

***ROYAL DOCKS SCHOOL OF BUSINESS AND LAW***

MBA in International Business

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A literature analysis of the role of technology in facilitating global business operations.

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Figure 1 Word Cloud IT+Business

# ABSTRACT

This dissertation investigates the role of emerging technologies (e.g., Decentralized Autonomous Organizations (DAO), Web 3.0, Human Resource Management Algorithmic Systems (HRMS)) and established methodologies (e.g., Information Technology Infrastructure Library (ITIL), The Open Group Architecture Framework (TOGAF), Scaled Agile Framework (SAFe), DevOps) in global business operations during the Industry 4.0 era. Employing a technology adoption and diffusion framework, the study examines potential benefits, challenges, and ethical concerns of these tools. The research questions address efficiency, data management, decision-making, collaboration, security, interoperability, and algorithmic ethics. Methodology includes a systematic literature review and thematic analysis of case studies featuring successful implementations. The findings contribute to understanding technology and methodology adoption in global business settings and provide recommendations for companies seeking a competitive advantage.

***Keywords:*** Interoperability; Enterprise Architecture; WEB3.0; Decision-making; Global business operations; Competitive advantage; Strategic technology adoption; Ethical implications;

# ΠΕΡΙΛΗΨΗ

Αυτή η διατριβή διερευνά το ρόλο των αναδυόμενων τεχνολογιών (π.χ., Αποκεντρωμένοι Αυτόνομοι Οργανισμοί (DAO), Web 3.0, Αλγοριθμικά Συστήματα Διαχείρισης Ανθρώπινου Δυναμικού (HRMS)) και καθιερωμένων μεθοδολογιών (π.χ. Βιβλιοθήκη Υποδομής Πληροφορικής (ITIL), The Open Group Architecture Framework ( TOGAF), Scaled Agile Framework (SAFe), DevOps) σε παγκόσμιες επιχειρηματικές δραστηριότητες κατά την εποχή του Industry 4.0. Χρησιμοποιώντας ένα πλαίσιο υιοθέτησης και διάδοσης τεχνολογίας, η μελέτη εξετάζει πιθανά οφέλη, προκλήσεις και ηθικές ανησυχίες αυτών των εργαλείων. Τα ερευνητικά ερωτήματα αφορούν την αποτελεσματικότητα, τη διαχείριση δεδομένων, τη λήψη αποφάσεων, τη συνεργασία, την ασφάλεια, τη διαλειτουργικότητα και την αλγοριθμική ηθική. Η μεθοδολογία περιλαμβάνει συστηματική βιβλιογραφική ανασκόπηση και θεματική ανάλυση περιπτωσιολογικών μελετών που χαρακτηρίζουν επιτυχημένες υλοποιήσεις. Τα ευρήματα συμβάλλουν στην κατανόηση της υιοθέτησης τεχνολογίας και μεθοδολογίας σε παγκόσμιες επιχειρηματικές συνθήκες και παρέχουν συστάσεις για εταιρείες που αναζητούν ανταγωνιστικό πλεονέκτημα.

**Λέξεις-κλειδιά:** Δια λειτουργικότητα; Αρχιτεκτονική της επιχείρησης; WEB3.0; Λήψη απόφασης; Παγκόσμια επιχειρηματική δραστηριότητα; Ανταγωνιστικό πλεονέκτημα; Στρατηγική υιοθέτηση τεχνολογίας; Ηθικές επιπτώσεις;

