EXPLORING A FEASIBLE PLATFORM FOR PROJECT MANAGEMENT

Project ID: RP24-002

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Project Proposal Report

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DECLARATION

We declare that this is our work, and this proposal does not incorporate without acknowledgment 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 acknowledgment is made in the text.

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The supervisor/s should certify the proposal report with the following declaration.

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

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ABSTRACT

Effective employee performance management requires metrics tailored to individual capabilities. However, organizations often rely on generic key performance indicators (KPIs) that fail to account for differences in staff skills and experiences. This component aims to develop a system for generating personalized KPIs based on each employee's strengths and development areas. The system will intake data on skills, competencies, and project histories for each staff member. Using this data, it will create statistical models to calculate benchmark targets and ratings for metrics like productivity, quality, and timeliness. These personalized KPIs will provide managers with customized goals aligned to employee abilities.

Additionally, the system will analyze employee project participation across domains like healthcare, finance, e-commerce, and education. Using this history, it will calculate domain experience indexes indicating their familiarity with each area. By combining personalized KPIs with domain experience scores, organizations can evaluate employees based on their unique capabilities and roles. This approach is superior to traditional generic performance ratings. It will allow an organization to better reward excellence, guide training needs, and foster employee growth. The product will be a set of customized KPIs and domain indexes for each staff member that map to their skills and experiences.

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LIST OF ABBREVIATION

Abbreviation	Description
KPI	key Performance Indicators
SDLC	Software Development Life Cycle
WBS	Work Breakdown Chart

1. INTRODUCTION

Employee performance management is a crucial process for organizations to measure and improve staff capabilities. However, relying on generic key performance indicators (KPIs) and metrics fails to account for differences among individual employees' skills, experiences, and competencies. This hinders effective evaluation and development of human capital. The proposed research component will develop a system to generate personalized KPIs and domain proficiency indexes for each employee based on their unique attributes.

The personalized KPIs will provide customized benchmark targets and ratings aligned to each staff member's strengths and development needs. The domain indexes will quantify experience across different organizational areas. By combining both metrics, managers can precisely evaluate employee performance and growth potential based on tailored metrics. This will improve upon traditional standardized evaluation approaches.

The system will intake employee competency and project history data. Statistical models and algorithms will then derive personalized KPIs and domain experience scores for each individual. The output will be a set of metrics adapted specifically to each staff member. This customized measurement approach will allow organizations to better reward excellence, address developmental gaps, and promote growth. Effective human capital management necessitates employee evaluation tailored to personal capabilities. This component will fulfill that need through an innovative application of analytics and modeling approaches.

2. BACKGROUND & LITERATURE SURVEY

- Performance evaluation and measurement:

Performance evaluation is an essential process for organizations to assess employee productivity, development, and contribution to objectives. Regular measurement and monitoring of performance against key metrics provide critical insights. It highlights both strengths that contribute to success as well as gaps that need to be addressed.

Key performance indicators (KPIs) are quantitative metrics used to track and communicate performance against targets. KPIs serve as benchmarks that reflect how well employees are executing their roles and responsibilities. Effective use of KPIs is vital for organizations to manage talent and human capital. [1]

- Tailored KPIs:

While KPIs are important, they need to be tailored and relevant to each employee's specific role and responsibilities. KPIs focused on the wrong competencies or outcomes will not provide useful insights.

With diverse teams and complex jobs, developing custom KPIs aligned to what an individual does is challenging. Generic KPIs fail to account for unique skills, experiences, and responsibilities. This results in poor evaluation. [2]

- Automated personalized KPI systems:

Recent research shows automated systems that leverage employee competency data can generate personalized KPIs tailored to individuals. Algorithms can analyze skills, projects, and roles to create focused metrics.

Such automated and personalized KPI approaches provide better evaluation rigor compared to traditional generic measures. They allow organizations to more precisely monitor employee performance based on customized goals.

