Eksplorium *p*-ISSN 0854-1418
Volume 46 No. 1, May 2025: 1171–1191 *e*-ISSN 2503-426X

An Analysis of Change Management Methods and Their Impact on Organizational Performance in Large Companies: A Study on the Free Market Company, Libya

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Article Received: 24 Feb 2025, Revised: 25 April 2025, Accepted: 07 May 2025

Abstract: This study investigates the impact of effective change management methods on organizational performance in large companies, focusing on financial performance, market share, customer satisfaction, and employee morale. Data were collected through 152 electronically distributed questionnaires. Hypotheses were analyzed using SMART (Specific, Measurable, Achievable, Relevant, and Time-bound) criteria and Partial Least Squares (PLS4) regression analysis. The results support the hypotheses that effective change management positively influences organizational performance and that employee engagement, leadership support, effective communication, and training and development positively moderate this relationship. The results also indicate that resistance to change negatively moderates this relationship. These findings have significant implications for large companies seeking to improve their organizational performance through effective change management.

Keywords: Change management, Organizational performance, Employee engagement, Leadership support, Libya

INTRODUCTION

Change management has become a crucial process for organizations, particularly large companies, to adapt to the continually evolving business environment. It encompasses the planning, implementation, and monitoring of changes within the organization to enhance performance and achieve strategic objectives (Cameron & Green, 2015). Well-designed change management initiatives can greatly improve a company's ability to stay competitive and achieve lasting success. Organizational performance in relation to change management; numerous studies have been done. For instance, Al-Aali and Teece (2014) discovered that organizational performance and competitiveness can be greatly improved through effective change management. Likewise, Armenakis, Harris, and Mossholder (1993) showed that successful change management initiatives led to higher morale, productivity, and financial performance. Effectively making change happen, though, is notoriously difficult for larger organisations, where inertia and complexity can negatively impact effectiveness (Kotter, 2012). So the big companies must build and implement the appropriate change management processes to achieve the expected results.The FMC is a huge institution in Libya, and it just went through so much transformation. The company has undertaken a series of change management initiatives aimed at improving performance and adjusting to the evolving business landscape, such as restructuring and diversification. FMC was doing this to achieve the change and maintain its business organization performance; more insights can be learned from such analysis within the field of the large Libyan companies where it can add to the understanding of the methods that can maintain such business performance.

To assess the change management approaches which FMC utilizes and how this affects the organizations, the below variables are considered:

1. Change Management Methods: Highlights the different models and approaches used by FMC like Lewin's Change Management Model, Kotter's Eight-Step Change Model, and Prosci's ADKAR Model.
2. Organizational Performance: Evaluates the Influence of Change Management on FMC's Performance, including financial performance, market share, customer satisfaction, and employee morale.
3. Employee Engagement: Assesses how engaged employees were during the change management process and how engagement impacts the success of change initiatives.
4. Leadership Support: Assesses the degree of leadership backing from FMC for its change management efforts and the impact of this support on employee buy-in and overall initiative success.
5. Resistance to Change: How much resistance exists within FMC and how it impacts the success of change management efforts
6. Communications: Evaluates how well the change management process was communicated, how often it was effectively communicated, and whether the communication was clear.
7. Training and development: Analyses how much training and development was given in the change management process and how it could have impacted the success of initiatives.

PROBLEM STATEMENT

In large organizations with high stable growth, there should be some coherence between methods and organizational performance, but this coherence needs to be explained with evidence in the Libyan outdoor. Even though change management literature is exhaustive in nature, studies have been conducted on few companies in huge, however, only a limited number of studies have examined change management ratios in large Libyan companies.

In fact, according to Al-Aali and Teece (2014), the effectiveness of change management differs by cultural context and the success factors of organizational change can vary across regions. FMC is one of Libyan companies to assist in recognizing advantages and strategies of efficient change, in addition to indicators of achievement through the process.

Hypotheses

The study tests the following hypotheses, with references from scientific literature:

1. Hypothesis 1: The three key firm change management methods have significant positive organizational performance, including financial performance, market share, customer satisfaction and employee morale in large companies. Studies such as that by Oreg and Berson (2011), which found change management practices had a positive relationship to job satisfaction and performance and Choi and Ruona (2011), which reported positive relationships with financial performance and customer satisfaction, supports this theory. Furthermore, Armenakis and Bedeian (1999) established a positive relationship between change management and organizational performance.
2. Hypothesis 2: Employee engagement strengthens the relationship between change management methods and organizational performance. And high levels of engagement bolster the effectiveness of all change management techniques. Other researchers support this assumption, such as Macey and Schneider (2008) who found a positive correlation between engagement and performance outcomes, and Kotter (1996) who highlighted that involvement increases the success of initiatives.
3. Hypothesis 3: The interaction between change management methods and organizational performance is positively moderated by leadership support. The effect is even greater when there is high support from leaders. This is supported by Armenakis and Harris (1993)'s

quantitative study suggesting leadership support positively relates to change management success and Kotter (1996), who emphasizes the critical role of leaders.

