Do Information System Influence Sustainable Performance of Manufacturing Companies in UAE? Structural Equation Modelling (SEM)

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Abstract—This study intend to analysis Role of Information System on Sustainable Performance of Manufacturing Companies in UAE. Using Structural Equation Modeling (SEM), this study has addressed a significant gap in Information System, Organisational Culture and Sustainable Performance. This is done by formulating, examining and establishing a research model linking the multidimensional relationships between Information System (IS), Organisational Culture (OC) and Sustainable Performance (SP) experienced by the employees. Financial Management Workbench (FMW) is found to have a negative relationship with Information System, while Transaction Process System (TPS), Operation Information system (OIS) and Support Decision System (SDS) are independently and positively related to Information system (IS).

Keywords: Information System (IS), Organisational Culture (OC), Sustainable Performance (SP) Financial Management Workbench (FMW) Transaction Process System (TPS), Operation Information system (OIS) and Support Decision System (SDS) and United Arab Emirate (UAE)

I. INTRODUCTION

With oil prices falling, the trend towards industry and services has become the only alternative to maintaining the UAE's international economic standing (Al-Maamary et al., 2017). The manufacturing sector represents the best opportunity for the UAE to enhance its economic position not only at the financial level but also at the technological level. Like other organizations, manufacturing companies face the problem of sustainability, which has become a global trend for all organizations, whether profit or non-profit, governmental or private. Laudon & Laudon, (2016), stated that Information systems (IS) play a major role in the success of any industry, either through applications of industrial technology or the diverse administrative applications of information systems. Their role in achieving sustainability is equally important, and this study examines the relationship between the effectiveness of the information system and the sustainability performance of the manufacturing companies in the UAE.

Organizations are increasingly inclined to integrate community expectations into their business strategies, not only to respond to growing pressure from customers, employees and other stakeholders, but also to explore opportunities to create competitive advantage. To this end, management researchers are trying to identify a set of factors that have the potential to effectively integrate sustainability into organizational practices (Petrini & Pozzeban, 2010). As Pamlin & Thorslund (2004) have noted, major players in the IT / IS industry are beginning to take sustainability issues seriously. It can be seen that this represents a major change in companies' policies, as the IT industry was not well aware of sustainability requirements a few years ago.

The manufacturing sector is playing a growing role in UAE's economy. This growing role is evident as presented in The Annual Economic Report 2015. The data shows that crude oil and natural gas extraction activities accounted for approximately 34.3% of the GDP's contribution to the economy, while both wholesale and retail trade and repair services activities contributed 11.3%. , Real estate and business services contributed 10.3% each, and construction and manufacturing activities contributed nearly 9%.

The real estate and business services sector accounted for 15.4% of all investments in all financial sectors and was the first in all sectors in 2014, followed by manufacturing at 15.3%, followed by transportation, storage and other communications with 14.1% of investments, followed by oil and The natural gas sector, which accounts for 13.7% of the investment volume, is followed by government services The sector invested 12.2%; Together, these sectors made up 70.7% of the total investment in 2014.

In terms of the relative distribution of employees in the financial services sector in 2013, the construction and building sector was in the forefront in terms of the proportion of people absorbed in the state, which was 19.5%, followed by the wholesale and retail trade and services sector at 19.1%, the repair sector at 11.6%, and the public services sector at 11.5%. The last time the home services sector repaired with 9.5%.

The percentage of total employment realized in the five sectors was 71.2% of the estimated number of people working in the state in 2013. Regarding wages and employee compensation, the public services sector is at the forefront of the financial sector.

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Wages from the government account for 19.4% of the total workforce compensation, followed by the wholesale and retail trade and repair services sector, followed by the construction and building sector with 13.4% and 11.8%, followed by real estate and business services with 11.0%. After that the manufacturing sector grew by 9.9%. Total compensation for employees in the five sectors reached 65.5% (or approximately 244.2 billion dirhams) of the state's projected total workers' compensation in 2013.

Hamilton & Chervany (1981) in their main work "Evaluating Information System Effectiveness" determined that there are Two general views can be drawn about what is system effectiveness and how to measure it: the goal-centered view and the systems-resource view. In goal-focused, the way to evaluate the effectiveness of the system is to first determine the system's work goals, or the organizational units that use the system, and then develop benchmark measures to assess how well the goals are being achieved. Efficiency is determined by comparing performance to objectives. An example of a goal-centric view of systems effectiveness is comparing actual costs and benefits to budget costs and benefits.

In the system-resource view, system effectiveness is determined by achieving a general state, e.g., standards of "good" practices. Efficiency is conceptualized about the feasibility of resources rather than related to specific work goals. For example, system impact in relation to human resources is indicated by communication and conflict between MIS and user staff, user involvement in system development, or customer job satisfaction. With respect to technical resources, system effectiveness is indicated by the quality or service levels of the system. The system resource model recognizes that systems fulfill other functions and have other consequences in addition to the achievement of official goals, and these need to be considered in assessing system effectiveness (Ricci et al., 2015).

