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Research Article

Employing Logistic Regression in Supporting Strategic Management Decisions

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ABSTRACT

This study aims to highlight the role and importance of logistic regression analysis in supporting and improving strategic decision-making within organizations. In today's complex and rapidly changing business environment, strategic decisions are often exposed to high levels of uncertainty and risk when based solely on personal judgment.

The research developed a hypothetical logistic regression model to examine the impact of several managerial variables — including leadership and decision-makers, available resources, organizational culture and institutional values, information quality, technology and innovation, market competition and pressure, and risk tolerance — on the effectiveness of strategic decisions.

The study adopted a descriptive-analytical approach using Binary Logistic Regression through SPSS Version 26 to analyze data collected from a sample of 120 administrative leaders working in Rafidain and Rasheed Banks.

The results indicated that leadership and decision-makers, available resources, information quality, technology and innovation, and risk tolerance have significant positive effects on strategic decision effectiveness, whereas organizational culture and market competition showed no statistically significant effects.

The study concludes that logistic regression provides an effective quantitative tool for analyzing complex organizational factors and estimating the probability of strategic decision success, thereby improving the efficiency and quality of strategic management decisions.

The study recommends integrating statistical analysis tools into decision support systems and training managers to interpret and apply statistical outputs effectively.

Keywords: Logistic Regression, Strategic Management, Decision Support, Information Quality, Quantitative Analysis

INTRODUCTION

Contemporary organizations face increasing challenges in a volatile and complex business environment that requires accurate and rapid strategic decisions. To improve the quality of these decisions, it has become necessary to rely on modern statistical methods that contribute to interpreting relationships among variables and predicting future outcomes.

Among the most important of these methods is logistic regression analysis, which is considered an effective tool for explaining factors affecting decision-making and classifying available alternatives based on the probability of success or failure.

This research aims to demonstrate how logistic regression can be employed as a supportive tool for strategic decision-making in organizations through an applied study on a sample of Iraqi banks.

RESEARCH PROBLEM

Despite the significant development in decision support tools, many strategic management departments still rely on personal experience and intuition in making decisions, which increases the probability of errors.

The research problem can be summarized in the following question:

How can the use of logistic regression analysis contribute to improving the quality and accuracy of strategic management decisions?

The following sub-questions emerge from this problem:

- What organizational factors most significantly affect the success of strategic decisions?
- To what extent can statistical results be used to predict decision effectiveness?
- How can logistic regression outputs be integrated into the strategic decision-making process?

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IMPORTANCE OF THE RESEARCH

1. Clarifies the analytical role of logistic regression in interpreting complex variables influencing strategic success.
2. Assists decision-makers in relying on objective quantitative data instead of intuition-based decisions.
3. Provides an applied framework that organizations can adopt to achieve higher efficiency in long-term decisions.

RESEARCH OBJECTIVES

Strategic decision-making represents a critical factor in organizational success and is influenced by several internal and external variables. Therefore, this research aims to:

1. Analyze the effect of managerial variables on the success of strategic decision-making using logistic regression.
2. Determine the relationship between managerial variables affecting strategic decision quality.
3. Build a logistic regression model to explain the factors influencing decision success.
4. Provide practical recommendations for employing logistic regression in decision support systems.

RESEARCH HYPOTHESES

LEADERSHIP AND DECISION-MAKERS

H0: There is no statistically significant relationship between leadership and decision-makers and administrative decision effectiveness.

H1: There is a statistically significant relationship between leadership and decision-makers and administrative decision effectiveness.

AVAILABLE RESOURCES

H0: There is no statistically significant relationship between available resources and administrative decision effectiveness.

H1: There is a statistically significant relationship between available resources and administrative decision effectiveness.

ORGANIZATIONAL CULTURE AND INSTITUTIONAL VALUES

H0: There is no statistically significant relationship between organizational culture and institutional values and administrative decision effectiveness.

H1: There is a statistically significant relationship between organizational culture and institutional values and administrative decision effectiveness.

INFORMATION QUALITY

H0: There is no statistically significant relationship between information quality and administrative decision effectiveness.

H1: There is a statistically significant relationship between information quality and administrative decision effectiveness.

TECHNOLOGY AND INNOVATION

H0: There is no statistically significant relationship between technology and innovation and administrative decision effectiveness.

H1: There is a statistically significant relationship between technology and innovation and administrative decision effectiveness.

COMPETITION AND MARKET PRESSURE

H0: There is no statistically significant relationship between competition and market pressure and administrative decision effectiveness.