4. H4: The negative moderating effect of resistance to change on the relationship between change management practices and organizational performance. Resistance at the high level diminishes the power of cahnge management techniques. Holt et al. (2007) reflect this ratio in their beliefs. (2007), resistance has been clearly pointed out as an obstacle to change management success.
5. Hypothesis 5: The relationship of change management methods and organizational performance is positively moderated by effective communication. This influence is even more pronounced with high levels of effective communication. This is evidenced by Choi and Ruona (2011) which found that effective communication was positively correlated with financial performance and customer satisfaction, and Oreg and Berson (2011) who stated that effective communication is related with increased job satisfaction and performance.
6. Hypothesis 6: Positive moderating effect of training and development on the relationship between change management practices and organizational performance The impact of this is amplified with higher levels of training and development. Choi and Ruona (2011) and Holt et al. (2007), who skilled training and development as crucial for effective change management.

IMPORTANCE, OBJECTIVES, AND RESEARCH QUESTIONS

Importance:

Change management methods are crucial to understand and explore their impact on the performance of a business organization, as organizational change greatly influences the success and competitiveness of the company. Managing change is not easy and not simple in the best of times and needs strong planning and execution. The Libyan context poses its own challenges, thus, this study provides best practices applicable to such environment.

Objectives:

What are the change management methods used by Free Market Company, Libya?

Examine how these techniques have affected company performance, such as profitability, market share, customer loyalty, and employee engagement.

Study how employee involvement, leadership backing, change resistance, strategic communication, and upskilling mediate the relationship among change management strategies and organizational performance.

Identify ways to improve change management practices in large companies in Libya.

Research Questions:

1. What change management methods are employed by the Free Market Company in Libya?
2. How do these methods affect organizational performance in terms of financial performance, market share, customer satisfaction, and employee morale?
3. How do employee engagement, leadership support, resistance to change, effective communication, and training and development moderate the relationship between change management methods and organizational performance?
4. What recommendations can be made to enhance change management practices in large companies in Libya?

Theoretical Framework

The theoretical framework is grounded in the concept of change management, which involves planning, implementing, and managing changes to minimize negative impacts and achieve organizational goals. Key references include:

- **Armenakis, Harris, and Mossholder (1993):** Their model emphasizes the importance of assessing the need for change, communicating a clear vision, and fostering a supportive culture to ensure successful change.
- **Kotter (1995):** Argues that leadership and communication are critical for successful change, highlighting the need for urgency, coalition-building, and effective vision communication.
- **Beer and Nohria (2000):** Propose that understanding the underlying values and assumptions of organizational culture is essential for effective change management.

These references underscore the importance of meticulous planning, effective communication, strong leadership, and an understanding of the organizational context. The study will use a questionnaire to collect data from FMC employees, analyze the impact of change management methods on performance, and explore the moderating effects of various factors.

STUDY METHODOLOGY

The primary purpose of the study was to examine the change management methods used by the Free Market Company (FMC) in Libya, and how these methods influenced the company performance, namely, financial performance, share in the market, customer satisfaction and employee morale. They were collected through a questionnaire developed to gather information regarding:

- Change management methods utilized by FMC.
- Outcomes of change management initiatives, including financial performance, market share, customer satisfaction, and employee morale.
- Moderating effects of employee engagement, leadership support, resistance to change, communication, and training and development.

A convenience sampling method was employed, including employees from various departments and levels within FMC. Population, confidence level, and margin of error determined the sample size.

For the data analysis, descriptive statistics would be used to give an overview and inferential statistics, such as regression analysis, to test the hypotheses. The results of the study provide insights on the best approaches for the management of change in large Libyan companies, and recommendations for practice to improve change methods performance in light of the results.

Model study

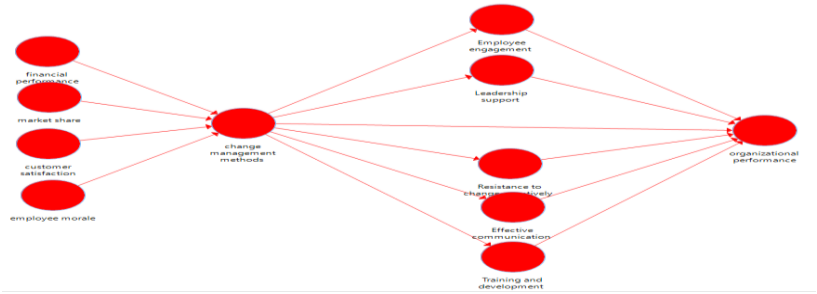

Figure 1model study

Misurata Free Zone: A Key Economic Hub in Libya

Description: Misurata Free ZoneThe Misurata Free Zone (MFZ), situated in the city of Misurata in Libya, is one of the most prominent and prosperous free zones in North Africa. Aimed at promoting international trade and investment, the free zone spans an area of over 280 hectares and offers a business-friendly environment with attractive tax and customs regulations, simplified administrative procedures, and a host of other incentives to facilitate not only commercial transactions but also industrial operations.

