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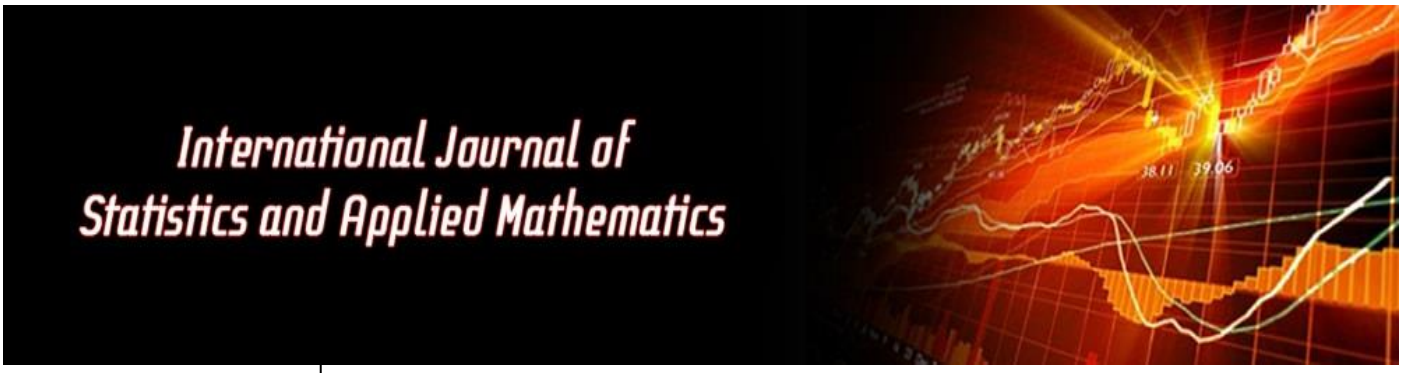

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Modeling influence of business excellence parameters on sustainable high performance of organizations

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Abstract
Organizations aspire to have sustainable high performance in order to have competitive advantage in the market. Business excellence models provide frameworks to be applied by organizations in order to develop thoughts, so that adequate actions be taken in a systematic and structured way to accomplish sustainable high financial as well as non-financial performance. Various business excellence models proposed by organizations as well as researchers are discussed. In this paper a mathematical model is proposed in which independent variables are: top management team characteristic, mission vision and core values, technology and innovation, and customer focus. Motivation and culture are moderating variables. Government policies and global economy are intervening variables. The financial and non-financial performance, are dependent variables. The proposed model would yield corresponding regression equations, representing stated hypotheses to be tested for the collected data from the field for the chosen business organization. Further correlation coefficient can also be computed to check the relationship between variables. From the estimated regression equations, through various tests, the elasticity of the coefficients of model parameters and their statistical significance can be investigated. Adequate recommendations can then be made to achieve the sustainable high performance for the selected organization.

Keywords: Factors of excellence, Motivation and culture, Government policies and global economy, Financial and non-financial performance

1. Introduction
The material as well as spiritual growth and overall well-being of humans can be described as development, which in the physically measurable sense may be linked with proper nutrition and educational opportunities, adequate shelter, healthcare and social amenities (Pokhariyal, 2007) [9]. In order to study certain aspects of reality, it is essential to begin with identification and representation of the attributes as well as characteristics of the chosen phenomena. Mathematical models attempt to represent the real situation in a precise and standard format. The development of the models help in analyzing the situation and understanding the observations made. This understanding comes about by using models as guides for observations, as predictors for future observations as well as tests the validity and consistency of our observations. Models provide the basis for informed predictions. For example, in the engineering design process or business process, models play crucial role not only in observation and pure prediction but also in some sort of modified predictions that allows the researcher to assess the consequences in advance. The process of predicting with such confidence assists the decision maker to spend time and money to design and build something, knowing in advance that the outcome would be successful. Businesses have currently moved from quality focus to excellence focus. European Foundation for Quality Management (EFQM) described business excellence as, "outstanding practices in managing the organization and achieving results, all based on a set of eight fundamental concepts". These concepts are: "Result orientation, customer focus; leadership and constancy of purpose; management by processes and facts; people development and involvement; continuous learning innovation and improvement; leadership development and public responsibility". The EFQM description of business excellence covers almost all aspects that are expected to results in high performance of organizations.

Tata Business Excellence Model (TBEM) is developed with the parameters: "leadership; strategic planning; Customer; systems, MIS, KMS; people focus; and process". TBEM covers business aspects that range from strategy and leadership to safety and climate change. TBEM encourages continuous improvement through formal system of benchmarking and assessment.

