PM PULSE

Exploring a Feasible Platform for Project Management

Project ID: RP-24-002

Project Proposal Report

Sandeepani J.W.H IT21049040

Supervised by – Dr. Anuradha Jayakody

B.Sc. (Hons) in Information Technology Specializing in Information Systems Engineering

Department of Computer Systems Engineering

Sri Lanka Institute of Information Technology

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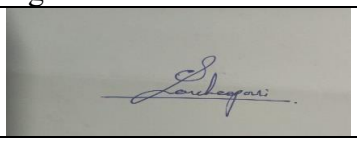
Declaration

We declare that this is our own work and this proposal does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any other university or Institute of higher learning and to the best of our knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

Name	Student ID	signature
Sandeepani J.W.H	IT21049040	

The above candidates are carrying out research for the undergraduate Dissertation under my supervision.

Name of supervisor: Dr. Anuradha Jayakody

Name of co-supervisor: Mrs. Buddhima Attanayaka

29/02/2024

…… ……

Signature of the supervisor: Date

(Dr. Anuradha Jayakody)

Buddhima Attanayaka (signed) 29/02/2024

……. ……

Signature of the co-supervisor: Date

(Mrs. Buddhima Attanayaka)

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Abstract

Successful project management is essential for firms to achieve their goals. Yet, there are restrictions on predicting deadlines, avoiding risks, and allocating labour optimally. The goal of this research is to create a smart online application that will improve project management and planning. A skill-based staff KPI generator, risk detection and mitigation techniques, a dynamic project navigator, and risk-adjusted time forecasting are the four primary parts of the suggested solution. The KPI generator generates customized performance measures by matching staff abilities to projects. Threats can be identified, analysed, and mitigation strategies can be suggested thanks to the risk identification component. simply it briefly, the goal of this applied research is to create a web tool that uses AI to improve timeline predictions, risk analysis, and project planning. As a final output system assign the most suitable team for conduct the project.

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LIST OF ABBREVIATIONS

DB	Database
UI	User Interface
ML	Machine Learning
AI	Artificial Intelligence
PM	Project Manager

1. INTRODUCTION

1.1. Background Study

According to achieving goals and delivering results, project management gets the vital place in every organization. Achieving goals and delivering results, project management gets the vital place in every organization. The discipline, structure, and procedure offered by project management guarantee that projects accomplish their intended objectives and deliverables within scope and on schedule. In order to do project tasks quickly and prevent waste, the project manager (PM) organizes all the personnel, tools, supplies, materials, procedures.

In today's complicated and rapidly changing world, project management is essential for enterprises to provide successful solutions. But there are still a lot of difficulties to overcome in areas like accurate project scoping, ideal team design, proactive handling of risks, and practical scheduling. Therefore, modern web-based project management systems that make use of cutting-edge technologies can offer better support. The goal of your research is to create a tool that has four main components are risk detection and mitigation strategies, skill-based employee KPI generator, dynamic project navigator, and risk-adjusted time forecasting.

Dynamic Project Navigator will be made possible by the dynamic project navigator's assistance in measuring project complexity and recommending the best teams [1,2]. By using AI to generate role-based goals and metrics, the skill-based employee KPI generator will increase productivity [3]. Machine learning will improve risk management by enabling intelligent risk assessment and mitigation [4]. In order to estimate timelines and account for known project risks and uncertainties, advanced algorithms will be employed.

The goal of our suggested online web application is to close important gaps that project managers now experience by integrating these features. Analytics, intelligent automation, and user-friendly interfaces will improve decision-making. It is also possible to scale the modular components across different sectors. Your application has the potential to significantly affect project delivery and results if it is accepted.

