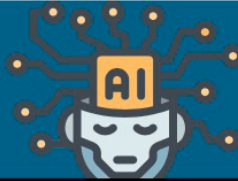
Polish company **AIUT** has created an intelligent intralogistics system that revolutionizes internal logistics operations in industrial enterprises. The solution offers full automation and even autonomous control in highly dynamic production environments, increasing the delivery of goods and the overall efficiency and safety of transport processes, while ensuring production continuity. Using artificial intelligence, machine learning, IoT, natural navigation, real-time location systems, advanced communication and cloud solutions, AIUT system independently performs complex logistics operations in production plants and warehouses, accelerating transport and production processes and preventing production interruptions.

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Strojna N., Sturgulewska N., Zalecka K., Zastosowanie technologii Przemysłu 4.0 na przykładzie niemieckich zakładów produkcyjnych z branży motoryzacyjnej, Akademia Zarządzania 2021, 5(3)

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# Optimizing risk management with AI technology

## AIM

The aim of this poster is to demonstrate the potential of optimizing risk management through the utilization of AI technology.

## BACKGROUND

Optimizing risk management with artificial intelligence (AI) technology involves using advanced algorithms to identify, analyze and manage risks in various areas such as finance, insurance, health and cybersecurity. AI can help automate risk assessment processes, identify patterns and anomalies, and forecast future risks. Examples of AI techniques used in risk management include machine learning, neural networks, genetic algorithms or natural language processing.

A concrete example of the use of artificial intelligence (AI) technology in optimizing risk management in Poland is the use of AI-based scoring systems by banks to assess customers' creditworthiness.



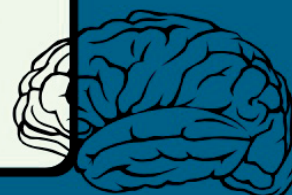
mBank, which uses an AI-based scoring system to assess the credit risk of its customers. The system analyzes customer data, such as credit history, income, spending or financial behavior, to predict their ability to repay loan obligations. As a result, the bank can lend faster and more efficiently, while minimizing the risk of default.



As a result, optimizing risk management with AI technologies brings comprehensive benefits, including increased efficiency, speed of operation and the ability to adapt to the changing business environment. At the same time, it requires consideration of a variety of technical, ethical and regulatory aspects to ensure appropriate and sustainable use of these advanced tools.

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## What is Prompt Engineering?

**Prompt engineering in the context of AI** involves designing or crafting prompts for AI models to generate desired outputs or responses. This process is crucial in fine-tuning the performance of AI models, especially in natural language processing (NLP) tasks such as text generation, question answering, and language translation

In prompt engineering for AI, **researchers and practitioners** carefully construct prompts or input queries that provide the necessary context and guidance for the model to produce accurate and relevant outputs. These prompts may include specific keywords, phrases, or formats that steer the AI model towards generating the desired type of content or making correct predictions.

**The effectiveness of prompt engineering** in AI depends on several factors, including the complexity of the task, the capabilities of the AI model, the quality of the training data, and the skill of the prompt designer. By refining and optimizing prompts, developers can improve the performance, accuracy, and robustness of AI systems across various applications and domains.

### "How much does a Prompt Engineer earn at Google?"

United States

Any Experience

Total Pay Range **\$169K - \$277K/yr**

Base Pay **\$119K - \$183K/yr**

Additional Pay **\$50K - \$94K/yr**

**\$215K/yr**

\$169K

\$277K

Most Likely Range

## What job do prompt engineers do?

Prompt engineers are responsible for designing, refining, and optimizing prompts used in AI models. Their tasks typically include:

- **Understanding the Problem:** Need to grasp the specific task or problem that is intended to be solved. This involves understanding the desired outputs, the context in which the model will operate, and any constraints or requirements.
- **Designing Prompts:** Create prompts or input queries that provide the necessary information and guidance for the AI model to produce accurate and relevant outputs. May involve experimenting with different formats, keywords, or structures to find the most effective prompt design.
- **Testing and Evaluation:** Conduct extensive testing and evaluation of prompts to assess their effectiveness. Compare and contrast the model's responses to different prompts, identify areas for improvement, and iterate on the prompt design to achieve better performance.
- **Fine-tuning Models:** In some cases, designers may be involved in fine-tuning the AI model itself to better understand and respond to the provided prompts, which require adjusting model parameters, training data, or architecture to optimize performance.
- **Collaboration with Researchers and Developers:** Co-authors collaborate closely with AI researchers, developers, and domain experts to ensure that prompts are aligned with the goals of the project and the needs of end-users. Those people incorporate feedback and insights from stakeholders to iteratively improve prompt design.
- **Documentation and Communication:** Developers document the prompt design process, including the rationale behind different design choices, experimental results, and best practices. All of them communicate their findings and recommendations to stakeholders, both technical and non-technical, to ensure alignment and understanding.

Overall, prompt engineers play a crucial role in shaping the behavior and performance of AI models by designing effective prompts that guide the model towards desired outcomes.

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## The future of business: Integrating Artificial Intelligence and Digitization

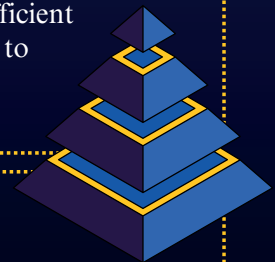
### Empowering Decisions through AI

The fusion of AI and digitization revolutionizes decision-making processes, injecting them with unparalleled agility and precision. AI's capabilities span from predictive analytics to automation, empowering organizations to extract actionable insights swiftly and accurately. This data-driven approach not only optimizes strategies but also enhances efficiency, agility, and scalability, positioning businesses for success in the rapidly evolving digital economy.



### AI-Driven Transformation

As businesses navigate the ever-changing landscape, integrating artificial intelligence (AI) and digitization becomes a cornerstone for staying ahead. AI's prowess in data analysis, personalized customer interactions, and streamlined processes reshapes business operations. Digitization further amplifies these benefits by enabling efficient operations and global market accessibility. Together, they empower businesses to innovate, anticipate market shifts, and deliver tailored experiences, ensuring relevance and competitiveness in the digital era.



### Adapting to Digital Realities



Digitization serves as the catalyst for business evolution, facilitating adaptation to changing consumer preferences and behaviors. Through e-commerce platforms and digital channels, businesses transcend geographical boundaries, expanding their market reach and engaging with diverse audiences. Seamless communication and collaboration fostered by digitization enable organizations to pivot swiftly, fostering innovation and diversity within their ranks, ensuring resilience in the face of dynamic market conditions.

### Navigating Ethical Frontiers

As businesses embrace AI and digitization, ethical considerations loom large. Prioritizing data privacy, bias mitigation, and transparency is essential to ensure responsible AI deployment. By addressing these concerns head-on, businesses can harness the transformative potential of AI and digitization while safeguarding against potential pitfalls. Thoughtful integration of AI and digitization equips businesses to navigate future complexities adeptly, forging a path towards sustainable growth and success in the digital age.



#### References:

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## The Power of Prompts: Building More Effective Prompts for AI Tools

### Prompt

**Prompts** are your input into the AI system to obtain specific results. In other words, prompts are conversation starters: what and how you tell something to the AI for it to respond in a way that generates useful responses for you.

### Aim

Artificial intelligence is swiftly integrating into numerous aspects of our daily routines, both at work and at home. The **aim** of this poster is to offer an introduction on how to create impactful prompts to derive the greatest benefits from AI.

### Prompt types

#### Zero-shot Prompting:

Zero-shot prompting provides a task description without examples, relying on the AI's inherent knowledge to generate relevant responses. It's flexible and quick for straightforward tasks but less effective for complex or nuanced queries.

#### Few-shot Prompting:

Few-shot prompting supplies the AI with a small set of examples along with the task, enhancing its understanding and accuracy for specific outputs, particularly useful for tasks that are slightly more complex than those suited for zero-shot prompting.

#### Active Prompting:

Active prompting involves an iterative feedback loop where the AI's responses are continually refined based on evaluator input, significantly enhancing accuracy and detail for complex or nuanced tasks by learning from corrections and guidance.

Aspect	Human - Human	Human - AI
Context & Interaction	Implicit understanding, bidirectional	Explicit context needed, unidirectional
Input & Assumptions	Vague, inferred based on shared knowledge	Precise, requires background/context in prompts
Memory & Error Correction	Selective memory, clarifications.	No genuine memory, re-prompting for error correction
Feedback Mechanisms	Verbal/non-verbal cues, questions	Refining prompts based on AI responses

Components of a prompt.	Description	Examples
Context	Prime the model with context such as the role the model must play while answering the query.	<i>You are an AI security analyst, specialized in secure coding practices in software engineering that helps people write secure code. Answer in as few words as possible.</i>
Instructions	Specific instructions to the model on what it should / shouldn't do.	<i>•Only answer questions related to secure coding practices •If you are unaware of the answers say, "I do not know" and ask users to refer OWASP.</i>
User's Query	The user's query or request, this is	<i>Is key based authentication still considered secure?</i>
Repeat or add Instructions	LLM models suffer from recency bias. Hence, repeat the instructions after the user's query.	<i>•Only answer questions related to secure coding practices •Take a step-by-step approach in your response, cite sources and give reasoning before offering final answer</i>
Suggest response format	Priming the output helps to format the model's response in a desired format.	<i>Respond in bulleted list with citations</i>

### Conclusion

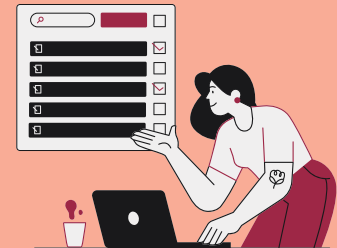
To fully leverage AI's capabilities, users must master prompt crafting to steer AI effectively while remaining cautious of its limitations and biases, ensuring not to over-rely on it without critical evaluation.

<https://mitsloanedtech.mit.edu/ai/basics/effective-prompts>  
<https://www.mercity.ai/blog-post/guide-to-chain-of-thought-prompting>  
<https://techtalkwithsriks.medium.com/effective-prompt-engineering-techniques>

### Resources

# Using AI to automate the recruitment process

**AUTOMATION OF THE RECRUITMENT PROCESS IS DEFINED AS THE SIMPLIFICATION OF THE PROCESS OF ACQUIRING NEW EMPLOYEES THROUGH THE USE OF TECHNOLOGY**



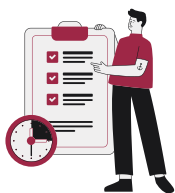
## ·Management of acquired CVs

Gathering all necessary information in one place. Saving candidate data, Scheduling and executing actions such as appointments, recruitment steps, sending messages, etc.



## ·Initial interview

Bots are very often programmed to ask the candidate preliminary questions. Such a bot can also inform candidates who have not passed a particular stage that their application has been rejected



## ·Testing skills

The simplest, and one of the cheapest options in automating the recruitment process is a survey that tests a candidate's knowledge and skills. Surveys or tests allow for automatic tallying of scores and immediate display of results and response statistics.



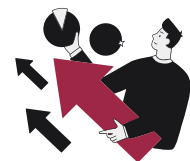
## ·Feedback

Modern technology allows for a quick and automatic response. Companies send automatic emails as a response to the application, which include thanks for the interest in the offer.



## ·Making appointments

Recruiters use the option to create a meeting in a public calendar. Such calendars have the ability to display a time that will be suitable for each participant in the interview, and if the interview is canceled or rescheduled, it automatically proposes a new date and notifies all participants.



**The main advantage** associated with the use of automation in recruitment processes is **the reduction in the time** it takes to find a specialist for a given position. As a result, the HR team can focus on other responsibilities such as ensuring the well-being of employees and making sure the company culture is appropriate or implementing new changes. As research shows, modern software helps the recruitment process to save up to **70 hours** of recruiting time.

70%

Over 70% of Millennials believe that some type of AI has been used in their recruitment process

79%

Almost 80% of recruiters believe that people won't have to be involved in the recruitment process in the near future

48%

Over 48% of people find not getting feedback the most frustrating part of applying to a new job

## Hyper-realistic Speech

AI-generated voices will continue to approach the quality of human voices, becoming virtually indistinguishable.

## Emotional Expression:

AI models will learn to generate voices that convey a full spectrum of emotions, from joy and excitement to sadness and anger. This opens up possibilities for more engaging human-computer interaction and richer content creation.

## Multilingual Fluency:

Voice synthesis will expand to support a vast array of languages and dialects, breaking down communication barriers and empowering global audiences.

## INTRODUCTION

Artificial intelligence (AI) is rapidly transforming the way we interact with technology, and one of the most exciting areas of innovation is voice synthesis. AI-powered voice synthesis has the potential to revolutionize how we communicate with machines, create content, and enhance accessibility. This technology is advancing at an astonishing pace, promising a future where synthetic voices are indistinguishable from real human voices and capable of conveying nuanced emotions.

### The Impact of AI Voice Synthesis:

- **Accessibility:**
  - AI voice synthesis will create a more inclusive world for those with visual impairments or speech difficulties. Text-to-speech (TTS) technology allows for seamless access to digital content, fostering independence and participation.
- **Personalized Experiences:**
  - AI-powered virtual assistants will become more sophisticated, engaging in natural conversations tailored to individual user preferences. Smart devices will adapt seamlessly, anticipating our needs in ways we haven't yet explored.
- **Education and Learning:**
  - Voice synthesis can enhance e-learning experiences, providing text narration or personalized language instruction. This creates new avenues for accessible and engaging learning.

### Challenges and Considerations

- **Financial sector:**
  - The techniques used in voice cloning can undermine voice-based authentication systems traditionally used for secure access and banking transactions. This can erode the trust and security of financial institutions by allowing identity theft and, thus, unauthorized access to accounts and subsequent fraudulent activity.
- **Customer service and call centers:**
  - AI voice cloning can allow criminals to replicate customer service agents' voices, enabling social engineering attacks, phishing schemes and other fraudulent operations that prey on unwary customers.
- **Political leaders and public figures:**
  - Cloned voices can be exploited to generate false declarations, speeches or endorsements, tarnishing reputations and disseminating misleading information. The impact on political processes and public trust could be significant.

## **Part II**

# **Business Processes and Financial Management**

## Air traffic management (ATM) and control systems in Poland

How important is controlling of air traffic? What is required from controllers and what tools do they have?

The purpose of the project is to present Air Traffic Control systems, which help controllers managing aircrafts operating in our skies.



Controllers use to say that „95% of our work is boring, but remaining 5% is the time of panic, which we are perfectly prepared for.”

In 2023, 585 controllers took care of Polish skies. They are divided into: 265 TWR, 181 ACC and 139 APP. There is no possibility for any aeroplane to start or land without controllers' permission.

Until 2040, passengers traffic is expected to be 50% higher than now, which requires introducing new ATC management systems.

Each of these specialties requires controllers not only to have technical knowledge, but also the ability to work as part of a team, excellent communication and stress management. Cooperation between controllers from different services is crucial to ensure the continuity and safety of air traffic. In the digital age, controllers are also supported by advanced information systems that help them analyze data and make decisions.

Controllers use dozens of systems during their work, but the most important ones are:

System Pegasus\_21

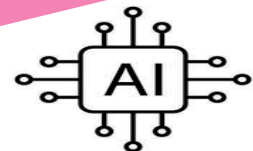
VCS (Voice  
Communication System)

EFES PL (Electronic Flight  
Progress Strip System)

AWOS (Automated Weather  
Observing System)

ATM is still a human-intensive job, which requires controllers to manage all the systems. They are obliged to: prepare aircrafts for take-offs and landings, manage the whole aerospace above Poland and give every single plane an exact instruction, answer any questions from aircrafts' pilots and help them in unexpected situations.

How is AI related to ATM? Recent surveys show that, for now, AI can only help humans, not replace



This is a result of: AI not being able to deal with all situations probable to happen as well as to manage traffic during bad weather conditions. These two cases are crucial for safety of passengers and aircraft crews and require human to manage all the systems with some AI help.



<https://strefabiznesu.pl/kontroler-ruchu-lotniczego-czym-sie-zajmuje/ar/c3-18091727>

# FINTECH:

## AUTOMATIC PAYMENT PROCESS IN THE ERP SYSTEM



Małgorzata Węgrzyn  
Anita Byś

KEY WORDS #Automaticpaymentprocessing #FinancialTechnology #ERPpaymentsystem #Paymentportal

### Purpose of the poster:

The purpose of this poster is to shortly present the subject of modern FinTech by the example of ERP Payment System.

