

Factors Determining Innovation Outcome. (A Survey of Chemist Enterprises in Wote Municipality of Makueni County in Kenya)

Dr. Patrick Karanja Ngugi, Phd
Jomo Kenyatta University of Agriculture and Technology,
Nairobi CBD Campus, Nairobi, Kenya.

Dr. John Karanja Ngugi, Phd
Kenyatta University
Nairobi, Kenya.

Fredrick Odhiambo Ndede, Phd Student
Jomo Kenyatta University of Agriculture and Technology,
Nairobi CBD Campus, Nairobi, Kenya.

Abstract:-

➤ *Purpose:*

The key objective of this research was to establish the factors determining innovation outcomes in the chemist enterprises in Wote Municipality of Makueni County in Kenya. The constructs for the independent variable included knowledge management, strategic leadership, business model, and strategy, whereas that of the dependent variable were incremental, radical, breakthrough, and disruptive.

➤ *Design/Methodology/Approach:*

The target population was 70 chemist enterprises of which 40 of them formed the sample. Data was successfully collected using questionnaire, interviews, and observation from 35 respondent chemist enterprises representing 88% response rate. Data processing and analysis was done through application of the Statistical Package for Social Sciences (SPSS).

➤ *Findings:*

Test results show strategic leadership as the leading predictor of innovation outcomes with adjusted $R^2 = 0.713$. The other independent variables, knowledge management, business model, and strategy with adjusted R^2 of 0.685, 0.594, and 0.296 followed respectively in descending order indicating lower prediction rates. Both the Kolmogorov-Smirnov test and Shapiro-Wilks test for normality revealed probabilities of more than 0.05 meaning that the data sets were normally distributed and all the four hypotheses were confirmed and accepted.

➤ *Originality/value:*

Some studies having dwelt on some analysis with findings of linkages in determining factors relating to innovation. The research undertaken here investigates individual and combined influence of the specific factors on innovation outcomes of an enterprise, as well as the prediction rate of the constructs, having not been revealed much in the available documented sources

especially with reference to the retail business industry of the Kenyan economy. It is of great value addition in enhancing understanding of the contributing factors to higher levels of innovation outcomes in enterprises.

Keywords: Innovation, Knowledge Management, Strategic Leadership, Business Model, Strategy, Radical Innovation, Incremental Innovation, Disruptive Innovation.

I. INTRODUCTION

Innovation refers to any new product, process, method, model, or service that is able to meet current or upcoming needs. Innovation process includes creation, internalization, implementation, and integration of new ideas and practices (Palm et al. 2014). These unique methods lead an organization towards innovation and improved results (Prajogo and Sohal, 2001). Innovation can involve the new product, process, technology, diversification including a combination of them. It could be an adoption of an idea or concept viewed as novel by the organization. For products or services to have novelty, organizations should have a knowledge base from where individuals can acquire, interpret and integrate knowledge whenever and wherever it is needed (Du Plessis, 2007). Throughout the above processes funding is involved. Observation shows that three out of five businesses fail within their third year of operation since inception due to several factors. Hence the need for this study to find out factors determining innovation outcomes.

➤ *Statement of the Problem:*

Chemist shops face hardships including identifying sources of their inventories as they deal with a variety of products from various suppliers both locally and internationally. In an attempt to curb this problem, they maintain inventory management models that help them track the merchandise as sourced and dispensed. Their sales activities also depend on prescriptions from health facilities or internally where there are personnel qualified to do so making it difficult for them to predict demand patterns. To

grow their enterprises, innovation management is key in the form of incremental, breakthrough, radical, and disruptive innovation so as to have competitive advantage. This necessitates the need for efficient management tools for products, processes, marketing and organization for the chemists to grow. In recent times a number of chemists' enterprises have shown lack of ability to stock variety of medicines as manifested in empty or lean shelves in their stores. This research was aimed at investigating the factors influencing innovation outcomes to enable them have competitive advantage.

