Original article

Revolutionizing procurement: Unveiling next-gen supplier strategies in UAE's oil & gas sector

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ARTICLE INFO

ABSTRACT

Procurement is a linchpin in organizational success, securing vital resources that enable top-tier service and product delivery. In fiercely competitive arenas like the oil and gas industry, cultivating robust supplier relationships isn't just beneficial—it's indispensable. Despite the ever-evolving market and myriad factors influencing these interactions, optimizing buyer-supplier dynamics remains paramount. The study delves deep into strategies to fortify procurement partnerships, spotlighting key elements shaping these relationships in the UAE's oil and gas landscape. Utilizing the renowned Kraljic's portfolio model (KPM), the study analyses purchasing strategies and their determinants. Data from a comprehensive online survey with 312 industry stakeholders and stringent reliability tests via SPSS offer compelling insights. Dominant themes include the prevalence of supplier and buyer dominance in ADNOC's procurement of both trivial and significant assets. Notably, no one-size-fits-all strategy emerges for major equipment acquisition, yet supplier dominance proves supremely effective for consumables and minor item procurements. A critical discovery underscores the significant role of employee tenure in shaping purchase decisions and supplier liaisons.

Introduction

Procurement encompasses various measures and choices by organizations or governmental bodies, which might produce diverse outcomes for the initiating party (Qazi and Appolloni, 2022). Emiliani (2010) suggests that the cost of services/goods, accessible data, and process transparency are pivotal for effective procurement. The advantages of procurement extend beyond immediate results, being an integral component of societies and institutions. Properly administered procurement can significantly boost economic advancement. Actions, choices, and mechanisms related to procurement by organizations or governments influence its immediate objectives and enduring advantages. Although Spekman (1985) emphasizes product quality and volume relevance, Emiliani (2010) promotes enriched supplier ties. Historic evaluations show a research gap in supplier relationship management practices. While quality sustainability and development bolster

procurement, Sarang-Sieminski and Christianson (2016) recognize the strong correlation between supplier and buyer relationships and their mutual performances. Ahmed et al. (2020) attribute procurement inefficiencies to non-compliance with norms and an inability to pinpoint enhancement strategies. Procurement is widely recognized as a mechanism involving parties in trade (Baily, 2005), demanding relationship cultivation, procedures, and techniques that facilitate successful business transactions (Mak et al., 2012). The means to refine buyer-supplier ties remain inadequately explored and harnessed for organizational gains (Joshi et al., 2021). Several elements, including timing, geographical location, and trust, often inhibit optimal procurement. Efforts to technologically streamline procurement haven't fully addressed these challenges (Li et al., 2015). While these elements might influence procurement in the UAE, the scarcity of empirical evidence makes these claims speculative, underscoring this study's necessity. This chapter delves deeper into the UAE's procurement landscape. The UAE,

Fig. 1. The Map of the UAE (World Atlas, 2018).

a confederation of seven emirates—Dubai, Ajman, Ras al-Khaimah, Fujairah, Umm al-Quwain, Sharjah, and the capital, Abu Dhabi (Herb, 2009), is strategically positioned for trade and economic endeavours, bordered by Saudi Arabia, Oman, the Arabian Gulf, and the Gulf of Oman (Sunil Dharmapala and Saber, 2007). The IMF recently ranked the UAE 17th among the world's affluent nations, attributable to its robust regional collaborations. Fig. 1 illustrates the proximity of all emirates, promoting economic synergy.

The UAE's strategic location adjacent to the Arabian Gulf and Gulf of Oman makes it a key player in the oil and gas industry. The UAE boasts one of the world's rapidly advancing economies (Kerr et al., 2014). This backdrop is pivotal, shedding light on the research scope and emphasizing the importance of effective buyer-supplier ties within the country, given its potential influence on neighbouring nations. The vibrancy of the country's procurement sphere is evident from its rich tapestry of oil and gas entities. While the UAE has gradually shifted its revenue streams away from natural resources, petroleum and natural gas remain economic cornerstones (Hinton et al., 2015). Consequently, the UAE garners attention from myriad domestic, regional, and global oil and gas firms (Bank, 2013). Renowned entities operating within the UAE encompass Emirates General Petroleum Corporation (EMARAT), Abu Dhabi National Oil Company (ADNOC), Atlantis Holdings, Crescent Petroleum Company, Dragon Oil Plc, Margham Dubai Establishment, and several others. The presence of such diverse organizations suggests a plethora of case studies to dissect and understand the intricacies of procurement in the UAE's oil and gas sector. Specifically, ADNOC is spotlighted due to its expansive role, encompassing onshore activities, liquified gas trade, and petrochemical product manufacture. The complexities of managing supplier relationships in the UAE and the need for enhanced buyer-supplier dynamics underscore this study's relevance. A lack of effective relationship management can impede the procurement process. While existing academic works pinpoint procurement issues, there's a dearth of solutions or strategies tailored for the UAE's oil and gas sector, amplifying the importance of this research in such a dynamic economic environment. This study delves into the nuances of buyer-supplier relationships in the UAE's oil and gas domain, striving to fortify ties despite the challenges outlined. Here, the focal terminologies include procurement, buyer-supplier relationships, and oil and gas. For clarity, this research adopts a specific perspective on procurement, given its multifaceted definitions. Herein, procurement is visualized as the strategic decision-making concerning what, from whom, and when to acquire goods or services (Chang et al., 2013). It's the art of securing quality goods or services at optimal costs and timeliness, whose advantages are harnessed by diverse entities, typically via contractual agreements (Mawdsley, 2015). At its core, procurement facilitates the

movement of products from vendors to their ultimate destinations. Further, it embodies the external acquisition of necessities (Van Weele and Van Raaij, 2014). Given these varied interpretations, this study encapsulates procurement as the orchestrated effort to timely secure quality and economically viable resources from vendors. This broadened definition underscores the intricate interplay between buyers and suppliers, essential for procurement success.

2. Research methodology

2.1. Study framework and methodology

A study's framework should align with the logic of the investigation, the aim behind the investigation, and the trajectory of logic. This investigation serves as a preliminary study aiming to enhance the UAE Oil and Gas sector. Preliminary studies, as a research method, are effective for phenomena marked by ambiguity, scarce empirical evidence, and a nascent understanding of challenges (Babbie, 2015). Such studies seek to elucidate research dilemmas, clarifying key variables pertinent to the study at hand (Denzin and Lincoln, 2011). These considerations have steered the selection of the preliminary study model for this project, determining the ideal methodology and strategy for this investigation.

2.2. Rationale for framework

Familiarity with preliminary research structures necessitates an examination of both qualitative and quantitative study designs. Quantitative methods focus on systematic empirical analysis of observable phenomena, employing statistical or numerical tools. Contrarily, qualitative methods delve into understanding underlying motivations, perceptions, and drivers, offering descriptive insights into problems instead of predictions. Qualitative studies pave the way for formulating concepts, frameworks, and potential quantitative investigations (Evans et al., 2011). Furthermore, qualitative research is diverse, indicating that unconventional methods can be integrated to enhance data quality and impartiality (Mathotaarachchi and Thilakarathna, 2021). An evaluation of diverse research methodologies reveals the merits and shortcomings of both qualitative and quantitative designs. The strategy for this study was distilled from a comprehensive review of procurement-related articles. Past studies in this domain illuminated methodologies that effectively collated data and produced credible findings. Experts in procurement have leveraged case studies, literature evaluations, and surveys. An examination of relevant literature, especially those focused on procurement within the oil and gas sector,
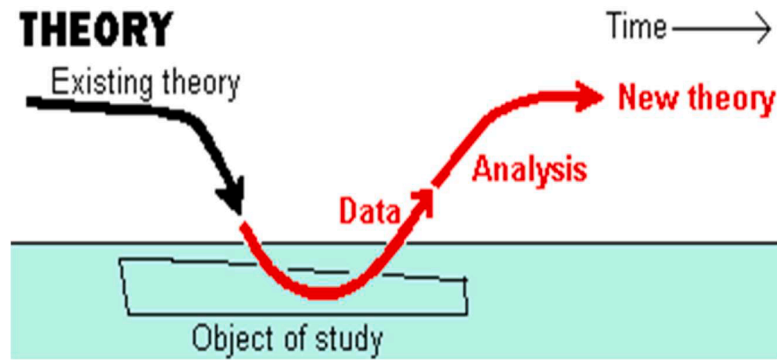
Fig. 2. Impact of theory on research process (Adapted from Bazeley, 2008).

Table 1

Differences between deductive and inductive approaches.

Inductive approach	Deductive approach
The collection of qualitative data	The need to explain casual relationships between variable
Less concern with the need to generalise	A highly structured approach
A close understanding of the research context	Moving from theory to data
A more flexible structure to permit changes in research emphasis as the research progresses	The application of controls to ensure the validity of data

Table 2

Characteristics of strategies.

Strategy	Form of Research Question	Control of investigator	Focus on Contemporary Events
Experiment	How, Why?	Yes	Yes
Survey	Who, What, Where, How many, How much?	No	Yes
Archival analysis	Who, What, Where, How many, How much?	No	Yes/No
History	How, Why?	No	No
Case study	How, Why	No	Yes

revealed a preference for quantitative designs. Historical examinations in this area offered a roadmap for attaining their research outcomes and suggested viable methods for this study. This informed the decision to adopt a quantitative study design for this research, given its ability to probe processes involving diverse participants across various settings (Kenneth S Bordens and Abbott, 2011). The choice of study design subsequently guides the subsequent research strategy elaborated in the following segment.