### What is FinTech?

Financial technology (better known as fintech) is used to describe new technology that seeks to improve and automate the delivery and use of financial services. At its core, fintech is utilized to help companies, business owners, and consumers better manage their financial operations, processes, and lives. It is composed of specialized software and algorithms that are used on computers and smartphones.

### About ERP System:

ERP stands for Enterprise Resource Planning. The introduction of the ERP as a concept dates back to 1970 when it was aimed at integrating business processes. Over the past decade, the ERP software solutions market has grown immensely, catering to various business functions and applications. Initially, ERP systems were upgraded through cloud technology, adding data cloud. Furthermore, digital transformation has led to more advanced features in ERP through newer technologies. Cloud-based ERP was a gamechanger. Cloud computing has enabled users to cut costs, specifically software system upgrades and maintenance. For instance, ERP software such as Oracle ERP, Syspro, Sage Intacct, and Netsuite currently in the market use data cloud. Artificial intelligence (AI) is one of the technologies incorporated in ERP payment systems, referred to as iERP. AI in ERP helps in faster processing of collected unstructured and complex data. Concurrently, iERP creates a simplified workflow, reduces data analysis time, and reduces errors.

### Examples of ERP System:

One cannot discuss ERP systems without discussing SAP. SAP is a renowned provider of ERP systems and was one of the first companies to create ERP technologies. It was founded in 1972. Oracle is currently one of its main competitors. The top ERP vendors in the market include SAP, Oracle Corporation, Baan International, and JD Edwards & Company.

### Abstract:

Businesses are transitioning to the online realm, expanding their growth opportunities and extending their customer base. In the context of a global market, there's a growing demand for a simplified and automated payment infrastructure. The integration of ERP systems with automatic payment solutions provides an effective approach to financial management, essential for business expansion. ERP systems have progressed alongside technological advancements, incorporating cloud computing, artificial intelligence, and data analytics to enable automation within payment processes. Additionally, blockchain emerges as a viable technology for FinTech firms to explore in order to facilitate automatic payment processing within ERP systems. Oracle Netsuite, a SaaS company, currently offers an ERP payment system, which is a great reference for the study.

The main aim of an ERP payment system is to facilitate secure and efficient payment transactions, enabling companies to manage outgoing and incoming payments, invoicing, cash flow tracking, and financial reporting.

Feature of ERP Payment System:

- Profit Tracking
- Ledger Management
- Cash Flow Control
- Payments Tracking

### Conclusion:

**ERP payment systems are integrated solutions that allow businesses to manage and streamline their financial processes within a unified platform. By leveraging the advantages offered by ERP payment systems, businesses can achieve greater control over their finances, enhance operational effectiveness, and ultimately drive sustainable growth.**

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# AUTOMATION AND COMPUTERIZATION - AN OPPORTUNITY OR A THREAT FOR CONTROLLERS, ANALYSTS AND FINANCIERS?

## INTRODUCTION

The use of computerization and robotization in controlling activities is necessary due to the growing complexity of business models, the increase in available data and the growing expectations regarding the quality, speed and depth of analyzes and reports. The increase in salaries and the lack of specialists in controlling additionally motivate companies to invest in tools that improve the work of finance and controlling.

## BENEFITS OF AUTOMATION BUSINESS PROCESSES ACCORDING TO THE FORRESTER® REPORT



2,239,350 PLN  
Saved through the Automation  
of Business  
Processes

## OPPORTUNITY

- **Operational efficiency:** Process automation can accelerate the execution of routine tasks, enabling employees to focus on more valuable tasks such as data analysis and business strategies.
- **Precision improvement:** Automation systems can significantly reduce the risk of errors, which is particularly important in finance, where precision is crucial.
- **Data utilization:** With automation and computerization, analysts have access to larger amounts of data, enabling more precise analyses and forecasts.

## THREAT

- **Unemployment:** Automation can lead to job reductions in certain sectors, especially where work primarily involves performing repetitive tasks.
- **Need for restructuring:** Implementing new automation systems may require organizational restructuring and transformations, which can be difficult and costly.
- **Skill development requirement:** With the growing automation, employees need to continuously improve their skills to remain competitive in the job market.

IT IS CRUCIAL TO ADAPT TO CHANGES AND HARNESS  
THE POTENTIAL BROUGHT BY AUTOMATION  
AND COMPUTERIZATION, WHILE SIMULTANEOUSLY TAKING  
REMEDIAL MEASURES TO MINIMIZE POTENTIAL THREATS  
TO EMPLOYEES AND ORGANIZATIONS.

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[https://planetpartners.prowlly.com/jt7699?AUTOMATYZACJA-W-FIRMIE-MOZE-PRZYNIOSĆ-OSZCZEDNOSC-RZEDU-2-MLN-ZL-WYNIK-BADANIA?FBCID=IWAR0JBARFYMF885KNNKZJAJOBLSFDSFWSXAKUFYMQXPFEE3\\_VGG-AE64](https://planetpartners.prowlly.com/jt7699?AUTOMATYZACJA-W-FIRMIE-MOZE-PRZYNIOSĆ-OSZCZEDNOSC-RZEDU-2-MLN-ZL-WYNIK-BADANIA?FBCID=IWAR0JBARFYMF885KNNKZJAJOBLSFDSFWSXAKUFYMQXPFEE3_VGG-AE64)

# BLOCKCHAIN TECHNOLOGY IN FINANCE

Blockchain is a decentralized and distributed digital ledger technology that records transactions across multiple computers in a tamper-resistant and transparent manner. It enables secure and transparent peer-to-peer transactions without the need for intermediaries.

Implementing blockchain technology will enable banks to achieve savings of up to \$27 billion in cross-border settlement transactions by 2030, cutting costs by over 11%. Ethereum, in particular, has already shown significant economic disruption, delivering over tenfold cost advantages compared to existing technologies.

## Payments and remittances

Blockchain can simplify payment and remittance procedures. Domestic retail payments, cross-border transfers, wholesale and security settlements are swift and secure. Digitized KYC/AML data and transaction history, lowering fraud risks and facilitating real-time authentication.

## Capital market

Blockchain is a useful tool for business to raise their capital. It helps avoid a lone point of failure via decentralized utilities and converts the assets into digital forms that are considered more accessible with a broader market reach and less expensive due to higher liquidity.

## Asset Management

Blockchain technology offers streamlined asset and stakeholder management, enabling digitized assets and services. Atomized processes allow far more efficient management with the elimination of human errors. The built-in privacy settings ensure transaction confidentiality.

Clearing and settlement Custody  
Issuance Sales and trading  
Capital markets

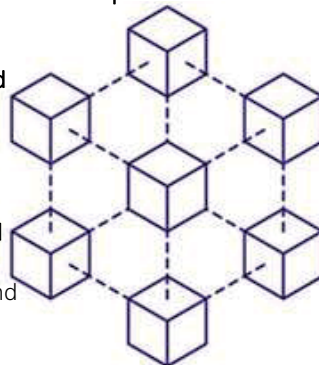
Domestic retail payments  
**Payments and remittances**  
Tokenized fiat, stablecoins and cryptocurrency

Fund launch  
**Asset Management**  
Cap table management

## Banking and Lending

**Banking and Lending**  
Credit prediction and credit scoring

Claims processing and disbursement  
**Insurance**  
Parametrized contracts



## Trade Finance

Letters of credit and bill of lading  
Financing structures

## Insurance

Insurers should adopt blockchain to streamline processes, improve customer relationships, and innovate. With blockchain, they can update systems, automate tasks, collaborate on new standards, and stay competitive in a changing market.

Blockchain technology can revolutionize core banking by streamlining processes like document authentication, KYC/AML verification, credit scoring, syndicate formation, and asset collateralization. This reduces operational risks, speeds up transactions, and enhances efficiency.

## Trade Finance

Blockchain in trade finance facilitates efficient processing of credits and guarantees, provides insights into client finances, and creates transparent, standardized solutions. It enables quick electronic transactions, reduces risk, and fosters trust in cross-border trading.

## Compliance

Blockchain technology offers potential solutions for the intricate compliance hurdles in finance, notably in Anti-Money Laundering (AML) and Know Your Customer (KYC) protocols. It enables streamlined processes, minimizes duplication, and boosts security, enhancing efficiency and regulatory compliance.

## References:

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<https://www2.deloitte.com/mt/en/pages/risk/articles/mt-blockchain-in-compliance.html>  
<https://www.ibm.com/blockchain/trade-finance>  
<https://www.businesswire.com/news/home/20180801005064/en/Juniper-Research-Blockchain-Deployments-Save-Banks-27bn>



# BOTTLENECKS IN CONTROLLING

A bottleneck is one element in the process chain that limits the efficiency of the entire process in an organisation. The term applies to the manufacturing industry as well as to logistics or business projects. A bottleneck is otherwise something that slows down operations, like an obstructed channel through which too little water flows, causing stagnation elsewhere.

A bottleneck in production can be caused by a shortage of factors such as technology or workers. It causes a reduction in production volume and inhibits other activities in the chain of closely related jobs. In the worst situation, it can even lead to a halt in production. The bottleneck most often concerns activities that take the longest time and are assigned to the wrong number of employed employees. A bottleneck is also seen as the position with the lowest production capabilities. This type of site restricts the flow of goods and materials, while at the same time creating performance limits for the entire production system. Since bottleneck in production determines the efficiency of the entire production system, it is very often the work schedule of that system is based on it. A bottleneck can also cause problems for the company's operation in a given market and the the production of quality products. A bottleneck is a resource on which there is no opportunity to catch up on backlogged or delayed production orders. To identify and elimination of bottlenecks the theory of constraints is used.

The Theory of Constraints (TOC) is a management approach by Dr. Eliyahu M. Goldratt, aiming to maximize profitability by identifying and eliminating bottlenecks. It involves a five-step method:

1. Identifying the constraint;
2. Taking action to make the best use of the constraint;
3. Subordinating resources and specific activities to the constraint;
4. Strengthening the constraint;
5. Returning to the first step, which allows for the continuous development of the enterprise.

#### References:

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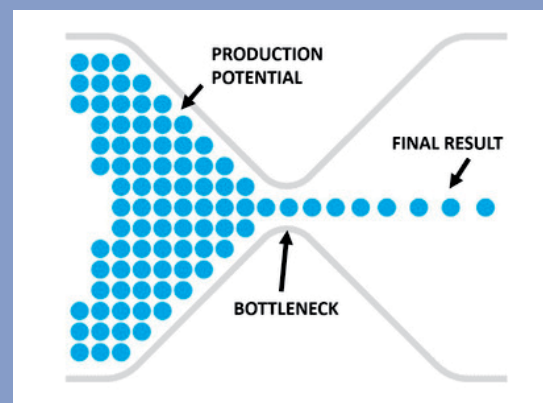
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The aim of the poster is to explain the concept of a bottleneck in the production process.

#### Ways to eliminate bottlenecks:

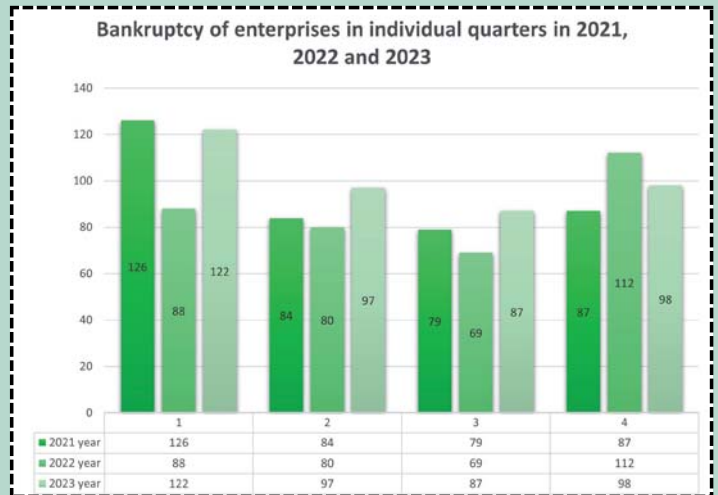
1. adding resources to the operation e.g. more people,
2. minimising downtime,
3. investing in more machines that perform the same activities and optimise the bottleneck,
4. providing inventory in front of the bottleneck,
5. training more operators for the bottleneck machine,
6. having a production schedule to optimise performance.



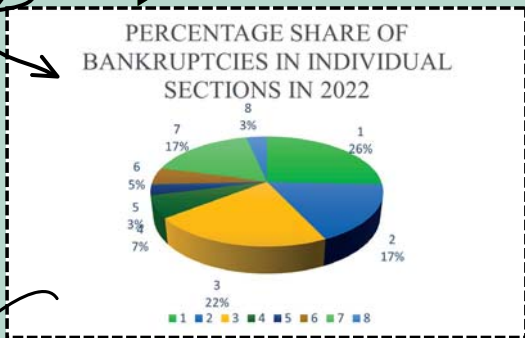
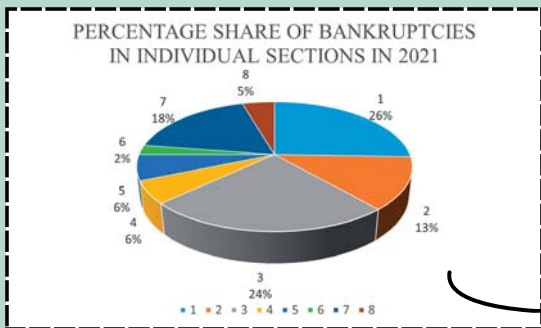
Kanban, a production control method developed by Taiichi Ōno for Toyota, focuses on managing bottlenecks by visualizing workflow with product cards. This method aims for uninterrupted workflow by organizing production according to customer demand, eliminating warehouses, and synchronizing production with orders. By reducing work-in-progress and using visual cues, Kanban swiftly detects and addresses bottlenecks in the manufacturing process.

# Company bankruptcies in Poland

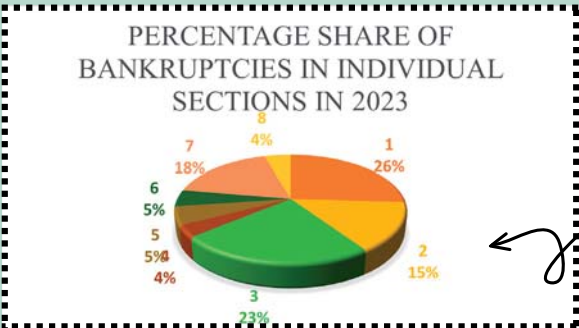
Financial bankruptcy is a situation in which an enterprise loses the ability to perform its obligations to creditors on an ongoing basis. Then the value of THE company's assets is lower than the sum of its debts, which leads to an insolvency. As a result of bankruptcy, a debtor may be forced to liquidate its assets to pay creditors or may be subject to a debt restructuring procedure that allows it to continue operating with a reduced debt burden.



- Main causes of financial problems:**
- High debt of the company
  - Lack of adequate financial control and internal audit
  - Failure to make changes in production technology in order to reduce production costs
  - Weaknesses and errors in managing receivables and cash



- Chart legend**
1. Industry
  2. Construction
  3. Trade; repair of motor vehicles
  4. Transportation and storage
  5. Accommodation and catering
  6. Information and communication
  7. Services
  8. Other sections



**References:**

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# CV of a Modern Controller



## Financial Controller

Modern controllers need to be prepared to leverage artificial intelligence, advanced technology, and data analytics tools to enhance efficiency and decision-making in controlling processes. They must adapt to the evolving challenges of a rapidly changing business landscape, including increased competition, regulatory changes, and the need for strategic business partnering.

Analytical mind  
Problem-solving  
Independence  
Meticulousness  
Excellent work organization

## PREPARING FOR THE FUTURE

In the future, controlling tasks and services will be characterized by increased automation and integration of new technologies. Tomorrow's reporting will see a shift from manual data collection and report generation to automated processes facilitated by cognitive agents, chatbots, and natural language generation solutions. This will streamline the reporting workflow, allowing for quicker decision-making by providing the CFO with more timely and insightful information. Therefore, while preparing for the future, it is important for Controllers to familiarize themselves with the use of the latest technologies and artificial intelligence in their field.

## SUMMARY

Future controllers must prioritize continuous learning, with a focus on developing skills in technology, data analytics, and strategic business partnering to remain relevant in an ever-evolving landscape. Cultivating effective communication and collaboration skills, fostering adaptability are essential for successfully navigating changing industry demands. By embracing change, seeking opportunities for growth, and consistently striving for excellence, future controllers will empower themselves to thrive in their roles and drive value for their organizations.

