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Transforming Procurement in the Arab Gulf: Integrating AI, Blockchain, and BI Tools for Enhanced Efficiency and Strategic Decision-Making

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Abstract. This study investigates the digitalization transformation, within Arab Gulf countries' procurement sector--from artificial intelligence (AI) to blockchain, and tools provided by business intelligence platforms (BI). Employing a qualitative research method, this research will interview procurement managers and industry experts to obtain first-hand data from both sides. Findings indicate these digital technologies are enhancing procurement efficiencies, transparency, and strategic decision-making. In the same breath though, we learn that challenges remain such as how to meet regulatory requirements in multiple jurisdictions; who has access to what data (and when?); and what kind of staff to hire or develop. Three main themes arise from our data: how economic theories are being married up with digital procurement practices; obstacles in technology adoption; and innovative opportunities for diversity within procurement--transforming this division's structure or ways it interfaces with other parts out there. The study concludes with the finding that shared efforts are the key to knowing which way digital transformation is going. Put simply, Policymakers must join hands with business leaders and developers of technology to solve the complexities engendered by turning an industry around through digital means successfully. This paper includes both theoretical and practical conclusions, offering fresh ideas on how regulations should change to cope and adapt with tomorrow's technology integrated into systems that can handle it all correctly. The work represents another step forward for a growing body of digital transformation knowledge in the Arab Gulf Region's procurement sector, providing valuable insights for stakeholders.

Keywords: Digital Transformation, Procurement Sector, Arab Gulf Countries, Artificial Intelligence, Blockchain Technology, Business Intelligence Tools

1. Introduction

What remains fixed in these most unstable times, then, is procurement. Despite its static nature in an age of swiftly changing technology; Above all, this will be true in the Arab Gulf countries. It is from these countries that three thousand years of history stand before us like a sheer barrier extending all the way back to ancient Mesopotamia. They are beginning now on a strategic journey towards digitalization, in keeping with their broader ambitions for economic diversification, innovation, and sustainability targets (A. A. A. Ali et al., 2023). This research project focuses on digital technologies-driving technologies namely Artificial Intelligence (AI), blockchain, and Business Intelligence (BI) systems-investment, and gingerly introduces them into procurement processes (Atieh Ali et al., 2024). It announces the dawn of a new approach in which data-driven decision-making and operation effectiveness agains dominance (Allioui & Mourdi, 2023; Althabatah et al., 2023). With deep roots in oil revenues, the Gulf region is now facing a critical transition. These countries are "pursuing using technological innovation to increase economic competing advantages, encourage foreign direct investments (FDI), and faster their efforts to attain their environmental sustainability objectives". The procurement sector within the Arab Gulf faces a difficult feature where the dependence on oil income is at its maximum, while the desire for economic diversification remains a difficult operating field due to cultural diversity and their governance structure. Moreover, the issue arises due to the need of these countries to reconcile the procurement standards with the evolving trend in the non-oil sections such as technology, renewable energy, etc. is the new challenge of digitization of procurement processes, which is an insufficiently explored and exploited domain.

This study is about digital transformation in procurement, focusing on the Arab Gulf. It covers the challenges and opportunities of technology-assimilation issues for example. We also note various regulatory problems, data protection, and human resources development needs of high ICT workers. Through scrutinizing these factors, the research emphasizes the role of strategic planning and innovation in leading to effectiveness as well as fairness when using technology to improve positional relationships between companies, transparency, and competitiveness as well as supporting goals for economic diversification (Brunetti et al., 2020; Irani et al., 2023).

Primary in the study's significance is the concentration on Arab Gulf countries, shed light on how countries in the region can deploy digital technology to bolster their economic standing and sustenance practices. On the investigate broad research questions drive the study: 1. What impact does the adoption of artificial intelligence (AI), blockchain, and business intelligence (BI) on procurement practices have in the Arab Gulf countries' efficiency, transparency decision-making ability, or profits? 2. How has it had an impact in terms of these aspects; faculties and prospects Digital technologies bring to procurement systems situated within the different socio-economic backgrounds or legal contexts of Arab Gulf countries? What kinds of challenges and prospects are there for forward-moving businesspeople to make of these? 3. How can policymakers, business leaders, and inventors help each other out and as a result program a better digital turn in procurement that meets the needs of people on all sides? All details coming from the current study Was conducted using semi-structured interviews among procurement editors and experts, combined with an exhaustive examination of related studies. In this way theoretical understanding and practical experience are combined to produce a comprehensive picture of digital progress in procurement (Morshed & Ramadan, 2023). Presented in a format which begins with a literary review laying out an overview of the paper, followed by details on research methods used including selections of why certain participants were chosen and analysis techniques for collecting data. Bringing us along into subsequent parts of text are passages pointing to results related with research questions asked in this paper, which walk us through different themes: Impact, challenges and opportunities in the realm of digital technology integration and/or development inside procurement. This chapter then digs deeper interweaving findings with references from broader literature, to determine what taking these lines of data seriously contributes toward guiding future public policies and practical administration decisions. The conclusion energetically concludes behind the

scenes data collection, in an attempt to help stakeholders navigate the treacherous terrain of digital transition. This five-line paragraph points up key findings from study so far--which could only have been arrived at down here not hardly embroiled in theory or details, but with a chance to gather lots earlier and provide them to stakeholders in their own form for action.

