



Unveiling manufacturing delays causes and implications in Sudanese industries: A study on manufacturing sector

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Abstract

Manufacturing delays cause significant financial losses and community disruptions, especially in developing countries. The lack of comprehensive data further complicates addressing these issues. This study investigates the causes of delays in Sudan's food and beverage industry. This exploratory and interpretative study employed semi-structured questionnaires targeting senior and general managers from 25 food and beverage companies in Sudan, focusing on supply chain, operations, and manufacturing departments. Respondents identified five main causes of manufacturing delays: government restrictions and political instability (including regulatory constraints and corruption leading to supply and technological shortages), economic factors, port customs delays, fluctuating material costs, and other indirect reasons. The findings offer unprecedented data that fill a significant literature gap on manufacturing delays in Sudan and help inform strategies to mitigate them. This study fills a research gap by examining manufacturing delays in Sudan's food and beverage industry, identifying key causes such as political instability and economic factors to inform better practices and further research. The findings may improve project timelines and overall performance in Sudan's manufacturing industry. However, since the research was conducted before the current conflict, its relevance today may be limited.

Keywords: Delay Causes, Developing country, Manufacturing-based factors.

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1. Introduction

Owing to the integration and cohesion of food industries, coupled with the globalization of food trade, food production and distribution patterns are continuously evolving. Changes in food trade, industry policies, technologies, lifestyles, legislation, and numerous other factors have introduced complexities that are not easily managed within the food industry sector [1].

The existing literature extensively documents delays, predominantly in the construction sector, highlighting their detrimental effects on project success and organizational performance [2]. However, there is a noticeable gap in research addressing delays across other domains, including various industrial sectors. According to Saha et al., existing studies have primarily focused on several key objectives: analyzing the causes and factors of project delays, classifying and evaluating delays and related claims, and understanding these issues through comparative analysis and specification [3].

In contrast, the manufacturing sector—defined as the production of goods utilizing equipment, labor, machinery, tools, and chemical or biological processes—plays a critical role in many organizations, particularly in the context of rapid economic development [4]. Unlike standard organizational structures, manufacturing is characterized by time sensitivity, which results in significant variability. Consequently, this variability often leads to frequent project failures in manufacturing management, underscoring the need for a thorough understanding of the causes and the implementation of effective preventive measures [5].

Delays in manufacturing projects are widely recognized as a significant risk, defined as any act or event that extends the time required for work completion. Such delays manifest as additional workdays or postponed activities and are frequently described as schedule overruns, extensions beyond the specified contract completion date, or an agreed project end date. These delays directly impact a project's time, quality, and cost. A project is deemed successful when it adheres to a specified timeline and budget [6].

Despite the critical importance of understanding the causes of delays, identifying the most frequent and significant causes remains challenging due to variations in the measurement scales used across different studies [7]. Additionally, differences in regional contexts and industry typologies further complicate the issue. The absence of unified criteria for identifying delay causes and the use of diverse quantitative methods make it difficult to establish a comprehensive global understanding of delay causes [8, 9].

In the manufacturing sector, delays have severe repercussions, including capital losses and broader financial impacts on the community due to the multifaceted nature of the problem. Therefore, identifying the causes of delays remains a significant area of interest within the scientific community. This issue is particularly pertinent in Sudan, where there is a critical lack of data on manufacturing delays.

Numerous studies have been conducted worldwide to examine various aspects of inefficiency, such as delays in manufacturing companies [10-12].

However, in the food and beverage industry, very few studies have specifically investigated the issue of production time concerning delays [13]. Particularly in Sudan, this study is among the first few related investigations. While some studies in other underdeveloped countries have explored manufacturing delays, they have primarily focused on general manufacturing performance, [14] such as in Bangladesh's ready-made garment industry. Furthermore, transportation is considered a crucial category of delay, as it plays a significant role in triggering foodborne diseases and illnesses. Hence, this study aims to investigate the causes of manufacturing delays in firms, particularly within the food and beverage industries in underdeveloped countries.