Business excellence is also described as outstanding practices in managing the organization and achieving results, all based on a set of fundamental concepts or values of the organization. These practices have evolved into models that explain how a world class organization should operate. Many country specific models (for example, in Japan, Australia) have been developed to suit their needs and aspirations through award programs that lead to increased performance. The most popular and influential model in the Western world is the one launched by US government, known as Malcoln Baldrige Award Model (also known as Baldrige model, the Baldrige criteria or criteria for performance excellence).Many organizations use Baldrige "Criteria for Performance" to guide enterprises and achieve the aspired goal of Organizational Excellence. The excellence model provided by Baldridge Foundation, is one of the forces and facilitators of a highly successful organization transformation. The Criteria for Performance Excellence or CPE-model is composed of many key component such as: Leadership; Analysis and knowledge management; Strategic planning; Customer focus; Measurement workforce; Operation focus; and finally the importance of results. The Baldrige values include: visionary leadership; customer driven excellence; organization and personal learning; valuing employees and partners agility; focus on the future; managing for innovation; management by facts; social responsibility; focus on results and creating values; systems perspective.

Performance may be defined as accomplishment of an assigned task which is mostly measured against preset known standards of accuracy, completeness, cost and speed. In an agreed contract, performance is deemed to be the fulfillment of an obligation, in such a way that released the performance from all liability under the (signed) contract. Performance is the completion of the assigned task with application of proper knowledge, skill and adequate use of abilities to accomplice the organizational objective most efficiently and effectively. However, for a few individuals performance is the reflection of their satisfaction due to commitment and dedication towards the assigned task to completion in the most ethical way (Pokhariyal, 2015) [7]. In order to sustain high performance, organization needs to develop long term strategy on the delivery of quality products and services. Such products and services must satisfy the needs of the present time without compromising the ability of future generations to meet their own needs. This should be followed by stringent as well as dynamic monitoring and evaluation system with immediate remedial actions.

President of America, Dwight D. Eisenhower emphasized the importance of integrity in all aspects of life to accomplice the desired results in the quote: "The supreme quality for leadership is unquestionably integrity. Without it, no real success is possible, no matter whether it is on a section gang, a football field, in an army, or in an office". HE Dalai Lama indicated the importance of compassion in various decision making processes in the quota: "when we are motivated by compassion, the results of our actions benefit everyone, not just our individual selves or some immediate convenience. When we are able to recognize and forgive ignorant actions of the past, we gain strength to constructively solve the problems of the present".

2. Empirical Studies

In Njoroge *et.al*. (2015) [1], we found that the moderating influence of performance contracting on the relationship between strategy implementation and performance of Kenya State Corporation to be statistically significant. Out of 178 Kenyan state corporation spread across all 18 ministries, 70 had been earmarked for dissolution, merges or transfer of functions to the newly create county government, leaving 108 corporations for study, that were served the questionnaire, the 95 filled and returned questionnaire were analyzed. Using hierarchical regression analysis along with interaction term the following model equation was obtained.

Performance1= 0.175 +0.763 Institutionalization + 0.224 Operationalization +0.134 involvement–0.066 Negotiation +0.024 cascading +0.165 target setting.

In this case, only constant and cascading were found to be not statistically significant and then the model was amended accordingly. The inclusion of moderating variable of performance contracting resulted in the following model equation.

$Performance_2$ = 0.566+1.385 strategy implementation–0.231 performance contracting +0.055 interaction term.

In Kyong *et al*., 2016 [5, 6, 7, 8], we studied the performance of the firms listed at Nairobi Securities Exchange, individually with firm level institutions, management competence and human resource management bundles. The performance of 34 firms out of 64 listed firms was analyzed. It was found that each of the independent variable has positive and significant effect on the performance of the firm. In Manene *et al*. 2015 [2], we modeled labor market performance in Sub- Sahara Africa. We aimed at investigating a set of measures that could explain maximum performance in the labor market using a set of variables categorized as independent (Demographic and resource factors), moderating (labor force and its characteristics), intervening (opportunities and qualifications) and dependent (economic attributes and welfare) to model market performance. Using linear programming, each category was considered a constraint to labor market performance. Four constraint equations were constructed using factor analysis. The constraints equations were labeled as employment by sector, labor forced participation rate, status on employment and working poverty. The objective function was determined by fitting a multiple linear regression equation to a set of factors in the constraints equation. Using simplex method the solution revealed that out of nine selected indicators only four (status of employment rate, labor force participation rate, labor productivity and working Poverty) could explain Sub-Sahara Africa labor market performance. Pokhariyal (2007) [9] introduced development strategies for Sub-Sahara Africa by identifying the parameters of development. Crop enhancement model and industrialization models were developed. In the crop enhancement model for which the most sensible and cost effective way to replenish soil fertility using naturally available agro minerals was suggested.

