Requirement Analysis

Prioritization of Requirements Document

Group-1

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Prioritization of Requirements

Introduction

In developing the Cloud Auto Repair Platform, a crucial step in the project lifecycle is the systematic prioritization of requirements. This process is fundamental to aligning the project deliverables with strategic business goals and ensuring that development efforts are focused effectively. By accurately prioritizing the requirements, we aim to efficiently allocate resources, manage risks proactively, and deliver value to our end-users promptly.

The prioritization of requirements not only guides the project team through a structured development plan but also aids in setting clear expectations for stakeholders. In this project, given the vast array of features and functionalities envisaged, we leverage the Eisenhower Matrix to aid our decision-making process. This prioritization strategy enables us to categorize each requirement based on its importance and urgency, thus identifying which features must be developed immediately, which should be planned for subsequent phases, which can be delegated, and which do not align with the project's core objectives and can be eliminated.

Our commitment is to a prioritization process that is both dynamic and responsive, allowing for adjustments as new information becomes available or as market conditions evolve. This approach ensures that our platform remains competitive, adheres to the highest standards of quality, and resonates with the needs and expectations of our customers and business partners.

Prioritizing Requirements using the Eisenhower Matrix

For the Cloud Auto Repair Platform project, prioritizing the plethora of requirements is a critical task that ensures we address the most impactful areas first, delivering value efficiently while staying on schedule. The Eisenhower Matrix, a time-tested prioritization framework, is particularly beneficial for this purpose.

This matrix distinguishes tasks based on their urgency and importance, allowing us to categorize requirements into four clear action categories: 'Do First', 'Schedule', 'Delegate', and 'Eliminate'. By classifying tasks this way, we can direct our immediate focus to features that are crucial for the platform's launch and customer satisfaction while strategically scheduling others that are essential but less time-sensitive.

In the practical application of our project, urgent and important tasks such as establishing secure payment gateways and ensuring regulatory compliance were tackled upfront. These are features that our users expect from the get-go and are fundamental to the trust and integrity of the platform. Conversely, important but not urgent features, like the development of a comprehensive loyalty program, were scheduled for subsequent releases.

The 'Delegate' quadrant guided us in identifying tasks that needed to be actioned swiftly but did not necessarily require the central project team's attention, such as the creation of promotional content or peripheral service integrations. Tasks in the 'Eliminate' category included those that did not align with our strategic vision or user needs, such as legacy system support that could overcomplicate the architecture without adding significant user value.

Using the Eisenhower Matrix has brought a high level of clarity and efficiency to the project management process. It helped us maintain a laser focus on our strategic goals, optimize resource allocation, and ensure that every feature we work on serves a purpose and brings us closer to our vision of transforming the automotive service industry.

Prioritizing Functional Requirements using Eisenhower Matrix

Urgent/Important	**Not Urgent/Important**	**Urgent/Not Important**	**Not Urgent/Not Important**
User Registration and Login	Specify problem, Vehicle Details	Assign Pickup Request to Driver	Billing and No-Charge Policy
Car Registration	Integration with GPS for Tracking	Generate/Send Quotes	Towing Services for Non-Drivable Vehicles
Request Repair/Maintenance Services	List of Preferred Service Centers	Review and Accept/Reject Services	
Secure Payment Gateway Integration	Service Centers Receive Requests	Partial Acceptance of Services	
Data Protection and Privacy Compliance	Documentation of Repair Process		
Secure Data Storage and Transmission	Detailed History of Services		

Prioritizing Non - Functional Requirements using Eisenhower Matrix

Urgent/Important	**Not Urgent/Important**	**Urgent/Not Important**	**Not Urgent/Not Important**
Security	Usability	-	Scalability
Reliability	Performance	-	-

Prioritization based on value, cost, and risk

The prioritization technique used in this project is a structured method to estimate the relative priorities of a set of features or requirements. It's inspired by Quality Function Deployment (QFD), a systematic approach to design based on customer requirements. The technique incorporates multiple factors to calculate the priority of each feature: the benefit it provides if included, the penalty (or negative impact) if it's excluded, the cost of implementation, and the technical risk associated with implementing the feature. The essential elements of this technique include:

- Benefit: The positive value or advantage gained by including a feature. This is assessed from the customer's or the end user's perspective. A higher benefit score indicates that the feature is highly valued by users.
- Penalty: The negative impact or disadvantage if the feature is not included. This measures the potential loss or customer dissatisfaction that may result from the absence of the feature.
- Cost: The resources (time, effort, money) required to implement the feature. This includes development time, materials, and any other expenses related to bringing the feature to life.
- Risk: The uncertainty involved in implementing the feature. This could be due to technical challenges, lack of knowledge, or dependencies on external factors.

The formula used for prioritization is:

$$Priority = \frac{Value\ \%}{Cost\ \% + Risk\ \%}$$

Where:

- Value % is the percentage of the total value (benefit + penalty) contributed by the feature.
- Cost % is the percentage of the total cost contributed by the feature.
- Risk % is the percentage of the total risk contributed by the feature.

This formula helps balance the value a feature provides against the cost and risk of implementing it, producing a prioritized list of features based on their overall contribution to the project goals.
Features with a higher priority score are those that offer the most significant benefits to users relative to their cost and implementation risk.

Reason for using it with our Project

The reason for using this technique in the project is to systematically evaluate and rank the features based on their potential impact on user satisfaction and the project's success, while also considering the practical aspects of development resources and risks. This approach

ensures that the project focuses on delivering the most valuable features to users first, thereby maximizing the effectiveness of the development effort and aligning the project outcomes with the users' needs and the business objectives.

Prioritizing Functional Requirements based on value, cost, and risk

The Functional Requirements focus on specific actions and capabilities the platform needs to offer, such as user registration, service requests, and real-time updates.