2.2.1. Strategy implemented

In determining the research strategy, the methodology employed to craft the research queries was pivotal. (Saunders et al., 2015) posit that discerning potential interrelations among themes aids in forging new theories or refining existing ones, as articulated by (Veltri et al., 2014). For instance, (Bazeley, 2008) noted how pre-existing theories shape the research subject. In this context, the research focal point is the dynamics of procurement, particularly the buyer-supplier nexus in the UAE. Fig. 2 depicts the iterative process leading to the genesis or refinement of theories.

The research methodology suggests that the focal point of investigation can be shaped by pre-existing theoretical frameworks, guiding the subsequent stages of data gathering, analysis, and the potential development of new theoretical models over time. Bordens and Abbott (2011) contend that such a process is inherently subjective, yet the endeavour to approach it with maximum objectivity may lead to the generation of novel theories. Saunders et al. (2015) echo this perspective, asserting that the research question and the body of existing knowledge within a particular area can dictate the chosen research methods. This chapter will further elucidate the approach taken. Data collected through the survey is then thoroughly interpreted and assessed to ascertain the scope and significance of the research findings. The selection of an appropriate research design and methodology was conducted with precision. The literature on research methods suggests two predominant approaches: deductive and inductive. Sarang-Sieminski and Christianson (2016) describe the deductive approach as starting with a theoretical framework and progressing toward empirical observations. Conversely, Bazeley (2015) defines the inductive approach as one where researchers make observations and derive conclusions from them. As illustrated in Table 1, the deductive approach is systematic,

transitioning from theory to data, with stringent controls to confirm the data's validity and the reliability of the results, as detailed by Creswell et al. (2011). This approach dictates how data is collected and analysed, which is further discussed in Chapter Four. In contrast, the inductive approach, also represented in Table 1, takes a bottom-up route. It involves qualitative data collection with attention to the context of the research and allows for a more adaptable structure. Table 1 also outlines the key distinctions between the deductive and inductive methods.

Choosing the right research methodology is essential for the success of any research project. It's crucial to employ the method that best addresses the research question. Deductive reasoning, as outlined in Table 1, aligns with a quantitative research paradigm. Therefore, this study has chosen a deductive approach to guide the development of its theoretical framework, informed by a review of the literature. This approach facilitates a structured investigation, starting with theory and moving towards data collection. The research design merges secondary data, such as literature reviews on oil and gas organizations in the UAE and other existing procurement research, with primary data collection. The subsequent section will detail how this design integrates with the chosen strategies and the overall research approach for the study.

2.2.2. Research strategies

This section reviews and discusses various strategies appropriate for a study of this nature and justifies the selection made for this research. In social science, several strategies are utilized for collecting primary data, which is information gathered directly from study participants or respondents specific to the research objective. Conversely, secondary data consists of pre-existing information, like archival records, corporate documents, published materials, and annual reports. Velde et al. (2015) note that surveys, interviews, observations, ethnography, historical analysis, and case studies are among the methods frequently employed in contemporary research. The following content will articulate how these strategies align with the research methodology chosen for this study.

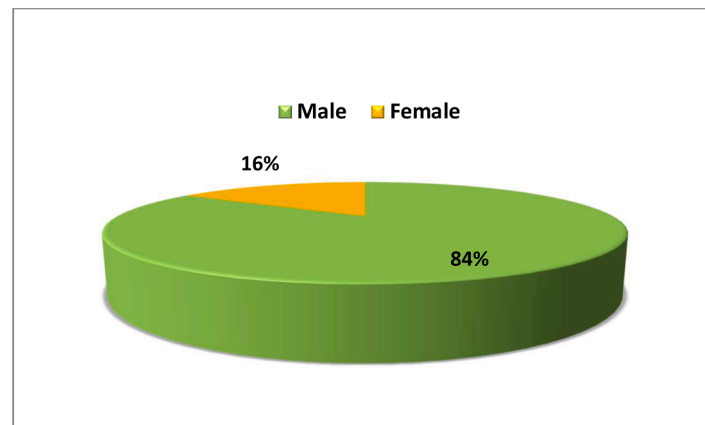Bell, 2005 pointed out three conditions that can be used in deciding

Fig. 3. Percentage of male and female respondents.

the appropriate research strategy:

a) the type of research question that needs to be answered.
b) level of control from the investigator; and
c) the nature and extent of the study focus on contemporary events.

The conditions outlined by Bell (are not conclusive and may be influenced by strategies and the extent to which research focuses on contemporary issues. Table 2 shows the three conditions and how they differ from strategy to strategy.

2.3. Research question formulation

Research strategies shape the formulation of research questions, with different methods, such as surveys and archival research, prompting distinct inquiries. In exploring the intricacies of buyer-supplier relationships in the UAE's oil and gas sector, the survey method was chosen for its appropriateness over archival research. This approach is conducive to asking a variety of questions, allowing for a comprehensive examination of the topic, particularly where detailed information is required. As indicated in Table 4.2, surveys support a wide array of question types, enabling an in-depth analysis from several perspectives. Surveys are particularly compatible with quantitative research and the deductive process, providing a robust framework for measuring variables. They are instrumental in gathering, analyzing, and interpreting the views of the target demographic (Slevitch, 2011). This research employs the survey method to explore the dynamics between buyers and suppliers in ADNOC and to uncover the factors that affect procurement practices in the oil and gas industry. All sources of data come with limitations. Saunders et al. (2015) emphasize that integrating different types of evidence can enhance the understanding of the research subject. The survey augments the limited secondary data available on procurement in the UAE, thereby deepening the insights into the buyer-supplier relationship within this specific context. The choice to focus on a single case study, ADNOC, is due to its significant role in the industry and is further justified in the following sections. The conglomerate's complex structure offers a rich field for study, presenting an opportunity to analyse the nuances of procurement practices within a major player in the oil and gas sector.

2.3.1. Focus on ADNOC

ADNOC's stature and its potential for providing a representative sample reflecting national procurement dynamics motivated its selection. The firm oversees 11 oil and gas reservoirs in Abu Dhabi, including notable ones like Asab, Bab, and Al Dabb'iya. They continually scout opportunities to tap into new reservoirs. A strong commitment to health, safety, and environmental (HSE) practices enhances operational efficiency and profitability and ensures staff welfare. Structured guidelines

and codes exist to actualize HSE goals (Fernandes et al., 2018). Regulations exist for employee interactions with external entities, including suppliers. Established norms ensure procurement processes are transparent and based on merit. Suppliers are mandated to align with ADNOC's ethical framework. Breaches in integrity are not tolerated, as both staff and suppliers' actions impact ADNOC's reputation. Ethical guidelines detail ADNOC Group's expectations regarding supplier conduct (El-Gharbawy et al., 2017). An electronic infrastructure further streamlines supplier registration, optimizing procurement and payment processes. Established suppliers, fitting ADNOC's criteria, can vie for new contracts via the ADNOC Onshore portal (Tayab et al., 2018). Based on this analysis, ADNOC was chosen as the primary research entity, utilizing the survey as the primary data collection mechanism, given that other UAE entities might not offer a substantial sample size for conclusive findings. The subsequent section discusses sampling and its influence on data gathering.

2.4. Data gathering and sample selection

Sampling entails choosing a representative subset of a population for investigation. Echoing this, (Babbie, 2020) describes sampling as the act of selecting specific units, be it individuals or entities, from a desired study population. This research employed random sampling to encompass a diverse cohort, particularly those engaged in oil and gas procurement. According to (K S Bordens and Abbott, 2011), random sampling guarantees equal representation for every population segment. This sampling strategy influenced how respondents were onboarded for the online survey. An effective survey design is paramount, informing the researcher about pertinent topics requiring data acquisition. Bergman (2008) posits that pertinent literature can also shape survey design. Leveraging statistical principles, this research phase utilized the survey method to identify potential external factors crucial for results analysis. Recognized as an efficient data-gathering tool, the survey was chosen for its efficacy in data procurement.

However, (Flick, 2011) notes that an effective survey hinges on the questions it aims to address, challenging participants to deeply contemplate the topic prior to answering. Questions must be succinct, lucid, relevant, and targeted (Saunders et al. 2014) and structured to evaluate specific variables (Denscombe, 2017). The devised survey consists of three sections: demographics, consumables and minor item queries, and major equipment procurement inquiries. Feedback was solicited via a Likert scale. Data collection was tiered, sourcing secondary data from ADNOC Group. To ensure data confidentiality, company executives supervised the information retrieval. This tiered approach also facilitated the pilot study, influencing the final online survey's design. The online survey reached all ADNOC employees, with 312 completions. Post-analysis, only 248 comprehensive surveys were considered.
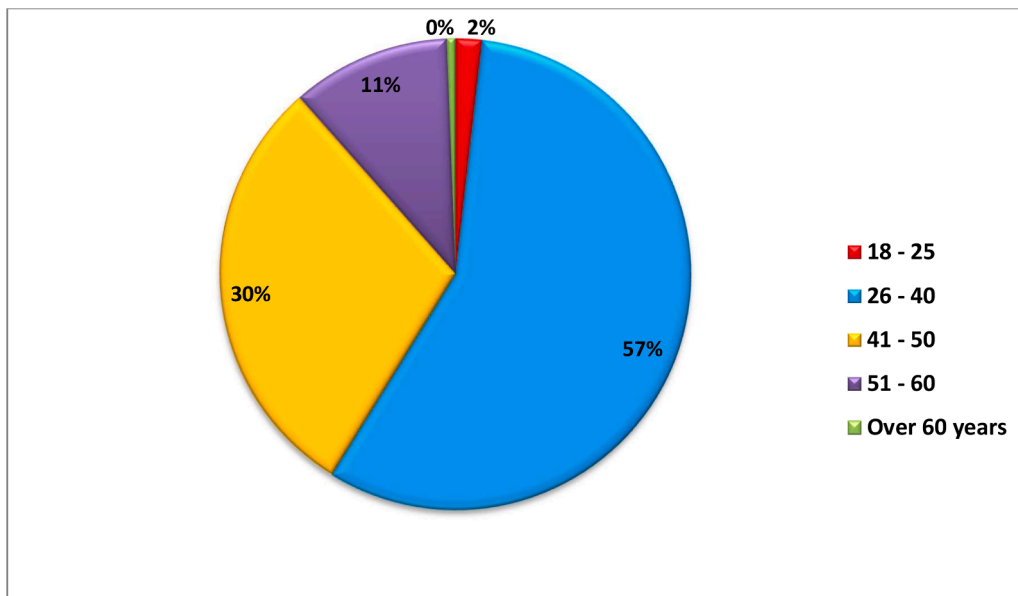
Fig. 4. Age range of respondents.