2. Literature Review

As a content rewriter, helping to transform online products or services is your primary job. The aim of this transformation is ultimately to enhance the operational efficiencies and innovations that are crucial for procurement sector development (Robertsone & Lapiņa 2023). In a competitive marketplace the survival of particular industries depends on becoming more adaptive. For this reason, the adaptation of this industry to focus on strategic acquisitions incorporating digital solutions becomes increasingly important if it is to maintain its international relevance and keep growing (Althabatah et al., 2023). The Arab Gulf countries, where traditional reliance on oil is being replaced by diversified and modern tech-driven economies, present us with a unique research subject. What are collectively striving for digitization-always linked to the GCC's strategic initiatives-is but one reflection of their broader desire across this region. It is hope that their digital transformation efforts prove an answer to both economic survival and how to carry out smarter procurement.

In today's rapidly changing global procurement environment, frontier digital technologies being integrated into its operations make this huge leap forward. This transition is particularly evident in the Gulf countries, these emerging economies. Turning away from their old way of life (oil bandits) they are ushering in a future driven by science and technology. With the use of Artificial Intelligence (AI) assisted analytics, blockchain technology, and Business Intelligence (BI) tools in the procurement process, the procurement efficiency and operational strategy of this region are being redefined as never before (Allioui&Mourdi, 2023; Althabatah et al., 2023).

With its self-visioning as the global 's digital first Gulf region accordingly They see it as not just a technical upgrade but a particular need to put underlying technology that is not only can IoT combined with AI bring prosperity where even remote areas of a desert country like Saudi Arabia benefit from connectivity and networks bring some degree of power into every home more importantly it makes the Gulf intelligent from top to bottom. A kind of intelligence that permeates every pore in its social being and lies at the very heart for countries like China who have gone through such transformations before while tacking ever more toward a greater digital future (Giesecke et al.,2021). To maximize efficiency in inventory management and logistics, the introduction of these technologies is critical. That is an area where the Gulf countries are already strong players at a global level (Albreem etal.,2023). Besides, the introduction of blockchain technology in procurement processes has the potential to change the very way transactions are carried out. It offers complete transparency and absolute security (Ramadan etal.,2024).This is a crucial development for Gulf states, given their strategic position in international trade networks and the ambition to attract more foreign investment by providing a business environment that is transparent, efficient, and above all else reliable (Aoun et al.,2021; Kademeteme&Bvuma,2023).In addition, as the application of BI tools to procurement sector can completely flip the tables on data analysis leaving vast amounts of raw information into usable insights (A. Ali et al., 2024). For Gulf countries, this kind of capability is crucial as they move towards greater governance by information and economic planning fixed in data revising procurement strategies, while commanding demand developments increasingly solidly (Hussain et al.,2023; Seyedan et al.,2023). Yet the integration of these advanced technologies into the Gulf's unique legal and organizational environments poses challenges. The rapid pace of technological innovation in the region demands just

as fast reforms. Some Gulf countries are forced to adapt differently than they otherwise would because they can't wait around for standards and laws to catch up. They need this today, not tomorrow (Yang& Zhang,2024). Data privacy, cybersecurity and international digital standards ttemporary Frameworks for the Gulf countries will have to be created in a hurry. In the iterations of a hurry-up operating system such as these learning from others can mean a world of difference This is an issue that the Gulf countries are encountering and to address which represents one of their greatest difficulties. Brunetti et al. (2020), Irani et al. (2023)

The regulatory compliance, high energy consumption as well as scalability issues associated with Blockchain technology continue to pose as barriers to its success. These kinds of issues are particularly significant here in the Gulf where a new emphasis is being put on sustainability and efforts to draw from non-oil and non-gas sources of energy (Gunasekara et al., 2022; Msawil et al., 2022). Another ethical issue surrounding AI in procurement is where bias in algorithms rears its head. Ensuring that AI systems are fair and unbiased is super important in a region that is a hotchpotch of cultures and such a crucial node in global supply chains. In addition, switching to AI-driven processes calls for a workforce that not only has technical expertise, but also the ability to supervise and interpret AI insights. This highlights a significant gap in current education and training systems in the Gulf (Guida et al., 2023; Mishrif et al., 2023; Zaoui et al., 2023). There are challenges to using BI tools effectively as well, depending on how high-quality integrated data sources are available or not. Given the considerable variety of economic activities in the Gulf, moving staff between these sectors for data consolidation represents a major challenge. This is made more difficult by the requirement for specialized expertise in interpreting BI-driven insights, underlining the complexities entailed in fully exploiting these technologies for the procurement sector (Antunes et al., 2022; Siciliani et al., 2023). The current research landscape points to a significant gap: while the individual advantages and disadvantages of introducing IoT, AI, blockchain, and BI into procurement are more and more obvious, there is still a clear deficiency of comparisons illustrating how they can be combined to overcome the unique barriers to digitizing procurement found in Arabian gulf countries.