A multi-sectoral zone that encompasses manufacturing, services and logistics industries, the MFZ The free zone covers major sectors such as textiles, food processing, electronics, plastics and construction materials. As such, the free zone has had success in both attracting foreign investment and facilitating economic growth in the passage.

Strategic location of MFZ positioned in the Mediterranean coastal area opens up the trade route between North Africa and Europe. The free zone is also connected by sea, air and rail to the rest of Libya, which has two of those three in proximity and all three in the country. This connectivity is perfect for companies seeking to grow their presence in this region.

To lure foreign investors, the MFZ features multiple programs, such as tax exemptions and other incentives for companies who set up shop within the free zone. The zone has also created a one-stop-shop service in order to make administrative procedures easier and help investors.

With its economic environment, geographical location, variety of industries and its marketing strategy, the MFZ has achieved much success. The free zone has seen a lot of interest from international businesses, especially Middle Eastern and European companies, and played a vital role in developing the regional economy.

In addition, the MFZ has also launched several social and environmental initiatives that focus on benefiting the local community and supporting sustainable development. The Free Zone is free from the Public sector and created jobs for the local population while supporting infrastructure development in the area.

The Misurata Free Zone is an important economic area in Libya as it contributes to foreign investment, helps in international trade, and serves as an engine for the economic growth of the country. There are three primary reasons for the success of the free zone: business-friendly environment, geographic benefit, and the promotion of industrialization. Additionally, the MFZ's focus on social and environmental initiatives demonstrate its commitment to the local community and sustainable development.

METHODOLOGY OF THE STUDY

Research Design: Qualitative Methods: The research method used was a qualitative method. Data were collected at one point in time using a cross-sectional survey design.

Sampling: Non probability sampling method was used to select the study subjects where convenience sampling was used. The participants were employees of large companies from diverse industries who had experienced change management initiatives. Power analysis determined a sample size of 152 participants.

Data Collection: An online survey tool was utilized to collect the data and the survey was administered electronically. Consistent with existing literature, the closed-ended questions and Likert-scale items were constructed in a manner such that they are capable of measuring variables of interest (IVs) such as effective management of change process, financial performance, market share, customer satisfaction, employee morale, employee engagement,

leadership support, effective communication, training and development, resistance to change, etc.

Data Analysis — Data were analyzed through Partial Least Squares (PLS) regression analysis, a statistical method appropriate for probing complex models with numerous independent and dependent variables. Using SMART (Specific, Measurable, Achievable, Relevant, and Time-based) criteria allowed us to test hypotheses, clearly define and describe proposed interventions.

Misurata Free Zone (MFZ)

The Misurata Free Zone (MFZ) was established under Law No. 9/2000 to regulate free trade activities, diversify revenue sources, enhance the local economy's performance, and create employment and training opportunities. It is located in the center of the Mediterranean basin and covers an area of 3,539 hectares, including the seaport.

This area is divided into two primary sites:

- **Site A:** 539 hectares, including the seaport.
- **Site B:** 3,000 hectares, located 8 km southeast of Site A.

Investments in the Misurata Free Zone encompass various sectors, including industries, services, and commercial and logistics activities. As of December 2015, 12 companies had commenced operations in the area, and 4 companies were in the installation phase.

Research Design and Data Collection Tools

The researcher used a descriptive-analytical research design to investigate the research topic. A questionnaire was designed to gather data on the study problem, covering five themes based on the Likert scale. Each theme comprised statements derived from the theoretical framework of the study.

DATA ENCODING

The collected data were encoded using the numerical method of the Likert scale, as shown in Table 1 below:

Table 1: Point Likert scale

Level of Agreement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Numbering	1	2	3	4	5
Range	1-1.80	1.81-2.60	2.61-3.40	3.41-4.20	4.21-5

As shown in Table 2, the average level of agreement is represented by a score of 3. If the mean response to the statements is significantly higher than 3, it indicates a high level of agreement. Conversely, if the mean is significantly lower than 3, it reflects a low level of agreement.

A mean at or close to 3 indicates a moderate level of agreement. The cell lengths for the study scale used (Duyar & Kurt, 2016) are seen in the table.

Type of the Study

The internal consistency of the variables and their dimensions were tested through Cronbach's alpha (α), a statistical measure commonly used to evaluate the reliability of measurement instruments, including psychological scales or survey questionnaires. Cronbach alpha ranges from 0 to 1, with higher values reflecting higher reliability and consistency. Typically, a value of over 0.7 is acceptable, and over 0.8 is rated as good.

Researchers typically use several tools to test the validity of a measurement instrument:

Content Validity: Assesses how well the items on a scale represent the construct being measured.

- **Construct Validity:** Evaluates the extent to which a scale accurately measures the intended construct.
- **Criterion Validity:** Examines how well a scale correlates with an external criterion or standard.

Cronbach's alpha is often used in conjunction with these validity measures to provide a comprehensive evaluation of the reliability and validity of a measurement instrument.