Sustainability is one of the latest “buzzwords” for politicians and businesses. Sustainability is sometimes compared to the Internet revolution, which has a broad impact on businesses. Sustainability is, in many cases, but not exactly, only associated with environmental factors, but corporate social responsibility is mainly considered social-oriented. Additional confusion is created by various social and eco-centric activities related to climate change or fair trade (Piotrovic & Cuthbertson, 2009).

Over the past few years, many organizations have recognized the importance of sustainability and developed their own metrics, scorecards, ratings and tools to measure and track them. However, the term "sustainability" means different things depending on who you ask and what you want, and they all seem to have their own set of company-specific indicators, which vary widely in scope and scale. This lack of stability leaves investors, consumers and the public at a disadvantage (Cohen & Al, 2014)

(Nicholescu et al, 2015) Sustainability can be embedded in corporate strategy and governance as: (1) the organization communicates its environmental and social goals, (2) sustainability with strategic planning and capital budgeting, and (3) sustainability-related risks and opportunities with stakeholders in general Analyzes and (4) compensation of the leadership team is consistent performance Is produced by the partial.

According to the Environment Data Services ustain Sustainable Business Report (2011), businesses have "rapidly increased their ability to engage with sustainability", and an increasing number of employees and graduates have been identified as having consistent skills and knowledge. However, because firms engage in sustainability, they must do so, especially during times of financial distress (Wales, 2013).

However, despite the roles of IS and sustainability in manufacturing industry in UAE, yet there are many challenges that posed the main issues to the effective utilization of IS for the sustainable performance of manufacturing companies in UAE, these issues emanate as a result of higher degree of competition require strategic management of IS and sustainability, lack of readiness toward digital world as well as 4th industrial revolution (IR 4.0).

However, findings of the relationship between IS and sustainable performance of manufacturing companies in UAE Several research studies have reported on information technology (IT) and information systems (IS), but the results are inconclusive (Li et al., 2015). Recent studies continue to find weak relationships (Ravichandran et al., 2015). This phenomenon is known as the “productivity paradox” because it highlights surprisingly negative or weak relationships between IS adoption implementation and sustainable performance (Brynjolfsson, 2014).

Therefore, this study intends to fill the gap by describing the role of the information system (IS) on the sustainable performance of manufacturing firms in the UAE.

II. METHODOLOGY

This study uses quantitative analysis using SPSS and AMOS software to analyze the data. The Social Sciences Statistical Package (SPSS) version 23 is used to analyze basic data and to provide detailed analyzes such as means, standard deviations and frequency. Structural equation modeling (SEM using AMOS 18) using Conformatory Factor Analysis (CFA) was used to test the measurement model. SEM was performed using the recommended two-stage approach (Hair et al., 2011)

II. FINDINGS AND ANALYSIS

After satisfying the need for measurement model validity, the structural relationship between structures in the research framework was analyzed using AMOS graphics. Although the initial product of the structural model achieved other fitness indicators, some indicators did not meet acceptable levels. For example, all the observed factor loadings and their associated square multiple regression meet the required thresholds of .50 and .30, respectively.

With respect to fit indices, RMSEA and p-value satisfy the criteria for acceptance, while CFI, GFI, and other measures report values below acceptable limits. This suggests that model re-specification is required.

