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## THE EVOLUTION OF THE IT PROFESSION NAVIGATING BY EXPONENTIAL GROWTH IN THE ERA OF AI AND DIGITALIZATION

**Abstract.** *The article is dedicated to exploring the strategic methods for the survival of IT professionals amidst the exponential proliferation of artificial intelligence and digitalization. The purpose of this article is to analyze the evolving strategies that IT experts can adopt to navigate and thrive in an environment characterized by the rapid advancement of AI and digitalization. The object of this study is the strategic approaches employed by IT professionals to adapt to the changing landscape of technological evolution. The subject is the formulation of effective survival strategies tailored to the challenges posed by the expanding domain of artificial intelligence and digital transformation. Tasks to be solved include evaluating the impact of exponential growth in AI and digitalization on traditional IT roles, formulating adaptive strategies for IT professionals, and proposing methods for skill enhancement and career sustainability in this dynamic environment. Methods employed encompass a comprehensive analysis of the impact of AI and digitalization on IT roles, strategic planning, empirical studies on the evolving skill sets demanded by the industry, and the examination of case studies illustrating successful adaptation strategies. The following results were obtained: identification of the transforming landscape for IT professionals due to the rise of AI and digitalization, formulation of adaptive strategies catering to the changing demands, insights into skill development, and continuous learning necessary for survival in the rapidly changing IT landscape. Conclusions drawn from this research emphasize the crucial need for IT professionals to adopt a proactive stance towards skill enhancement, continuous learning, development of soft skills, and adaptation to the evolving technological paradigms to ensure career sustainability.*

**Keywords:** *IT professionals, artificial intelligence, digitalization, survival strategies, skill enhancement, soft skills development, career sustainability*

### Introduction

In the ever-evolving landscape of information technology (IT), the profound impact of exponential

growth in artificial intelligence (AI) and digitalization has sparked a transformative journey for professionals within the industry. The rapid pace of technological advancement is reshaping the traditional contours of IT

roles, demanding an unprecedented level of adaptability, skill diversification, and ethical considerations. This paper delves into the multifaceted dimensions of the IT profession, exploring how the surge in AI capabilities and the pervasive influence of digitalization are not merely trends but seismic shifts that necessitate a recalibration of skills, roles, and ethical frameworks.

The integration of AI technologies and the widespread adoption of digital practices have ushered in a new era, one where IT professionals find themselves at the nexus of innovation and responsibility. As machines augment human capabilities and algorithms become integral to decision-making processes, IT professionals must navigate the intricacies of this dynamic landscape. This paper aims to dissect the various facets of this evolution, shedding light on the emergence of new job roles, the demand for specialized skills, and the ethical considerations that accompany the development and deployment of AI in the digital age.

As automation and AI algorithms redefine routine tasks, the nature of work within the IT sector is undergoing a paradigm shift. The displacement of certain roles by automation necessitates a reevaluation of skill sets, pushing IT professionals to embrace continuous learning and adaptability. Simultaneously, the creation of new job opportunities arises from the need to design, implement, and manage AI systems, underscoring the profound impact of these technological advancements on the workforce.

Ethical considerations loom large in this era of rapid technological progression. AI's pervasive influence requires IT professionals to grapple with questions of bias, transparency, accountability, and the overall ethical implications of AI-driven decision-making. As the custodians of innovation, IT professionals play a pivotal role in shaping responsible AI practices and ensuring that technological progress aligns with ethical standards.

This paper will explore the challenges and opportunities presented by the exponential growth of AI and digitalization for the IT profession. By examining the evolving job landscape, skill requirements, ethical considerations, and the broader implications for the industry, we aim to provide insights into how IT professionals can thrive in an era defined by the convergence of human ingenuity and artificial intelligence.

### **Goal and tasks of the paper**

The goal of research would likely be to provide valuable insights that can inform IT professionals, organizations, policymakers, and educational institutions about the current state and future trajectory of the IT profession in the face of exponential technological growth.

The tasks for the research.

1. Understanding Historical Trends

Investigate the historical evolution of the IT profession, examining how roles, skills, and responsibilities have changed over time in response to technological advancements, including the rise of AI and digitalization.