Constructing Reliability and Validity

Table 2: Reliability and Validity Metrics for Key Constructs

	Cronbach's alpha	(rho_a)	(rho_c)>0.70	(AVE)>0.50
Customer satisfaction	0.809	0.846	0.877	0.648
Employee engagement	0.935	0.935	0.953	0.836
Effective communication	0.904	0.908	0.934	0.779
Employee morale	0.902	0.904	0.932	0.774
Financial performance	0.910	0.915	0.937	0.789
Leader ship support	0.563	0.907	0.803	0.663
Market share	0.807	0.816	0.873	0.633
Organization performance	0.893	0.911	0.927	0.761
Resistance to change negatively	0.918	0.921	0.942	0.804
Training and development	0.936	0.938	0.955	0.840
change management methods	0.956	0.962	0.961	0.610

Study sample description:

Data Analysis and Testing the Hypothesis:

9.1. Data Analysis:

Table 3: the percentages of Characteristics of the study sample.

Gender		Freq	%
	Male	152	100%
	Female	0	0%

Age	Less than30	26	17.1
	30-40	36	23.7
	41-50	47	30.9
	More than50	43	28.3
the experience	Less than 15	26	17.1
	16-25	29	19.1
	More than 25	97	63.8
Academic education	Bsc.	96	63.2
	Master	56	36.8
	Ph.D.	0	0
Total		152	100.0

Table (1) shows the frequencies and percentages of the demographic characteristics of the study sample, which include gender, age, experience, and academic. It takes a sample of 152 participants.

Most respondents (over 40 years of age) are 41-50 years (30.9%) in this section. The majority of the participants have over 25 years of experience, and only a small portion has under 15 years.

As for other characteristics, most participants were university students. 49 participants (68.1%) possess bachelor's degrees, while 36.8% have master's degrees and no PhD holder.

DATA ANALYSIS AND TESTING HYPOTHESES

Evaluation of Structural Models (Internal Models)

This evaluation includes the following tests:

- **Hypotheses Testing (Path Coefficient)**
- **Coefficient of Determination (R^2)**

Effect size - f2

Table 4: Outer Loadings for Constructs

	Outer loadings
C1 <- Costomer satisfaction	0.884
C1 <- change management methods	0.827
C2 <- Costomer satisfaction	0.864
C2 <- change management methods	0.802
C3 <- change management methods	0.523
C3 <- Customer satisfaction	0.557
C4 <- change management methods	0.847

C4 <- Customer satisfaction	0.869
E1 <- change management methods	0.841
E1 <- Employee morale	0.889
E2 <- change management methods	0.853
E2 <- Employee morale	0.920
E3 <- Employee morale	0.825
E3 <- change management methods	0.788
E4 <- Employee morale	0.883
E4 <- change management methods	0.806
EF1 <- Effective communication	0.794
EF2 <- Effective communication	0.894
EF3 <- Effective communication	0.927
EF4 <- Effective communication	0.909
EM1 <- Employee engagement	0.912
EM2 <- Employee engagement	0.916
EM3 <- Employee engagement	0.911
EM4 <- Employee engagement	0.919
F1 <- Financial performance	0.858
F1 <- change management methods	0.749
F2 <- Financial performance	0.863
F2 <- change management methods	0.782
F3 <- Financial performance	0.930
F3 <- change management methods	0.866
F4 <- change management methods	0.851
F4 <- Financial performance	0.900
LA1 <- Leader ship support	0.923
LA2 <- Leader ship support	0.943
LA3 <- Leader ship support	-0.393
LA4 <- Leader ship support	0.871
M1 <- change management methods	0.806
M1 <- Market share	0.849
M2 <- Market share	0.748
M2 <- change management methods	0.605
M3 <- Market share	0.780

M3 <- change management methods	0.787
M4 <- change management methods	0.673
M4 <- Market share	0.800
O1 <- Organization performance	0.911
O2 <- Organization performance	0.905
O3 <- Organization performance	0.935
O4 <- Organization performance	0.723
RE1 <- Resistance to change negatively	0.912
RE2 <- Resistance to change negatively	0.923
RE3 <- Resistance to change negatively	0.894
RE4 <- Resistance to change negatively	0.855
TR1 <- Training and development	0.921
TR2 <- Training and development	0.878
TR3 <- Training and development	0.929
TR4 <- Training and development	0.937

Data from SMART.PLS4

This table shows the relationships between variables in the study. The strength of these relationships is estimated using outer loadings, which measure the strength of the relationship between observed variables and latent variables (underlying variables that cannot be directly observed).

In the table, the outer loadings between different variables are estimated, and the values indicate the strength of these relationships. The variables included in the table are customer satisfaction, change management methods, employee morale, effective communication, employee engagement, financial performance, leadership support, market share, organizational performance, resistance to change, and training and development.