Most studies conducted in other parts of the world have focused on manufacturing companies with complex and sophisticated technologies. Additionally, previous research has examined the occurrence of failures in foodstuffs, but from perspectives different from those explored in this study. Other studies have also been carried out in hospitality-based sectors in various regions. However, this study specifically investigates the food and beverage industry. The primary objective of this study is to identify the major causes of delays in the manufacturing industry in Sudan through an opinion survey and to propose potential solutions to mitigate or eliminate these delays. In doing so, the study aims to provide valuable insights into the factors contributing to manufacturing delays in Sudanese companies. By identifying these factors, this research seeks to facilitate the development of effective mitigation strategies that can prevent future delays and enhance overall project efficiency. The main question guiding this study is as follows: What are the primary causes of project delays in the manufacturing sector in Sudan, and how do these causes differ from those identified in other industries and regions?

The structure of the paper is organized as follows: Section 2 reviews the relevant literature; Section 3 describes the methodology, including the design, participant profiles, and protocol; Section 4 presents and analyzes the results; Section 5 discusses the findings; and finally, Section 6 outlines the implications, applications, recommendations, further research, limitations, and conclusions.

2. Literature Review

Several studies have explored delays in the manufacturing industry, with some documenting that natural disasters can cause significant delays. Others have addressed the reasons for and remedies for delays in the construction industry. For instance, both Khan, et al. [14] and Yilmaz and Şahin [15] revealed that multisourcing can decrease the probability of supply chain delays. Additionally, some studies proposed exploring occupational accidents, safety issues, and potential solutions in Bangladesh's ready-made garment industry (RMGI) [14, 15]. Furthermore, transportation is considered a critical cause of delay, particularly in triggering foodborne diseases and illnesses. In 2005, a study summarized the implications of skills development in the South African food and beverage manufacturing sector, outlining the determinants affecting such development for firms of various sizes. Moreover, the availability and use of gas transportation were restricted due to an explosion, which reduced the amount of chlorine produced, ultimately impacting the food and beverage industry.

Manufacturing delays can have a significant impact on industries dealing with perishable products. Consumers, in general, will do anything to avoid purchasing products that appear to be out of stock.

Delays in projects are among the major issues confronting the Sudanese manufacturing industry, as they are in most developing countries. Understanding the nature of these delays is essential for improving project efficiency and, consequently, the growth of the industry [16]. Accordingly, this literature review describes the causes of delays in the manufacturing industry in Sudan compares the findings with those in other regions and offers different perspectives on the problem under study. Common causes of project delays in any developing country include government restrictions and political instability [17]. Recently, political instability has been identified as a significant cause of delays. It is now well-established that, in addition to disrupting supply chains, political unrest instigates increased operational uncertainty, which causes delays in the timely execution of projects. Coupled with these factors are import restriction policies imposed by the government, which trigger bureaucratic inefficiencies and other causes of delay [18]. Economic mismanagement also contributes to some of the primary causes of delays in the manufacturing process. Poor economic management, such as inflation, fluctuating material prices, and financial instability, negatively affects manufacturing efficiency [19]. Researchers have revealed that economic instability in Sudan results in unpredictable costs and resource shortages, further contributing to project delays. Such factors align with a study conducted in other developing countries where economic instability similarly impacts manufacturing operations [20].

Another critical factor contributing to these delays is logistical challenges. It has been well documented in Sudan that port customs and transportation problems significantly affect the speed of delivery for both raw materials and finished products [21]. This situation, however, is not unique to Sudan, as globally, issues related to logistics and infrastructure have been called to be streamlined [22, 23].

In addition to logistical challenges, another significant factor contributing to delays is the internal inefficiency of manufacturing companies. Inadequate training and poor management practices within Sudanese companies have been identified as key causes of project overruns, reduced productivity, and diminished efficiency [24]. These findings are consistent with those observed in other regions and industries, where internal factors play a critical role in causing project delays [16]. According to Hamid et al., manufacturing delays are defined as overruns beyond the scheduled time for completion or activities that extend the time it takes to deliver goods, often manifesting in terms of additional workdays [25].