- Jakich kompetencji potrzebuje controller przyszłości?, [www.akademiacontrollingu.pl](http://www.akademiacontrollingu.pl)
- Controlling 2025 – Exploring the future of controlling, [www.dillerup.net](http://www.dillerup.net)
- The Future of Controlling, [www2.deloitte.com](http://www2.deloitte.com)

## EDUCATION

The education of a controller typically involves a combination of academic qualifications, such as a Bachelor of Economic Studies, and professional certifications, including Certified Public Accountant (CPA) and Certified Internal Auditor (CIA), along with ongoing professional development (e.g. training in financial analysis software, ERP systems, data analytics tools, and communication and leadership skills).

Some controllers choose to pursue a master's degree in accounting, finance, or business administration to deepen their knowledge and enhance their career prospects.

## EXPERIENCE

A modern Financial Controller should have a diverse range of experiences that reflect both traditional financial management skills and proficiency in modern financial technologies and methodologies. Employers are looking for Controllers with years of experience in financial management, accounting and strategic planning, with proven achievements in process optimization and decision support. The ability to lead cross-functional teams and provide financial insights that support business goals is also desired.

## SKILLS

- Proficiency in Spreadsheets, ERP Systems
- Data Analysis
- Understanding of AI and Machine Learning Concepts
- Technology Proficiency
- Critical Thinking and Problem-Solving
- Ethical and Regulatory Awareness
- Collaboration and Communication
- Financial Management
- Strategic planning
- Budgeting & Forecasting
- Process Optimization
- Financial Reporting
- Project management skills
- Presentation skills

## DATA SECURITY IN THE ERA OF CONTROLLING

### INTRODUCTION

In today's world where individuals and organizations increasingly rely on digital platforms for storing, processing, and transmitting sensitive information, the risks associated with unauthorized access, manipulation, or theft of data have escalated. This has prompted an analysis of the methods and technologies used to protect data.

### RESEARCH PROBLEM

The purpose of the poster is to encourage understanding of the problem of data security and to present controlling methods and tools that help ensure data security.

Moving on to the tools that can ensure data security in the enterprise, these include, for instance:

- Enterprise Resource Planning (ERP) Systems



- Security Information and Event Management (SIEM) Systems



- Customer Relationship Management (CRM) Softwares



Even though nowadays enterprises use advanced technologies, research conducted by KPMG in 2022 shows that in that year, 58% of companies in Poland recorded at least one security breach incident.

**58%**

Moreover, in the case of as many as one in three surveyed companies, the intensity of security breach attempts has increased

**33%**

<https://vermont.pl/system-erp-co-to-jest/>

<https://commence.com/blog/2013/12/20/top-20-crm-software/>

<https://kpmg.com/pl/pl/home/insights/2023/02/barometr-cyberbezpieczenstwa-2023-detekcja-i-reakcja-na-zagrozenia-w-czasie-podwyzszonego-alertu.html>

# DIGITALIZATION PROCESS IN THE POLISH PUBLIC ADMINISTRATION

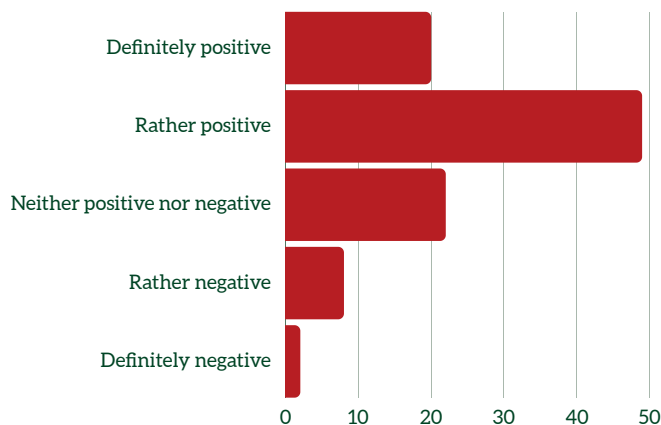
## INTRODUCTION

Digitalization is a key process in the modern world. It changes both the business world and the public institutions. Digitalization in public administration is a comprehensive process implementing modern technological solutions to improve the functioning of government institutions and provide more services to citizens.

## OBSTACLES IN THE DIGITALIZATION PROCESS

- Insufficient financial resources
- Employee resistance to change
- Insufficient employee competence
- Generally applicable law
- Low digital competence of residents
- Inadequate cooperation between different government departments
- Low priority of digital transformation in the office's tasks

How do you assess the digitalization of administrative services?

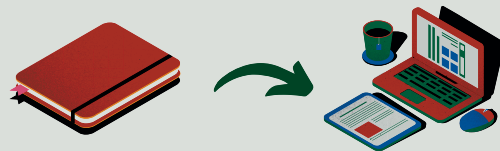


## REFERENCES

- Miazga A., Dziadowicz K., Pistelok P., 2022, Cyfryzacja urzędów miast, Badania Obserwatorium Polityki Miejskiej, Instytut Rozwoju Miast i Regionów, Warszawa-Kraków. <https://doi.org/10.51733/opm.2022.01>  
<https://infin.gov.pl/raporty/cyfrowe-osiagniecia-i-wyzwania/>  
<http://archiwum.mc.gov.pl/projekty/od-papierowej-do-cyfrowej-polski/wdrozenie-programu-korzysci>  
 Suchanek M., Sroka K. 2017, Cyfryzacja usług administracji publicznej. Studia Administracyjne 9/2017. DOI: 10.18276/sa.2017.9-03

## AIM OF THE POSTER

The objective of this poster is to provide information about the implementation of digitalization in the Polish public administration and to show the significance of embracing digital transformation in public services.



## ADVANTAGES

Reducing paperwork and manual tasks, leading to faster and more efficient service delivery.

Online platforms make government services more accessible to citizens, regardless of their location or physical ability, as they can be accessed anytime, anywhere.

Digitalization can lead to cost savings for both the government and citizens by reducing administrative overheads, such as printing and postage, and optimizing resource allocation.

Digital public administration encourages innovation and the adoption of new technologies, enabling the development of more user-friendly services and solutions to meet evolving citizen needs.

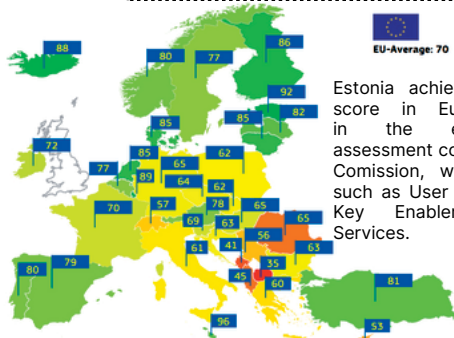


# e-Administration in Estonia



## e-Administration

E-Administration, or electronic administration, pertains to the utilization of information and communication technologies to optimize governmental functions, service provision and communication channels. This encompasses the digitization of services, electronic dissemination of information, proficient management of data, automation of administrative processes and facilitation of citizen engagement. The overarching objective is to advance the efficiency and efficacy of governmental operations, elevate service quality, as well as augment transparency and citizen involvement within governance frameworks.



Estonia achieved the second-highest score in Europe with 92 points in the eGovernment maturity assessment conducted by the European Commission, which considered factors such as User Centricity, Transparency, Key Enablers and Cross-Border Services.

## e-Identity

The Estonian national ID-card system leads globally with a 99% adoption rate, granting seamless access to secure electronic services and enabling various activities through robust encryption. Estonia also introduced the e-Residency program in 2014, with over 109,000 e-residents to date. This initiative offers a transnational digital identity, facilitating access to the EU business environment and Estonian public e-services. E-residents use this platform to establish and operate EU-based companies online, providing global business flexibility.



## e-Health

Estonia's e-Health Record system integrates data from diverse healthcare providers into a unified online platform accessible to patients. It retrieves information from different systems and presents it uniformly via the e-Patient portal. This aids doctors in accessing comprehensive patient records easily. Utilizing KSI Blockchain technology ensures data integrity and system security. This innovation propelled Estonia to the top rank in the 2019 digital health index by the Bertelsmann Foundation.



## e-Tax

The Estonian Tax and Customs Board's e-Tax system is the primary electronic platform for tax filing, with nearly 98% of tax declarations in Estonia submitted annually through it. Its functionalities encompass the submission of declarations for various taxes, including income tax, social tax, unemployment insurance and mandatory pension fund contributions for enterprises. Additionally, it facilitates requests for value-added tax returns, as well as customs declarations and personal income tax filings.



## e-Business Register

Estonia's e-Business Register streamlines online business registration, eliminating the need for notarial intervention. Since its establishment in 2011, a significant portion of company formations has shifted to this digital solution, significantly reducing registration time from days to mere hours. This tool supports various functions, including company registration, data updates, report submission, member list management for political parties, and entity inquiries.



## i-Voting

Introduced in 2005, Internet Voting (i-Voting) enables citizens to securely cast their ballots using their government-issued electronic identification from any internet-connected device during a designated pre-voting period. The system anonymizes voter identity before transmission to the National Electoral Commission for tabulation, ensuring confidentiality. Presently, around 51.1% of Estonians utilize this system.



## Justice

Estonia's digital justice systems is built around three main components: the e-File central information system, court information system and a public portal. The e-File serves as the core, supplying data to various entities such as courts, police and prosecutors. All communication is electronic, including workflow management and decision-making, with parties able to monitor proceedings digitally. According to the European Commission for the Efficiency of Justice, Estonia's court proceedings rank as the second fastest in Europe.



## School management system

Estonia collaborates with the private sector to deliver educational programs and ICT services to schools, enhancing teaching and learning. Innovative solutions such as digital textbooks, e-learning materials, digital class diaries and digital assessments streamline operations and facilitate collaboration among parents, teachers and students. Estonia's educational achievements are evidenced by its top ranking among European countries in the OECD's PISA test conducted in 2022.



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<https://doi.org/10.1787/53f23881-en>  
[https://commission.europa.eu/document/db44e228-d84e-43f5-99ce-17ca3f2f2933\\_en](https://commission.europa.eu/document/db44e228-d84e-43f5-99ce-17ca3f2f2933_en)  
<https://digital-strategy.ec.europa.eu/en/library/egovernment-benchmark-2023>



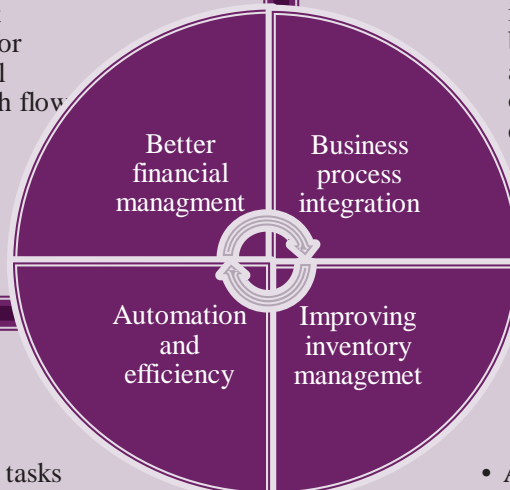
## ENTERPRISE RESOURCE PLANNING (ERP) SYSTEMS

Companies decide to implement ERP (Enterprise Resource Planning) systems for many reasons, mainly due to their comprehensive nature and the extensive benefits these systems offer. There are some of the main goals for which companies implement ERP systems:

**The objective of this poster is to demonstrate the operational, strategic and financial that ERP systems offer to companies, enabling them to achieve a higher level of efficiency and competitiveness in the market.**

- ERP systems offer advanced tools for financial management, including accountin, budgeting, forecasting and cash flow management functions. This allow for more accurate financial tracking and better cash flow management.

- ERP systems integrate various enterprise activities such as production, procurement, sales, finance, HR, inventory management and many others into one system. This enables better coordination of activities and simplification of information flow between different departments.



- Automation of routine tasks is one of the consequences of using an ERP system. These systems minimize the manual entry of data, which reduces errors, speeds up processes and increases optional efficiency.

- Advanced inventory management features in ERP systems enable better forecasting of needs, optimization of inventory levels and minimization of storage costs. This, in turn, leads to more efficient supply chain management.

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2. Gospodarek Tadeusz, „Systemy ERP. Modelowanie, projektowanie, wdrażanie.”
3. Gupta A., Verma R., Kumar J., „Enterprise Resource Planning”



# HOW AI CAN IMPROVE WORK OF FINANCIAL CONTROLLER?

IN THE DYNAMIC REALM OF FINANCE AND BUSINESS, THE ROLE OF A FINANCIAL CONTROLLER HAS EVOLVED INTO A MULTIFACETED RESPONSIBILITY. FACED WITH COPIOUS AMOUNTS OF DATA, INTRICATE FINANCIAL TRANSACTIONS, AND THE IMPERATIVE FOR PROMPT DECISION-MAKING, THE INTEGRATION OF ARTIFICIAL INTELLIGENCE (AI) STANDS OUT AS A TRANSFORMATIVE CATALYST. THIS FUSION OF FINANCIAL ACUMEN AND AI PRESENTS AN OPPORTUNITY TO RESHAPE THE MODUS OPERANDI OF FINANCIAL CONTROLLERS, OFFERING HEIGHTENED EFFICIENCY, PRECISION, AND STRATEGIC FORESIGHT.

IN THIS STUDY, WE WILL DELVE INTO THE MYRIAD WAYS IN WHICH AI HAS THE POTENTIAL TO ELEVATE THE ROLE OF FINANCIAL CONTROLLERS, USHERING IN AN ERA OF MORE STREAMLINED FINANCIAL MANAGEMENT AND INFORMED DECISION-MAKING AMIDST THE CURRENT DELUGE OF DATA.



## DATA ANALYTICS

BUSINESS INTELLIGENCE IS CRUCIAL FOR FINANCE AND ACCOUNTING, PROVIDING INSIGHTS FOR DECISION-MAKING. AI BOOSTS BI BY AUTOMATING DATA ANALYSIS AND OFFERING REAL-TIME INSIGHTS THROUGH CUSTOMIZED DASHBOARDS. THESE DASHBOARDS AGGREGATE DATA FROM VARIOUS SOURCES, PRESENTING A UNIFIED VIEW OF FISCAL HEALTH AND PERFORMANCE METRICS.

AUTOMATED SYSTEMS AND SPECIALIZED FINANCIAL SOFTWARE, INCLUDING BIG DATA ANALYTICS, ENHANCE CONTROLLER TASKS. CONTINUOUS ACCOUNTING INTEGRATES AUTOMATED DATA PROCESSING, CONTROL, AND PERIOD CLOSING TASKS INTO DAILY ACTIVITIES FOR ACCURATE FINANCIAL PERFORMANCE INFORMATION.

AI ENABLES REAL-TIME REPORTING BY CONTINUOUSLY PROCESSING AND UPDATING FINANCIAL DATA AS IT BECOMES AVAILABLE. THIS ALLOWS CONTROLLERS TO ACCESS UP-TO-DATE INFORMATION INSTANTLY, FACILITATING FASTER DECISION-MAKING AND RESPONSIVENESS TO CHANGING MARKET CONDITIONS.

AI-POWERED PREDICTIVE ANALYTICS CAN FORECAST FUTURE FINANCIAL OUTCOMES BASED ON HISTORICAL DATA, ECONOMIC TRENDS, AND OTHER RELEVANT FACTORS. THIS HELPS CONTROLLERS ANTICIPATE POTENTIAL FINANCIAL CHALLENGES OR OPPORTUNITIES AND MAKE PROACTIVE DECISIONS TO MITIGATE RISKS OR CAPITALIZE ON OPPORTUNITIES.

## CUSTOM DASHBOARDS

AI-POWERED DYNAMIC TOOLS OFFER REAL-TIME DATA, PREDICTIVE ANALYTICS, AND TREND ANALYSIS. THEY HELP TRACK FINANCIAL PERFORMANCE, MONITOR CASH FLOW, AND ASSESS EXTERNAL FACTORS' IMPACT ON MONETARY OUTCOMES.

## FRAUD DETECTION

AI ALGORITHMS CAN DETECT UNUSUAL PATTERNS OR ANOMALIES IN FINANCIAL TRANSACTIONS THAT MAY INDICATE FRAUDULENT ACTIVITY. BY AUTOMATICALLY FLAGGING SUSPICIOUS TRANSACTIONS, AI HELPS CONTROLLERS IDENTIFY AND INVESTIGATE POTENTIAL FRAUD MORE EFFICIENTLY.

