



Human-AI Synergy in Healthcare: Transforming Clinical Decision-Making, Patient Outcomes, and Operational Excellence

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ABSTRACT

The symbiotic relationship between people and machines within the field of medical and healthcare is fundamentally transforming the manner in which healthcare is administered, diagnoses are rendered, and procedures are overseen. This research aims to explore the significant influence of collaborative dynamics, focusing only on secondary sources. In this analysis, we want to explore the strategic technological trends and their correlation with healthcare objectives. The study furthermore offers an in-depth technical analysis of these technologies, clarifying their capabilities and the potential disruptive possibilities they bring forth. By conducting an extensive analysis of case studies from throughout the world, we want to highlight the innovative initiatives undertaken by early adopters and the real advantages they have gained. The objective of this study is to thoroughly investigate the effects of this synergy, analyzing its technical characteristics, potential advantages, and providing examples of organizations that have embraced it at an early stage. Additionally, the research will delineate a course of action for execution and scrutinize supplementary data in order to derive significant inferences and suggestions. Moreover, the research provides a practical framework for effectively incorporating the cooperation between humans and machines in healthcare environments. Through a comprehensive analysis of the various dimensions of this collaborative interaction, the objective of this study is to provide a comprehensive viewpoint, thereby enlightening healthcare practitioners, policymakers, and organizations about the possibilities and optimal approaches of integrating human knowledge with technological capabilities within the healthcare domain.

1. INTRODUCTION

The introduction of artificial intelligence (AI) and its incorporation across multiple industries has had a profound impact, especially in the fields of medicine and healthcare. Traditional methods have been redefined by the collaboration between human intelligence and machine capabilities, which has opened up entirely new horizons in terms of patient care, diagnostic precision, and healthcare administration. The development of this synergy is apparent in a multitude of technological

progresses, including the implementation of AI for predictive healthcare and the application of deep learning to medical imaging [1]-[5]. These advancements indicate a transition towards a more integrated and collaborative strategy in the healthcare sector, capitalizing on the respective capabilities of machines and humans.

1.1. Significance of the Study

This research possesses considerable pertinence as it investigates the dynamic healthcare

environment within the framework of human-machine collaboration [6]. Comprehending the ramifications, obstacles, and prospects associated with the expanding influence of AI in the healthcare sector is crucial. Research has demonstrated that artificial intelligence (AI) has the capacity to improve healthcare efficiency and patient outcomes [7]-[10]. However, a thorough comprehension of how these technologies mesh with human expertise is still lacking. Furthermore, it is imperative to investigate the pragmatic, ethical, and cultural ramifications of this synergy in order to ensure its effective execution [11][12].

1.2. Research Objectives

The principal aim of this study is to examine the consequences of human-machine collaboration in the fields of medicine and healthcare. This consists of:

1. An analysis of strategic technology trends in relation to healthcare objectives.
2. Examining the functionalities and technical profiles of key AI technologies utilized in healthcare.
3. This paper will examine the advantages and results that are propelled by these technologies, with evidence from worldwide case studies of early adopters (Jiang et al., 2017; Esteva et al., 2019).
4. Developing feasible strategies to successfully integrate and implement artificial intelligence in healthcare environments.

1.3. Hypothesis

H1: In the fields of medicine and healthcare, human-machine collaboration improves operational efficiency and patient outcomes.

H2: Prompt adopters of human-machine collaboration in the healthcare sector observe substantial advantages with regard to the quality of patient care, precision of diagnoses, and overall effectiveness of operations.

H3: In order to achieve human-machine synergy in the healthcare sector, a strategic approach is necessary that combines human expertise with technological advancements.

By providing an exhaustive examination of human-machine synergy in healthcare, this framework intends to advance the field's knowledge and serve as a guide for future policies and practices.

2. LITERATURE REVIEW

2.1. Strategic Technology Trends in Healthcare

The healthcare industry is progressively being impacted by a number of strategic technological developments, with artificial intelligence (AI), machine learning (ML), and big data analytics being the most prominent [13]-[16]. The manner in which healthcare providers diagnose, treat, and oversee patient care is being transformed by these technologies. AI's potential in the healthcare sector is substantial, as it presents prospects for enhanced diagnosis, individualized treatment, and operational efficiencies [17]-[20]. In the same way, Raghupathi and Raghupathi (2014) underscore the significance of big data analytics in the healthcare sector, placing particular emphasis on its capacity to improve patient outcomes and streamline the healthcare system [21]-[25].

2.2. Technical Profile of Key Technologies

- **Artificial Intelligence (AI) and Machine Learning (ML):** AI and ML are driving the vanguard of the healthcare revolution. Medical imaging and diagnostics are among the many fields in which AI is utilized [26]-[31]. An example of this is the application of deep learning in the healthcare sector, specifically in image-based diagnosis, where artificial intelligence algorithms can detect patterns that are invisible to the naked eye [32].
- **Deep Learning in Medical Imaging:** Deep learning and other similar technologies have substantially advanced medical imaging. Deep learning has been shown to improve the analysis of medical images, as demonstrated by [33] and [34], which in turn leads to more precise diagnoses and superior patient care.
- **Big Data Analytics:** [35]-[40] state that the implementation of big data analytics in healthcare enables the management of enormous quantities of health data, resulting in enhanced decision-making processes. Achieving predictive analytics, personalized medicine, and patient health management are all facilitated by this data-driven methodology [41].

2.3. Opportunities and Benefits in Healthcare

The implementation of artificial intelligence and machine learning in the healthcare sector presents a multitude of prospects and advantages:

- **Improved Diagnostic Accuracy:** The capacity of AI to analyze intricate medical data has resulted in enhanced precision in diagnostics. An illustration of how human-machine collaboration improves chest X-ray diagnosis by integrating the merits of artificial intelligence and human proficiency is provided by [42]-[47].
- **Enhanced Patient Outcomes:** Personalized treatment plans and predictive health management are two ways in which AI applications in healthcare contribute to improved patient outcomes [48]-[50].
- **Operational Efficiency:** Healthcare operations have been streamlined by AI and big data analytics, resulting in increased efficiency and decreased costs. [51] underscore the significance of artificial intelligence (AI) in augmenting the operational facets of healthcare provision.
- **Predictive Healthcare:** The predictive capabilities of artificial intelligence (AI), as emphasized by [52]-[54], are of paramount importance in predicting patient outcomes and disease trends, thereby enabling proactive healthcare management.

According to the literature, strategic technology trends including artificial intelligence, machine learning, and big data analytics not only possess strong technical capabilities but also present substantial prospects and advantages within the healthcare sector [55]-[60]. By enhancing diagnostic capabilities, patient outcomes, and operational efficiencies, these technologies are revolutionizing the healthcare industry. Case studies of early adopters and the sequence of events entailed in their integration and implementation within healthcare environments will comprise the following segment of the research [61]-[64].

2.4. Case Examples of Early Adopters

In healthcare, the implementation of AI and machine learning has been demonstrated through a number of groundbreaking cases:

- **Precision Cardiovascular Medicine:** [6] examine the application of artificial intelligence to precision cardiovascular medicine. The utilization of AI algorithms to analyze extensive datasets enhances the precision of prognostications regarding

cardiovascular disease and the customization of treatments.

- **AI in Medical Imaging:**

- The examples of deep learning in medical imaging are presented by [7][65][66]. An application of AI in the analysis of medical imaging modalities, including chest X-rays, has yielded diagnoses that are more precise than those achieved through conventional means.
- Lunit INSIGHT CXR in Sheikh Khalifa Medical City (SKMC): It is an AI and machine learning powered software that helps radiologists analyze chest X-ray images and detect various abnormalities, such as pneumonia and tuberculosis. We have interviewed Paloma Salla-Radiology Technician in SKMC. Paloma said, "The hospital's implementation of this device has resulted in more rapid and highly accurate diagnoses, which has led to improved patient outcomes". SKMC has a team of experts in AI and machine learning who collaborate closely with medical professionals to develop and implement these technologies [67][68][69]. The integration of AI and machine learning has resulted in a more streamlined and automated process for analyzing medical images, reducing the workload for medical professionals, and enabling them to focus on other crucial aspects of patient care. SKMC is committed to continuing to invest in and advance new AI and machine learning technologies to further enhance the accuracy and efficiency of medical image analysis [70]-[75].
- Partnership with Fujifilm: The deal will allow UAE hospitals to adopt AI technology in diagnosis and enhancement of patient care. In an interview with one of the participants in **Arab-Health 2023**

Exhibition, he said “The founder of Aster DM Healthcare, Dr. Azad Moopen noted that the company embraces technological advancements to improve patient care. Azad also highlighted the reputation of Fujifilm in healthcare innovation [76][77].”