Implementing these innovative systems can significantly improve performance management and analytics capabilities for diverse teams. The proposed research will explore the development of a personalized KPI generator. [3]

- Key performance indicators (KPIs) used for employee evaluation must evolve to stay aligned with changing organizational strategies and priorities. As companies expand

into new markets or adopt emerging technologies, existing KPIs may become outdated and fail to direct employee efforts toward current critical outcomes. Organizations must regularly reassess their KPI frameworks, dropping obsolete metrics and adopting new indicators that map to updated core competencies essential for success in dynamic business environments. Maintaining relevant KPIs through continuous reevaluation and refinement ensures performance measurement keeps pace with organizational shifts and keeps employees focused on the right objectives.

3. RESEARCH GAP

- Automatically generating personalized KPIs for each employee based on their skills and experience.

Unlike most performance management systems that use standardized or manually configured KPIs, this research aims to develop a system that automatically generates personalized key performance indicators tailored to each employee's unique skills and experiences. It will utilize AI and advanced analytics to intake and analyze individual competency data, past projects, and roles to create customized KPI benchmark targets. By developing machine learning algorithms that can match KPIs to employee strengths and responsibilities, the system can provide more relevant and focused metrics for evaluating staff. This automated approach to creating individualized performance measures aligns KPIs to the specific capabilities of each person. It promises more effective goal setting, development, and productivity than traditional one-size-fits-all indicators applied uniformly across the organization. The result is an intelligent system that uses data science to enable granular, personalized KPIs without relying on generic metrics or manual customization. [4]

- Incorporating more roles beyond just software engineers, QA, etc.

Much of the existing research on personalized performance management focuses narrowly on technical roles like software engineering and quality assurance. However, organizations have a diverse workforce with many different functions. This presents an opportunity for the proposed system to expand beyond tech-centric roles and enable personalized KPIs for a wider variety of positions across the organization. By incorporating competency data, responsibilities, and projects from non-engineering roles like marketing, finance, HR, and more, the system can be generalized to automatically generate customized KPIs tailored to individual employees regardless of their function. Expanding beyond technical roles to include all staff can provide the benefits of personalized performance measurement to the entire organization. This will better align evaluation and development initiatives to the unique skills and experiences of individual employees across all departments and roles. The proposed research will demonstrate the flexibility of the platform to move beyond common technology-centric applications and deliver personalized KPIs to a diverse workforce. [5]

- Enabling continuous updates to KPIs over time as skills evolve.

A key limitation of current personalized performance management research is the lack of focus on enabling continuous updates to KPIs as employee skills and organizational needs evolve. Most systems generate static KPIs during an annual review process that remain fixed. However, abilities, competencies, and roles constantly change in dynamic work environments. The proposed research aims to address this gap by developing algorithms that can regularly optimize and update each employee's KPIs based on their latest demonstrated skills, completed projects, and responsibilities. By enabling the system to automatically adjust KPIs based on new data, it can ensure performance metrics remain precisely tailored as both employees and the organization change. Rather than fixed metrics, research is needed on flexible, intelligent systems that can refresh KPIs at appropriate intervals to maintain alignment with emerging competencies. This will ensure employees are evaluated and developed according to dynamic, individualized targets instead of obsolete benchmarks. [6]

Research Gap Feature	**Research 1** [7]	**Research 2** [8]	**Research 3** [9]	**Research 4** [10]	**Proposed Research Solution**
Personalized KPIs	☑	☒	☒	☒	☑
Dynamic KPI Updates	☒	☑	☒	☒	☑
Skills Gap Analysis	☒	☒	☑	☒	☑
Skills-Connected KPIs	☒	☒	☒	☑	☑

Table 1 Research Gap Table

4. RESEARCH PROBLEM

- Manual generation of KPIs is time-consuming, has low accuracy, and results in unrelated.