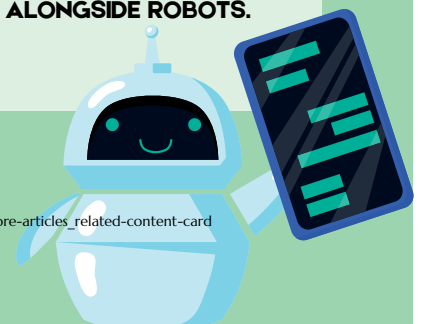
## EXPENSE MANAGEMENT

AI-BASED EXPENSE MANAGEMENT TOOLS CAN AUTOMATE EXPENSE CATEGORIZATION, RECEIPT MATCHING, AND APPROVAL WORKFLOWS. THIS STREAMLINES THE EXPENSE MANAGEMENT PROCESS.

**THE GOAL IS NOT TO REPLACE AS MANY HUMANS AS POSSIBLE WITH ROBOTS, BUT RATHER TO ENHANCE HUMAN PRODUCTIVITY THROUGH COLLABORATIVE WORK ALONGSIDE ROBOTS.**

## REFERENCES

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- [https://www.linkedin.com/pulse/future-decision-making-ai-driven-business-intelligence-jha-k85me?trk=article-ssr-frontend-pulse\\_more-articles\\_related-content-card](https://www.linkedin.com/pulse/future-decision-making-ai-driven-business-intelligence-jha-k85me?trk=article-ssr-frontend-pulse_more-articles_related-content-card)
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# INTEGRATED INFORMATIZATION SOLUTIONS FOR FURNITURE ENTERPRISES

Increasing production efficiency is impossible without measuring the results attained. Assessing the performance of industrial production poses a notably more challenging endeavor compared to evaluating the outcomes of other activities. The complexity stems from the need to integrate and consolidate data gathered from various devices, then generating a comprehensive report to aid in managing the company's processes.

## Production management with ERP systems



### Manufacturing Execution System

MES is a system for managing and controlling production, constantly monitoring manufacturing performance. It collects and processes real-time data from production stations, generating visualizations for production managers, operators, and supervisors. However, a challenge arises from reconciling files and reports due to different machine software.



### Recording of production data

With the MES module situated directly in the production halls, employees can document their activities. This module not only informs employees about their assigned production tasks but also records their work. By registering production data, the company acquires valuable information regarding ongoing activities at workstations, machine operations, and production durations.



### Measuring the consumption of raw material

Usually, the consumption of raw material is specified in the product documentation, but in the furniture industry there are often specific cases that make it difficult to accurately predict the consumption of raw material. For example, the consumption of upholstery fabric for different numbers of products is not proportional, nor is the use of friezes for specific slats. The MES module enables direct recording of raw material consumption during production, offering real-time cost insights.



### Measurement of operating times

With the MES module, it is possible to record the start and end times of operations, allowing you to monitor delays, plan compliance, production progress and productivity. The collation of the execution times of all operations makes it possible to accurately determine labor costs and evaluate the efficiency of the various elements of the production process.



### Production planning - scheduling

Recording execution times of technological operations enables adjustments to benchmark times. Accurate benchmarks facilitate rational future production planning, enhancing its success rate. Quality foresight on future production opens avenues for performance optimization. Yet, the primary aim of production planning remains providing customers with dependable delivery timeframes for products meeting their expectations.

## KEY PERFORMANCE INDICATORS

### WHAT IS KPI?

→ (KPIs) are crucial elements of your organizational strategy, defining desired results and metrics for assessment.

→ They establish aims, timelines, and are vital for evaluating effectiveness.

→ Typically, 5-7 KPIs are integrated into effective strategies to monitor progress towards targets.

### BENEFITS OF KPI?

- 1 Provide clarity and focus to your strategic plan
- 2 Create a way to communicate a shared understanding of success
- 3 Provide signposts and triggers to help you identify when to act

### FIVE ELEMENTS OF KPI



#### A measure

Every important thing we measure in a business needs a way to be measured. The really good ones have clear and detailed ways of measuring them.



#### A target

Each key performance indicator (KPI) should have a target that aligns with the measurement and timeframe of your objective.



#### A source

Every key performance indicator (KPI) must be associated with a transparent data source for accurate measurement.



#### A frequency

Various measures may necessitate different reporting frequencies, yet a solid guideline is to report on them at least monthly.



#### An owner

Though not obligatory in your KPI statement, it's important to specify who is accountable for reporting progress.

### KPI and controlling

KPIs serve as performance metrics that help organizations gauge their progress towards goals, while controlling involves the process of managing performance to ensure alignment with objectives through continuous monitoring and adjustment. Together, they play a crucial role in driving organizational performance and success.

### HOW TO DEVELOP KPIs



Choose metrics that directly quantify your primary annual goals.

Select a balance of leading and lagging indicators that are quantifiable.

KPI need ownership.





Set goals and be consistent. Select measures that can be reported at least monthly

#### References:

- <https://onstrategyhq.com/resources/27-examples-of-key-performance-indicators/> fbclid=IwAR2vbNEbnhdNoH5C5qk3pXIwRhV0J3zay83DnVNsdWboMVNKmB4suAZ0j20
- <https://www.igc-controlling.org/fileadmin/downloads/Standards/ControllingProcessKPIs.pdf?fbclid=IwAR2n9wVFBk2C0RHgEOIZ2qMAIv4UDIf7zFbh9Jf8G7xu-0hIAMEtZW4UfAI>
- Chat GPT

# Logistics controlling

The objective of this poster is to provide information about logistics controlling, its use, its benefits and the risk associated with it.

	<p>What is logistics controlling?</p> <p>Logistics controlling in a company is considered a functional component of controlling, combining financial and market aspects related to logistics. It is a logistics management system that coordinates planning, control, and information gathering and processing processes. Its main goal is to effectively achieve logistics objectives.</p>
	<p>Logistics controlling tasks</p> <ul style="list-style-type: none"> <li>• Providing management with meaningful information regarding operational results.</li> <li>• Offering advisory support in the planning and management processes.</li> <li>• Engaging in activities aimed at coordinating and facilitating agreements within and between organizational subsystems.</li> </ul>
	<p>Benefits of using controlling in logistics:</p> <p>Conducting logistics controlling enables cost supervision and identification of areas for potential savings. Cost control is crucial in logistics because expenses significantly impact a company's profitability as an essential element of the entire logistical process. Through logistics controlling, it's possible to monitor costs associated with transportation, warehousing, customer service, and other logistics elements.</p>
	<p>Risk management in logistics controlling:</p> <p>An important aspect of logistics controlling involves proficient risk management. Monitoring costs helps pinpoint areas vulnerable to financial threats and enables the implementation of strategies to mitigate such risks. For instance, scrutinizing expenses may address potential hazards linked to production processes and supply chains, allowing the company to identify areas of vulnerability.</p>

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KRAWCZYK, S. (2009). CONTROLLING LOGISTYCZNY W SIECIACH USŁUG TRANSPORTOWYCH. PRACE NAUKOWE POLITECHNIKI WARSZAWSKIEJ, (69), 89-100.  
[HTTPS://LOCURA.PL/CONTROLLING-LOGISTYCZNY/](https://locura.pl/controlling-logistyczny/)

## WHAT IS ROSSUM?

Rossum is an intelligent document processing platform that automates document workflows from start to finish. It is the fastest document processing platform built for the cloud. Rossum can reduce costs and improve a company's productivity or efficiency. The platform has been trained on millions of transactional documents using an advanced AI language. Rossum is built for processing and integrates seamlessly into a company's ecosystem, working with, for example, SAP, Coupa, Workaday and many others.

## COMPANY VALUES

At Rossum all of their interactions, from internal meetings with peers to executive-level customer conversions, are guided by their values: strong opinions, weakly held work smart, learn fast, differences make them strong. Rossum provides a comprehensive transactional document automation platform to more than 275 enterprise businesses worldwide. The mission is to empower an individual to seamlessly process a million transactions annually.

### SOLUTIONS BY INDUSTRY:

- Manufacturing
- Construction
- Logistic & Transportation
- Retail & CPG
- Technology
- Business services
- Financial Services
- Healthcare
- Insurance Solutions

### SOLUTIONS BY USE CASE:

- Accounts payable
- Customs clearance
- Sales orders
- Quality assurance

### SOLUTIONS BY DEPARTMENT:

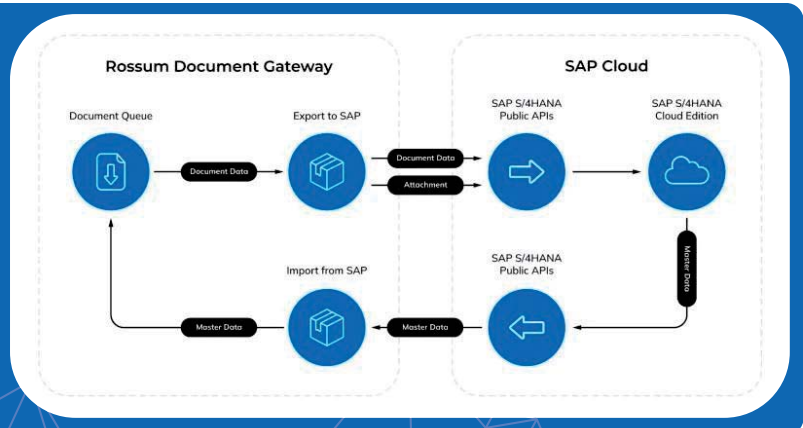
- Finance & Accounting
- IT
- Automation & Transformation
- Shared service centers

## ROSSUM + SAP INTEGRATION

Using trained artificial intelligence, Rossum extracts invoices and verifies all the data contained on them. It matches the invoice data with the information contained in the company's master data, and then converts it to the desired format for integration with SAP. Invoices extracted by Rossum are posted automatically.

Main benefits:

- reduce error rates
- minimize risk
- leaving the manual processing and more valuable task for the staff.



Many large international companies from various industries, such as Deloitte, Veolia, Siemens, DPD, Wolt, have cooperated with Rossum. All of these companies have seen significant benefits from using Rossum. Wolt company accelerated Accounts Payable AI automation and reduced error rates by 44%. Another example is Veolia that achieved 8x faster processing time with Rossum. Using Rossum's solution results in generating the maximum return on automation for clients. From commercial companies to Fortune 500 firms, customers have one thing in common - the value they get from a transactional document automation solution.

82%

manual  
workload  
reduction

95%

time  
saved per  
document

90%

automation  
rate

90%

accuracy



Reference:

<https://rossum.ai>

<https://www.youtube.com/watch?v=P9cMIHgdMIs>

<https://therecursive.com/revolutionizing-b2b-communication-how-rossum-automates-document-processing-with-ai/>

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# The Crucial Role of Controlling

## in Company Financial Management

### INTRODUCTION

In today's dynamic business environment, effective financial management is essential for the success and sustainability of any organization. The concept and understanding of controlling techniques play a crucial role in this. It is a process of monitoring, analyzing, and correcting financial results, which enables companies to gain a precise understanding of their financial situation and make informed decisions.



### KEY FUNCTIONS OF CONTROLLING

Risk management    Budgeting & Forecasting    Variance Analysis    Performance Measurement    Cost Control



### CONTROLLING AS AN INFORMATION SYSTEM FOR MANAGERS

It is an incredibly important tool that enables the effective utilization of data in company management. Through controlling, managers have access to comprehensive information regarding the finances, operations, and results of the company, enabling them to make informed business decisions. Controlling systems facilitate the collection, analysis, and presentation of data in a clear and understandable manner, facilitating the monitoring and evaluation of the effectiveness of actions and the identification of areas requiring improvement.

### TOOLS AND TECHNIQUES USED BY FINANCIAL CONTROLLERS

○ Financial Analysis Tools	○ Cost Accounting Methods	○ Business Intelligence (BI) Tools
○ Blockchain Technology	○ Budgeting and Forecasting Software	○ Robotic Process Automation
○ Machine Learning and AI	○ Financial Reporting Systems	○ Performance Measurement Metrics

### THE IMPORTANCE OF CONTROLLING IN INVESTMENT AND STRATEGIC DECISION-MAKING

The importance lies in how controlling provides crucial insights and data-driven analyses that inform investment and strategic decisions. It helps in assessing investment opportunities, evaluating potential risks, and aligning decisions with the company's overarching goals and objectives. Controlling ensures that resources are allocated efficiently, maximizing returns while minimizing potential losses. Additionally, it facilitates the monitoring and evaluation of the effectiveness of implemented strategies, enabling timely adjustments to achieve desired outcomes.

**Controlling in business is an extremely important tool that allows for effective financial management of the company. Through it, all aspects of operations can be monitored and analyzed, enabling informed decision-making.**

<https://centrakonferencyjne.com.pl/controlling-w-biznesie-klucz-do-zrozumienia-i-opanowania-finansow-firmy/>



# THE USE OF COBOTS IN THE AUTOMOTIVE INDUSTRY

## INTRODUCTION

In the realm of automotive manufacturing, the integration of robotic technologies has revolutionized production processes. Cobots, which are industrially proven, hugely reliable automation solutions, play pivotal roles in tasks like assembly, welding, and material handling. This paper explores the diverse landscape of these robots, shedding light on their functionalities, technologies, and the collective impact they have on accelerating, simplifying, and enhancing efficiency in car manufacturing.

## OBJECTIVE

In this poster, we will explore a few of many uses of industrial robots, taking a closer look on their use in automotive industry and the benefits, they provide.



## Cobots have revolutionized car manufacturing across various critical processes:

1. Car Part Painting: Robotic precision in painting ensures uniformity, minimizing errors, overspray, and resource use.
2. Subtractive Manufacturing: Automated CNC machines and robotic systems streamline subtractive manufacturing, enhancing efficiency and precision.
3. Welding and Joining Tasks: Robotic welding systems perform high-precision welds, ensuring quality connections and automation of various joining applications.
4. Assembling: Automation of repetitive and precise assembly tasks accelerates production, aligning with the industry's long-standing spirit of innovation.
5. Hazardous Materials Handling: Robots play a crucial role in safely handling hazardous materials, minimizing risks to human workers and the environment.



### References:

<https://blog.spatial.com/automotive-robots>

<https://www.procoobot.com/6-przykladow-zastosowania-robotow-przemyslowych-w-przemysle-motoryzacyjnym/>





## Unlocking The Future:

# CENTRAL BANK DIGITAL CURRENCY (CBDC)

**Discover the transformative potential of Central Bank Digital Currency (CBDC) and its implications for the global financial landscape.**

**Explore its benefits, challenges, and the path forward in this concise guide.**

As the world becomes increasingly digital, traditional forms of currency face new challenges.

Central banks are exploring the potential of CBDC as a means to modernize financial systems, enhance efficiency, and address emerging issues such as financial inclusion and cross-border transactions.

## Central Bank Digital Currency

CBDC is a digital form of sovereign currency issued by a central bank. Unlike cryptocurrencies like Bitcoin, CBDC is centralized and regulated by the issuing authority. It represents a digital equivalent of a nation's physical currency and can be used for transactions, payments, and other financial activities.

## Potential Benefits

CBDC offers several potential benefits. It could enhance the efficiency of financial transactions, reduce costs associated with cash management, and improve transparency in the financial system. Additionally, CBDC has the potential to promote financial inclusion by providing access to digital payment services for individuals who are currently underserved by traditional banking systems.

## Challenges

The implementation of CBDC also poses significant challenges. Central banks must carefully consider issues such as privacy, cybersecurity, and monetary policy implications. Additionally, the adoption of CBDC could disrupt existing financial systems and require significant infrastructure upgrades.

Despite these challenges, the potential benefits of CBDC are driving widespread interest and experimentation among central banks worldwide. Countries such as China, Sweden, and the Bahamas have already launched or are piloting CBDC projects, while others are actively researching potential use cases and implementation strategies.

## Future of money

As the global financial landscape continues to evolve, CBDC has the potential to play a central role in shaping the future of money. By understanding its opportunities and challenges, policymakers, financial institutions, and consumers can prepare for the transition to a more digital and inclusive financial ecosystem.

## References

- [1.https://www.bankofengland.co.uk/paper/2020/central-bank-digital-currency-opportunities-challenges-and-design-discussion-paper](https://www.bankofengland.co.uk/paper/2020/central-bank-digital-currency-opportunities-challenges-and-design-discussion-paper)
- [2.https://www.mckinsey.com/featured-insights/mckinsey-explainers/what-is-central-bank-digital-currency-cbdc](https://www.mckinsey.com/featured-insights/mckinsey-explainers/what-is-central-bank-digital-currency-cbdc)
- [3.https://hbr.org/2021/10/what-if-central-banks-issued-digital-currency](https://hbr.org/2021/10/what-if-central-banks-issued-digital-currency)
- [4.https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2662-fa8429a967.en.pdf](https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2662-fa8429a967.en.pdf)



# Utilizing Big Data Processing Techniques for Market Trends Forecasting

## THE OBJECTIVE

The main objective of the poster is to explore the utilization of Big Data processing techniques for forecasting market trends and facilitating informed business decision-making.