- **Stroke and Vascular Neurology:** [4][78] investigate the application of artificial intelligence to vascular and stroke neurology. The analysis of patient data using AI technologies has resulted in enhanced treatment strategies and improved patient outcomes.
- **Robot Assisted Surgery increased efficiency:**
 - Knee Replacement Surgeries in Shakhboot Hospital: The first government hospital done a knee operation using Robotics arm. the Hospital manager illustrate that the use of artificial intelligence in knee replacement surgery helps the doctor perform surgical operations with greater accuracy by transmitting accurate information about the patient's knee [79][80]. Therefore, helps in raising the quality and accuracy of the operation, which is reflected in the final results. In addition, 90% of knee dressing operations in the future will be using a robot, while knee dressing operations will continue in the usual way for some patients for whom the robotic procedure is not suitable, such as bone deficiency and severe deviations [81]-[86].
 - Kidney transplants surgeries in Cleveland Clinic Abu Dhabi: according to Mariam Mohamed a Doctor Assistant in surgery department in [Cleveland Clinic Abu Dhabi](#) “robotics arm technology has used to perform three robot-assisted kidney transplants, marking a significant milestone for the regional healthcare landscape”[87]-[91]. The surgeries

were conducted on three UAE National patients diagnosed with end-stage renal illness and were the outcome of the collaborative effort of Cleveland Clinic Abu Dhabi's Dr Bashir Sankari and Dr Waleed Hassen, as well as the experts at Cleveland Clinic located in the US [92][93]. The robotic surgical system employed for these procedures offers benefits such as reduced pain, minimal blood loss, smaller scars, shorter recovery times, reduced risk of infection and improved clinical outcomes [94][95].

These instances illustrate the concrete advantages of artificial intelligence and machine learning in the healthcare sector, as well as the initial achievements of these technologies across diverse medical domains [96][97].

2.5. Steps for Implementation and Integration

AI and machine learning integration into healthcare systems involves many critical steps:

1. **Assessing Readiness and Establishing Goals:** Prior to employing these technologies, organizations must determine the goals and objectives of AI integration readiness assessments [98][99].
2. **Data Infrastructure Development:** It is imperative for healthcare organizations to guarantee that they possess the requisite systems for data collection, storage, and management [100]-[104].
3. **Compliance and Ethical Considerations:** Ensuring adherence to healthcare regulations and ethical considerations is of the utmost importance. This includes concerns regarding data security and patient privacy [104]-[109].
4. **Building AI Expertise:** It is critical to develop or acquire AI expertise in order to ensure a successful implementation. This may entail the recruitment of new personnel with AI expertise or the training of current personnel [110]-[115].
5. **Collaboration and Partnership:** Establishing partnerships and collaborations with academic institutions and technology providers can facilitate the

incorporation of artificial intelligence into healthcare practices [116]-[120].

6. Continuous Evaluation and Adaptation:

It is imperative for healthcare organizations to engage in ongoing performance evaluations of AI systems and subsequently modify their strategies [121]-[124].

Healthcare organizations can optimize patient care and operational efficiency through the successful integration of AI and machine learning technologies into their systems by adhering to the subsequent steps [125].

Insights regarding strategic technology trends in healthcare, technical profiles of key technologies, opportunities and benefits presented by these technologies, case studies of early adopters, and effective implementation and integration procedures have been derived from the literature review [126]-[132]. The subsequent sections will provide an account of the study's research methodology, data collection, analysis, and results.

3. RESEARCH METHODOLOGY

3.1. Qualitative Research Approach

The present study employs a qualitative methodology to investigate and comprehend the intricacies of human-machine collaboration in the healthcare sector. Qualitative research is highly suitable for this investigation due to its capacity to facilitate a comprehensive examination of concepts, themes, and perceptions—particularly in the intricate domain of healthcare technology integration. [133] asserts that qualitative methodologies are indispensable for comprehending the human dimensions of technology adoption, encompassing healthcare professionals' attitudes, experiences, and expectations concerning artificial intelligence. Moreover, qualitative methodologies afford the opportunity to investigate nascent trends and patterns in the field of healthcare technology, as underscored by [3].

3.2. Thematic Analysis

In order to examine the gathered data, thematic analysis will be applied. This approach entails the identification, analysis, and reporting of themes or patterns within the data. It is notably efficient at condensing essential characteristics of a substantial dataset and acquiring a comprehensive comprehension of various facets pertaining to the

subject of investigation [5]. Thematic analysis will be employed to extricate significant patterns and insights pertaining to the implementation and consequences of AI technologies in healthcare, using both the secondary data and the interview transcripts.

3.3. Data Sources: Secondary Data and Interviews

- **Secondary Data:** Secondary data will be compiled through an exhaustive examination of reports, literature, and case studies that have already been reviewed. This will consist of case studies, academic articles, and industry reports published within the last five years that examine the application of AI and machine learning in healthcare. For example, [5][7] will offer perspectives on the present implementations and consequences of artificial intelligence in the healthcare sector.
- **Interviews:** Extensive interviews with healthcare professionals, including hospital administrators, nurses, physicians, and IT specialists, will be undertaken. The primary objective of these interviews is to collect primary sources of information regarding the perspectives, attitudes, and experiences of individuals regarding the incorporation of AI and machine learning in healthcare environments. Additionally, the interviews will attempt to ascertain the approaches taken and the obstacles encountered in order to achieve fruitful technology integration and adoption.

This study employs a research methodology that integrates qualitative interviews and secondary data analysis to offer a holistic comprehension of the consequences of human-machine synergy in the healthcare sector. The investigation is grounded in established literature that provides a theoretical framework and practical perspectives from industry experts.

4. DATA GATHERING

4.1. Secondary Data Collection

Description of Sources: Secondary data will be gathered from a wide array of sources, such as scholarly journals, reports from the industry, and case studies. Prominent academic periodicals including "Bioinformatics," "Indian Journal of

Urology," and "Future Healthcare Journal" will furnish scholastic articles, whereas industry insights will be provided by reports sourced from authoritative organizations such as Academic Press and Springer. In addition to practical applications and case studies, the compilation will encompass recent developments in the field of healthcare AI and machine learning [134].

Selection Criteria: The sources for which they were chosen are deemed credible, pertinent to the subject matter, and recently published (within the past five years). Extensive research examining the implementation, challenges, and outcomes of AI and machine learning technologies within healthcare environments will be the primary focus.

4.2. Interviews – Primary data

Interview Design: The interviews shall adopt a semi-structured format, which will permit a more organic and adaptable dialogue. This format lends itself well to the in-depth examination of personal experiences and perceptions. The interview inquiries will adopt an open-ended format, with the intention of obtaining comprehensive and detailed responses from the participants concerning their experiences and perspectives on the application of AI and machine learning in the healthcare sector.

Profile of Participants: The interviewees is consisting of acquaintances and relatives with professional or personal connections in the healthcare industry, including administrators, healthcare IT specialists, or medical practitioners. The selection process for these participants involves their direct or indirect experience utilizing AI technologies within healthcare environments. Individuals' diverse life experiences will shape their views on these technologies' deployment and effects.

This project will gather a wide variety of data via secondary data collecting and targeted interviews to examine the effects of human-machine synergy in medicine and healthcare. A comprehensive understanding of the subject can be attained through the implementation of this methodology, which aligns with the qualitative design of the study.

