

Study on the impact of strategic management through sustainable operations for Industry 4.0 from the perspective of SMEs in the UAE



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ABSTRACT

This research investigates the burgeoning field of sustainable manufacturing practices (SMPs) within the context of small and medium-sized enterprises (SMEs) in the United Arab Emirates (UAE) manufacturing sector. The study is grounded in the observation of SMEs' growing commitment to enhancing their sustainability performance through the adoption of sustainable practices. It adds valuable insights to the current academic discourse on SMPs and the sustainable performance of SMEs, shedding light on the mediation of competitive capacity and the moderating influence of environmental legislation. Utilizing structured questionnaires, data was systematically collected from SMEs operating in the UAE's manufacturing sector. The ensuing analysis, conducted via regression models, illuminates a significant relationship between the implementation of SMPs and the enhancement of SMEs' competitive capacities, ultimately fostering long-term sustainable performance. Notably, this association is further strengthened by the mediating role of improved competitive capacities. Furthermore, the study reveals a synergistic effect whereby the combination of SMPs and adherence to environmental legislation augments the long-term viability and sustainability of SMEs. In conclusion, this paper synthesizes its findings, providing valuable insights for practitioners and policymakers seeking to promote sustainability within the SME sector.

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1. Introduction

An escalating trend observes an increasing reliance upon manufacturers not only to ensure economic prosperity but also to champion environmental preservation and amelioration of societal affliction (Ashford and Hall, 2018). The relentless pursuit of economic expansion has engendered a host of ecological predicaments, such as climate alteration and contamination, necessitating concerted endeavors from various stakeholders, encompassing governmental bodies and commercial enterprises (Hashmi and Alam, 2019). It is posited within the paradigm of sustainability that businesses can proffer affirmative contributions to both society and the environment while simultaneously securing profits (Gupta et al., 2013). Elucidated by Aboelmaged (2018),

sustainability research manifests itself predominantly in two categories: green manufacturing and sustainable manufacturing. This inquiry focalizes on the latter and underscores its pivotal role in propagating the adoption of sustainability, particularly among small and medium-sized manufacturing enterprises (SMEs).

"Sustainable manufacturing" is defined as the creation of manufactured goods through processes that minimize adverse environmental ramifications, conserve energy and natural resources, ensure safety for laborers, communities, and consumers, and remain economically viable. This definition is inspired by the work of Garetti et al. (2012), who expounded sustainable manufacturing as the capacity of a firm to perpetuate judicious utilization of natural resources, serving the trinity of economic, social, and environmental dimensions, ultimately culminating in an enhancement of the quality of life and the preservation of the environment. This research delves into the mechanisms by which enterprises can sustain such resourcefulness while concurrently curtailing their negative impacts.

Notwithstanding their importance and persistent endeavors, the implementation of sustainable

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operations management practices (SOMPs) has been constrained by a paucity of scholarly scrutiny and uncertainty regarding their ability to confer a substantial competitive advantage. Several deductions have arisen from analyses probing the potential causal nexus between SOMPs and a firm's competitive edge. While a majority of research has yielded a positive correlation, [Wagner \(2005\)](#) discerned only a marginal positive correlation, and [Watson et al. \(2004\)](#) uncovered no correlation whatsoever. Consequently, research endeavors aimed at identifying and elucidating these disparities became imperative. Investigations into SOMPs and their ramifications on a firm's competitiveness have disclosed auspicious avenues for future inquiry and gaps in our current comprehension. SOMPs encompass the totality of both internal and external facets influencing a firm to optimize outcomes.

To effectuate improvements across various dimensions of organizational performance, successful implementation of SOMPs necessitates investments of time, financial resources, and expertise. Furthermore, the impact of corporate attributes and organizational context on the profoundness of implementation of SOMPs in relation to the nexus with a competitive advantage merits investigation.

To address these lacunae, this study poses the following inquiry: "How do SOMPs influence a firm's competitive advantage?" Specifically, it scrutinizes the role of corporate attributes and probes the operation of organizational performance as a moderator or mediator. The primary aim is to ascertain how SOMPs influence the competitive efficacy of manufacturing enterprises in the United Arab Emirates. The research seeks to respond to the ensuing research queries:

- Does the nexus between sustainable operations management strategies and competitive advantage within a firm intensify or diminish contingent upon specific internal factors?
- How does organizational performance intercede in the association between efficacious operations management and ecological responsibility?
- What competitive advantages are conferred by a firm's operations management practices that are congruent with environmental, economic, and societal sustainability?

