Requirement Analysis

Elicitation Document

Group-1

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Elicitation

Introduction:

Following IEEE Std 830-1998, our requirement elicitation process is designed to be a collaborative and analytical effort aimed at uncovering the true needs, constraints, and expectations of all stakeholders involved with the cloud-based automotive repair service system. Recognizing the criticality of this process, we meticulously adhered to the standard's guidance to ensure a comprehensive and inclusive approach, thus facilitating a clear, precise, and actionable set of requirements that serves as the foundation for our system's design and development phases.

Participants:

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Elicitation Techniques Used:

Interviews

To deeply understand the unique needs of our stakeholders, we employed interviews as a primary elicitation technique. Recognizing the diversity within our stakeholders—ranging from car owners requiring repair services to service center representatives managing the repairs—we tailored our interview approach to capture the nuanced perspectives of each group.

Objective: Our primary objective was to gather in-depth, qualitative insights that could inform the design and functionality of our cloud-based automotive repair service. By engaging in one-on-one and small group discussions, we aimed to uncover the detailed requirements and expectations of our users and business partners.

Methodology: We conducted a series of structured interviews, ensuring a comfortable and open environment for stakeholders to share their experiences, challenges, and desires. These

interviews allowed us to explore the intricacies of automotive repair and maintenance from multiple viewpoints, ensuring a comprehensive understanding of the service ecosystem. Key topics included the logistics of car pick-up and drop-off, the intricacies of service center selection, and the transparency of repair processes and communication.
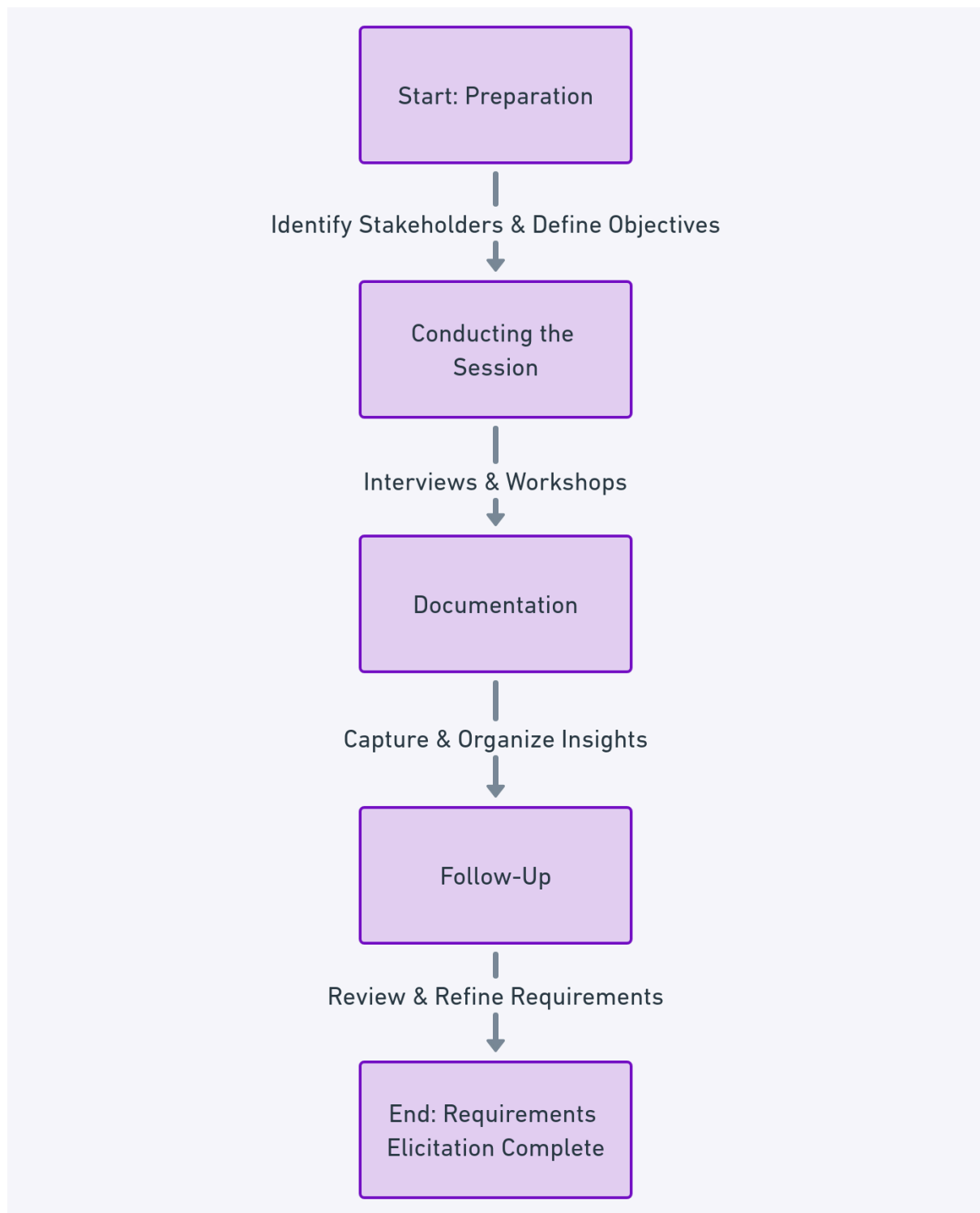
Workshops