The manual creation of key performance indicators for employees is a tedious, inefficient process that often produces inaccurate or irrelevant metrics. HR professionals must invest significant time customizing KPIs for each employee based on job analysis and subjective decisions. However, research shows that manually defined KPIs frequently fail to capture the most important competencies, are not tailored to individual strengths, and lack focus on development areas. Relying on humans to manually configure customized KPIs is simply not scalable or consistent for large diverse workforces. It is also prone to bias and error without the rigor of data-driven analytics. By automating KPI generation using machine learning algorithms, the proposed system can eliminate the inaccuracy and misalignment issues inherent in manual customization. Smart automation also reduces the time burden while producing personalized KPIs tuned to each employee's capabilities. This promises to resolve key challenges with traditional manual performance metric definitions that are disconnected from data insights.

- Generic KPIs fail to account for individual competencies and responsibilities. This leads to inaccurate assessment of employee performance.

While Key Performance Indicators (KPIs) are commonly used to gauge employee performance, relying solely on generic ones can be misleading. These broad measures often fail to capture the unique skills and responsibilities of individual roles. As a result, a high performer in one area, crucial for their specific function, might be overshadowed by another employee excelling in a generic KPI not directly relevant to their core duties. This can lead to inaccurate assessments, hindering both individual development and effective team dynamics.

- Lack of customized, skills based KPIs hampers effective performance measurement and talent development.

The absence of customized, skills-based Key Performance Indicators (KPIs) creates a significant barrier to both accurately measuring employee performance and fostering talent

development. Generic KPIs, lacking in tailored consideration for individual skills and responsibilities, provide an incomplete picture of an individual's contribution. This can lead to inaccurate assessments, potentially overlooking valuable contributions in specific areas while misleadingly highlighting performance in metrics not directly relevant to the role. Consequently, both employee development and overall team effectiveness are hindered by the lack of a nuanced understanding of individual capabilities.

5. OBEJCTIVE

5.1. Main Objective

The main objective is to design an automated system capable of generating personalized key performance indicators (KPIs) for individual employees. This system would consider each employee's unique skillset and experience level when creating these KPIs, ensuring they are both relevant and achievable. By tailoring KPIs to individual strengths and weaknesses, this system could potentially improve employee engagement, performance evaluation accuracy, and overall organizational effectiveness.

5.2.Sub Objectives

- Generate Personalized KPIs

  Specific: Develop a system to create tailored KPIs aligned with organizational goals and individual roles.

  Measurable: Implement metrics to gauge accuracy and relevance, comparing against historical data.

  Achievable: Utilize existing data to develop scalable algorithms for personalized KPI generation.

  Relevant: Enhance performance management and employee engagement.
  Time-bound: Set a timeline for development, testing, and implementation.

- Dynamic KPI Update

  Specific: Implement a system that automatically adjusts KPIs based on real-time data and changing business conditions to enhance decision-making and resource allocation.

  Measurable: Develop metrics to assess the effectiveness of the dynamic KPI update system in responding to trends and anomalies, optimizing resource allocation, and driving strategic objectives.

Achievable: Utilize advanced analytics, machine learning algorithms, and real-time data streams to develop a scalable and adaptable system for dynamic KPI updates.

Relevant: The dynamic KPI update system directly contributes to organizational agility and competitiveness by ensuring that performance metrics remain relevant and actionable in response to evolving circumstances.

Time-bound: Set a timeline for the development, testing, and implementation of the dynamic KPI update system, ensuring timely responsiveness to changing business conditions and strategic objectives.

- Analyze various skills and experience required for different roles.

  Specific: Conduct a thorough assessment of the specific competencies, qualifications, and attributes needed for each role within the organization, considering both technical and soft skills, industry expertise, and educational background.

  Measurable: Develop criteria and metrics to quantify the skills and experiences required for each role, allowing for a systematic evaluation process.

  Achievable: Utilize standardized methodologies and tools for skills assessment and job analysis to ensure a comprehensive understanding of the requirements for each role.

  Relevant: The analysis of skills and experiences aligns with organizational objectives by ensuring that individuals are matched to roles where they can contribute effectively, thereby enhancing overall team and organizational performance.

  Time-bound: Set a timeline for completing the skills analysis process, including data collection, analysis, and implementation of findings, to ensure timely alignment of workforce capabilities with organizational needs.