2.1. Crop Enhancement Model

The agro-minerals are available in most of the developing countries in the natural form and release the nutrients at relatively slower rate, which is considered effective for maintaining soil fertility for a long period of time.

Table 1: Crop Enhancement Model

Agro-mineral	Characteristic feature	Applicable in
Calcium	Assists in pod development	Corresponding plants
Gypsum	Reduce phytoxicity in acid soil	All plants
Liming materials	Raise pH of acid soil provide Ca-ions decrease AI-toxicity	All plants
Micronutrients (B, ci, Co, Cu, Fe, Mn, Mo and Zn)	In small amount (for optimal growth)	Cash crops and other plants
Peat	Good aeration and water holding	All plants
Perlite	Aeration in artificial growth media	Plants in greenhouse and Otherwise
Phosphate rocks	Direct application to acid soil	Buckwheat, kale or rape Phosphate rocks Direct application to acid soil white lupins, cabbage, pigeon peas
Potash	Water sol LIble and slow release of K	Bananas, coconu~rubbe G palm oil, others
Sulphur and pyrite	Synthesis of proteins and produce acids to lower pH	All plants
Vermiculite and Zeolite	Store and release nutrients and moisture Slowly	All plants

Source: Pokhariyal(2007).

2.2 Industrialization Model

Industrialization is considered to be the key for development of any nation. Globally counties are seeking to have most modern industries in order to enhance standard of living for their people. In the industrialization model, aspects of secondary production were emphasized, that can be initiated and sustained through long term economic policies ensuring:

- Regular flow of raw materials.
- Stable administrative and judicial structure.
- Minimal legislative, political and government interference.
- Mechanism for continuous updating of technology.
- Opportunities for incorporating scientific development (e.g. nano technology) into manufacturing processes.
- Deep-rooted ethical norms and fulfillment of duty (dharma).

The industrialization model, in which the use of productive factors is ensured under the umbrella of dharma, sustainability agents (catalysts) and consequences are mentioned, is given as follows.

Table2: Industrialization Model

Productive factors	Sustainability agents/catalyst	Consequences
• Raw materials	• Scientific and technical knowledge	• Progress
• Technological	• Long term economic policies	• Prosperity
• Human Resource	• Individual and social desire	• Dignity
• Capital	• Ethical environment (adherence of dharma) by all	• Overall welfare
	• Transparent state and institutional participation and cooperation	• Self-respect
	• Critical partnerships	• Assured future
	• Cultural and traditional inputs	• Peace

Source: Pokhariyal (2007) [9].

Under dharma, raw materials will be extracted without exploitation of mother earth and the environment will be adequately protected, updated technology would be adopted into production system rather than being a dumping ground for obsolete technologies of the developed world. Workers, managers, professionals, entrepreneurs and politicians should follow their respective dharma, so that overall objectives of Rastra (National) dharma are accomplished. In some cases regional cooperation need to be promoted, so that complementary raw materials can easily be transported within the region. This would also increase the combined local market for consumption of the finished goods, for mutual benefits.

In a study (Bwire *et al*. 2017) [3] we have studied the mediating effect of corporate strategy on the relationship between top management team demographics and performance was expressed by the following regression equations.

$P_1 = 2.189 + 0.462$ TMT.

In this model, unit change in composite TMT demographics lead to 0.462 unit positive change in performance, which is statistically significant.

$P_2 = 1.177 + 0.184$ TMT $+ 0.542$ CS.

In this model unit change in composite TMT characteristics yields 0.184 unit positive change in performance, which is not statistically significant. However, a unit change in composite corporate strategy resulted in 0.542 unit positive change in performance, which is statistically significant.

In a study of "The influence of religion, technology and economy on culture, diplomacy and peace", Pokhariyal (2015) [1-2] proposed a model to investigate the relationship between culture and diplomacy with peace and prosperity, which is moderated by religion and intervened by technology and global economy. The paper provides a way of viewing the relationships between components of society that are after conflated with other components or dominated by other components, which can lead to an impoverished or failed social system. The aim of the model was to provide a way to better analyze and promote the constructive aspects of religion, technology, culture and diplomacy for the overall development and advancement of the entire society.