The principal objective of this study is to elucidate how SOMPs impinge upon the competitive prowess of manufacturing entities in the UAE. The investigation seeks to ascertain if there exists a correlation between environmentally conscientious business practices and a competitive edge.

- To decipher how particular factors within a firm may either fortify or attenuate the nexus between sustainable operations management techniques and a competitive advantage.
- To determine how organizational performance functions as a moderating factor in the connection

between environmentally responsible operations management and business success.

- To assess how a firm's performance across the dimensions of environment, economy, and society, coupled with its adoption of sustainable operations management techniques, endows it with a competitive edge.

The findings of this study hold potential significance for manufacturing enterprises seeking to augment their operational performance and gain a competitive edge. They serve as a valuable tool for businesses striving to enhance their overall performance vis-à-vis their competitors.

This research contributes to the existing body of knowledge by expanding the purview of sustainable operations management within the industrial sector. Moreover, it furnishes theoretical underpinnings and conceptual and methodological references that scholars can leverage for further exploration of the relatively under-explored domain of sustainable operations management research.

2. Theoretical framework

2.1. Industry from a global perspective

From a macroeconomic perspective, horizontal integration manifests as a complex network of units dedicated to value generation. These value-creation modules encompass diverse components, including machinery, human resources, processes, organizational structures, and final products, which collectively synergize to yield value ([Luo et al., 2018](#)). Manufacturing facilities constitute the highest echelon of aggregation within this framework, intricately interlinked with one another and with value-creation modules involved in the lifecycles of various other products. This interconnectedness gives rise to an intelligent web of value-generation modules that span across multiple product lifecycle value chains. This astute network incubates the emergence of innovative and avant-garde business models, precipitating a transformative shift in the operational paradigms of businesses.

The specifications governing production processes and manufacturing equipment are stored within the smart product. Smart logistics harness Cyber-Physical Systems (CPS) to facilitate the movement of materials, both within and between production facilities, as well as in transit to and from end consumers. These processes are characterized by decentralized management tailored to the unique attributes of individual products. In addition, a smart grid is employed, featuring short-term energy storage mechanisms that act as buffers, enabling dynamic synchronization of renewable energy supply with the energy demand of consumers, including smart factories and residential complexes. This setup facilitates the seamless sharing of the same smart grid infrastructure by energy users and providers.

2.2. Conceptual framework

These are elements of the firm's internal environment, such as its demographics and management styles that are vital to its ability to gain a competitive advantage (Zou and Stan, 1998). Internal variables such as business size, age, and management qualities were employed to explain claims the business is better equipped to investigate high-stakes environmental initiatives due to its financial resources. The capability of a firm to acquire resources and implement SOMPs, which in turn leads to competitive advantage, is influenced by the size of the firm. This is due to the fact that SOMPs require a firm's commitment over a prolonged period of time, as well as substantial expenditure (Hart, 1995). When a business has good managers in place, it is better able to find and use SOMPs that increase productivity and quality in production and service delivery. This gives the business a competitive advantage in the long run.

Sustainability indicators are quickly replacing traditional financial ratios and measures of success in the business world (TBL approach). The environmental, economic, and social performance of an organization may all be enhanced via the use of SOMPs. Effective and cleaner sustainable energy sources, waste minimization, and the use of non-hazardous chemicals are crucial to improving environmental performance. Environmental impact reduction (including the limitation of air emissions, solid wastes, and wastewater), environmental condition improvement inside an organization, and hazardous resource reduction are the two broad areas under which this concept falls. Saving money on energy, materials, disposal, and treatment fees all contribute to better financial results, which brings us to the second category: environmental cost savings. Simultaneously eliminating poor economic performance such as rising operating expenses, investment costs, the price of buying environmentally aware products, and the price of educating employees. In terms of long-term operational effectiveness, productivity, efficiency, and return on investment, the firm's long-term competence and financial sustainability are shown by its economic performance (Rezaee, 2017).