2.5. Participant demographics

Understanding participant demographics is crucial for research validity. This subsection sheds light on participant gender, age, tenure in the oil and gas sector, and duration within their current organizations.

2.5.1. Gender insights

Grasping the gender distribution within a sector can help pinpoint areas of focus and potential gaps. While this study doesn't centralize the effects of gender balance in the oil and gas industry, it's still valuable to gauge its possible influence on the buyer-supplier relationship and the procurement strategies adopted in the UAE, as compared to the literature insights provided in Chapter Two. Thus, Fig. 3 will depict the proportional distribution of male and female respondents.

The data presented in the figure reveals a significant gender disparity among respondents, with males comprising 84 % and females making up the remaining 16 %. This finding indicates a male-dominated workforce in the UAE's oil and gas industry. While the predominance of males in the sector aligns with the UAE's traditionally male-oriented business culture (Yazeen and Okour, 2012), it also reflects the gender composition in a region that employs a considerable number of expatriates in its oil and gas companies. Consequently, procurement processes and decision-making within these organizations are likely influenced

predominantly by male perspectives. Although the existing literature does not specifically link gender dynamics to procurement relationships, this aspect could be a pertinent consideration when interpreting the outcomes of this research. The gender distribution among professionals in the industry may offer additional context to the study's findings, suggesting that gender could play a role in shaping procurement practices and relationships within the sector.

2.5.2. Age range

The age of respondents is a crucial factor in research as it helps to establish the maturity and decision-making capacity of the participants, providing insights into their potential to understand the context of the study comprehensively. To analyze the age distribution of the respondents, five age categories were established. These classifications allow for a clear understanding of the age range among the participants, which is detailed in Fig. 4. This demographic segmentation enables a more nuanced analysis of the data, ensuring that conclusions drawn are reflective of a group that is competent and informed enough to contribute meaningfully to the research topic.

Fig. 4 illustrates that none of the survey respondents is over 60, with only one individual falling into this age category, effectively rounding to 0 per cent. The data also indicates a workforce concentration in the oil and gas sector within the 26–40 age bracket and among individuals in
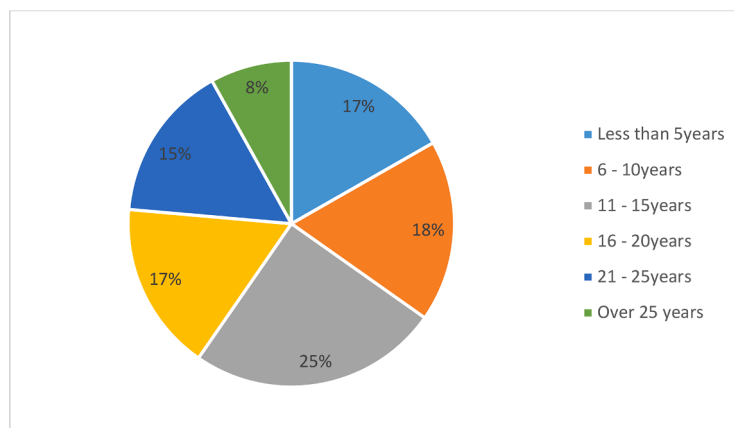

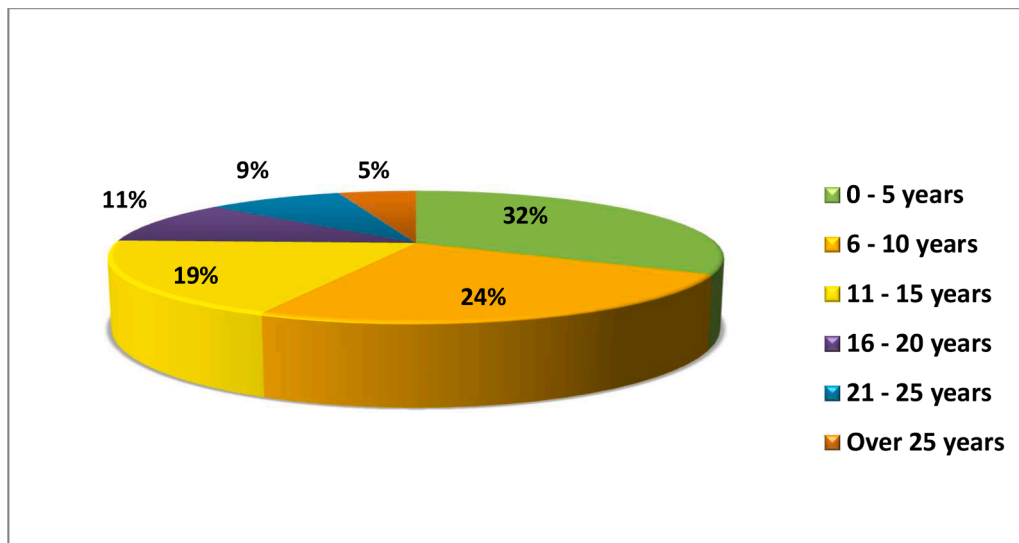**Fig. 5.** Respondent's years of experience.

Fig. 6. Respondents' years of experience in current organisation.

their forties. This trend suggests a lower representation of younger individuals, defined as those 30 years old and under in the UAE, within the sector. The prevalence of a mature workforce implies that the sector is largely staffed by expatriates, a finding corroborated by secondary data. The UAE's oil and gas industry tends to recruit foreign nationals, valuing their experience as a critical asset for the sector's development. While experience is a valuable commodity, its influence on the procurement strategies employed within the industry cannot be overlooked. The focus on age demographics naturally led to inquiries regarding years of experience, linking age with professional expertise and its potential impact on procurement practices. The subsequent questions in the survey were designed to delve deeper into the relationship between age, experience, and procurement strategies in the UAE oil and gas sector.

2.5.3. Years of experience

The number of years an individual has worked in a sector is often indicative of their level of expertise and familiarity with industry-specific practices and challenges. To evaluate this premise, years of experience are divided into five distinct categories, which are graphically represented in Fig. 5. This categorization aids in assessing the depth of industry knowledge among respondents, which is essential for deriving insights that are grounded in substantial professional exposure and experience.

The result shows that the highest representations are those with 11 to 15 years of experience, followed by those with 6 to 10 years and those with 16 −20 years and less than 5 years, respectively. This pattern of results is not conclusive because respondents may have started their profession in the field in the UAE and are not necessarily foreign nationals. To determine this, the next question focused on years of experience in the current organisation.

2.5.4. Years of experience in current organisation

The duration of respondents' tenure within their current organization, as well as their overall experience in the oil and gas sector, are critical for providing informed and objective responses regarding procurement strategies in the context of this survey. Establishing the range of their professional tenure is essential for ensuring the validity and reliability of the survey's data and findings. Hence, Fig. 6 illustrates that a significant portion of respondents has less than five years of experience in their present organization. This information is pertinent to understanding the perspectives and insights shared in response to the survey questions.

Fig. 6 indicates that 32 % of respondents have less than 6 years of

tenure in their present organization, a percentage higher than those with under 6 years of experience in the field. This suggests that some participants might have switched between organizations. Yet, it's notable that 44 % have over a decade of experience in their sector, even though it's not a majority. This insight guided our interpretation in the discussion segment and influenced our analytical methods, ensuring data credibility and consistent findings.

2.6. Analytical approach

This segment outlines the techniques and processes implemented for interpreting and confirming findings. We utilized the Statistical Package for Social Sciences (SPSS) to process the quantitative survey results – a popular software for evaluating study variables. SPSS is apt for this survey's evaluation. Moreover, we employed Cronbach's alpha to ensure the reliability and coherence of our variables. As Alhammadi (2019) posits, Cronbach's alpha evaluates the correlation between grouped items, often called internal coherence.

2.6.1. Evaluation framework

Cronbach alpha is widely recognized for its efficacy in scale dependability. A high alpha value suggests a singular dimensional measure, crucial when it's imperative to verify a scale's dimensionality (Hogan and Illingworth, 2000). In this scenario, dimensionality is verified using factor analysis. Cronbach alpha, though not a statistical test per se, functions as a consistency coefficient. It aims to test dependability, unlike convergent and discriminant, which validate. A score range of 0 to 1 is deemed optimal, while negative values suggest data anomalies. However, as pointed out by Padilla & Divers (2016), an alpha between 0.70 and 0.80 is commendable, while above 0.90 is optimal. Such benchmarks guide the forthcoming chapter's outcomes. Integrating data from diverse sources is pivotal for refining the buyer-supplier relationship in the UAE's energy sector. The subsequent segment delves into the ethical aspects of our research.

