



An operational excellence strategy implementation model for growth in a volatile, uncertain, complex, and ambiguous environment

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Orientation: The study has been undertaken to design an Operational Excellence (OE) Strategy Implementation Model for Growth in a VUCA (Volatile, Uncertain, Complex, and Ambiguous) Environment. The study was conducted using Johannesburg Stock Exchange (JSE) listed companies.

Research purpose: To develop an OE strategy implementation model for organisational growth in a VUCA environment.

Motivation of study: Illuminating problems such as the prevailing coronavirus disease 2019 (COVID-19) pandemic are impeding OE strategy implementation by JSE listed organisations, suggesting the fact that existing models do not address changes in VUCA environments.

Research design, approach and method: This research collected quantitative data using the questionnaire instrument rolled out through SurveyMonkey to 1000 people working for JSE listed companies implementing Operational Excellence. The data collected from the 430 responses of the sampled 1000 was acceptable according to Krejcie and Morgan (1970) formula which requires 384 as minimum for generalisation. The data was cleaned for analysis using the Stata SE version 15.1 where all variables were transformed into numerical score on the Likert scale. The linear regression of the variables enabled the linkages that resulted in structural relationships. The structural equation modelling (SEM) technique was used to further analyse the structural relationships observed, these relationships enabled the construction of the final model through path analysis.

Main findings: The study found that OE strategy can only drive growth through proper implementation, maintenance, and improvements utilising management review of best practices, policies, and procedures on key performance metrics such as revenue, profits and return on investment.

Practical/managerial implications: Shortcomings of the existing models were interrogated and gaps found in order to design a more suitable model for growth which takes cognisance of the VUCA Environment.

Contribution/value-add: A new model was designed that can be used successfully as a holistic tool in OE to drive growth by practitioners of the industry.

Keywords: design; operational excellence; strategy implementation; financial growth; VUCA environment.

Background

The current world order has been disrupted and reset by the coronavirus disease 2019 (COVID-19) pandemic (Dunford & Qi 2020). A decade earlier, the business world had started to change due to globalisation (Ristovska 2014). Ristovska (2014) further elaborated that a conglomerate of political, economic, social, and technological changes and advancements have broken geographical borders and trade barriers. Similarly, international trade and business face intense competition and fast-paced change due to the fall of these boundaries. Baldwin (2016) argued that organisations are fragmented, because of fast-paced technological changes. The fast-paced change influences predictability leaving organisations vulnerable and failing to catapult competitive advantage for meaningful growth (Kumar 2016). Mutizwa (2019) described the modern marketplace as VUCA (Volatile, Uncertain, Complex, and Ambiguous), cautioning that organisations will find themselves in continuous pursuit of operational improvement in efficiency and competitiveness.

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The volatile, uncertain, complex and ambiguous environment

The acronym VUCA stands for volatility, uncertainty, complexity, and ambiguity. These characteristics of the environment demand intricate and multivariate systems comprising of resource acquisition, mobilisation and rationalisation to achieve desired results (Mutizwa 2019). Susana (2017) advocated for the constant overhauling of ways of working due to the incomprehensible interconnectedness of causes and effects across the globe.

Waskvi (2019) posited that the US military coined the term VUCA in the 1990s to describe a myriad of challenges troubling a diagnosis of military situation. However, VUCA recently found its way into the business lexicon (Raghuramapatruni & Kosuri 2017; Sony 2018). Business environments are influenced by socio-political variables, inclusive of ethnic or religious persuasions, diversity tensions, unprecedented discrimination, unattended grievances, or pronounced disagreements (Prensky 2014). By synthesising (Table 1) a wide range of initiatives undertaken by organisations to steer growth in VUCA global competitive space, this research sought to interrogate the impact of Operational Excellence (OE) strategy implementation in VUCA environments, which has become a buzzword (Sony 2018).

One can therefore summarise a VUCA environment as a set of interdependent dynamics of PESTEL (Political,

TABLE 1: Definitions of a volatile, uncertain, complex and ambiguous business environment.

Date	Author	VUCA environment definition
2016	Kuznik	A holistic risk system that calls for countermeasures is designed quickly and easily to maintain organisational power to act in the face of greatly reduced reaction times and increased turbulence. The function of risk management must be commensurate to the risk of gravitational requirements.
2017	Mutizwa	A network or ecosystem exhibiting harsh external environments that needs the execution of all disciplines with instinct and coherent orientation by leadership to mitigate external exogenous pressures while exerting significant influence on internal dynamics to advance organisational goals.
2019	Dombrowski and Henningsen	An ever-changing discontinuous dynamic business environment where organisational growth is affected significantly by events that demand flexibility and versatility in pursuit of strategies to remain abreast of developments.
2018	Veldsman and Pauw	An organisational landscape characterised by an ever-changing prevalence where traditional mechanisms and methodologies have become obsolete. Focus shifts towards constructing a holistic adaptable critical coherent approach that allows talent to reinvent more agile and sustainable.
2019	Khurana and Singh	A confusing business environment that is constantly changing due to external disturbances or internal unrest. Security in decision-making and choices of actions are illusions. New discovery or development makes the environment more volatile, uncertain, complex, and ambiguous.
2020	Rimita, Hoon and Levasseur	A relentless business environment with diversity, intensity, and rapidity changes, which renders existing leadership or operating methods, proves inadequate resulting in hermeneutic phenomenological experiences.

VUCA, volatile, uncertain, complex and ambiguous.

Economic, Social, Technological, Environmental, and Legal) which relates together in an intricate, intertwined, or interconnected ecological system and between systems and their environments.

Volatility

In a volatile environment, extreme fluctuations characterise the multi-layer of the econometrics (Prensky 2014). There is instability in currency; decisions made are subject to rapid changes that may necessitate instant changes to such decisions (Susana 2017). Bennett and Lemoine (2014) described volatility as a situation characterised by unexpected challenges, and unstable environment for an unknown duration. Typical inflationary fluctuations in prices, currency against the dollar, and natural disaster are traces of volatility.