H1: There is a statistically significant relationship between competition and market pressure and administrative decision effectiveness.

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RISK AND TOLERANCE CAPACITY

H0: There is no statistically significant relationship between risk tolerance and administrative decision effectiveness.

H1: There is a statistically significant relationship between risk tolerance and administrative decision effectiveness.

RESEARCH METHODOLOGY

- Research Type: Descriptive-Analytical.
- Research Tool: Questionnaire distributed to managers and administrative leaders in Rafidain and Rasheed Banks.
- Sample Size: 120 administrative leaders.
- Statistical Method: Binary Logistic Regression using SPSS Version 26.

THEORETICAL FRAMEWORK

STRATEGIC TOOLS AND THEIR ROLE IN SUPPORTING ADMINISTRATIVE DECISIONS

CONCEPT OF STRATEGIC MANAGEMENT

Strategic management is considered one of the most important modern administrative fields that contributes to directing organizations toward achieving long-term goals within a dynamic and challenging environment. It involves defining the organization's mission, long-term objectives, analyzing internal and external environments, formulating suitable strategies, implementing them, and evaluating performance.

Strategic management is defined as the art and science of formulating, implementing, and evaluating decisions that enable organizations to achieve long-term objectives and maintain competitiveness.

STAGES OF STRATEGIC MANAGEMENT

Strategic management consists of three main stages:

1. Strategy Formulation:
 - Internal and external environmental analysis.
 - Identifying strengths, weaknesses, opportunities, and threats.
 - Defining vision, mission, and strategic goals.
2. Strategy Implementation:
 - Translating strategic plans into practical programs and procedures.
 - Allocating resources and responsibilities.
3. Strategy Evaluation:
 - Measuring performance.
 - Comparing results with objectives.
 - Taking corrective actions.

CHALLENGES FACING STRATEGIC MANAGEMENT

Organizations face several challenges, including:

- Rapid technological change.
- Difficulty predicting future environments.
- Resistance to organizational change.
- Intense global competition.
- Lack of accurate analytical data.

IMPORTANCE OF STRATEGIC TOOLS IN MODERN MANAGEMENT

In light of rapid changes in the business environment, strategic tools have become essential for helping organizations adapt and achieve competitive advantages.

Among the most important strategic tools are:

- SWOT Analysis.
- PESTEL Analysis.
- Porter's Five Forces.

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- BCG Matrix.
- Logistic Regression Analysis.

Logistic regression has proven highly effective, especially in binary decision situations, such as success/failure and acceptance/rejection.

QUANTITATIVE ANALYSIS

Quantitative analysis refers to the use of mathematical and statistical methods to analyze organizational phenomena and support accurate decision-making.

Its importance lies in:

- Reducing uncertainty.
- Predicting future trends.
- Providing objective performance indicators.
- Supporting strategic planning.

LOGISTIC REGRESSION AS A STRATEGIC TOOL

Logistic regression is one of the most important statistical models used to predict the probability of occurrence of a binary event.

Its importance includes:

- Handling non-linear data.
- Providing probabilistic interpretations.
- Identifying influential variables.
- Supporting strategic planning and risk analysis.

STATISTICAL ANALYSIS

Data were analyzed using SPSS Version 26.

Table 1. Descriptive Statistics

Variable	N	Min	Max	Mean	SD
X1 Leadership	120	2	5	4.12	0.72
X2 Resources	120	1	5	3.88	0.81
X3 Organizational Culture	120	2	5	3.95	0.76
X4 Information Quality	120	2	5	4.05	0.70
X5 Technology	120	1	5	3.78	0.82
X6 Competition	120	1	5	3.60	0.85
X7 Risk Tolerance	120	2	5	3.92	0.74
Y Decision Effectiveness	120	0	1	0.67	0.47

RELIABILITY TEST (CRONBACH'S ALPHA)

Variable	Items	Cronbach's Alpha
Leadership	5	0.88
Resources	5	0.85
Organizational Culture	4	0.82
Information	4	0.84
Technology	4	0.80
Competition	4	0.78
Risk	4	0.83

All values exceeded 0.70, indicating acceptable to very good internal consistency.

LOGISTIC REGRESSION ANALYSIS

Table 3. Model Fit Statistics

Test	Value	df	Sig.	Interpretation
Omnibus Test	68.35	7	0.000	Significant model
Hosmer-Lemeshow	7.62	8	0.46	Good model fit
Nagelkerke R ²	0.48	-	-	Explains 48% of variance

The model demonstrated acceptable goodness of fit and substantial explanatory power.