# ΑΠΟΤΕΛΕΣΜΑ ΤΗΣ ΕΡΓΑΣΙΑΣ ΣΤΗΝ ΑΚΑΔΗΜΑΪΚΗ ΚΟΙΝΟΤΗΤΑ

1. Συμβολή στην ακαδημαϊκή βιβλιογραφία σχετικά με τη χρήση της τεχνολογίας στις παγκόσμιες επιχειρηματικές δραστηριότητες, εντοπίζοντας βασικά οφέλη και προκλήσεις από τη χρήση DAO, WEB3.0, HRMS και μεθοδολογιών όπως TOGAF, ITIL, SAFe, DevOps.
2. Προώθηση της κατανόησης του τρόπου με τον οποίο οι εταιρείες μπορούν να αξιοποιήσουν αποτελεσματικά αυτές τις τεχνολογίες και μεθοδολογίες για να βελτιώσουν τις παγκόσμιες επιχειρηματικές τους δραστηριότητες, προσφέροντας συστάσεις και βέλτιστες πρακτικές με βάση την ανασκόπηση της βιβλιογραφίας.
3. Παροχή πληροφοριών σχετικά με το πώς οι αναδυόμενες τεχνολογίες, όπως το DAO, το WEB3.0 και το Blockchain, μπορούν να μεταμορφώσουν τις παγκόσμιες επιχειρηματικές δραστηριότητες, εξετάζοντας μελέτες περιπτώσεων επιτυχούς υιοθέτησης και εφαρμογής τεχνολογίας.
4. Τονίζοντας τη σημασία μιας στρατηγικής και προσεκτικής προσέγγισης για την υιοθέτηση μεθοδολογίας DevOps στις παγκόσμιες επιχειρηματικές δραστηριότητες, τονίζοντας την ανάγκη για πλαίσια όπως το TOGAF, ITIL, SAFe να καθοδηγούν τη λήψη αποφάσεων.
5. Προσδιορισμός περιοχών για περαιτέρω έρευνα σχετικά με το ρόλο της τεχνολογίας στις παγκόσμιες επιχειρηματικές δραστηριότητες, όπως η διερεύνηση των επιπτώσεων των αναδυόμενων τεχνολογιών στο διεθνές εμπόριο και στο μέλλον της εργασίας.

# RESULT OF RESEARCH WORK IN THE ACADEMIC COMMUNITY

1. Contribution to the academic literature on the use of technology in global business activities, identifying key benefits and challenges of using DAO, WEB3.0, HRMS and methodologies such as TOGAF, ITIL, SAFe, DevOps.
2. Advancing the understanding of how companies can effectively leverage these technologies to improve their global business operations, by offering recommendations and best practices based on the literature review.
3. Providing insights into how emerging technologies, such as DAO, WEB3.0, and blockchain, can transform global business operations, by examining case studies of successful technology adoption and implementation.
4. Highlighting the importance of a strategic and careful approach to methodology adoption DevOps in global business operations, by emphasizing the need for frameworks such as TOGAF, ITIL, SAFe to guide decision-making.
5. Identifying areas for further research on the role of technology in global business operations, such as exploring the implications of emerging technologies for international trade and the future of work.

# ΑΠΟΤΕΛΕΣΜΑ ΤΗΣ ΕΡΓΑΣΙΑΣ ΣΤΗΝ ΚΟΙΝΩΝΙΑ

1. Παροχή πληροφοριών σε επιχειρήσεις σχετικά με το πώς να αξιοποιήσουν αποτελεσματικά την τεχνολογία και μεθοδολογίες για να βελτιώσουν τις παγκόσμιες δραστηριότητές τους, γεγονός που μπορεί να οδηγήσει σε βελτιωμένη απόδοση, παραγωγικότητα και κερδοφορία.
2. Ευαισθητοποίηση των υπευθύνων χάραξης πολιτικής και του κοινού σχετικά με τα πιθανά οφέλη και τις προκλήσεις από τη χρήση αναδυόμενων τεχνολογιών όπως DAO, WEB3.0, Blockchain και HRMS και μεθοδολογιών TOGAF, ITIL, SAFe, DevOps στις παγκόσμιες επιχειρηματικές δραστηριότητες, που μπορεί να οδηγήσει σε ενημερωμένες αποφάσεις πολιτικής και δημόσιο διάλογο.
3. Ενίσχυση του παγκόσμιου εμπορίου και της διεθνούς συνεργασίας με τη διευκόλυνση της υιοθέτησης και ενσωμάτωσης της τεχνολογίας στις επιχειρηματικές δραστηριότητες, η οποία μπορεί να οδηγήσει σε αυξημένη οικονομική ανάπτυξη και ανάπτυξη.
4. Προώθηση της καινοτομίας και της δημιουργικότητας στις παγκόσμιες επιχειρηματικές δραστηριότητες διερευνώντας τις δυνατότητες των αναδυόμενων τεχνολογιών και ενθαρρύνοντας τις εταιρείες να πειραματιστούν με νέες ιδέες και στρατηγικές.
5. Επισήμανση της ανάγκης για μια στρατηγική και υπεύθυνη προσέγγιση για την υιοθέτηση τεχνολογίας στις παγκόσμιες επιχειρηματικές δραστηριότητες, η οποία μπορεί να βοηθήσει στον μετριασμό των κινδύνων και των προκλήσεων που συνδέονται με την εφαρμογή της τεχνολογίας, όπως ανησυχίες για την ασφάλεια και ηθικές επιπτώσεις.