Delays not only reduce manufacturing performance but also lead to a loss of output and revenue, as contractors forgo the execution of other projects. The opportunity cost of forgoing these projects represents a significant financial loss. Every business project is inherently dynamic and uncertain, which may explain why delays have traditionally been accepted as part of a project manager's responsibility. Kraiem and Diekman categorized delays into three types: compensable, excusable, and non-excusable. Compensable delays are those within the owner's control, excusable delays are those beyond the control of either party, while non-excusable delays result from the contractor's actions and may lead to recoverable damages [26].

Extensive literature exists on manufacturing delays, which have been addressed from various perspectives. For instance, Doloi's team examined the causes of delays in construction projects in [27]; Durdyev and Hosseini [28] probed delays in residential projects in Cambodia [28]; another study focused on delays in geopolitically risky countries [29]; and Santoso and Soeng analyzed delays in road projects [30]. These studies indicate a global interest in understanding the causative factors of construction project delays [31, 32].

A literature review has established that while manufacturing delays in Sudan share similarities with those in other developing countries, their impacts and remedies vary. Therefore, specific solutions tailored to local contexts and industry-specific challenges are required.

3. Methodology

This study focuses on the causes of delays in industrial and manufacturing projects in Sudan, with the primary objective of understanding these causes and, consequently, reducing the problem. The methodology employed in this study followed a qualitative approach, utilizing semi-structured interviews. This method blends elements of both structured and unstructured interviews, offering a flexible framework for collecting in-depth information while allowing for adaptation based on the interviewee's responses [33]. This approach ensured that specific areas of interest were addressed, while maintaining a degree of consistency across the interviews. Moreover, the format promotes detailed responses, enabling interviewees to fully articulate their thoughts and experiences. The collected data were then transcribed and analyzed to inform the research findings [34].

3.1. Data Collection

The methodology was structured into several key steps. Initially, a literature review was conducted to identify common causes of delays in manufacturing projects, which helped establish existing problems and gaps in the field [35]. This was followed by a more targeted literature review, which was informed by the initial comprehensive review. Subsequently, targeted interviews were conducted with local experts in Sudan to uncover both reported and unreported factors of delay that are specific to the Sudanese context.

After the interviews, the identified factors were integrated into a questionnaire. In this questionnaire, opinions from industry professionals were collected regarding the importance and frequency of each delay factor. To ensure effective data collection, a pilot study was conducted to refine the questionnaire [36]. The improved questionnaire was then administered to 25 professionals involved in industrial and manufacturing projects in the eastern province of Sudan. The data obtained from the questionnaires were analyzed using statistical methods to determine the relative importance and ranking of each delay factor. Based on this analysis, conclusions were drawn regarding the remedial measures for the causes of delay identified.

Additionally, primary information was sourced from qualitative descriptive in-depth interviews with senior and general managers in the Sudanese food and beverage industry. Semi-structured interviews were conducted for 30 to 60 minutes, during which open-ended questions were used to elicit detailed insights. These interviews were transcribed within 24 hours and analyzed to identify the most significant delay factors and their impact.

3.2. Survey Design

Upon completion of the interviews, a questionnaire was designed to obtain detailed information. The questionnaire begins by collecting background information about the respondents, such as their job level, years of experience, and the type of organization to which they belong. It then presents 39 factors, asking respondents to rate the impact and frequency of each factor on a scale ranging from very low to very high. The questions in the questionnaire were designed to be simple and easy to understand, ensuring that respondents could answer the survey with ease. The impact level measures the extent to which each factor affects the business organization, while the frequency level indicates how often each factor occurs.

Descriptive statistics and frequency analysis were then used to describe the profile of the respondents and provide insights into the data.

3.3. Respondent Profile Characteristics

As shown in Table 1, the respondent profile for this study provides a comprehensive view of those involved in investigating project delays within Sudan's manufacturing sector. In terms of gender, 76% were male, and by age, the majority were over 36 years old (52%), with 24% in the age groups of 25-30 and 31-35. This distribution ensures a good mix of experience and mid-level working professionals. Furthermore, in terms of experience, 64% had less than 10 years of experience, while 20% had over 30 years, reflecting a youthful yet highly knowledgeable workforce.