The gap in the literature can be said to obligate us to advance our understanding of how these technologies can be put together in combination and solve problems like interoperability, compliance with regulations, data protection, and censoring networks. In particular, what will this influence mean for the Gulf region's ambitious digital transformation initiatives? Nevertheless, the literature reviewed concentrates largely on each technology's peculiar advantages and disadvantages without taking into account how they might actually be integrated in distinct organizational and regulatory environments typical of the Gulf regions. By addressing this research gap this paper seeks to measure the impact of digital technology on procurement practices of Arab Gulf countries. It is trying to understand how using IoT, AI, blockchain and BI together will not only improve operating efficiencies and transparency but also support strategic decision-making within the specific socio-economic and regulatory setting of the Gulf region. Technology will only take you so far. In addition, the study hopes to avail itself of theories such as transaction cost economics (TCE) and resource dependence theory (RDT) together with these technologies, to tailor local purchasing strategies that are designed to meet the particular challenges and opportunities of digital conversion faced by all manner organizations in the Gulf. By so doing, this inquiry aspires to provide a more complete understanding of just how digital procurement has the potential to transform efficiency, transparency, and strategic procurement planning systematically in the whole of the Arab Gulf region. This understanding is crucial for placing the Arab Gulf countries in the ascendancy of global Digital here is the stage. It is also important as these findings may be able to offer valuable directions for policymakers, business leaders, and technologists who want to capitalize on the region's strategic advantages in an age of digitization.

3. Methodology

In this study, we chose to utilize a qualitative research methodology meticulously designed to work in the experiences and views of participants, taking Business Intelligence (BI) Systems for example, to explore their impact on customer relationship management at consulting firms in the Arab Gulf. Such an approach overcomes the shortcomings of traditional methodologies (Morshed, 2020) which rely on surveys and questionnaires or quantitative data alone as well as providing guidelines for apprehending closely various phenomena. The research adopts these lines when it comes to interviews: inspired both by qualitative analysis framework but also deep consideration given especially key elements from qualitative approach While influenced by the qualitative analysis constructs suggested by (Morshed, 2020) and further made explicit in (Morshed & Ramadan, 2023), the methodology we have employed combined the rigor of a semi-structured interview with dynamism for exploratory discussions.

3.1. Participants' Selection and Criteria

As for consultation companies in the Arab Gulf area, we spent four months carrying out our selection process over 24 periods from Nov. 2023 through February 2024))

We recruited 54 experts with deep experience in BI projects (labelled EXPER) across different industries and 72 Arab Gulf companies' procurement managers (labelled MANAG). Our goal was to cover as broad a range of perspectives as possible when taking readers into account. The criteria for expert selection were Years of Experience: A minimum of two years of experience with BI project. Types of Projects: A diverse array of projects, such as development, implementation, and optimization of BI system. Industries Served: If possible, representation from a few industries outside the ones listed in order to give some perspective on BI impacts in general.

The distribution of participants by role, country, and industry is detailed in the following table:

Table1: Sample distribution

Role	Country	Number by Country	Industry	Number by Industry
MANAG	UAE	26	Retail	34
	Saudi Arabia	18	Manufacturing	28
	Kuwait	10	Hospitality	14
	Oman	8		
	Bahrain	6		
	Qatar	4		
EXPERT	UAE	22		
	Saudi Arabia	18		
	Kuwait	6		
	Oman	4		
	Bahrain	2		
	Qatar	2		

3.2. Interview Development and Execution

Experts in qualitative research, BI technologies and industry-specific problems. Designed generously by a committee each interview question is comprehensive and relevant for its specific audience. Taking part at online video conferencing to make it possible for wide involvement from people across the nation, each interview lasted 45-60 min and all were carried out within the four months appointed so as not only to achieve efficiency but also thorough data collection.

3.3. Thematic Analysis

Using NVivo for theme analysis, all interviews were first transcribed. The coding process involved identifying recurring words, phrases, and concepts connected with management accounting in BI systems in the Arab Gulf. Next, these codes formed the basis for themes identified that emerged from an ongoing process in comparison with repeated checks on inter-coder reliability. By sticking to this well-worn method, we hope to demonstrate the soundness and worth of our study driven by (Morshed, 2024) guidelines.

3.4. Ethical Considerations

The researchers over at the company are proud to study subjects that are up-to-standard as they follow ethical, top standard operations of research. Among the standards applied, for example, were measures to preserve the privacy of participants and serve informed consent forms. Furthermore, subjects have every right at any point during their time in a study with no consequences.

4. Finding

Discoveries The hermeneutic analysis method provides a pathway to delve into texts to unveil hidden linkages and deeper meanings. Our findings, derived from a meticulous review of relevant documents and dialogues, specifically consider the context of Arab Gulf countries.

