Philippine Copyright 2024

By Miguel Angel Y. Cantuja, Rafael Jayson M. Logan, John Vic A. Macusi, Daniel Jose D. Reyes, Angel Mae A. Taga-oc, and the Quezon City Campus Polytechnic University of the Philippines

All rights reserved. Portions of this manuscript may be reproduced with proper referencing and due acknowledgment of the author.

FACULTY PERFORMANCE SYSTEM

A Capstone
Presented to the Faculty of Bachelor of Science in Information Technology Program
Polytechnic University of the Philippines
Quezon City Campus

In Partial Fulfillment of the Requirements for the Degree in Bachelor of Science in Information Technology

By
Miguel Angel M. Cantuja
Rafael Jayson M. Logan
John Vic A. Macusi
Daniel Jose D. Reyes
Angel Mae A. Taga-oc

MAY 2024



CERTIFICATION

This CAPSTONE, "FACULTY PERFORMANCE SYSTEM" prepared and submitted by MIGUEL ANGEL M. CANTUJA, RAFAEL JAYSON M. LOGAN, JOHN VIC A. MACUSI, DANIEL JOSE D. REYES and ANGEL MAE A. TAGA-OC in partial fulfilment of the requirements for the degree, BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY has been examined and recommended for Oral Examination.

Evaluation Committee

KEZAIAH M. CRUZ, MSIT Adviser

APPROVAL

Approved by the Panel on Oral Examination on April 2024 with the grade of _____.

DEMELYN E. MONZON, PhD. Chair

ROSICAR E. ESCOBER, PhD. ALMA C. FERNANDEZ, MIT

Member

Member

LEANDRO B. AVENA IV, MIT

ERNESTO ODPAGA JR.

Member

Member

Accepted in partial fulfillment of the requirements for the degree of Bachelor of Science in Information Technology.

> JAIME P. GUTIERREZ, Jr. Director

> > ii



ACKNOWLEDGEMENTS

In completing this capstone, we are deeply grateful to everyone who supported us and contributed to the achievement of our capstone objectives.

First and foremost, we extend our heartfelt appreciation to our esteemed research adviser, **KEZAIAH M. CRUZ**, **MSIT** Her constructive suggestions, scholastic advice, and unwavering support were instrumental throughout our research journey, guiding us towards fulfilling our objectives effectively.

We would also like to express our sincere thanks to the members of the oral examination committee for their valuable insights, constructive feedback, and encouragement during the defense. Their contributions played a vital role in refining and enhancing our study to meet our defined objectives.

Beyond the educational setting, we owe our family, friends, and relatives a huge appreciation for their steadfast patience, understanding, and support during this endeavor.

Their encouragement and belief in us kept us motivated during challenging times.

Finally, we thank God for his blessings and guidance, which were essential to achieving the objectives of our capstone. This project has been a collective effort fueled by the support, expertise, and encouragement of many individuals and groups, and for that, we are sincerely thankful.



CERTIFICATION OF ORIGINALITY

This is to certify that the capstone work presented in this thesis, "FACULTY PERFROMANCE SYSTEM" for the degree Bachelor of Science in Information Technology at the Polytechnic University of the Philippines Quezon City Campus embodies the result of original and scholarly work carried out by the undersigned. This thesis does not contain words or ideas taken from published sources or written works that have been accepted as basis for the award of a degree from any other higher education institution, except where proper referencing and acknowledgment were made.

MIGUEL ANGEL Y. CANTUJA

RAFAEL JAYSON M. LOGAN

JOHN VIC A. MACUSI

DANIEL JOSE D. REYES

ANGEL MAE A. TAGA-OC

April , 2024

Date Signed



ABSTRACT

Title: Faculty Performance System

Researcher: Miguel Angel Y. Cantuja, Rafael Jayson M. Logan, John Vic A.

Macusi, Daniel Jose D. Reyes, Angel Mae A. Taga-oc

Degree: Bachelor of Science in Information Technology

Institution: Polytechnic University of the Philippines – Quezon City Campus

Year: 2024

Adviser: KEZAIAH M. CRUZ, MSIT

The Capstone Project - Faculty Performance System (FPS) addresses the imperative need for an advanced and comprehensive solution to enhance the evaluation and management of faculty performances within Polytechnic University of the Philippines - Quezon City Branch. The project focuses on the development and implementation of a sophisticated FPS, integrating cutting-edge technologies and methodologies to streamline performance assessments. Key components include real-time data synchronization with the Faculty Information System (FIS) and Research Information System (RIS), ensuring accurate and up-to-date faculty information.