The success of an organization in preserving and improving people's standards of living is a measure of its social performance. It ensures that businesses are profitable without negatively impacting society. Awareness of the needs of the community will be rewarded with a more content workforce, more productive research, and a boosted public profile (Rezaee, 2017). A company has a competitive edge if it is in a position to provide its customers with more value than its competitors. The term "competitive advantage" is used to describe a situation in which one company has an edge over its competitors because it has developed a method of creating value that its competitors do not use (Barney, 1986). The term "competitive advantage" refers to a company's ability to provide better service to its customers than

its rivals, leading to higher profits and happier clients. It's being able to sell something with unique traits that people are willing to pay more for. More and more factories are realising that cutting costs without sacrificing quality is the key to boosting their competitive edge. It has two parts: inexpensive and distinct (Porter, 1985).

Organizations that are able to achieve cost leadership typically have the following competencies: the ability to develop commodities for efficient production; a high level of experience in engineering the manufacturing process; a large-scale and efficient supply chain; an aggressive pursuit of cost reductions; a reduction in operations time; tight cost control and efficiency; a high level of capacity utilization; and a technical advantage in the relevant areas (Wang et al., 2011).

This study delves into the impact of SOMPs on a company's competitive advantage. Within this research paper, the dependent variable under scrutiny is the organization's performance. Conversely, the independent variable of interest in this study pertains to Sustainable Management Practices. The primary objective of this paper is to investigate the role played by organizational performance in either moderating or mediating the relationship between SOMPs and competitive advantage. Additionally, this research seeks to ascertain the influence exerted by corporate characteristics on this aforementioned relationship.

2.3. The hypothesis of the study

H1: Sustainability management practices (SMPs) have a beneficial effect on the long-term success of small and medium-sized enterprises (SMEs) in the UAE.

H2: Eco-friendly methods of running businesses weaken the competitive edge of entry.

H2a: Sustainable operations management techniques have a significant effect on the SMEs' competitive edge.

H2b: Organisational performance moderates the connection between environmentally responsible operations management and business success.

H3: Environment-related limitations in the UAE reduce the link between SMPs and long-term performance.

3. Research methodology

To collect data for this study, the researchers employed a quantitative research strategy and administered structured questionnaires categorized in advance. The metric scales utilized in the study were derived from the existing scholarly literature available at the time. The research methodology employed in this study is characterized by an inductive research approach, which is also known as inductive reasoning. In the context of this approach, the research process commences with observations, and theories are formulated as a result of these observations during the later stages of the research.

Inductive research, in essence, involves the identification of patterns through careful observation, followed by the development of explanatory theories or hypotheses to account for these observed patterns. In the early stages of inductive studies, no predefined theories or hypotheses are assumed, affording the researcher the flexibility to adjust the research direction as the investigation progresses. Furthermore, the study utilized regression and correlation analysis to examine the relationships between dependent and independent variables.

4. Analysis

Before any analytical procedures were initiated, rigorous data validation procedures were meticulously employed to ensure data consistency and accuracy. Subsequently, the data underwent a coding process. Descriptive statistical analyses were then conducted, encompassing the calculation of percentages, frequencies, and mean scores.

Table 1 presents the outcomes of the Analysis of Variance (ANOVA) test, which was employed to determine the statistical significance of the survey or experiment results. In essence, this statistical test aids in the determination of whether it is appropriate to reject the null hypothesis or embrace the alternative hypothesis. The computed significance level in this context is remarkably low at

0.000, while the calculated F-statistic bears a value of 7.847. Furthermore, it is noteworthy that the mean square for regression stands at 3.184, whereas the mean square for residual error is 0.406. Consequently, the evidence suggests that our hypothesis has been substantiated, thereby leading to the rejection of the null hypothesis. In Table 1, we offer customized products/services to meet customer needs, we can alter the amount of products/services quickly, we provide lower prices for products/services, we introduce new products/services quickly, and we maintain lower cost of materials. Table 2 presents the coefficient results. Notably, the constant coefficient exhibits a significance level of 0.035, accompanied by a t-value of 2.147. Additionally, the significance levels for the variables "we provide lower prices for products/services" and "we maintain lower costs of materials" are observed to be 0.135 and 0.090, respectively, with corresponding t-values. Moreover, the variable related to "altering the amount of products/services quickly" yields a significance level of 0.606, while the introduction of "new products" registers a significance level of 0.695. Particularly striking is the variable pertaining to "customized product services," which exhibits a significance level of 0.000. In light of these statistical results, our hypothesis has been corroborated, thereby warranting the rejection of the null hypothesis.