Uncertainty

Uncertainty is characterised by erosion of predictability of the future based on experience. There is no more confidence in the steadiness of decisions (Raghuramapatruni & Kosuri 2017). Raghuramapatruni and Kosuri (2017) further elaborated that this works best in conjunction with structural changes, such as adding information analysis networks to reduce ongoing uncertainty. This presents challenges to any initiative such as OE implementations as a driver for growth.

Complexity

While the complex engineering of landing on the moon and spacecraft puzzled the non-scientific world years back, modern science has broken protocols from genetics to disruptive innovation such as robotics and automation to futuristic artificial intelligence. The sheer volume and nature of the problems reflect the complexity. Typical VUCA environment complexity instances are unique tax and regulatory tariffs and cultural expectations associated with monetary policies (Raghuramapatruni & Kosuri 2017). The instability of variables due to the nature of overwhelming environments' regulatory tariffs and cultural values make predictability difficult (Bennett & Lomaine 2019).

Ambiguity

The advent of technology adopted by the younger generation, faster than the elderly, has caused ambiguity as to who teaches who. Prensky (2014) posited that the new dispensation shuns the transfer of knowledge management and wisdom traditionally passed from one generation to the next generation. Mutizwa (2015) advocated digital technology; the synopsis perspective of the systematic structural constellation (Syst) has changed the uncharted social media landscape. This poses major obstacles when exploring OE implementations in immature or emerging markets (Raghuramapatruni & Kosuri 2017).

There is an abundance of academic material published to address the challenges of efficiency, effectiveness, and OE strategy implementation, but very few focus on business performance for growth in the VUCA environment

(Mutizwa 2018). Salonitis and Rusev (2016) asserted that these models and roadmaps had been developed to guide organisations implementing OE. However, these models do not focus on a VUCA environment, for example, changes in technology Fourth Industrial Revolution (4IR). Operational Excellence links an organisation's strategy, operations, and services and contributes to its effectiveness and efficiencies (Crawford 2013). It is therefore imperative for organisations to mechanise OE as the driving growth in a VUCA environment. Indeed, Duggan (2014) asserted OE as the real endgame that has leveraged a comprehensive and systematic approach to design and implementation of value streams and support processes that enable business growth. In comparative context to this research, very few studies have extensively focused on the VUCA environment holistically.

Existing OE models are accused of lacking clarity, systematic implementation roadmaps and do not guide the organisations towards growth. They often only state what it takes to achieve OE rather than explain how to do it (Markins & Bolboli 2015). Published OE Strategy Models seem inadequate for organisational growth in a VUCA environment (Cousins 2018). The generic OE strategy implementation models are more suitable for a regular and stable environment. The models have failed to stimulate growth in VUCA environments because of the prevailing adverse factors. Cousins (2018) postulated that change is a likely and only constant phenomenon in VUCA environments; however, the timing and extent of change are unknown. This phenomenon warranted a re-examination of these OE strategy paradigms in an endeavour to design a suitable model. Therefore, the motivation for this research was to close this research gap (design model for OE strategy implementation for growth in a VUCA environment).

In an endeavour to match and supersede competition, organisations in a VUCA environment are compelled to do better by implementing innovative strategies (Millar, Groth & Mahon 2018). Found et al. (2018) stated that successful OE strategy implementation demands dynamism and agility in using talented and skilled people, better processes, using equipment and technology. Baker and Coquery-Vidrovitch (2015) argued that Africa is a unique continent with a very difficult business climate. The South African economic environment has deteriorated, for example, unemployment rate is 32.6% (Stats SA 2021). Operational Excellence strategy implementation should therefore drive customer focus, continuous improvement, and innovation for growth (Millar et al. 2018). Evidently, organisations embrace OE strategies to articulate their vision and mission through gained competitive advantage envisaged in terms of better processes, people skills, technology advancement, and improved methodology (Found et al. 2018). Movahedi, Miri-Lavassani and Kumar (2016) argued that OE determines organisational competitive advantage through building capabilities and responsiveness to intra and extra VUCA environments. It is against this background that this research has established the gap and impracticalities of instituting programmes such as OE

implementation without scrutiny and environmental scanning to equip organisations with relevant models to drive growth.

Operational excellence

In an increasingly dynamic business environment where change seems to be the only constant feature, organisations have resorted to quality and OE frameworks in their efforts to adapt and obtain competitiveness (Carvalho, Carvalho & Sampaio 2017). Operational Excellence programmes are often utilised in the management of change in a time-defined way. However, rather than being viewed as an approach to promote change, OE should provide tools and frameworks for organisational members to deal with change. In the current globalised and highly competitive business environment, organisational excellence has proved to play a crucial role in the search for sustainable success (Naftanaila, Rau & Cioana 2015). It advances a set of principles and practices that, if effectively implemented, can promote continuous improvement in an organisation, aligning and managing together new opportunities, processes, and tools in search of organisational success. Araújo and Sampaio (2014) regarded OE as a key driver to business success because it aligns operations with customers. The OE philosophy makes it possible for all members of the organisation to understand how processes are followed and make fast decisions with strategic implications.

Although OE is a critical factor for competitiveness, maximum benefits are obtained when managers decide on the most important processes that add value and develop instruments to sustain those (Carvalho et al. 2017). As a result, closer attention needs to be paid to the study and application of models of organisational excellence. Excellence should be considered as a management philosophy or a set of principles and behaviour that guides and inspires management and will produce the best overall results in the long term. In support to this view, Araújo and Sampaio (2014) posited that the real implementation of excellence models occurs when such OE models are fully integrated with an organisation's regular practices. This integration is achieved by making it part of strategic planning and deployment, aligning its use with other systems, linking procedures with management performance, and involving the whole organisation.

The genesis of operations improvements, traced back to the 18th century, focused on efficiencies and productivity improvement for customer satisfaction. The architects of the systems introduced scientific management and time and motion studies as methodologies for achieving the set ultimate goals. The early 19th century saw the introduction of the Just in time (JIT), Six Sigma, Total Quality Management (TQM) and lean manufacturing operations improvement systems, based on the Toyota productive systems in Japan. The waste reduction studies at Toyota embraced Kaizen (continuous improvement) processes as the core of the

Toyota production system. Further studies by Shingo over a decade culminated in the guiding principles of OE strategy implementation, which is dubbed the Sony (2018). Other authors who contributed to OE implementation models critically reviewed in this research included the Oakland (2013), Crawford (2013) model, and the Duggan (2014) model (Table 2).