1.2. Literature Survey

For project management to be effective, measuring project complexity is essential. Complexity can be determined by variables such as scope, domain, and occupancy level. Complexity indicators facilitate the allocation of suitable resources (Vidal et al., 2011). Analysing relationships, structural a state of and cognitive weights are examples of common measurements (Lu et al., 2015). It's an advantage for categorize complexity as high, medium, or low, as I suggested. Using key performance indicators (KPIs) to map project complexity can facilitate data-driven decision making. KPIs that are appropriate for tracking the health of a project include quality conformance, schedule performance, and budget variance (Marques et al., 2011). My plan to match complexity levels to KPIs is going to produce useful information. A more efficient use of employees can be achieved by determining the ideal team composition and skill sets for a project of known complexity. Methods such as flexible cognitive mapping assess backgrounds and competencies. Individuals can also be assigned effectively with the use of role assignment algorithms (Lv and El-Gohary, 2011). According to my idea which is well-supported, is to use complexity analysis to suggest a qualified team for a project.

Adapting project management tactics in response to current events and project dynamics is known as dynamic project navigation. This is addressed by a few approaches and technologies, including Agile and Scrum, which emphasize flexible and iterative project management [5]. Teams can easily adjust to changing project needs by using popular tools for dynamic project tracking and collaboration, such as Trello and Jira [6]. Understanding the difficulty of a project is essential to efficient project management. Project managers can adjust their strategy according to the complexity of a project by using the Cynefin framework, which was established by Snowden and divides projects into basic, complicated, complex, and chaotic categories [7]. Furthermore, models for managing and evaluating the complexity of software projects, such as the COCOMO (Constructive Cost Model), have been presented by scholars such as Boehm and Papaccio [8].

1.3. Research Gap

Certain topics, including Agile approaches, complexity measurement models, or team selection techniques, are frequently covered in the literature that is now available on project management tools and practices. However, a clear deficiency exists in the integration of these constituents into an all-encompassing framework that adeptly navigate through project situations. Current tools could concentrate on one area but don't provide a cohesive strategy to evaluate the complexity of the project, match it with KPIs, and suggest the best team. Current instruments might concentrate on a single part, but they don't have an overall plan to evaluate the difficulty of the project, integrate it with key performance indicators, and suggest the best team.

The way My dynamic project navigator differentiates out is by giving empirical confirmation a lot of significance. Although current tools frequently depend on theoretical models to adjust for team dynamics and project complexity, my component actively seeks proof of concept in real-world settings to address a research gap. Our product seeks to demonstrate its usefulness and efficacy in various project situations through case studies or trials, offering an empirical backing that many other tools might not have.

Table 1.3.1 : Comparison with Other Tools

Features	Jira	Trello	PM Pulse
User friendly	✓	✓	✓
Complexity	✓	✓	✗
Dynamic team formation	✗	✗	✓
KPI mapping to team selection	✗	✗	✓
Specificity of project domains	✗	✗	✓

1.4. Research Problem

As overall research problem we identified What are the daily challengers in PMs Face in working time. They assign all the teams in manually. So, we decided to do that part an automatically. We decided to create a system which helps to reduce PMs tasks. Apart from that we got some daily issues from PMs through questionaries and surveys. The main problem that I identified they said assigning the teams are little bit risky when they did it manually. Furthermore, we identified they find project complexity also manually. As a solution, we hope to do it through automatically.

Our project's “Dynamic Project Navigator Component's “research topic is how to quantify and map project complexity effectively using input factors like "project scenario, scope, project domain, and occupancy level." The first task is to create an accurate method or program that can classify and measure a project's complexity in an objective manner. To do this, specific measures to assess complexity must be defined and established, considering variables such as project size, complexity, and possible difficulties. The selection of the best project team considering the measured complexity is also part of the study problem. Further difficulties exist in defining the criteria of an "optimal" team and creating an algorithm that balances team capabilities against project complexity. This calls for taking into thought the knowledge, abilities, and experience of team members in connection to the project requirements.

2. OBJECTIVE

This proposed solution is creating an intelligent web-based project management system with improved resource management, scheduling, risk analysis, and project planning skills is the main objective of this research. The goals are to use creative ways to address significant challenges in currently available technologies.