Regarding education, nearly half of the respondents (48%) held a bachelor's degree, while 36% had a master's degree, with a few possessing diplomas or PhDs. Additionally, in terms of job position, 72% were senior managers responsible for strategic decisions, and 80% worked in operations and manufacturing, which is central to this study. Concerning certifications, 88% held management-related certificates, whereas only 12% had certifications specific to supply chain management. Moreover, the international certifications held by respondents ranged from general management to specialized fields, reflecting a diverse range of expertise.

In terms of firm ownership, 92% were employed by private firms, indicating that the manufacturing sector in Sudan is predominantly privately owned. This broad representation highlights the large scale of the Sudanese manufacturing industry. Overall, the respondent profile presents a well-rounded group of professionals with rich experience and education, providing invaluable insights into the causes of project delays in the Sudanese manufacturing sector.

		Frequency	Percent
Sex	Female	6	24
	Male	19	76
	Total	25	100
		Frequency	Percent
Age	25 to 30	6	24
	31 to 35	6	24
	More than 36	13	52
	Total	25	100
		Frequency	Percent
Experience years	10 to 20	4	16
	Less than 10	16	64
	More than 30	5	20
	Total	25	100
	·	Frequency	Percent
Education	Bachelor	12	48
	Diploma	2	8
	Master	9	36
	PhD	2	8
	Total	25	100
		Frequency	Percent
Position	General manager	7	28
	Senior manager	18	72
	Total	25	100
	·	Frequency	Percent
Division	Operation and manufacturing	20	80
	Supply chain	5	20
	Total	25	100

Table 1.Respondents profile.

		Frequency	Percent
		Frequency	Percent
International certificate	Other management certificate	22	88
	Supply chain certificate	3	12
	Total	25	100
		Frequency	Percent
		Frequency	Percent
Company ownership	Joint ventures	1	4
	Others	1	4
	Private	23	92
	Total	25	100
		Frequency	Percent
Food companies' categories	Food processing	8	32%
	Bakeries and biscuits	6	24%
	Juices and beverage	3	12%
	Meat products factory	2	8%
	Flour mills	2	8%
	Different foods	4	16%
	Total	25	100

4. Data Analysis and Result

This section presents descriptive statistics, including means and standard deviations, to characterize the variables under study. The following tables summarize the mean values and variability of each variable, highlighting their relative importance and ranking. The results are presented in simple, narrative English.

4.1. Descriptive Statistics of Variables

In this section, descriptive statistics, such as the mean and standard deviation, were used to describe the characteristics of the surveyed variables. Table 2 shows the means and standard deviations of these variables. The results of the descriptive statistics provide valuable insights into the causes of project delays within the manufacturing sector in Sudan.

Government restrictions emerged as the most influential factor, with the highest mean score of 4.00, where 80% of the respondents identified it as a major cause of delays. Political factors closely followed, with a mean score of 3.96 and 79% of respondents citing them as significant. Economic factors also played an important role, with a mean score of 3.84 and 77% of respondents acknowledging their impact on project timelines. Other prominent causes included port customs delays and varying material costs, each with a mean score of 3.80, affecting 76% of the respondents. These findings highlight the significant influence of logistical and financial challenges on project delays.

Additionally, cash flow problems (mean = 3.64, 73%) further compounded the financial issues affecting project progress. Supply chain problems and poor technology followed, with a mean score of 3.36, impacting 67% of the respondents. Late procurement, the unavailability of materials, and delays in inspection and testing were also notable, with a mean score of 3.32, affecting 66% of the sample.

Other prevalent causes included inadequate communication and poor coordination, both with a mean score of 3.32 and 66%, as well as poor organization within the company (mean = 3.24, 65%). Other critical factors that ranked at a slightly lower level of importance included last-minute tasks (mean = 3.16) and late delivery of materials (mean = 3.12).

Low-scoring factors, including inadequate data collection, unqualified workers, and environmental disasters, were considered less frequent but still relevant issues. Equipment shortages, low productivity, and warehouse layout were identified as less critical but still potential contributors to delays.