Additionally, the survey's demographic details, as previously covered, undergo further scrutiny via SPSS and Cronbach alpha. As stated by Kumar et al. (2014), digital tools can streamline complex statistical methods, visualizing and graphing data effectively. Bryman (2008) underscores that such tools not only aid in data processing but also maintain data integrity.

2.6.2. Ensuring research credibility and consistency

Validity measures the authenticity of research outcomes in real-

Table 3
Validity types and process.

Tests	Research Tactics and Plan	Phase of research in which tactics occur
Internal validity	Do explanation-building	Data analysis
	Do hypothesis testing	Data analysis
	Do time-series analysis	Data analysis
External validity	Use replication logic in survey	Research design
Construct validity	Use multiple sources of evidence	Data collection
	establish chain of evidence	Data collection

Table 4
Internal validity and reliability results.

Variables	Cronbach' Alpha	N of questions
Buyer-supplier relationship	.72	7
Purchase classification	.75	8
Purchasing strategies effectiveness	.75	8

world scenarios. Flick (2011) classifies potential inaccuracies into three types: the first concerns wrong assumptions, the second involves erroneously dismissing accurate data, and the third arises from posing irrelevant queries. Creswell et al. (2011) discern that while validity gauges appropriate concept measurement, reliability focuses on measurement consistency. Both these elements govern internal coherence. Various methodologies exist to ensure research validity and reliability. For instance, Johnson et al. (2010) and Saunders et al. (2015) distinguish between construct, internal, and external validity types. External validity contemplates the broader applicability of research outcomes, often associated with qualitative studies. Construct validity, conversely, is concerned with operational metric definitions (Kumar et al., 2014). This type leverages multiple data sources, evidence chains, and triangulation for validation. Internal validity, in contrast, assesses inter-variable relationships and influential external factors. Table 3 succinctly describes these validity types, commonly invoked in research endeavours.

Table 3 outlines the strategies, plans, and stages at which three types of validity are employed in research. In this quantitative case study, two validity types identified in the table were applied. Internal validity was utilized to derive explanations from theoretical constructs through a deductive process. This deductive reasoning enabled the formulation of research questions pertaining to the explication of buyer-supplier relationships, procurement categorization, and the efficacy of purchasing strategies. Furthermore, the study measured the internal validity and reliability of each variable to ascertain Cronbach's alpha coefficient, which is a measure of scale reliability. The results concerning the internal validity and reliability—indicative of how well each question gauged the intended variables—are documented in Table 4. This approach to validation ensures that the study's findings are based on a sound and rigorous assessment of the data collected.

Padilla and Divers (2016) state that a Cronbach's alpha value of 0.7 or higher is indicative of good internal validity, meaning the survey questions are effectively measuring what they are intended to measure. In this study, internal validity and reliability were secured by employing an explanation-building approach to data analysis, which involves a detailed examination of the case study data to form a coherent explanation of the findings. The study's research questions and variables served as tools for testing and enhancing internal validity, allowing for a rigorous examination of the constructs under study. Construct validity was also a focus, achieved through the integration of primary and secondary data in discussing the results and reaching conclusions related to each research objective. This form of validity was further affirmed through meticulous testing, including the assessment of internal consistency and the averaging of response scores from participants. The

Table 5
Internal validity and reliability results.

Procurement type	Variables	Code
Consumables and minor items (Tier B)	Buyer-supplier relationship	PCMA 1- 7
	Purchase classification	PCMB 1 - 8
	Purchasing strategies effectiveness	PCMC 1 – 8
Major Equipment (Tier A)	Buyer-supplier relationship	PMEA 1- 7
	Purchase classification	PMEB 1 - 8
	Purchasing strategies effectiveness	PMEC 1 – 8

section in question delineates the analysis of data collected throughout the study, describing the analytical process and the review of findings. The discussion underscores how the research supports and validates the data to ensure that its contribution to academic knowledge is well-founded. Moreover, the explanation of these processes accounts for ethical considerations, ensuring that the study adheres to the required standards of research integrity and academic rigor.

3. Results and discussions

3.1. Research questions and demographic information

The literature review generated some questions that needed to be answered in order to achieve the research objectives and overall purpose for conducting this study. These questions are:

a) What type of buyer-supplier relationships exist in the UAE oil and gas sector?
b) What purchasing strategy best explains the current status of procurement in ADNOC?
c) Which purchasing classification and supplier relationship are most effective in ADNOC?
d) What factors influence supplier relationships in ADNOC?

The methodology for examining the procurement practices at ADNOC employs a structured coding system to classify data and streamline the analysis. The procurement of consumables and minor items, designated as Tier B, is captured under the PCM code, while procurement related to major equipment, designated as Tier A, is denoted with the PME code. This coding is further subdivided into three sections—A, B, and C—for each tier, with each section corresponding to a set of questions that address the four central research questions of the study. This coding scheme enables a systematic approach to data presentation and ensures clarity in the findings related to each procurement category. It avoids potential overlaps and redundancies by distinguishing the data according to the type of procurement under investigation. Table 5 illustrates how distinct codes correlate with similar variables across different procurement types, ensuring that the analysis remains organized and that key findings are easily attributable to their respective procurement categories. This organized approach facilitates a more effective data interpretation process and supports the overarching research objectives.

The details in the table align with the internal validity and consistency highlighted in Table 5 from the prior chapter. This table reveals that there are 7 queries related to the buyer-supplier relationship, 8 inquiries centred on purchase type evaluation, and 8 about gauging the efficiency of purchasing tactics, as noted by Wynstra et al. (2018). The diversity in questions arises from Kraljic's (1983) assertion that distinctive purchasing types mandate distinct procurement approaches, each underpinned by specific practices and assets. This explains the increased number of questions regarding purchase type categorization and the efficacy of buying tactics in the survey. Consequently, a dual set of outcomes is expounded and deliberated in this segment. The emphasis on acquiring accurate data determined the selection of participants,

Table 6
Test for internal validity of PCM.

	Question	Highest Value	Frequency	Percentage	Cronbach's Alpha
PCMA					0.72
	PCMA1	4	66	26.61	
	PCMA2	4	46	18.55	
	PCMA3	4	57	22.98	
	PCMA4	4	58	23.39	
	PCMA5	4	54	21.77	
	PCMA6	4	39	15.73	
	PCMA7	4	37	14.92	
PCMB					0.75
	PCMB1	4 & 5	46	18.55	
	PCMB2	4	59	23.79	
	PCMB3	4	50	20.16	
	PCMB4	4	51	20.56	
	PCMB5	4	45	18.15	
	PCMB6	4	52	20.97	
	PCMB7	3	47	18.95	
	PCMB8	4	52	20.97	
PCMC					0.75
	PCMC1	4	51	20.56	
	PCMC2	2	38	15.32	
	PCMC3	4	50	20.16	
	PCMC4	4	52	20.97	
	PCMC5	4	43	17.34	
	PCMC6	4	57	22.98	
	PCMC7	4	54	21.77	
	PCMC8	2	36	14.52	

Table 7
Test for internal validity of PME.

	Question	Highest Value	Frequency	Percentage	Cronbach's Alpha
PMEA					0.72
	PMEA1	2	36	14.52	
	PMEA2	4	48	19.35	
	PMEA3	4	34	13.71	
	PMEA4	4	40	16.13	
	PMEA5	4	49	19.76	
	PMEA6	4	46	18.55	
	PMEA7	2	25	10.08	
PMEB					0.75
	PMEB1	4	26	10.48	
	PMEB2	4	43	17.34	
	PMEB3	4	50	20.16	
	PMEB4	4	32	12.90	
	PMEB5	3	31	12.50	
	PMEB6	4	40	16.13	
	PMEB7	4	36	14.52	
	PMEB8	3	29	11.69	
PMEC					0.75
	PMEC1	4	48	19.35	
	PMEC2	4	41	16.53	
	PMEC3	2	30	12.10	
	PMEC4	4	45	18.15	
	PMEC5	4	48	19.35	
	PMEC6	4	31	12.50	
	PMEC7	4	46	18.55	
	PMEC8	4	40	16.13	

detailed in the methods chapter. Information about participants and results from the UAE survey previously discussed shape this chapter's essence. To reiterate, demographic results demonstrate a male predominance in the UAE's energy sector. Most oil and gas sector employees are aged 26 to 50. A substantial segment boasts a tenure of 6 to 25 years in this industry. An overwhelming 86 % have been with their present employer for under two decades. These metrics underscore the participants' cumulative industry familiarity, ensuring their feedback's relevance. Such factors hold weight, as outlined by Iacob et al. (2012) when elucidating tangible outcomes from supplier relationship management and industry-specific conditions.

3.2. Verification of variables

While procurement maturity often dictates strategy choices, Lee and Drake (2010) spotlight how strategic procurement aids companies in realizing their market ambitions. On the other hand, Ates et al. (2018) shed light on the decisive roles leaders play in shaping procurement frameworks and tactics. The survey consequently probed participants on their departmental affiliations, though all were part of the procurement cycle. Demographic data revealed that 52 % hail from departments other than supply chain, while the rest belong to supply-chain roles. This demographic mix enriched the results, offering a balanced view of the buyer-supplier dynamic and the procurement methods employed in UAE's energy firms, discussed later in this section. The following part delves into variable tests and their outcomes.