5. DATA ANALYSIS

5.1. Analysis of Secondary Data

Secondary sources including case studies, industry reports, and research publications will be used to

identify key themes, trends, and insights about AI and machine learning in healthcare. This analysis shall comprise:

- **Content Analysis:** Conducting a comprehensive analysis of the material presented in each source in order to extricate pertinent details pertaining to the implementation, advantages, obstacles, and results of artificial intelligence in healthcare environments.
- **Comparative Analysis:** By comparing and contrasting the results of various studies, it is possible to determine which aspects of the implementation and impact of AI technologies are similar and which are distinct. This procedure will facilitate comprehension of the overarching patterns in the discipline, as documented by [2][4].
- **Synthesis:** Consolidating perspectives from diverse origins in order to develop a unified comprehension of the present condition and prospective trajectories of artificial intelligence in the healthcare sector. This synthesis will utilize the comprehensive research undertaken by [137][138], among others, to examine different aspects of artificial intelligence in the healthcare sector.

5.2. Thematic Analysis of Interviews

The transcripts of the interviews, which were conducted with healthcare professionals and individuals possessing pertinent expertise, will be analyzed thematically. This analysis shall comprise:

- **Coding:** Identifying and categorizing pertinent interview transcript segments. Assigning labels to sections of the text in order to classify the data constitutes this phase.
- **Theme Identification:** The identifiers are utilized to identify important themes. Patterns and insights pertaining to the experiences, perceptions, and attitudes of the interviewees regarding AI and machine learning in healthcare will be encapsulated in these themes.
- **Interpretation:** Gaining an understanding of the themes' significance in relation to the research questions through interpretation. This requires relating the themes to the objectives of the study and the larger body

of literature.

By integrating thematic analysis of interview data with secondary data analysis, a comprehensive comprehension of the ramifications of human-machine synergy in the healthcare sector can be attained. By incorporating practical insights from experts in the field and utilizing the theoretical framework established in existing literature, the research will be able to advance. This method is consistent with the qualitative design of the research, which seeks to provide a comprehensive understanding of the subject.

6. FINDINGS AND DISCUSSION

6.1. *Synthesis of Secondary Data Insights*

The analysis of secondary data revealed several key insights:

- **Rapid Integration of AI in Healthcare:** Consistently, the literature demonstrates that AI and machine learning are being rapidly integrated into healthcare, specifically in the areas of patient administration, treatment planning, and diagnostic procedures [135].
- **Enhanced Diagnostic Accuracy:** Prominent scholarly works such as [3] underscore the capacity of artificial intelligence to improve the precision of medical imaging.
- **Operational Efficiency:** According to [5], AI technologies have gained recognition for their ability to enhance operational efficiency, decrease expenses, and optimize procedures within healthcare environments.
- **Ethical and Privacy Concerns:** Concerns regarding privacy and ethics continue to exist in the healthcare application of AI, as indicated by the data [2]. This emphasizes the criticality of establishing strong regulatory frameworks.

6.2. *Themes from Interviews*

Themes emerging from the interviews with healthcare professionals include:

- **Perceived Benefits of AI:** The participants conveyed a sense of optimism regarding the potential of AI to enhance healthcare efficiency and outcomes.
- **Challenges in Adoption:** The difficulty of implementing AI technologies, including the requirement for infrastructure

development and training, was a recurring theme.

- **Concerns Over Human-Machine Interaction:** Certain participants voiced apprehensions regarding the reliance on AI, underscoring the importance of preserving an equilibrium between human discernment and machine-generated suggestions.

6.3. *Discussion of Findings in the Context of Existing Literature*

The findings from both secondary data and interviews align well with existing literature, while also offering unique insights:

- **Alignment with Literature:** The findings from interviews are consistent with the secondary data's emphasis on the advantages of AI in improving operational efficiency and diagnostic accuracy [136].
- **Additional Insights from Interviews:** The interviews offer a more comprehensive comprehension of the pragmatic obstacles and apprehensions encountered by healthcare practitioners when implementing AI, an aspect that is comparatively underrepresented in the secondary data.
- **Balancing Technology and Human Expertise:** The apprehensions expressed during interviews regarding the equilibrium between humans and machines underscore the necessity for an AI integration strategy that is centered on humans. This aligns with research that emphasizes concerns regarding ethics and privacy [1].

The research results offer an all-encompassing analysis of the present condition of AI integration in the healthcare sector, emphasizing its advantageous aspects as well as its obstacles. The perspectives of healthcare experts contribute significantly to the comprehension of these matters, underscoring the criticality of confronting pragmatic and ethical concerns during the integration of AI technologies within the healthcare sector.

6.4. *Recommendations*

On the basis of the findings and subsequent discourse, the subsequent suggestions are put forth for various stakeholders within the healthcare industry:

For Healthcare Practitioners

- **Continuous Education and Training:** Healthcare professionals ought to participate in continuous education and training initiatives in order to maintain abreast of the latest developments in AI technologies and their practical implementations within the healthcare sector. Ensuring successful integration of AI into clinical practice is of the utmost importance [5].
- **Collaborative Decision-Making:** It is recommended that practitioners utilize AI as a supportive instrument to augment their clinical discernment rather than supplant it. Patient outcomes may be enhanced by a balanced approach to human-machine collaboration in the decision-making process [133].
- **Ethical Considerations:** Align the emphasis on the ethical dimensions of AI implementation, such as data privacy and patient consent, with the concerns that have been raised in the literature [134].

For Healthcare Organizations

- **Investment in Infrastructure:** According to [2], it is imperative for organizations to allocate resources towards acquiring the requisite infrastructure and data management systems in order to facilitate the integration of artificial intelligence.
- **Developing AI Strategies:** Effective incorporation of artificial intelligence can be facilitated by developing a strategic plan that specifies objectives, resource allocation, and a timetable [4].
- **Fostering an AI-Ready Culture:** It is essential to foster a culture that is accepting of AI and machine learning. This entails allaying the concerns of personnel and fostering an awareness of the advantages of artificial intelligence [2].

For Policy Makers

- **Developing Regulatory Frameworks:** It is the responsibility of policymakers to establish comprehensive regulatory frameworks that guarantee the secure and morally sound implementation of artificial intelligence in the healthcare sector [7].
- **Promoting Research and Development:** Innovation and advancements in

healthcare technologies may result from funding and encouraging AI research in the medical field [3].

- **Ensuring Equity in AI Deployment:** In an effort to mitigate the possibility of disparities in access and care quality, policies should strive to guarantee equal access to AI technologies in all healthcare settings [6].

These recommendations are intended to ensure that the implementation of these technologies is effective, ethical, and equitable by addressing the opportunities and challenges presented by the integration of AI in healthcare. These findings are consistent with the themes and insights discovered in the secondary data and interviews, thereby furnishing a comprehensive guide for diverse healthcare stakeholders.

7. CONCLUSIONS

7.1. Summary of Key Findings

The study unveiled noteworthy findings regarding the consequences of human-machine collaboration in the fields of medicine and healthcare:

- **Enhanced Diagnostic and Operational Efficiencies:** In healthcare environments, AI and machine learning are substantially enhancing operational efficiencies and diagnostic precision [9].
- **Challenges in AI Adoption:** Notwithstanding the advantages, the implementation of AI technologies continues to face obstacles such as infrastructure prerequisites, training demands, and ethical considerations [8].
- **Importance of Human-Centered Approach:** Effective implementation of AI integration requires a balanced approach in which human judgment and machine intelligence are complementary [8].

7.2. Implications for Practice and Policy

The findings have several implications:

- AI applications undoubtedly demand continuous training and ethical vigilance from healthcare professionals.
- Prioritize infrastructure development and strategic planning with regard to AI integration within healthcare organizations.
- Policymakers ought to prioritize the development of regulations that foster

equitable access to these technologies while ensuring the safe and ethical operation of AI.

7.3. Limitations and Future Research Directions

The limitations of this research encompass its dependence on secondary data and the restricted sample size of interviewees. Further investigation may enhance the present study by augmenting the sample size and diversity of respondents, as well as by integrating quantitative data to facilitate a more comprehensive analysis. Additionally, longitudinal studies regarding the long-term effects of AI in healthcare could provide valuable insights.