The least influential causes of delays were poor site management, early completion incentives, and holidays, each having mean scores of less than 3.00. In summary, the findings of this study allow for the ranking of delay causes as follows: first, government restrictions and political factors; second, economic problems; and third, logistical problems. This ranking illustrates the complex interaction of factors that impede manufacturing efficiency in Sudan. These insights provide a rationale for developing targeted strategies to address these main causes and improve project performance.

Table 2.			
Descriptive	statistics to	all	variables.

		Mean	Std. deviation	Important	Rank
1.	Government restriction:	4.00	1.291	80%	1
2.	Political factors:	3.96	1.241	79%	2
3.	Economic factors:	3.84	1.375	77%	3
4.	Port custom delay:	3.80	1.19	76%	4
5.	Varying material cost:	3.80	1.225	76%	5
6.	Cash flow problem:	3.64	1.319	73%	6
7.	Supply chain challenges:	3.36	1.319	67%	7
8.	Inadequate technology:	3.36	1.551	67%	8
9.	Late procurement of material:	3.32	1.314	66%	9

	Mean	Std. deviation	Important	Rank
10. Non-availability of material:	3.32	1.464	66%	10
11. Delay in performing inspection and testing:	3.32	1.145	66%	11
12. Poor communication and coordination with other parties:	3.32	1.282	66%	12
13. Poor company organization:	3.24	1.332	65%	13
14. Last minute task:	3.16	1.214	63%	14
15. Late delivery of Materials:	3.12	1.201	62%	15
16. insufficient data collection and work preparation:	3.12	1.301	62%	16
17. Lab test and report:	3.12	1.201	62%	17
18. Unqualified/ inexperienced workers:	3.08	1.525	62%	18
19. Environmental/natural disaster factors:	3.08	1.222	62%	19
20. Equipment shortage:	3.08	1.382	62%	20
21. Material storage problem:	3.04	1.306	61%	21
22. Low productivity of labor:	3.00	1.118	60%	22
23. Warehouse location and layout:	3.00	1.384	60%	23
24. No incentive for contractors to finish earlier:	2.96	1.136	59%	24
25. Poor Site/operation management and supervision:	2.88	1.301	58%	25
26. Holiday:	2.88	1.364	58%	26
27. Delay in progress payment:	2.84	1.214	57%	27
28. Design change by owners:	2.84	1.375	57%	28
29. Manager-worker relations:	2.84	1.375	57%	29
30. Slowness in decision making:	2.76	1.48	55%	30
31. Schedule of subcontractor:	2.76	1.012	55%	31
32. Equipment failure:	2.72	1.308	54%	32
33. Contract negotiation:	2.72	1.021	54%	33
34. Inaccurate shipping information:	2.72	1.429	54%	34
35. Failed delivery attempt:	2.48	1.262	50%	35
36. Inadequate contractor experience:	2.40	1.384	48%	36
37. Excessive work load:	2.40	1.19	48%	37
38. Shortage of labor:	2.36	1.254	47%	38
39. Contract related dispute:	2.16	0.943	43%	39

Note: * The scale is from 1–5 where 1 means very low, 2 low, 3 moderate, 4 high, and 5 very high

The results of the analysis revealed that the top five ranked causes of delay, in order of importance, were government restrictions, political factors, economic factors, port customs delays, and varying material costs. Content analysis of the interviews uncovered many additional reasons that were distinct from those in the questionnaire and more varied than those found in previous studies. These additional reasons are summarized in Table 3. This study identifies the major causes of delays in Sudan's manufacturing sector, particularly in relation to the aims and objectives of this research. First, limited exposure to world markets and economic challenges are key factors. Furthermore, excessive fuel and diesel prices, along with frequent power outages, were ranked as significant causes of delays. Specific issues with local resources, such as the low productivity of livestock breeds and high manufacturing costs related to electricity and taxes, further contribute to these delays. Additionally, deficiencies in training, coupled with low salaries, poor incentives, and ineffective management, play a substantial role in the observed inefficiency within manufacturing. Operational challenges arising from the closure of Port Sudan and difficulties importing materials highlight logistical hurdles. The economy also impacts operations by increasing costs and raw material prices, while simultaneously affecting commodity marketing. A lack of adequate product control and marketing efforts, poor coordination between market needs and actual production, compounded by energy issues and concerns about product shelf life, further complicate the situation. Therefore, the findings provide a basis for developing targeted strategies to address the multiple and complex factors influencing the manufacturing sector, with the goal of reducing delays and enhancing efficiency within Sudan's manufacturing industry.