3.2.1. Examination of PCM variables

As cited, the assessment touches upon two procurement categories, broken down into 23 individual questions per category. This section shares insights from the measurement model. It pinpoints the prevalent response chosen by participants for PCMA-related questions, which is 'agree', represented by the numeral 4. Moreover, the Cronbach's alpha value for PCMA stands at 0.72, as showcased in Table 6.

Table 6 presents that the value for Purchase Classification Measurement B (PCMB) received the highest selection frequency from respondents. Notably, for PCMB1, the responses "agree" and "strongly agree" both had an identical frequency of 18.55 %. For PCMB7, the most frequent response was "neutral," suggesting that respondents neither agree nor disagree with the statement, an aspect that merits further discussion in relation to purchase classification. The reliability of the PCMB responses is supported by a Cronbach's alpha coefficient of 0.75, indicating good internal consistency and justifying the acceptance of the PCMB results as valid. Similarly, Purchase Classification Measurement C (PCMC) demonstrated notable results; despite "agree" being the most frequently chosen response, PCMC2 and PCMC8 had "disagree" as the most selected option. The validity of the PCMC construct is also affirmed with a Cronbach's alpha of 0.75, pointing to a reliable measurement. Consequently, the findings from this section of the survey are deemed valid. Although the loading error for Purchase Classification Measurement A (PCMA), PCMB, and PCMC varies and the percentage for each construct is less than 50 %, the Cronbach's alpha values exceeding the 0.70 benchmark confirm the validity and reliability of these results. The distinctive outcomes observed in PCMB (specifically PCMB1 and PCMB7) and PCMC (notably PCMC2 and PCMC8) are acknowledged and will be further explored in the subsequent discussion.

3.2.2. Test for PME variables

A similar process for PCM is applied to carry out tests for PME variables. This is presented in Table 7, which shows the test results for the internal validity of PMEs.

Table 7 indicates that for the Purchase Methods Evaluation A (PMEA), both PMEA1 and PMEA7 yielded a most frequent value of '2', which corresponds to 'disagree'. Similarly, for Purchase Methods Evaluation B (PMEB), both PMEB5 and PMEB8 recorded '3' as their most frequent value, aligning with 'neutral'. For Purchase Methods Evaluation C (PMEC3), 'disagree' was the predominant response among participants. Despite the diverse responses for the PME variables, Cronbach's alpha for PME was comparable to that of PCM, suggesting a level of internal consistency within the data. A Cronbach's alpha greater than 0.5 indicates that the survey questions are effectively assessing the variables they were designed to test. This is a crucial factor in producing valid results. The varying response values are less of a concern when Cronbach's alpha serves as a benchmark to validate that the survey instruments are accurately measuring the intended variables. The section corroborates the validity of the survey questions for the variables they

Table 8
Mean values for each PCM scale and variables.

Variable	N	Mean	Std dev	Cronbach's alpha
PCMA total	116	24.78	3.66	0.72
PCMB total	108	28.80	4.00	0.75
PCMC total	98	27.34	3.85	0.75

Table 9
Test for the impact of gender on PCMA, PCMB and PCMC.

	Gender recode	N	Mean	Std. Deviation	T-Test	Significance
PCMA total	Male	98	24.56	3.58	1.48	0.141
	Female	18	25.94	3.98		
PCMB total	Male	93	28.81	3.90	0.07	0.948
	Female	15	28.73	4.70		
PCMC total	Male	88	27.35	3.61	0.12	0.906
	Female	10	27.20	5.81		

Table 10
Test for impact of age range on PCMA, PCMB and PCMC.

	Age recode	N	Mean	Std. Deviation	T-Test	Significance
PCMA total	</= 40 years	67	25.22	3.76	1.55	0.124
	> 40 years	49	24.16	3.47		
PCMB total	</= 40 years	60	29.33	4.55	1.57	0.119
	> 40 years	48	28.13	3.10		
PCMC total	</= 40 years	52	27.60	4.50	0.71	0.481
	> 40 years	46	27.04	2.97		

Table 11
Test for the impact of years in organisation on PCMA, PCMB and PCMC.

	Years in organization recode	N	Mean	Std. Deviation	T-test	Significance
PCMA total	</= 10 years	39	25.62	4.09	1.91	0.058
	>10 years	76	24.26	3.31		
PCMB total	</= 10 years	34	29.91	4.48	2.05	0.043
	>10 years	73	28.23	3.68		
PCMC total	</= 10 years	28	28.39	5.05	1.68	0.096
	>10 years	69	26.96	3.20		

sought to evaluate. The application of Cronbach's alpha in assessing the validity of these variables ensures that, despite the variation in responses across PCM and PME, the resulting data is both valid and reliable, aligning with the research objectives. The forthcoming section will detail the principal findings for both PCM and PME, laying out the implications of these results within the context of the study.

3.3. Findings for PCM and PME

The findings for PCM and PME reflect important insights into ADNOC's procurement practices with respect to Tier B (consumables and minor items) and Tier A suppliers (major equipment), respectively. They underscore the perceptions and efficacy of existing supplier relationships, procurement categorizations, and the success of purchasing strategies.

For Tier B suppliers (PCM), the research would have delved into the nuances of how consumables and minor items are sourced, managed, and categorized. It would likely assess how these procurement activities align with ADNOC's broader operational goals and explore the depth of relationships with suppliers providing these goods.

For Tier A suppliers (PME), the focus would be on the procurement of major equipment, a critical operation considering the scale and impact of such purchases on the company's operations. This tier's findings would examine the strategic alignment of procurement practices with long-term corporate objectives and the strength of relationships with key equipment suppliers.

The test outcomes provide a comprehensive look at the effectiveness of ADNOC's purchasing strategies. These strategies are important for maintaining the company's competitive edge, ensuring the reliability of its supply chain, and achieving operational efficiency. By examining the effectiveness of these strategies, ADNOC can identify areas of strength to build upon and potential weaknesses to address, ensuring that procurement functions support overall business sustainability and growth.

3.3.1. PCM – Tier B findings

Table 8 presents the mean values for each scale. It is the measure of variables that shows a comparison between the buyer-supplier relationship, purchase classification, and effectiveness of purchasing strategies.

The analysis of mean values for Purchase Classification Measurement (PCM) did not reveal any anomalies for the most part, except specific variables from PCMB (PCMB1 and PCMB7) and PCMC (PCMC2 and PCMC8) identified previously. This suggests that while these variables will require further discussion, there is a need to scrutinize the factors

that could influence the PCM supplier relationship. This analysis is contextualized with the demographic data from the survey respondents. The decision to examine the impact of personal and social factors on supplier relationship effectiveness draws upon the work of Iacob et al. (2012), who posited that these factors are critical to the success of such relationships. The study also seeks to determine whether additional factors influence supplier relationships in ADNOC, beyond those recognized in the literature, such as market analysis, strategic positioning, action plans, and cultural influences, as discussed by Hesping and Schiele (2016). Consequently, Table 9 is dedicated to evaluating the effect of gender on the buyer-supplier dynamic, procurement categorization, and the efficacy of procurement strategies. This evaluation involves testing for statistically significant differences, using a threshold p-value of less than 0.05 to ascertain significance. The test results will help identify whether gender plays a notable role in shaping procurement practices and strategies within ADNOC.

Table 9's findings reveal that the significance levels for PCMA, PCMB, and PCMC variables are 0.141, 0.948, and 0.906, respectively, which exceed the standard threshold of 0.05 for statistical significance. These results suggest that gender does not significantly influence the variables within this category. In other words, the difference in mean scores between male and female respondents is not statistically meaningful, indicating that the impact of gender on these variables is negligible. Following this analysis, an additional test was conducted to examine the potential influence of age on the variables in question. The outcomes of this subsequent analysis are documented in Table 10.

The lack of significant differences across age ranges suggests that respondents' maturity or generational perspective does not skew their perception of buyer-supplier relationships, purchase classifications, and the effectiveness of purchasing strategies within ADNOC. This indicates that these procurement dynamics are viewed consistently regardless of age, which is beneficial because it suggests a shared understanding and acceptance of procurement practices across the organization's demographic. In contrast, the test results showing differences based on tenure within the organization (as revealed in Table 11) suggest that the amount of time employees spend at ADNOC influences their confidence in and perception of procurement categories and their effectiveness.

Table 12
Mean values for each PME scale and variable.

Variable	N	Mean	Std Dev
PMEA total	88	24.25	3.82
PMEB total	84	28.75	3.93
PMEC total	80	28.57	3.81

This could be due to several reasons:

Familiarity with Organizational Practices: Longer-tenured employees may better understand ADNOC's procurement processes and the underlying reasons for certain classifications and strategies.

Adaptation to Organizational Changes: Employees with more years of service might have witnessed shifts in procurement strategy and supplier relationships, giving them a broader context to evaluate current practices.

Insight into Procurement Outcomes: Tenured employees will likely have seen the long-term outcomes of procurement decisions, providing them with a unique perspective on what works and what does not.

This finding is significant as it suggests that experience within the company could be a factor in shaping perceptions about the procurement process and its effectiveness. It may also point to potential challenges in aligning perceptions and practices between newer and more established employees. Understanding these dynamics can help ADNOC tailor its training and communication strategies to ensure a unified approach to procurement across the organization.