- Develop algorithms to map skills and experience to relevant KPIs.

  Specific: Design computational models to analyze employee data and match skills and experiences with appropriate KPIs, ensuring a systematic approach to performance assessment.
  Measurable: Develop metrics to evaluate the accuracy and effectiveness of the algorithms in mapping skills and experiences to relevant KPIs, using techniques such as machine learning and statistical analysis.
  Achievable: Utilize available data on employee skills, experiences, and performance history to develop algorithms that can effectively identify correlations and patterns between different variables.
  Relevant: This objective directly contributes to improving performance management processes by ensuring that KPIs are aligned with individual competencies and organizational objectives.
  Time-bound: Set a timeline for the development and implementation of the algorithms, allowing for testing and refinement to ensure accuracy and alignment with strategic goals.

- Create a user-friendly interface for entering employee details.

  Specific: Design a user interface that allows for efficient input of employee information, including job roles, skills, experiences, and performance data, in a clear and organized manner.

  Measurable: Establish usability metrics to gauge the effectiveness of the interface in facilitating data entry and user satisfaction through testing and feedback collection.

  Achievable: Utilize user interface design principles and best practices to develop an intuitive platform that meets the needs of both administrators and employees.

Relevant: This objective is essential for ensuring accurate and comprehensive data collection, which is critical for various organizational processes such as performance management and talent development.

Time-bound: Set a timeline for the design, development, and implementation of the user interface, allowing for iterative improvements based on user feedback and testing.

6. METHODOLOGY

To create personalized KPIs and domain experience indexes for employees on the project management website, the first step involves defining the key performance indicators (KPIs) and domains for evaluation. Following this, data on employee skills, experiences, and project history is collected. Subsequently, a method is developed to map these skills and experiences to the defined KPIs and domains. Assigning weights to each skill and experience based on their relevance to each KPI and domain is essential. Using this mapped data and weights, personalized KPIs and domain experience indexes are calculated for each employee. Validation and testing ensure the accuracy of these metrics through comparison with actual performance data and feedback gathering. User-friendly interfaces are then designed to visualize and report these personalized metrics. Continuous iteration based on feedback is crucial for refinement. Finally, integration of this component into the project management website is undertaken, along with thorough documentation of the methodology and implementation details for future reference and reporting purposes.