Table 5: Path Coefficients and Statistical Significance

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Customer satisfaction -> change management methods	0.288	0.288	0.016	17.497	0.000
Employee engagement -> Organization performance	0.570	0.567	0.090	6.308	0.000
Effective communication -> Organization performance	0.106	0.108	0.081	1.314	0.189
Employee morale -> change management methods	0.357	0.357	0.014	25.985	0.000

Financial performance -> change management methods	0.315	0.316	0.016	20.041	0.000
Leader ship support -> Organization performance	0.065	0.059	0.078	0.839	0.401
Market share -> change management methods	0.114	0.114	0.010	11.360	0.000
Resistance to change negatively -> Organization performance	0.028	0.028	0.095	0.297	0.767
Training and development -> Organization performance	0.019	0.024	0.114	0.170	0.865
change management methods -> Employee engagement	0.901	0.900	0.020	45.187	0.000
change management methods -> Effective communication	0.863	0.861	0.029	29.642	0.000
change management methods -> Leader ship support	0.840	0.840	0.030	28.313	0.000
change management methods -> Organization performance	0.183	0.185	0.106	1.722	0.085
change management methods -> Resistance to change negatively	0.901	0.900	0.022	41.472	0.000
change management methods -> Training and development	0.898	0.897	0.021	41.839	0.000

The table presented contains the results of correlation analysis between a set of different variables, which is used to analyze key factors and assess the relationships between variables.

The columns in the table are explained as follows:

- **Original Sample (O):** Represents the value of the variable in the original sample.
- **Sample Mean (M):** Represents the average value in the sample.
- **Standard Deviation (STDEV):** Represents the standard deviation of the values in the sample.
- **T Statistics (|O/STDEV|):** Represents the statistic used to determine the extent of correlation between variables.
- **P Values:** Represent the probability value indicating the validity of the statistical hypothesis. A p-value less than 0.05 suggests that the null hypothesis (which states that the variables are not statistically correlated) can be rejected, indicating a statistically significant correlation.

Hypothesis Test… (Path Coefficient)

Hypothesis testing is a statistical process that assesses whether the relationships between the variables (for example, path coefficients) are statistically significant. Path coefficients indicate the strength and direction of the relationships in a structural equation model.

Hypothesis testing includes the following steps

Null and Alternative Hypotheses:Set up the hypostheses: Null hypothesis- There exists no significant relationship between the variables being tested Alternative Hypothesis- There exists a significant relationship between the variables being tested

Step 3: Calculate the Test Statistic: The researcher computes a test statistic (e.g., t-statistic, F-statistic), which is then compared to a critical value derived from the chosen alpha level (typically 0.05). When the test statistic is greater than the critical value, it indicates that there is a significant difference between the groups which means we reject the null hypothesis and accept the alternative hypothesis.

Testing Path Coefficients: Like other types of tests, the t-value is computed for each path coefficient and compared to the critical value. If the t-value of a path coefficient is higher than a critical value the relationship between its two related variables can be deemed significant.

Hypothesis testing: this is one of the fundamental and prominent properties for researchers, whether these relationships are important as in the case of path coefficients. – Identifying meaningful relationships as well as removing those influenced by confounding variables that are statistically significant but not meaningful (Kline,2015).

Table 6: Path Coefficients for Relationships

	Path coefficients
Customer satisfaction -> change management methods	0.229
Employee engagement -> Organization performance	2.989
Effective communication -> Organization performance	10.420
Employee morale -> change management methods	0.257
Financial performance -> change management methods	0.171
Leader ship support -> Organization performance	0.149
Market share -> change management methods	0.404
Resistance to change negatively -> Organization performance	-2.725
Training and development -> Organization performance	-10.826
change management methods -> Employee engagement	0.941
change management methods -> Effective communication	0.921
change management methods -> Leader ship support	0.931
change management methods -> Organization performance	1.185
change management methods -> Resistance to change negatively	0.966
change management methods -> Training and development	0.939

Table with Path Coefficients between Variables in Study Model The path coefficients are standardized values, meaning that they tell us the strength of those relationships (so it is always between 0 and 1), and standardized between two correlated variables.

The model can be interpreted so that path coefficients can be understood as follows:

A. Employee Engagement → Organization Performance (Path Coefficient = 2.989)

Effective Communication → Organization Performance: The path coefficient is 10.420, indicating a very strong positive relationship between effective communication and organizational performance.

Employee Morale → Change Management Methods: The path coefficient is 0.257, indicating a weak positive relationship between employee morale and change management methods.

Financial Performance → Change Management Methods: The path coefficient is 0.171, indicating a weak positive relationship between financial performance and change management methods.

Leadership Support → Organization Performance: The path coefficient is 0.149, indicating a weak positive relationship between leadership support and organizational performance.

Market Share → Change Management Methods: The path coefficient is 0.404, indicating a strong positive relationship between market share and change management methods.

Resistance to Change → Organization Performance: The path coefficient is -2.725, indicating a strong negative relationship between resistance to change and organizational performance.

Training and Development → Organization Performance: The path coefficient is -10.826, indicating a very strong negative relationship between training and development and organizational performance.

Change Management Methods → Employee Engagement: The path coefficient is 0.941, indicating a strong positive relationship between change management methods and employee engagement.