The dynamic project navigator component's objective is to make it possible to create the project team intelligently and automatically using important project attributes. To assess the total project difficulty on a defined scale of high, medium, or low, the component will gather essential project details such as scenario, scope, domain, and occupancy. Based on the input of this complexity score, job skill definitions, and past performance information, the system will determine which cross-functional team is most suited to carry out the project. Enhancing resource utilization, lowering risks, improving project delivery, and raising employee happiness are the goals of this dynamic matching of staff talents to project needs. The navigator, which enables data-driven and ideal team staffing, will be a fundamental component of an integrated enterprise project management suite.

2.1. Main Objective

The main objective of the dynamic project navigator is to enable data-driven assembly of optimal project teams. In order to intelligently match project demands with employee capabilities, it will assess the difficulty of the project based on important attributes and use the resulting complexity score together with personnel skills data. By dynamically staffing each project with the most skilled cross-functional team, the objective is to raise satisfaction among employees, minimize risks, optimize resource usage, and improve project delivery.

2.2. Specific Objective

The dynamic project navigator's specific goal is to automate and optimize the formation of project teams according to the skill levels and complexity of the work involved. The component will assess overall complexity on an ordinary low/medium/high scale by analysing project data such as scenario, scope, domain, and occupancy. This complexity score will be compared to a database of worker capabilities in various skill sets and areas. Based on the unique requirements and levels of complexity, the system will then use an approach to determine which cross-functional team is best suited to complete the project.

The specific objective is to eliminate manual bias and difficulties associated with staffing projects by using data and intelligence to dynamically construct teams that are most suited to the needs of each

project and have the best chance of succeeding. This will improve enterprise project management through the formation of a data-driven team.

- Using a defined low/medium/high scale, quantify complexity.
- Using project data, automate and optimize the formation of the project team.
- Match project complexity score against employee skills database.

3. METHODOLOGY

Agile software development methodologies like Scrum or Kanban can be used in the development of the web application and its constituent parts, such as the risk assessment and dynamic project navigation modules. This facilitates incremental feedback inclusion, continuous testing, and iterative development [5,6]. User stories combined with sprint planning and regular prioritization can be used to manage requirements. Every module can have a prototype constructed and regularly displayed to get user input for enhancements in line with Agile principles. Boards can be used to track issues, and releases can be scheduled gradually. Real-world use cases can be used for testing and validation by collaborating with pilot clients. The advantage is that parts can be modified based on actual data rather than only a theoretical blueprint. The Agile cycle of build-measure-learn can quickly converge the tools to the ideal set. The objective is to integrate the Agile principles of cooperation, functional software, user engagement, and adaptability within the larger framework of design science methodology.

Design science research principles utilizing experimentation and prototyping for solution design and validation would comprise the entire study process (References 7, 8). Each component's framework or model, such as the skill based KPI generator and dynamic project navigator, would be created by fusing information from industry practices and literature reviews. After then, prototypes would be constructed and gradually improved in response to user testing, comments, and performance indicators.

The dynamic project navigator will be developed using an expert system technique that is based on rules [1]. Establishing a consistent framework for measuring complexity will be the first step. This framework will use weighted principles to classify project parameters such as scenario, scope, domain, and occupancy as low, medium, or high complexity. Expert reviews and case studies from the industry will be used to validate this framework [2]. To find the most capable cross-functional team that is aligned with the project complexity level, the following stage will utilize a matching algorithm to map the calculated complexity score against a skills database that has been created through talent profiling and evaluations [3].

To maximize team selection, training datasets and machine learning methods like regression [4] will be used to hone the criteria and matching algorithm. In order to achieve data-driven staffing as opposed to manual staffing, the ultimate navigator will enable managers to input project details, assess complexity, and obtain suggested team profiles and justification.