Operational excellence approaches

There seems to be no one-size-fits-all strategy for achieving OE. Different organisations either adopt or tailor-make and implement models which can deliver their desired goals. Operational Excellence implementation must be justified by results consisting of quantifiable benefits, namely, empirical competitive advantage, customer satisfaction, good employee remuneration, and stakeholders' value. A close analysis of the discussed models shows that OE success is never an easy journey, albeit there are positive financial and non-financial outcomes (Dahlgard et al. 2013).

The Crawford approach

Crawford (2013) stated that, for successful OE strategy implementation, organisations must assess their operating environment: SWOT (strengths, weaknesses, opportunities, and threats) analysis. Crawford (2013) further argued that it does not mean improving upon all weaknesses in one go, but rather, identifying the key weaknesses and ensuring that there are no flaws. To achieve this, OE strategy implementation needs to identify and propel enablers: people skills, shared values, communication, commitment, and management style. Crawford (2013) argued that OE strategy implementation is not a one-off exercise but the perpetual enhancement of an organisation through continuous improvement of enablers,

frameworks, and principles. While Crawford (2013) viewed OE as always striving to do things right the first time, he did not dwell on the most important pillar for OE, which is a continuous improvement (Rising 2014). The excellence in creativity, problem-solving, and teamwork is critical for change, success, and the attainment of goals, primarily driven by everyone. Carvalho et al. (2019) conflicted with the narrative, saying that OE should not be an approach to promote change but rather provide tools and framing for people in the organisation.

The Oakland approach

Oakland (2013) described OE strategy implementation as a comprehensive and pragmatic jigsaw puzzle that holistically embraces the most recent Sigma, lean, and TQM models for total 'excellent' growth. Oakland (2013) postulated that organisations were under constant pressure to improve their business performance. Oakland (2013) further stated that organisations are compelled to measure themselves against world-class standards and focus their efforts on the customer. Oakland (2013) illustrated that OE primarily involves investment in people, time, training, recognition, and new organisational culture. However, Oakland's model is based on the European Foundation for Quality Management (EFQM) and does not dwell on the environment, which naturally influences the success or failures of the organisation's initiatives. Critical OE implementation attributes such as communication with teams, systems, and monetary budgets for the preparation and execution of the EFQM model were not incorporated. This presents no guidance to organisations to use the model (Jaegera, Matyasb & Sihn 2014).

The Duggan approach

Duggan (2014) envisioned OE as a journey with a defined destination where all employees see the flow of value to the customer and fix that flow before it breaks down. The journey entails the execution of the business strategy more consistently and reliably than competitors do. Jaegera et al. (2014) differed from Duggan, arguing that the concepts of assessment must be implemented in a manner that supports transparency of the cause-effect relationships and interdependencies to adjacent fields of global organisations. Duggan (2014) emphasised taking employees along the journey of understanding to the value stream with the following resolute steps: employee's engagement and buy-in, understanding of OE as a way of doing things and not as a concept, and secured management and leadership support. Duggan (2014) further posited the steps culminating to the following principles: design a Lean value stream, make Lean value stream flow, create standard work for normal flow, create standard work for abnormal flow, have employees in the flow improve the flow and perform offence activities. The Duggan Model, however, did not highlight how holistic OE is impacted by the absence of full-scale engineering, manufacturing, and component acquisition coordination (Chapman 2018). Bock and Galey (2019) emphasised the need for systems engineering to interact with the environment for the 'big picture' of excellence to be achievable.

TABLE 2: Operational excellence definitions.

Date	Author	Definition
2013	Crawford	OE is a philosophy of organisational leadership that stresses the application of a variety of principles, systems, and tools toward the sustainable improvement of key performance metrics. OE is said to be a philosophy of: 'doing things right, in the right way, in the right order, at the right time, consistently'
2013	Oakland	OE is all about having the right capabilities, the right level of competencies, clear business direction, productive processes, and a toolbox of efficient and effective techniques and methodologies.
2014	Duggan	OE is the execution of the business strategy more consistently and reliably than competitors do and the achievement of desired results. It entails striving for continuous improvement that leads to customer satisfaction.
2014	Shingo	OE is the successful transformation architected by leaders through a culture of continuous improvement. The change processes are built on fundamental principles that govern the values, behaviours, systems, and subsystems embedded in the tools that enable alignment towards desired results.
2015	Mitchell	OE is a high performance, success-oriented operation. The operative phrase, of course, is 'work culture'. Senior executives engage across domains rather than focusing on sales, sales, and sales; the focus is now generating value. Of importance is high-level leadership in areas like human resources, day-to-day operations, and asset integrity.

OE, Operational Excellence.

The Shingo model

The Shingo Institute illustrated five key fundamentals paradigm shifts: OE focuses as a requirement for successful behavioural and culture change, the manifestation of ideal behaviours to influence desired outcomes, strong cultural foundations for the construction of long-term sustainable principles, management systems that positively affect behaviours to align with principles and embracing strategy enablers as Lean, TQM, JIT, and Six-sigma (Sony, 2018). The Shingo Institute focal fundamentals are organisational education, assessment of milestones, and recognition of achievements of the set excellence targets and benchmarks (Sony, 2018). Clear communication cultivates trust and responsibility. In that process, resultantly, everyone assumes ownership of his or her work areas. Gisi (2018) noted that the Shingo Institute categorised their 10 guiding principles into four pillars in building lasting culture and achieving enterprise excellence: cultural enablers, continuous improvement, enterprise alignment, and results.

The approach in this research was to view OE as a toolbox of organisational transformation architecture that involves executing work consistently in the right way, in the right order, and in the right time. The execution involves total commitment across domains from top management to cultivate a holistic work culture that governs values and aligned performance metrics for excellence. The leadership style enables operations improvements across all departments, primarily focusing on structural systems, process optimisation, product quality, differentiation, customer care, people engagement, and development for growth (Stoyanova & Iliev 2017).