2. Analyzing Current Industry Landscape.

Provide an in-depth analysis of the current state of the IT industry, highlighting the impact of AI and digitalization on job roles, organizational structures, and industry dynamics.

3. Identifying Emerging Trends.

Explore and identify emerging trends within the IT profession, considering factors such as the adoption of AI technologies, the integration of digital tools, and the evolution of skill requirements.

4. Assessing Skills and Competencies

Evaluate the skills and competencies that IT professionals need to thrive in the era of AI and digitalization. This could include technical skills, soft skills, and a combination of both.

5. Examining Organizational Adaptation

Investigate how organizations are adapting to the exponential growth of AI and digitalization, including changes in organizational structures, workforce management, and strategic planning.

6. Evaluating the Impact on Job Roles

Assess how specific IT job roles have been influenced by the advancements in AI and digital technologies. Identify roles that are becoming more prominent, evolving, or diminishing.

7. Global Perspectives

Consider the global context and variations in how different regions are adapting to the evolution of the IT profession in the era of AI and digitalization.

### **Literate review**

Artificial intelligence (AI) aims at critically transforming the information and communication technology (ICT) sector through various technological advancements, such as machine learning, deep learning, and natural language processing. These technologies are meant to develop the process of communication, digital commerce, content, and apps. AI is also meant to initiate novel business frameworks and formulate a completely novel business opportunity as efficiencies and interfaces facilitate the engagement, which has been heretofore unintelligible. AI is revolutionizing the ICT sector by transforming communication, digital commerce, content, and apps, while also introducing novel business opportunities and efficiencies [1].

The IT industry is not new to change and evolution, however, we are now in an era of two fundamental waves of IT changes. First, the post-PC era, where mobile devices and tablet-like devices are giving end-users the ability to consume information when they want it and where they want it. Second, the post-server era where

companies no longer need to neither buy nor provision servers in their own data centers but instead rent the computer resources as needed. Modern software development faces challenges due to the post-PC era and the post-server era, requiring flexible, agile, and cost-effective solutions for delivering software to end-users [2].

Modern IT has enabled us to organize our society, business, and lives in new ways. Both in the private and public sector, services or ‘meta-services’, i.e. services required for or supporting the acquisition of the primary service, are increasingly transferred to the internet, and people are being coerced more or less gently into using these electronic services. User involvement in systems development is crucial for understanding and addressing the needs of users in a rapidly changing digital world [3].

Innovation is gaining ground in modern business, to the extent that it is becoming increasingly indispensable when it comes to digital technologies. There is an ever-increasing number of digital technology users, which goes hand in hand with its increasing availability, so the fact is that they are evolving. In this context, the importance of management within the companies engaged in these types of activities is increasing. Project managers' competencies are increasingly broader due to the increasing use of digital technologies and the industrial revolution 4.0, with the internet being the most significant change [4].

In this digital era, data is new oil and artificial intelligence (AI) is new electricity, which is needed in different elements of operations management (OM) such as manufacturing, product development, services and supply chain. This study explores the feasibility of AI utilization within an organization on six factors such as job-fit, complexity, long-term consequences, affect towards use, social factors and facilitating conditions for different elements of OM by mining the collective intelligence of experts on Twitter and through academic literature [5].

An integrated intelligent control model for managing innovative projects and programs significantly increases the value of the products by integrating business, social, emotional, technical, and cognitive competencies [6 – 8].

### Conceptual model of evolution IT profession

Conceptual model highlights the continuous evolution of the IT profession driven by advancements in technology. Professionals in the IT field need to adapt to emerging technologies, acquire new skills, and stay updated to remain relevant in the ever-changing landscape of information technology. The future may see further integration of technology into various aspects of human life, leading to new and diverse roles within the IT profession.

A conceptual model is a representation of a system, process, or concept that helps people understand, visualize, and communicate complex ideas. In the context of the conceptual model of the evolution of the IT profession, various elements contribute to its structure and comprehensibility.

This model identifies the contribution to the exponential growth of artificial intelligence system adoption, project management team roles, and IT specialist roles, the competencies employed, and the delivered value using artificial intelligence systems (Figure).