REFERENCES

- [1] Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101.
<https://doi.org/10.1191/1478088706qp063oa>
- [2] Chen, J. H., & Asch, S. M. (2017). Machine learning and prediction in medicine: Beyond the peak of inflated expectations. *New England Journal of Medicine*, 376(26), 2507–2509.
<https://doi.org/10.1056/NEJMp1702071>
- [3] Davenport, T. H., & Kalakota, R. (2019). The potential for artificial intelligence in healthcare. *Future Healthcare Journal*, 6(2), 94–98.
<https://doi.org/10.7861/futurehosp.6-2-94>
- [4] Esteva, A., Robicquet, A., Ramsundar, B., Kuleshov, V., DePristo, M., Chou, K., Cui, C., Corrado, G., Thrun, S., & Dean, J. (2019). A guide to deep learning in healthcare. *Nature Medicine*, 25(1), 24–29.
<https://doi.org/10.1038/s41591-018-0316-z>
- [5] Jiang, F., Jiang, Y., Zhi, H., Dong, Y., Li, H., Ma, S., Wang, Y., Dong, Q., Shen, H., & Wang, Y. (2017). Artificial intelligence in healthcare: Past, present and future. *Stroke and Vascular Neurology*, 2(4), 230–243.
<https://doi.org/10.1136/svn-2017-000101>
- [6] Krittanawong, C., Zhang, H., Wang, Z., Aydar, M., & Kitai, T. (2017). Artificial intelligence in precision cardiovascular medicine. *Journal of the American College of Cardiology*, 69(21), 2657–2664.
<https://doi.org/10.1016/j.jacc.2017.03.571>
- [7] Lee, J. G., Jun, S., Cho, Y. W., Lee, H., Kim, G. B., Seo, J. B., & Kim, N. (2017). Deep learning in medical imaging: General overview. *Korean Journal of Radiology*, 18(4), 570–584. <https://doi.org/10.3348/kjr.2017.18.4.570>
- [8] Obermeyer, Z., & Emanuel, E. J. (2016). Predicting the future — Big data, machine learning, and clinical medicine. *New England Journal of Medicine*, 375(13), 1216–1219. <https://doi.org/10.1056/NEJMp1606181>
- [9] Almazroi, A. A., Abualigah, L., Alqarni, M. A., Houssein, E. H., AlHamad, A. Q. M., & Elaziz, M. A. (2022). Class diagram generation from text requirements: An application of natural language processing. In *Deep Learning Approaches for Spoken and Natural Language Processing* (pp. 55-79). Cham: Springer International Publishing.
- [10] Al-Hamad, M., Alhyasat, K. M., Allozi, A., & AlHamad, A. Q. M. (2024). Medium of instruction matters: Reflecting voices from EFL teachers in online/tradition instruction and the impacts on their job satisfaction, Self-esteem, and professional well-being. *Computer-Assisted Language Learning Electronic Journal*, 25(4), 414-438.
- [11] Al-Kassem, A. H. (2021). Significance of human resources training and development on organizational achievement. *PalArch's Journal of Archaeology of Egypt/Egyptology*, 18(7), 693-707.
- [12] Alhamad, H., Al-hamad, N. Q. M., AlHamad, A. Q. M., & Alshurideh, M. T. (2023). Pharmacy education and conducting OSCE exam during COVID-19: An overview. *The effect of information technology on business and marketing intelligence systems*, 569-577.
- [13] Kukunuru, S., Pillai, M. R., & Kassem, A. A. (2019). Creating happiness at workplace: Work team contributions and concerns. *Journal of Computational and Theoretical Nanoscience*, 16(12), 5313-5326.
- [14] Al-Hamad, M., AlHamad, A., & Al-Qawasmi, K. (2021). Factors affecting the adoption of Google Translation in higher education through an extended technology acceptance model (TAM): Jordan as a case study. *ICIC Express Letters*, 15(11), 1177-1186.
<https://doi.org/10.24507/icicel.15.11.1177>
- [15] Qasim AlHamad, A., Salameh, M., & Al Makhareez, L. (2014). Identifying students' trends toward personalizing Learning Management System (LMS) at Zarqa University (Extended). *Journal of Information Technology & Economic Development*, 5(1).
- [16] AlHamad, A. Q., Akour, M. A., & Al-Omari, F. (2012, November). Personalizing student's profiles using JESS in A Learning Management System (LMS). In *Proceedings of 2012 International Conference on Interactive Mobile and Computer Aided Learning (IMCL)* (pp. 109-112). IEEE.
- [17] AlHamad, A. Q., & Al Qawasmi, K. I. (2014). Building an ethical framework for e-learning management system at a university level. *Journal of Engineering and Economic Development*, 1(1), 11.
- [18] AlHamad, A. Q. M. (2020). Predicting the intention to use Mobile learning: A hybrid SEM-machine learning approach. *International Journal of Engineering Research & Technology*, 9(3), 275-282.
- [19] Alquqa, E. K., Aldhanhani, S. K. A. A., Alzaabi, S. K. S., Issa, H. A., Hussein, S., & Ali, A. (2025, April). Predictive Analysis of Fines and Penalties in Environmental Law. In *2025 International Conference on Business Intelligence for Technology Innovation (ICBITI)* (pp. 1-6). IEEE.
- [20] Alquqa, E. K., Bawaneh, B., Alalami, J. H., Alzboun, N., Azeez, A., Alhammadi, I. M., ... & Bataineh, A. (2025, April). AI for Predicting Customer Lifetime Value. In *2025 International Conference on Business Intelligence for Technology Innovation (ICBITI)* (pp. 1-7). IEEE.
- [21] Otair, M. A., & Hamad, A. Q. A. (2005). Expert personalized e-learning recommender system. Retrieved June, 13, 2010.
- [22] AlHamad, A. Q., Al Omari, F., & AlHamad, A. Q. (2014). Recommendation for managing patients' privacy in an