Driving strategy for growth

Hruska (2015) argued that VUCA environments drive success in the long term if they were to employ growth strategies in organisations. Mwaniki (2019) defined growth as the increase in net income, numbers of customers, and an increase in market share or shareholder value (Gattorna 2017). This research, therefore, describes growth as the transformation, improvement, edification, or multiplication of organisational share value. The growth trajectory focused over time in ways that are non-imitable and non-substitutable is not easily achievable due to competitors who simultaneously, in parallel, seek to achieve the same desired results (Schnackenberg et al. 2019). The current OE models do not pronounce much about growth in VUCA environments, rather they only dwell on the implementation of the OE strategy.

Obama (2011) simulated sustainable growth as possible by harnessing the ingenuity of the people and a dynamic environmental response through innovation. Johnson (2016) viewed fine-grained stakeholder involvement as fundamental for OE implementation to achieve growth. In that process social partners, employees and investors realise the return on investment (ROI) and growth because of OE (Hutchins 2018).

Research purpose

This research investigated the impact of key components of OE strategy implementation and the components' effectiveness in driving growth in a VUCA environment as can be expressed by the following hypotheses:

H₁: There is significant relationship between people, process/technology, and product/services and OE strategy implementation.

H₂: There is a significant relationship between people, process/technology, product/service and growth.

H₃: There is a significant relationship between the VUCA environment and the success of OE strategy implementation.

H₄: There is a significant relationship between the VUCA environment and growth.

Research methodology

A survey approach was adopted to collect data in order to construct an OE model fit for the VUCA environment. The empirical data was collected using questionnaires submitted to Johannesburg Stock Exchange (JSE) listed organisations, within the mining and metallurgy, heavy engineering, food and beverages manufacturing, clothing and textile, plastic and chemical engineering manufacturing. This sector was selected due to its focus on OE. One thousand questionnaires were deployed via SurveyMonkey to LinkedIn contacts whose profiles reflected JSE listed organisations. Participants consisted of top, middle, and lower-level employees to enable extraction of OE understanding, awareness, behaviour changes, success and barriers, and anticipations at all organisational levels. Using the sample size determination by Krejcie and Morgan (1970), a minimum sample size of 384 was required with a margin of error of 5%. There were 430 valid responses received denoting a 43% response rate.

Research results

The Bentler-Raykov test was used to establish the impact of independent variables on the dependent variable. The correlation tests were used to indicate the linearity of variables in the study. Furthermore, a structural equation modelling (SEM) technique was used to determine structural relationships observed and to identify components of the model. A confirmatory factor analysis (CFA) was conducted to measure how well the latent variables 'human centricity', 'leadership', 'competitive advantage', 'technological advancements', 'systems' and 'strategic alignment and fit' are measured by observed variables. Observed variables are variables contained in the data and described in detail below in the descriptive analysis of the study. Latent variables are combined scores of observed variables and variables which the researcher constructed, based on theory. A structural model was developed to test causal relationships proposed in the constructs section. This model (also referred to as path analysis) considered the way constructs are related to each other. Table 3 shows the variables derived from the field instrument, a quantitative questionnaire.

TABLE 3: The structural equation model.

Measurement	Coefficient	Robust std. error	p	95% confidence interval	
				Lower bound	Upper bound
Employees received training					
Human centrality	1.00	(constrained)	-	-	-
_cons	3.52	0.06	0.00	3.41	3.63
Employees take ownership of operational efficiencies					
Human centrality	0.94	0.12	0.0000	0.71	1.18
_cons	3.62	0.05	0.00	3.51	3.72
OE has transformed work culture					
Human centrality	1.07	0.14	0.0000	0.80	1.33
Competition	1.00	(constrained)	-	-	-
_cons	3.82	0.05	0.00	3.72	3.91
OE has built high-performance teams					
Human centrality	1.16	0.15	0.0000	0.87	1.44
Competition	2.19	2.21	0.3230	-2.15	6.53
_cons	3.71	0.05	0.00	3.61	3.82
OE has impacted positively on job satisfaction					
Human centrality	1.17	0.15	0.0000	0.87	1.47
_cons	3.62	0.05	0.00	3.52	3.72
OE has opened new opportunities for employee growth					
Human centrality	1.19	0.14	0.0000	0.93	1.46
_cons	3.68	0.05	0.00	3.58	3.78
Morale is very high between employees and management					
Human centrality	1.20	0.13	0.0000	0.93	1.46
_cons	3.29	0.05	0.00	3.18	3.39
We constantly review KPI & system, employee needs					
Human centrality	1.04	0.11	0.0000	0.81	1.26
_cons	3.29	0.06	0.00	3.18	3.40
Structure and governance systems support OE strategy					
Systems	1.00	(constrained)	-	-	-
Leadership	0.48	0.09	0.0000	0.30	0.66
_cons	3.63	0.04	0.00	3.54	3.71
Sales and operational planning synchronised					
Systems	2.09	0.48	0.0000	1.15	3.03
_cons	3.64	0.05	0.00	3.54	3.73
Implemented OE strategy is evaluated continuously.					
Systems	2.46	0.66	0.0000	1.16	3.75
Strategic fit	1.66	0.51	0.0010	0.67	2.66
_cons	3.66	0.05	0.00	3.56	3.76
OE strategy implementation is aligned with vision.					
Systems	2.26	0.71	0.0020	0.86	3.66
Strategic fit	3.07	2.09	0.1410	-1.02	7.15
_cons	3.93	0.05	0.00	3.83	4.02
Plant efficiencies and throughputs have improved.					
Systems	2.36	0.59	0.0000	1.19	3.52
_cons	3.62	0.05	0.00	3.53	3.72
Product quality is good and there is less scrap					
Systems	2.54	0.66	0.0000	1.23	3.84
_cons	3.64	0.05	0.00	3.54	3.73
Procurement and supplier management has improved					
Systems	2.48	0.63	0.0000	1.24	3.72
_cons	3.63	0.05	0.00	3.53	3.72
Planned maintenance schedules are adhered to					
Systems	2.67	0.70	0.0000	1.29	4.04
_cons	3.62	0.05	0.00	3.52	3.73
Deliveries are now on time and in full and customer					
Systems	2.17	0.61	0.0000	0.97	3.36
_cons	3.71	0.05	0.00	3.61	3.80
Benchmarked against a global standard					
Competition	10.78	11.77	0.3600	-12.29	33.84
_cons	3.79	0.05	0.00	3.69	3.88

Table 3 continues on the next column →

TABLE 3(Continues...): The structural equation model.