6.1.System Architecture

6.1.1. System Diagram

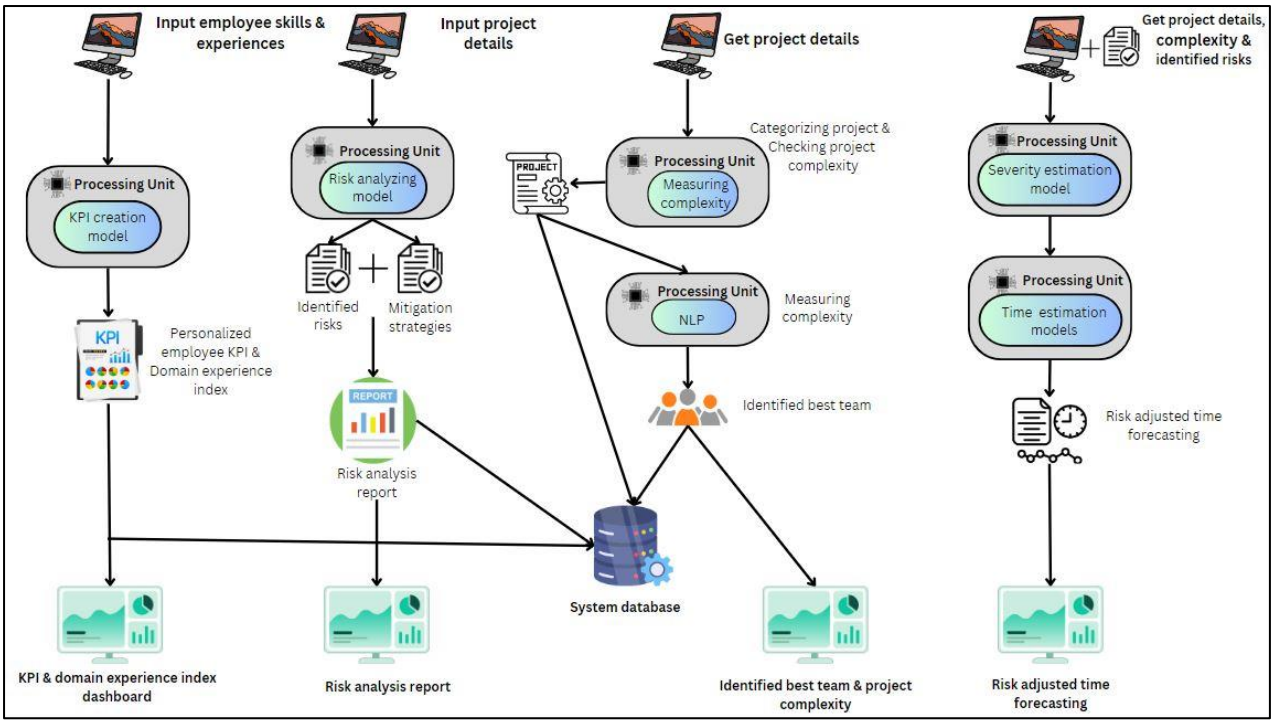

Figure 1 System Diagram

6.1.2. Component Diagram

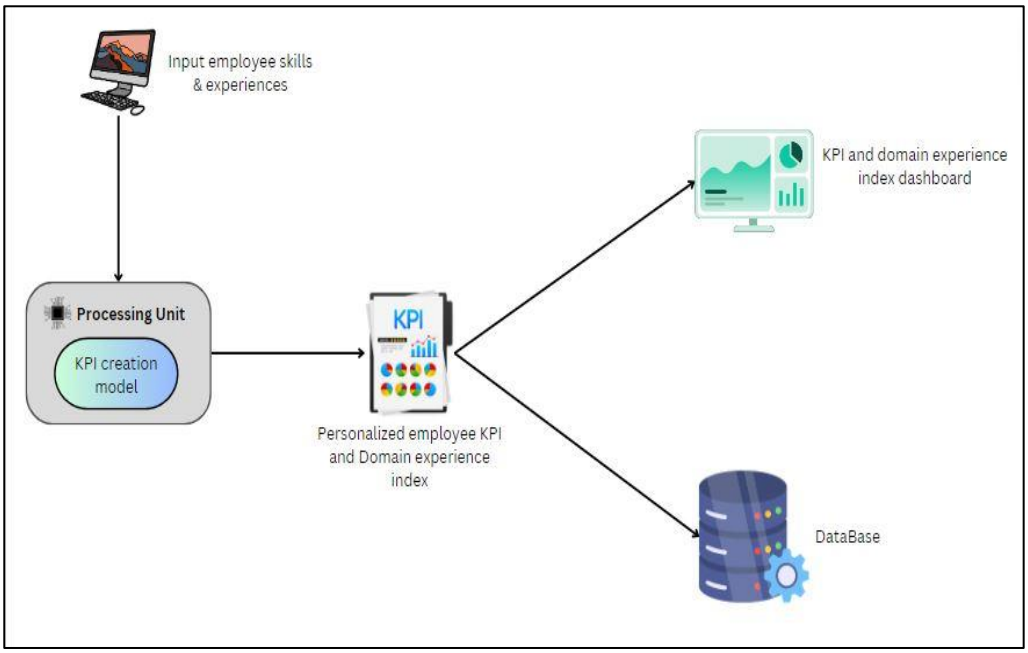

Figure 2 Component Diagram

6.2. Software Architecture

We are using the System Development Life Cycle (SDLC) technique, which is a well-known and well-established development strategy. This method should be used because this is a research project. As a result, everything must be created step by step in a straightforward manner, with each step building on the one before it. Our research team intends to clearly develop this finished product, which consists of four outstanding components. The SDLC's primary steps are listed below.