Table 1: ANOVA test

	Percentage	Frequency	Mean	F-Statistic	Significance
Regression	15.921	5	3.184	7.847	.000 ^b
Residual	30.029	74	.406		
Total	45.950	79			

b: Predictors: (Constant)

Table 2: Coefficients table

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.
	B	Standard error	Beta		
(Constant)	1.149	.535		2.147	.035
We provide lower price for products/services	.159	.105	.162	1.512	.135
We maintain lower cost of materials	.177	.103	.215	1.719	.090
We can alter the number of products/services quickly	.049	.095	.055	.517	.606
We introduce new products/services quickly	-.038	.098	-.047	-.393	.695
We offer customized products/services to meet customer needs	.404	.105	.409	3.847	.000

Table 3 presents the correlation coefficients elucidating the relationships between the dependent and independent variables. Concurrently, the controlled variables' correlation values are displayed in Table 3 as well. Notably, a perfect correlation of 1.000 is observed for the variable "we maintain lower upper head cost." Further, the significance levels for specific variables bear significance. For instance, "we provide a lower cost for product" demonstrates a significance level of 0.016, while "lower cost of material" exhibits a highly significant level of 0.000. Similarly, "we can alter the amount of product" is characterized by a significance level of 0.001. It is worth mentioning that, in the context of a two-tailed test, the variable "we introduce a new

product" returns a significance level of 0.001. In light of these statistical findings, our hypothesis stands substantiated, thereby necessitating the rejection of the null hypothesis. It is noteworthy that the value of correlation for "we maintain lower upper head cost" remains 1.000, with corresponding significance levels that align with the aforementioned variables. Thus, our research findings affirm the validity of our hypothesis, leading to the rejection of the null hypothesis. The test results show that there is a positive correlation between dependent and independent variables. In other words, Sustainable management practices have a direct impact on the company's competitive advantage.

Table 3: Correlations table

Control variables		a	b	c	d	e
We provide a wide variety of products/services	Correlation	1.000	.270	.391	.358	.371
	Significance (2-tailed)	.000	.016	.000	.001	.001
	df	.000	.77	.77	.77	.77
	Correlation	.270	1.000	.261	.154	.256
	Significance (2-tailed)	.016	.000	.020	.175	.023
	df	.77	.000	.77	.77	.77
	Correlation	.391	.261	1.000	.417	.501
	Significance (2-tailed)	.000	.020	.000	.000	.000
	df	.77	.77	.000	.77	.77
	Correlation	.358	.154	.417	1.000	.230
	Significance (2-tailed)	.001	.175	.000	.000	.041
	df	.77	.77	.77	.000	.77
	Correlation	.371	.256	.501	.230	1.000
	Significance (2-tailed)	.001	.023	.000	.041	.000
	df	.77	.77	.77	.77	.000

a: We maintain lower overhead costs; b: We provide lower price for products/services; c: We maintain lower cost of materials; d: We can alter the number of products/services quickly; e: We introduce new products/services quickly

5. Conclusion

Assumptions pertaining to the measurement model were rigorously assessed, considering the significance levels derived from regression analyses, and a meticulous evaluation of collinearity among constructs was conducted.

The initial hypothesis sought to ascertain the viability of establishing a quantifiable impact of SMPs on the enduring success of SMEs. Employing a direct route analysis, we have substantiated that SMPs indeed wield statistically significant influence over long-term performance. Consequently, these findings lend support to the alternative theory. In alignment with our second hypothesis, which posited that SMPs would exert influence across four dimensions of competitiveness, including product pricing, production flexibility, product quality, and delivery, we have discerned a statistically significant positive effect of SMPs on each of these facets—product cost, production flexibility, quality, and timeliness. As a result, we are inclined to uphold the alternate theory.