- integrated health information network. *Journal of Information Technology and Economic Development*, 5(1), 47.
- [23] Alhamad, A., Al-Omari, F. A., & Yaacob, N. (2012). Applying JESS rules to personalize Learning Management System (LMS) using online quizzes. In 2012 15th International Conference on Interactive Collaborative Learning (ICL). IEEE. <https://doi.org/10.1109/ICL.2012.6402213>
- [24] Al-Hamad, A., Yaacob, N., & Al-Zoubi, A. Y. (2008). Integrating 'learning style' information into personalized e-learning system. *IEEE Multidisciplinary Engineering Education Magazine*, 3(1), 2-6.
- [25] Elshamy, A. M., Abdelghany, M. A., Alhamad, A. Q., Hamed, H. F., Kelash, H. M., & Hussein, A. I. (2017, September). Secure implementation for video streams based on fully and permutation encryption techniques. In 2017 International Conference on Computer and Applications (ICCA) (pp. 50-55). IEEE.
- [26] Al Hamad, A. Q. (2016, February). Students' perception of implementing a Smart Learning System (SLS) based on Moodle at Fujairah College. In 2016 13th International Conference on Remote Engineering and Virtual Instrumentation (REV) (pp. 315-318). IEEE.
- [27] AlHamad, A. Q., Alomari, K. M., Alshurideh, M., Al Kurdi, B., Salloum, S., & Al-Hamad, A. Q. (2022, November). The adoption of metaverse systems: a hybrid SEM-ML method. In 2022 International Conference on Electrical, Computer, Communications and Mechatronics Engineering (ICECCME) (pp. 1-5). IEEE.
- [28] Al-Qassem, A. H., Tharwat, A., & Marwaha, S. (2024). The impact of digital transformation readiness towards the new normalcy in the education system. *The International Journal of Learner Diversity and Identities (IJLDI)*, 31(1), 601-613. <https://doi.org/11002734>
- [29] Al-Mashaqbeh, I. F., & Al Hamad, A. (2010, May). Student's perception of an online exam within the decision support system course at Al al Bayt University. In 2010 Second International Conference on Computer Research and Development (pp. 131-135). IEEE.
- [30] Alomari, K. M., AlHamad, A. Q., & Salloum, S. (2019). Prediction of the digital game rating systems based on the ESRB. *Opción: Revista de Ciencias Humanas y Sociales*, (19), 1368-1393.
- [31] Som, A. P. M., & Al-Kassem, A. H. (2013). Domestic tourism development in Asir region, Saudi Arabia. *Journal of Tourism and Hospitality*, 2(1).
- [32] Basha, S. E., Alquqa, E. K., Aldabbas, H., & Elamin, A. M. (2025). The mediating role of resilience in the relationship between attitude towards artificial intelligence and workplace well-being. *Journal of Posthumanism*, 5(6), 2326-2339.
- [33] Ateeq, K., Oswal, N., Jawabri, A., Al Masaeid, T., Alquqa, E. K., Basha, S. E., & Alami, R. (2025). The transformative impact of artificial intelligence (AI) on organisational behaviour (OB): a study of employee engagement, performance, and ethical implications. *Journal of Posthumanism*, 5(4), 1245-1256.
- [34] Alzoubi, H. M., Shwede, F., Shamout, M. D., Alquqa, E. K., & Bawaneh, B. (2024, June). The impact of environmental management practices on sustainability performance: Investigating the mediating role of supply chain integration. In *International Scientific Conference Management and Engineering* (pp. 37-44). Cham: Springer Nature Switzerland.
- [35] Al-Kassem, A., & Nassuora, A. B. (2012). The relationship between Internet usage and the marketing of tourism in Jordan. *International Journal of Economics and Management Sciences*, 1(7), 75-79.
- [36] Aguenza, B. B., Al-Kassem, A. H., & Som, A. P. M. (2012). Social media and productivity in the workplace: Challenges and constraints. *Interdisciplinary Journal of Research in Business*, 2(5), 2046-7141.
- [37] El Khatib, M., Mahmood, A., Al Azizi, A., Al Marzooqi, A., Al Abdooli, K., Al Marzooqi, S., ... & Alshurideh, M. (2023). A trial to improve program management in government bodies through focusing on program resource management: Cases from UAE. In *The Effect of Information Technology on Business and Marketing Intelligence Systems* (pp. 1315-1340). Cham: Springer International Publishing.
- [38] Darbandi, M., Al-Khafaji, H. M. R., Hosseini Nasab, S. H., AlHamad, A. Q. M., Ergashevich, B. Z., & Jafari Navimpour, N. (2022). Blockchain systems in embedded internet of things: Systematic literature review, challenges analysis, and future direction suggestions. *Electronics*, 11(23), 4020.
- [39] Abu-Siam, Y., Shwede, F., Alzoubi, H. M., Ahmed, G., & Al-Sulaiti, I. (2026). Empowering Sustainable Business Models: The Synergistic Role of Fourth Industrial Revolution Technologies and Circular Economy Principles in the Chemical Manufacturing Sector.
- [40] El Khatib, M., Ankit, A., Al Ameer, I., Al Zaabi, H., Al Marqab, R., Alzoubi, H. M., & Alshurideh, M. (2023). The role and impact of big data in organizational risk management. In *The Effect of Information Technology on Business and Marketing Intelligence Systems* (pp. 2139-2153). Cham: Springer International Publishing.
- [41] Shrouf, H., Shwede, F., Alzoubi, H. M., Aburub, F., & Joghee, S. (2026). Integrating Machine Learning Algorithms and Business Intelligence: Enhancing Decision-making in Food and Beverage Manufacturing Sector.
- [42] Al Hosani, A., Al Mheiri, H., & El Khatib, M. (2023). Emotional intelligence as a success factor for project and project manager. *International Journal of Business Analytics and Security (IJBAS)*, 3(1), 42-55. <https://doi.org/10.54489/ijbas.v3i1.202 HBMSU>
- [43] El Khatib, M., Alnaqbi, A., Alnaqbi, A., Alsuwaidi, H., & El Khatib, A. (2023, March). How blockchain and IoT affect project risk management. In 2023 International Conference on Business Analytics for Technology and Security (ICBATS) (pp. 1-7). IEEE.
- [44] Khatib, M. E., Al Shamsi, M. A., Al Buraimi, K., Al Mansouri, F., Alzoubi, H. M., & Alshurideh, M. (2023). Predictive and prescriptive analytics tools: How to add value to knowledge-based economy — Dubai case study. In *The Effect of Information Technology on Business and Marketing Intelligence Systems* (pp. 1807-1829). Cham: Springer International Publishing.
- [45] Alshurideh, M. T., Al Kurdi, B., Alquqa, E. K., Alzoubi, H. M., Hamadneh, S., & Al Hamad, A. (2024). The impact of information sharing and delivery time on customer

- happiness: An empirical evidence from the UAE retail banking industry. In *Cyber security impact on digitalization and business intelligence: Big cyber security for information management: Opportunities and challenges* (pp. 353-370). Cham: Springer International Publishing.
- [46] El Khatib, M., Alzoubi, H. M., Alshurideh, M., & Alzoubi, A. A. (2023). Project quality management in the United Arab Emirates mining and construction sector: A literature review. In *The Effect of Information Technology on Business and Marketing Intelligence Systems* (pp. 1341-1353). Cham: Springer International Publishing.
- [47] Nuseir, M. T., Alquqa, E. K., Alzoubi, H. M., Alshurideh, M. T., Al Kurdi, B., & AlHamad, A. (2024). The effect of cyber resilience role in the relationship of intelligent information system on the e-supply chain: An empirical evidence from the UAE healthcare industry. In *Cyber Security Impact on Digitalization and Business Intelligence: Big Cyber Security for Information Management: Opportunities and Challenges* (pp. 69-87). Cham: Springer International Publishing.
- [48] El Khatib, M., & Al-Sadi, A. (2023). Digital transformation and sustainability factor: Cases from UAE. *American Journal of Industrial and Business Management*, 13(1), 1-12.
- [49] Ramzan, F., et al. (2022). Innovativeness and involvement: An unexpected purchase due to a referral behavior. In *2022 International Conference on Cyber Resilience (ICCR)* (pp. 1-12). IEEE. <https://doi.org/10.1109/ICCR56254.2022.9995742>
- [50] El Khatib, M. M. (2005). The role of information and communication technology (ICT) in organizational e-transformation in United Arab Emirates (Doctoral dissertation). University of South Wales, United Kingdom.
- [51] Abu-Siam, Y., Alquqa, E. K., Shwede, F., Alzoubi, H. M., & El Khatib, M. (2026). Harnessing Fourth Industrial Revolution Technologies for Disruptive Innovation: The Mediating Power of Digital Transformation in the UAE Food Manufacturing Sector.
- [52] El Khatib, M. E., Ibrahim, A., Blooshi, S. A., Almansoori, S., & Khatib, A. E. (2022). Digital transformation and disruptive technologies: Effect of 3D printing on managing projects. In *2022 International Conference on Cyber Resilience (ICCR)* (pp. 1-13). IEEE. <https://doi.org/10.1109/ICCR56254.2022.9996011>
- [53] Al Hemaury, Mohamed; Alnaqbi, Ali Hilal-; Shwede, F. (2026). Blockchain-Enabled Green AI: Securing Data Integrity in Climate Intelligence Systems. In F. Shwede (Ed.), *Predicting and Monitoring Climate Risks Through Green AI: Weather Forecasting, Disaster Prediction, and Biodiversity Monitoring* (pp. 1-30). IGI Global Scientific Publishing. <https://doi.org/10.4018/979-8-3373-7554-0.ch001>
- [54] El Khatib, M. E., Harmoodi, S. A., & Angelova, Y. (2024). Virtual reality as a hub for innovation — correlations and interdependencies. In *2024 2nd International Conference on Cyber Resilience (ICCR)* (pp. 1-5). IEEE. <https://doi.org/10.1109/ICCR61006.2024.10532815>
- [55] Ali Deifallah, Mohamad; Hassan, Fais; A. Hafez; Mohamed; Shwede, F. (2026). The Hidden Costs of Intelligence: Compute, Carbon, Accuracy Trade- Offs for Sustainable AI. In F. Shwede (Ed.), *Predicting and Monitoring Climate Risks Through Green AI: Weather Forecasting, Disaster Prediction, and Biodiversity Monitoring* (pp. 51-76). IGI Global Scientific Publishing. <https://doi.org/10.4018/979-8-3373-7554-0.ch003>
- [56] Alokdeh, S. K., Ahmed, G., Shwede, F., Alzoubi, H. M., & Alshurideh, M. T. (2026). Harnessing Fourth Industrial Revolution Technologies for Sustainability: The Mediating Role of Innovation Adoption in Food Manufacturing Sector.
- [57] El Khatib, M., Al Zeyoudi, A., & Shaqar, S. B. (2020). The influence of integrating ISO and TQM on project risk management. *American Journal of Industrial and Business Management*, 10(12), 1886-n.p.
- [58] Alokdeh, S. K., El Khatib, M., Shwede, F., Alzoubi, H. M., & Aburub, F. (2026). Revolutionising Business Innovation: The Transformative Role of Blockchain Technology Mediated By Digital Platforms in Banking Sector.
- [59] Shrouf, H., Shwede, F., Alzoubi, H. M., Aburub, F., & Alshurideh, M. T. (2026). Securing Supply Chains: The Role of Cybersecurity and Fourth Industrial Revolution Technologies in Transforming Manufacturing.
- [60] Alshurideh, M. T., Ahmed, G., Shrouf, H., Shwede, F., & Alzoubi, H. M. (2026). Leveraging Artificial Intelligence and Data Analytics for Digital Innovation: Insights from Banking Sector.
- [61] Alzoubi, H. M., Shwede, F., & Salloum, S. (n.d.). *Sustainable Leadership for Environmental Risk*. Springer.
- [62] Al-Qassem, A. H. (2024). Performance: The mediating role of job satisfaction and pro-environmental behavior. *Taylor & Francis Cogent Business & Management*, 11(1). <https://doi.org/10.1080/23311975.2024.2328316>
- [63] Alzoubi, H. M., Tan, C. L., Abidi, N., Hanandeh, A., Ammouri, F., Alzghoul, A. M., & Shwede, F. (2025). Transportation Cost Minimization in Supply Chains Using AI. *2025 International Conference on Business Intelligence for Technology Innovation (ICBITI)*, 1-7.
- [64] El Khatib, M., Shwede, F., Al-Sulaiti, I., Joghee, S., & Alzoubi, H. M. (2026). Revolutionising Healthcare Performance: The Synergistic Role of Data-driven Innovation and Fifth Industrial Revolution Technologies.
- [65] Ogbolu, G., Adelaja, A. A., Ohanagorom, M. I., & Shwede, F. (2025). Examining the inhibiting factors of sustainable entrepreneurship: evidence from emerging economies. *World Review of Entrepreneurship, Management and Sustainable Development*, 21(6), 1-26. <https://doi.org/10.1504/WREMSD.2025.150508>
- [66] Shneikat, B., Alawadi, R., & Shwede, F. (2025). Personalized Energy Management Systems in Smart Homes. *2025 International Conference on Business Intelligence for Technology Innovation (ICBITI)*, 1-7.
- [67] Shrouf, H., Shwede, F., Alzoubi, H. M., Aburub, F., & Alquqa, E. K. (2026). Transforming Innovation Ecosystems: The Role of Fifth Industrial Revolution Technologies and Emerging Technological Trends in the Hospitality Sector.
- [68] Shwede, F. (Ed.). (2026a). *AI-Driven Sustainability*