## Introduction

The ability to predict and respond to changing market trends is crucial for the success of enterprises. In this context, the utilization of Big Data processing techniques is becoming increasingly important, enabling businesses to analyze vast datasets to identify patterns and forecast future market trends. This project examines the potential of these techniques in streamlining decision-making processes and strategic business planning. Leveraging Big Data processing techniques empowers businesses to gain deeper insights into market trends, customer behavior, and competitive dynamics, enabling them to make more informed decisions and stay ahead in today's fast-paced business landscape.

## The research problem revolves around:

- Investigating the effectiveness of Big Data processing methods in analyzing market data.
- Assessing the capability of predictive modeling to forecast future market trends accurately.
- Exploring the potential applications of market trend forecasting for strategic business decisions.

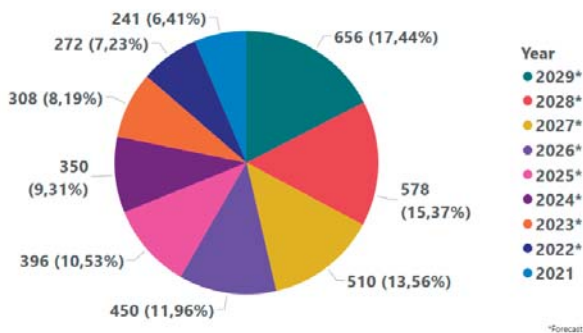
## Advantages

- **Enhanced Accuracy:** Big Data processing enables the analysis of large and diverse datasets, leading to more accurate forecasts and informed decision-making based on comprehensive insights.
- **Real-Time Insights:** By processing data in real-time, businesses can quickly identify emerging trends and adapt their strategies accordingly, gaining a competitive edge in dynamic market environments.
- **Better Risk Management:** By analyzing historical data and current market trends, businesses can identify potential risks and opportunities, allowing for proactive risk management strategies to be implemented.
- **Strategic Planning:** Insights derived from Big Data analysis aid in strategic planning by providing valuable information about market dynamics, customer behavior, and competitor activities, enabling businesses to make data-driven decisions about future investments and initiatives.

## BIG DATA USAGE BY INDUSTRY



Market size in billion U.S. dollars

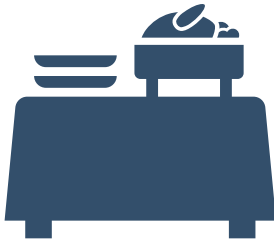


REFERENCES: „Size of the big data analytics market worldwide from 2021 to 2029(in billion U.S. dollars)”, <https://www.statista.com/>, Petroc Taylor  
 “Big Data: The next frontier for innovation, competition, and productivity.”, McKinsey & Company, <https://www.mckinsey.com/>  
 Davenport, T. H., & Harris, J. , “Competing on Analytics: The New Science of Winning.”, Harvard Business Press, 2007  
<https://www.scnsoft.com/>

## **Part III**

# **Social Dynamics and Workplace Evolution**






## A New Era of Gastronomy Technology



Gastronomy is undergoing a breakthrough moment thanks to technological innovations. Robotization becomes an integral part of the industry, changing the way we cook, serve, and experience food

**The aim of the project is to assess the impact of adopting new technologies in gastronomy, including their effects on operational functioning, efficiency, customer satisfaction, and improvement of sustainable development**

New technologies in gastronomy have the potential to solve many problems, both for restaurateurs and customers. Here are several key issues that can be addressed by introducing new technologies:

-  **Increased operational efficiency:** Automating kitchen processes with robots can speed up food preparation and streamline inventory management, leading to increased operational efficiency in restaurants.
-  **Cost optimization:** Introducing technology can help optimize costs by reducing food waste, minimizing losses due to human errors, and optimizing energy consumption.
-  **Enhanced customer attractiveness:** New technologies can provide customers with new and innovative experiences that capture their attention and increase the attractiveness of restaurants.
-  **Improved customer service:** Online reservation systems, mobile food ordering apps, and self-service kiosks can improve customer service and provide them with a more convenient experience.
-  **Promotion of sustainable development:** New technologies can support sustainable development goals by reducing resource consumption, limiting CO2 emissions, and promoting ecological practices such as plastic reduction.

Introducing new technologies can be a response to many challenges faced by restaurateurs, contributing to both improved operational efficiency and increased customer satisfaction.

# ADVANTAGES OF REMOTE WORK

Remote work is a work arrangement in which employees do not work from a central office. Many employers choose to introduce the option of remote work for their employees, which has many benefits.

## 1 Increased productivity

Remote workers are more productive than their office-based counterparts. Organizations agree that workplace flexibility is a key factor influencing employee engagement - higher than compensation.

## Reduced costs

Remote work can save companies money on office space, equipment, and supplies. The saved funds of the company can be used, among other things: for employee benefits, creating an integration space.

## 3 Improved employee morale

Remote workers are happier and more engaged than their office-based counterparts. Employees stated that the opportunity to work remotely has made them happier and more motivated in their role.

## Greater flexibility

Remote workers have more flexibility to work when and where they want. Working mothers consider flexible work schedules as their top priority or prefer remote work options.

## 5 Improved work-life balance

Remote workers have a better work-life balance than their office-based counterparts. A lot of employees expect their employer to support them in balancing work and personal responsibilities.

## Conclusion

Remote work is a growing trend that is changing the way we work. It offers a number of benefits for both employers and employees.

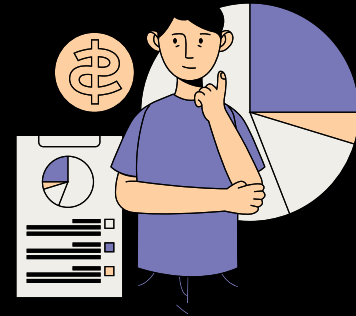
### References:

<https://www.zavvy.io/pl/blog/statystyki-dotycz%C4%85ce-pracy-hybrydowej-i-zdalnej#>  
<https://chat.openai.com/>  
<https://www.canva.com/>

# BLIK AS THE MOST CONVENIENT POLISH FORM OF PAYMENT

## HISTORY

THE ORIGINS OF BLIK DATE BACK TO 2013, WHEN SIX POLISH BANKS ENTERED INTO AN AGREEMENT TO CREATE A COMMON MOBILE PAYMENT SYSTEM. ON 13 JANUARY 2014, THE COMPANY POLSKI STANDARD PŁATNOŚCI (PSP) WAS REGISTERED WITH THE NATIONAL COURT REGISTER TO BUILD MOBILE PAYMENT SERVICES BASED ON THE IKO PAYMENT SYSTEM CREATED BY PKO BANK POLSKI. IN 2014, THE NATIONAL BANK OF POLAND GRANTED PERMISSION FOR PSP TO OPERATE THE PAYMENT SYSTEM, AND THE BLIK SERVICE WAS MADE AVAILABLE ON 9 FEBRUARY 2015

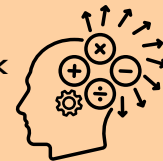


## THE CODE-BASED AUTHORISATION MODEL

1. THE PAYER LAUNCHES A BANKING APPLICATION, SELECTS BLIK AND THE CODE IS GENERATED,
2. THE PAYER ENTERS THE CODE AT THE POINT OF ACCEPTANCE (TERMINAL, ATM, WEBSITE),
3. TRANSMISSION OF THE AUTHORISATION CODE BY THE MERCHANT VIA THE SETTLEMENT AGENT TO THE PSP,
4. VERIFICATION OF THE CODE BY THE PSP, RECOGNITION OF THE BANK THAT ORDERED IT AND TRANSMISSION OF THE AUTHORISATION CODE TO THE BANK,
5. AUTHORISATION BY THE BANK,
6. SENDING BACK THE BANK'S AUTHORISATION TO THE PSP, WHICH FURTHER FORWARDS IT TO THE MERCHANT VIA THE SETTLEMENT AGENT.
7. CONFIRMATION BY THE PAYING PARTY OF THE TRANSACTION IN ITS BANKING APPLICATION.

## TRIVIA

ACCORDING TO THE NATIONAL BANK OF POLAND, IN 2019 THE NUMBER OF BLIK TRANSACTIONS EXCEEDED THE NUMBER OF PAYMENT CARD TRANSACTIONS MADE ON THE POLISH INTERNET...



## DEVELOPMENT STATISTICS IN TABLE



Year	Number of users	Number of transactions	Transactions value (PLN)
2015	1,4 m	1,27 m	346,9 m
2016	3,1 m	7,8 m	1,5 bn
2017	6,1 m	33 m	4,5 bn
2018	8,8 m	91 m	12 bn
2019	13,1 m	218 m	47 bn
2020	16,9 m	424 m	57 bn
2021	21,6 m	763 m	103,3 bn
2022	25,9 m	1 200 m	163,9 bn
2023	28,8 m	1 800 m	243 bn

### REFERENCES:

<https://chat.openai.com>

<https://pl.wikipedia.org/wiki/Wikipedia>

<https://www.bankier.pl>

# CBDC

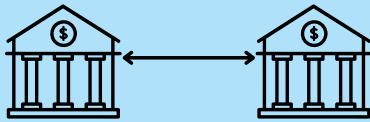
## WHAT IS IT?

Central bank digital currency (CBDC) is a type of digital currency issued by a nation's central bank. Unlike cryptocurrencies, its value is fixed by the central bank and is equivalent to the country's fiat currency.

The purpose of this poster is to present what CBDC is. It will be shown how it functions and in which countries it operates. It will also not take away the advantages and disadvantages of using CBDC.

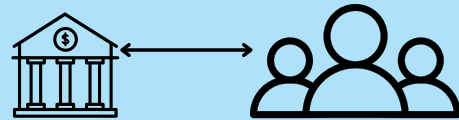
**There are two main categories of CBDC: wholesale and retail. Wholesale CBDCs are primarily utilized by financial institutions, while retail CBDCs are intended for use by consumers and businesses.**

## WHOLESALE



Wholesale CBDCs function like traditional reserve holdings, allowing financial institutions to manage deposits and transfers. This empowers central banks to influence lending through monetary policy tools.

## RETAIL



Retail CBDCs, used by consumers and businesses, mitigate risks linked to private issuers. They include token-based, allowing anonymous transactions, and account-based, requiring digital identification.

## Pros

1. CBDCs aim to offer privacy, convenience, accessibility, and financial security for transactions.
2. They could reduce maintenance costs and cross-border transaction expenses.
3. CBDCs provide a stable alternative to volatile cryptocurrencies, enhancing economic stability.

## Cons

1. Freezing or seizing assets - with cbdc, governments could freeze assets more efficiently, establishing a direct link between citizens and the government.
2. Negative interest rates - cbdc could enable negative rates, potentially stimulating spending.
3. Programmable spending - cbdc's programmable nature could lead to spending restrictions, such as limiting purchases for individuals with alcohol-related offenses.



Currently, three countries, namely the Bahamas, Jamaica, and Nigeria, have implemented or are experimenting with CBDC. Additionally, many other countries, including the United States, China, Russia and Poland, are conducting research and development efforts to introduce their own central bank digital currencies.

### References:

- <https://www.investopedia.com/terms/c/central-bank-digital-currency-cbdc.asp>  
<https://www.cato.org/visual-feature/risks-of-cbdc>  
<https://www.weforum.org/agenda/2023/10/what-are-central-bank-digital-currencies-advantages-risks/>  
<https://www.atlanticcouncil.org/cbdctracker/>



# ChatGPT

## APPLICATIONS AREAS



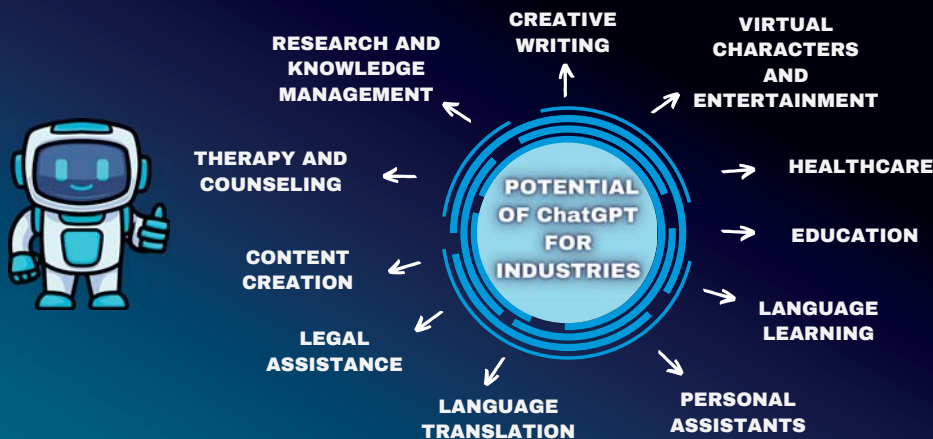
### WHAT ChatGPT IS?

ChatGPT is an Artificial Intelligence (AI)-powered Natural Language Processing (NLP) tool that comprehends and produces text in response to given commands. Now ChatGPT can comprehend both text and graphics as input.

### BENEFITS OF USING ChatGPT

Using ChatGPT offers instant, scalable assistance around the clock, ensuring consistent, cost-effective support with efficient response times and valuable data insights.

### HOW IT WORKS



### THREATS OF ChatGPT FOR INDUSTRIES

- **JAILBREAKING**
- **FACTUALITY**
- **REGULATORY COMPLIANCE**
- **USER TRUST AND ACCEPTANCE**
- **TECHNICAL LIMITATIONS AND PERFORMANCE**
- **INTEGRATION WITH EXISTING SYSTEMS**



### SUMMARY

OVERALL, WHILE GPT MODELS OFFER NUMEROUS OPPORTUNITIES FOR INNOVATION AND EFFICIENCY ACROSS VARIOUS INDUSTRIES, IT'S ESSENTIAL TO ADDRESS CHALLENGES SUCH AS ETHICAL CONSIDERATIONS, INTEGRATION COMPLEXITIES, AND ENSURING RESPONSIBLE DEPLOYMENT TO REALIZE THEIR FULL POTENTIAL.

### REFERENCES

[HTTPS://CHAT.OPENAI.COM/?MODEL=TEXT\\_DAVINCI\\_002\\_RENDER\\_SMA](https://chat.openai.com/?model=TEXT_DAVINCI_002_RENDER_SMA)  
[HTTPS://365DATASCIENCE.COM/TRENDING/THE-EVOLUTION-OF-CHATGPT-HISTORY-AND-FUTURE/](https://365DATASCIENCE.COM/TRENDING/THE-EVOLUTION-OF-CHATGPT-HISTORY-AND-FUTURE/)  
[HTTPS://WWW.ADAPTIVEUS.COM/BLOG/CHATGPT-FOR-FINANCIAL-ANALYSIS/](https://www.adaptiveus.com/blog/chatgpt-for-financial-analysis/)  
[HTTPS://WWW.SPORTSKEEDA.COM/GAMING-TECH/5-BEST-USES-CHAT-GPT-WRITING](https://www.sportskeeda.com/gaming-tech/5-best-uses-chat-gpt-writing)  
[HTTPS://BLOG.WEAREDREW.CO/EN/MAIN-GPT-CHAT-APPLICATIONS-WHAT-DOES-THIS-TOOL-PROPOSE](https://blog.wearedrew.co/en/main-gpt-chat-applications-what-does-this-tool-propose)





# Chess mate in business: using chess strategies to win in the marketplace

## ANALYSIS OF THE OPPONENT (MARKET/COMPETITION):

Before taking action in the market, it is necessary to thoroughly understand competitors, market trends, customer preferences and other factors affecting the business. Just as a chess player analyzes his opponent's moves, an entrepreneur should closely monitor the activities of competitors and adjust his strategies in response responses.

## SECURING THE "KING" (CORE BUSINESS):

Business should first focus on securing the basic elements of operations that are critical to the success of the company. This means ensuring financial stability, solid relationships with customers, high quality products or services, and effective internal organization. Only when these elements are fully established, company can effectively consider expansion, investments or other offensive actions.

## MAINTAINING COLD BLOOD UNTIL THE END:

In business, as in chess, there are moments of pressure, uncertainty and risk. Maintaining calm and cool-bloodedness in such situations is crucial. Companies must be ready for unexpected challenges, market changes or crises, and be able to make rational decisions even in stressful situations. Long-term strategies and flexibility are key to maintaining competitiveness in the long term.

