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"Implementation of the Assurance Management System for Critical Asset; Predictors of Global Industry Performance"

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Abstract
Today, several industries in the region have adopted an innovative approach to critical asset assurance management implementation to maximize their performance at lower operating costs. This research attempt identifies related factors that influence the selected global industry's performance by implementing the critical asset assurance management system in the United Arab Emirates. By utilizing quantitative analysis, survey questionnaires were administered, and data were collected from 102 respondents from different industry practitioners. Results have been analyzed by descriptive, frequency, correlation, and regression using the Statistical Package for the Social Sciences (SPSS V21x64) and R-software software. The findings revealed that there is empirical evidence that most of the company has experienced a high level of implementation of the assurance management system within the organization. Furthermore, most of the employees have college degrees with more than 16 years of experience in the industry, which indicated that organizations were more likely to hire educated and well-experienced employees in the field. Relatively, more than half of the convincing reasons for an organization to improve its performance level contributed by the Implementation of Integrated Maintenance Management System (IMMS). Therefore, the higher the implementation of the Integrated Maintenance Management System within the organization, the higher the performance score. For a sustainable implementation of the assurance management system, it is recommended that organizations should adopt the structured approach found in this study as their guidance and best practices in the organization through the Assurance Management System for Critical Asset Framework (AMSCAF). Thus, hiring the right talent promoting competitive advantages is significant to organizational growth. Finally, top management commitment to enhancing the Asset Management Policy is required to successfully implement the Integrated Maintenance Management System that successfully improves organizational performance in compliance with regulation and international standards.
Keywords *Assurance Management System, Performance, Critical Assets, Global Industry, Predictors.*

1. Introduction

Leaders must understand and work out how to operate effectively under the given circumstances because the global economy is still struggling and in its final equilibrium following the recent global financial crisis (Dincer, 2017; Viera and Kramer, 2020). Businesses nowadays will remain challenging due to the dynamic environment in which they are operating. It increases concern in the rapid growth of the sharing economy coming from both academicians and practitioners in the industry is very complex (Kumar et al., 2018). Consequently, the United Arab Emirates (UAE) strives for quality and efficiency in all industrial and business sectors (El Khatib, & Ahmed, 2018). Accordingly, in a 2018 economic study published by the Ministry of Economic of the UAE, the contribution from crude oil and natural Gas to GDP in 2017 contributes to 29.5%, which rose by 0.8% (The UAE Government's official portal, 2018). On the other hand, public and private companies are exposed to dangerous incidents and risks crucial for their operations and development (Păunescu & et al., 2018). Bourassa & et al. (2016) study revealed that accidents in the manufacturing sector, including operating methods, construction of machinery, maintenance, and reliability, may be caused by various factors and lack of training. The study of Tubil et al. (2021) analysis showed that 272 of the 773 occurrences include a breakdown of equipment, 13 of which have direct human implications. Although, in construction aspects, building assets are recognized as critical, they also have issues due to the high rate of critical asset failure and accidents caused by unskilled operators (Manikandan & et al., 2018; FitzPatrick et al., 2013). Indeed, the most crucial cause of equipment-related incidents with an operating cost of 23 percent and a maintenance and repair cost of 37 percent is the lack of equipment operators' training (Manikandan & et al., 2018). In contrast, the supervisor is perceived safety support substantially links to safety enforcement (Beamond et al., 2016; Hu & et al., 2016).