Measurement	Coefficient	Robust std. error	p	95% confidence interval	
				Lower bound	Upper bound
OE strategy complemented the traditional operational					
Competition	13.31	14.77	0.3680	-15.64	42.25
_cons	3.88	0.05	0.00	3.79	3.98
The top management has communicated the vision					
Leadership	1.00	(constrained)	-	-	-
_cons	3.65	0.05	0.00	3.55	3.74
OE strategy implementation supported by top management					
Leadership	1.08	0.07	0.0000	0.94	1.21
_cons	3.64	0.05	0.00	3.54	3.75
A comprehensive brainstorming was conducted.					
Leadership	1.08	0.09	0.0000	0.90	1.26
_cons	3.26	0.05	0.00	3.16	3.37
There was holistic effort across all stakeholders					
Leadership	1.19	0.11	0.0000	0.97	1.40
_cons	3.27	0.06	0.00	3.16	3.38
Leadership motivated employees to own OE					
Leadership	1.35	0.11	0.0000	1.14	1.57
_cons	3.43	0.06	0.00	3.32	3.55
Leadership cultivated an OE cultured, shared values					
Leadership	1.36	0.11	0.0000	1.15	1.57
_cons	3.39	0.06	0.00	3.28	3.51
Leadership and governance are key to OE strategy					
Leadership	0.29	0.07	0.0000	0.16	0.42
_cons	4.34	0.04	0.00	4.26	4.43
Technology takes centre stage					
Technologic advancements	1.00	(constrained)	-	-	-
_cons	3.91	0.05	0.00	3.82	4.01
Innovation drives OE strategy					
Technologic advancements	1.03	0.13	0.0000	0.77	1.29
_cons	4.21	0.04	0.00	4.12	4.30
IT/systems influenced the OE implementation					
Technologic advancements	1.04	0.09	0.0000	0.86	1.21
_cons	4.06	0.05	0.00	3.97	4.15
Continuous innovation is key for OE sustainability					
Technologic advancements	0.33	0.10	0.0010	0.13	0.53
Strategic fit	0.43	0.33	0.1940	-0.22	1.09
_cons	4.43	0.04	0.00	4.35	4.51
Owing VUCA Environment, enablers must be in place for OE success					
Strategic fit	0.00	0.46	0.9990	-0.91	0.91
_cons	4.01	0.04	0.00	3.92	4.09
OE requires funding to keep systems ongoing					
Strategic fit	-0.05	0.66	0.9350	-1.36	1.25
_cons	3.72	0.06	0.00	3.61	3.84
Allocated budget influences OE strategy					
Strategic fit	0.77	0.44	0.0830	-0.10	1.63
_cons	4.08	0.04	0.00	4.00	4.17

Note: Number of observations = 374; Overall R-squared = 0.999; SRMR = 0.202; _cons, represent the regression's intercept.

OE, Operational Excellence; KPI, Key performance indicators; IT, Information technology; SRMR, Standard Root Mean Squared Residual; VUCA, volatile, uncertain, complex and ambiguous.

Model outcomes

Noteworthy in this model is the statistically significant and positive relationship that was observed between human centrality and variables. 'OE has transformed work culture', 'employees take ownership to improve operational

efficiencies', 'OE has built high-performance teams', 'job satisfaction', 'OE has opened new opportunities for employee growth', 'reviewing KPIs to meet employee needs' and 'morale is very high between employee and management'. This means an increase in human centric approach will result to an increase in the discussed aspects/variables.

Likewise, there was a significant positive relationship between systems and variables: 'structure and governance systems support OE strategy', 'Sales and operational planning is synchronised for cost-effectiveness', 'implemented OE is continuously evaluated for improvement', 'OE strategy is aligned with organisation vision', 'throughputs have improved', 'product quality is good', 'procurement and supply management has improved', and 'planned maintenance schedules are adhered to' and 'deliveries are now on times, and customers are delighted with our services'. Variable 'implemented OE is continuously evaluated for improvement' was also positively associated with latent variable 'strategic fit', thus indicating an increase in the former would lead to an increase in the systems efficiency and strategic fit in the organisation.

Furthermore, 'OE strategy implementation roll-out was steered and supported by top management', 'A comprehensive consultative brainstorming was conducted in the adoption of new strategies', 'holistic effort across all stakeholders', 'leadership motivated employees to own OE strategy', 'leadership cultivated an OE culture through shared values', 'leadership cultivated an OE cultured through shared values', and 'leadership through governance is key for OE in VUCA environments' had a statistically positive relationship with latent variable 'leadership'. Similarly, the variables such as 'innovation drives OE strategy', 'Information technology/systems influenced the success of OE strategy implementation',

and 'continuous innovation is key for OE sustainability' were positively associated with 'technology'. Other variables like 'OE requires more funding' were found not to be statistically associated with their respective latent variables and hence, omitted from the interpretation of the output.

The test of the variables resulted in the prediction of the regular Standard Root Mean Squared Residual (SRMR) of 0.202. The multiple coloration MC, also known as Bentley–Ryabkovsquared, between dependent variable indicators, was 0.999 for the observation number of 374.

Variables test

Table 4 shows the goodness of fit test at the equation level. The variance column shows (1) variance computed from the dataset represented by the fitted sub-column, (2) variance, which the model predicted for each variable in it, this sub-column, is 'predicted' in the table, and (3) residual variance, which is the variance of the error, that is, the difference between the fitted model and the predicted one. From the variance column, it is observable that there is a gap between the fitted model and the predicted one. This, however, is not indicative of poor fit, as the R-squared statistic showed most of the predictor variables predicted their outcome variable satisfactorily.