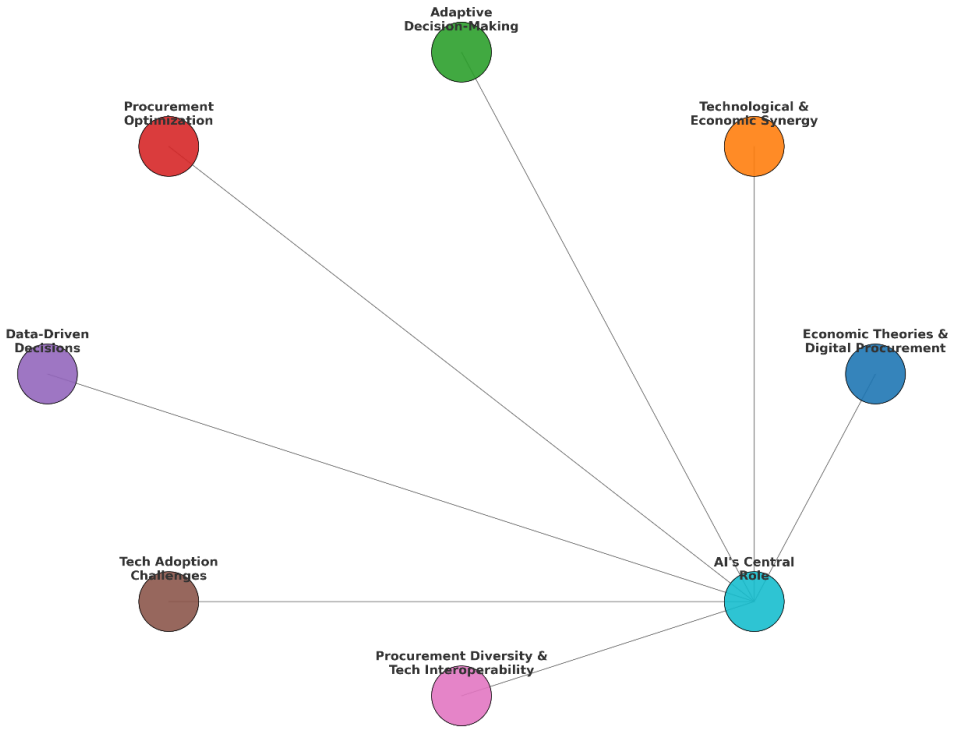

Figure 1: AI's Transformative Impact on Economic Strategies and Digital Procurement in the Arab Gulf

It is possible to see from the diagram how AI is connected with economic theories and digital procurement in the Arab Gulf, including technical synergy, optimal decision-making, and tech adoption challenges. The diagram suggests that AI is essential in assisting the regional market in developing procurement strategies, making them more efficient, and based on accurate data. Economic Theory and Digital Integration Frameworks in the Gulf Region. To interact with their regional markets properly, businesses have to apply economic theory to their procurement initiatives. "Using platforms such as planergy is not only useful but requires as they furnish an economic framework to procurement structures, and these are necessary when needing to understand the various market roles present in MANAG Gulf today," states. These findings were also confirmed by the study of Allioui & Mourdi 2023, who assert that using these tools is vital for the effective application of these frameworks. This argument is also reinforced by the EXPR report. This platform also supports the discussion on economic theory as part of standard procurement practices. The platform has two components, economic theory and rankings, economics, and rankings. Building on the above supplied explanation, it can be concluded that economic theory is essential: it enables professionals to organize the up-to-date material context, and the rankings and economics maintain the focus of attention. This is why this study on the Arab Gulf is supported by Helo & Hao 2022. It was planergy that included the AI-operations necessary to incorporate these sophisticated economic theories into the platforms, which rendered effective, applied integration obtainable. MANAG claims that "the assistant AI drives settings presented by Planergy are vital for modernizing economic strategies and applying them throughout the specific dynamics of the Gulf market," In addition, EXPR emphasizes the vital role of tools designed to make possible employment of principles in economics an insight that leads to more prompt and better decisions than any manual intervention, as shown by studies from (Bhat et al., 2021; Kademeteme & Bvuma, 2023).

Adaptive Decision-Making for Gulf Markets: Enhancing Strategic Operations

Platforms similar to Planergy are altering the way in which economists are integrated into digital procurement workflow, thus facilitating a lot of revenue strategies throughout the Gulf Region. MANAG went on to note, "The introduction of such technologies permits advanced sourcing and risk management strategies that speak directly to regional duties and problems. This view is backed up by Nuwagaba et al. (2021), who also stress the great potential of such disruptions. The same is true for EXPR, which stresses the importance of integrating Chengdu AI analytics with economics models for refining procurement strategies in Gulf, a method endorsed by recent research from Madan & Ashok, 2023.

Optimizing Procurement through Economic Theories: A Strategic Imperative

Application of digital economic models is revolutionizing procurement strategy, particularly in the Gulfs. Such integrations can greatly improve decision-making and operational efficiency. MANAG notes that the seamless integration of economics with digital procurement platforms leverages not just operational processes but strategic agility too. This is substantiated by the research results of (Friedman & Ormiston, 2022; Singh & Adhikari, 2023). In addition, EXPR points out that inserting these theories into digital tools for a fuller Gulf market analysis is absolutely necessary. The (Gunasekara et al., 2022; Msawil et al., 2022) contribute their support.

Data-Driven Decisions in Gulf Procurement: The Edge of AI Integration

By using digital economic-based procurement tools like Planergy, organizations in the Gulf can form strategies that are very data-oriented. MANAG points out that "A data-driven decision-making model is essential for the present Gulf market, and technologies like Planergy are leading the way." This view is given extra weight by the work of Hussain et al. (2023) and that of Jafari et al. (2023), both of whom have underlined the advantages demonstrated by such methodologies. Over in EXPR, choices are made about procurement as they are empowered by economics, examples of which have been further underlined with references to (Antunes et al., 2022; Bharadiya, 2023).