Critical Assets should be identified and prioritized (Wittkop, 2016). The study of Kian et al. (2018) found out that critical asset failure results in delays and downtimes in marine industries, translating into additional costs and penalties imposed by the clients. The railway network industry used quantitative earthwork criticality to measure failure, combining two components for an individual earthwork (Power & et al., 2016). According to Kolios and Luengo's (2016) study, those critical assets are subject to a range of challenging operational and environmental conditions, particularly those installed in the ocean, leading to a performance and structural deterioration. The study of Muganyi et al. (2018) discusses a specific model that can give reliable outcomes when an organized approach has been undertaken. An assessment must be done in every asset to assess its vulnerabilities once critical assets are identified (Wittkop, 2016). Simultaneously, the asset criticality optimization model is implemented cost-effectively to maintain physical assets to increase their reliability in an economically optimum manner (Muganyi & et al., 2018). The collective methodology for assessing the most critical asset's vulnerabilities can be demonstrated into confidentiality, integrity, and availability assessment, which will assess the entire assurance process (Tubil, 2021). Furthermore, the criticality optimization model must eventually create a priority hierarchy of assets constructed on specific application criteria (Muganyi & et al., 2018. Hence, vulnerability rating gives an indication and opportunity to see the organization's information assets' weakness inherent and residing (Gebremedhin, 2016).

Moreover, critical assets are the gateway to the company, both from an organizational and a security perspective (Samimi & et al., 2020; Wittkop, 2016). It may include fixed assets, such as particular sites or structures, and temporary incidents that increase a particular facility's criticality, as illustrated from the study of Badii & et al. (2014). Thus, it is considered the key element of services essential to the sustainability of goods, utilities, and communications (Maliszewski, & et al., 2012). However, the productivity of critical assets in industrial and urban areas depends on network-based systems (Evazabadian & et al., 2014). Therefore, critical assets' efficient positioning can theoretically occur within the spatial optimization models dealing with security, operation, coverage, equity, and risk (Maliszewski & et al., 2012). Effective assurance management implementation is more complicated than formulating strategies, which shows that only less than 10% of well-formulated policies are successfully implemented (Palladan & Chong, 2016). Consequently, to turn the company into a competitive advantage and enhance its operational efficiency, the company needs to consider the broader context in which the data were produced (Mawed & Al-Hajj, 2017).

Relatively, the study of Cahyo et al. (2015) elaborated that the research's future steps should include the complete human resources in the investigation of maintenance and related costs for all activities. The study of Jaradat (2017) emphasized that employees are most observed as a capital resource, with being the leading resource in gaining competitive advantages. Thus, effective and transparent HR practices can be focused on through supervisors and leaders (Uhl-Bien & Arena, 2018; To et al., 2015). Strategic leaders shape and manage relationships outside the firm and represent the organization's image to external parties (Samimi & et al., 2020). Many organizations that invest significant resources have a task to improve and partner with leaders to effectively deliver those strategies (Carasco & et al., 2014). The study of Dincer (2017) emphasized that the future leader's leadership model must underscore the actions that can react quickly to change and adapt to changes. Top management support is a vital investment at any manufacturing firm determined to integrate supply chain partners with the manufacturing processes to accomplish a competitive advantage (Birasnav, 2019). The study of Rahman et al. (2018) has projected that strategic competitiveness would provide companies an edge to survive in an uncertain and stormy era. By framing and executing the required strategies effectively, modern asset management revolves around the four key elements: leadership, value, alignment, and assurance (Copperleaf, 2017). On the other hand, older companies are more likely to fail due to their inability to respond to environmental change, while younger companies struggle due to a lack of management experience and financial management skills (Thornhill & Amit, 2003). Indeed, failing firms capitalize on intangibles more aggressively than non-failed firms, especially in the five years leading to a firm failure (Jones, 2011; Thornhill & Amit 2003).

Challenging changes across industries are more attractive to the asset owner (Roy & Cohen, 2017). The study of Eckhardt & Shane (2011) revealed that technological advancement is a significant determinant of growth behavior. The manufacturing industry has experienced more significant changes in recent years (Vijayakumar & Gajendran, 2014). Online monitoring technologies today offer an opportunity for predictive and proactive asset management in many different industries. The most recommended thing for a better production facility is

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performance, productivity, and operating costs (Tubil, 2021Agarwal, et al., 2013; Dal et al., 2000). Tsarouhas's (2013) study illustrated that components' efficiency and quality are immediately improved to optimize productivity and efficiency. Moreover, top management in the organization, including demand from organizations, faces numerous challenges (Maletič & et al., 2017). A significant improvement has now been made in maintaining assets and production systems to reduce the waste of energy and resources (Vijayakumar & Gajendran, 2014). Hess & Rothaermel's (2011) study broadens the understanding of the importance of considering the variability of the company's intellectual human capital and the relationship between vital, innovative activities along the knowledge value chain. Undoubtedly, it is possible to preserve the necessary information for later safety assessments by providing a consistent documentation system for equipment failures and documenting accidents (Ghahramani et al., 2008).