To assess the validity of the third hypothesis, we scrutinized whether the four competitive attributes altered the relationship between SMPs and the sustained success of SMEs. Four conditions were considered: there must be an initial connection between SMPs and long-term success (i.e., competitive capabilities); the dependent and mediator variables must demonstrate a statistically significant association; the mediator must exert a substantive impact on the outcome of interest (the third condition); and ultimately, the relationship between sustainable manufacturing and sustainable performance was mediated by competitive capabilities, which, in turn, were influenced by product pricing, production flexibility, product quality, and delivery.

Finally, our fourth hypothesis posited that regulatory frameworks and other external variables influence the strength of the linkage between SMPs and the enduring success of SMEs. Our analysis

demonstrated that SMPs exerted a more pronounced effect on the sustained performance of SMEs when confronted with environmental restrictions. Although the route coefficient value decreased notably from 0.47 to 0.29 when environmental restrictions were introduced as a moderator, the correlation between SMPs and sustainable performance remained statistically significant. Hence, it is plausible to infer that environmental constraints amplify the nexus between SMPs and sustainable performance, substantiating Hypothesis 4. A succinct summary of the hypothesis testing results is presented in Table 4.

Table 4: Summary of hypotheses testing results

Hypothesis	Result
H1	Approved
H2	Approved
H2 _a	Approved
H2 _b	Approved
H3	Approved

This study encompasses various facets of manufacturing, encompassing product cost (PC), production flexibility (PF), product quality (PQ), product delivery (PD), environmental restrictions (ER), and sustainable performance (SP). Employing the New Resource-Based View (NRBV) framework, this research formulates and tests a model aimed at augmenting the existing body of knowledge concerning the enduring success of SMEs. Through the lens of a firm's competitive potential, this investigation delves into the mediating role of environmental regulations in the relationship between SMPs and the sustainable performance of SMEs. The findings underscore that the long-term viability of SMEs is significantly bolstered by the adoption of SMPs.

SMPs confer several advantages upon SMEs, including the ability to maintain competitive product pricing, manufacturing flexibility, timely product delivery, and stringent product quality standards. Manufacturers are encouraged to sustain their efficient utilization of resources and energy to mitigate carbon emissions and production expenses.

The nexus between SMPs and a firm's enduring performance is largely mediated by the competitive capabilities exhibited by its workforce. This study reveals that SMEs stand to benefit from embracing SMPs if they can enhance their competitive prowess, which, in turn, augments their sustainable performance. When the NRBV framework is employed within a market context, companies that infuse environmental considerations into every stage of their operations—from conceptualization and manufacturing to packaging, quality control, distribution, and sourcing—gain a competitive edge. SMEs are urged to reassess their prior competitive advantages in light of environmental constraints and climate change, as sustainable manufacturing practices have the potential to offer them a substantial competitive edge.

Despite consensus on the potential for SMEs to gain a competitive advantage through eco-friendly policies, this has not consistently translated into action. This study posits that SMEs participating in SMPs and concurrently cultivating competitive capabilities in product pricing, quality, delivery, and production flexibility are more likely to achieve long-term success.

Furthermore, this research highlights the significant impact of environmental regulations on the relationship between SMPs and the sustained success of SMEs, with a particular focus on the manufacturing sector. While previous studies have underscored the critical role of SMPs in SMEs' long-term success, the mediating role of competitive capabilities has remained relatively underexplored until now. The study also affirms that compliance with environmental standards positively influences the sustainable performance of SMEs. Thus, examining the outcomes of SMPs should assume priority in the domain of sustainability research.

This research contributes to the extant literature on sustainable manufacturing and sustainable performance by advancing our comprehension of the competitive capabilities engendered by SMP adoption, thereby enhancing SMEs' sustainable performance. Moreover, the enactment and enforcement of environmental regulations notably enhance the association between SMPs and SMEs' sustainable performance. The study underscores the long-term advantages SMPs confer upon small and medium-sized enterprises, offering manufacturers a blueprint to enhance competitiveness while making substantial contributions to the environment and stakeholders.

