

EXAMINING THE EFFECT OF MANPOWER OPERATIONS IN CONSTRUCTION FIRMS USING VUCA MODEL

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Abstract

Poor manpower operations are affecting the construction industry in Nigeria despite the importance of the industry for national development. This study aimed to examine the effect of manpower operations in construction firms using VUCA model. A quantitative research design was adopted using a sample size of 300 among the population of construction professionals (Architects, Builders, Civil Engineers, and Quantity Surveyors), by employing a questionnaire as an instrument for data collection. Statistical Package for Social Sciences (SPSS version 23) was used as a tool for descriptive and inferential analyses. The results showed that: The professionals are somewhat aware of VUCA model in the building construction industry. However, social and financial uncertainties are the factors hindering the adoption of VUCA Model in construction firms for effective manpower operation. However, Firm reputation, occupational education and training, material management, and supervision are the most relevant factors for effective manpower operations in construction firms. VUCA model affects manpower operations in construction firms; which ensures project success, and adequate resource allocation, efficiently and effectively affects time and cost management of construction project delivery, and also, ensures the quality of project out-put by manpower operations as parts of most effect of VUCA model. The study recommended that professionals must have new perspectives and create stronger ideas, be flexible to challenges, as well as to develop responsible professional leadership styles that are generous, and capable of developing constructive ideas and networking, this can curtail factors hindering the adoption of VUCA model.

Keywords: Manpower, Construction, Firms, VUCA model, Professional.

1. INTRODUCTION

The notion of VUCA, which represents a volatile, uncertain, complex and ambiguous environment was introduced by the United States Army to describe the unfavourable conditions that resulted from the end of cold war (Bennis & Nanus, 1985). The VUCA model was subsequently adopted by business leaders across the globe to approach different kinds of challenging situations posed by various external factors. This has been an on-going phenomenon and forecasts suggest that it is going to stay with us in the future (Mitika & Farhat, 2020). VUCA is like an on-going test that any organization needs to pass in order to succeed (Sahu & Panda, 2016). According to Bennett and Lemoine (2014), VUCA model has four dimensions such as:

- a. Volatility:** Volatility may be defined as a frequent, rapid and significant change for which the duration may be unknown. Sullivan (2012), define volatility where things change rapidly but not in a repeatable pattern or predictable trend. While, Lawrence (2013), volatility means the speed, volume, magnitude and nature of change that is in an unpredictable pattern. Also, Bennett and Lemoine (2014) define the volatile situation as “one that is unstable or unpredictable; it does not necessary involve complex structure, a critical lack of knowledge or doubt about what outcomes may result from key events”.
- b. Uncertainty:** Uncertainty may be defined as the lack of predictability of the future. It is a situation where events and outcomes are unpredictable. Uncertainty is a term used to describe a

situation characterized by a lack of knowledge not as to cause and effect but rather pertaining to whether a certain event is significant enough to constitute a meaningful cause” (Bennett & Lemoine, 2014). Schick *et al.* (2017) pose that, uncertainty is characterized by the lack of predictability and the likely prospects for surprise. Uncertainty is the result of the multiple feedback loops and interactions that are inherent to complex systems (Gunderson & Holling, 2002).

- c. **Complexity:** Complexity may be defined as a phenomenon having many interconnected parts or variables resulting in an overloaded information network. According to Sullivan (2012), complexity indicates where “there are numerous and difficult-to-understand causes and mitigating factors involved in a problem”. Furthermore, complexity adds turbulence of change, makes decision making difficult due to the absence of past predictors and also leads to confusion that can cause ambiguity (Lawrence, 2013). Complexity situation differs from a volatile or an uncertain situation. For instance, organization doing business in many countries may face complexity due to the regulatory environment and political climates but this does not necessary mean that the situation is volatile or uncertain (Bennett & Lemoine, 2014). Complexity poses several challenges for managers (Schick *et al.*, 2017).
- d. **Ambiguity:** Ambiguity may be defined as lack of clarity. It is a phenomenon or a situation having more than one interpretation. The meaning of an event is unclear and nature of cause-and-effect relationships is doubtful in ambiguity situation (Bennett & Lemoine, 2014; Lawrence, 2013). Sullivan (2012), define ambiguity “where the causes and the ‘who, what, where, when, how and why’ behind the things that are happening are unclear and hard to ascertain”. Ambiguity is the most abstract factor of VUCA (Schick *et al.*, 2017), and it relates to the cloudiness of reality, the potential for misreads, the mixed meanings of conditions, and the mixed outcomes of actions.