Table 11 indicates a noteworthy pattern: employees with over ten years of experience within the organization demonstrate a statistically significant difference in their perception of purchase classification compared to their less experienced counterparts, with a p-value below 0.05. This suggests that the confidence in purchase classification decisions tends to diminish with increased organisational tenure. This unique observation has not been prominently featured in existing literature or previous studies, marking it as an original contribution of this research. This revelation prompts an in-depth examination of the PME variables to understand how tenure may similarly affect other aspects of procurement, such as the perception of the effectiveness of supplier relationships or the strategic value of significant equipment procurement. It challenges the assumption that experience uniformly enhances procurement proficiency and suggests a more complex relationship that warrants further exploration. The subsequent analysis of PME variables may reveal if this trend is an isolated phenomenon within purchase classification or if it extends to broader procurement practices within the organization.

3.3.2. PME – Tier A findings

The findings for PCM have set a precedent for examining the PME variables with the expectation of uncovering unique insights. Accordingly, the same analytical rigour applied to PCM is extended to PME, with a detailed presentation of mean values for each scale provided in Table 12. A preliminary review of the PME data suggests that the outcomes related to buyer-supplier relationships, purchase classifications, and the effectiveness of strategies show no substantial deviation from those observed for PCM. This consistency allows for a cohesive interpretation across different procurement categories, enabling a comprehensive understanding of the procurement dynamics in ADNOC. The subsequent discussion will likely explore how these findings correlate with theoretical insights and what implications they may hold for procurement practices within the organization.

Similar to PME, the examination of PCM variables did not present any notable deviations. However, it was observed that respondents generally disagreed on certain variables—specifically PMEA1, PMEA7, and PMEC3—while they remained neutral on PMEB8. The analytical process subsequently honed in on the determinants that might affect buyer-supplier relationships, procurement categorization, and the efficacy of procurement strategies. This step is preparatory for a

Table 13
Test for impact of gender on PMEA, PMEB and PMEC.

	Gender recode	N	Mean	Std. Deviation	T-value	Significance
PMEA total	Male	80	24.24	3.68	−0.10	0.923
	Female	8	24.38	5.29		
PMEB total	Male	76	28.62	3.78	−0.95	0.347
	Female	8	30.00	5.24		
PMEC total	Male	72	28.51	3.52	−0.43	0.670
	Female	8	29.13	6.20		

Table 14
Test for the impact of age range on PMEA, PMEB and PMEC.

	Age recode	N	Mean	Std. Deviation	T-Test	Significance
PMEA total	</= 40 years	47	24.40	4.20	0.40	0.687
	> 40 years	41	24.07	3.36		
PMEB total	</= 40 years	47	29.34	4.55	1.57	0.121
	> 40 years	37	28.00	2.85		
PMEC total	</= 40 years	45	29.11	4.36	1.43	0.155
	> 40 years	35	27.89	2.89		

Table 15
Test for impact of years in organisation on PMEA, PMEB and PMEC.

	Years in organization recode	N	Mean	Std. Deviation	T-Test	Significance
PMEA total	</= 10 years	26	25.27	4.32	1.64	0.105
	>10 years	62	23.82	3.54		
PMEB total	</= 10 years	26	30.58	4.52	2.99	0.004
	>10 years	58	27.93	3.36		
PMEC total	</= 10 years	24	30.54	4.78	3.19	0.002
	>10 years	56	27.73	2.99		

comprehensive interpretation of the results in the following section. Table 13 details the testing for the influence of gender across three variables, spanning 23 questions. Analogous to the PCM analysis, this test seeks to ascertain significant differences, which a p-value of less than 0.05 would indicate.

Table 13 shows that gender does not impact any part of PMEA, PMEB, or PMEC. A similar test is conducted for the age range to determine the potential impact, if any. Table 14 shows the findings of the test.

Table 14 shows no significant difference between those below 40 years and those above 40 years. However, the impact of years spent in an organisation does not reveal the same result as the impact of age. Table 15 shows the test for effects of years spent in an organisation on PMEA, PMEB and PMEC.

Table 15 highlights discernible disparities in the values for Purchase Methods Evaluation B (PMEB) and Purchase Methods Evaluation C (PMEC). The results, emphasized in bold, show a statistical significance (with p-values less than 0.05) for PMEC among respondents with ten years or fewer of tenure versus those with more than ten years of tenure in their organization. This suggests that the length of service in a UAE oil and gas organization may inversely affect employees' confidence in purchase classification and the perceived effectiveness of purchasing strategies. In other words, the findings indicate that these two factors—purchase classification and strategy effectiveness—are affected by

Table 16
Differing views on buyer supplier relationship in ADNOC.

	Dept recode	N	Mean	Std. Deviation	T-Test	Significance
PCMA total	Non- supply chain	86	24.27	3.53	−2.59	0.011
	Supply chain	30	26.23	3.70		

the duration of employment within the industry, specifically in the context of the UAE. The section completes the presentation of findings regarding PCM and PME. Sections 3.2 and 3.3 have brought to light specific insights related to ADNOC, which extend beyond the general observations. The significance of these findings will be elaborated upon in the subsequent analysis, focusing on their implications for the research variables under study. This comprehensive review of the data provides a deeper understanding of the internal mechanisms at ADNOC, to improve procurement practices.

3.4. Interpretation of findings

This section delves into interpreting the results discussed earlier in this part. The outcomes are deemed valid because the survey questions reliably reflected the intended constructs. Accordingly, the results elucidated in this chapter are considered credible and are associated with tangible implications for ADNOC's procurement and supplier relationships. A closer examination is provided in areas where substantial consensus or divergence in views exists. The interpretive emphasis lies on the variables and survey items that garnered the most agreement among respondents from supply chain and non-supply chain backgrounds and on items that demonstrated significant discrepancies in perspectives between these two respondent groups.

3.4.1. Implication of PCM findings

The findings related to PCM, which addresses consumables and minor items supplied by Tier B suppliers, present notable points for discussion. For instance, significant differences in mean scores were observed when comparing buyer-supplier relationship perceptions between respondents from non-supply chain and supply chain departments. This discrepancy, as reflected in Table 16, warrants a closer analysis to understand the underlying reasons for such divergence and to explore its implications for procurement practices within ADNOC. Interpreting these findings involves examining the dynamics of procurement from the perspective of different organizational roles and understanding how position within the company may influence perceptions of supplier relationships. It may also entail investigating the specific factors that lead to variations in viewpoints, such as differences in daily responsibilities, strategic involvement, or exposure to supplier interaction. These insights can be critical for ADNOC in aligning its procurement strategies across departments and enhancing supplier relationship management.

The responses to PCMA1, PCMA4, and PCMA3 reveal the respondents' perceptions of the supplier relationships at ADNOC, ranked in descending order of reflectiveness. These items were designed to assess the prevalence of exploit and balanced buyer-supplier strategic positions within the organization. The opinions diverge depending on the respondent's role, with supply chain professionals viewing an exploit approach as more common in ADNOC, while non-supply chain respondents perceive a balanced relationship. The types of items associated with these supplier relationships are categorized as leverage items (associated with exploit relationships) and strategic and non-critical items (related to balanced or mutually dependent relationships). According to Sepehri (2013), while none of these items are detrimental to the buyer, they present varying degrees of profit impact and supply risk. For instance, leverage items are characterized by a high-profit impact but low supply risk, strategic items by high-profit impact and high

supply risk, and non-critical items by low-profit impact and low supply risk (Tangpong et al., 2015). The significance of this finding for ADNOC lies in the interplay between supplier relationship dynamics and the corresponding profit impact and supply risks of different item classifications. These factors must be judiciously managed to strengthen supplier relationships.

Regarding PCMB, which examines purchase classifications specific to ADNOC, the results show consistencies and discrepancies compared to the PCMA findings. For instance, PCMB2, PCMB6, and PCMB8 rank high in percentage and reflect the presence of strategic, bottleneck, and non-critical items, respectively. While the findings for strategic and non-critical items correspond with the PCMA interpretation, the prominence of bottleneck items presents a notable contradiction. The acknowledgement of dominant suppliers and the associated risks and challenges with procurement suggests that ADNOC also deals with considerable bottleneck items, which were not as evident in the PCMA analysis. This discrepancy points to a complexity in ADNOC's procurement that requires further exploration, especially concerning how bottleneck items, despite their lesser visibility in the initial analysis, play a significant role in the organization's purchasing strategy.

The insights gained from PCMA suggest a potential gap in ADNOC's comprehension of the interplay between supplier relationships, purchasing strategies, and classification. A lack of awareness can lead to obstacles in understanding the ramifications of managing bottleneck items, characterised by low-profit impact and high supply risk, and often result in supplier dominance and low buyer-supplier interdependence. The existence of significant bottleneck items can skew the procurement process towards supplier dominance to the detriment of a balanced buyer-supplier relationship. Such dominance may lead to a situation where ADNOC is disadvantaged due to high supply risks and a lack of mutual engagement in procurement activities. Regarding purchasing strategy effectiveness, the respondents seem to align in recognising the current approach to bottleneck items as the most effective, despite its supplier-dominant nature. This perception suggests that the most prevalent procurement strategy may not be in ADNOC's best interest but tilts the advantage towards suppliers. The implications are multifaceted:

- For bottleneck items, which are supplier-dominated, ADNOC may need to develop risk assessment measures and contingency plans, which could entail additional costs.
- When dealing with non-critical items, the frequent procurement from various suppliers might increase administrative and logistical expenses, although these transactions have fewer commercial or technical challenges and exhibit a balanced power dynamic.
- With leverage items, where buyer dominance prevails, ADNOC experiences a different kind of interdependence, which is lower than that with strategic items but higher than with bottleneck items.