3.1. System Overview Diagram

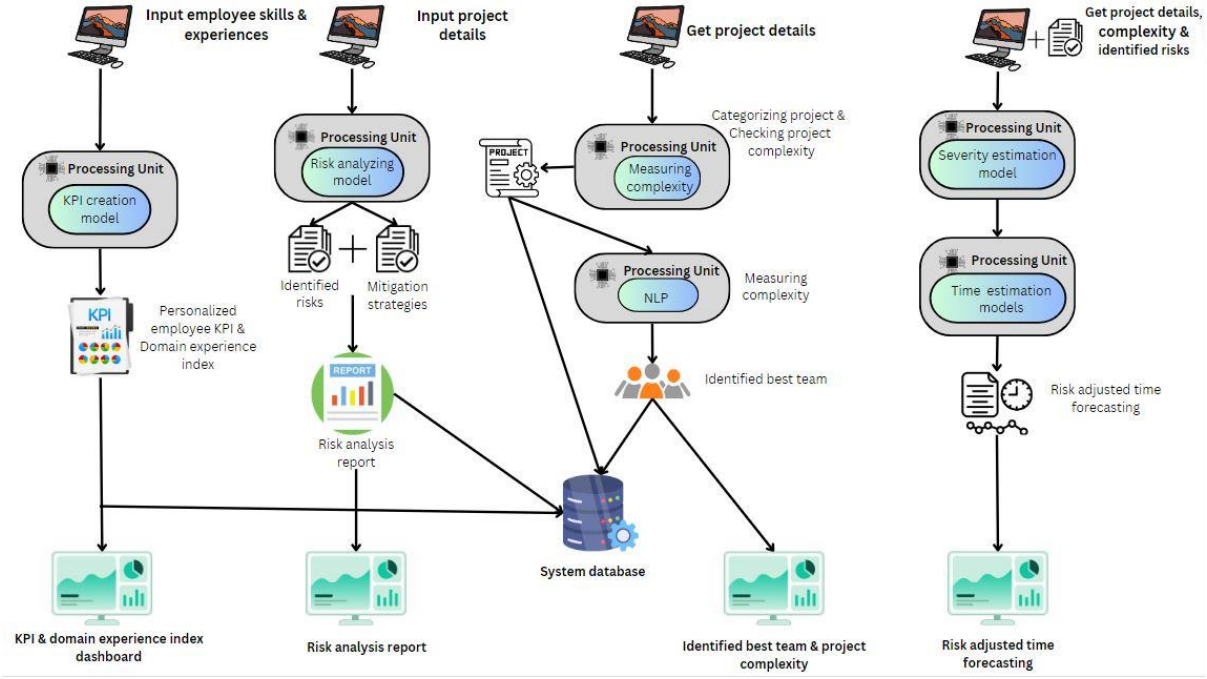

Figure 3.1.1 : System Overview Diagram

3.2. Component Overview Diagram

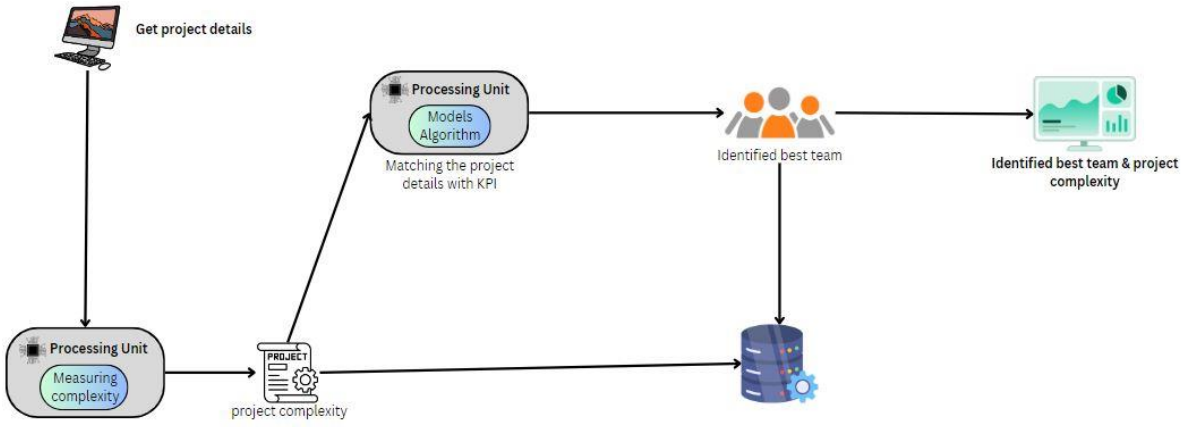

Figure 3.2.1 : Component Overview Diagram

3.3. Gantt Chart

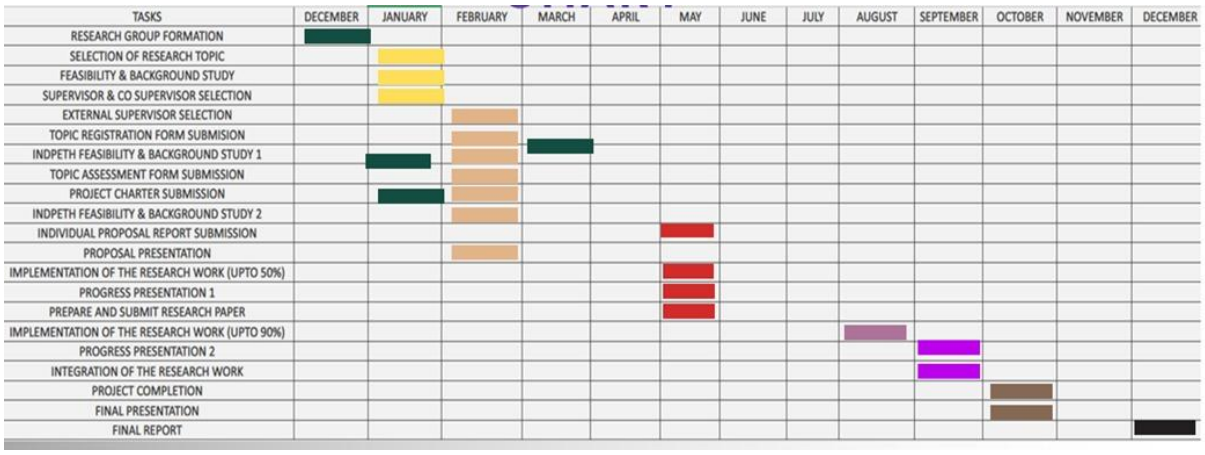

Figure 3.3.1 : Gantt Chart

3.4. Work Breakdown Structure

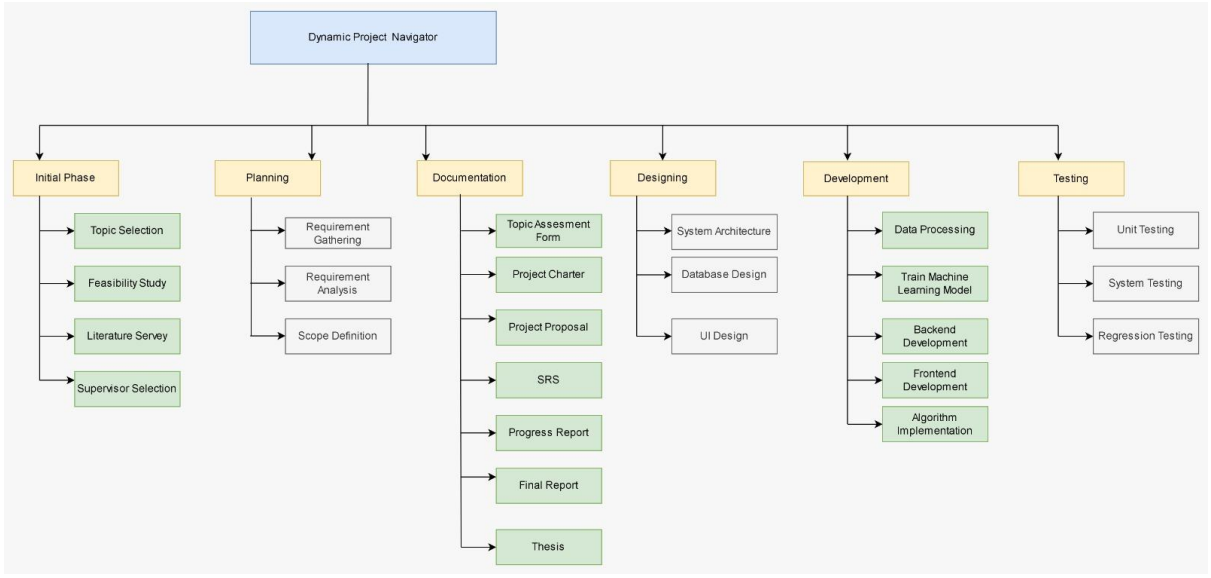

Figure 3.4.1 : Work Breakdown Structure

4. PROJECT REQUIREMENTS

The following functional, nonfunctional, and system requirements will be only focusing on the component “Dynamic Project Navigator”.

4.1. Functional Requirements

- Users will be able to enter project details into the system, such as the occupancy, domain, scope, and scenario.
- Based on a rules-based examination of the input details, the system will assign a low, medium, or high overall project complexity rating.

- The system will extract personnel data and push suggested teams through an interface with enterprise platforms.

4.2. Non-functional Requirements

- The system should be user-friendly and easy to use.
- Should provide accurate information faster.