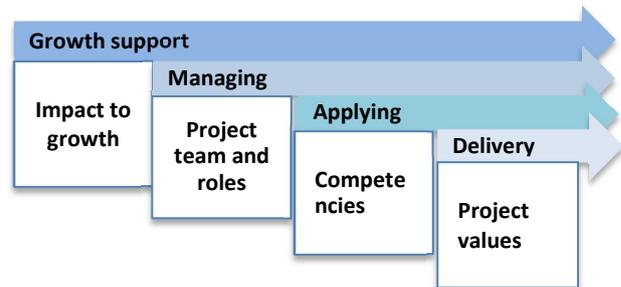


Figure. Conceptual model of competencies development and driving growth

Project Management Competency Development for Driving Growth Through AI effectively communicates the idea that there is a deliberate effort to enhance project management skills in the context of AI to promote and drive growth. There are a few potential directions:

- Impact on Project Efficiency.
- Effect on AI Implementation Success.
- Business Growth and Innovation.
- Adaptability and Change Management.

Based on our particular emphasis, we can examine these facets to assess how the development of project management competencies influences the processes and adds value to the product, contributing to the advancement of growth through AI.

In the dynamic landscape of information technology (IT), project success depends on the collaborative efforts of various team roles. This interdisciplinary collaboration is organized by a well-structured team usually consisting of a project manager (PM), scrum master, developer, coder, and quality assurance (QA) specialist. The Project Manager organizes the work on the project, the Scrum Master creates an Agile environment, the Developer designs software solutions, the Coder creates accurate code, and the Tester controls the quality (Table 2).

Thus, the successful implementation of software projects depends on the harmonious interaction of various IT roles, each of which makes its own unique contribution to the common cause. This synthesis of specialized skills allows the team to navigate the complexities of software development and deliver exceptional value to users.

*Table 1 – Competency Development Area for Driving Growth Through AI*

№	Area of competencies development and driving growth	Impact pre year %	Earn Value %
1	Automation of Repetitive Tasks	40	5
2	AI in Software Development	40	7
3	Enhanced Data Management	13	8
4	Agile and DevOps Adoption	12	10
5	Increased Collaboration through Cloud Computing	15	7
6	Integration of AI in Project Planning	25	7
7	Security Challenges and Solutions	35	3
8	Skill Set Evolution	37	3
9	Innovation in IT Solutions	37	3
10	User-Centric Design	20	7
11	Increased Project Complexity	15	4
12	Aggregated Project Data for Insights	32	5
13	Adoption of Chatbots and Virtual Assistants	23	5
14	Real-time Monitoring and Reporting	22	3

The ubiquitous integration of Artificial Intelligence has ushered in a paradigm shift in the traditional IT development team structure as it brings the consequential shifts in responsibilities, workflow dynamics, and overall team synergy. As AI increasingly permeates development processes, team dynamics undergo a transformation towards more collaborative, human-AI interactions. Effective integration of AI necessitates a paradigm shift in communication patterns and collaborative frameworks, emphasizing the importance of cross-disciplinary understanding.

The key changes the team is facing are AI-powered automation, adaptive project management, flexible facilitation with AI, automated quality control, and increased accuracy. AI is not replacing traditional development roles; rather, it is augmenting and enhancing them, creating a dynamic ecosystem of AI-empowered professionals.

Consequently, the integration of artificial intelligence into traditional IT development teams is changing the landscape of roles and responsibilities. This requires team members to take a proactive approach to adapting, upskilling, and harnessing the joint potential of the human-AI partnership. Understanding and effectively

using AI in the context of traditional team structures is imperative to harnessing its transformative potential while maintaining the synergy needed to successfully complete a project.

Table 3 scrutinizes the transformative influence of advancements in Artificial Intelligence (AI) and digital technologies on specific Information Technology (IT) job roles. Through a meticulous assessment, this study identifies the roles that have experienced prominence, evolution, or diminishment in response to the rapid integration of AI and digital technologies within the IT sector. Employing a comprehensive approach that combines quantitative metrics and qualitative insights, the research identifies roles that have experienced prominence, evolution, or diminishment in the wake of AI and digital technology integration.