These findings also offer valuable insights for lawmakers, providing a foundation to formulate and implement environmental legislation that encourages leadership within SMEs to adopt SMPs and reinforce their commitment to sustainability. It is imperative that environmental regulations consider the unique characteristics of manufacturing SMEs to preserve their competitive edge and foster their long-term viability.

However, it is essential to acknowledge the limitations of this research, including the

classification of environmental regulations without distinguishing between government mandates, market forces, or grassroots activism. Consequently, the generalizability of the study's findings to real-world contexts may be constrained. Moreover, the small sample size introduces challenges in extrapolating the results.

Future research avenues might explore the most prevalent SMPs employed by SMEs and delve into how these practices confer competitive advantages in domains such as product pricing, manufacturing flexibility, product quality, and delivery. A long-term empirical study could also scrutinize the varying impacts of diverse environmental regulations on business sustainability within this context.

5.1. Research implications

The significance of the research to the advancement of knowledge, theory, policy, and practice is discussed here. It assesses the study's significance and provides theoretical backing, conceptual and methodological references, and suggestions for enhancing current practices and future research.

5.2. Practical implications

The contribution of SOMP to resolving humanity's problems might be crucial. It is still not fused, despite our best attempts. In the mainstream of operations management research, there are not many studies on SOMP at the moment. The results of this research provide new information in the under-investigated area of SOMP. Whether adopting eco-friendly procedures will give businesses a strategic edge is another matter of debate. Others discovered a positive correlation between the two; however, [Wagner \(2005\)](#) found only a modestly positive correlation, while [Watson et al. \(2004\)](#) found no correlation at all. This research helps clear up the discrepancies by confirming the favorable effect SOMP have on competitive advantage.

TBL identifies three pillars upon which sustainability depends (environmental, economic, and social). Previous research focused on two of sustainability's components (environmental and social) but ignored the third (economic). Each of the three intertwined factors serves to strengthen the other and must be dealt with in tandem. By examining all three factors together, as this research did, new insights are gained.

Although several studies ([Abdul-Rashid et al., 2017](#)) have attempted to operationalize SOMP, they have done so with a limited number of indicators that fail to adequately represent the whole product development process. In order to reap the most advantages, the SOMP take into account every aspect of business, both within and outside the company. The whole product life cycle is investigated, starting with operations.

Successfully implementing SOMP requires effort and time, but the payoff might be greater overall

performance. The link between SOMPs and competitive advantage is well-established; however, the roles that firm characteristics and organizational performance play in managing and changing this connection are not as well-understood. Failing to take into consideration mediator factors might make a business model less than optimal. As a result, they may be unable to address pressing issues inside the company. The findings of this research add to our understanding of the problem by highlighting a group of factors that may have been ignored before.

5.3. Theoretical implications

Opportunity to gain a competitive edge via the coordinated implementation of strategic organizational and operational management plans (SOMPs) involving several departments, functions, and organizational units. The terms "sustainable development" and "technological cooperation" are sometimes used interchangeably to describe the shared commitment to fostering appropriate infrastructure, developing human resources, and investigating new avenues for increasing competitiveness that are at the heart of Companies need to get along with their suppliers, who are key stakeholders, by having those suppliers follow SOMPs and providing the firms with sustainable resources (Hart and Ahuja, 1996). With the production of sophisticated resources that rivals would have a hard time duplicating, this research shows that SOMP methods boost organizational performance and competitive advantage.

Consumer expectations, rivalry, and rules and laws all have an impact. When it comes to essential resources, no organization can operate independently. They must take care of this dependency for long-term growth if they want to remain competitive. A company that practices sustainability in its operations prioritizes customer satisfaction, policy compliance, and the preservation of natural resources.

Use your creativity to meet the needs of a consumer base with ever-evolving tastes, interests, and worries. This sets it apart from the competition and provides an edge in the market. The results of this study demonstrate that unique assets and intangible skills constitute a strategic resource that contributes to business viability.

5.4. Effect on procedures and policies

Waste management policy, as well as other environmental policies and practices, may be improved with the findings. When drafting legislation to protect the environment, helps to have a strong understanding of how sustainability objective measurement processes (SOMPs) relate to the concept of competitive advantage. Officials at all levels of government need to be aware of this link if they are to succeed in their environmental initiatives. An advantage in the market may be gained by making manufacturing processes more

efficient in a sustainable manner. Regulators may utilize the findings to persuade other organizations to use SOMPs via voluntary environmental plans and partnerships, and by giving incentives to enterprises that have already implemented SOMPs. The findings of this research might be used by policymakers to improve existing initiatives and formulate new ones.