In an international Symposium on Agriculture Communication and Sustainable Rural Development, Pokhariyal (2012) proposed a conceptual model for India with three interconnected systems: farm, market and Society. The functioning of each system, which would be represented by a factor, is governed by its variables. Effective interface between three systems is established with the help of efficient and adequate communication mechanism and is considered

necessary for the steady state for the stratified integrated model. With the help of factor analysis for the collected data the extent of sustainable development can be determined through the following model equation.

Sustainable development = $\beta_o + \beta_i$ Farm + β_2 Market + β_3 Society +ϵ.

Third diversity Regional Implementation Forum on Sustainable Development in Latin America and Caribbean, (La Antigue, Guatemala, 26-27 November, 2009) [15], despite the diversity of thematic areas have identified the following common challenges:
Information, education and awareness; Building state capacity; the potential for public-private partnership with participation of multiple actors; the potential for regional cooperation; the need for a sub-regional approach; and Cooperation, financing and technology transfer. The report also discussed management of the available assets and resources as well as made recommendations, on the basis of collected and analyzed data in the areas of: Sustainable consumption and production; Mining; Transport; Chemicals; and Waste.
Clark, G. *et al*. (2015) [4], using 200 different sources found remarkable correlation between diligent sustainability business practices and economic performance. Exploring from a strategic management perspective, 88% of the reviewed sources found that companies with robust sustainable practices demonstrate better operational performance, which ultimately translate into cash flows. Further, it was seen that 80% of reviewed studies demonstrate that prudent sustainable practices have a positive influence on investment performance.

3. Business excellence model for sustainable high performance

A conceptual model for sustainable high performance suitable to developing countries of Asia, Africa, Latin America and other regions, is proposed by identifying the various parameters. The independent variable, moderating variables, intervening variables and dependent variable are described along with their components as well as determinants. In an undertaken study mainly the relationship between independent variables and dependant variable is proposed to be investigated. The moderating variables, that are mostly internal to the system, influence the relationship in a relatively soft or persuasive manner .On the other hand, the intervening variables are mostly external to the system and influence the relationship in a relatively harsh or forceful manner (Pokhariyal, 2019).
In the model, business excellence is taken as independent variable, with components as:

- Top management characteristic (Age, qualification, experience, gender, tenure).
- Mission, vision and core values.
- Customer focus and regional cooperation.
- Technology and innovation.

Providing quality goods at affordable price and other aspects of social responsibility of the organizations are also included under independent variable.
The moderating variable's components are:

- Motivation (reward system, performance contracting).
- Culture (Organizational and societal, religious input and adherence of Dharma).

Conducive working environment, mutual trust and open discussions provide motivation to employees in the organization. The aspects of integrity (individual as well as collective), loyalty, honesty and compassion are embedded in dharma, which ensures long term success in most decisions making processes.
The component of intervening variable are;

- *Government polices.*
- *Global economy.*

Organizations have no control over government policies and should aspire to get optimum results under these conditions. The global economy is bound to affect the performance of the organizations due to aspects of demand and supply for the raw materials as well as the finished goods. In the current situation posed by Covid-19, the global economy has been adversely affected, which needs to be pulled back through sincere collective efforts of all.
The dependent variable is sustainable high performance, with financial and non-financial determinants. The determinants of financial performance include: earning per share, share price, market/book value, sales growth, assets, return on equity, dividend yield (firm level risk/ business level risk). The non financial determinants include: market reputation; organizational stability; productivity; employee turnover, satisfaction, work performance and contribution to society.

