

Impact of Artificial Intelligence on the Speed of Decision-Making Among Employees

An Applied Study on NEOM Company in Tabuk City

تأثير الذكاء الاصطناعي على سرعة اتخاذ القرار للموظفين
بالتطبيق على شركة نيوم في مدينة تبوك

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Chapter 3: Research Methodology

3.1 Introduction

This chapter presents the research methodology adopted to investigate the impact of artificial intelligence on the speed of decision-making among employees at NEOM Company in Tabuk City. The chapter outlines the operational definitions of the research variables, the research design based on Saunders' Research Onion, the target population and sampling techniques, data collection methods, types of data used, and the statistical analysis procedures applied to test the research hypotheses. The methodology is designed to ensure validity, reliability, and objectivity in achieving the research objectives.

3.2 Operational Definitions for Research Variables

3.2.1 Artificial Intelligence (AI) – Independent Variable

Operational Definition:

Artificial Intelligence refers to the use of computer systems and software tools that simulate human intelligence, including machine learning, data analytics, and automation, to perform tasks such as data processing, pattern recognition, and decision support. In this study, AI is measured through employee perceptions of AI's ability to provide accurate data, reduce analysis time, support quick decisions, and minimize human errors.

3.2.2 Speed of Decision-Making – Dependent Variable

Operational Definition:

Speed of decision-making is defined as the time taken by an employee to identify a problem, evaluate available information, choose an appropriate alternative, and implement a solution. In this study, it is measured through self-reported employee perceptions of how quickly they can make decisions after using AI tools, including reduced discussion time and improved response time to daily problems.

3.3 Research Design (Research Onion)

This study adopts **Saunders' Research Onion** model to structure the research design systematically. The layers are as follows:

3.3.1 Research Philosophy: Positivism

A positivist philosophy is adopted because the study relies on objective, measurable data and statistical analysis to test hypotheses. The researcher assumes that reality is observable and that AI's impact on decision-making speed can be quantified.

3.3.2 Research Approach: Deductive

A deductive approach is used because the study begins with existing theories and hypotheses derived from literature, then tests them empirically using collected data. This approach is suitable for confirming or rejecting the proposed relationships.

3.3.3 Research Strategy: Survey

A survey strategy is employed to collect quantitative data from a large number of respondents efficiently. This strategy allows generalization of findings to the target population and facilitates statistical analysis.

3.3.4 Time Horizon: Cross-Sectional

The study adopts a cross-sectional time horizon, as data is collected at a single point in time from NEOM employees. This is appropriate given the time constraints of the academic semester.

3.3.5 Data Collection Techniques: Questionnaire

A structured questionnaire is used as the primary data collection instrument. It includes closed-ended items measured on a 5-point Likert scale, making it suitable for quantitative analysis.

3.4 Research Population and Sampling Methods

3.4.1 Research Population

The target population of this study consists of all employees working at **NEOM Company in Tabuk City**. This includes employees from various departments, job levels, and functions. The total number of employees at NEOM is estimated to be large, but the exact figure is not publicly available.

3.4.2 Sampling Technique

A **convenience sampling technique** (non-probability sampling) is used due to accessibility and time constraints. However, the researcher ensures diversity in job titles and experience levels to enhance representativeness.

3.4.3 Sample Size

The sample size is determined based on the following criteria:

- The questionnaire is distributed to approximately **80–100 employees**.
- This sample size is considered sufficient for conducting correlation and regression analyses using SPSS.
- According to statistical rules, a minimum of 30 respondents is required for parametric tests, and a larger sample (above 50) improves reliability.

Category	Details
Target Population	NEOM Employees – Tabuk
Sampling Method	Convenience Sampling
Estimated Sample Size	80–100 respondents
Data Collection Period	Academic Semester 2025–2026

3.5 Data Collection Method

The primary data collection method is a **self-administered questionnaire**, which is distributed to NEOM employees via an online platform (Google Forms) and in some cases through direct email.

3.5.1 Questionnaire Structure

The questionnaire consists of three main sections:

Section	Content	Number of Items
A	General Information (Job Title, Experience, AI usage)	3
B	Artificial Intelligence (AI) Statements	4
C	Speed of Decision-Making Statements	4
D	Suggestions/Comments	Open-ended

3.5.2 Questionnaire Scale

A **5-point Likert Scale** is used:

Response	Score
Strongly Disagree	1
Disagree	2
Neutral	3
Agree	4
Strongly Agree	5

3.5.3 Questionnaire Validity and Reliability

- **Face Validity:** The questionnaire was reviewed and approved by the supervisor, Dr. Abdul Rahim Nader.
- **Reliability:** Internal consistency will be measured using **Cronbach's Alpha**. A value of ≥ 0.70 is expected, indicating acceptable reliability.

3.6 Types of Data

The study utilizes **primary quantitative data**, collected directly from respondents through the questionnaire.

3.6.1 Primary Data

- Collected via questionnaire from NEOM employees.
- Includes both demographic data and perceptual data on AI and decision-making.

3.6.2 Secondary Data

- Used in the literature review (Chapter 2).

- Sourced from academic journals, books, and previous studies.

Data Type	Source	Purpose
Primary	Questionnaire	Hypothesis testing
Secondary	Journals, Books	Theoretical background

3.7 Statistical Analysis Procedures

Data analysis is performed using **SPSS (Statistical Package for the Social Sciences) version 26**. The following statistical procedures are applied:

3.7.1 Descriptive Statistics

- **Mean and Standard Deviation** are calculated for each questionnaire item to describe the central tendency and dispersion of responses.
- Frequency distributions are used for demographic variables (e.g., experience, AI usage).

3.7.2 Inferential Statistics

- **Pearson Correlation Coefficient** is used to measure the strength and direction of the relationship between AI and decision-making speed.
- **Simple Linear Regression** is used to test the predictive impact of AI on decision-making speed.
- **T-test** may be used to compare decision-making speed between AI users and non-users.

3.7.3 Hypothesis Testing

Each hypothesis is tested at a **significance level of $\alpha = 0.05$** :

- If **p-value < 0.05**, the hypothesis is supported.
- If **p-value $\geq$ 0.05**, the hypothesis is rejected.

Statistical Tool	Purpose
Mean & Standard Deviation	Describe responses
Cronbach's Alpha	Test reliability
Pearson Correlation	Test relationships
Regression Analysis	Test impact/prediction

T-test	Compare groups
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3.8 Conclusion

This chapter outlined the research methodology used to investigate the impact of artificial intelligence on the speed of decision-making among NEOM employees. The study adopts a positivist, deductive approach using a survey strategy and a cross-sectional time horizon. A structured questionnaire is used as the primary data collection tool, targeting a convenience sample of 80–100 employees. Statistical analysis will be conducted using SPSS, including descriptive statistics, correlation, and regression analysis to test the research hypotheses. The methodology ensures that the study is systematic, reliable, and valid, providing a solid foundation for data analysis and interpretation in Chapter 4.