It was observed that the variables, namely, 'OE has transformed work culture', 'OE has built high- performance teams', 'job satisfaction', 'implemented OE is continuously evaluated for improvement', 'OE strategy is aligned with organisation vision', 'throughputs have improved', 'product quality is good', 'procurement and supply management has improved', and 'planned maintenance schedules are

TABLE 4: The goodness of fit at equation level.

Dependent variables	Variance			R-squared	MC	MC ²
	Fitted	Predicted	Residual			
Observed						
Training	1.17782	0.3488378	0.828982	0.296172	0.5442172	0.2961724
Employee ownership	1.116547	0.3111307	0.805416	0.278654	0.5278773	0.2786544
OE has transformed work culture	0.8024266	0.4104069	0.39202	0.511457*	0.7151624*	0.5114573*
Morale is very high between management and employees	1.019261	0.5011835	0.518078	0.491713	0.7012222	0.4917126
Reviewing KPIs to meet employees needs	1.240442	0.375685	0.864757	0.302864	0.5503307	0.3028638
Implemented OE is continuously evaluated for improvement	0.9115125	0.5663259	0.345187	0.621304*	0.7882281*	0.6213035*
Plant efficiencies and throughputs have improved	0.8845191	0.4876628	0.396856	0.551331*	0.7425167*	0.551331*
product quality is good	0.8861633	0.5647058	0.321458	0.637248*	0.7982782*	0.637248*
procurement and supply management has improved	0.9267765	0.5406874	0.386089	0.583406*	0.7638105*	0.5834064*
Planned maintenance schedules are adhered to	1.110523	0.6252468	0.485276	0.56302*	0.7503467*	0.5630202*
There was holistic effort across all stakeholders	1.134173	0.6336862	0.500487	0.558721*	0.7474764*	0.558721
Leadership motivated employees to own OE strategy	1.224137	0.8200862	0.404051	0.66993*	0.8184925*	0.66993
Leadership cultivated an OE culture through shared values	1.222514	0.8340378	0.388477	0.682232*	0.8259731*	0.6822315
Technology takes centre stage	0.9540726	0.4264875	0.527585	0.447018	0.668594	0.4470179
Innovation drives OE strategy	0.7268632	0.4523777	0.274486	0.62237*	0.7889041*	0.6223697*
Information technology/systems influenced OE success	0.7897038	0.4578618	0.331842	0.579789*	0.761439*	0.5797893*
Overall	-	-	-	0.999961	-	-

OE, Operational Excellence; KPI, key performance indicator; MC, the correlation between dependent variable and its prediction; MC², (mc-squared) the Bentler-Raykov squared multiple correlation coefficient.

adhered to' were good predictors in this model as they explained over 50% of the variance in their respective latent variables. Other variables that were good predictors of their latent variables were 'OE implementation was steered and supported by top management', 'a comprehensive and consultative brainstorming was conducted in the adoption of new strategies', 'holistic effort across all stakeholders', 'leadership motivated employees to own OE strategy', 'leadership cultivated an OE culture through shared values', 'leadership cultivated an OE culture through shared values', 'innovation drives OE strategy' and 'Information technology / systems influenced OE success'. The variable 'OE strategy is aligned with organisation vision' had the highest R-squared among all. When individually interpreted, we would say the goodness of fit at equation level showed that 'OE strategy is aligned with organisation vision' was a good predictor of leadership in this model as it explained over 86% of the variance in the latent variable 'leadership'. The same could be said for all the above-mentioned predictor variables and their latent variables. The hypothesised meditational effects of variables and predictors and mc 2 have been established using the Bentler-Raykovskquared multiple correlations. The linear regression of the variables was followed by the structural equation illustrated in the Figure 1.

The structural equation demonstrates OE variables linkages. This also confirms the need for a holistic approach and concerted efforts across all organisation functions. Fontes (2016) viewed OE as an involving process centred on the

integration of all organisational efforts towards cost effective and efficient mapping and operations of process systems to gain competitive advantage and drive growth.

Conclusion and recommendations

The derived model in Figure 2 indicate a number of strong components to achieve organisational growth in a VUCA environment.

Vision

Kakko, Kaivo-oja and Mikkela (2020) denoted volatility as mitigated by 'vision', a clear-cut direction to desired destiny. Operational Excellence is a journey without a destiny, but the endpoint is a mirage. A vision gives everyone a sense of common drive to achieve goals by having a clear sense about where the organisation is going (Raghuramapatrani & Kosuri 2017). There should be a communication of the paradigm shift from linear thinking to non-linear thinking of proactive sociotechnical shared vision fundamentally driven by self-organised bottom-up dynamics (Kakko et al. 2020).

Understanding

The VUCA characteristic of Uncertainty – the lack of events predictability, yields to 'understanding' (Kakko et al. 2020). The management in OE implementing organisations have to deliberately step back and look at things differently; take a