➤ *Study Objectives:*

The key objective of this research focused on the factors that determine innovation outcomes. The specific objectives were:

- To investigate how knowledge management influences business innovation outcomes of chemist enterprises.
- To investigate how strategic leadership influences business innovation outcomes of chemist enterprises.
- To investigate how business model influences business innovation outcomes of chemist enterprises.
- To determine the influence of strategy on business innovation of chemist enterprises.

➤ *Hypotheses:*

- H₁: Knowledge management positively associates with innovation outcomes in chemist enterprises.
- H₂: Strategic leadership positively associates with innovation outcomes in chemist enterprises.
- H₃: Business model positively associates with innovation outcomes in chemist enterprises.
- H₄: Strategy positively associates with innovation outcomes in chemist enterprises.

➤ *Justification:*

The ability of any business enterprise to thrive depends highly on its innovation factors in application. This enables adaptation and allows firms to survive, grow and increase opportunities for competitiveness. This study helped to shed light in how the innovation factors can help to spur

innovation outcomes and enhance growth of the enterprises. It is of use to researchers, institutions, public agencies and scholars in leading to promotion of entrepreneurship in economies and hence creation of job opportunities.

➤ *Scope:*

This research investigated how business innovation is influenced with reference to the variables specified of which the focus area was Wote Municipality in Makueni County of Kenya. The study looked into how knowledge management, strategic leadership, business model, and strategy act as determinants of innovation outcomes. The licensed chemists' shops issued with the Single Business Permits for the year 2022 by the Government of Makueni County in Kenya formed the sampling frame. Thus, the findings of the research may not be generalized based on the assumptions that other organizations may be operating under different environmental conditions. Respondent's unwillingness to give information and be truthful also posed another limitation. In addition, the measures used in this study reflected only the respondent's facts from their historical records.

II. LITERATURE REVIEW

➤ *Schumpeter Theory of Innovation:*

Firms innovate in order to reduce costs of production and to increase demand for their products. Introducing new products, opening new markets and creation of new market structures are aimed at increasing and managing demand for products. Innovation becomes the underlying factor for an enterprise desirous of realizing continuous improvement.

➤ *Conceptual Framework:*

The conceptual framework in this study illustrates that the outcomes of innovation in the form of incremental, breakthrough, radical, and disruptive innovation are mainly driven by the level of Knowledge management; strategic leadership; business model; and strategy in an enterprise as depicted below. The factors have both individual and combined influence.