## WHAT CAN BUSINESS LEADERS LEARN FROM THE MASTERS OF THE CHESS?

1. no decision is a decision
2. every decision has consequences
3. you have limited time to make a decision

## PHASES OF COMPANY DEVELOPMENT AND STAGES OF A CHESS GAME?

**Opening - Business Idea/Business Startup:**

In the opening phase of a business, much like a chess game, the business idea is the first step that establishes the foundation of the strategy by defining the goal, identifying the target market and planning the first steps, analogous to the initial moves on the chessboard that shape the position and strategy of the game.

**The middle game - business development:**

Similar to the middle phase of a chess game, business development brings with it activity and dynamic changes. In this phase, the company seeks to expand, acquire new customers, introduce new products or services, just as in the middle part of the game, where players try to strengthen their position, develop attacks and defenses.

**Closure or succession:**

In the closing phase of the business of a company, similar to the closing phase in chess, decisions become crucial as the company moves toward closure or succession. Similar to chess, where players try to play to their strengths and achieve their goals, so too in this phase the company strives to achieve its business goals and achieve success or moves on to the next stage of development.

## THE MOST EFFECTIVE QUALITIES OF CHESS PLAYERS IN BUSINESS

- anticipating the movements of competitors/ opponents,
- strategic thinking,
- thinking about the end goal
- distinguishing between tactical (operational) from strategic (long-term).

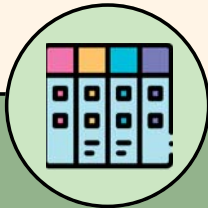
Source:

- Michał Kanarkiewicz, *Strategie szachowych mistrzów w biznesie*, 2019
- <https://hrlityczny.pl/strategie-szachowych-mistrzow-w-biznesie-wywiad-z-michalem-kanarkiewiczem/>

# Continuous Improvement

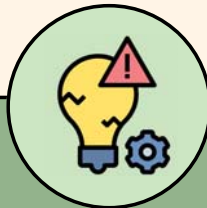
Continuous improvement is an idea rooted in Japanese work culture, particularly in the concept of Kaizen. It is an ongoing process of identifying, analyzing, and implementing small changes to systems, processes, products, and services. The accumulation of these small changes leads to increased efficiency, improve quality, reduce waste, defects, and deficiencies in products or services.

## Core methods used in Continuous Improvement



### Kanban

It involves production control through events that occur directly in production. It also utilizes process mapping, which improves information flow within the enterprise. The benefits associated with this concept include low inventory, on-time delivery, quality control at every stage of production, and short processing times.



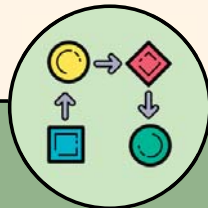
### Poke-yoke

Poke-yoke prevents errors from a technical standpoint, assuming that mistakes arise due to poor work organization rather than human error



### Six Sigma

Six Sigma aims to systematically identify and eliminate defects, reduce process variation, and ultimately improve customer satisfaction and profitability.



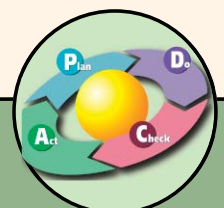
### Process mapping

Presenting processes in a graphical form facilitates understanding of the organization's activities, identification of areas where materials are wasted, and allocation of responsibilities for decision-making.



### 5S

**Seiri (Sorting)** – separating all materials at the workplace and getting rid of unnecessary ones  
**Seiton (Set in Order)** – labeling and designating tools and their parts.  
**Seiso (Shine)** – cleaning the workplace, arranging items, and tidying it up.  
**Seiketsu (Standardization)** – maintaining the workplace cleanliness and order.  
**Shitsuke (Sustain)** – maintaining improvements introduced in the workstation, educating employees.



### PDCA Cycle

**P - Plan** – It is crucial to prepare accordingly answering following questions: who, when, what  
**D - Do** – Execute planned actions, implement changes.  
**C - Check** – Monitor results and effectiveness of actions.  
**A - Act** – Infer from results and make corrections, implement improvements.

## Benefits of Continuous Improvement



Lower error ratio



Greater employee engagement



Higher productivity



Safer workplace



Higher-quality products & services



# CONTROLLING PROFESSION ACROSS GENERATIONS

## PURPOSE OF THE POSTER

THE POSTER AIMS TO SHOW THE DIFFERENT SOCIAL PERSPECTIVES TOWARDS THE ROLE OF A CONTROLLER, DEPENDING ON AGE. BY HIGHLIGHTING THESE DIFFERENCES, ITS INTENTION IS TO STIMULATE REFLECTION ON GENERATIONAL DIFFERENCES IN PERCEPTIONS OF THE CONTROLLING PROFESSION AND TO ENCOURAGE OPEN DISCUSSION BETWEEN DIFFERENT AGE GROUPS.

## WHO IS THE CONTROLLER?

A CONTROLLER IS PRIMARILY RESPONSIBLE FOR MONITORING AND ANALYZING FINANCES AND REPORTING. THEIR DUTIES INCLUDE TRACKING BUDGETS, COST ANALYSIS, PREPARING FINANCIAL REPORTS, AND EVALUATING OPERATIONAL EFFICIENCY. CONTROLLERS TYPICALLY HOLD A MID TO SENIOR-LEVEL POSITION WITHIN THE COMPANY'S ORGANIZATIONAL STRUCTURE. THEIR ROLE IS CRUCIAL FOR ENSURING THE FINANCIAL HEALTH AND EFFECTIVE FINANCIAL MANAGEMENT OF THE COMPANY.

## METHODOLOGY:

TO EXAMINE THE PERCEPTION OF THE CONTROLLER PROFESSION, AN ONLINE SURVEY WAS CONDUCTED. 33 PEOPLE TOOK PART IN THE STUDY, INCLUDING: 11 WOMEN AND 7 MEN FROM THE AGE GROUP OF 20-40 YEARS AND 9 WOMEN AND 6 MEN FROM THE AGE GROUP OF 40-60 YEARS. EACH OF THE RESPONDENTS HAS VOCATIONAL OR HIGHER EDUCATION AND HAS PREVIOUSLY HEARD ABOUT THE PROFESSION OF A CONTROLLER.

## CONTROLLER ACCORDING TO YOUNG PEOPLE

A CONTROLLER IS A PERSON WHO HELPS IN RUNNING THE ENTERPRISE AND PARTICIPATES IN THE DECISION-MAKING PROCESS.

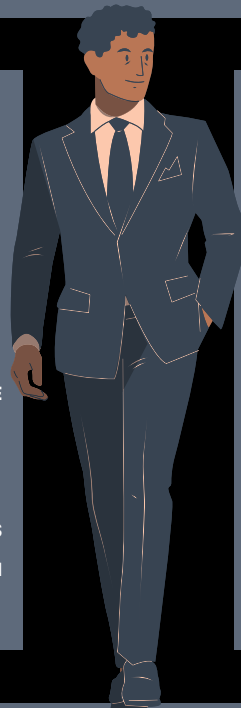
ITS BASIC TASKS INCLUDE:

- PLANNING,
- CONDUCTING ANALYSES,
- COMPANY CONTROL,
- SUPPORTING THE DECISION-MAKING PROCESS.

A GOOD CONTROLLER SHOULD HAVE THE FOLLOWING FEATURES:

- CREATIVITY,
- ACCURACY,
- METICULOUSNESS,
- FLEXIBILITY.

THE PROFESSION OF A CONTROLLER EVOKES POSITIVE OR NEUTRAL EMOTIONS. THE CONTROLLER IS A PERSON WHO HELPS BOTH THE MANAGEMENT AND EMPLOYEES.



## CONTROLLER ACCORDING TO MATURE PEOPLE

A CONTROLLER IS A PERSON WHO CONTROLS THE PROCESSES TAKING PLACE IN THE ENTERPRISE AND IS IDENTIFIED PRIMARILY WITH CONTROL (E.G. COSTS, WORK EFFICIENCY).

THE MAIN TASKS OF THE CONTROLLER INCLUDE:

- COMPANY CONTROL,
- EMPLOYEE CONTROL,
- SUPERVISION OVER THE QUALITY OF PRODUCTS AND SERVICES,
- SUPPORTING THE DECISION-MAKING PROCESS.

A GOOD CONTROLLER SHOULD HAVE:

- METICULOUSNESS,
- ACCURACY,
- RUTHLESSNESS,
- INFLEXIBILITY.

THE CONTROLLER EVOKES NEUTRAL OR NEGATIVE EMOTIONS.

THIS IS A PERSON WHO COOPERATES WITH THE MANAGEMENT AND MOST OFTEN ACTS TO THE DETRIMENT OF EMPLOYEES.

THERE IS AN EVOLUTION IN THE PERCEPTION OF THE CONTROLLER PROFESSION. YOUNGER GENERATION IS PLACING GREATER EMPHASIS ON COOPERATION AND SUPPORT, WHILE OLDER GENERATIONS FOCUS ON TRADITIONAL ASPECTS OF SUPERVISION. WE VALUE THE OPINION OF EACH OF OUR RESPONDENTS. WE WOULD LIKE TO DRAW YOUR ATTENTION TO THE FACT THAT IT IS UP TO US TO DETERMINE HOW THE IMAGE OF PEOPLE ASSOCIATED WITH THE CONTROLLING DEPARTMENT WILL BE SHAPED IN THE EYES OF SUBSEQUENT GENERATIONS. LET US BE AWARE THAT WHAT WE BRING TO COMPANIES, OR WHAT VALUES WE FOLLOW, MAY ACTUALLY INFLUENCE THE PERCEPTION OF THE CONTROLLER PROFESSION BY OTHERS.



# CYBERSECURITY

## THREATS AND PREVENTION METHODS

**CYBERSECURITY** IS THE PROTECTION OF DATA AND INTERNAL SYSTEMS FROM THE THREATS POSED BY CYBER ATTACKS. THE PRIMARY GOAL OF ENSURING SECURITY IN NETWORKS IS TO REDUCE THE RISK OF CYBER ATTACKS AND EFFECTIVELY GUARD AGAINST UNAUTHORIZED USE OF DATA AND PROGRAMS.

*What?*

### TYPES OF CYBERCRIMES

**PHISHING:**  
Fraud involving impersonation to obtain personal data like passwords and credit card numbers.

**DDoS ATTACKS:**  
Overloading internet services to disrupt legitimate user access.

**RANSOMWARE:**  
Malicious software that blocks access to data or systems until a ransom is paid.

**DATA BREACH:**  
Unauthorized disclosure of personal or corporate data on the internet.

**MALWARE AND SPYWARE:**  
Malicious software designed to infiltrate and harm computer systems covertly.

### WAYS TO PREVENT CYBERCRIMES:

Education and awareness



Updates and security patches

Phishing resilience

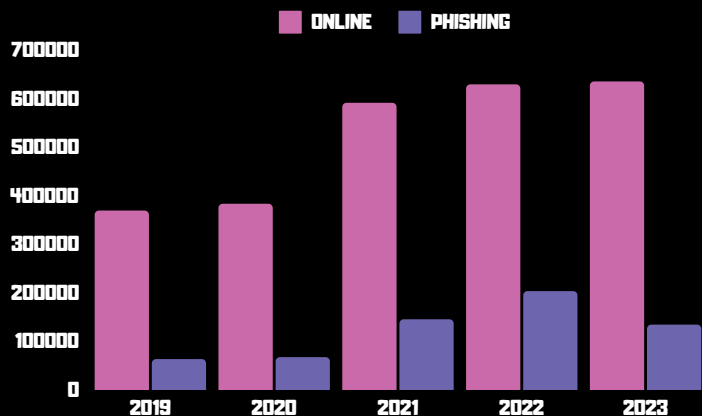


Network security measures

Regular backups



### THE NUMBER OF CYBERCRIMES IN POLAND:



### REFERENCES:

[https://www.ey.com/pl\\_pl/cybersecurity/cyberbezpieczenstwo-jak-zadbac-o-bezpieczenstwo-w-sieci](https://www.ey.com/pl_pl/cybersecurity/cyberbezpieczenstwo-jak-zadbac-o-bezpieczenstwo-w-sieci)

<https://www.rp.pl/biznes/art39842121-zaskaku-jace-dane-o-atakach-hakerskich-w-polsce?fbclid=IwAR0jzn-sFxxReWvOiAueu9X00ZUkgCGi8toQQu539CAJiYy--fxnZTWuHgU>

# DATA-DRIVEN DECISIONS OF ZARA

Zara's story illustrates how a data-driven approach and speed-to-market can disrupt an industry. By staying attuned to fashion trends and delivering runway styles quickly, Zara won over customers and built a multi-billion dollar global brand.

The lessons for any business are clear: intimately know your customers, provide what they want rapidly, and success will ensue. Staying ahead of trends and agile in operations is the key to winning in today's fast-paced world.

## 1. Online customer surveys

Zara frequently surveys customers on its website and mobile app. Questions cover product interests, shopping preferences, and brand satisfaction. The data gathered helps determine which products to develop and how to improve the online shopping experience.

## 2. In-Store interactions:

Zara store associates regularly engage with customers to gather insights on current fashion trends, brand perception, and potential improvements. Associates document these interactions and share key findings with the market research team.

## How Zara collects customer Data through market research?

To gain valuable insights into customer needs and shopping behaviors, Zara conducts ongoing market research.

By gathering data from multiple sources, Zara can make data-driven decisions to enhance the customer experience.

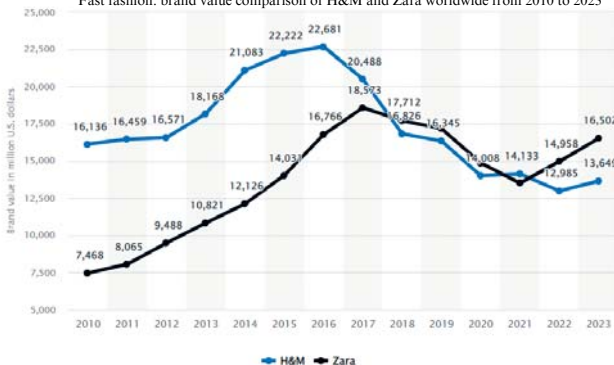
## 3. Social media monitoring:

Zara closely monitors various social media platforms to understand customer sentiment towards the brand and its products. Mentions of Zara on social media provide valuable insights that can influence strategic decisions.

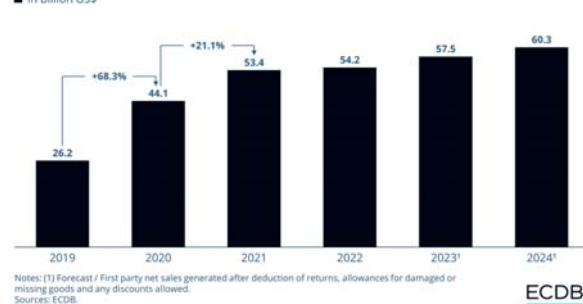
## 4. Competitor research:

Zara analyzes competitors' operations to identify best practices and potential advantages. Comparing competitors' pricing, products, marketing strategies, and customer service helps Zara make informed decisions tailored to its target customers.