Priority Threshold for FRs:
Low: ≤ 0.4741
Mid: > 0.4741 and ≤ 0.495
High: > 0.495 and ≤ 0.52695
Very High: > 0.52695

Feature	Benefit	Penalty	Total Value	Value %	Cost	Cost %	Risk	Risk %	Priority Score	Priority
User Registration and Login	9	10	19	0.0631	4	0.0417	3	0.039	0.7829	Very High
Car Registration	8	9	17	0.0565	5	0.0521	4	0.0519	0.5429	Very High
Request Repair/Maintenance Services	8	7	15	0.0498	4	0.0417	2	0.026	0.7367	Very High
Specify problem, Vehicle Details	8	8	16	0.0532	5	0.0521	4	0.0519	0.511	High
Assign Pickup Request to Driver	9	9	18	0.0598	6	0.0625	5	0.0649	0.4693	Low
Integration with GPS for Tracking	7	6	13	0.0432	4	0.0417	3	0.039	0.5357	High
List of Preferred Service Centers	8	7	15	0.0498	5	0.0521	4	0.0519	0.479	Mid
Service Centers Receive Requests	9	9	18	0.0598	6	0.0625	5	0.0649	0.4693	Low
Generate/Send Quotes	9	8	17	0.0565	6	0.0625	5	0.0649	0.4432	Low

Review and Accept/Reject Services	9	8	17	0.0565	5	0.0521	4	0.0519	0.5429	Very High
Partial Acceptance of Services	9	8	17	0.0565	5	0.0521	4	0.0519	0.5429	Very High
Documentation of Repair Process	7	6	13	0.0432	4	0.0417	3	0.039	0.5357	High
Detailed History of Services	7	6	13	0.0432	4	0.0417	3	0.039	0.5357	High
Secure Payment Gateway Integration	10	9	19	0.0631	7	0.0729	6	0.0779	0.4185	Low
Billing and No-Charge Policy	10	9	19	0.0631	6	0.0625	5	0.0649	0.4953	Mid
Towing Services for Non-Drivable Vehicles	8	7	15	0.0498	5	0.0521	4	0.0519	0.479	Mid
Data Protection and Privacy Compliance	10	10	20	0.0664	8	0.0833	7	0.0909	0.3813	Low
Secure Data Storage and Transmission	10	10	20	0.0664	7	0.0729	6	0.0779	0.4405	Low

Prioritizing Non-Functional Requirements using based on Value, Cost, and Risk

Non-functional requirements, on the other hand, outline the qualities the system must possess, like usability, reliability, and security, which are crucial for supporting the functional aspects in a robust, efficient, and secure manner.

Priority Threshold for NFRs:
Mid: ≤ 0.486
High: > 0.486 and ≤ 0.5275
Very High: > 0.5275

Feature	Benefit	Penalty	Total Value	Value %	Cost	Cost %	Risk	Risk %	Priority Score	Priority
Reliability	9	8	17	13.71%	5	12.50%	4	13.33%	0.531	Very

										High
Usability	8	7	15	12.10%	4	10.00%	3	10.00%	0.605	Very High
Security	10	9	19	15.32%	7	17.50%	5	16.67%	0.448	Mid
Performance	8	7	15	12.10%	5	12.50%	4	13.33%	0.468	Mid
Scalability	7	6	13	10.48%	4	10.00%	3	10.00%	0.524	High

Conclusion:

The comparison between using the Eisenhower Matrix for prioritizing requirements and a structured prioritization technique based on value, cost, and risk reveals distinct advantages in both methods. However, the structured technique offers a more nuanced and comprehensive approach to managing project priorities, especially for complex projects like a cloud-based automotive repair service.

The Eisenhower Matrix is effective for quickly categorizing tasks into four quadrants of urgency and importance, providing an immediate visual representation of priorities. This method is particularly useful for the initial sorting of requirements and for projects with clear-cut distinctions between urgent/important tasks and those less critical. It excels in simplifying decision-making and is easily communicable across teams.

On the other hand, the structured prioritization technique, which assesses requirements based on a combination of their benefit, cost, and risk, allows for a more detailed analysis. This method goes beyond the binary categorization of the Eisenhower Matrix by incorporating a quantitative assessment that yields a prioritized list reflecting the nuanced trade-offs between the value a feature offers, its development cost, and the associated implementation risks. This approach is especially beneficial for projects with numerous and complex requirements, as it provides a clear rationale for why certain features are prioritized over others, ensuring resources are allocated to maximize user satisfaction and project value while minimizing risks and costs.

Given the complexity and scope of the cloud-based automotive repair service project, which includes a wide range of functional and non-functional requirements, the structured prioritization technique based on value, cost, and risk emerges as the superior method. It offers a detailed, scalable, and flexible framework for making informed prioritization decisions throughout the project lifecycle. This technique not only aligns development efforts with strategic project objectives and user needs but also facilitates effective risk management and efficient resource utilization.

In conclusion, while the Eisenhower Matrix serves as a useful tool for quickly sorting requirements into categories of urgency and importance, the structured prioritization technique provides a more comprehensive and strategic framework for decision-making in complex projects. This makes it better suited to the demands of prioritizing requirements for the cloud-based automotive repair service project, ensuring a balanced approach to delivering high-quality, valuable features within budget and on schedule.

References:

1. Wiegers, K., & Beatty, J. (2013). Software Requirements. Microsoft Press.

2. Team Asana. "The Eisenhower Matrix: How to prioritize your to-do list." Asana, 29 Jan. 2024, https://asana.com/resources/eisenhower-matrix

3. A. Newportright, "Requirement Prioritization," LinkedIn, [Online]. Available: https://www.linkedin.com/pulse/requirement-prioritization-angel-newportright/