Figure 3 Stages of Software development life cycle.

6.2.1. Requirement Gathering

To gather requirements for the personalized KPI and domain experience index component, several approaches can be utilized. Stakeholder interviews with HR managers, department heads, and employees can offer valuable insights into their expectations and needs regarding performance evaluation and skill assessment. Surveys distributed among employees can provide additional perspectives on the current evaluation process and suggestions for improvement. Reviewing existing documentation, such as job descriptions and performance evaluation forms, can help identify the essential skills and competencies required for different roles. Additionally, prototype testing of the user interface for entering employee details can gather feedback on usability and design aspects. By employing these strategies, the requirements gathering process ensures that the personalized KPI and domain experience index component effectively captures and utilizes employee skills and experiences for performance evaluation while meeting stakeholder expectations.

The SDLC's initial stage is this one. Getting a clear grasp of the entire project is the goal of this stage. It involves planning, requirement identification, and requirement gathering, and all fundamental requirements-related data will be gathered. To collect information on the area, articles which are based on existing research were referred to identify the research problem and to identify a research gap.

6.2.2. Feasibility Study (Planning)

- **Economic feasibility**

The benefit and project development cost are covered in the economic feasibility report. When a good economic feasibility plan is in place, the procedure will be successful. As a result, the suggested solution ought to be efficient and affordable.

- **Scheduled feasibility**

Scheduled feasibility in a feasibility study assesses the timetable (period) for the planned, proposed project and directly affects the project because the project's intent would fail if the deadline were not met.

- **Technical feasibility**

Technical feasibility is the assessment of the expertise, resources, and skills needed to create the proposed mobile application, as well as the knowledge of the system architecture and the communication abilities needed to comprehend the demands of the stakeholders to complete the proposed project solution.

6.2.3. Implementation (Development)

The implementation of the personalized KPI and domain experience index component involves integrating employee data, developing algorithms to analyze skills and experiences, designing a user-friendly interface, ensuring scalability and performance, testing, and validating the system, integrating with existing systems, providing training and deployment, and gathering feedback for iterative improvements.

6.2.4. Testing (Track & Monitor)

At this phase, the developed system will be tested to ensure that it meets all criteria as planned and that there are no system gaps. When testing and ensuring the quality of the generated software, it is also important to check for any system errors and correct any defects that are discovered. To ensure the proposed system's quality, a variety of testing techniques, including component, integration, unit, system, and user acceptability testing, will be used.

6.3. Commercialization & Business Plan

Our web application has the significantly increase project management efficiency. It eliminates a large portion of the manual labor 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.

6.4. Future Steps

In future steps for the personalized KPI and domain experience index component involve enhancing analytics, integrating emerging technologies, ensuring scalability and flexibility, offering customization options, gathering continuous feedback, expanding into new markets, fostering partnerships, and staying abreast of industry trends to sustain its relevance and effectiveness.

7. PROJECT REQUIREMENTS

7.1. Functional Requirements

Data Input: Ability to input and store employee data, including skills, experiences, project history, and performance evaluations.

Algorithm Development: Development of algorithms to analyze employee data and map it to relevant KPIs and domain expertise areas.

Personalized KPI Generation: Generation of personalized KPIs for each employee based on their unique skills, experiences, and responsibilities.

Domain Experience Index Calculation: Calculation of domain experience indexes for different areas based on the number of projects completed by each employee in each domain.

User Interface: Creation of a user-friendly interface for entering and managing employee details, allowing for efficient data input and retrieval.

Accuracy and Reliability: Ensuring that the algorithms and calculations are accurate and reliable, providing meaningful insights into employee performance and expertise.

7.2. Non-Functional Requirements

The user interface should be intuitive and user-friendly, requiring minimal training for users to navigate and input data effectively.

Strong security measures should be implemented to protect sensitive employee data from unauthorized access, ensuring compliance with data privacy regulations.