Table 3.

Extra reasons.
1. Poor exposure to global markets
2. A. Economic resources. B/ Human staff. C/ Poor management.
3. Lack of cash liquidity - instability of the political situation - fluctuation of the exchange rate
4. Cows and their breeds have low productivity.
5. High fuel and diesel - high prices - abundant power outages
6. lack of qualification and adequate training for workers - salaries and incentives are not fair.
7. Manufacturing costs, electricity and taxes
8. Closure of Port Sudan - Problems in importing materials
9. The economic situation affects the productivity process - the increase in operating costs and raw materials - dealing with external
parties has become difficult
10. One of the main reasons for the delay in production is the scarcity of salaries for workers, the high cost of production inputs and
difficulty of marketing these commodities

11. A. Non-activation of product control B-Not activating the marketing role that includes advertisements and sales

12. Coordination between market need and actual production, energy problems in Sudan and product shelf life

5. Discussion

The results of this study reveal an interplay of various factors contributing to delays in the manufacturing process within Sudan's food industry. The findings, based on both open-ended responses and scale questions, indicate that the primary causes of these delays are deeply intertwined with political, economic, and logistical issues. The top five causes, ranked according to their impact, are government restrictions, political instability, and economic factors. These issues significantly affect the industry, as it is heavily influenced by unstable political climates and corruption. Such instability leads to supply shortages and technological setbacks, further substantiating the argument put forth by Abdullah and Shonm, who associate political risk with food security in developing countries [37]. The impact of these factors is felt particularly in the disruption of normal business operations, which results in projects exceeding projected timelines and exacerbating delays.

In addition to political factors, the economic environment plays a critical role in these delays. Misdirected policies and mismanagement are at the heart of the issue, as they contribute significantly to financial instability and inefficiencies in the manufacturing sector. Mahmoud et al. further highlighted that poor economic management and ineffective political leadership are major contributors to financial instability, leading to production disorder and prolonged delivery times [38]. Compounding these economic challenges are delays in customs at ports and fluctuations in material costs, which raise production costs and affect supply chains. These findings align with other studies on manufacturing delays, confirming that economic factors are central to understanding project setbacks. In response to the questionnaire, twelve additional causes of delay were identified. Among these, poor exposure to global markets was noted as a key challenge, as it hampers engagement with external parties and complicates market expansion. Furthermore, the high costs of fuel and frequent power interruptions exacerbate operational expenses and disrupt the production process. Problems with local resources, such as the low productivity of livestock and high production costs, alongside delays in key activities, also play a significant role in causing delays. Moreover, inadequate training, low salaries, and poor management further contribute to inefficiency in the sector. Operational issues, such as the closure of Port Sudan and difficulties in material importation, present logistical hurdles that severely impede production. Additionally, poor product control and ineffective marketing strategies hinder the timely delivery of products. When comparing these findings to previous studies on construction delays, this research underscores the critical role of political and economic factors, which were not emphasized in some earlier studies. For instance, Abdellatif's research focused solely on the relationships between contractors and management, excluding the broader political and economic influences [39]. Factors such as breaks in delivery attempts and contractor-related disputes, identified in Abdellatif's study, did not emerge as key factors in this research [3]. Similarly, Al-Kharashi and Skitmore's work on government contractors and construction delays in Saudi Arabia did not account for Sudan's unique economic and political context [40]. Ultimately, this study highlights that delays in Sudan's manufacturing sector are multifaceted, with political, economic, and logistical drivers [21]. The detailed information derived from open-ended responses not only supports the profiling of respondents but also emphasizes the complexity of the issues contributing to these delays. In terms of resolving these delays, effective measures should consider both immediate operational challenges and the broader economic and political factors that shape the Sudanese manufacturing sector.