Finally, asset performance measurement is essential to achieve the desired business objectives within the domain of Physical Asset Management (Maletič & et al., 2017). Therefore, routine maintenance of machinery and equipment is crucial for the mining industry to function appropriately without interruption (Petrović, 2014). In light of the discussions and observation from the literature review, the researcher would like to discover its performance to ensure critical assets functionality through business continuity. This study would like to re-contextualize the three models, "Asset life cycle phase's model," "Criticality optimization model," and "Asset Management System Activities, Relationships & Mechanism model," which assures the owner in the management of the critical asset. This study sought to explore the selected global industry's performance to implement an assurance management system for the United Arab Emirates' critical asset. This study addresses the relevant factors that influence industry performance as to the various system and approach implementation for asset management system mainly on the critical asset with the related assurance management predictor related to the integrated maintenance management system (IMMS) as the only variables that predict the performance of the global industry.

2. Theoretical Perspective

This study's theoretical framework is based on three theoretical models of asset management system implementation in the industry.

2.1 Model-1 Asset life cycle phases (Maletič1 & et al., 2017)

Based on the contingency theory, the results indicate that contingency is a valuable technique to improve asset management practices and evaluate asset efficiency (Maletič1 & et al., 2017). The management of physical assets, such as machinery, vehicles, equipment, facilities, buildings, and utilities, is characterized as physical asset management. It provides a structured approach, from definition to disposal to the facilities' management (Hastings, 2010). Schuman & Brent's (2005) studies proposed study directs decisions taken during the early stages of a project to maximize assets' output at reduced life-cycle costs. Furthermore, Amadi-Echendu et al.'s (2010) study provide the basis for a highly integrated analysis of physical asset management's general problem, linking engineering potential to economic cost and value. Simultaneously, Hipkin's (2001) study indicates that where the maintenance management information system resulted in higher knowledge levels, higher levels of benefits were achieved. Therefore, incorporating a theoretical framework brings together many management theories to understand the asset management activities found in the standards and guidelines (Alhazmi, 2018).

2.2 Model-2 Criticality optimization model (Muganyi & et al., 2018)

Criticality optimization for managing physical assets is intended to guarantee the processing plant's high plant reliability. It is a positive attribute that, due to incorrect maintenance priorities, most industrial establishments discount and calamitous consequences are usually experienced, such as decreased reliability of installed equipment (Muganyi & et al., 2018). To maximize performance outcomes, the findings of Maletič (2020) emphasized the importance of incorporating risk management activities into asset management processes. Though optimizing resilience by mitigating significant risk resulting from multiple economic, environmental, and social criteria, the study states a framework for prioritizing waterway infrastructure projects (Connelly, 2016). Schmit & Roth (1990) study predicted lower cost effects associated with higher retention levels, larger scale, and less risky industries. The risk modeling exercise is designed to model the risk that exists at the present moment, and it is not intended to scheme to pertain to the risk (Wittkop, 2016). Accordingly, when a threat misuses a vulnerability, it increases the likelihood of attack and leads to risk. In this instance, the identified vulnerabilities could be a critical component of the risk modeling exercise (Wittkop, 2016; Kassa, 2016).