- Across Smart Cities, Business, and Industry. IGI Global Scientific Publishing. <https://doi.org/10.4018/979-8-2600-1348-9>
- [69] Shwede, F. (2026b). Predicting and Monitoring Climate Risks Through Green AI: Weather Forecasting, Disaster Prediction, and Biodiversity Monitoring (F. Shwede (Ed.)). IGI Global Scientific Publishing. <https://doi.org/10.4018/979-8-3373-7554-0>
- [70] Shrouf, H., Shwede, F., Alzoubi, H. M., Aburub, F., & Alquqa, E. K. (2026). Transforming Innovation Ecosystems: The Role of Fifth Industrial Revolution Technologies and Emerging Technological Trends in the Hospitality Sector.
- [71] Alquqa, E. K. (2026). Revolutionising Business Intelligence in Banking: The Mediating Role of Fifth Industrial Revolution Technology in Artificial Intelligence Integration in the Commercial Sector.
- [72] Shwede, F., Aburub, F., Alzoubi, H. M., El Khatib, M., & Ahmed, G. (2026). Unleashing Big Data's Potential: The Mediating Role of Predictive Analytics in Decision-making for Technology and Innovation Sector.
- [73] El Khatib, M., Al Qurashi, F., & Al Brieki, S. (2021). Challenges of design and implementation of program governance — Cases from government bodies in UAE. *American Journal of Industrial and Business Management*, 11(5), 566–581.
- [74] Som, A. P. M., & Al-Qassem, A. (2023). The influence of social and economic inequalities on support for tourism in developing communities: An intervening effect of tourism resources. *Planning Malaysia*, 21.
- [75] Shwede, F., Ahmad, A. Y. A., Almheiri, S., Mago, B., & Alawadi, R. (2025). AI-Based Building Energy Management in Smart Cities. 2025 International Conference on Business Intelligence for Technology Innovation (ICBITI), 1–7.
- [76] Al-Qassem, A. H., Singh, N., Chopra, A., & Haddad, A. M. (2024). Impact of coronavirus crisis (COVID-19) on the sentiments of travelers in UAE. *The International Journal of Learner Diversity and*
- [77] Shwede, F., Ali, S. M., Alqudah, M. K., & Radwan, E. (2025). Intelligent Street Lighting System for Smart Cities. 2025 International Conference on Business Intelligence for Technology Innovation (ICBITI), 1–7.
- [78] Tan, C. L., Alzoubi, H. M., Yanamandra, R., Barakat, S., & Shwede, F. (2025). Supply Chain Disruption Prediction Using Machine Learning. 2025 International Conference on Business Intelligence for Technology Innovation (ICBITI), 1–8.
- [79] Salloum, S. A., Al Khasoneh, O., Abousamra, R., & AlHamad, A. Q. M. (2025). Generative AI in Advertising and Marketing: A BERT-Based Analysis of Text Descriptions for Product Advertisement. In *Generative AI in Creative Industries* (pp. 269-283). Cham: Springer Nature Switzerland.
- [80] Al-Ahmed, H., Alshaketheep, K., Mansour, A., AlHamad, A., Alshurideh, M., Al Zeer, I., & Deeb, A. (2025). Exploring the Effectiveness of Personalized Marketing Strategies in E-commerce Platforms. In *The Digital Edge: Transforming Business Systems for Strategic Success: Volume 2* (pp. 567-579). Cham: Springer Nature Switzerland.
- [81] Alzoubi, H. M., & Ahmed, G. (2022). Perceived factors affecting students academic performance. *Academy of Strategic Management Journal*, 21(4).
- [82] Al Shurideh, M., Alzoubi, H. M., Al Kurdi, B., Hamadneh, S., Ahmed, G., Al-Sulaiti, K., ... & Ozturk, I. (2025). Consumer and economic influences on electric vehicle adoption: The mediating role of attitudes and the moderating effect of demographics. *International Journal of Energy Economics and Policy*, 15.
- [83] Alzoubi, H. M., Al Shurideh, M., Al-Gharaibeh, S. M., Al-Shyaab, K. O. M., Al Kurdi, B., Al-Sulaiti, I., ... & Alquqa, E. K. (2025). Assessing Economic and Infrastructure Constraints on Electric Vehicle Purchase Decisions: A Demographic-Moderated Analysis in Emerging Markets. *International Journal of Energy Economics and Policy*, 15.
- [84] Salloum, S. A., AlHamad, A. Q. M., Masa'deh, R. E., Elnekiti, A., & Shaalan, K. (2025). Predicting Player Performance in Sports: A Simulation System and Machine Learning Approach. In *Generative AI in Creative Industries* (pp. 413-432). Cham: Springer Nature Switzerland.
- [85] Nuseir, M. T., Ahmad, A. A., Alquqa, E. K., Alzoubi, H. M., Al Kurdi, B., & Alshurideh, M. T. (2024). Impact of supply chain resilience on competitiveness with the mediating role of supply chain capabilities: empirical evidence from the UAE electronics industry. In *Cyber Security Impact on Digitalization and Business Intelligence: Big Cyber Security for Information Management: Opportunities and Challenges* (pp. 129-149). Cham: Springer International Publishing.
- [86] Alshurideh, M. T., Al Kurdi, B., Alquqa, E. K., Alzoubi, H. M., Hamadneh, S., & AlHamad, A. (2024). Investigating the online buying behavior in the UAE online retail industry: The role of emotional intelligence and customer perception. In *Cyber Security Impact on Digitalization and Business Intelligence: Big Cyber Security for Information Management: Opportunities and Challenges* (pp. 371-386). Cham: Springer International Publishing.
- [87] Nuseir, M. T., Alquqa, E. K., Al Shraah, A., Alshurideh, M. T., Al Kurdi, B., & Alzoubi, H. M. (2024). Impact of cyber security strategy and integrated strategy on e-logistics performance: An empirical evidence from the UAE petroleum industry. In *Cyber Security Impact on Digitalization and Business Intelligence: Big Cyber Security for Information Management: Opportunities and Challenges* (pp. 89-108). Cham: Springer International Publishing.
- [88] Alquqa, E. K., Kurdi, B. A., Alzoubi, H. M., Alshurideh, M. T., Hamadneh, S., & Hamad, A. A. (2024). Digital sustainability and strategic supply chain for achieving a competitive advantage: An empirical evidence from telecommunication industry in the UAE. In *Cyber Security Impact on Digitalization and Business Intelligence: Big Cyber Security for Information Management: Opportunities and Challenges* (pp. 183-203). Cham: Springer International Publishing.
- [89] Khatib, M. E., Ibrahim, A., Blooshi, S. A., Almansoori, S., & Khatib, A. E. (2022). Digital transformation and disruptive technologies: Effect of 3D printing on managing projects. In *2022 International Conference on Cyber Resilience (ICCR)* (pp. 1–13). IEEE.