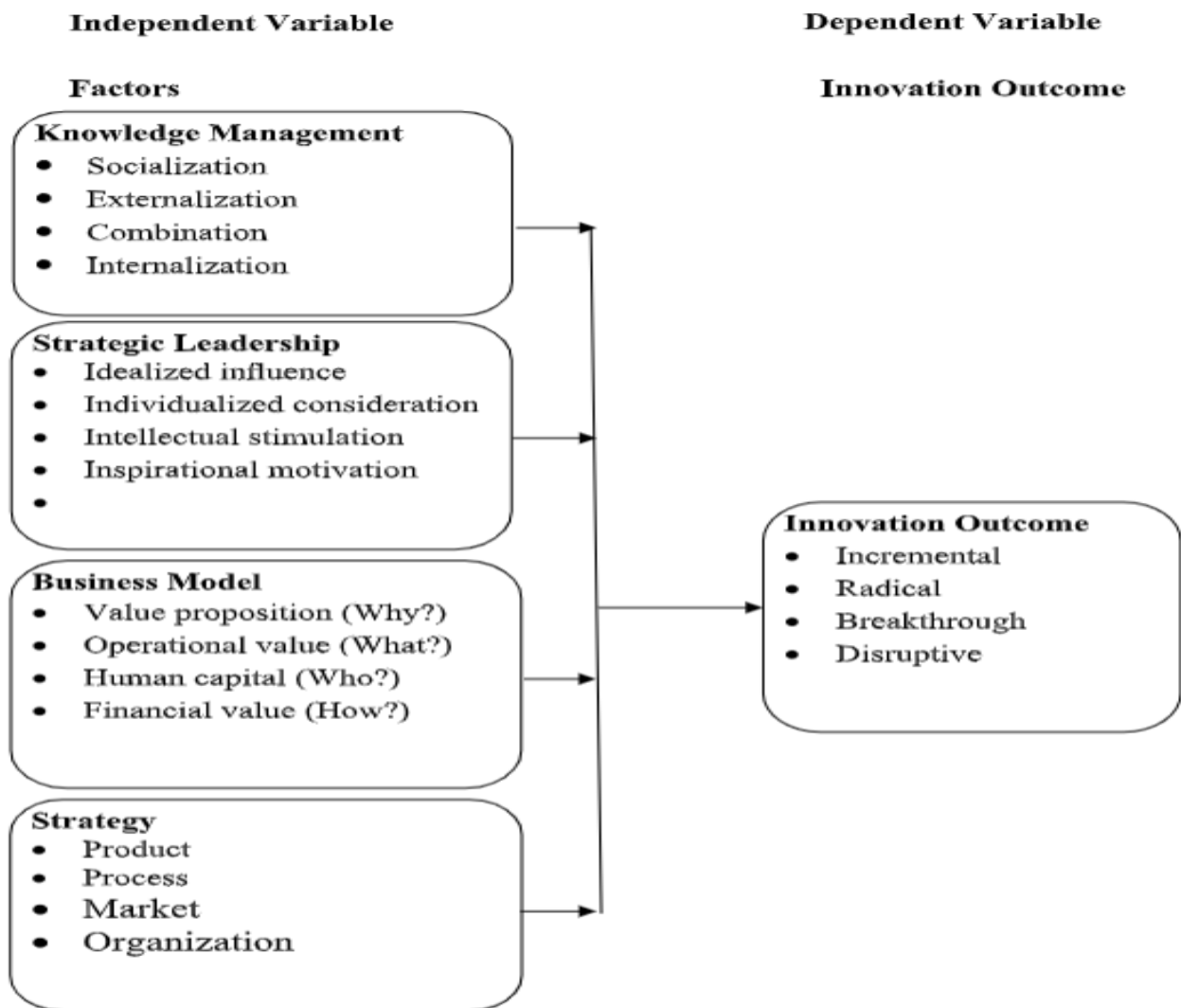


Fig 1 Conceptual Framework

➤ **Knowledge Management:**

According to Nonaka and Takeuchi (1995) there are four processes involved in this construct. Socialization is the process of tacit-tacit conversion (Tseng, 2010). In this mode of conversion, individuals interact with each other to create knowledge but this interaction is not in tangible form (Linderman *et al.*, 2004). It is usually an informal sort of conversation in which people share their personal experience and learned skills with others (Lee and Choi, 2003). Some popular ways of socialization are coaching, observation, following others and mentoring. Through socialization process, people are more inclined to share their feelings and ideas with others and likewise understand theirs. Nonaka named the output of this process as sympathized knowledge (Nonaka & Takeuchi, 1995). Externalization is the process of tacit-explicit conversion (Tseng, 2010). In this mode of conversion, tacit knowledge is converted into explicit concepts. Explicit concepts are in more stated and codified form (Lee and Choi, 2003) like metaphors, hypotheses, drawings, stated concepts and models (Nonaka & Takeuchi, 1995). The output of this process is described as conceptual knowledge. Internalization is the process of explicit-tacit conversion (Tseng, 2010). This mode of conversion helps individuals to

enrich their tacit knowledge on the bases of explicit knowledge (Linderman *et al.*, 2004). Written manuals and standard operating procedures help individuals to learn the required skill. That skill is further apprehended with personal experience and improves individual’s tacit knowledge (Lee and Choi, 2003). Internalization often refers to “learning-by-doing” (Asif *et al.* 2013). The output of this process is described as operational knowledge. Combination is the process of explicit-explicit conversion (Tseng, 2010). This mode of conversion helps organizations to arrange explicit knowledge for better and efficient utilization. Different bodies of explicit knowledge are reconfigured and systematized to extract new knowledge (Nonaka & Takeuchi, 1995). The output of this process is described as systematic knowledge. Knowledge management is then an important factor in any innovation process.