While AI has introduced new opportunities and enhanced existing capabilities, this study seeks to systematically analyze the specific influences on job roles within the IT domain, elucidating trends in prominence, evolution, and diminishment.

The role of Project Manager is evolving to encompass strategic oversight of AI-driven initiatives, requiring a nuanced understanding of AI capabilities and ethical considerations. The prominence of AI in project planning and execution is reshaping the PM's decision-making framework, showcasing an increased reliance on AI-powered project management tools, leading to improved resource allocation efficiency and risk mitigation.

Scrum Master's role is transitioning to higher-order problem-solving and adaptive facilitation. As AI automates certain Scrum framework elements, Scrum Masters are increasingly focusing on fostering collaborative team dynamics and addressing complex challenges. Scrum Masters experience a quantitative increase in the adoption of AI-powered tools for sprint planning, backlog prioritization, and performance analytics, streamlining agile processes.

Developers and Coders witness a surge in productivity through AI-driven automation, reducing manual coding efforts and expediting debugging processes. The qualitative transformation involves Developers and Coders adapting to a paradigm where AI contributes to code generation and optimization. There is an evolving emphasis on algorithmic design and innovative problem-solving as routine coding tasks diminish in prominence.

QA professionals significantly improve test accuracy and efficiency with AI-enabled automated testing tools. The qualitative dimension underscores the transformation of QA roles from manual testing to overseeing AI-generated test scripts. QA specialists are required to possess a more strategic and analytical skill set, addressing complex testing scenarios and ensuring robust AI-integrated system validation.

**Table 2 – Competencies relevant to different IT roles  
(Project Manager (PM), Scrum Master, Developer, Coder, QA)**

Competence	Project Manager (PM)	Scrum Master	Developer	Coder	QA (Quality Assurance)
Technical Skills	Project planning and management methodologies, AI-powered analytics	Agile methodologies, AI tools for process optimization	Programming languages, frameworks, AI-assisted development tools	Proficiency in coding, AI-driven coding paradigms	Testing methodologies, automation tools, AI-integrated testing platforms
Leadership	Team leadership, conflict resolution, strategic decision-making	Facilitation and coaching, virtual team leadership	Collaboration skills, teamwork, AI-driven task delegation	Problem-solving and analytical skills	Leadership in quality testing, data-driven testing analysis
Communication	Stakeholder management, effective communication, digital collaboration tools	Clear communication with teams and stakeholders, virtual collaboration facilitation	Clear communication, teamwork, adaptability to evolving communication technologies	Communication skills, technical writing proficiency	Reporting and communication skills for bug tracking, data-driven testing insights
Problem-solving	Analytical skills for risk management, AI-assisted risk assessment	Problem-solving skills, AI-powered bottleneck identification	Analytical and problem-solving abilities, AI-assisted debugging and code optimization	Problem-solving skills, adaptability to AI-influenced coding environments	Analytical skills for identifying issues, AI-driven defect analysis
Planning	Project planning, resource allocation, AI-driven resource optimization	Sprint planning and execution, AI-assisted sprint management	Development planning and execution, AI-powered agile development methodologies	N/A	Test planning and execution, AI-driven test case generation and automation
Adaptability	Adaptability to changing project requirements, AI-influenced project management approaches	Adaptability in Agile environments, AI-powered Agile methodologies	Adaptability to new technologies and tools, AI-driven skill development	Adaptability in coding environments, continuous learning of AI-influenced coding paradigms	Adaptability to changing testing methodologies, AI-integrated testing strategies

**Table 3 – Outlining potential predictions on how the rapid development and evolution of AI and digitalization could influence various IT roles, potentially leading to transformation or evolution:**

Role	Predicted Influence of AI and Digitalization	Potential Transformation of Competencies
Project Manager (PM)	AI-driven analytics could streamline project risk assessment and management, optimizing resource allocation. Digitalization might facilitate seamless collaboration and remote project management.	Increased emphasis on data analytics, AI integration for risk assessment, proficiency in managing remote teams and leveraging digital tools for collaboration and project oversight.