Thus, to improve the procurement process, ADNOC might consider strategies that reduce supplier dominance in bottleneck items and maintain the equilibrium achieved with routine items. The discussion of PCM has not only unveiled new insights but also underscored the impact of tenure within an organization on purchasing classification and supplier relationships. Table 11's demonstration of variances in mean scores between staff with different lengths of service further underlines the influence of organizational experience on procurement practices and strategies.

3.4.2. Implication of PME findings

The Purchase Methods Evaluation (PME) for significant equipment, predominantly sourced from Tier A suppliers, yielded distinct results. Similar to the Purchase Classification Measurement (PCM), the PME analysis revealed respondents' perceptions about supplier relationships within ADNOC concerning central equipment procurement. Respondents identified PMEA5, PMEA2, and PMEA6 as the key indicators of the supplier relationship status for major equipment in ADNOC. These

indicators suggest a notable presence of diversify (supplier dominance) in the procurement of major equipment, with both PMEA5 and PMEA6 confirming this trend. Unlike PCM, there was no discrepancy between supply chain and non-supply chain respondents; all showed a decisive inclination toward recognizing the diversify relationship as prevalent. The classification of items within the diversify category includes bottleneck items, which are marked by supplier dominance, while exploit relationships are associated with leverage items, characterized by buyer dominance. The findings imply that in major equipment procurement, the situation is clear-cut: it's either supplier or buyer dominance. From the results for PMEB, which pertain to the purchase classification for major equipment, PMEB3, PMEB2, and PMEB6 stood out. These indicate a significant presence of both leverage (exploit) and bottleneck (diversify) items, with leverage items being the most dominant in terms of strategic positioning for major equipment procurement in ADNOC.

While strategic items do present a mutually dependent and balanced relationship between buyers and suppliers, they also carry high supply risks despite their high profit impact. Therefore, exploit (buyer dominance) appears to be the most prominent classification for PMEB. However, the presence of bottleneck items suggests an underlying risk of supplier dominance, potentially undermining the balance that could otherwise be achieved.

Regarding purchasing strategies, PMEC1, PMEC5, and PMEC7 were highlighted by respondents as reflective of the effectiveness of ADNOC's strategies. The data suggest that balanced (strategic items) and diversify (bottleneck items) power dynamics are considered to be on par in ADNOC, while mutual dependence (routine items) might be an inhibiting factor. In summary, the PME findings suggest that:

- Balanced relationships stemming from strategic item procurement can be managed through partnerships due to mutual dependence.
- Diversify relationships, originating from bottleneck items, expose buyers to risks due to supplier dominance, necessitating ADNOC to conduct risk assessments and contingency planning.
- If both balanced and diversify relationships are deemed equally effective, it may indicate that they are both influenced by market forces to a significant extent, lacking substantial benefit to the organization.

The overall deduction is that no single purchasing strategy or classification stands out as significantly more effective than others, particularly concerning the procurement of major equipment. This could imply that current purchasing strategies are driven by market dynamics and do not provide a competitive advantage or strategic strength to ADNOC. The Purchase Methods Evaluation (PME) has corroborated the Purchase Classification Measurement (PCM) findings in revealing that tenure within an organization significantly impacts both the classification of purchases and the effectiveness of supplier relationships. According to Table 15, the length of service, notably exceeding ten years, has a marked influence on the dynamics of supplier relationships as well as on the effectiveness of the purchasing classification strategy for central equipment procurement in ADNOC. This pattern suggests that more experienced individuals within an organization may have a deeper understanding of the procurement processes and supplier relationships, potentially influencing the procurement strategies and outcomes. It might also imply that with time, individuals in an organization accumulate knowledge that can lead to better negotiation power with suppliers, improved risk management strategies, and a more sophisticated approach to managing the procurement of major equipment.

The following section will delve into a detailed discussion of these findings, aiming to address the extent to which the research questions have been resolved. This discussion will likely explore the implications of these findings for ADNOC's procurement practices, with a focus on how the organization can leverage the experience and insights of its long-serving staff to optimize its procurement strategies for both immediate and long-term benefits.

3.5. Discussion of findings

The discussion section that scrutinizes the PME and PCM findings in relation to the research questions serves as a critical juncture where theoretical insights from earlier chapters on procurement, supplier relationships, and purchasing strategies are cross-referenced with the primary data collected from ADNOC. This methodological cross-examination facilitates a comprehensive understanding of the dynamics at play within ADNOC's procurement practices. This approach allows the researcher to validate findings through triangulation, where multiple data sources are combined to corroborate the results. The primary data was meticulously gathered to address a set of five research questions that were crafted to align with the secondary data previously evaluated. These questions, pivotal to the research aims and objectives, help to ensure that the study's findings are robust and grounded in empirical evidence. By drawing parallels between the primary data and the theoretical frameworks established in chapters two and three, the discussion provides a rich analysis that not only answers the initial research questions but also contributes new knowledge to the field. This analysis likely includes strategic recommendations for ADNOC, derived from identified patterns and trends concerning longevity in the organization, the prevalence of certain procurement strategies, and the impact of these factors on supplier relations and purchasing effectiveness. The overarching goal is to enhance ADNOC's procurement mechanisms and strategic partnerships, thereby bolstering its competitive edge in the oil and gas industry.

Question 1: *What type of buyer-supplier relationships exist in the UAE oil and gas sector?*

The literature on the UAE oil and gas sector's buyer-supplier relationships can be interpreted through network theory (NT), which has been shown to elucidate the underlying operational efficiencies, trust, and cooperation between parties. This theory uses the concept of nodes to illustrate the interconnections among buyers and suppliers, indicating the complexity and interdependency of modern supply chains.

In line with the characteristics explored in Chapter Three, Chicksand et al. (2012) highlighted how NT could enhance operational efficiency and foster trust and cooperation, which are crucial for the success of supply chain management. By applying the NT framework, the study delineates the types of buyer-supplier relationships in ADNOC into two distinct categories:

Tier A Relationships - These involve the procurement of major equipment, which likely necessitates a more strategic and high-level collaboration due to the high value and critical nature of such purchases.

Tier B Relationships - This category pertains to the procurement of consumables and minor items, which may require a different set of strategies focused on efficiency and routine transactional processes.

Using the buyer-supplier triad model proposed by Pagell et al. (2010), the relationships in ADNOC can be visualized in a triadic context where ADNOC represents one node, Tier A suppliers another, and Tier B suppliers the third. This triadic arrangement acknowledges the different dynamics and interactions that occur within each tier of procurement:

For Tier A procurement, the triad emphasizes strategic partnerships, innovation, and long-term contracts, with a focus on ensuring supply security and managing the higher levels of risk associated with critical equipment procurement.

In Tier B procurement, the triad may prioritize operational efficiency, cost-effectiveness, and supplier performance, reflecting a more transactional and possibly more competitive relationship.

The application of NT to the study's findings about ADNOC's procurement practices provides a structured way to analyze and enhance these relationships, taking into account the different needs and challenges of each tier. This theoretical underpinning is essential for proposing strategies that can optimize ADNOC's procurement activities, build resilient supply chains, and maintain a competitive advantage in
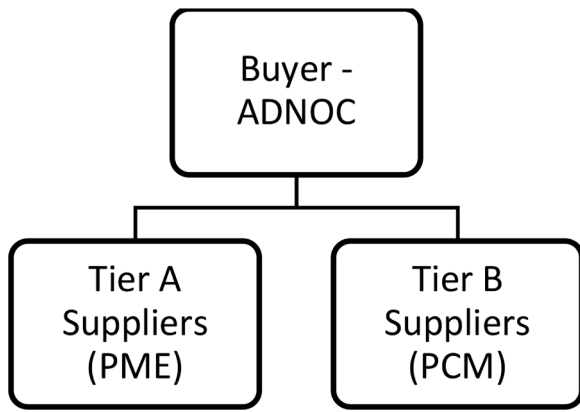
Fig. 7. Buyer-supplier triad for ADNOC.

the dynamic oil and gas sector.

In the context of the study, it appears that Fig. 7 does not show any direct interconnections between suppliers within the same tier, as might be suggested by Pagell et al. (2010). Instead, the relationships depicted are exclusively between the buyer (ADNOC) and Tier A suppliers for major equipment procurement, and separately with Tier B suppliers for consumables and minor items, without any inter-supplier connections. This isolated buyer-supplier dynamic indicates a centralized procurement model within ADNOC, where the core decision-making authority resides with the head or regional offices. Senior management within these offices is responsible for selecting suppliers and determining procurement specifics, aligning with the centralized structures described by Dubois and Pedersen (2002). Respondents from both the supply chain and non-supply chain departments at ADNOC corroborate this model, suggesting that the practice is widespread across the organization. However, this centralization presents certain drawbacks. It can overlook the competitive advantages and innovative solutions that a more decentralized or market-driven approach might offer. Specifically, it may neglect the unique capabilities and market knowledge that individual branches or local managers could contribute to procurement decisions. As a result, this structure could potentially lead to less optimal purchasing decisions for individual branches and lower overall satisfaction with procurement outcomes. The research findings also indicate that the nature of buyer-supplier relationships varies significantly between the two tiers. This variation suggests a need for tailored management strategies that reflect the specific requirements and

characteristics of each tier. For instance, Tier A relationships might benefit from a more collaborative and strategic approach due to the complexity and high stakes of major equipment procurement. In contrast, Tier B relationships might necessitate a focus on efficiency, cost control, and routine supply management due to the less complex nature of the items procured.