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2.3 Model-3 Framework of Asset Management System Activities, Relationships & Mechanism of (El-Akruti et al., 2013)

The current definition of an asset management (AM) framework focuses on the engineered asset life-cycle, and little has been done about its relation to organizational strategy in the literature. Evaluating practices, relationships, and processes that constitute the connection between AM and strategy offers a more AM-oriented, systemic, and holistic approach (El-Akruti et al., 2013). Hence, asset performance management is shifting the landscape of how companies are managing their critical asset. When an asset is aging, critical assets' performance is expected to decline (Borges & et al., 2017; Kolios & Luengo, 2016). The study of Kapur et al. (2019) stated that it is a well-known fact that supply chain management affects a firm's performance positively. According to Wisner & Fawcett (1991), and efficient performance assessment system will direct an organization's efforts to achieve its strategic objective. Moreover, assessing asset performance is necessary to achieve the Physical Asset Management domain (Maletič1 et al., 2017). This involved overall efficiency of equipment is an acceptable measure of industry performance (Eckhardt & Shane, 2011). While most people in the industry are unsatisfactory, performance evaluations serve various important organizational purposes (Wiese & Buckley, 1998).

3. Conceptual Framework

The conceptual framework of the study was adopted based on the combination of Maletič1 & et al. (2017) model of the asset life cycle phases, the criticality optimization model of Muganyi & et al. (2018), and the framework of asset management system activities, relationships & mechanism of El-Akruti et al. (2013) wherein the five predictors of performance are determined as the following; leadership engagement (LE), operational compliance (OC), business threats and strategy (BTS), human capital management (HCM), integrated maintenance system (IMS). This study is limited only to the above predictors based on the researcher's review of related literature, as explained in the following discussions.

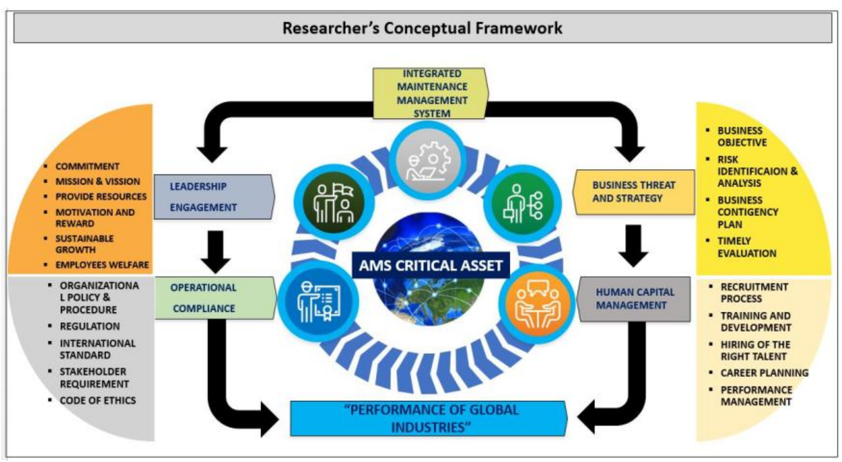

Figure-1: Assurance Management System for Critical Asset Framework (AMSCAF)

Research Objectives

1) To describe the socio-demographic profile of the respondents.

Hypothesis

2) Do the Leadership Engagement, Operational Compliance, Business Threat and Strategy, Human Capital Management, Integrated Maintenance Management System significantly determine Global Industry Performance?

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4. Research Methodology

4.1.1 Research Design

4.1.2 Respondents of the Study

This study's respondents are employees working from different industries within the United Arab Emirates (UAE) who gave their honest opinion about the survey questionnaire they received. The researcher carefully defined the respondent's profile as they were the person who could provide the necessary information based on their expertise employed in their respective organization using purposive sampling (Acosta & Acosta, 2017; Bernard, 2002; Tongco, 2007; Teddlie, 2007; Landreneau & Creek, 2009). During data collection, only those who were committed responded to the survey.

Data were collected from 102 respondents from different industry practitioner in the United Arab Emirates through the use of an online survey questionnaire (google form) along with the written informed permission to contribute to the study and ensuring confidentiality, then collected and analyzed to get the results (Gelo, 2008).

4.1.3 Data Gathering

Data were obtained through an online platform survey questionnaire (Google form). The survey questionnaire was self-crafted, and the survey items were provided based on the study of the literature review and other data backup sources, such as books, news articles, and journals. Data were gathered via survey questionnaires distributed through the online platform (Google Form). The survey links were attached to emails, WhatsApp, and via Facebook messages purposely selected from the various industry, practitioners were distributed. The survey included the demographic profile of the respondents and their views of the independent variables.