The KPI generation process should be fast, accurate and bias-free.

The system should be easy to maintain and update, with clear documentation and well-structured code.

The system should be reliable, with minimal downtime and accurate results consistently.

8. GANTT CHART

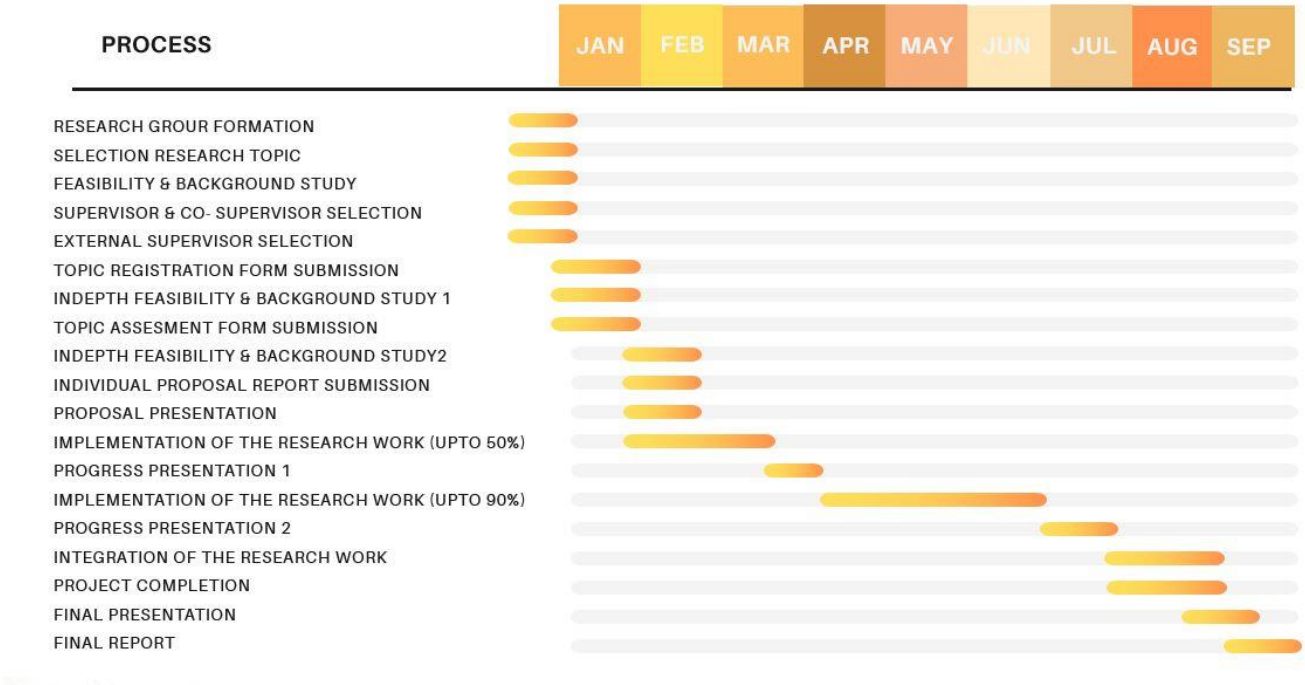

Figure 4 Gantt Chart.