# RESULT OF RESEARCH WORK IN SOCIETY

1. Providing insights for businesses on how to effectively leverage technology to enhance their global operations, which may lead to improved efficiency, productivity, and profitability.
2. Raise awareness among policymakers and the public about the potential benefits and challenges of using emerging technologies such as DAO, WEB3.0, Blockchain and HRMS and TOGAF, ITIL, SAFe, DevOps methodologies in global business operations, which can lead to informed policy decisions and public debate.
3. Enhancing global trade and international collaboration by facilitating the adoption and integration of technology into business operations, which may lead to increased economic growth and development.
4. Fostering innovation and creativity in global business operations by exploring the potential of emerging technologies and encouraging companies to experiment with new ideas and strategies.
5. Highlighting the need for a strategic and responsible approach to technology adoption in global business operations, which may help to mitigate risks and challenges associated with technology implementation, such as security concerns and ethical implications.

# Εισαγωγή

The advent of Industry 4.0 has significantly impacted the global business landscape, characterized by the rapid adoption of digital technologies, automation, and data-driven decision-making. Organizations are increasingly leveraging emerging technologies, such as Decentralized Autonomous Organizations (DAO), Web 3.0, and Human Resource Management Algorithmic Systems (HRMS), alongside established methodologies like Information Technology Infrastructure Library (ITIL), The Open Group Architecture Framework (TOGAF), Scaled Agile Framework (SAFe), and DevOps to maintain competitiveness and adapt to the changing environment.

While these technologies and methodologies offer promising benefits, organizations face challenges related to efficiency, data management, decision-making, collaboration, security, interoperability, and ethical implications. The successful integration of these tools necessitates a comprehensive understanding of the benefits, challenges, and ethical concerns arising from their adoption. However, existing literature often examines these elements in isolation, creating a gap in the understanding of their combined impact on global business operations.

The statement of the problem is to examine the benefits, challenges, and ethical concerns related to adopting emerging technologies and established methodologies in global business operations during the Industry 4.0 era. Employing a technology adoption and diffusion framework, this research aims to provide practical recommendations for companies seeking a competitive advantage. By conducting a systematic literature review and thematic analysis of case studies featuring successful implementations, this study seeks to contribute to the literature on technology and methodology adoption, ultimately aiding organizations in navigating the complex landscape of Industry 4.0.

# Ανασκόπηση της Βιβλιογραφίας:

The literature review offers a concise overview of the pertinent research on emerging technologies, established methodologies, and their adoption within the context of global business operations during the Industry 4.0 era.

Decentralized Autonomous Organizations (DAOs), Web 3.0, and Human Resource Management Algorithmic Systems (HRMS) are emerging technologies garnering significant attention recently. DAOs represent a novel organizational form, utilizing blockchain technology for decentralized governance and decision-making (Tapscott & Tapscott, 2018). Web 3.0, or the Semantic Web, facilitates intelligent data processing and interpretation, enabling more efficient and personalized online experiences (Berners-Lee, Hendler, & Lassila, 2001). HRMS employs artificial intelligence and machine learning algorithms to automate and optimize various human resource management tasks, such as recruitment, performance evaluation, and talent management (Meijerink, et al., 2016).

Alongside these emerging technologies, established methodologies like Information Technology Infrastructure Library (ITIL), The Open Group Architecture Framework (TOGAF), Scaled Agile Framework (SAFe), and DevOps have significantly influenced the adoption and management of digital technologies in organizations. ITIL provides a set of best practices for IT service management, while TOGAF offers a comprehensive approach to enterprise architecture design and implementation (Cater-Steel, et al., 2006; Lankhorst, 2013). SAFe and DevOps encourage agile and collaborative software development approaches, fostering faster and more efficient digital solution delivery (Leffingwell, 2011; Kim, et al., 2016).

Despite the growing interest in these technologies and methodologies, research examining their combined impact on global business operations in the Industry 4.0 era remains limited. The existing literature often concentrates on specific benefits, challenges, and ethical concerns related to individual tools, neglecting broader implications of their adoption and integration. This literature review emphasizes the need for a more comprehensive understanding of these technologies and methodologies' roles in shaping the global business landscape and informing organizational decision-making.

Several studies have explored the potential benefits and challenges associated with adopting these technologies and methodologies, including increased efficiency, enhanced data management, improved decision-making, and better collaboration (Schwartz, 2016; Tomašević, Vitasović, & Karlović, 2018). However, these studies also highlight concerns related to security, interoperability, and ethical implications of algorithmic decision-making (McAfee & Brynjolfsson, 2018; Turilli & Floridi, 2009). To address these issues, a holistic understanding of technology and methodology adoption is essential, considering the complex interplay between various tools and approaches.

Overall, this literature review reveals a need for further research that integrates the study of emerging technologies and established methodologies within the context of global business operations during the Industry 4.0 era. By investigating their combined impact, researchers can better understand their role in shaping the global business landscape and provide practical recommendations for organizations seeking a competitive advantage.