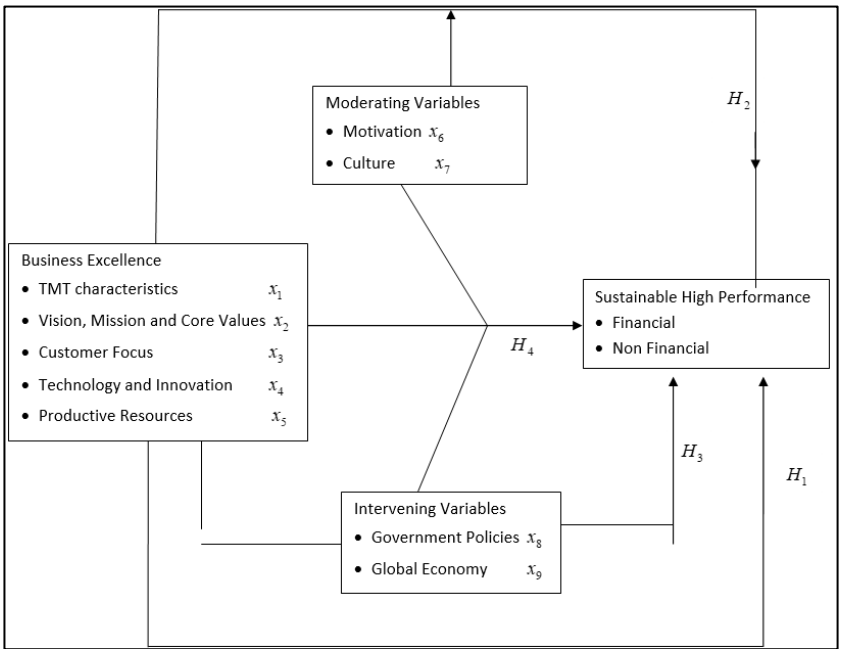

Fig 1: The conceptual framework and the proposed hypotheses to be tested with the help of collected data are shown as follows

H_1: There is a significant relationship between business excellence and sustainable high performance.
The corresponding regression model equation is:

$$SP_1 = \beta_{10} + \beta_{11} x_1 + \beta_{12} x_2 + \beta_{13} x_3 + \beta_{14} x_4 + \beta_{14} x_5 + \in_1$$

H_2: The relationship between business excellence and sustainable high performance is significantly moderated by motivation and culture.
The corresponding regression model equation is:

$$SP_{2\alpha} = \beta_{2aO} + \beta_{2a1} \times + \beta_{2a2} X_6 + \beta_{23} X_7 + \in_{2\alpha}$$

(Interaction through addition).

$$SP_{2b} = \beta_{2b0} + \beta_{2b1} X + \beta_{2b2} X. X_6 + \beta_{2b3} X. X_7 + \in_{2b}$$

(Interaction through multiplication). We have taken X as the composite score for business excellence.
H_3: The relationship between business excellence and sustainable high performance is significantly intervened by government policies and global economy.
The corresponding regression model equation is:

$$SP_3 = \beta_{30} + \beta_{31} X + \beta_{32} x_8 + \beta_{33} x_9 + \in_3.$$

H_4: The relationship between business excellence and sustainable high performance is jointly moderated by motivation and culture and intervened by government policies and global economy in significant manner.
The corresponding regression model equation is

$$SP_4 = \beta_{40} + \beta_{41} x + \beta_{42} x_6 + \beta_{43} x_7 + \beta_{44} x_8 + \beta_{45} x_9 + \in_4.$$

For the collected data, the coefficients of the model parameters are estimated. The statistical significance and elasticity of these coefficients is then investigated, for appropriate actions. Further by computing correlation coefficients, the nature as well as strength of the relationships between the study variables can also be investigated, which would then assist in decision making process.

4. Discussion

Business excellence parameters and their influence on sustainable high performance of organizations have been studied by various authors and institutions by considering appropriate variables suitable to the operating conditions. EFQM, TBEM, Baldrige model and Bwire *et al*. (2017) [3] emphasized on the leadership traits as well as social responsibility, among other variables, for high performance. Njoroge *et al*. (2015) [1] showed the importance of institutionalization, operationalization, involvement and target setting (in that order) for performance. Kyong *et al*. (2016) [5] indicated the importance of management competence and human resource management bundle on the performance of firms. In Manene *et al*. (2016) [2], it was found that only four indicators (status of employment, labor force participation, labor productivity, and working poverty) could explain sub-Sahara Africa labor market performance. Forum on sustainable development in Latin America and Caribbean (2009) [15], suggested some of the aspects for development (as: building state capacity, public-private participation, regional cooperation, financing and technology transfer) for sustainable development. Clark et.al (2015) [4] showed high correlation between diligent sustainable business practices and economic performance. President Eisenhower has highlighted the aspect of unquestionably integrity for success for all areas. HE Dalai Lama stated the importance of compassion in decision making processes. Crop enhancement model and industrialization model with corresponding factors have been suggested and importance of dharma has been emphasized on all fronts (Pokhariyal, 2007) [9]. Focus on integrity, compassion, honesty and adherence of dharma must be made by all concerned persons as well as organizations, without these any set of strategies would not be able to bring sustainable development, in the long run. In the suggested model most of the critical variables from previous studies have been incorporated. By collecting adequate data followed by proper analysis, sustainable high performance for the selected organization can be accomplished, by identifying critical variables for the undertaken study and making suitable recommendations for the overall welfare.

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