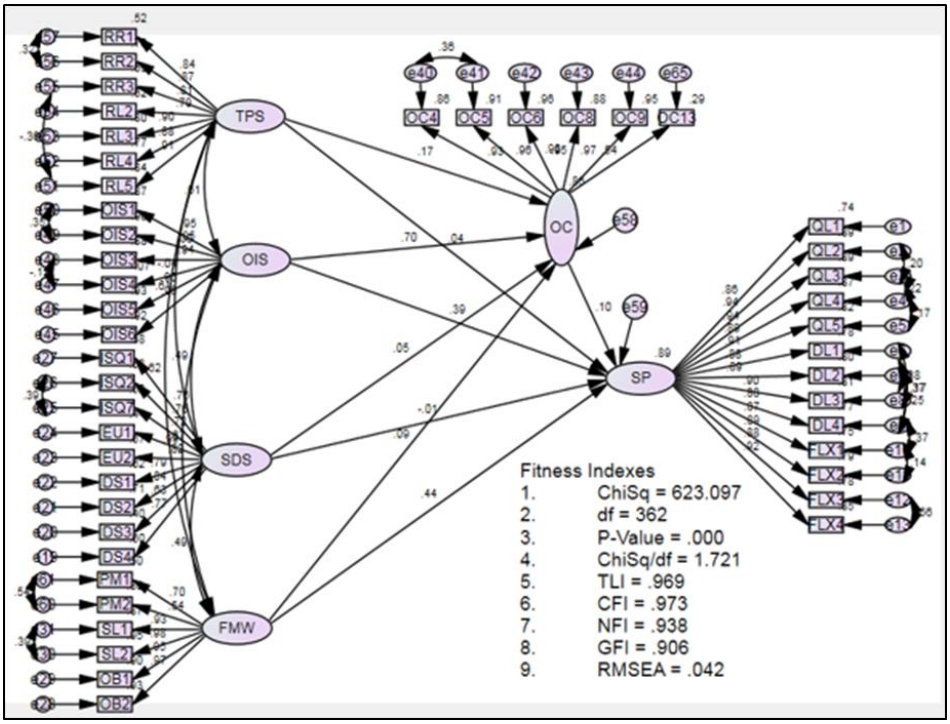

Figure 1: Final structural model of the research constructs

The final structural model (Figure 1) satisfies all the requirements for model acceptance. Standard regression weights, squared multiple regression and all goodness-of-fit indices meet recommended limits. The final structural model came after the iterative process of model re-specification. This shows the causal effect of exogenous constructs (TPS, OIS, SDS, and FMW) on endogenous construct (SP).

Table 1: Standardized Regression Weight of the Path Relationship

Path relationship	Estimate	S.E	C.R.	P-value	R^2
SP←TPS	.040	.040	1.089	.276	
SP←OIS	.387	.216	1.738	.082	
SP←SDS	-.007	.050	-.203	.839	.89
SP←FMW	.441	.230	1.983	.047	
SP←OC	.101	.069	1.382	.167	

From figure 1, it is shown that TSP, OIS and FMW have positive effect on SP while SDS indicated a negative effect. Collectively, the five exogenous constructs (TSP, OIS, SDS, FMW and OC) explained 89 percent variation in sustainable performance. Similarly, the table also presents the path relationship between the four exogenous variables (TSP, OIS, SDS, and FMW) and the mediator variable (OC). From the result in figure 1, it is shown that TSP, OIS, SDS, FMW collectively explained 86 percent of the variation in organizational culture.

1) Organisational Culture (OC) will fully mediate the relationship between Transaction Process System (TPS) and Sustainable Performance (SP) (ù = 0. .069, z = 1.382, p = 0.167< 0.01, r2 = 0.89). 6)

2)Organisational Culture (OC) will fully mediate the relationship between Operation Information system (OIS) and Sustainable Performance (SP) (ù = 0. 216, z = 1.738, p = 0.082 < 0.01, r2 = 0.89).

3) Organisational Culture (OC) will fully mediate the relationship between Support Decision System (SDS) and Sustainable Performance (SP) (ù = .050, z = -.203, p = 0.839 < 0.01, r2 = 0.89).

4) Organisational Culture (OC) will fully mediate the relationship between Financial Management Workbench (FMW) and Sustainable Performance (SP) (ù = 0. 230, z = 1.983, p = 0.047 < 0.01, r2 = 0.89).

The results of the empirical study model indicate that increased levels of Support Decision System (SDS), lead to lower levels of Organisational Culture (OC). The presence of Transaction Process System (TPS), Operation Information system (OIS) and Financial Management Workbench (FMW) results in higher levels of Organisational Culture (OC).

The practice of Transaction Process System (TPS) and Support Decision System (SDS) leads to lower levels of Sustainable Performance (SP) experienced by the employees. However, the dimension of Operation Information system (OIS) and Financial Management Workbench (FMW) induces more Sustainable Performance (SP) among the employees.

Besides confirming that Sustainable Performance (SP) is exacerbated by Operation Information system (OIS) and Financial Management Workbench (FMW), Organisational Culture (OC) is reported to be a full mediator between Information system (OIS) and

Financial Management Workbench (FMW).

In addition, the overall goodness-of-fit indices of the model provide statistical evidence of the robustness and generalisability of the model.

IV. CONCLUSIONS

In conclusion, this study has addressed a significant gap in Information System, Organisational Culture and Sustainable Performance. This is done by formulating, examining and establishing a research model linking the multidimensional and mediating relationships between Information System, Organisational Culture and Sustainable Performance experienced by the employees.

Financial Management Workbench (FMW) is found to have a negative relationship with Information System, while Transaction Process System, Operation Information system and Support Decision System are independently and positively related to Information system.Given the significant impact of Information System, Organisational Culture and Sustainable Performance, the organisations could apply the current Information System, select and fine-tune the right characteristics that will increased the levels of Organisational Culture, leading to improve of employees and Sustainable Performance.

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