➤ **Strategic Leadership:**

Nusair, Ababneh and Bae (2012) affirm four concepts. Idealized influence means transformational leaders undertake activities which include the top management ability to : walk the talk and act as a model for excellent performance; uphold and strictly follow the established policies of the firm; communicate the firm’s mission, vision

and operating policies to the employees and ensure that the information is fully understood; regularly have in place specified objectives to maximize the employees’ capability and potentials; and, have in place specified objectives in different appropriate stages and clearly define responsible persons. Individualized consideration-In this component and include here are activities relating to top management ability to: provide works or assignments that are stretching and achievable; welcome each individual employee’s viewpoint; and mentor employees. Intellectual stimulation- Activities here include the top management ability to: link up the firm’s objectives to that of the employees; place the capable/skilled staff in the most potential projects and opportunities; invest in the staff education and let them make decisions and solve problems; encourage the employees to learn from failures; and, motivate the employees’ participation and value their contribution. Inspirational motivation-This dimension means the transformational leader undertakes activities relating to the top management ability to: reward the employees’ contribution and continuously motivate them; have in place a crystal-clear reward system to motivate the employees; and have in place a culture to encourage the employees in the knowledge and information sharing.

➤ *Business Model:*

Business model innovation consists of four areas of innovation. They answer the why, what, who, and how of innovation. The questions provide the grounding upon which innovation is based in an enterprise. This model applies much in innovation outcomes of enterprises.

➤ *Strategy:*

Strategy refers to the approach an enterprise applies in order to realize its vision, mission, and achieve its stated objectives. The key document guiding the operations of an enterprise is a strategic plan for an established one or a business plan for a startup. Usually strategy is operationalized by the top management and implemented by the tactical team in an organization. Its main components include market, organization, product, and process.

➤ *Target Population:*

Out of the total of 70 chemist enterprises which formed the sampling frame 40 firms were selected for this study. They were clustered as follows:

Table 1 Target population

Cluster	Target population
Mbau Junction - Kaiti River route	20
Mbau Junction – Greenpark route	40
Mbau Junction – Zimo Rroute	10
Total	70

Source: Government of Makueni County, 2022.

➤ *Innovation:*

Innovation can occur in an enterprise mainly in a continuum comprising of four aspects. They include incremental, radical, breakthrough and disruptive pattern. For innovation to be realized there should be a strong basis of capacity, capability, and financial resources. Realization of any one of the forms elevates the position of an enterprise in terms of market share, revenue earnings, and growth.

➤ *Research Gap:*

While there is much research that has been carried out in innovation across the globe and particularly in the developed world, there is scarce literature on innovation in Kenya especially in relation to prediction rate for innovation outcome in enterprises. Bareghel, Rowley, Sambrook and Davis (2012) supports this approach in the global context with a view to improving business performance. Hence the need for this study with a specific reference to factors influencing innovation outcomes.

III. RESEARCH METHODOLOGY

➤ *Design:*

This survey adopted mixed research. The method applies both qualitative and quantitative models in obtaining and analysing the data. The design also determines and reports the way things are and attempts to describe such things as possible behaviour, attitudes, values and characteristics (Mugenda, 2008). It also has enough provision for protection of bias and maximized variability (Kothari 2008) and gives the importance of descriptive analysis to provide clues regarding the issues that should be focused on leading to further studies. Importantly they provide the foundation up on which correlational and experiential studies emerge.

➤ *Population:*

This research was conducted in Wote Municipality of Makueni County in Kenya and comprised of 70 chemist enterprises as per the register of the licensed businesses in Wote Municipality according to the records for 2022 maintained by the Government of Makueni County of Kenya. They were segregated into three clusters based on the location in the town where the chemist enterprise operates from.

➤ *Sampling Frame:*

The sampling design and procedure focused on the function holders within those enterprises who were to provide the desired information. In this research 40 chemist enterprises were the sample size. Respondents refer to those who respond to the research instruments (Kothari 2008). In this study staffs in the managerial positions were the respondents. The sample distribution was as follows:

Table 2 Sample Size Distribution.