8.1. Work Breakdown Structure (WBS)

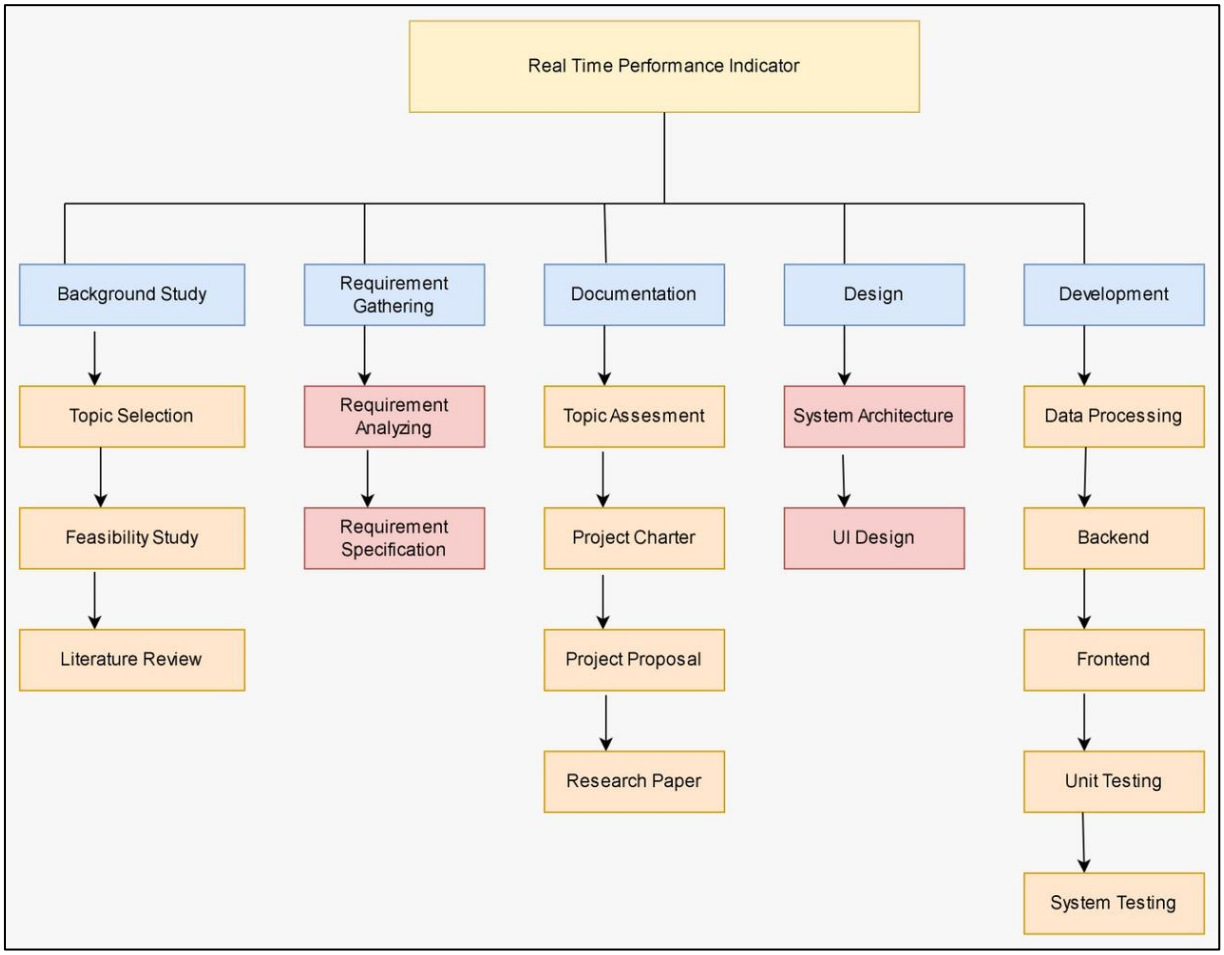

Figure 5 Work Breakdown Chart

9. BUDGET & 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

Figure 6 Budget.

10.CONCLUSION

In conclusion, the personalized KPI and domain experience index component offers a comprehensive solution for organizations to effectively evaluate employee performance and expertise. By leveraging algorithms to analyze employee skills and experiences, this component generates personalized KPIs and domain experience indexes that align with organizational objectives and individual roles. With a user-friendly interface for data input and retrieval, the component ensures ease of use and accessibility for users across the organization. Furthermore, scalability, reliability, and security measures are implemented to accommodate organizational growth, maintain accuracy, and protect sensitive employee data. Through continuous improvement and adaptation to emerging technologies and market trends, the personalized KPI and domain experience index component remains a valuable tool for driving employee performance, organizational success, and competitiveness in the ever-evolving business landscape.

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