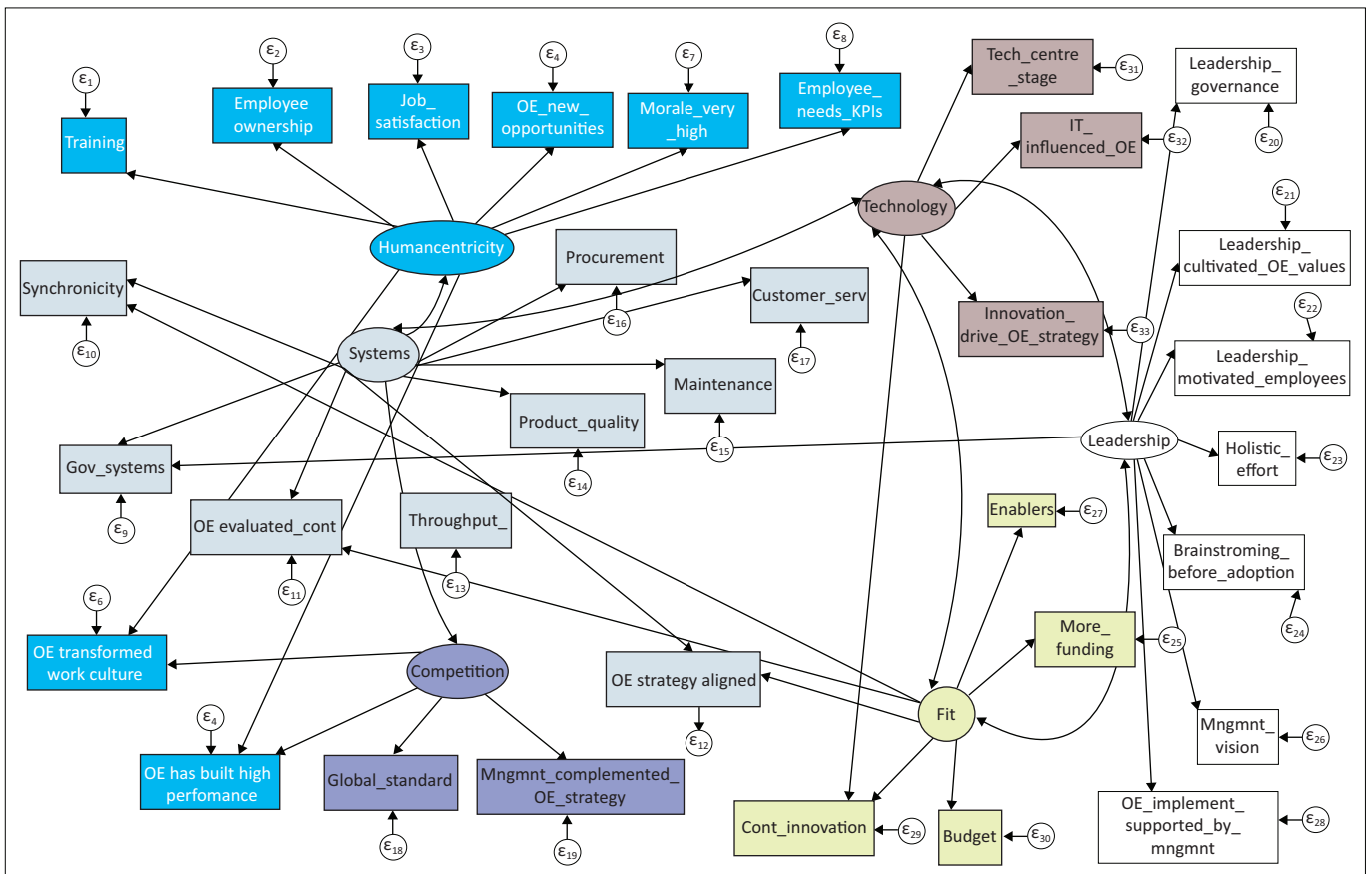
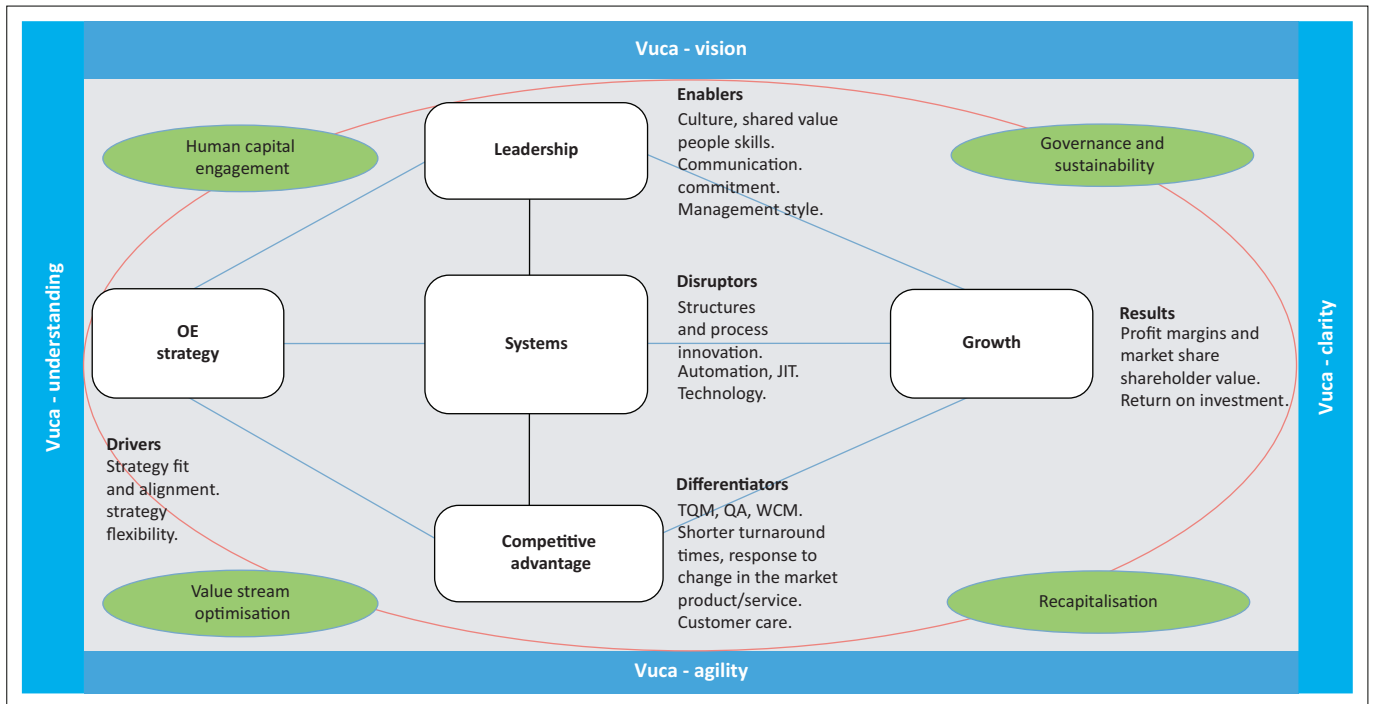


FIGURE 1: Structural equation modelling.