Cluster	Target population	Sample
Mbau Junction - Kaiti River route	20	11
Mbau Junction – Greenpark route	40	23
Mbau Junction – Zimo Rroute	10	6
Total	70	40

Source: Government of Makueni County, 2022.

➤ *Data Collection Methods:*

In this research interviews and desk study was applied in addition to the mixed model. According to Mugenda (2008) face to face interview allow the interviewer to get as much information as possible.

➤ *Validity of the Questionnaire:*

The actual procedure of accessing validity is to go through the practitioners in that area of focus. This was determined with professionals and scholars whose field of work is innovation at the principal author’s institution above.

➤ *Data Analysis and Presentation:*

The unit of an analysis was each chemist shop. Descriptive statistics was used. Descriptive statistics provide for meaningful distribution of score using statistical measures of central tendencies, dispersion and distribution

(Kothari, 2008). Data was first entered and coded in Excel and then imported into Statistical Package for Social Sciences (SPSS) for descriptive analysis. Multiple regression analysis was applied to show the relationship between the variables in order to ascertain the casual effect of one variable upon another as follows:

- $Y = \beta_0 + \beta_i x_i + e$
- Where $i = 1, 2, 3,$ and 4
- $Y =$ The dependent variable (Innovation Outcomes)
- $\beta_0 =$ Innovation Outcomes which is insensitive to independent variable (factors determining innovation)
- $\beta_i =$ Change due to unit change in factors determining innovation.
- $X_i =$ The independent variable (factors determining innovation)
- $e =$ Is the error term.

IV. RESULTS AND ANALYSIS

➤ *Rate of Response:*

Out of the 40 questionnaires distributed a total of 35 were returned properly completed as shown per each cluster in table 3 below. This represented 88% of the questionnaires sent out. The 88% overall return achieved for this study was very good for an analysis.

Table 3 Response Per Cluster

Cluster	Sample	Response	Response as % of the total Sample
Mbau Junction - Kaiti River route	11	10	25
Mbau Junction – Greenpark route	23	20	50
Mbau Junction – Zimo Rroute	6	5	13
Total	40	35	88

Source: Survey, 2022.

Statistics in table 4 below reveals that of the sample in this study majority of the enterprises comprising 43 percent were registered under the sole proprietorship category, 28.5 percent were in the partnership category, and another 28.5 percent were in the private limited company category.

Table 4 Category of the Enterprise in Terms of Registration Certificate

Valid		Frequency	Percent	Cumulative Percent
	Private limited Company	10	28.5	28.5
	Partnership	10	28.5	57.0
	Sole proprietorship	15	43.0	100
	Total	35	100.0	

Source: Survey, 2022.

Statistics following below indicates the sample in this study in terms of the employees. Majority of the enterprises comprising 43 percent had the highest number of employees, and the rest types comprising 28.5 percent respectively had similar number of employees.

Table 5 Total of Employees

		Frequency	%	Cumulative %
Valid	Private Limited Company	10	28.5	28.5
	Partnership	10	28.5	57.0
	Sole proprietorship	15	43.0	100
	Total	35	100%	

Source: Survey, 2022.

Statistics in table 6 below reveals the sample in this study. Majority of the enterprises comprising 57.1 percent fell in the bracket (6 — 10), (1— 5) comprised 11.4 percent, (11— 15) comprised 17.1 percent and the rest 4.2 percent comprised the age bracket above 16. This provides a fair representation in terms of years in existence.

Table 6 Age of the Enterprise in Calendar Years

		Frequency	Percent	Cumulative Percent
Valid	1—5	4	11.4	11.4
	6—10	20	57.1	68.9
	11— 15	6	17.1	85.8
	above 16	5	14.2	100.0
	Total	35	100.0	

➤ *Tests for Hypothesis One:*

H₁: Knowledge management is positively associated with innovation outcomes. Model 1 in the table below tests how knowledge management affects innovation outcomes as per H₁.