- The system should be available when needed.
- The system should be easy to maintain and update.

4.3. System Requirements

- Mobile/Laptop
- Mobile Phone
- Internet connection

5. DESCRIPTION OF PERSONAL AND FACILITIES

Table 5.1 : Description of Personal and Facilities

Registration No	Name	Task Description
IT21049040	Sandeepani J.W.H	• Using the relevant complexity models and metrics, examine the project's specifics and determine a complexity score or rating (high, medium, or low). • Assign the most suitable team to continue the project. • Testing and Documentation

6. COMMERCIALIZATION

Our web application has the significantly increase project management efficiency. It eliminates a large portion of the manual labour associated with traditional project management by automatically matching the best teams to projects based on skill sets, risk assessments, and timeline projections. This is beneficial to any organization that oversees several complex projects.

This application's main target market would be low to medium-sized organizations that manage several projects at once across departments and distant staff. This covers, among other things, consultancy, marketing, IT, Health, Education likewise software companies. These fields obviously need intelligent project management systems.

Create a business-to-business software-as-a-service strategy and collect monthly fees per user. Provide categories of pricing and free trials. To contact clients, form connections with appropriate systems integrators and consulting businesses. Attend conferences and trade exhibitions to demonstrate the product and create interest.

- Using the proposed application, we hope to provide software companies considering each side.
- Market the app to companies, especially in the software/IT services and project management spaces, as a tool to manage their web development projects.
- Offer customized versions and premium support. Using the proposed app as the platform for an agile web project management service.
- Charge clients a fee to manage their projects using the app and your project management methodology. Offer in-person or online training programs that certify people on using the app to manage agile web projects. Charge fees for training.