4.1.4 Research Instrument

This study's design, data collection, research location, the respondent's profile, and the instrument used are discussed in this chapter. In this research study, data analysis, collection of respondent responses, and statistical activity were used as part of the research methodology (Rovai et al., 2014; Almalki, 2016; McCarthy, 2017; Ali, 2016). It considered the questionnaire's distribution detailing the clear instructions and purpose of the study and protecting all respondents' confidentiality does reduce the chances of receiving biased responses (Wiza & Hlanganipai, 2014). Data can also be obtained using questionnaires and surveys to be part of more detailed interviews simultaneously (Canals, 2017). In this research study, through the use of a Google Form, a researcher prepared a survey questionnaire that was designed to provide the required result and used it as the primary method in data collection. The designed survey questionnaire (SQ) were divided into three segments: (1) The first segment is the respondents' demographic profile, (2) The second segments are the identified independent variables for the level of implementation of assurance management to determine performance, and (3) the third segment is the dependent variables which determine performance as a result. The three parts of the survey questionnaire used a five-point Likert scale within the range between strongly agree (5) to (1) strongly disagree.

4.1.5 Data Analysis and Statistical Treatment

Data collected have been analyzed by descriptive, frequency, correlation, and bootstrap regression using the Software Statistical Package (SPSS V21x64) and R-software. The statistical data study was done in various phases: first, descriptive statistics were employed when the socio-demographic data was measured based on all respondents. Similarly, a frequency analysis revealed the respondents' interpretation of the company's successful implementation. The correlation of all the primary predictors correlated with the dependent variables was analyzed using the spearman rank correlation technique. Since only those engaged responded in the quantitative phase survey, the distribution-free approach to correlation was used as a measure of the relationship between two variables to measure mixing patterns in complex networks in a distribution-free approach between two sets of measurements made on the same individuals (Zar, 2005; Bolboaca & Jäntschi, 2006; Zhang et al., 2016). The third goal was to evaluate the essential variables in the global industries' output using the R-software sequence of step-by-step

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bootstrap regression analyses. The bootstrap approach provides the benefits of probabilistic and parametric methods of estimating a confidence set's performance and robust jackknife evaluation, variance, and prejudice projections or estimations (Sonmez, 2008; Beran, 1986). In this study, the respondents' sampling focused on the population where they work, based in the UAE. To analyze the relationship between the asset management team's response and the company's assurance management framework's implementation level, the researcher collected quantitative survey data from the respondents (Bullock, 2017) and considered it a deductive research approach (Rovai et al., 2014).

4.1.6 Compliance with Ethics and Survey Consent

Data were collected from 102 respondents from different industry practitioners in the United Arab Emirates through an online survey questionnaire (google form) and the written informed permission to contribute to the study, ensuring confidentiality and keeping their identity anonymous. The respondents were informed on the nature and purpose of the research, the reasons for their choices, the advantages, and risks involved, their rights as respondents, such as ending their participation without the need for clarification, answering the questions they wanted, and refusing to answer certain things. The survey links were attached to emails, WhatsApp, and via Facebook messages from various industries. Their expertise and experience of the subject and willingness to participate in the survey have been considered. The collected data from the respondents further analyzed to get the results.

5. Results and Discussion

This chapter presents the research findings, the interpretation, and the result of the study. It further demonstrates the extent of implementation of the Critical Assets Assurance Management System across the respondents' socio-demographic profile for the selected industry within the United Arab Emirates in terms of gender, age, highest educational achievement, years of experience, and place in the company. It also shows the predictors of the success of global industries found in the report.