In summary, the crucial link between economics theory and digital purchasing strategies, particularly by platforms like Planergy, is indispensable for companies operating in the Gulf region. This layered approach not only ensures that economic principles are easily integrated with business strategies but also takes advantage of the flexibility and insights gained A blade through AI technology. Moreover, it underlines again the urgent need for Gulf businesses to fit into a world of technology enabled economies, thus refining both hard and soft procurement opportunities inside the region. By so doing, overall management can be enhanced and we are able to increase our competitiveness as well.

4.1. Overcoming Technological Adoption Challenges in the Gulf's Procurement Sector.

AI Adoption Barriers and Strategies

One challenge in the Gulf region is that it is difficult to adopt AI in procurement. The regulatory issues in Japan have mostly been taken care of

However, the management at MANAG has designed so far with the massive hurdle being to "Do all that is in line with the regulatory standards set by the Gulf." Comprehensive knowledge of a very limited regulatory environment and strong governance structures aimed at achieving integration with AI will be critical (Akter 2001; Truby 2014). This reflects not only on the difficulty of the legal and regulatory environment but also that planning is necessary for strategic adaptation to ensure compliance with customs and successful adoption of artificial intelligence.

Blockchain Integration Challenges

Specifically, the integration of blockchain technology into various procurement processes in the region faces a number of obstacles, including those related to cybersecurity and compliance. For instance, experts from MANAG report that “Procurement data are highly sensitive. Thus, cybersecurity-related measures are important”, which reveals the critical concern with the implementation of blockchain technology that guarantees all data to existing procurement practices. Therefore, it is necessary to create a robust cybersecurity regime and compliance measures that would take into account the vulnerabilities of blockchain technology and protect procurement data from potential cyberthreats.

BI Tool Adoption Challenges

Resistance from the traditional business environment that is a feature too well known in procurement can prevent BI tools from taking root in the Gulf. Based on concerns about the complicated nature of advanced technologies such as AI or blockchain, this resistance has become a major challenge. MANAG's discussion exposes such issues, stating: "It is important to address concerns like those encountered in AI and block chain complexity." This view is supported by academic literature that describes how effective strategies for change-management should be implemented when confronted by skepticism or inertia from organizations (Antunes et al., 2022; Bharadiya, 2023). This argues for educational campaigns and transparent communication on the technologies to de-mystification them and move them into the mainstream of organizational cultures. Adopting advanced technologies as complex as AI, block chains, and BI tools within Gulf region procurement poses a wide spectrum of new challenges for companies. These could be the heavy hand of regulatory compliance, ensuring cyber security or resistance from organizations in their adoption of these newfangled methods. To really address these issues, we must adopt strategic initiatives and install sturdy governance mechanisms. Such measures are key not only in tearing down the technological barriers opposing us today but also in liberating the potential of these technologies to drive forward procurement innovation. Approaches which have been tailored to account for both the huge variety of business landscapes and cultural nuances in Gulf region are simply necessary when turning technology into a winning card to play in procurement excellence aim after bidding the region's economic development further.

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4.2. Enhancing Procurement Diversity and Overcoming Interoperability Issues with Emerging Technologies.

AI in Expenditure Management and International Sourcing

The introduction of artificial intelligence in expenditure management and international sourcing marks a significant move away from homogeneity in procurement diversity to this method of overcoming interoperability. Dynamics In this region with such fluid market conditions as the Gulf, artificial intelligence has applicable significance. AI may be the source of valuable insights As an MANAG expert put it, "Gulf artificial intelligence advanced spend classification algorithms are a strong tool for strategic expense control". This perception sits closely with recent academic analysis of the AUD's leading role in data-based decision-making and procurement processes (Allioui & Mourdi 2023; Helo & Hao 2022).In addition, according to EXPERT's standpoint on these industry issues: "Any tool which offers a combination of rich data velocity and behavioral awareness, can be seen as extremely valuable indeed. "This also accords with the findings of recent studies that: Artificial intelligence is beneficial in advancing supply chain flexibility and market response (Kazancoglu et al., 2023) Scott W. Lee, 2023).

AI in Regulatory Compliance and Risk Management

AI integration in regulatory compliance and risk management is a paradigmatic change from the normal, and it enhances the degree of protection in the Gulf's regulatory landscape. According to MANAG, "Incorporate AI into compliance tasks, in other words, represents a transform from the humble origins of the degree of protection provided in the Gulf's regulatory landscape". This statement is consistent with other AI research confirming its ability to expand its enforcement operations and ensure more precise regulatory compliance, and first coverage. On the other hand, the feasibility research done by EXPER suggests that adopting AI practices, particularly big data approaches, can provide favorable strategic settings for the Gulf in managing supplier risk. In line with this avenue of AI functionality, relevant research suggests AI's proactive role in reducing and managing hazards before they become severe issues.

AI in Contract Management and Anomaly Identification

Subsequently, the transformative effect of AI in contract management, and particularly AI-integrated tools, is profound within the Gulf region. According to MANAG, AI technologies are revolutionary to the contract management process, improving the technology to make it more efficient and less prone to human error. "The Gulf region sees a transformative impact in contract management through AI-integrated tools," he said, which is agreed upon considering Althabatah and his research of 2023 on AI in automating and optimizing the contract lifecycle. In addition, EXPER noted the AI's drastic role in identifying anomalies, and differences, ensuring accuracy and integrity, and further improving procurement strategies.