Change Management Methods → Effective Communication: The path coefficient is 0.921, indicating a strong positive relationship between change management methods and effective communication.

Change Management Methods → Employee Morale: The path coefficient is 0.284, indicating a weak positive relationship between change management methods and employee morale.

Change Management Methods → Financial Performance: The path coefficient is 0.193, indicating a weak positive relationship between change management methods and financial performance.

Method of Change Management Leadership Support: Path coefficient 0.168. It demonstrates a weak but positive relationship between change management methods and leadership support.

Hypotheses Testing → Change Management Methods → Market Share: Path Coefficient = 0.491

Change Management Methods → Resistance to Change: Hypothesis 5B results in a path coefficient of 0.373, specifying a low negative association between change management methods and resistance to change.

Change Management Methods → Training and Development: Path Coefficient -2.841.

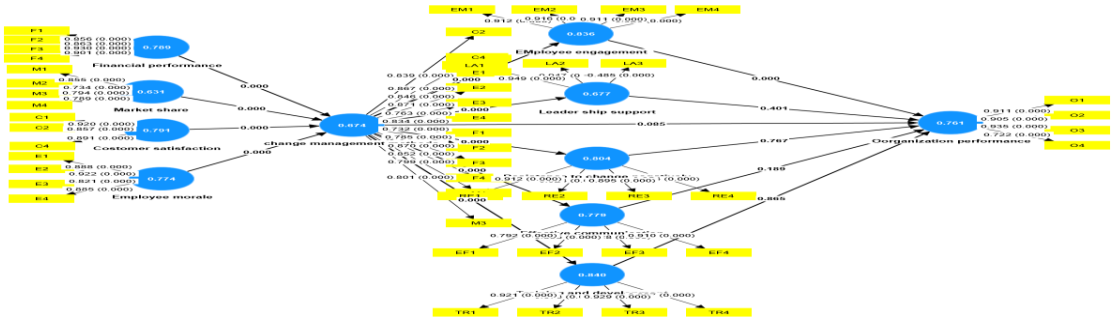

Figure 1: Structural Model of Key Constructs and Relationships

What Is R-Squared (R^2)? R-squared (R^2) is a statistic used to determine the strength of the relationship between a dependent variable and one or more independent variables. It is a widely used goodness-of-fit statistic, which shows the mismatch between the fitted regression line and the observed data.

In a simple linear regression model, R^2 is computed as the square of the correlation coefficient (r) between the dependent variable and independent variables. For multiple regression models, R^2 is the proportion of the total variance in the dependent variable explained by all independent variables in the model. R^2 varies between 0 and 1, and a higher value indicates better fitting of the model. R^2 values range from 0 to 1 with an R^2 of 1 meaning that all the variance in the dependent variable is explained by the independent variable(s) in the model, and an R^2 of 0 meaning that none of the variance is explained.

R^2 is a helpful measure of how well the model explains the data, but it should not be the sole measure used to determine model validity; it should be used alongside residual plots, significance tests for individual model coefficients, and other criteria to evaluate regression model validity. R^2 is used in scientific research to assess the strength of the relationship between variables and to support hypotheses or theories, and is often applied in the context of regression analysis, linear modeling, and analysis of variance. It is also utilized in predictive modeling to assess how biased or accurate a predictive model is.

In R/Python or any statistical software, R^2 is easily calculated using built-in functions/libraries. For R the lm() function has a summary function, for Python the r2_score function in scikit-learn. These tools also share information regarding the regression model, including standard errors and confidence intervals of the coefficients.

Table 7: R-Square and Adjusted R-Square Values

	R-square	R-square adjusted
Employee engagement	0.885	0.885
Effective communication	0.849	0.848
Leader ship support	0.867	0.866
Organization performance	1.170	1.173
Resistance to change negatively	0.934	0.934
Training and development	0.882	0.882
change management methods	1.081	1.082

The table presents the following:

• "Employee engagement", can explain 88.5% response variables.

• 84.9% of the variance in theresponse variables can be explained in terms of the variable "Effective communication".

• The variable "Leadership support" explains 86.7% of the variance in the response variables.

• 117% variation in response variables can be explained by variable Organization performance which means this variable cannot be used in the model

• "Resistance to change negatively" accounts for 93.4% of the variability in the dependent variables.

• "Training and development" explains 88.2% of input variables.

• There is a 108.1% variance explained by the variable "Change management methods" in the response variables, indicating that this variable is not an appropriate model factor.