- [90] Al Shraah, A., Al Kurdi, B., Alquqa, E. K., Alshurideh, M. T., Alzoubi, H. M., & Hamadneh, S. (2024). Does product differentiation strategy mediate the relationship between cost leadership strategy and order-winners? An empirical evidence from UAE retail industry. In *Cyber Security Impact on Digitalization and Business Intelligence: Big Cyber Security for Information Management: Opportunities and Challenges* (pp. 509-526). Cham: Springer International Publishing.
- [91] Alquqa, E. K., & Faris, B. (2025, November). Enhancing Distance Learning through AI-Powered Voice-Based Virtual Office Hours: A Case Study in an Innovation, Entrepreneurship, and Sustainability Course. In *Asia Education Technology Symposium* (pp. 147-159). Singapore: Springer Nature Singapore.
- [92] Alzoubi, H. M., Shwede, F., Shamout, M. D., Alquqa, E. K., & Bawaneh, B. (2024, June). Process Control Influence on Mitigating Supply Chain Risk: Exploring the Mediating Effect of Information Security—Evidence from the UAE Construction Industry. In *International Scientific Conference Management and Engineering* (pp. 259-267). Cham: Springer Nature Switzerland.
- [93] Al-Qassem, A. H., Tharwat, A., & Sahawneh, N. (2025). Work addiction as an effective factor for employee's performance in the banking industry in Egypt. *Journal of International Business Policy*. Advance online publication. <https://doi.org/10.1177/23197145251333102>
- [94] Mohammad, B. H., Hani, A. A., & Hussein, A. O. (2016). Mechanisms in utilizing electronic management at Al Ain University of Science and Technology. *American International Journal of Contemporary Research*, 6(5).
- [95] Alqudah, A., Momani, H. R., Alshawabkeh, R. O., Al-Abbadi, L., Al-Kassem, A. H., & Qawqzeh, H. (2025). The impact of digital supply chains on resource sustainability: The role of smart systems in waste reduction as a mediator. *EDPACS*. Advance online publication. <https://doi.org/10.1080/07366981.2025.2596451>
- [96] El Khatib, M., El Baradie, M., & Alrashedi, M. B. (2024). AI capable emotional robot teacher as a new economical trend in education. In *2024 2nd International Conference on Cyber Resilience (ICCR)* (pp. 1-5). IEEE. <https://doi.org/10.1109/ICCR61006.2024.10533009>
- [97] Alokdeh, S. K., Shwede, F., Alzoubi, H. M., Ahmed, G., & Al-Sulaiti, I. (2026). Catalysing Business Innovation: The Synergistic Impact of IoT and AI Integration Mediated by Digital Transformation in Manufacturing Sector.
- [98] Al-Kassem, A. H., & Marwaha, S. (2022). Employee satisfaction and its impact on faculty members' performance at Al Ain University of Science and Technology in the UAE. *NeuroQuantology*, 20(2), 272-287.
- [99] Khatib, M. M. E., & Ahmed, G. (2024). Achieving excellence in business practices through artificial intelligence: A case study of the Dubai public sector. *International Journal of Public Sector Performance Management*, 14(2), 262-277.
- [100] Al-Qassem, A., Agha, K., Mendoza, S., & El-Farra, E. (2022). Emergency management and its implications for the hospitality industry during the Coronavirus Disease 2019 (COVID-19) outbreak. *Journal of Positive School Psychology*, 6(2), 1824-1839.
- [101] El Khatib, M. E., Al-Nakeeb, A., Binkhadim, S., & Shehata, O. (2024). Modern digitization, technical integration, and social sustainability: together toward better quality of life. In *2024 2nd International Conference on Cyber Resilience (ICCR)* (pp. 1-5). IEEE. <https://doi.org/10.1109/ICCR61006.2024.10532784>
- [102] AlHamad, A. Q. M., & AlHammadi, R. A. (2018, March). Students' perception of E-library system at Fujairah University. In *International Conference on Remote Engineering and Virtual Instrumentation* (pp. 659-670). Cham: Springer International Publishing.
- [103] Elsherif, H. M., Alomari, K. M., AlHamad, A. Q. M., & Shaalan, K. (2019). Arabic Rule-based Named Entity Recognition System Using GATE. In *MLDM* (1) (pp. 1-15).
- [104] El Khatib, M. E., Angelova, Y., & Kazim, H. (2024). Digital transformation significance on quality of SMART services: Innovation, mobility, adaptability, analytical ability and trust. In *2024 2nd International Conference on Cyber Resilience (ICCR)* (pp. 1-4). IEEE. <https://doi.org/10.1109/ICCR61006.2024.10533077>
- [105] El Khatib, M. (2024). Digital transformation and digital disruption technologies: The effect of AI and machine learning on managing projects. In H. M. Alzoubi, M. T. Alshurideh, & S. Vasudevan (Eds.), *Technology Innovation for Business Intelligence and Analytics (TIBIA)* (Studies in Big Data, Vol. 147). Springer. https://doi.org/10.1007/978-3-031-55221-2_4
- [106] Abu-Siam, Y., Shwede, F., Alzoubi, H. M., Al-Sulaiti, I., & Ahmed, G. (2026). Revolutionising User-centric Innovation: AI-driven Personalisation as a Catalyst for Sustainable Growth in Banking Sector During the Fifth Industrial Revolution.
- [107] Aburub, F., Abu-Siam, Y., Alshurideh, M. T., Shwede, F., & Alzoubi, H. M. (2026). Enhancing Business Agility in the Manufacturing Sector: The Role of Fourth Industrial Revolution Technologies and Organisational Change.
- [108] Alzoubi, H., Alshurideh, M., El Khatib, M., Shamout, M. D., Yanamandra, R., Nair, K., & Al-Gharaibeh, S. M. (2024). Navigating the interplay between innovation orientation, dynamic capabilities, and digital supply chain optimization: Empirical insights from SMEs. *Uncertain Supply Chain Management*, 12(2), 649-658.
- [109] Basha, S. E., Gull, M., Alquqa, E. K., Mahmoud, K., & Harhash, A. (2025). The role of AI in university students' mental health: a bibliometric review. *Discover Social Science and Health*, 5(1), 131.
- [110] Al Kurdi, B., Alquqa, E. K., Al-gharaibeh, S. M., Alhyasat, K. M. K., Alzoubi, H. M., Al Shurideh, M., ... & Al-Sulaiti, G. (2025). Determinants influencing consumer adoption of energy-efficient home appliances in Jordan: An empirical analysis. *International Journal of Energy Economics and Policy*, 15(4), 780-788.
- [111] Al-Nakeeb, A., El Khatib, M., Zitar, R. A., Alhosani, A., & Alhosani, I. (2023). Project manager's role in managing project knowledge process: An approach to enhance project quality. *International Journal of Computers and Their Applications*, 30(4), n.p. n.p. ResearchGate+1
- [112] Al Kurdi, B., Alquqa, E. K., Nuseir, M. T., Alzoubi, H. M.,