Table 4. Logistic Regression Coefficients

Variable	B	SE	Wald	Sig.	Exp(B)
Constant	-3.10	0.95	10.63	0.001	-
X1 Leadership	0.90	0.28	10.36	0.001	2.46
X2 Resources	0.70	0.26	7.27	0.007	2.01
X3 Culture	0.35	0.21	2.78	0.096	1.42
X4 Information	0.85	0.27	9.91	0.002	2.34
X5 Technology	0.55	0.26	4.48	0.034	1.73
X6 Competition	-0.25	0.19	1.74	0.187	0.78
X7 Risk	0.60	0.22	7.44	0.006	1.82

LOGISTIC REGRESSION MODEL

The logistic regression equation is:

$$\log\left(\frac{P}{1-P}\right) = -3.10 + 0.90X_1 + 0.70X_2 + 0.35X_3 + 0.85X_4 + 0.55X_5 - 0.25X_6 + 0.60X_7$$

CONCLUSIONS

1. Leadership and decision-makers represent the most influential factor affecting strategic decision effectiveness.
2. Available resources, information quality, technology, and risk tolerance positively influence decision effectiveness.
3. Organizational culture and competition did not show statistically significant effects.
4. The logistic regression model demonstrated good explanatory capability, explaining approximately 48% of variance in strategic decision effectiveness.

RECOMMENDATIONS

1. Integrate statistical analysis tools into strategic decision support systems.
2. Enhance leadership and managerial training programs.
3. Provide adequate human and financial resources for strategic projects.
4. Improve data collection and analysis systems.
5. Encourage innovation and modern technology adoption.
6. Strengthen organizational ability to manage calculated risks through contingency planning.

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APPENDIX

Questionnaire Form

Dear Participants,

Greetings,

This questionnaire aims to collect research data for scientific purposes regarding the use of logistic regression analysis in supporting strategic management decisions.

You are kindly requested to answer the questionnaire items objectively and honestly. All information provided will be used solely for scientific research purposes and will remain completely confidential without revealing participants' identities.

Thank you for your valuable cooperation and time.

General Information (Optional)

Gender:

Male Female

Age:

Less than 30

30–40

41–50

More than 50

Educational Qualification:

Bachelor's Degree

Master's Degree

PhD

Years of Experience:

Less than 5 years

5–10 years

More than 10 years

Administrative Position:

Top Management

Middle Management

Supervisory Position

Section One: Leadership and Decision-Makers (5 Items)

No.	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Leadership possesses sufficient experience in strategic decision-making.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Ability to analyze information and make effective decisions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Encouraging team participation in decision-making.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Clarity of vision and strategic leadership within the organization.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Speed and effectiveness of decision-making when needed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section Two: Available Resources (5 Items)

No.	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Financial resources are sufficient to support decisions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Qualified human resources are available.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Physical resources and infrastructure support implementation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	The budget is flexible enough to cover strategic project needs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	An effective administrative support team assists implementation.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section Three: Organizational Culture and Institutional Values (4 Items)

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No.	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	The organizational culture encourages innovation and initiative.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Institutional values support strategic decision-making.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Employees are committed to organizational goals.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	There is a clear policy for employee participation in decision-making.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section Four: Information Quality (4 Items)

No.	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Information is accurate and reliable.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	There is an effective system for collecting and analyzing information.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Information is available at the appropriate time.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Advanced analytical tools support decision-making.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section Five: Technology and Innovation (4 Items)

No.	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	The use of modern technology supports decision-making.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	The ability to innovate helps in decision-making.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Advanced technological systems are used for data analysis.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Innovation in processes and services enhances decision-making.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section Six: Competition and Market Pressures (4 Items)

No.	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Competition affects strategic decision options.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	The emergence of new competitors requires modifying decisions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Competitors' movements are monitored regularly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Marketing strategies influence managerial decisions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section Seven: Risk and Risk Tolerance (4 Items)

No.	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	The organization has the ability to tolerate risks associated with decisions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	The level of risk affects the type of decision made.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Risks are evaluated before making decisions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	There is a contingency plan to deal with negative decision outcomes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section Eight: Effectiveness of Administrative Decision

No.	Statement	Yes	No
1	Was the strategic decision made or not?	<input type="checkbox"/>	<input type="checkbox"/>

This questionnaire was prepared based on reference [12], with modifications by the researcher.