Scrum Master	AI tools might assist in optimizing Agile processes, enhancing team productivity, and identifying bottlenecks. Digitalization could lead to more virtual collaboration and agile tools for managing sprints.	Enhanced understanding and utilization of AI tools in Agile methodologies, virtual team facilitation skills, proficiency in Agile tools for virtual collaboration, and adaptable methodologies for dynamic changes.
Developer	AI could automate certain coding tasks, aiding in code optimization and development speed. Digitalization might introduce new platforms and tools for development and deployment.	Increased focus on AI-assisted development, proficiency in utilizing new development platforms, integration of AI technologies in coding workflows, and adapting to evolving digital development environments.
Coder	With AI aiding in automated coding aspects, coders might transition to more specialized roles in AI model development or working on AI-driven tools. Digitalization might introduce new coding paradigms and languages.	Shift towards specialized AI model development, proficiency in AI programming languages, understanding AI-driven tools, and adaptation to new coding paradigms influenced by digital transformation.
QA (Quality Assurance)	AI-driven testing automation could become more sophisticated, changing the QA role to focus on strategic testing planning and analysis. Digitalization might introduce new testing methodologies and tools.	Evolution towards strategic test planning, increased focus on data-driven testing analysis, proficiency in advanced testing tools and methodologies influenced by AI, and adaptability to rapidly evolving testing technologies.

Advances in artificial intelligence will automate various routine tasks of IT specialists. This does not necessarily mean job loss, but rather a transformation of responsibilities. IT professionals may find themselves more involved in the design, management and optimization of artificial intelligence systems. Continuous learning and adaptation will be key to maintaining workforce relevance.

IT roles may involve even closer collaboration with artificial intelligence systems. Professionals will need to understand how to utilize AI tools to enhance their work, whether in data analytics, system optimization, or cybersecurity. The synergy between human intelligence and artificial intelligence capabilities will be a determining factor.

As artificial intelligence advances, the need for robust cybersecurity measures will grow. IT roles will encompass not only developing and implementing security protocols but also proactive strategies to counter evolving cyber threats.

Artificial intelligence-based analytics will play a crucial role. The ability to interpret and strategically apply these insights will be a valuable skill. IT roles may involve making more strategic decisions that influence business lines based on data-driven recommendations.

IT professionals may deal with more complex systems integrating artificial intelligence, cloud computing, and other digital technologies.

Understanding the seamless integration of these components will be essential to effectively manage and optimize systems.

As artificial intelligence and digitalization become ubiquitous, IT professionals will grapple with ethical issues and navigate changing regulations. Ensuring that AI applications are ethically sound and compliant with data protection laws will become an integral part of IT jobs.

The future of IT professionals in the era of artificial intelligence and digitalization poses both challenges and opportunities. Harnessing the transformative potential of these technologies, coupled with a commitment to continuous learning, will be key to the success of IT professionals in the dynamic years ahead.

## Conclusion

In conclusion, the exponential growth of artificial intelligence (AI) and the pervasive wave of digitalization have ushered in a new era for the IT profession, necessitating a paradigm shift in skills, roles, and ethical considerations. The dynamism of this evolving landscape presents both challenges and opportunities that demand a strategic and adaptive approach from IT professionals. The impact of AI and digital technologies on specific IT job roles is multifaceted. Prominent roles are characterized by a deep integration of AI capabilities,

evolving roles require adaptation to new technological paradigms, and diminishing roles underscore the changing nature of certain IT tasks. The emergence of cross-functional roles emphasizes the need for IT professionals to acquire a diverse skill set. This research provides insights into the evolving IT job landscape, aiding professionals and organizations in navigating the dynamic intersection of AI and digital technologies.

The emergence of new roles, such as machine learning engineers and data scientists, underscores the need for specialized skills in AI and machine learning. Traditional roles have transformed, requiring IT professionals to integrate AI components into their work and manage vast datasets, emphasizing the imperative for continuous learning and upskilling.