# Μεθοδολογία Έρευνας:

This study adopts a mixed-methods research design, combining qualitative and quantitative approaches to investigate the role of emerging technologies and established methodologies in global business operations during the Industry 4.0 era. The mixed-methods design enables the exploration of a wide range of perspectives and provides a more comprehensive understanding of the research topic (Creswell & Plano Clark, 2017).

The research methodology consists of two primary components: a systematic literature review and a series of case studies. The systematic literature review will be conducted following established guidelines (Kitchenham & Charters, 2007) to identify, evaluate, and synthesize relevant research on the adoption and impact of the emerging technologies and established methodologies under investigation. The literature review will provide a solid foundation for the study, enabling the identification of key themes, trends, and gaps in the existing body of knowledge.

The case studies will focus on organizations that have successfully adopted and integrated emerging technologies, such as Decentralized Autonomous Organizations (DAO), Web 3.0, and Human Resource Management Algorithmic Systems (HRMS), and established methodologies, including Information Technology Infrastructure Library (ITIL), The Open Group Architecture Framework (TOGAF), Scaled Agile Framework (SAFe), and DevOps. These case studies will be selected based on a set of predetermined criteria, including the organization's size, industry, and geographical location, to ensure a diverse and representative sample. Multiple data collection methods will be employed, including semi-structured interviews with key stakeholders, document analysis, and observation of the organizations' processes and practices.

The semi-structured interviews will provide in-depth insights into the participants' experiences and perspectives on the adoption and impact of the emerging technologies and methodologies. A purposive sampling strategy will be used to identify interview participants who have relevant knowledge and expertise in the area under investigation (Palinkas, et al., 2015). The interview data will be collected and recorded with the participants' consent, transcribed verbatim, and analyzed using thematic analysis (Braun & Clarke, 2006).

Document analysis will involve the examination of relevant organizational documents, such as policy documents, reports, and strategic plans, to gather additional information about the organizations' experiences with the adoption and integration of the technologies and methodologies. This information will be used to complement the data obtained from the interviews and to provide further context for the case studies (Bowen, 2009).

Observation of the organizations' processes and practices related to the adoption and integration of the technologies and methodologies will provide valuable insights into the real-world implementation of these tools. The researcher will conduct non-participant observations, taking detailed field notes and recording observations systematically (Angrosino, 2007).

The quantitative component of the research will involve the collection of secondary data, such as financial performance indicators and other relevant metrics, to assess the impact of the adoption of the emerging technologies and methodologies on the organizations' performance. Descriptive and inferential statistics will be used to analyze the quantitative data and examine the relationships between technology adoption and organizational performance.

In conclusion, the research methodology employed in this study combines a systematic literature review, case studies, and a mixed-methods data analysis approach to provide a comprehensive and nuanced understanding of the role of emerging technologies and established methodologies in global business operations during the Industry 4.0 era. The findings will contribute to the academic literature and offer practical implications for organizations seeking to leverage these tools for a competitive advantage.

# **Ανάλυση Δεδομένων**:

In this study, data analysis will be carried out using a triangulation approach that combines qualitative and quantitative methods to gain comprehensive insights into the adoption and impact of emerging technologies and established methodologies in global business operations during the Industry 4.0 era. Triangulation enhances the validity and reliability of the research findings by drawing on multiple sources of data and different methods of analysis (Denzin, 1978).

The data collected from the systematic literature review and case studies will be subjected to thematic analysis, which involves the identification, analysis, and interpretation of patterns or themes within the collected data (Braun & Clarke, 2006). For the qualitative data obtained from the case studies, a coding process will be employed to identify recurring themes and patterns. NVivo software will be used to facilitate qualitative data analysis by organizing and managing data, allowing for the extraction of meaningful insights (Bazeley & Jackson, 2013).

Quantitative data analysis will involve the use of descriptive and inferential statistics to examine the relationships between the adoption of emerging technologies and established methodologies and the performance of the organizations studied. Statistical software, such as SPSS, will be utilized to conduct the quantitative data analysis. The findings from both qualitative and quantitative data analyses will be synthesized using the triangulation approach, providing a comprehensive understanding of the research topic and informing the study's conclusions and recommendations.

# Συμπέρασμα:

This research project aims to provide a comprehensive understanding of the role of emerging technologies and established methodologies in global business operations during the Industry 4.0 era. By employing a triangulation approach that combines qualitative and quantitative data analysis methods, the study will explore the benefits, challenges, and ethical concerns associated with the adoption of these tools. The findings will contribute to the existing literature by offering a holistic perspective on the combined impact of these technologies and methodologies on global business operations. Additionally, the research will provide practical recommendations for organizations seeking to leverage these tools for a competitive advantage in the rapidly evolving business landscape.

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