5.1 Socio-demographic profile of the respondents

Table-1

Table-1 Socio-demographic profile of respondents

		Frequency	Percent (%)
Sex	Male	85	83.3
	Female	17	16.7
	Total	102	1
Age	(20 to 30) yrs. Old	5	4.9
	(31 to 40) yrs. old	32	31.4
	(41 to 50) yrs. old	43	42.2
	(51 to 60) yrs. old	20	19.6
	(61 and above)	2	2
Size of Company (No. of employees)	(< 50)	10	9.8
	(51 to 100)	12	13.7
	(101 to 200)	2	2.0
	(201 to 300)	5	4.9
	(301 to 500)	4	3.9
	(> 501)	69	65.7
Type of Industries	Logistic	9	8.8
	Construction	14	13.7
	Oil and Gas	17	16.7
	Manufacturing	13	12.7

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	Support Services	42	41.2
	Power and Utilities	7	6.9
Educational level	(PhD / Doctoral)	1	0.98
	(Master Degree)	25	24.5
	(College Degree)	74	72.5
	Diploma	1	0.98
	(Vocational/Certificate)	1	0.98
Position in the Company	Manager	14	13.7
	Chief Engineer	2	2
	Master / Chief Mate	1	1
	Section head / Team leader	5	4.9
	Specialist	5	4.9
	Superintendent	9	8.8
	Sr. Engineer	10	9.8
	Engineer	11	10.8
	Tech. Support	7	6.9
	Supervisor	11	10.8
	Advisor	1	1
	Technician / Mechanic	8	7.8
	Human Resource and Admin	3	2.9
	Safety officer	5	4.9
	Other	8	7.8
Management level	Top Management	19	18.6
	Middle Level	61	59.8
	Lower Level	22	21.6
Years of Experience	(16 above yrs.)	42	41.2
	(11 to 15 yrs.)	39	38.2
	(6 to 10 yrs.)	13	12.7
	(0 to 5 yrs.)	8	7.8
Type of software used	SAP	40	39.2
	Maximo	9	8.8
	Utility cloud	2	2.0
	E-maint.	2	2.0
	Manual (excel)	19	18.6
	One ERP	4	3.9
	Other	15	14.7

5.2 Survey Respondents Demographic Information

The result indicated the frequency when clustered according to sex and the percentage distribution of the respondents. As seen, most respondents are male, with (83%) of the total population and the remainder of the respondents being female (17%). The possible explanation for this is that, as many understand, the industrial services sector is masculine. As little as 2 percent of the maritime industry workforce is estimated to be made up of women (MacNeil & Ghosh, 2017). Due to Islamic traditions, fewer women work and hold a role in the Middle East working in the oil and gas industry than any other country (Ross, 2008).

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Most (42.2%) of the respondents were between the ages of 41 and 50 years. The age ranged from 31 to 40, which included 31.4% of the respondent's population. Such data may also be demonstrated that most of the respondents were 41 to 50 years old when the study was performed. Individuals aged 25 to 54 are those in their prime working lives, according to OECD (2020). The above result also indicated that most of the respondents experienced (41.2%) is more than 16 years working in a different industry, followed by 11 to 15 years of experience (38.2%), and work experience between 6 to 10 years (12.7%) respectively. Jobs survey evidence shows that staff classes in the public sector prefer to be older than the entire workforce. The median age for all working employees nationally in 2012 was 42.3 years (Maciag, 2013).

The (65.7%) were from multinational companies with more than 501 workers, followed by (13.7%) from companies with 51 to 100 employees. Whereas most of the respondents (41.2%) worked in support services, followed by the oil and gas sector (16.7%), construction (13.7%), and manufacturing (12.7%). This result suggests that when the survey was conducted, most of the respondents came from support systems. These individuals had completed a college degree (72.5%), and 24.5% had a master's degree, and just a few (1.0%) of the respondents had PhDs and vocational certificates. The more educated and trained, the more likely employee is to get hired, and the more likely to earn more. Employability studies clearly illustrate that employers place the highest importance on soft-skills' educational quality and the lowest value. They asserted that higher education institutions provide students with various resources for improving employability, including (MacNeil & Ghosh, 2017) self-presentation, lifelong learning, and many others. Employability has been identified as an attribute of higher education quality and advantage of career and work programs for college and university degrees.