Understanding these differences is essential for ADNOC to optimize its procurement strategies and enhance overall supply chain performance. The implications of these findings should be further explored to determine how ADNOC can balance the benefits of centralization with the need for flexibility and responsiveness to local market conditions (Fig. 8).

Therefore, the type of buyer-supplier relationships that exist in ADNOC (UAE) are diversified and exploited for Tier A suppliers and explored and balanced for Tier B suppliers.

Question 2: *What purchase classification best explains the current status of procurement in ADNOC?*

The process of addressing the first question has indeed shed light on the prevailing procurement strategies in ADNOC. According to Gelderman and Semeijn (2006), a centralized purchasing strategy is the one that most accurately depicts the procurement operations within ADNOC. This strategy oversees purchasing activities and is applicable to both Tier A and Tier B suppliers, despite their differing relationship dynamics. Within this framework, different categories of items are procured under varying classifications that align with the specific needs of each tier:

For Tier A suppliers, which are involved in the procurement of major equipment, the classification of purchases often falls under leverage and strategic items. This distinction is drawn because Tier A procurement usually involves high-value transactions with a significant impact on the organization's strategic goals. Leverage items in this context may refer to commodities that can be sourced from multiple suppliers, allowing ADNOC to leverage its purchasing power for better terms. Strategic items, conversely, are critical to ADNOC's operations and require careful supplier selection and relationship management due to their high impact and potential supply risks.

For Tier B suppliers, the focus shifts to strategic and bottleneck items. Strategic items remain crucial but are likely less complex or high-stake than those in Tier A. Bottleneck items, on the other hand, maybe those that carry a risk of supply interruption or are from a limited number of suppliers, hence requiring more nuanced management to avoid operational disruptions.

The variation in purchase classification between the two tiers underscores the nuanced approach ADNOC must take to manage its
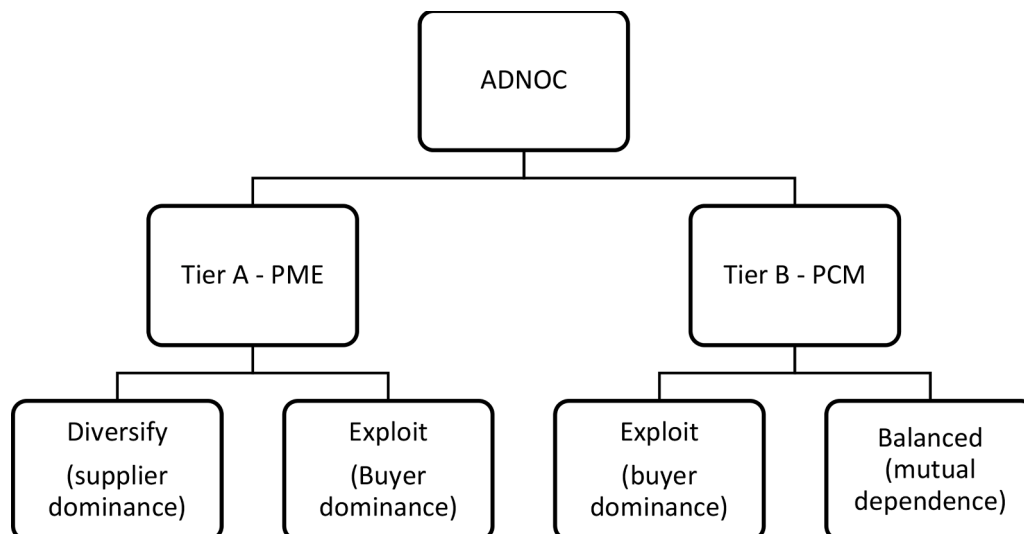

Fig. 8. Buyer-supplier relationship types of triad for ADNOC.

procurement effectively. By recognizing the unique challenges and opportunities within each tier, ADNOC can craft tailored strategies that maximize efficiency and minimize risk, ensuring that procurement supports the company's overall strategic direction.

Question 3: *Which purchasing classification and supplier relationship are most effective in ADNOC?*

For Tier A suppliers in ADNOC, the effectiveness of purchasing strategies appears to be a balance between diversification and exploiting relationships, indicating a dynamic approach to procurement. The balanced strategy reflects a symbiotic relationship where both parties are dependent on each other, while diversification suggests a risk-averse approach to avoid over-reliance on any single supplier. The conclusion drawn from the study's data triangulation suggests that neither strategy is superior in isolation because each carries inherent risks that could affect the other, leading to the assertion that no single strategy stands out as definitively more effective for major equipment procurement. In contrast, Tier B procurement in ADNOC reveals a preference for diversification, as well as non-critical and exploit strategies. Diversification in this context may refer to maintaining a wide base of suppliers for various minor and consumable items, ensuring that the company isn't critically affected by the failure of any single supplier. The non-critical classification involves items that, while necessary, do not impact the core operations of ADNOC and, therefore, can be sourced from a variety of suppliers without prioritizing long-term strategic relationships. The exploit classification typically represents leverage items, where the buyer can exercise control due to the high availability of alternative suppliers. From the responses, it seems that the diversified classification and the corresponding supplier dominance relationship type are perceived to be more effective for PCM (Procurement Classification Matrix) items. This may reflect the respondents' views that in the case of procurement for consumables and minor items, having a dominant position over suppliers ensures better control over procurement processes, reduces dependency, and potentially improves bargaining power and cost savings for ADNOC. The study's findings offer a nuanced perspective on procurement effectiveness, suggesting that different tiers require different strategies and that effectiveness is context-dependent, influenced by factors such as item criticality, market conditions, and the strategic importance of the items to ADNOC.

Question 4: *What factors influence supplier relationship in ADNOC?*

The years of experience of employees within an organization have been identified as a significant factor influencing procurement processes and outcomes in ADNOC. Specifically, the data suggests that employees with over a decade of experience bring a different perspective to purchasing strategies and supplier relationships, which in turn can impact the effectiveness of procurement operations. For PME (Procurement of Major Equipment), which involves high-stake procurement decisions, the influence of experience is twofold:

Purchase Classification: Experienced employees tend to have a more profound understanding of the procurement landscape and can more effectively classify purchases based on strategic importance and supply risk. Their insights into past trends, supplier performance, and market dynamics enable them to make informed decisions about which classification—leverage, strategic, or bottleneck—each purchase should fall under.

Effectiveness of Supplier Relationships: With greater experience comes a refined ability to manage and cultivate relationships with suppliers. Experienced staff can leverage their knowledge and networks to build partnerships that balance power dynamics and align with organizational goals, potentially leading to more favorable terms and reliable supply chains.

For PCM (Procurement Classification Management), where the focus is on consumables and minor items, the impact of experience is primarily on purchase classification rather than on the effectiveness of supplier relationships. This indicates that while experienced employees contribute valuable knowledge in categorizing purchases, the relationships in this sector are likely more transactional and not significantly

Table 17
Summary of findings.

	Tier A	Tier B
Supplier Relationship types	Diversify (supplier dominance)	Exploit (buyer dominance)
	Exploit (buyer dominance)	Balanced (mutual dependence)
Purchase Classification	Leverage	Strategic items
	Strategic	Bottlenecks items
Effective strategy	NONE *(Balanced & diversify were same)*	Diversify, non-critical and exploit

enhanced by tenure alone.The implications of these findings suggest that experience within the company not only contributes to a deeper understanding of procurement categories and processes but also equips employees with the skills necessary to foster strategic and beneficial supplier relationships. Consequently, ADNOC's procurement strategy and its outcomes, particularly for major equipment, might be substantially shaped by the collective experience of its workforce. This insight underscores the importance of harnessing the institutional knowledge of long-tenured employees to optimize procurement practices and relationships for long-term success.

Table 17 outlines the key findings for each variable tested and research questions. As noticed in the table, some elements are enhancing while some are major barriers to healthy relationships. Therefore, it is recommended that a model that may enhance supplier relationships in ADNOC and the wider UAE oil and gas sector needs to eliminate all elements that may hinder good supplier relationships.

4. Conclusion

The discussions suggest that in this sector, relationships where one party—either the supplier or the buyer—exerts more control, are particularly prominent. While it has been found that balanced relationships, characterized by mutual reliance, tend to occur with the procurement of consumable and minor items, the dominant relationship types still define procurement practices in the oil and gas industry. Nonetheless, the type of purchasing does not always align with these relationship models. For instance, strategic item classification is commonly applied to major equipment and minor item acquisitions, fostering interdependence and a balanced dynamic between the parties involved. It is notable that the prevailing relationship models in the industry and at the Abu Dhabi National Oil Company (ADNOC) do not fully align with the purchasing classifications used within the company. This discrepancy could explain the challenges respondents faced in identifying the most effective procurement strategy at ADNOC, where beneficial mutual relationships coexist with supplier-dominated ones. Problems such as extended transaction times, underutilization of support systems, and procurement inconsistencies all point to deeper issues with supplier relations and procurement processes. The infrequent use of ICT and other procurement platforms reflects a preference for direct engagement with suppliers to achieve timely and effective procurement—a goal not easily met through ICT alone. This points to a broader implication that issues with supplier relationships are not merely operational but fundamental, necessitating an in-depth examination to understand why existing relationships do not prevent or mitigate the problems that prompted this research.

CRediT authorship contribution statement

Ali Alhammadi: Writing – original draft. **Talal Yusaf:** Project administration. **Jeffrey Soar:** Investigation. **Bashar Mahmood Ali:** Conceptualization, Visualization. **Kumaran Kadirgama:** Investigation, Methodology. **Belal F Yousif:** Validation, Writing – review & editing.

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