Automation in Accounts Payable

The role of AI and machine learning in automating accounts payable processes has garnered AI and machine learning has been embraced as the indispensable means of automating accounts payable processes, especially in light of their alignment with the Gulf region's overall goals on operational efficiency and regulatory compliance. "AI and machine learning's role in accounts payable automation aligns with the Gulf's focus on operational efficiency and regulatory adherence," MANAG noted. Yet the literature shows that AI enhances operational efficiency and aids in regulatory compliance (Hussain et al., 2013). EXPER agreed, remarking on not only how AI can serve to improve efficiency in accounts payable for Gulf enterprises but also the importance of sustaining their health and remaining compliant

with financial. The technology's entrance into not only contract management but also detecting anomalies and fraud highlights its strategic importance further still. In the age of AI and machine learning automation in accounts payable, it is an ongoing trend that reflects an ever-increasing move toward both higher operational efficiency and tighter regulatory adherence. Together these advances illustrate AI 's crucial place in modernizing and optimizing commercial practices already in the Gulf region, from spend management and risk assessment to operational efficiency and strategic decisions.

5. Discussion

The switch to digital technology in procurement in the Arab Gulf represents a complete change from old ways of doing things where knowledge is derived from naturally occurring data to current, data-driven methods. This is also seen as part and parcel of the region 's broader economic strategy to wean itself off oil by developing an industrial society (Allioui & Mourdi, 2023; Althabatah et al., 2023). AI, blockchain, and BI have played critical roles in shaping procurement best practices. The use of Digital The capacity for these tools and systems to enhance both efficiency at the operational level and bandwidth at senior management level has also been shown (Jaadat et al.2023). AI and IoT are identified as essential elements needed to enhance inventory management and logistics--areas in which the Gulf states can make major global contributions (Albreem et al., 2023). The Blockchain employs transparency and security as a means of luring foreign investment to the Gulf (Aoun et al., 2021; Kademeteme & Bvuma, 2023). This concept also jells with goals set by the Gulf states themselves, to show an open, transparent business environment capable of winning the adulation and support of private investors--goals which are particularly important in today's uncertain global digital economy (Cwiakala et al., 2023).The author also highlights the transforming capabilities of Business Intelligence tools to turn huge amounts of raw data into actionable information, which can be invaluable to a society now moving into more data-driven governance (Hussain et al., 2023; Seyedan et al., 2023).Yet the integration of these advanced technologies into the distinctive organizational and regulatory contexts of the Gulf is a considerable challenge. This entails creating a flexible regulatory structure that will secure privacy of data as well as its status and modeling (Brunetti et al., 2020; Irani et al., 2023). The introduction of AI into procurement work also raises questions about ethics. This not only points out the need for a technically sophisticated workforce capable of interpreting AI-derived insights, but also underlines a basic governance rule concerning how we responsibly exercise that newfound power (Guida et al., 2023; Mishrif et al., 2023).

Implications

Strategic digital integration: comprehensive plans are needed to bring the technologies of digital commerce smoothly into the ecotourism sector, while taking into account both unique organizational frameworks and regulatory systems found across the Gulf region. This means applying specific theoretical frameworks to produce strategies which better suit the challenges and opportunities presented by digital transformation itself.

Regulatory Frameworks: Time and again it is pointed out that we must put in place more adaptable regulatory frameworks, able to keep up with progress in technology. Ensuring data privacy, cybersecurity and compliance with international norms will help the smooth adoption of digital technologies.

Workforce Development: There is presently a great lacuna in education and training that must be filled. A workforce proficient technically and capable of negotiating complex data insights and the ethical qualifications of AI is the essential background for success in an environment where procurement goes digital.

Cross-Sectoral Cooperation: Integrated cooperation between government officials, business leaders and innovation technocrats is a key part of dealing with the complexities of digital procurement. This kind of cooperation could help the Gulf region, in a meritocracy, to do as much as possible, and as effectively as possible.This collaboration can help to maximize the Gulf region's strategic position.

Procurement Practice Innovation: Digital technologies can offer ways to improve traditional procurement practices; they will make it more efficient, more transparent and yield strategic decisions.

6. Conclusion

To sum up, the present study introduced clear understanding of the digitization process in the Arab Gulf countries' procurement and aimed at investigating the implementation of AI, blockchain and BI. Findings showed that in general, these technologies have a very positive impact on the means of boosting the procurement's efficiency, transparency and strategic decision making. Concurrently, there can be seen numerous challenges including the considerations related to the regulation, the vulnerability of data and lack of workers' skills.