The majority of respondents were company managers with (13.7%), followed by engineers and supervisors (10.8%), followed by Sr. Engineer with (9.8%), Superintendent with (8.8%), and others with Technician/mechanic and other designations (7.8%). It showed from the result that (59.8%) of respondents were from the middle level of the company and (21.6%), from employees at the lower work professional level, and (18.6%) from top management. The majority of the automated maintenance system used SAP with (39.2%), followed by (18.6%) using manual excel, other applications with (14.7%) and Maximo with (8.8%).

5.2.1 Regression Analyses

Table-4

Bootstrap for Coefficients

Model	Estimates (B)	Std. Error	T value	Sig.
(Constant)	0.213	0.2308	0.917	0.361
Leadership Engagement	0.125	.094	1.371	.174
Operational Compliance	0.0770	.098	.778	.439
Business Threat and Strategy	0.104	.118	.904	.368
Level of Human Capital Management	0.0881	.113	.744	.459
Integrated Maintenance Management System (IMMS)	*0.554*	*.121*	*4.552*	*.000*

R Squared = 0.785; Adjusted R = 0.774; *p value* of 0.000 (P value is less than 0.05

The findings showed using bootstrap regression analysis through R-software, as among the five predictors, only the Integrated Maintenance Management System (IMMS) is a single predictor with a determination coefficient of 0.554, which crafted a model for the performance is (P) = 0.554*IMMS, which means that, for every

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increase in IMMS, there is a 0.554 point increase in the Performance achievement. The result implies that the output of performance is accounted for by implementing the Integrated Maintenance Management System that predicts 55.4% of the variance. Therefore, more than half of the convincing reasons for an organization to improve its performance level contributed by the Implementation of Integrated Maintenance Management System. Conversely, several scholars and practitioners have recognized that maintenance is a significant contributor to the manufacturing process's quality and profitability (Kutucuoglu, 2001). According to Parida & Kumar (2016), measuring maintenance performance has also become necessary for today's industry. The maintenance system's efficacy and reliability play a key role in the company's performance and survivability, characterized as the process by which a company achieved (Bititci et al., 1997). Additionally, to remain competitive and cost-effective in business, each company should measure its maintenance performance to achieve business target. Thus, the primary target of the measurement method should be to bridge the gap and create the link between the inner measures (causes) and external (effects) measures (Jonsson and Lesshammar, 1999).

Meanwhile, companies using an integrated, balanced Preventive Maintenance system perform better than those not testing their performance. Measuring the value generated by maintenance, justifying expenditure, revising resource allocations, health, and environmental concerns, concentrating on knowledge management, adjusting to emerging developments inactivity and maintenance policy, and organizational, systemic changes are the essential factors behind criteria for measuring maintenance management system performance (Murthy, 2002; Kennerly and Neely, 2003; Kaplan and Norton, 2001). The study of Parida and Kumar (2006) mentioned that when linked to operational information, the identified Maintenance Performance Indicators (MPIs) with their stated criteria provide support for performance assessment and decision-making to achieve maintenance optimization. Chang and Morgan (2002) research demonstrated performance scorecards' idea to monitor performance metrics in the maintenance system.

While integrated maintenance management systems (IMMS) mostly support performance improvement, the above findings argued with the study of Muchiri et al. (2010), which claimed that there was no direct correlation between the maintenance targets sought and the key performance indicator (KPI) used. The study conducted across four industries and ten European countries suggested that customer relationship management's introduction in the maintenance management system was not the only impact on performance in all facets (Visser & Pretorius, 2003). Finally, the study of Tätilä et al. (2014) showed that inspection, improvement, and motivation were the critical use behaviors that contributed to improved performance and not the maintenance management system phase, as seen in the results, emphasizing motivation as an essential behavioral element that is accomplished through the use of performance assessment systems and relates to improved performance.