Table 7 Knowledge Management and Innovation Outcomes. Model 1 Summaries

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	0.828 ^a	0.686	0.685	1.60705		
a. Predictors: (constant) Knowledge management						
b. Dependent Variable: innovation outcomes						
(a) ANOVA						
Model	Sum of Squares	Df	Mean Square	F	Sig.	
1	Regression	14.335	1	14.335	5.550	0.000 ^b
	Residual	49.077	19	2.583		
	Total	63.412	20			
(b) Coefficient						
Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	
1		B	Std. Error	Beta		
	Constant	-9.490	1.325		-7.163	0.000
	Knowledge management	0.752	0.034	0.828	22.387	0.000
b. Dependent: innovation outcomes						

Source: Survey, 2022.

The data in table 7 above indicates prediction rate of 68.6%. Keeness of employees is noted but they can get out of the business forcing the management to rethink on new ways of operations, number of times the vision and mission statements get reviewed in various enterprises, and in-house policy documents. New suppliers can be sourced, thus reducing complaints. New computer programmes can be installed to replace staff who have left.

➤ *Tests for Hypothesis Two:*

H₂: Strategic leadership is positively associated with innovation outcomes. The following tabulation tests how strategic leadership relates to innovation outcomes in response to H₂.

Table 8 Strategic Leadership and Innovation Outcomes. Model 2 Summaries

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	0.872 ^a	0.760	0.713	0.10122		
a. predictors: (constant) Strategic leadership						
b. Dependent Variable: Innovation outcomes.						
(a) ANOVA						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2.28	1	2.28	9.956	0.004 ^b
	Residual	4.351	19	0.229		
	Total	6.631	20			
a. Dependent Variable: Innovation outcomes.						
(b) Coefficient						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
1		B	Std. Error	Beta		
	(Constant)	-1.821	455		-0.004	-1.821
	Strategic leadership	0.523	0.218	0.489	2.399	0.523
b. Dependent variable: Innovation outcomes						

Source: Survey, 2022.

In table 8 above the prediction rate is 71.3%. It can be noted that when employees were encouraged to interact more with customers through specifically entrusting them with the responsibility of collecting information on customer feedback, customer complaints handling in the enterprise, seminars/workshops/trainings sponsored by external bodies attended jointly by the employees, and firm’s products stock taking, more ideas would be generated resulting in improved innovation outcomes of the firm.

➤ *Tests for Hypothesis three:*

H₃: Business model positively associates with innovation outcomes. Model 3 tests causal relationship between business model and innovation outcomes in response to H₃.

Table 9 Business Model and Innovation Outcomes. Model 3 Summaries

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	0.772 ^a	0.596	0.594	1.82446		
a. predictors: (constant) Business model						
b. Dependent Variable: innovation outcomes.						
(a) ANOVA						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	13.487	1	13.487	4.051	0.000 ^b
	Residual	79.896	24	3.329		
	Total	93.383	25			
(b) Coefficient						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
1		B	Std. Error	Beta		
	(Constant)	-2.678	1.244		-2.152	.032
	Business model	1.318	0.072	0.772	18.372	0.000
b. Dependent variable: Innovation outcomes.						

Source: Survey, 2022.

In table 9 above the prediction rate is 59.4%. It can be noted that when employees were encouraged to monitor lead times and participate in-house coaching and mentorship programs for the employees undertaken in the enterprise on refresher courses, internal key performance indicators being formulated and achieved, and internal critical success factors formulated and implemented successfully by the enterprise, more innovation outcomes would be generated.

➤ *Tests for Hypothesis four:*

H₄: Strategy associates with innovation outcomes. Model 4 in table 11 below tests how strategy impacts on innovation outcomes following H₄.