7. BUDGET AND BUDGET JUSTIFICATION

Table 7.1 : Budget and Budget Justification

		Unit Cost	Total Cost
Cloud Price	*3	6000	18,000
Developers' value	*4	50,000	200,000
Database Price		5000	5000
AWS		7000	7000
Marketing and Advertisements		10,000	10,000
Total Value			240,000

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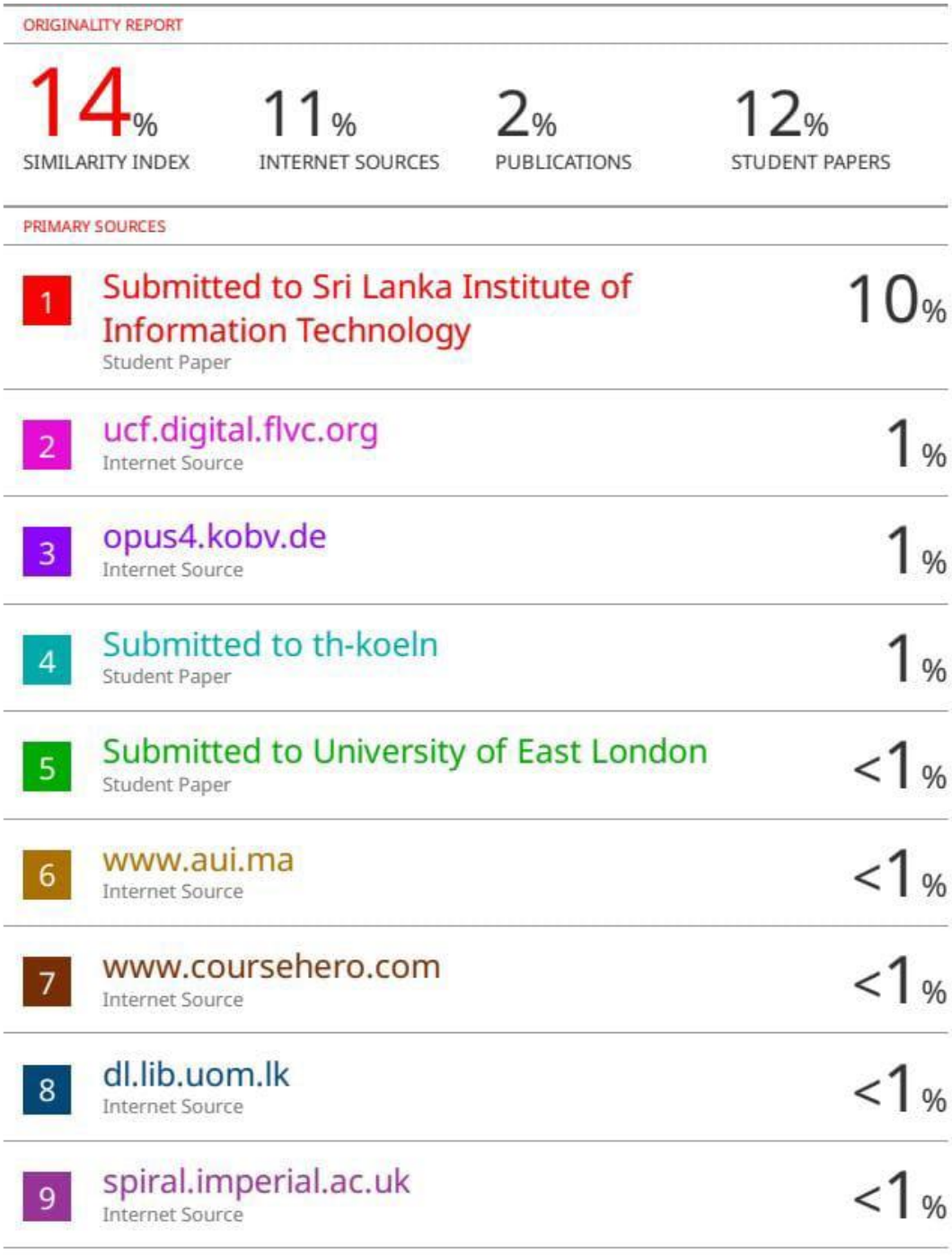
APPENDICES



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