Fast fashion: brand value comparison of H&M and Zara worldwide from 2010 to 2023



ZARA.COM ECOMMERCE NET SALES DEVELOPMENT, 2019-2024



By collecting data from surveys, face-to-face interactions, social media, and competitor analysis, Zara obtains valuable customer and industry insights. These insights enable Zara to make informed, data-driven decisions that have propelled their success as a leading global fast-fashion retailer. Continuous research and optimization using up-to-date data will further enhance Zara's ability to deliver an exceptional customer experience, both online and in brick-and-mortar stores

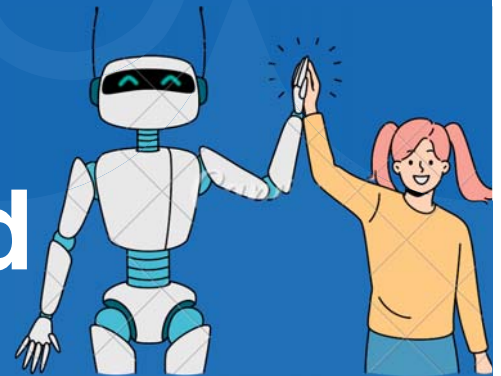
## REFERENCES

<https://www.linkedin.com/pulse/secret-zaras-success-data-driven-decisions-steadypace-sa>



Discover new life possibilities

# Interactive World



## Virtual assistant

- Siri
- Google Assistant
- Alexa



There is a voice option to control and perform tasks such as planning daily tasks, searching for information and home appliance control

## Home automation

- SmartHome



The application allows to remotely lighting/ temperature control and monitoring safety and energy

## Healthy lifestyle

- Apple Health
- Endomondo
- MyFitnessPal



AI-based application helps with tracking physical activity, sleep monitoring and offer advice regarding healthy lifestyle

## Intelligent translator

- Microsoft Translator
- Google Translate



Intelligent translator facilitates communication between people speaking different languages and guarantees fast and accurate text translation

## Education

- Duolingo
- Coursera
- Photomath



The system can adapt materials to students individual needs and provide personalized support

references:

<https://www.blockchain-council.org/ai/what-are-the-benefits-of-artificial-intelligence-in-our-daily-lives/>

<https://medium.com/@gizemnazli9/10-ways-that-ai-can-positively-affect-our-lives-960e8a9def37>

## Streaming services

- Facebook
- Spotify
- Amazon



Using AI to analyze preferences, suggest content, products or friends on social media



## Home Office

Home office, is a form of work organization that is involving the performance of professional tasks away from the employer's headquarters, using information and telecommunications technologies. Remote work is not a new phenomenon, but it has grown in popularity and importance in recent years, particularly in the wake of the COVID-19 pandemic, which has forced many organizations and employees to adapt to new conditions.

The purpose of this poster is to analyze the advantages and challenges of remote work, its impact on organizations and employees, and predictions for its future.

- XIX -  
initiated remote work by writers or journalists

- 1960s -  
General Electric and IBM are introducing home office as a type of work performance

- 1980s -  
development of technology

- 1990s -  
a common form of employment

- 2020 -  
Covid-19 pandemic outbreak, enforced remote working

**Benefits of home office listed by survey respondents**

- 81.9% - saving time on commuting
- 87 % - no dress code
- 65.3% - adjusting working conditions to personal preferences
- 60.4 % - reduced transportation costs
- 57.7% - ability to do the work at personal pace

### Employer's perspective



- decrease in office maintenance costs
- expansion of the number of employees
- possible increase in efficiency of employees



- difficulties in objective assessment of an employee
- bearing responsibility for home office accidents
- problem with data security

### The future of remote work



The growing importance of remote work in the labor market



Changes in the organizational culture of companies



Changes in employees' lifestyles



Development of information and communication technologies



#### REFERENCES

- <https://www.officernd.com/blog/do-companies-save-money-with-remote-employees/> (23 grudnia 2023)
- P. Szostak, M. Twardowski, „Praca zdalna w Polsce: Stan obecny i perspektywy”, CeDeWu, Warszawa, 2022
- K. Czerniak, „Technologia a praca zdalna”, Wolters Kluwer, Warszawa, 2022
- M. Król, „Technologie wspierające pracę zdalną” Instytut Pracy i Dialogu Społecznego, Warszawa, 2022
- M. Krzyszkowska-Dąbrowska, „Praca zdalna. Praktyczny przewodnik.”, Wolters Kluwer, Warszawa, 2023, s.5
- M. Król, „Praca zdalna – cechy, uwarunkowania, implikacje dla procesu pracy”, Wydawnictwo Uniwersytetu Ekonomicznego w Katowicach, Katowice, s.74-77

# How to deal with blocked order?

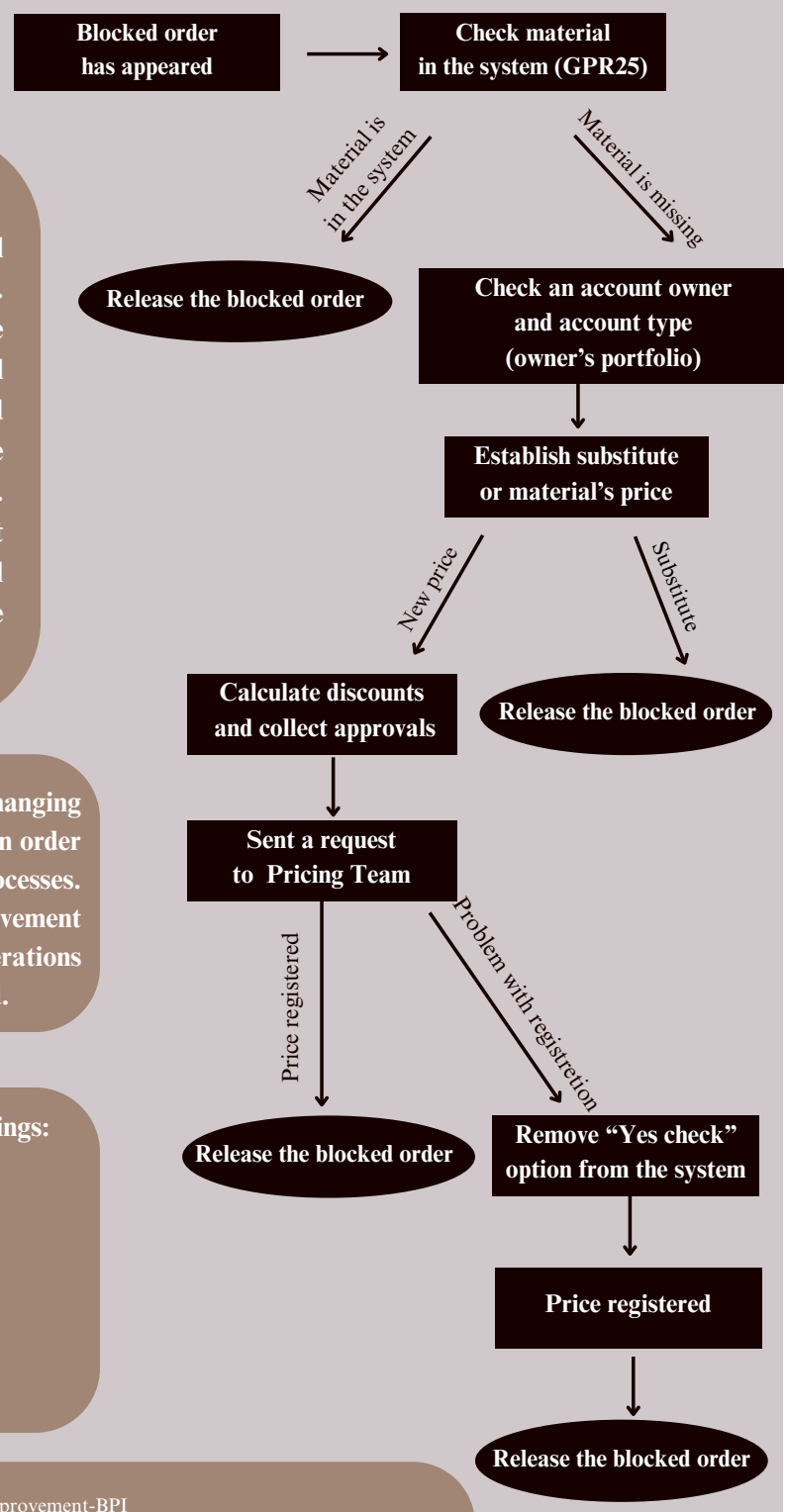
Demonstration of business process improvement using the example of a blocked order

**“blocked order”**  
A blocked order appears when the material is inactive in the system. Inactivity of the material may be due to poor registration or when the material has not been registered at all. If a blocked order appears, the order cannot be released to the customer. In such a situation, the owner must set a price with which the material will be uploaded into the system or provide a substitute for the ordered material.

Process improvement in a company consists of changing the functioning of certain spheres of the company in order to improve the effectiveness of the processes. The main objective of business process improvement is to increase the efficiency of operations even if the current methods are possibly abandoned.

- The benefits that business process improvement brings:
- increased efficiency
  - improved risk management
  - reduced costs
  - better control of the process
  - increased competitiveness
  - greater flexibility
  - reduction of process time

References  
 1. <https://www.techtarget.com/searchcio/definition/business-process-improvement-BPI>  
 2. <https://www.planview.com/resources/guide/business-process-improvement/>  
 3. <https://pragmago.pl/porada/optimalizacja-procesow-biznesowych-jak-ja-przeprowadzic-i-rozwijac-firme/>





# IS CHAT GPT ALWAYS RIGHT?

## WHAT IS CHAT GPT?

It is an artificial intelligence (AI) chatbot technology that can process our natural human language and generate a response.

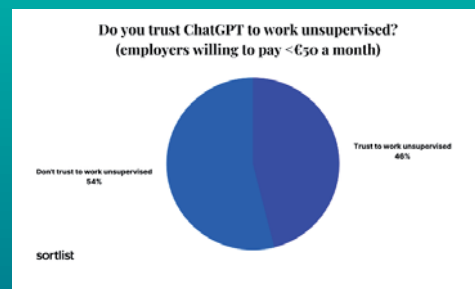
The poster aim is to evaluate the accuracy and limitations of ChatGPT, exploring its pros and cons through examples of mistakes it makes.



- 24/7 Availability
- Efficiency
- Scalability
- Cost-Effective
- Multilingual Support

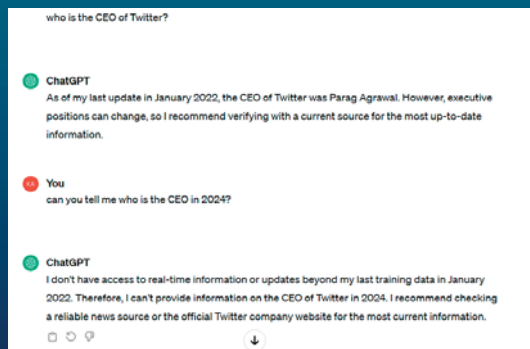


- Lack of Emotional Intelligence
- Over-Reliance
- Privacy Concerns
- Initial Setup Complexity
- Inaccuracy



For employers who are willing to pay less than €50 a month, 54% said they would not trust ChatGPT to work unsupervised and that it should be checked or merely used as inspiration.

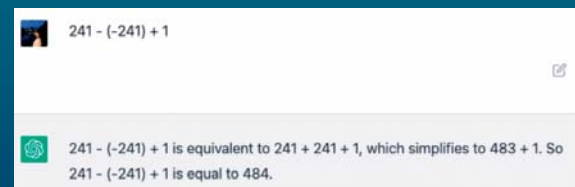
## CHAT COMMON MISTAKES



While chat GPT strives to provide accurate and helpful information based on its training data, it's essential to recognize that its knowledge is limited to what was available up until January 2022.

### REFERENCES:

- <https://lighthouseguild.org/what-is-chat-gpt/>
- <https://medium.com/@jerryngoma6/5-advantages-and-disadvantages-of-using-chat-gpt-b5fdefd5f234>
- <https://www.retable.io/blog/why-is-chatgpt-bad-at-math>
- <https://chat.openai.com>
- [https://www.sortlist.com/datahub/reports/chat-gpt-statistics/?fbclid=IwAR1tkmCjRirVMZmZfBPZrB2MolSjhW7meatsaQVb1\\_Urh5BgEToGKUXZKc](https://www.sortlist.com/datahub/reports/chat-gpt-statistics/?fbclid=IwAR1tkmCjRirVMZmZfBPZrB2MolSjhW7meatsaQVb1_Urh5BgEToGKUXZKc)



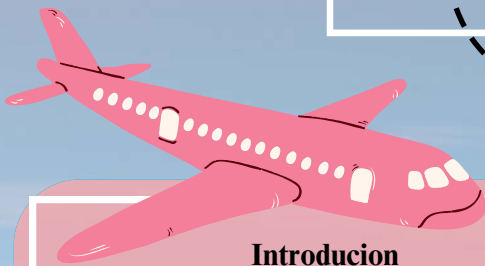
While a calculator uses pure arithmetic to process your requests, this numerical logic is not explicitly programmed into GPT 3.5, which currently is available for free. The GPT 4 model (in most of browsers) is only available with a paid subscription to ChatGPT Plus or ChatGPT Enterprise.

### CONCLUSION:

Chat GPT can be very helpful and beneficial, however we should remember that there are some potential risks associated and we should not trust it in 100%.



# MASSIVE CARBON EMISSION IN AIRPLANE

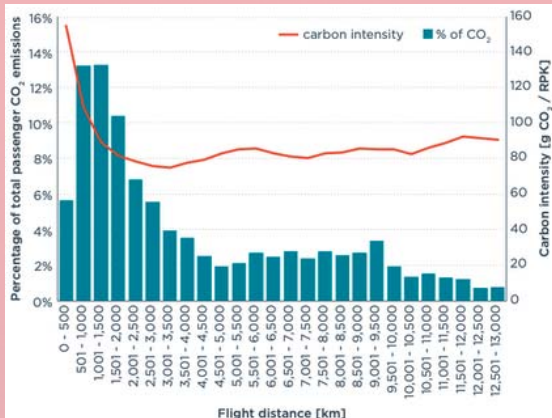


## Introduction

Air travel is a major contributor to carbon emissions, which are a major cause of climate change. The aviation industry is responsible for around 2% of global carbon emissions, and this is expected to increase in the future as air travel demand grows.

## How much CO<sub>2</sub> does a plane emit?

If we calculate based on CO<sub>2</sub> emissions from aviation fuel of 3.15 grams per 1 gram of fuel, this means we arrive at a figure of 115 gm per passenger km. Since these planes cruise at approximately 780 km per hour, we can conclude a figure of 90 kg CO<sub>2</sub> per hour.



<https://climatescience.org/pl/advanced-flying-driving> <https://www.carbonindependent.org/22.html> <https://ourworldindata.org/travel-carbon-footprint>

## How controlling help reduce carbon emission?

Control towers at airports not only take care of planes taking off and landing to prevent accidents but help with reducing carbon emission. There are a few ways they make it happen.

**Optimal flight routes.** Control towers try to choose shorts routes for flight to minimize fuel consumption which leads to reduced carbon emissions. They also take into account atmospheric conditions as strong contrary winds or turbulence.

**Proper landings and take-offs.** It's important because it prevents airplane from making more laps in the air which leads to spending less time in the air and reduce fuel consumption.

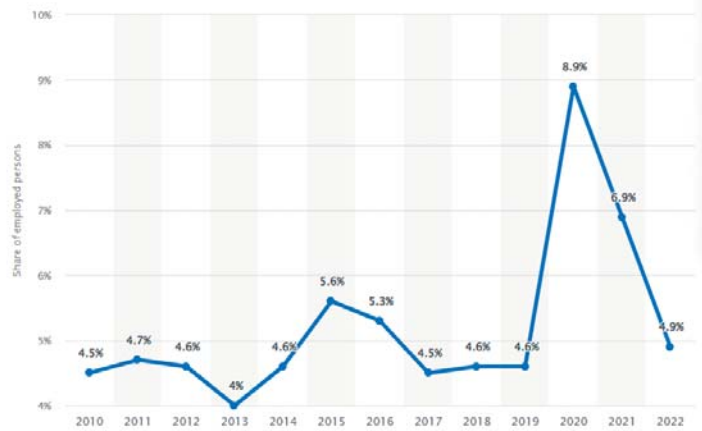
**Effective traffic management at airports.** It helps ensure proper airport refueling and taxiing procedures. It prevents the formation of delays, which reduces the operating time of the engines, leading to reduced fuel consumption.

**Optimal flight altitudes.** They support the selection of appropriate altitudes where weather conditions and air flows are favorable. Thanks to less air resistance, planes use less fuel.

## POST-PANDEMIC REMOTE WORK: BENEFITS, CHALLENGES, AND FUTURE PERSPECTIVES

### Post-pandemic reality

The history of remote work dates back to the 70s when telecommunication technology enabled long-distance communication. However, it was only in recent years that the importance of remote work has increased due to the pandemic of Covid-19. Many employers were forced to look for solutions during that time to ensure that the company's economic activity would remain stabilized.



Employed people working from home as a percentage of the total employment in Poland from 2010 to 2022



### Benefits:

- Increased flexibility in the schedule
- Reduced costs for everyone
- Time-saving
- The ability to hire remote employees regardless of their location

### Challenges:



- Social isolation
- Problems with the workplace
- Home distractions, that may lead to lower efficiency
- Higher risk of data leakage
- Difficulties in time management



### Legal conditions

The epidemiological situation and the popularity of remote work forced countries to create legal regulations regarding remote work. The employer is obliged to provide the employee with the necessary materials, tools, and equipment like a computer, mouse, and keyboard for this type of work. Additionally, it is obliged to pay the equivalent and cover the costs incurred by the employee.