Manpower in building construction industry is the working force that is committed to building constructions through which building construction objectives are realized, such as planning, erecting, and modelling the buildings among others. Building construction projects are nowadays far more complicated than ever before, as it involve large capital investments and embrace several disciplines, widely dispersed project participants, tighter schedules, and stringent quality standards among other characteristics (Kehinde, Afolabi & Omogbolahan, 2017). Çiçeklioğlu (2020) confirmed that, nowadays, it has become very difficult to achieve profitability and growth by gaining a sustainable competitive advantage with the effect of the VUCA phenomenon throughout the world; therefore, what is needed to do by the professionals (leaders) and manpower (employees) in the built environment is to be aware of VUCA, use the right management models and put forward appropriate strategies. Hence, the purpose of this study is to examine the effect of manpower operations in construction firms using VUCA model in Abuja, Nigeria, intending to increase project success by the construction firms.

2.0 RESEARCH METHODOLOGY

A quantitative research design was adopted which involved a questionnaire survey as an instrument to collect quantitative data. The study population is heterogeneous constituting experienced and core construction project professionals. However, the study could not get an authoritative sample frame of professionals’ experience in construction, therefore, the study used an accessible population of 300 core building professionals that are identified to be involved in construction project management which include Architects, Builders, Civil engineers, Quantity surveyors. Krejcie and Morgan (1970) table for determining sample size is used to arrive at a sample size of 169. Because of the heterogeneous nature of the study population, the study adopted a convenience sampling technique to access the respondents that were available at the time of the study and reflects the proportional distribution of the population, this follows suits with the assertion of Sambo (2008) and, Dawson (2002). The instrument was subjected to the experts in the industry and the academician for validation. A reliability test of the instrument was conducted The data used for this study was analyzed using both descriptive and inferential methods of data.

3.0 RESULT AND DISCUSSION

3.1 Reliability and Validity Analyses

The minimum acceptable value for Cronbach's alpha is from 0.5 to 0.6 (Ogwueleka, 2011; Olatunji, 2010). Based on Olatunji (2010), alpha-value of: < 0.5 = Poor reliability; 0.5 – 0.7 = Sufficient reliability; while, > 0.7 = Good reliability. The reliability of the variables used in the study with all the Cronbach's alpha values ranging from 0.69 – 0.81; which means sufficient and good reliabilities.

3.2 Presentations and Analyses Data

The result of the professional's awareness of volatility dimension in building firms for effective manpower operations with the mean scores ranged from 1.64 – 3.05 and, standard deviation of 0.99 – 1.78. The average mean score value of 2.36 means that, the respondents are somewhat aware of volatility dimension of VUCA Model. The results of the uncertainty dimension for effective manpower operations in the building industry has the average mean score value of 2.4183 means that, the respondents are somewhat aware of uncertainty dimension of VUCA Model. The results of the complexity dimension of VUCA Model for effective operation in construction industry. The average mean score value of 1.7350 shows that, the respondents are somewhat aware about the complexity dimension for VUCA Model. The results for ambiguity dimension for effective manpower operation. The average mean score value of 1.9816 shows that, the respondents are somewhat aware about the ambiguity dimension for VUCA Model. Therefore, the findings of the level of the professional's awareness of volatility dimension in building firms for effective manpower operations matched the earlier assertion of Rimita (2019) that, studies on VUCA as a leadership phenomenon are predominantly in the first world and grossly understudied in the African context. Also, based on Hubbard and Rogers (2019), awareness of professionals on VUCA model and leadership's agility is also reflected in their functional personnel's ability to become agile in their day-to-day work. By implication of this finding, it can be predicted that volatility, uncertainty, complexity, and ambiguity are going to become more and more widespread in the building construction business world.

Factors hindering the adoption of VUCA model in building construction firms for effective manpower operations

Table 1: Rotated Component Matrix^a of Extraction method (Principal Components Analysis) & Rotation method (Varimax with Kaiser Normalization)

	Component						
	1	2	3	4	5	6	7
Imagination to adapt and flexibility.	.859						
Ineffective leadership/performance failure and shared vision.	.831						
Rampant structural (operational) in the business.	.680						
New ideas in building construction.	.624			.523			
Shifts in client and stakeholder expectations.		.986					
High levels of unemployment leading to poverty and insecurity.		.986					
Social and financial uncertainties.			.850			-	
						.309	
Growth in economy.			.835				
Ecological (environmental) dilemma.			-				
			.676				.306
Government and international regulation.				.743	-		
					.333		
Political issues in the business world.				-			.474
				.693			
Poor infrastructure & implementation of development plans.				.547			
						-	
Sectorial terrorism.					.838	.476	

Technology.	.344			-		-
Changing nature of the workforce/demographic and social forces and employee dissatisfaction.				.612		.317
Devastating levels of corruption.					.785	.311
Agile global competitors.				.407	.770	
Globalization.		.343				.865
						.480

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 11 iterations.