Recognizing the collaborative nature of our project, we organized workshops to bring together a diverse group of stakeholders. These workshops facilitated a collective effort to define, refine, and agree upon the project deliverables, fostering a sense of ownership and alignment among all participants.

Objective: The workshops aimed to harness the collective knowledge and expertise of stakeholders, including technical teams, customer service representatives, and logistics partners. Our goal was to create a shared vision for the project, addressing the multifaceted aspects of the automotive repair service, from technological integration to customer interaction.

Methodology: The workshops were designed as facilitated sessions, with clear roles and structured activities to ensure productive discussions. We employed various collaborative techniques, such as brainstorming, role-playing, and scenario analysis, to stimulate creative thinking and problem-solving. These sessions were instrumental in identifying common goals, resolving potential conflicts, and establishing consensus on key project requirements and features.

A single requirement elicitation session followed the following steps:

The follow-up component entails that stakeholder feedback was integrated in a "loop" manner.

Elicitation Outcomes:

The elicitation process, through interviews and workshops, yielded comprehensive insights that have been instrumental in shaping the project's direction. The outcomes have been categorized into business requirements, user requirements, business rules, functional requirements, quality attributes, external interface requirements, constraints, data requirements, and solution ideas.

Raw Requirements:

The elicitation phase for our cloud-based automotive repair service project yielded a comprehensive set of raw requirements. These requirements represent the initial inputs from stakeholders, capturing their immediate needs, expectations, and constraints related to the service. The following list encapsulates these raw requirements, which will serve as the foundation for further analysis and refinement:

User Interface and Experience

1. Users must be able to register and log in to the service through a mobile application or web interface.

2. The interface should allow users to register their car on the app.

3. The interface should allow users to easily request either repair or maintenance services with minimal steps.

4. Users should be able to specify the problem or service needed, vehicle details, and preferred pickup times.

Service Logistics:

5. The system must automatically assign a pickup request to the nearest available driver with the appropriate vehicle type.

6. Integration with GPS services for real-time tracking of the vehicle from pickup to drop-off at the service center.

7. The application should provide a list of preferred service centers based on the vehicle make or specific problem reported.

Service Center Interaction

8. The system must allow service centers to receive service requests, inspect the vehicle, and upload inspection reports.

9. Service centers should be able to generate and send quotes for the required services to the user through the system.

User Decision Process

10. Users must have the ability to review inspection reports and quotes and accept or reject proposed services.

11. The system should facilitate partial acceptance of services, allowing users to select specific services from the quote.

Documentation and Transparency

12. The service must document all stages of the repair process, providing photo and video evidence to the user.

13. A detailed history of all services, quotes, and communications should be accessible to the user for each vehicle registered.

Payment and Billing
14. Integration with secure payment gateways for processing payments for accepted services.

15. The system must handle billing, including a no-charge policy for services rejected by the user.

Non-Drivable Vehicles

16. The system should provide an option for towing services for non-drivable vehicles, with associated fees clearly communicated.

Regulatory and Data Security
17. All data handling must comply with relevant data protection and privacy regulations.