6. Conclusion

This section presents the implications, limitations, and directions for future research. The findings highlight key issues regarding Sudanese manufacturing, specifically within the food industry, by attributing delays to government restrictions, political instability, and poor economic management. To address these issues, systemic reform within the project cycle is essential to reduce delays and improve efficiency. In order to foster growth in the industry and reduce delays, stable political conditions and improved economic policies will be necessary. Moreover, logistical challenges at ports, such as customs delays and fluctuations in material costs, emphasize the need to enhance supply chain management and operational resilience.

To implement these changes, several measures could be considered. These include discussions with the government concerning policy reforms and political stability, enforcement of economic reforms to ensure logistics stability, improvements in logistics and infrastructure, and training programs aimed at addressing internal inefficiencies. It is crucial for industry stakeholders and the government to collaborate in supporting a more conducive manufacturing environment.

The societal implications of the findings suggest that addressing delays in Sudan's manufacturing sector requires broadbased reforms at the political and economic levels. To ensure long-term stability, the government must be encouraged to implement reforms aimed at reducing political instability and correcting economic mismanagement. A stable and transparent regulatory environment would not only enhance the functioning of the manufacturing sector but would also foster trust and confidence in the broader economy. This stability is crucial for the development of a thriving and sustainable industrial base that benefits society as a whole, creating job opportunities, increasing productivity, and improving the overall economic climate. At the organizational level, the findings imply that manufacturing companies must adapt and invest in enhancing their internal processes to cope with the challenges identified in the study. For instance, significant improvements in logistics are necessary to reduce delays and ensure the smooth operation of manufacturing activities. Investments in port infrastructure and the streamlining of customs procedures can drastically reduce the time lost in material handling, leading to more efficient supply chain management. In addition to logistical improvements, businesses should also focus on financial stability by implementing financing arrangements that help hedge material costs and provide safety mechanisms to prevent bankruptcies. Such measures would enable companies to operate more smoothly despite economic fluctuations.

On a practical level, companies must prioritize skill development and better management practices to address internal inefficiencies. Investment in training programs will help workers and managers improve productivity and performance, which is essential for meeting market demands and maintaining competitiveness. Furthermore, enhancing product control and marketing strategies will help businesses improve the marketability of their products, extend their product life, and ensure

customer satisfaction. The collective focus on these key areas will enable organizations to operate more efficiently, reduce delays, and contribute to the overall success of Sudan's manufacturing sector. In turn, these changes will have a profound impact on the practical functioning of the industry, enhancing its capacity to meet both domestic and international demand.

The strategies proposed for addressing manufacturing delays are based on the findings of this study. A time-based approach is suggested to assess these strategies, where actions are implemented and monitored over a 90-day period to observe the outcomes. This approach is informed by the Kalman Principle, which asserts that the longer individuals are involved in a project, the more they become attuned to its incremental details. This idea resonates with Parkinson's Law: "Work expands to fill the time available for its completion." In practice, when resources are deployed for a longer period, the sense of urgency diminishes, potentially slowing progress. Therefore, it is important to measure the effectiveness of this strategy by estimating the timing rate for each action and the time required for its completion. This will allow for a more structured and precise evaluation of the changes being implemented. However, there are limitations to this study that need to be addressed in future research. One of the key limitations is that generalizations could not be made due to the ongoing conflict in Sudan, which may have affected the study's findings. Furthermore, the small sample size of 25 professionals from the eastern region and the reliance on self-reported data reduce the broader applicability of the results. These factors also mean that the study may not fully account for regional variations or other unforeseen circumstances that could influence project delays. Therefore, future research should aim to include larger and more diverse samples, taking into consideration dynamic conditions that could provide a more comprehensive understanding of the factors contributing to manufacturing delays in Sudan. Further research could focus on specific policy and economic reforms, evaluate current efforts to reduce delays, and explore the impact of technology on manufacturing efficiency. Case studies from other developing countries could provide valuable comparative insights. By analyzing delays in Sudanese food manufacturing through the lens of structural political, economic, and logistical issues, this research offers a comprehensive understanding of the interconnected challenges. These challenges can be addressed with targeted strategies and further studies that aim to improve efficiency and drive the sector's growth and performance.

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