Extraction Method: Principal Component Analysis.

Table 1 displayed the factors hindering the adoption of VUCA Model in building construction firms for effective manpower operation using factor analysis which was factored from the Eigenvalues, extraction sums of squared loadings & rotation sums of squared loadings, and the most seven factors hindering the adoption of Model in building construction firms include: Imagination to adapt and flexibility, ineffective leadership/performance failure and shared vision, rampant structural (operational) in the business, new ideas in building construction, shifts in client and stakeholder expectations, high levels of unemployment leading to poverty and insecurity, and, social and financial uncertainties. The finding agrees with the result of Rimita (2019), Subas (2017), that change is happening everywhere in this 21st century and how to lead change successfully has become one of the foremost issues for the in-construction firms as well as its speed and complexity are increasing rapidly. By implication of this finding, since it appears that there is a shortage of widely and robust application of VUCA model in building construction industry and, the construction firm is now facing these inevitable changes which are even predictable but lack in leadership, imagination to adapt and flexibility. Therefore, for any building construction firm to be able to survive the business environment it is mandatory for it to quickly and effectively responds to changing environment.

Relevant factors for effective manpower operations in building construction firms

Table 2: Rotated Component Matrix of Extraction method (Principal Components Analysis) & Rotation method (Varimax with Kaiser Normalization)

	Component			
	1	2	3	4
Firm reputation makes manpower to stick to effective operation in VUCA model.	.829			
Manpower needs occupational education and training for effective operation in VUCA model.	.746			
Manpower appreciates material management for effective operation in VUCA model.		.829		
Supervision is relevant for effective manpower operation in VUCA model.	.345	.698		
Systematic flow of work ensures effective manpower operation in VUCA model.			-	.708
Relaxation allowances to manpower ensures effective operation in VUCA model.		.368	.654	
Crew size and efficiency ensures effective manpower operation in VUCA model.			.520	
Site layout gives manpower sense of effective operation in VUCA model.				.643
Camping conditions encourage effective manpower operation in VUCA model.				.624
Site management caution manpower for effective operation in VUCA model.			.401	.609

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

Tables 2 revealed the four most relevant factors for effective manpower operations in building construction firms as factored using factor analysis as factored and revealed by the Eigenvalues, extraction sums of squared loadings & rotation sums of squared loadings to include: firm reputation makes manpower to stick to effective operation in VUCA model, manpower needs occupational education and training for effective operation in VUCA model, manpower appreciates material management for effective operation in VUCA model, and, supervision is relevant for effective manpower operation in VUCA model. The finding correlates with results of Kazaz *et al.* (2008), even as Ola-Awo *et al.* (2020) asserts that, the role of manpower resources in building construction industry cannot be over emphasized as construction firm's always target to improve labour efficiency and human factors influence greater the efficiency, performance and project success in the productivity determines the profitability of many projects. By implication of this finding, Nigeria like most developing countries where building construction industry plays a dominant role in the economic activities of the country and, the industry cannot do without manpower operations which in turn affects construction activities that affect nearly every aspect of the economy and that the industry is vital to the continued growth of the economy.

4.0 CONCLUSION

The study concluded that based on the findings: The professionals are somewhat aware of VUCA model in the building construction industry. Also, Imagination to adapt and flexibility, ineffective leadership/performance failure and shared vision, rampant structural (operational) in the business, new ideas in building construction, shifts in client and stakeholder expectations, high levels of unemployment leading to poverty and insecurity, and, social and financial uncertainties are the factors hindering the adoption of VUCA Model in building construction firms. In addition, Firm reputation, occupational education and training, material management, and, supervision are the most relevant factors for effective manpower operations in building construction firms. VUCA model has an effect on manpower operations in building construction firms; which ensures project success, adequate resource allocation, efficiently and effectively affects time and cost management of building project delivery, also, ensures quality of project out-put by manpower operations as parts of the most effect of VUCA model. Therefore, it is recommended that Professionals must be agile and sustainability conscious in the VUCA world to curtail factors hindering the adoption of VUCA model by ensuring relevant factors for effective manpower operations for timely delivery of building projects within cost and quality.

