

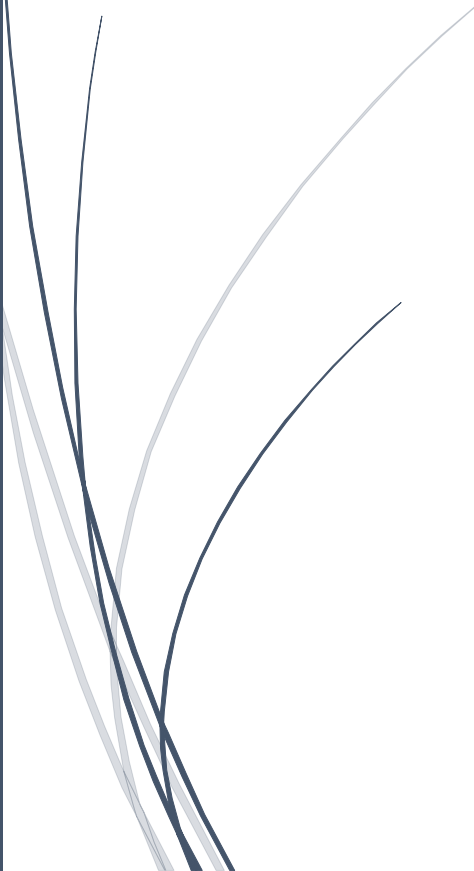


Final Project 2

PMG 497

VALMZ

Value Management Zone- VMZ



Midocean University
Faculty of Management
Department/ Specialization



VALMZ

Value Management Zone- VMZ

Student name

Ibrahim Gamal Mohammed Ali

Final Project - 2

Faculty of Management - Midocean University

Supervisor Dr's

Dr. Abdulraheem Dr. Sara Dr. Yusra Dr. Alaa
Faculty member- Faculty of management- Midocean University

Date of submission 24/10/2025 – number of Semester Third 2025

Chapter 3: Research Methodology

3.1 Introduction

This chapter outlines the comprehensive methodology employed to investigate the development and potential impact of VMZ.ai as an AI-powered Project Management Information System. The research adopts a systematic approach to ensure the validity, reliability, and practical relevance of the findings. This section details the research design, data collection methods, sampling techniques, and analytical procedures that will be used to address the research questions and test the established hypotheses.

3.2 Operational Definitions for Research Variables

Independent Variables:

- **AI Integration**: The implementation of machine learning algorithms and predictive analytics within PMIS to automate tasks, forecast project outcomes, and provide intelligent insights for proactive decision-making.
- **Integrated Communication**: The seamless incorporation of real-time collaboration tools (video conferencing, voice calls, instant messaging) directly within the PMIS platform, eliminating the need for external communication applications.
- **Comprehensive Archiving**: A systematic approach to capturing, storing, and organizing all project-related data, documents, and communications in a structured manner that enables easy retrieval and supports organizational learning.

Dependent Variables:

- **Project Management Efficiency**: The measurable improvement in project performance indicators including schedule adherence, budget compliance, and optimal resource utilization.
- **Communication Effectiveness**: The enhancement in quality, timeliness, and clarity of information exchange among project stakeholders, leading to reduced misunderstandings and improved collaboration.
- **Decision-Making Quality**: The degree to which project-related decisions are informed by accurate, relevant, and timely data provided by the AI-enhanced PMIS.
- **Organizational Learning**: The organization's capacity to capture, retain, and apply knowledge gained from past project experiences to improve future project performance.

3.3 Research Design (Research Onion)

This study employs a **mixed-methods research design** following the research onion framework:

- **Research Philosophy**: Pragmatism - focusing on practical solutions and outcomes relevant to real-world project management challenges
- **Research Approach**: Deductive - testing established hypotheses derived from existing literature
- **Methodological Choice**: Mixed-methods - combining quantitative and qualitative approaches
- **Research Strategy**: Survey and case study - utilizing questionnaires and in-depth interviews
- **Time Horizon**: Cross-sectional - data collection at a single point in time
- **Techniques and Procedures**: Structured questionnaires, semi-structured interviews, and statistical analysis

3.4 Research Population & Sampling Methods and Technique

Research Population:

The target population includes:

- Project managers across various industries
- PMO directors and staff
- Project team members
- Portfolio managers
- IT professionals involved in project management tool selection

Sampling Technique:

- **Sampling Method**: Stratified random sampling to ensure representation across different industries and organizational sizes
- **Sample Size**: Target of 200 respondents for quantitative analysis

- ****Sampling Frame****: Professional networks, PMI chapters, and LinkedIn groups focused on project management
- ****Qualitative Sample****: Purposive sampling of 15-20 experienced project management professionals for in-depth interviews

3.5 Data Collection Method

Primary Data Collection:

1. ****Online Survey Questionnaire****:
 - Structured questionnaire using 5-point Likert scale
 - Distributed through professional networks and online platforms
 - Covering all research variables with demographic section
2. ****Semi-Structured Interviews****:
 - Conducted with project management experts
 - Focus on understanding current PMIS limitations and VMZ.ai potential
 - Recorded and transcribed for thematic analysis
3. ****Document Analysis****:
 - Review of existing project management tools and their capabilities
 - Analysis of project success metrics and reporting structures

Secondary Data Collection:

- Academic literature on PMIS and AI in project management
- Industry reports on project management trends
- Case studies of successful PMIS implementations

3.6 Types of Data

Quantitative Data:

- Likert-scale responses from survey questionnaires
- Demographic information of respondents
- Project performance metrics
- Usage statistics of current PMIS tools

Qualitative Data:

- Interview transcripts with project management professionals
- Open-ended responses from survey
- Field notes from observational studies
- Document analysis findings

Data Characteristics:

- **Primary Data**: Collected directly from respondents
- **Secondary Data**: Sourced from existing literature and reports
- **Structured Data**: Survey responses in standardized format
- **Unstructured Data**: Interview transcripts and open-ended responses

3.7 Statistical Analysis Procedures

Quantitative Analysis:

1. **Descriptive Statistics**:

- Frequency distributions
- Mean, median, mode
- Standard deviation and variance

2. **Reliability Analysis**:

- Cronbach's Alpha for internal consistency
- Item-total correlation
- Split-half reliability

3. **Inferential Statistics**:

- Pearson correlation analysis
- Multiple regression analysis
- T-tests for group comparisons
- ANOVA for multiple group analysis

4. **Hypothesis Testing**:

- Significance level: $p < 0.05$
- Confidence interval: 95%
- Effect size calculation using Cohen's d

Qualitative Analysis:

1. **Thematic Analysis**:

- Coding of interview transcripts
- Theme identification and categorization
- Pattern recognition across responses

2. **Content Analysis**:

- Systematic classification of qualitative responses
- Frequency analysis of key concepts
- Cross-case analysis

Software Tools:

- **SPSS** for statistical analysis
- **NVivo** for qualitative data analysis
- **Microsoft Excel** for data organization and preliminary analysis

3.8 Conclusion

This chapter has detailed the comprehensive research methodology designed to investigate the development and potential impact of VMZ.ai. The mixed-methods approach ensures both breadth and depth in understanding the research problem. The systematic data collection and analysis procedures outlined here will ensure the validity and reliability of research findings. The next chapter will present the results obtained through the implementation of this methodology, providing insights into the feasibility and potential benefits of the proposed VMZ.ai system.

The rigorous methodological framework established in this chapter will enable the research to effectively address the research questions, test the hypotheses, and provide valuable insights for both academic literature and practical implementation of AI-enhanced project management systems.