5.2.2 Hypothesis

The hypothesis stated in this study that the Integrated Maintenance Management System (IMMS) would significantly determine Global Industry Performance. Based on the finding, it is concluded that the hypothesis is supported because IMMS is significantly significant to industry performance. This means that the higher the Integrated Maintenance Management System's implementation, the higher the performance score. Simultaneously, the weak implementation of the Integrated Maintenance Management System lowers performance delivery in the organization.

6. Conclusions

The maintenance system's efficacy and reliability play a vital role in its performance and survivability, characterized as the company's process. Besides, to remain competitive and cost-effective in business, each company should measure its performance to achieve its business target. Thus, the measurement method's primary target should be to bridge the gap and create the link between the inner measures (causes) and external (effects) measures. Meanwhile, companies using an integrated, balanced Integrated Preventive Maintenance Management System (IMMS) perform better than those not testing their performance. Therefore, the below conclusions are drawn based on results and findings;

1) Most of the employees have a college degree with more than 16 years of experience in the industry, which indicated that organizations were confident and more likely to be educated and well-experienced employees in the field.
2) More than half of the convincing reasons for an organization with 55.4% to improve its performance contributed by the implementation of the Integrated Maintenance Management System (IMMS). This means that the higher the Integrated Maintenance Management System's implementation, the higher the performance score. Simultaneously, the weak implementation of the Integrated Maintenance Management System lowers performance delivery in the organization.

7. Recommendations

Based on the above conclusion, the below recommendations have been established.

1.) Organizations' should hire the right talent with a college degree as a minimum, empowering individuals from diverse cultural backgrounds, promoting competitive advantages in cost structures, and retaining qualified employees are significant to organizational growth.
2.) The industry should adopt the new program to benefit from the new opportunities to all the asset management stakeholders working in different industries to enhance the existing practices to the international standards and recommended best practices. It is highly recommended that non-multinational companies generate a systematic and organized program for the maintenance management system implementation of the critical asset and strict compliance of the asset management policy that links to an automated system to ensure proper tracking and monitoring of the organizational performance. Top management commitment for enhancing the Asset Management Policy is required to successfully implement the Integrated Maintenance Management System that successfully improves organizational performance.

For a sustainable implementation of the assurance management system for a critical asset, it is recommended that other organizations should adopt the structured approach as their guidance and best practices in the organization through the Assurance Management System for Critical Asset Framework (AMSCAF).

8. Implications

Critical assets are vital for supporting the business needs of the service provider company in the UAE. Its failure is one of the causes of significant business impacts and economic losses of the company. Each company should have the scheme to identify these critical assets based on the organization's criteria, as it has an individual risk that needs to be controlled and appropriately mitigated to undertake its overall business impact when it fails. The results of this study are to establish a broader view of the impacts that predict the performance of the selected global industry in the United Arab Emirates at the level of implementation of the assurance management system as the foundation for creating recommendations and its implications that fully addressed to all stakeholders in the critical asset management: Global Industry companies, asset owner, top management, assurance management team, maintenance team, talent management, Standardization body, researchers, government regulators, and other interested parties.

Thus, the study's result provides perception in implementing a critical asset's assurance management system, particularly in the different industries in the United Arab Emirates, to enhance their existing asset management program and adopt change in the organization to have better performance. Hence, the other aspects of this research for the sample size limitation of the industry professional and other predictors related to leadership engagement, operational compliance, business threat and strategy, and human capital management are recognized as the limitations to the related findings. This study will allow future researchers to conduct similar research and extend the sampled population's coverage to other industries outside the region.

Conflict of Interest

There is no conflict of interest to declare for this research.

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Note:

1) This Article is Ph-1 of the Mixed-Methods (MM) research which has been submitted to Preprints an early versions of research articles that have not been peer-reviewed.

2) They should not be regarded as conclusive and should not be reported in news media as established information. https://advance.sagepub.com/articles/preprint/When_Assurance_Management_Systems_Matters_Global_Industry_Performance_Level_of_Implementation_of_the_Assurance_Management_System_for_Critical_Asset_A_Mixed_Methods_Study/14134964/1
3) The qualitative counterpart of the MM research has been published in the International Journal of Scientific and Technology Research (IJSTR).

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