5.0 REFERENCES

- Bennett, N. & Lemoine, G. J., 2014. What a difference a word makes: Understanding threats to performance in a VUCA world. *Business Horizons*. 57. pp311–317. Doi: 10.1016/j.bushor.2014.01.001
- Bennis, W., & Nanus, B., 1985. *Leaders: The strategies for taking charge*. New York: Harper & Row.
- Çiçeklioğlu, H., 2020. VUCA Concept and Leadership. *Management & Strategy*. pp229-244. <https://www.researchgate.net/publication/346470856>
- Dawson C., 2002. *Practical Research Methods: A User-friendly Guide to Mastering Research Techniques and Projects*. Oxford: How to books, Ltd.
- Gunderson, L., & Holling, C., 2002. *Panarchy: Understanding Transformations in Human and Natural Systems*. Washington DC: Island.
- Hubbard, D. G. & Bolles, D. L., 2014. PMO Framework and PMO Models for Project Business Management. *Paper; 8th Annual University of Texas at Dallas, Project Management Symposium Proceedings*. Richardson, Texas.
- Hubbard, D. G. & Bolles, D. L., 2015. PMOs of Today and Tomorrow. *Paper; 9th Annual University of Texas at Dallas, Project Management Symposium Proceedings*. Richardson, Texas.
- Hubbard, D. G. & Rogers, P. W., 2019. A VUCA-Mindset and VUCA-Model for Project Business Management in the 4th Industrial Revolution; presented at the 13th Annual UT Dallas Project Management Symposium, Richardson, Texas, USA in May 2019; *PM World Journal*. VIII(VII), August 2019.
- Kazaz, A., Manisali, E. & Ulubeyli, S., 2008. Effect of Basic Motivational Factors on Construction Workforce Productivity in Turkey. *Journal of Civil Engineering and Management*. 14(2): pp95–106. DOI: 10.3846/1392-3730.2008.14.4

- Kehinde, O. M., Afolabi, O. J. & Omogbolahan, I. A., 2017. Evaluation of the effect of project management techniques on Road construction projects in Nigeria. *European Project Management Journal*. 7(1). pp1-10.
- Krejcie, V. R. & Morgan, W. D., 1970. Determining sample size for research activities. *Educational and Psychological Measurement*. 30. pp607 – 610.
- Lawrence, K., 2013. Developing Leaders in a VUCA Environment. UNC Executive Development, 1-15.
- Mitika, N. & Farhat, M., 2020. Identifying VUCA Factors in a Pandemic Era – A framework focused on Indian Industry. *Journal of Critical Reviews*. 7(7). pp931-936.
- Ogwueleka, F. N. J., 2011: Data Mining Application in Credit Card Fraud Detection System. *Journal of Engineering Science and Technology* Vol. 6, No. 3 311 - 322
- Ola-Awo, W. A., Olonilebi, P., Ganiyu, B. O. & Alumbugu, P. O., 2020. Assessment of Motivational Factors for Workers Productivity Improvement in Construction Projects in Abuja. *Environmental Technology & Science Journal*. 11(2). pp53-64.
- Olatunji, A. A., 2010. *Influences on Construction Project Delivery Time*. South Africa: PhD Thesis NMMU.
- Rimita, K. N., 2019. *Leader Readiness in a Volatile, Uncertain, Complex, and Ambiguous (VUCA) Business Environment*. MPhil, Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy Management Walden University.
- Sahu, M. K. and Panda, Dr.A. K., 2016. A ‘VUCA’ Metrics Analysis of Organized Retail Sector in India. *European Journal of Business and Management*, 8(31),1-6.
- Sambo, A. A., 2008. *Statistical Principles for Research in Education and Social Sciences*. Zaria-Nigeria: S. Asekome & co.
- Schick, A., Hobson, P. R. & Ibisch, P. L., 2017. Conservation and sustainable development in a Volatility, Uncertainty, Complexity, and Ambiguity world: the need for a systemic and ecosystem-based approach. *Ecosystem Health and Sustainability*. 3(4):e01267. 10.1002/ehs2.1267
- Sullivan, J., 2012 January 16. VUCA: The new normal for talent management and workforce planning. Ere.net. Retrieved from <http://www.ere.net/2012/01/16/vuca-the-new-normal-for-talentmanagement-and-workforce-planning/>.
- Sullivan, J., 2012 October 22. Talent strategies for a turbulent VUCA world—shifting to an adaptive approach. Ere.net. Retrieved from <http://www.ere.net/2012/10/22/talent-strategies-for-a-turbulentvuca-world-shifting-to-an-adaptive-approach>.