### Future of remote work

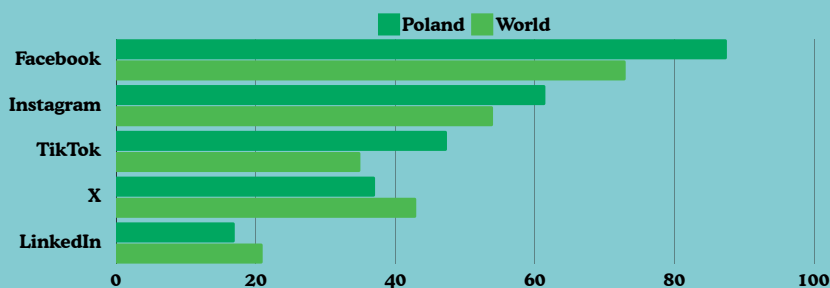
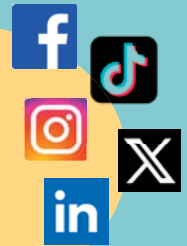
Forecasts and trends regarding remote work indicate that it will stay. While remote work has traditionally been prevalent in industries such as IT, digital media, and financial services, recent research (Future Business Institute), suggests that it will become increasingly accepted across a broader spectrum of industries. This research highlights significant potential for remote work's further development. Results of the research indicate that a compromise satisfactory for both employees and employers lies in a hybrid work model, which combines remote work with on-site work. The main strategy should involve scheduling specific days for in-person meetings while allowing remote work on others. The future of remote work is associated with technology development, mainly due to the use of AI in improving systems and operating programs.

#### References:

- Radziukiewicz, M., 2021, Remote work in Poland and its perspectives.
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- <https://bordio.com/blog/pros-cons-working-remotely/?fbclid=IwAR1rjyLyB4gDABbHmimDazmGV1JO7tnFrNPhy04hAhWjUjkoEvCeVGQE>
- <https://vpnalert.com/resources/remote-work-statistics/?fbclid=IwAR34gvUqLyq4kWmvmQ1MM23xhMRUAVRYaCEuEesluyeqVnN7neqIvJvBk>
- ChatGPT 3.5

# SOCIAL MEDIA MARKETING

Social media marketing refers to a set of marketing activities aimed at generating traffic to a website through the use of social media platforms, such as popular services like Facebook, X, LinkedIn, YouTube, or Instagram. By actively managing social media profiles, companies can more easily find new customers and reach them through advertising. Social media platforms can be utilized to redirect users to the company's website, product pages, or blog. It is also an ideal space for communicating with a loyal audience and building relationships between the brand and the customer. Therefore, social media marketing plays a crucial role in the development of a long-term marketing strategy.



**MOST USED SOCIAL  
MEDIA PLATFORMS  
IN 2023**

Social media marketing largely relies on a well-prepared viral marketing strategy. A well-crafted post of this type can generate significant traffic. However, it's important to be aware that the engagement of the individuals managing the profile also plays a crucial role. Interactions with portal users who follow the profile are essential. Responding to questions and comments is necessary to demonstrate that the audience's opinions matter.

Another crucial aspect is the careful selection of the social media platform. It's best to choose one where the highest number of people interested in the product or service can be found. Defining the target audience can assist in this decision. Factors such as age, location, gender, and interests are just a few that characterize a potential audience. It's worthwhile to dedicate more attention to this issue or even invest in research to avoid the risk of an unsuccessful campaign.

The next consideration is whether to rely solely on the free options provided by social media or to use paid advertisements, and if so, to what extent (e.g., promoting a specific post or the entire profile).

## EXAMPLES OF COMPANIES THAT CAN EXPAND THEIR BUSINESS THROUGH SOCIAL MEDIA MARKETING

### Small Businesses and Startups

Social media marketing is an excellent tool for businesses of this kind. If your products or services are new to the market, social media can help you build awareness of your offering. Another advantage offered by social media in marketing is the ability to build a network of contacts and customers. In this case, business-oriented social media platforms such as LinkedIn work best.

### B2B Companies

B2B companies rely on collaboration between businesses. Through a presence on social media and the use of targeted advertisements, directed at the right audience, companies can reach suitable business partners at the right time.

### Direct Sales Companies

Direct sales are based on individual contacts, emphasizing trading outside traditional retail settings. Businesses of this nature thrive through communities. Social media marketing allows the building and development of these communities beyond the circle of family and friends. It also creates a space where consultants can organize meetings and showcase their services and products.

<https://www.znajdzreklame.pl/blog/kampanie-internetowe/digital-2023-najnowszy-raport-dotyczacy-internetu-w-polsce/>

<https://www.eactive.pl/blog-o-social-media/co-to-jest-social-media-marketing-i-jakie-oferuje-mozliwosci/>

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## SYNERGISTIC RELATIONSHIP OF STANDARDIZATION & AUTOMATION

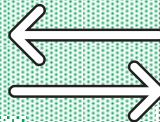
Standardization plays a key role in facilitating the market potential of innovative ideas and technologies. It acts as a catalyst for innovation, facilitating research, enabling technology transfer, and supporting intellectual property management. Standards set the frameworks needed to unleash creativity and enable new innovations to be widely adopted.

Objective of this poster is to depict a connection between standardization and innovative technologies like automation that is transforming manufacturing and construction through Industry 4.0

Standardization and automation are synergetic because they amplify benefits of the other, further enhancing value of its implementing.

### AUTOMATION

1. Efficiency – streamlines processes by reducing manual intervention.
2. Consistency – ensures tasks are performed consistently and reliably.
3. Quality - Enforce quality standards by automating inspection and validation.
4. Adaptability – Enhancement of agility and responsiveness of the process.
5. Compliance – Automate compliance checks
6. Improvement – Accelerates pace of improvement by reducing time consumption of the employees.



### STANDARDIZATION

1. Efficiency – Maximizes efficiency ensuring the process is optimized and uniform.
2. Consistency – Establishment of procedures across different tasks.
3. Quality – Defines quality benchmarks.
4. Adaptability – Stable foundation enabling easily adaptation of the automated solution.
5. Compliance – Ensures process is adhere to regulatory requirements and standards.
6. Improvement – Providing a baseline for measuring performance and identifying optimizable areas.

#### Conclusion:

Synergetic relationship of automation and standardization benefiting of each other is key component of achieving greatness and constat development. One that will posses an ability of connecting their benefits will form a powerful framework enhancing organizational performance and competitiveness. Dynamic growth of automated solutions in multiple different brands in recent years set a trend to which current businesses must adapt so they won't fall out of the track.

#### REFERENCES:

**Standardization and innovation**, ISO – CERN conference proceedings:  
<https://www.manifest.ly/blog/process-standardization-a-complete-guide/>

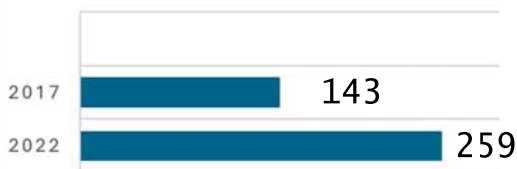


## THE AGE OF ROBOTS: CHANGES IN THE JOB MARKET

The IFR (International Federation of Robotics)'World Robotics 2022' report revealed that in 2021, the installation of new industrial robots increased. According to the study, Poles are noticing accelerating automation and robotization, but also their consequences - 12% know someone who lost their job in 2021 due to implemented automation in the company.

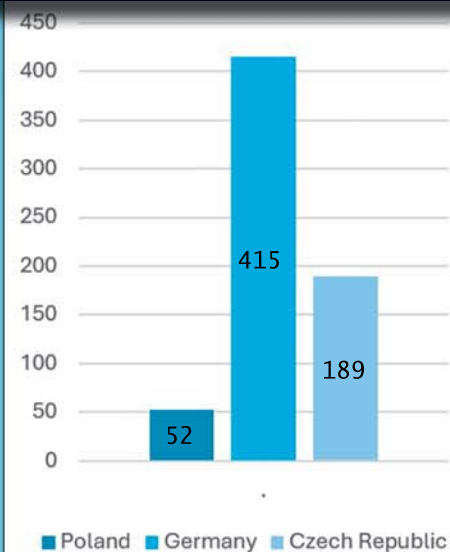
12%

### THE NUMBER OF ROBOTS PER 10,000 WORKERS IN 2017 AND IN 2022



The leader in the robotics category is the automotive industry. From 2017 to 2022, the number of robots per 10,000 employees has increased significantly.

Number of robots per 10,000 employees in the general industry category



General industry saw even greater growth, averaging 19 percent annually from 2017 to 2022. Here, in turn, 52 robots work per 10,000 people. employees. Poland's neighbors have much better results. In Germany, there are 415 robots **per 10,000 employees, and in the Czech Republic, 189.**

References:

- <https://automatykaonline.pl/z-branzy/Raport-IFR-coraz-wiecej-robotow-w-polskim-przemysle-a-le-liderzy-nam-uciekaja>
- <https://serwisy.gazetaprawna.pl/praca-i-kariera/artyku1y/8694070,roboty-miejsc-a-pracy-pracodawcy-us1ugi-sektor-ba-danie.html>

# Transformation into the Future

## Business Transition



### New Chapter, New Opportunities

A business transition refers to a company's move from one state to another, often involving adaptation to changing market, technological or strategic conditions. A new chapter in a company's life opens the door to new opportunities, such as expansion into new markets, introduction of innovative products or services, and development of strategic partnerships.



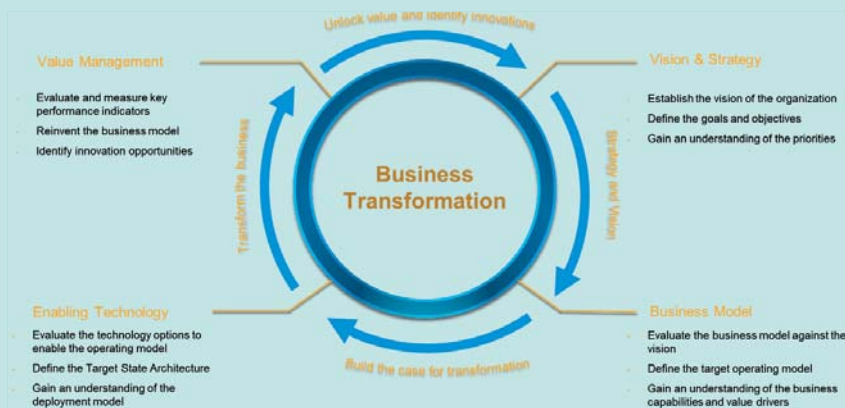
### Innovation as the Key to Transition.

During business transitions, innovation is a key tool to achieve competitive advantage and market breakthrough. Companies must be open to introducing new ideas, technologies and processes that will enable them to adapt to changing conditions and meet the growing eyes of the



### Restructuring for Sustainability

Business transitions often require organizational, financial or operational restructuring to ensure the sustainability of the company. Restructuring can include changes in organizational structure, cost reduction, process optimization, and reallocation of resources to achieve better efficiency and profitability.



### Disadvantages:

- costs and risks
- employee resistance
- disruption of business operations
- loss of human resources
- implementation difficulties
- change in organizational culture

### Benefits:

- increased competitiveness
- improve operational efficiency
- expanding the scope of operations
- increase profitability
- innovation and breakthroughs
- increasing the value of the company



## TYPES OF MOTIVATION AND THEIR INFLUENCES

To discuss employee motivation, we must first understand the meaning of this word. Motivation is the description of various phenomena responsible for initiating, directing, sustaining, and terminating human behavior.

The aim of this poster is to examine and present how employee motivation affects the productivity of their work.

### TYPES OF MOTIVATION AND WHAT INFLUENCES IT

#### Internal motivation

Initiating individual activity, considering the subjective justification for taking action – stimulus and motive for action.

Stimulates and convinces a person to engage in behaviors aimed at achieving specific goals – these behaviors stem solely from their beliefs.



#### External motivation

- It constitutes a set of carefully selected and logically connected motivators that form the motivational system of the enterprise,
- It is associated with the concept of motivation,
- It has a managerial character,
- It relates to the function of managing labor resources.



#### Salary

A high salary ensures that employees are compensated fairly for their skills, experience, and expertise. When employees feel that they are being paid well, they are more likely to be motivated to work hard and perform at their best.



#### Development opportunities

A desire for career development opportunities is one of the top reasons workers move to a new company or start their job search. That alone proves that employees desire professional growth and a chance to learn new skills.

#### Summary

Motivating employees is key to a company's success. Through trust, appreciation, and support for personal development, you can maintain their engagement and achieve better results.

#### REFERENCES

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[https://www.researchgate.net/figure/Employee-Motivation-towards-Salary\\_fig1\\_310587457](https://www.researchgate.net/figure/Employee-Motivation-towards-Salary_fig1_310587457)  
 Kopertyńska M.W., Motywowanie pracowników. Teoria i praktyka, Placet.





# WOMEN in LEADERSHIP



## IN PRACTICE

Businesses boasting over 30% female executives tended to surpass those with less gender diversity among their top leadership.

30%

Higher representation of women in executive roles correlates with enhanced profitability: companies ranking in the top quartile for gender diversity among their executive teams have a 21% higher chance of outperforming the national average.

Internationally, women are 1.4 times more inclined to prioritize the maintenance of an engaged workforce compared to men.

21%

## IN NUMBERS

From 2023 onward, 39% of women in managerial and professional positions are earning more than their husbands, a notable rise from 18% in 1987.

18% → 39%

The percentage of women in top managerial roles worldwide increased to 32% by 2022.

32%!

In 2020, a quarter of high-level managerial positions were held by women.

## IN THE FUTURE

Anticipated is an increase in the presence of women in leadership positions across diverse fields such as politics, business, academia, and non-profit sectors.

The forecast suggests a growth in the quantity of businesses owned by women and startups spearheaded by female entrepreneurs.

It's foreseeable that there will be an uptick in the representation of women as CEOs, board members, and executives in prominent global corporations. Businesses are progressively acknowledging the importance of gender-balanced leadership teams for fostering innovation and achieving success.

## ACTIONS NEEDED

Educating young women in the early stages of their careers about the significance of networks, mentors, and sponsors is crucial. Moreover, organizations should establish structured avenues to facilitate these connections.

Provide opportunities for women to have a voice and contribute in discussions.

Put an end to biases and discrimination against mothers who are part of the workforce.

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## Interesting facts

- On average, Poles work 1928 hours per year.
- Among the most developed countries, Chileans, Russians, Greeks, Koreans, Costa Ricans, and Mexicans work longer hours.
- Germans are the most "relaxed" - they work only 1363 hours per year.
- Poles are the 7th most overworked nation among 35 OECD countries



# WORK LIFE BALANCE

**Work-life balance** refers to the healthy balance between professional responsibilities and personal life, ensuring neither is overlooked. It involves efficiently juggling work and personal commitments to achieve satisfaction and well-being.



## How employers can help employees maintain work-life balance?

- **Remote work options:** Even 1-2 days a week allow for errands and family time.
- **Flexible hours:** Accommodate individual preferences, promoting work-life balance.
- **Inclusive events:** Include families in company activities, eliminating conflicts.
- **Health initiatives:** Promote physical activity and provide medical benefits.
- **Convenient office locations:** Minimize commute time, increasing satisfaction.
- **Feedback mechanisms:** Use surveys and meetings to gauge balance.
- **Professional development:** Offer training and opportunities to prevent burnout.

## How to learn work-life balance?

- Avoid perfectionism. Focus on completing tasks well rather than perfectly to maintain work-life balance.
- Limit phone and social media use to enjoy the present moment.
- Exercise regularly to boost energy levels and combat stress.
- Break routines to add balance to your life.
- Prioritize tasks and avoid wasting time to prevent encroaching on personal time.
- Pursue hobbies and interests outside of work to break free from routine.
- Make time for social activities during the workweek, not just on weekends.
- Set boundaries during days off and vacations to ensure relaxation and recharge.



## Advantages

- **Increased productivity:** Testing a 6-hour workday has shown positive results, as well-rested employees accomplish more in less time.
- **Better well-being and health:** Maintaining work-life balance reduces stress, promotes health, and prevents burnout.
- **Greater job satisfaction:** Separating work from personal life enhances enjoyment in the job.
- **Opportunity for growth and pursuing passions:** Balanced employees can develop skills and interests outside of work.
- **Improved employer image and loyalty:** Prioritizing work-life balance boosts employer reputation and employee loyalty.
- **Reduced recruitment costs:** Satisfied employees are less likely to leave, saving on recruitment time and expenses.



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