As a result, the study aims to address this knowledge gap by offering its contribution to both theory and practice. First of all, the study findings indicate the necessity for flexible and adaptive regulatory regimes that would respond to the pace of digital changes without overlooking the need for data protection and users' privacy. Second, for business practitioners, the outcomes can be viewed as a guide to a more strategic approach to technology utilization, multidisciplinary work, and new skills acuity in procurement processes. Finally, there is an opportunity for further research developments, exploring the role of cultural factors in technology acceptance, the creation of performance indicators for the newly developing digital procurement sector, and the implementation of comparative studies across industries and countries. However, there are still several limitations to the current study provided herein, which include the use of a non-random sampling style, the risk of having biased participants, and the limited utilization area. Therefore, future research could correct these limitations, use more robust sampling strategies, employ several data sources, and conduct longitudinal or cross-cultural comparative studies. In addition, they could further decompose the total effect of implemented technologies and look into their combined potential for addressing the sector's challenges. Besides, empirical examinations of the use of AI, blockchain, and BI tools in the GCC procurement could provide valuable information on the successful launch strategies, potential hurdles, and technology acceptance specifics. Therefore, the currently developed study in question may benefit different audiences, including businesses and policymakers motivated to create robust strategies for improving procurement and promoting digitization. Thus, this topic is useful and relevant considering the importance of digitization effects for the GCC procurement.

References

Akter, S., Michael, K., Uddin, M. R., McCarthy, G., & Rahman, M. (2022). Transforming business using digital innovations: The application of AI, blockchain, cloud and data analytics. *Annals of Operations Research*, 1–33.

Albreem, M. A., Sheikh, A. M., Bashir, M. J., & El-Saleh, A. A. (2023). Towards green Internet of Things (IoT) for a sustainable future in Gulf Cooperation Council countries: Current practices, challenges and future prospective. *Wireless Networks*, *29*(2), 539–567.

Ali, A. A. A., Udin, Z. M., & Abualrejal, H. M. E. (2023). The Impact of Humanitarian Supply Chain on Non-Government Organizations Performance Moderated by Organisation Culture. *International Journal of Sustainable Development & Planning*, *18*(3).

Ali, A., Sharabati, A., Alqurashi, D., Shkeer, A., & Allahha, M. (2024). The impact of artificial intelligence and supply chain collaboration on supply chain resilience: Mediating the effects of information sharing. *Uncertain Supply Chain Management*, *12*(3), 1801–1812.

Allioui, H., & Mourdi, Y. (2023). Exploring the Full Potentials of IoT for Better Financial Growth and Stability: A Comprehensive Survey. *Sensors*, *23*(19), 8015.

Althabatah, A., Yaqot, M., Menezes, B., & Kerbache, L. (2023). Transformative Procurement Trends: Integrating Industry 4.0 Technologies for Enhanced Procurement Processes. *Logistics*, *7*(3), 63.

Antunes, A. L., Cardoso, E., & Barateiro, J. (2022). Incorporation of ontologies in data warehouse/business intelligence systems-a systematic literature review. *International Journal of Information Management Data Insights*, *2*(2), 100131.

Aoun, A., Ilinca, A., Ghandour, M., & Ibrahim, H. (2021). A review of Industry 4.0 characteristics and challenges, with potential improvements using blockchain technology. *Computers & Industrial Engineering*, *162*, 107746.

Atieh Ali, A. A., Sharabati, A.-A. A., Allahham, M., & Nasereddin, A. Y. (2024). The Relationship between Supply Chain Resilience and Digital Supply Chain and the Impact on Sustainability: Supply Chain Dynamism as a Moderator. *Sustainability*, *16*(7), 3082.

Bharadiya, J. P. (2023). A Comparative Study of Business Intelligence and Artificial Intelligence with Big Data Analytics. *American Journal of Artificial Intelligence*, *7*(1), 24.

Bhat, S. A., Huang, N.-F., Sofi, I. B., & Sultan, M. (2021). Agriculture-food supply chain management based on blockchain and IoT: a narrative on enterprise blockchain interoperability. *Agriculture*, *12*(1), 40.

Brunetti, F., Matt, D. T., Bonfanti, A., De Longhi, A., Pedrini, G., & Orzes, G. (2020). Digital transformation challenges: Strategies emerging from a multi-stakeholder approach. *The TQM Journal*, *32*(4), 697–724.

Friedman, N., & Ormiston, J. (2022). Blockchain as a sustainability-oriented innovation?: Opportunities for and resistance to Blockchain technology as a driver of sustainability in global food supply chains. *Technological Forecasting and Social Change*, *175*, 121403.

Ganesh, A. D., & Kalpana, P. (2022). Future of artificial intelligence and its influence on supply chain risk management–A systematic review. *Computers & Industrial Engineering*, *169*, 108206.

Guida, M., Caniato, F., Moretto, A., & Ronchi, S. (2023). The role of artificial intelligence in the procurement process: State of the art and research agenda. *Journal of Purchasing and Supply Management*, 100823.

Gunasekara, H. G., Sridarran, P., & Rajaratnam, D. (2022). Effective use of blockchain technology for facilities management procurement process. *Journal of Facilities Management*, *20*(3), 452–468.

Helo, P., & Hao, Y. (2022). Artificial intelligence in operations management and supply chain management: An exploratory case study. *Production Planning & Control*, *33*(16), 1573–1590.

Hussain, Z., Jabbar, A., & Kong, K. (2023). Power, dominance and control: Implementing a new business intelligence system. *Digital Transformation and Society*, *2*(2), 129–148.

Irani, Z., Abril, R. M., Weerakkody, V., Omar, A., & Sivarajah, U. (2023). The impact of legacy systems on digital transformation in European public administration: Lesson learned from a multi case analysis. *Government Information Quarterly*, *40*(1), 101784.