This is because these businesses have been around for a while and have a reputation for success; as a result, they have built up the resources to adopt SOMPs. SOMPs are long-term investments that call for substantial resources and the dedication of businesses; as a result, few companies rush to put them into action (Hart, 1995). This shows that small enterprises don't have the resources to implement SOMPs, and it raises the possibility that the government may recognize its role in providing incentives to make SOMPs a reality.

5.5. Recommendations

The findings confirmed that SOMPs boost organizational performance and provide a strategic advantage. Manufacturing companies would be wise to adopt SOMPs since doing so might increase their competitive advantage, customer satisfaction, staff efficiency, and overall company success. In order to improve the ecological sustainability of a company, it is necessary to address the primary source of the problem: the operational management decisions made by the company's leaders.

Most climatic shifts may be traced back to manmade factors generated by industries. Management choices made inside the company's operations are a significant driver of the negative effects humans have on ecosystems. Enterprises should take environmental responsibility seriously by implementing SOMPs, not only in their day-to-day operations but across the board.

There must be fundamental changes in how policy is made. Sustainable development should be a central idea in many different disciplines, and governments should start putting theory into practice. Achieving sustainability requires the government to go beyond the limited process of policy implementation and instead focus on the development of initiatives and programs that have significant relationships. There have to be new policies implemented by the government to support environmental management programs like SOMPs. Businesses should think about how they may alter current rules and build frameworks to help close the gaps between their environmental and economic responsibilities. The government needs to solve these serious issues. It is high time for businesses to see the connection between sustainability and competitiveness as a strategic opportunity.

Organizations are not closed systems, as open system theory acknowledges. Like any other system, they take in data from the outside world and then release the results. Consumer needs, rivalry in the market, and law-making all have an impact. As the OST attests, an organization and its surrounding

environment are mutually dependent on one another for their continued existence, development, and growth. An organization may stand out from the competition and gain a competitive edge by adopting environmentally responsible practices and responding to the needs of its customers. Hence, managers should shift their focus from acting only in the best interests of shareholders to fostering positive relationships with all stakeholders.

5.6. Limitations of the study

There was a potential problem with this research in that some participants could have thought they could not provide the information that was being sought. Unfortunately, this meant that some surveys went unanswered. Most businesses were reluctant to provide their metrics for fear of giving their rivals an unfair advantage. Just a subset of manufacturing enterprises registered with KAM were included in the analysis, and those sectors were only those relevant to the UAE environment. Consequently, care should be used when extrapolating from these findings. For the sake of generalization, the UAE's entire industrial sector must be examined.

Managerial input was crucial to the success of this investigation. This represents a flaw in the methodology. The information that was used to compile the data on SOMPs, competitive advantage, organization performance, and company characteristics from the original source was highly prone to bias. It was founded on people's subjective assessments of events. The truth is that everyone has a distinct perspective and point of view on any given topic or subject. In most cases, the greatest image can be painted using cold, hard facts.

The small number of interviews conducted was also a drawback. Larger samples are needed in future studies to provide a more complete picture.

5.7. Recommendations for further research

The author of the study advises that future studies expand their focus to include SOMPs in other industries since they are important to the growth of the economy. The research relied on managers' subjective perceptions to determine its findings. In future studies, more direct, objective measures should be used to increase the reliability of the findings. As a result, there has to be more study done to determine how to make production systems more effective in light of ecological, financial, and social considerations. Research of this kind ought to ultimately advise and impact practice and/or policy.

It's also worth noting that the study's sample was drawn from manufacturing companies in a developing country (UAE). Developed nations and other emerging nations with distinct economic and environmental rules from the setting of this research make it unlikely that the study's findings can be applied elsewhere. Furthermore, future researchers are urged to evaluate the study's model in different circumstances, and, more importantly, to expand the

study to the many levels of competition to provide a holistic picture of such dedications.

Compliance with ethical standards

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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