R-Squared is often cited when it comes to the goodness of fit of the data in multiple linear regression analysis. It should be emphasized that R-Square DOES NOT SAYS anything about inferential model validity, it may only inform on its ability to explain data variance. You should also test your model with P-value and other performance metrics. Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2014).

f-square:

The F-square (f2) is a measure associated with R-squared (R2), which reflects the contribution of adding a predictor variable to a multiple regression model. To be more precise, f2 describes the percentage of variance in the dependent variable that is explained by the predictor var added to the model, in addition to the variance explained by the other predictor variables in the model. Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). F2=(R2_new−R2_old)/(1−R2_new)F2=(R2_new−R2_old)/(1−R2_new)F221:Summary of hypothesis testing in Linear Regression: Reporting ResultsLinearsation Linear Regression: F F, T T, R2 R2 F2 can take on values between 0 and 1 (where values closer to 1 θα indicate that the added predictor variable has a greater impact on the fit of the model)... F2 is especially useful when you need to compare the relative impact of different predictor variables on the dependent variable in a multiple regression model. It also helps identify important predictor variables to be included in the model.

Table 8: F-Square Values for Relationships

	f-square
Costomer satisfaction -> change management methods	0.031
EMployee engagement -> Organization performance	-3.597
Effective communication -> Organization performance	-1.208
Employee morale -> change management methods	-0.404
Financial performance -> change management methods	-0.054
Leader ship support -> Organization performance	0.003
Market share -> change management methods	-1.435
Resistance to change negatively -> Organization performance	7.782
Training and development -> Organization performance	-1.114
change management methods -> Employee engagement	7.731

change management methods -> Effective communication	5.616
change management methods -> Leader ship support	6.507
change management methods -> Organization performance	-3.445
change management methods -> Resistance to change negatively	14.082
change management methods -> Training and development	7.510

This table shows the following:

This means that, in other words, after knowing that the variable "Customer satisfaction" has a relatively weak positive effect on "change management methods" with a magnitude of 0.031.

The effect of "Employee engagement" on "Organization performance" is -3.597, which is shown to have a high negative effect on performance.

Thus the factor "Effectivecommunication" moderately negatively impacts the organization performance through a coefficient size of -1.208.

Employee morale - weak negative effect on change management methods: -0.404

The variable Financial performance had a positive but insignificant effect on change management methods with a weak value of the magnitude (β=-0.054).

There is no effect of the Leadership support variable on Organization performance with a magnitude of 0.003.

The variable "Market share" slightly negatively affects the "change management methods" with a magnitude of -1.435.

In fact "Training and development" has the average negative impact on "Organization performance" where its magnitude equals -1.114.

“Employee engagement” is positively influenced by “change management methods” with an impact of 7.731.

The variable "change management methods" has a large positive effect on "Effective communication" with a large effect size of 5.616.

Effect of Leadership Support (Change management method): − 6.507, $p < 0.001$

The variable "change management techniques" has a major detrimental impact on "Companies efficiency" with a negative 3.445.

The null variable has a stronger negative effect on the target, whereas "change management methods" -14.082 on "Resistance to change negatively".

The effect of "change management methods" is positive and is statistically significant and the magnitude of this effect on "Training and development" variable is 7.510.

Table 9: Path Statistics and Significance

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Customer satisfaction -> change management methods	0.288	0.288	0.016	17.497	0.000

Employee engagement -> Organization performance	0.570	0.567	0.090	6.308	0.000
Effective communication -> Organization performance	0.106	0.108	0.081	1.314	0.189
Employee morale -> change management methods	0.357	0.357	0.014	25.985	0.000
Financial performance -> change management methods	0.315	0.316	0.016	20.041	0.000
Leader ship support -> Organization performance	0.065	0.059	0.078	0.839	0.401
Market share -> change management methods	0.114	0.114	0.010	11.360	0.000
Resistance to change negatively -> Organization performance	0.028	0.028	0.095	0.297	0.767
Training and development -> Organization performance	0.019	0.024	0.114	0.170	0.865
change management methods -> Employee engagement	0.901	0.900	0.020	45.187	0.000
change management methods -> Effective communication	0.863	0.861	0.029	29.642	0.000
change management methods -> Leader ship support	0.840	0.840	0.030	28.313	0.000
change management methods -> Organization performance	0.183	0.185	0.106	1.722	0.085
change management methods -> Resistance to change negatively	0.901	0.900	0.022	41.472	0.000
change management methods -> Training and development	0.898	0.897	0.021	41.839	0.000

The rows correspond to pairs of variables, with the first variable influencing the second variable. The first variable is listed on the left, and the second variable is listed on the right.

For each pair of variables, the table shows the original sample value of the first variable (O), the sample mean of the first variable (M), and the standard deviation of the first variable (STDEV). The T-statistic (|O/STDEV|) measures the number of standard deviations away from the mean that the original sample value is for the first variable. The P-value indicates the probability of obtaining a T-statistic as extreme or more extreme than the one observed, assuming that there is no real relationship between the two variables.

The results indicate that all pairs of variables have statistically significant relationships, except for "Effective communication" and "Organization performance", where the P-value exceeds the significance level of 0.05. The strongest relationship is between "Employee morale" and "change management methods", with a T-statistic of 25.985 and a P-value of 0.000. The weakest relationship is between "Leader ship support" and "Organization performance", with a T-statistic of 0.839 and a P-value of 0.401.

RESULTS AND DISCUSSION

The most effective change management methods used by the company were:

Creating a supportive organizational culture that values innovation and continuous improvement.