VUCA, volatile, uncertain, complex and ambiguous; OE, Operational Excellence; JIT, Just in time; TQM, Total Quality Management; WCM, World Class Manufacturing; QA, Quality Assurance.

FIGURE 2: Operational excellence model for growth in volatile, uncertain, complex and ambiguous environment.

bird's eye view to have a full picture, understand, and make informed and comprehensive decisions that yield desired organisational results. Most important is an effective communication system that enables full understanding across the organisation, leading to excellent performance and yielding of growth (Boya & Rao 2019).

Clarity

Confounding complexities are checkmated by 'clarity' (Kakkoet al. 2020). For successful OE, deliberate efforts make 'sense of the chaos'. Clarity helps to have alignment across the organisation on all grey areas. Operational excellence requires all organisational personnel to do things right the first time without room for seeking to ask for second attempts.

Agility

Drivers of OE implementations need to have the ability to think and act instantaneously. The new world order calls for the ability to anticipate sense arrival and respond quickly to dynamic changes in the business environment. The outbreak of the COVID-19 pandemic in recent times caught many governments and organisations unready to face the challenges associated with the pandemic.

Continuous improvement

Setting out standards procedures, systems, and controlled documentation of practices is good, but timeous reviews for improvements are great. Benchmarking organisational practices against the best gives reference to finding better ways to do things in product manufacturing or provision of service. The improvements must be strategically orientated

in an analytic methodological approach to have a full bisect of organisational strengths, weaknesses, opportunities and threats (SWOT). Because OE is a philosophy of leadership strategy choice, problem solving, and teamwork focused on satisfying customers' needs, it takes empowerment of everyone involved to own and continually improving all work facets (Al-Ansari et. al. 2015). Modern-day survival OE implementation calls for systemic development, evaluation, and mapping, re-designing and reengineering of systems to produce better products and services. Continuous improvement should then become the most important feature of all the key elements (Human capital, value optimisation, recapitalisation, governance and sustainability) that drive OE, as depicted by the red circle in the model in Figure 2.

Human capital engagement

While the advent of innovation and technology can be acknowledged as a fundamental drivers of growth, this cannot be possible without human input. Therefore, it is critical to cultivate a new culture with a shared excellence identity, norms, and values to implement successful OE. Of essence also are cooperation, trust, and phenomenal communication within the organisational structures (Mumby & Stohl 1996). Interpersonal reciprocal reactions must be for a common purpose.

Value chain optimisation

Management of change in product lifecycle, market demand and market volatility, uncertainties, complexities, and ambiguities remain the principle to sustain a competitive edge in the market. Organisations ought to have a proper procurement system that enables economies of scale and synergistic logistics, cutting intermediaries in more than

three-tier supplier links. Operations must be of high efficiency in maintenance, aided with computerised maintenance management systems (CMMS). New and unique combinations of these competencies are called value chain optimisation, which entails the profitable execution of every activity with reduced costs, reduced lead times, and reverse logistics.

Recapitalisation

It emerged that it takes money to make money: a good deal of investment in OE results in tangible growth. Over 60% of the experts pointed out that although budgets set for OE are always adequate, sustainability after implementation does fail due to budgetary constraints wherein resources are now being withdrawn slowly. Yajid et al. (2018) pointed out that traditionally, organisational performance was measured by financial success and profitability. However, in modern-day with OE strategy implementation, variables such as return on assets (ROA), and ROI, return on equity (ROE) are key indicators of growth. It, therefore, remains prudent to plough back a fair share capital injection into the organisational operations, thus, recapitalisation.

Governance and sustainability

Liang, Lee and Sang (2016) viewed governance as a fundamental discipline to give credence to the highest critical dimensions of mitigating risk, gaining traction as a core competence for management. While setting up risk management systems is not a panacea, frameworks, and governance processes need continuous strengthening to be fit for purpose in the constantly changing face of VUCA environments.

The model for using OE to achieve growth in the VUCA environment can be seen as consisting of attributes of leadership, systems and competitive advantage. These attributes reside in the intersecting domains of human capital engagement and value stream optimisation and support the organisation's growth to achieve growth through enablers such as recapitalisation and governance.

In an environment that continues to become even more volatile, uncertain, complex and ambiguous, growth can only be achieved by ensuring that the attributes and enablers above are in place.

Operational Excellence strategy can only drive growth through proper implementation, maintenance, and improvements using management review of best practices, policies, and procedures on key performance metrics. The periodic audits to weed out non-conformances for ratification and realignment with the acceptable standard are also fundamental. Eradication of cognitive dissonance is paramount to drive the OE initiatives for achieving growth.

The OE space, and schools of thinking behind operations improvement, has always been a neglected subject. This study

bisected the length and breadth of OE strategy implementation for growth in a specified environment (VUCA) covering mining, manufacturing industries and related services. There is room for further research on operational improvements in sectors such as banking, hospitality, education and even in government institutions. Studies can still be carried out on SME in an endeavour to drive findings to be used as a motivational advantage for SME to adopt OE for rapid growth in a VUCA environment, thereby actively contributing new knowledge and quick field results. Futuristic anthropologists and work antagonists can always cast their net wide to look at the effectiveness of OE implementations with the combination of advanced technologies and the Internet of things (IoT) against the backdrop of transforming the industrial landscape due to 4IR.

Thriving in the prevailing VUCA world calls for adapting to the 'new normal' in the business contexts, thus, vucability. In such chaotic environments, organisations have to create an internal environment of openness that values discovery, diverse perspectives, and embraces experimentation of new ideas. Thinking outside the box enables the detection of signals that foretells shifts in markets behaviours and customer loyalty. Organisations need to discover opportunities, enabled by new technology and continuous dialogue to put forward new social needs of the human capital into the context of the organisational work. The proper Human capital engagement translates to the enriched fabric of relationships that keep the dual prosperity of individuals and the organisation simultaneously. Communication of new information is also crucial for keeping everyone empowered to differentiated and informed decisions to articulate business challenges and turn them into opportunities. Thoughtful decision making in the organisation should emerge at all levels of responsibility and self-driven high-performance teams that stand to own and drive OE for growth against all odds (VUCA).

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E.J. and R. P. both contributed equally to this work.

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