Automation, driven by AI, has automated routine tasks, challenging professionals to redefine their roles and focus on higher-order problem-solving and creativity. The displacement of certain tasks by automation is counterbalanced by the creation of new opportunities in designing, implementing, and managing AI systems.

Ethical considerations take center stage as AI becomes deeply integrated into decision-making processes. IT professionals bear the responsibility of ensuring the responsible development and deployment of AI, addressing issues of bias, transparency, and accountability. The ethical dimension of AI is not merely a compliance requirement but a cornerstone for building trust and safeguarding societal values.

As the IT profession navigates this transformative

landscape, the importance of interdisciplinary collaboration becomes evident. Collaborative efforts with experts in ethics, law, business, and other fields are crucial for addressing the multifaceted challenges posed by AI and digitalization.

The demand for cybersecurity measures intensifies in the face of increased digitalization. IT professionals play a pivotal role in developing and implementing robust security measures to protect against cyber threats, emphasizing the inseparable link between technological advancement and cybersecurity.

In this era of global connectivity and remote work, IT professionals are adapting to collaborative tools and effective communication strategies, emphasizing the importance of a globally connected workforce.

The environmental impact of digital technologies has brought forth the concept of Green IT, wherein IT professionals are involved in developing sustainable practices and optimizing energy consumption in data centers, aligning the industry with broader environmental goals.

In essence, the development of the IT profession under the influence of AI's exponential growth and digitalization signifies a transformative journey marked by adaptability, continuous learning, ethical considerations, and a commitment to shaping technology in alignment with societal values. As IT professionals navigate this intricate landscape, they hold the key to unlocking the full potential of AI and digitalization while safeguarding the ethical and societal dimensions that underpin the future of the IT profession.

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### ЕВОЛЮЦІЯ ІТ-ПРОФЕСІЇ В КОНТЕКСТІ ЕКСПОНЕНЦІЙНОГО ЗРОСТАННЯ В ЕПОХУ ШТУЧНОГО ІНТЕЛЕКТУ І ДИДЖИТАЛІЗАЦІЇ

**Анотація.** Стаття присвячена дослідженню стратегічних методів виживання ІТ-фахівців в умовах експоненціального поширення штучного інтелекту та цифровізації. Мета цієї статті – проаналізувати стратегії розвитку, які ІТ-експерти можуть взяти на озброєння, щоб орієнтуватися і процвітати в середовищі, що характеризується швидким розвитком ШІ та цифровізацією. Об'єктом цього дослідження є стратегічні підходи, які використовують ІТ-фахівці для адаптації до мінливого ландшафту технологічної еволюції. Предметом є формулювання ефективних стратегій виживання, адаптованих до викликів, пов'язаних із розширенням області штучного інтелекту та цифрової трансформації. Завдання, які потрібно вирішити, включають оцінювання впливу експоненційного зростання штучного інтелекту і цифровізації на традиційні ролі в ІТ, формулювання адаптивних стратегій для ІТ-фахівців і пропонування методів підвищення кваліфікації та стійкості кар'єри в цьому динамічному середовищі. Застосовувані методи охоплюють комплексний аналіз впливу штучного інтелекту і цифровізації на роль ІТ, стратегічне планування, емпіричні дослідження набору навичок, що розвиваються, які потребує галузь, а також аналіз тематичних досліджень, що ілюструють успішні стратегії адаптації. Було отримано такі результати: виявлення трансформаційного ландшафту для ІТ-фахівців через зростання ШІ і цифровізації, формулювання адаптивних стратегій, що задовольняють мінливі вимоги, розуміння розвитку навичок і постійного навчання, необхідного для виживання в ІТ-ландшафті, що швидко змінюється. Висновки, зроблені за результатами цього дослідження, підкреслюють вкрай важливу потребу для ІТ-фахівців у прийнятті проактивної позиції щодо підвищення кваліфікації, постійного навчання, розвитку навичок м'якого спілкування та адаптації до технологічних парадигм, що розвиваються, для забезпечення сталості кар'єри.

**Ключові слова:** ІТ-фахівці; штучний інтелект; цифровізація; стратегії виживання; підвищення кваліфікації; розвиток м'яких навичок; стійкість кар'єри

#### Link to publication

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