18. The system must ensure secure storage and transmission of all user and vehicle data.

Classified Requirements:
Following the IEEE Std 830-1998, we classified the elicited requirements into distinct categories, including business requirements, user requirements, and functional requirements. This classification enables a clear understanding of the project's scope and aids in the subsequent design and development phases.

Business Requirements:
- **Market Expansion:** The service aims to attract a broader customer base by offering a convenient, reliable, and transparent automotive repair experience.
- **Cost Efficiency:** By streamlining the repair process, the service seeks to reduce operational inefficiencies, thereby lowering costs for both the service provider and the customers.

User Requirements:
- **Ease of Service Requests:** Users require a straightforward mechanism to request service or report breakdowns, emphasizing the need for a user-friendly interface.
- **Transparency and Communication:** There is a strong need for clear, real-time communication regarding the status of repairs, including detailed inspection reports and quotes.

Business Rules:
- **Driver Certification:** Only certified drivers are permitted to transport vehicles, ensuring safety and reliability.
- **Repair Approvals:** Repairs can only commence once the customer has approved the provided quotes, ensuring customer control over the service process.

Functional Requirements:
- **Automated Driver Assignment:** The system must efficiently assign the nearest available driver for vehicle pickup.
- **Quote Management Interface:** Users must have access to a platform where they can review and either approve or reject service quotes.

Quality Attributes:
- **User Interface Usability:** The app must be intuitive, ensuring ease of use for diverse user demographics.
- **Data Security:** Protecting user data and payment information is paramount, necessitating robust security measures.

External Interface Requirements:
- **GPS Integration:** Accurate location tracking is essential for the pickup and drop-off of vehicles.
- **Payment Gateway Integration:** The service requires a secure and reliable payment processing mechanism.

Constraints:
- **Platform Compatibility:** The app should be universally accessible, requiring compatibility with major mobile operating systems.

- **Regulatory Compliance:** All data handling and processing must adhere to relevant privacy laws, such as GDPR.

Data Requirements:
- **User Profiles:** Essential user information, including vehicle details and service history, must be securely stored and managed.
- **Service Records:** Detailed records of each service, including dates, costs, and statuses, are crucial for transparency and accountability.

Solution Ideas
- **Visual Inspection Feature:** A proposed feature allowing users to view their vehicle's condition through images and videos uploaded by the service center, enhancing trust and transparency in the service.

Elicitation Conclusion:

The elicitation phase, guided by the principles and recommendations of IEEE Std 830-1998, has been instrumental in laying a solid foundation for our cloud-based automotive repair service project. By adhering to the standard's recommended practices, we have ensured that the elicitation process was comprehensive, inclusive, and effective in capturing the true needs and expectations of our stakeholders. This rigorous approach underscores our commitment to developing a solution that is not only technologically advanced but also deeply aligned with the needs of our users and stakeholders, thus setting the stage for the successful realization of our project objectives.

In navigating the elicitation process, we remained vigilant against the risks of overextending our analysis—a cautionary principle well-articulated in the domain literature (Wiegers & Beatty, 2013). The balance between exhaustive requirement gathering and pragmatic decision-making was maintained to ensure that the project advanced efficiently without compromising on the depth and breadth of stakeholder insights.

The collaborative and engaging nature of our elicitation techniques fostered a robust dialogue with stakeholders, ensuring that the requirements captured were not only comprehensive but also aligned with the operational realities and strategic objectives of the service. This alignment is crucial for the subsequent design and development phases, providing a clear and actionable blueprint that is deeply rooted in the actual needs and expectations of the end-users.

As we transition from the elicitation to the design phase, the insights garnered serve as a beacon, guiding our efforts towards creating a service that is not only technologically sound but also resonant with the values and preferences of our users. The successful execution of

this phase marks a significant milestone in our project's lifecycle, setting a solid foundation for the innovation and excellence we aim to achieve in the automotive repair domain.

References:

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

2. Institute of Electrical and Electronics Engineers. (1998). IEEE recommended practice for software requirements specifications (IEEE Std 830-1998). IEEE. https://doi.org/10.1109/IEEESTD.1998.88286

3. Dean Leffingwell, 'Agile Software Requirements: Lean Requirements Practices for Teams, Programs, and the Enterprise', Addison-Wesley Professional, 2011.