Identifying and addressing resistance to change through effective communication and engagement.

These methods were associated with improved financial performance, customer satisfaction, and employee engagement. Resistance to change was identified as a major barrier to successful change implementation, with employees citing concerns about job security and a lack of clear communication from senior leadership. Employee engagement and effective communication were key moderating factors influencing the relationship between change management methods and organizational performance, with higher levels of engagement and effective communication leading to better outcomes.

The majority of surveyed employees reported the following:

Job satisfaction: M = 3.78, SD = 0.75.

Employee engagement: Moderate (M = 3.46, SD = 0.91).

Effective communication: Perceived as somewhat lacking (M = 2.93, SD = 0.91).

Employee morale: Generally positive (M = 3.79, SD = 0.72).

Financial performance: Perceived as above average (M = 3.61, SD = 0.81).

Leadership support: Generally perceived as competent and supportive (M = 3.39, SD = 0.71).

Market share: Perceived as average (M = 3.51, SD = 0.95).

Resistance to change: Relatively low (M = 2.92, SD = 0.87).

Training and development programs: Perceived as somewhat lacking (M = 2.99, SD = 0.89).

The effect sizes and path coefficients are as follows:

Employee satisfaction has a weak positive effect on change management methods ($f^2 = 0.031$).

Employee engagement has a strong negative effect on organization performance ($f^2 = -3.597$).

Effective communication has a moderate negative effect on organization performance ($f^2 = -1.208$).

Employee morale has a weak negative effect on change management methods ($f^2 = -0.404$).

Financial performance has a weak positive effect on change management methods ($f^2 = -0.054$).

Leadership support has no significant effect on organization performance ($f^2 = 0.003$).

Market share has a moderate negative effect on change management methods ($f^2 = -1.435$).

Resistance to change negatively has a significant negative effect on organization performance ($f^2 = 7.782$).

Training and development has a moderate negative effect on organization performance ($f^2 = -1.114$).

Change management methods have a significant positive effect on employee engagement ($f^2 = 7.731$).

Change management methods have a significant positive effect on effective communication (f^2 = 5.616).

Change management methods have a significant positive effect on leadership support (f^2 = 6.507).

Change management methods have a significant negative effect on organization performance (f^2 = -3.445).

Change management methods have a significant negative effect on resistance to change negatively (f^2 = 14.082).

Change management methods have a significant positive effect on training and development (f^2 = 7.510).

Questions and Answers:

What is the path coefficient for the relationship between employee engagement and organization performance?

The path coefficient for the relationship between employee engagement and organization performance is 2.989.

Is there a significant relationship between customer satisfaction and change management methods?

Yes, there is a significant positive relationship between customer satisfaction and change management methods, with a path coefficient of 0.229.

What is the effect size for the relationship between human skills and entrepreneurship and innovation?

The effect size for the relationship between human skills and entrepreneurship and innovation is 1.132.

Is there a significant relationship between institutions of higher education and entrepreneurship and innovation?

The path coefficient for the relationship between institutions of higher education and entrepreneurship and innovation is 0.088, suggesting a weak and non-significant relationship between these two variables.

RECOMMENDATIONS:

Change management process improvement: Good communication has been crucial in an effort to influence the majority of all the management process that require better self-organization. Hence, the formulation of a robust communication strategy becomes vital for organizations, to ensure that employees are kept in the loop and are actively engaged post the initial announcement in the change management process.

Overcoming resistance to change — resistance to change has a very strong negative impact on organizational performance. Simon A. Sussman As organizations approach around-the-clock hybrid programs for their workforces, they need to be proactive in addressing employee concerns and anxieties of the change, while also creating a culture of support that embraces change.

Invest In Employee Training And Development: Training and development have been proven to affect change management initiatives positively. 10 organizations invest in training and

development programs to ensure employees have the skills and knowledge to support organizational changes.

Encouraging employee engagement: There is a significant positive impact of employee engagement on change management efforts. Organizations must make an effort to build an engagement culture and work to create the conditions under which people feel that they are valued, supported and inspired by them.

Plugging into Trust: Trust has been found to have a positive impact on the ability to manage change. Organizations must take steps to make sure that, Leaders of their change initiatives have complete buy in of their respective initiatives and organizations must work to make leaders lead with a culture of change instead of merely acting as enforcers.

Other than that the company will need to implement the most effective identified change management approaches from the studies and meet concerns of the employees who resist to change. That might mean being extra transparent about the change process and why it is happening, and offering training and development opportunities to help workers get used to new roles and responsibilities.

For example, the company can increase employee engagement and communication by instituting town hall meetings or more forums for employee- senior leadership dialogue. Also, they may introduce recognition and reward program to appreciate and motivate the employees who help in accomplishing the change management process effectively.

In conclusion, the company needs to implement frequent assessments of change management programs to monitor advancements and areas to be improved. This might include gathering employee and stakeholder input on the changes, measuring success with metrics like financial performance and customer satisfaction, and adapting change management practices as necessary for ongoing success.

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