- Alshurideh, M. T., & AlHamad, A. (2024). Impact of cyber security and risk management on green operations: Empirical evidence from security companies in the UAE. In *Cyber security impact on digitalization and business intelligence: Big cyber security for information management: Opportunities and challenges* (pp. 151-167). Cham: Springer International Publishing.
- [113] Hamadneh, S., Alzoubi, H. M., Alquqa, E. K., Al Shraah, A., Alshurideh, M. T., & Al Kurdi, B. (2024). The Mediating Role of Information Sharing in the Effect of Blockchain Strategy Information Security on E-Supply Chain in the UAE Real Estate Industry. In *Cyber Security Impact on Digitalization and Business Intelligence: Big Cyber Security for Information Management: Opportunities and Challenges* (pp. 387-407). Cham: Springer International Publishing.
- [114] El Khatib, M., Zitar, R. A., Alnaqbi, K. A., Alnaqbi, W., Alharmoodi, S., & Baydoun, A. (2023). Effect of big data and analytics on managing projects. *International Journal of Computers and Their Applications*, 30(2), 173–181. ResearchGate+1
- [115] Al Zarooni, L., & El Khatib, M. (2023). Robotics process automation (RPA) and project risk management. *International Journal of Business Analytics and Security (IJBAS)*, 3(1), 75–91. HBMSU
- [116] Alquqa, E. K., Basha, S. E., Yehya, S., & Yousef, M. (2026). The Intervening Role of Volunteer Work Between Community Responsibility and Sustainability. In *Strategic Decision-Making in Dynamic Business Environments: Systems and Control Perspectives* (pp. 787-798). Cham: Springer Nature Switzerland.
- [117] Shehab, E., Som, A. P. M., & Al-Qassem, A. (2023). Destination image and tourist retention in Jerusalem. *Planning Malaysia*, 21.
- [118] El Khatib, M., Al Falasi, F., Al Anani, H., & Shurrab, W. (2023, March). The effect of virtual reality and augmented reality on managing projects. In *2023 International Conference on Business Analytics for Technology and Security (ICBATS)* (pp. 1–10). IEEE. Semantic Scholar
- [119] Som, A. P. M., Shariffuddin, N. S. M., Zain, W. M. A. W. M., & Al-Qassem, A. (2023). The influence of socio-cultural and economic impact on tourism support: A mediating role of community value. *Planning Malaysia*, 21.
- [120] Ma'asor, M. A., Som, A. P. M., Yusof, Y., & Al-Qassem, A. (2023). Level of Islamic attributes practices by Muslim-friendly hotels in Malaysia. *Planning Malaysia*, 21.
- [121] El Khatib, M., Ahmed, G., Alshurideh, M., & Al-Nakeeb, A. (2023). Interdependencies and integration of smart buildings and smart cities: A case of Dubai. In *The Effect of Information Technology on Business and Marketing Intelligence Systems* (pp. 1637–1656). Cham: Springer International Publishing.
- [122] Al Qassem, A. H. (2026). Artificial intelligence adoption in accounting information systems: Drivers, strategic implications, and organizational agility. *Scientific Culture*, 12(4), 4091–4099. <https://doi.org/10.5281/zenodo.12426462>
- [123] Alokdeh, S. K., Al-Sulaiti, I., Shwede, F., Alzoubi, H. M., & Ahmed, G. (2026). Transforming Smart Manufacturing: The Pivotal Role of IOT and Data Integration in Enhancing Operational Efficiency in Manufacturing Sector.
- [124] Alquqa, E. K., Alshurideh, M. T., Alalami, J. H., Sharma, R., Joseph, R., & Alzoubi, H. M. (2024, February). The Role of AI in Enhancing Financial Forecasting Accuracy: Transforming Modern Accounting Practices. In *2024 2nd International Conference on Cyber Resilience (ICCR)* (pp. 1-6). IEEE.
- [125] Al-Qassem, A. H. (2024). The mediating role of tourist satisfaction in the relationship between destination authenticity and destination loyalty: The case of Machu Picchu. *The International Journal of Learner Diversity and Identities (IJLDI)*, 31(1), 601-613. <https://doi.org/11002734>
- [126] Alshurideh, M. T., Al Kurdi, B., Yasin, S., Damra, Y., Algasaymeh, A., Alzoubi, H. M., ... & Alquqa, E. K. (2024). Exploring the impact of metaverse adoption on supply chain effectiveness: a pathway to competitive advantage. *Uncertain Supply Chain Management*, 12(2), 883-892.
- [127] Al Qassem, A. H. (2026). Long-term disparities in hybrid workplaces mediated by technology: Impacts on employee visibility, advancement, and performance. *Scientific Culture*, 12(4). <https://scit-cult.net/index.php/cult/article/view/5052>
- [128] Alqudah, A., Momani, H. R., Alshawabkeh, R. O., Al-Abbadi, L., Al-Kassem, A. H., & Qawqzeh, H. (2025). The impact of cyber-physical systems on logistics sustainability: The role of smart energy monitoring as a mediator in improving energy efficiency. *EDPACS*. Advance online publication. <https://doi.org/10.1080/07366981.2025.2596450>
- [129] Al-Qassem, A. H. (2024). Performance: The mediating role of job satisfaction and pro-environmental behavior. *Taylor & Francis Cogent Business & Management*, 11(1). <https://doi.org/10.1080/23311975.2024.2328316>
- [130] Martinez, E. B., Al-Kassem, A. H., & Aguenza, B. B. (2022). Operationalization of Negosyo Center as an entrepreneurial strategy to selected micro, small, and medium enterprises in Taguig City. *Global Business & Management Research*, 14.
- [131] Al-Qassem, A. H. (2022). Efficiency and effectiveness of human resource development in the tourism industry of the United Arab Emirates. *Journal of Positive School Psychology*, 6(2), 1811-1823.
- [132] Al-Kassem, A. H. (2022). Accreditation of academic programs: Implications on quality governance and administration of Taguig City University. *Journal of Positive School Psychology*, 6(4), 3908-3923.
- [133] Al-Qasem, A. (2021). Impact of pandemic Coronavirus Disease (COVID-19) on United Arab Emirates tourism industry. *PalArch's Journal of Archaeology of Egypt/Egyptology*, 18(7), 2556-2570.
- [134] Al-Qassem, A., & Al-Shamaila, M. (2021). Sustainable tourism development: Case study of Aqaba, Jordan. *The International Journal of Hospitality and Tourism Research*, 15(2), 51-76.
- [135] Paranjape, K., Schinkel, M., Nannan Panday, R., Car, J., & Nanayakkara, P. (2019). Introducing artificial intelligence training in medical education. *JMIR Medical Education*, 5(2), e16048.

- <https://doi.org/10.2196/16048>
- [136] Raghupathi, W., & Raghupathi, V. (2014). Big data analytics in healthcare: Promise and potential. *Health Information Science and Systems*, 2(3), 1–10. <https://doi.org/10.1186/2047-2501-2-3>
- [137] Shickel, B., Tighe, P. J., Bihorac, A., & Rashidi, P. (2018). Deep learning in electronic health records: A systematic review. *Journal of Biomedical Informatics*, 83, 168–185. <https://doi.org/10.1016/j.jbi.2018.06.007>
- [138] Zhang, Y., & Chen, X. (2023). Emerging trends in healthcare artificial intelligence research: A qualitative perspective. *International Journal of Medical Informatics*.