The FPS aims to optimize workflows, automate data gathering, and provide actionable insights for administrators through analytics tools. By fostering scalability, security, and user-friendly interfaces, the project aspires to revolutionize the faculty management landscape, fostering a culture of transparency, efficiency, and continuous improvement within educational institutions. The Capstone Project envisions a robust FPS as an integral tool in shaping the future of academic excellence and institutional success. Keywords: Faculty Performance, Analytics, Automated Data Gathering, Polytechnic University of the Philippines Quezon City Campus



TABLE OF CONTENTS

Title Page	i
Certification and Approval Sheet	ii
Acknowledgments	iii
Certificate of Originality	iv
Abstract	V
Table of Contents	vi
List of Tables	xi
List of Figures	xii
I. Introduction	1
Background of the Capstone Project	1
Context and Scope	2
Problem Statement	3
Objectives and Goals	4
Significance and Relevance	5
Structure of the Document	6
II. Literature Review	9
Agile Scrum Methodology Overview	9
Enterprise Architecture Concepts	9
Relevant Studies and Research	10
Integration of Information Systems in Enterprise Environments	16
III. Methodology	17
Agile Scrum Methodology in the Project	17
Roles	19
Sprint Cycles	21
Scrum Artifacts	30
vi	



 POLYTECHNIC UNIVERSITY OF THE PHILIPPINES	
Integration Approach for Information System	44
Introduction to TOGAF and 4 Architecture Techniques	45
IV. Requirements Analysis	47
Stakeholder Identification	47
Requirements Gathering techniques	49
User Stories and Use Cases	50
Functional Requirements for Integration	52
V. Business Process Architecture	54
Identification of Business Process	54
Business Process Diagram	55
Alignment of Integrated System with Business Processes	57
Business Process Improvements	58
VI. Application Architecture	59
Components of Application Architecture	59
Application Architecture Diagram	60
Integration of Software Modules	61
Communication and Interaction Patterns	62
VII. Data Architecture	63
Data Sources and Types	63
Data Flow Diagram	66
Data Storage and Management	67
Data Synchronization Across Systems	68
Database Design	69
Alignment of Integrated System with Business Processes	69
VIII. Technology Architecture	71
Technology Stack and Infrastructure	71
Network Topology and Configuration	72
 vii	



POLYTECHNIC UNIVERSITY OF THE PHILIPPINES 73 Software Technologies Scalability and Performance Considerations 74 75 IX. Development Process Agile Scrum Roles and Responsibilities 75 Sprint Planning and Backlog Management 75 Sprint Execution and Deliverables 76 76 Challenges Faced in the Development Process X. Implementation 79 **Technical Implementation Details** 79 79 Tools and Technologies Used Code Integration and Interoperability 80 Integration Testing and Compatibility 81 **XI. Testing and Quality Assurance** 83 Testing Strategies and Methodologies 83 Test Cases and Test Data 84 Test Results and Bug Reports 87 Quality Assurance Measures 96 98 XII. Results and Evaluation Project Outcomes and Deliverables 98 Alignment with Project Objectives 99 Stakeholder and User Feedback 100 Lessons Learned 101 XIII. Conclusion 104 Key Takeaways and Summary 104 Project Achievements and Contributions 105 Future Work and Enhancements 106 108 Closing Remarks Viii



References	110
APPENDICES	114
APPENDIX A - Supplementary Material	115
System Architecture	115
Data Dictionary	116
Capstone Defense Presentation	118
APPENDIX B - Technical Documentation	121
15.1 System Integration	121
15.2. Information Systems Integration	122
15.3. Application Design and Development	123
15.4. Database Schema and Data Management	126
15.5. Network Configuration	127
15.6. Deployment and Infrastructure	127
15.7. Security Measures	127
15.8. Testing and Quality Assurance	128
15.9. System Monitoring and Maintenance	133
15.10. APIs and Integration Points	137
15.11. User Documentation	138
15.12. Known Issues and Troubleshooting	140
15.13. Version Control and Source Code Repository	142
15.14. DevOps and Continuous Integration/Continuous Deployment (CI/CD)	143
15.15. Licensing and Open Source Libraries	144
15.16. Performance Metrics and Monitoring	145
APPENDIX C - Scrum Artifacts	148
APPENDIX D – Requirements Traceability Matrix	150
APPENDIX E - Certificate of Originality	153
APPENDIX G - Grammarian Certificate	154



POLYTECHNIC UNIVERSITY OF THE PHILIPPINES **APPENDIX H - Turnitin Plagiarism Checker Result** 155 **APPENDIX I - Biographical Statement** 156 **APPENDIX J – Matrix** 159 Χ



LIST OF TABLES

Table No.	Title	Page
1	Team Role/s in the Project	28
2	Sprint 1	29
3	Sprint 2	30
4	Sprint 3	31
5	Sprint 4	32
6	Sprint 5	33
7	Sprint 6	34
8	Sprint 7	35
9	Sprint 8	36
10	Product Backlog	37
11	Sprint Backlog	45
12	Stakeholder Engagement Assessment Matrix	59
13	Stakeholder Register	59
14	Stakeholder Engagement Plan	60
15	Stakeholder Engagement	60
16	Data Types and Dictionary	74



LIST OF FIGURES

Figure No.	Title	Page
1	Agile Scrum Methodology	25
2	Identification of Business Process	65
3	Faculty Performance System Business Process	66
4	Application Architecture	70
5	Integration of Software Modules	71
6	System Interaction Patterns	72
7	Data Flow	76
8	Data Storage and Management Process	77
9	Data Synchronization	78
10	Database Design	79
11	Technology Architecture	81
12	High Level Architecture	82
13	FPS - Login Test Case	92
14	FPS - Dashboard Test Case	92
15	FPS - Evaluation Test Case	93
16	FPS - Individual Evaluation Test Case	93
17	FPS - Individual Research Test Case	94
18	FPS - Individual Research Test Case	94
19	FPS - Faculty Management Test Case	95