Jafari, T., Zarei, A., Azar, A., & Moghaddam, A. (2023). The impact of business intelligence on supply chain performance with emphasis on integration and agility–a mixed research approach. *International Journal of Productivity and Performance Management*, *72*(5), 1445–1478.

Javaid, M., Haleem, A., Singh, R. P., Khan, S., & Suman, R. (2022). Sustainability 4.0 and its applications in the field of manufacturing. *Internet of Things and Cyber-Physical Systems*, *2*, 82–90.

Jreissat, E.R., Khrais, L.T., Salhab, H., Ali, H., Morshed, A., Dahbour, S. (2024). An In-Depth Analysis of Consumer Preferences, Behavior Shifts, and Barriers Impacting IoT Adoption: Insights from Jordan's Telecom Industry. *Applied Mathematics and Information Sciences, 18*(2), 271–281.

Kademeteme, E., & Bvuma, S. (2023). Using Blockchain Technology to Improve the Integrity and Transparency of Procurement Processes between SMMEs and Government: A Systematic Literature Review. *The Journal of The British Blockchain Association*, *2*(1).

Kazancoglu, I., Ozbiltekin-Pala, M., Mangla, S. K., Kumar, A., & Kazancoglu, Y. (2023). Using emerging technologies to improve the sustainability and resilience of supply chains in a fuzzy environment in the context of COVID-19. *Annals of Operations Research*, *322*(1), 217–240.

Lee, J. K. (2023). The roles of individual differences in time perspective, promotion focus, and innovativeness: Testing technology acceptance model. *Current Psychology*, *42*(33), 29448–29460.

Madan, R., & Ashok, M. (2023). AI adoption and diffusion in public administration: A systematic literature review and future research agenda. *Government Information Quarterly*, *40*(1), 101774.

Mishrif, A., Karolak, M., & Mirza, C. (2023). Bridging the Gap Between Gulf Higher Education and Labor Market in Industry 4.0. In *Nationalization of Gulf Labour Markets: Higher Education and Skills Development in Industry 4.0* (pp. 319–332). Springer.

Moro-Visconti, R., Cruz Rambaud, S., & López Pascual, J. (2023). Artificial intelligence-driven scalability and its impact on the sustainability and valuation of traditional firms. *Humanities and Social Sciences Communications*, *10*(1), 1–14.

Morshed, A. (2020). Role of working capital management in profitability considering the connection between accounting and finance. *Asian Journal of Accounting Research*, *5*(2), 257-267.

Morshed, A. (2024). Comparative analysis of accounting standards in the Islamic banking industry: A focus on financial leasing. *Journal of Islamic Accounting and Business Research*.

Morshed, A., & Ramadan, A. (2023). Qualitative Analysis of IAS 2 Capability for Handling the Financial Information Generated by Cost Techniques. *International Journal of Financial Studies*, *11*(2), 67.

Msawil, M., Greenwood, D., & Kassem, M. (2022). A Systematic evaluation of blockchain-enabled contract administration in construction projects. *Automation in Construction*, *143*, 104553.

Noura, M., Atiquzzaman, M., & Gaedke, M. (2019). Interoperability in internet of things: Taxonomies and open challenges. *Mobile Networks and Applications*, *24*, 796–809.

Nuwagaba, I., Molokwane, T., Nduhura, A., & Tshombe, L. M. (2021). Procurement Planning and Procurement Performance for Operations and Projects in Public Sector Entities-A Case of Uganda Management Institute. *International Journal of Supply Chain Management*, *10*(6), 11–22.

Pontes, D., Santos, V., Samões, O., Wang, S., & Figueiredo, R. (2024). Towards Internationalization: Exploring Economic Diplomacy in the Middle East (GCC). *Economies*, *12*(4), 82.

Ramadan, A., Alkhodary, D., Alnawaiseh, M., Jebreen, K., Morshed, A., & Ahmad, A. B. (2024). Managerial Competence and Inventory Management in SME Financial Performance: A Hungarian Perspective. *Journal of Statistics Applications & Probability,13*(3), 859-870.

Robertsone, G., & Lapiņa, I. (2023). Digital transformation as a catalyst for sustainability and open innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, *9*(1), 100017.

Seyedan, M., Mafakheri, F., & Wang, C. (2023). Order-up-to-level inventory optimization model using time-series demand forecasting with ensemble deep learning. *Supply Chain Analytics*, *3*, 100024.

Siciliani, L., Taccardi, V., Basile, P., Di Ciano, M., & Lops, P. (2023). AI-based decision support system for public procurement. *Information Systems*, *119*, 102284.

Singh, N., & Adhikari, D. (2023). AI and IoT: A Future Perspective on Inventory Management. *International Journal for Research in Applied Science and Engineering Technology*, *11*(11), 2753–2757.

Truby, J., Brown, R., & Dahdal, A. (2020). Banking on AI: mandating a proactive approach to AI regulation in the financial sector. *Law and Financial Markets Review*, *14*(2), 110–120.

Zaoui, S., Foguem, C., Tchuente, D., Fosso-Wamba, S., & Kamsu-Foguem, B. (2023). The viability of supply chains with interpretable learning systems: The case of COVID-19 vaccine deliveries. *Global Journal of Flexible Systems Management*, *24*(4), 633–657.