Table 10 Strategy and Innovation Outcomes. Model 4 Summaries

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
One	0.562 ^a	0.335	.296	.24153		
a. predictors: (constant) Strategy						
b. Dependent Variable: Innovation outcomes						
(b) ANOVA						
Model	Sum of Squares	Df	Mean Square	F	Sig.	
1	Regression	15.227	1	15.227	6.780	0.000 ^b
	Residual	53.904	24	2.246		
	Total	69.131	25			
a. Dependent Variable: Innovation outcomes.						
(c) Coefficient						
Model	Unstandardized Coefficients		Standardized Coefficients		T	Sig.
1		B	Std. Error	Beta		
	(Constant)	-19.871	2.055		-6.177	0.000
	Strategy	0.423	0.208	0.389	2.034	0.004
b. Dependent variable: Innovation outcomes						

Source: Survey, 2022.

In table 10 above the prediction rate is 29.6%. It is noted that when firms were encouraged deploy strategy by way of number of research projects undertaken in relation to idea generation of new products in the enterprise, new processes carefully selected and implemented in the enterprise, a number of market innovations in the enterprise, and organizational innovation by the enterprise, more improved innovation outcomes would be generated but not in an accelerated manner since this requires heavy financial costs.

V. DISCUSSIONS

Table 11 The Factors and Innovation Outcomes Using Multiple Regression Analysis in a Summarized Form.

Model					Change statistics					
	R	R ²	Adjusted R ²	SE of the estimate	R ² Change	F Change	df1	df2	Sig. F Change	
1	0.828 ^a	0.686	0.685	1.60705	0.001	5.550	1	19	0.000	
2	0.872 ^b	0.760	0.713	0.10122	0.047	9.956	1	19	0.523	
3	0.772 ^c	0.596	0.594	1.82446	0.002	4.051	1	24	0.000	
4	0.561 ^d	0.315	0.296	0.24153	0.019	6.780	1	24	0.004	

Source: Survey, 2022.

Table 11 above shows the findings of the four models. From the table results from the test of model 1 shows that strategic leadership was a significant predictor of innovation outcomes (adjusted R² =0.047, p =0.01) indicating this construct of innovation explains 0.713 of the variation of innovation outcomes. The second regression model shows that strategy significantly explains only 0.019 of the variation of innovation outcomes. As table 12 shows, the third model (Business model, strategic leadership, and strategy) explained 0.596 of the variation of innovation outcomes. The fourth regression model shows that the contribution of the strategy on explaining the variance of innovation outcomes is close to zero (0.019). Therefore, all the four research objectives were positively confirmed.

VI. CONCLUSIONS

This research has clearly revealed the variables which have predictive power in any innovation undertaken in a business enterprise. It has confirmed that strategic leadership if well applied can result in an innovation which could be incremental, radical, breakthrough, or disruptive. Firms need to look into their way of ensuring that they have in place

mechanisms relating to acquisition and application of knowledge management, strategic leadership, business model, and strategy. Developing documented tools in connection with the constructs can add value in a big way as shown in the outcome of this survey analysis. The descending pattern of ranking in fostering innovation is to emphasize on strategic leadership, knowledge management, business model, and strategy and in line with this research indicated adjusted R² of .713, .685, .594 and .296 respectively.

RECOMMENDATIONS

Innovation outcomes in an enterprise is an area which if well managed can give rise to a firm gaining competitive advantage. It is recommended that an enterprise which is desirous of having a strong grounding for innovation needs to focus more on its strategic leadership, knowledge management, business model, and strategy in descending order in terms of resource allocation to reap maximized output. This can be enhanced through instilling and installing empowerment activities to improve capacity and capability in all aspects of its business functions and core

objectives. The innovation outcomes arising from the constructs in this research if keenly observed and applied in an enterprise can enormously lead to their growth.

VII. FURTHER SURVEY

The analysis in this research has revealed that 68.5% for knowledge management, 71.3% for strategic leadership, 59.4% for business model and 29.6% for strategy provide explanation for prediction of innovation outcomes of the population studied. This calls for further research to obtain the remaining percentage of each of the constructs. Various characteristics that were not captured in this survey still need to be factored in further research to enhance understanding of the variables. Innovation management if well undertaken in enterprises can contribute to their geometric growth and to creation of employment opportunities in a big way leading to increase in the social and economic empowerment of a nation or a region.

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