1 Introduction

This document is mainly focusing on identifying relevant context objects and requirement sources for the Campus Ride-Sharing Platform with Parking System Integration. The system is designed for university community members like students, faculty, and staff to coordinate carpools, reduce parking demand while providing real-time parking availability data to users.

Context objects are material and immaterial aspects that have a relationship to the system. These include primary users, supporting systems, hardware, and institutional constraints. Identifying these elements early helps define the system’s boundaries and integration points, enabling a design that fits its real-world operational environment.

Requirement sources refer to the origins of information that define what the system must do and how it should behave. These include direct stakeholders, existing documentation, and comparable platforms or systems. Identifying reliable sources ensures that the system requirements are well-informed, traceable, and aligned with both user expectations and institutional needs.

By analyzing these context elements and requirement sources, we can establish a solid foundation for accurate, realistic, and stakeholder-driven requirements. These insights will directly support the next phase, which is planning and executing effective requirements elicitation strategies.

2 Context Object

2.1 Usage Facet

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| **Context Object** | **Explanation** |
| Students | Students are the primary user of the system. They can request a ride, offer seats in carpools, and view real-time parking availability. Their usage defines core system operations, making them central to functional and usability requirements. |
| Faculty and Staff | Faculty and staff are university personnel who may use the system for commuting purposes. They can also access the ride-sharing features. The system will have a wider user base after including them. |
| Parking Management Administration | These are the staff members responsible for managing campus parking resources. They can provide data and assist in integrating our system with their system. Also, they need to ensure accurate parking information, and all operations are following the university policies. |
| Campus Security | Campus security are responsible for safety and managing incidents. They may need to access information like ride history, user identity, etc in emergencies. They are needed to ensure our university complies with safety protocols. |

2.2 Subject Facet

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| **Context Object** | **Explanation** |
| Parking Lots | Parking lots are physical areas for vehicle placement. The system will display their availability in real-time situations. Accurate information of availability is essential to inform users and reduce congestion. |
| Ride Requests and Offers | This is the user-generated record representing the availability and demand of a ride. The platform matches requests with offers based on time, location, and capacity. This functionality is core to enabling carpooling and efficient ride coordination. |
| User Accounts | User accounts contain personal information, role type, verification status, and ride history. They allow the system to authenticate users and personalize their experience. They are critical for managing access control and service customization. |

2.3 IT System Facet

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| **Context Object** | **Explanation** |
| Campus Parking Management System | A system for parking lot usage and availability tracking. The ride-sharing system integrates with it for real-time parking data. |
| MMU IDM System | A centralized authentication platform used across campus. The ride-sharing system integrates with it to validate user identity and roles. This ensures secure access control and institutional compliance. |
| GPS / Map Integration Services | External APIs or libraries for location tracking and route suggestions. The system uses them to match rides, calculate distances, and recommend meeting points. Their integration enhances user experience and accuracy of transport logistics. |
| Mobile Devices | Devices such as smartphones and tablets used to access the system. Users interact with the platform via web or app interfaces. The design must accommodate mobile-specific constraints to ensure accessibility and responsiveness. |

2.4 Development Context

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| **Context Object** | **Explanation** |
| System Developers | Developers are responsible for implementing the platform’s backend logic and integrating external services. They work with requirements to build core system functions. Their role directly affects functionality, performance, and compliance. |
| UI / UX Designers | UI / UX designers plan the layout, flow, and visual elements of the platform. They ensure the system is intuitive and usable across devices. Their work influences user satisfaction and adoption. |

2.5 Requirement Engineering Context

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| **Context Object** | **Explanation** |
| University IT Department | The department responsible for managing digital infrastructure and enforcing technology policies. It defines technical constraints, security protocols, and integration requirements. Their approval and coordination are mandatory for system deployment. |
| Legal / Policy Teams | A team that ensures university regulations and data protection laws are complied. They review how user data is collected, stored, and shared. So, we are able to minimize legal risks and build institutional trust. |
| Project Stakeholders | Individuals or groups with decision-making influence, such as university administrators or student representatives. They provide system expectations, approve features, and review progress. Their input aligns the system with institutional priorities and user needs. |

3 Requirement Sources

3.1 Stakeholders

According to Pohl (2015), “stakeholders are people or organizations that (directly or indirectly) influence the requirements of a system. Examples of stakeholders are users of the system, operators of the system, developers, architects, customers, and testers” (p. 19).

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| **Stakeholder** | **Explanation** |
| Students | As primary users, students provide input on usability features such as ride requests / offers, filtering options, map integration, and notification preferences. Their feedback helps define core functions and user experience priorities. |
| Faculty and Staff | Similar to students but with different usage patterns, faculty and staff may have recurring schedules or departmental needs. Their input influences features like regular ride scheduling and reserved parking access. |
| Campus IT Department | Supervise on technical infrastructure and system integration. They define requirements related to authentication protocols, security policies, system access controls, and API usage for the ride-sharing platform. |
| Parking Management Administration | Refers to the administrators in charge of parking management. They offer input on parking space allocation rules, real-time space updates, and zone-based restrictions. Their expertise supports integration with the parking data system. |

3.2 Documents

According to Pohl (2015), “documents often contain important information that can provide requirements. Examples of documents are universal documents, such as standards and legal documents, as well as domain- or organization-specific documents, such as requirements documents and error reports of legacy systems” (p. 19).

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| **Document** | **Explanation** |
| MMU Student Handbook 2021 / 2022 | This document provides the policy for road traffic discipline. We need to ensure our system comply with all the requirements defining the system constraints. |
| MMU Privacy Notice  (26 September 2022) | This document explains how MMU handles personal data under the PDPA. Since our system integrates with MMU’s parking system, we must ensure any personal data usage aligns with their privacy policy. |

3.3 Existing Systems

According to Pohl (2015), “systems in operation can be legacy or predecessor systems as well as competing systems. By giving the stakeholders a chance to try the system out, they can gain an impression of the current system and can request extensions or changes based on their impressions” (p. 19).

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| **Existing System** | **Explanation** |
| Campus Parking Management System | Real-time system that tracks available parking slots across campus. Integration with this system defines how parking data is fetched, how often it is refreshed, and how availability is displayed to users within the platform. |
| MMU IDM System | Existing platform used for user authentication and role verification. Requirements from this system affect login flow, user roles, and secure access control in the ride-sharing platform. |

4 Conclusion

This document has identified and explained the key context objects and requirement sources that influence the development of the Campus Ride-Sharing Platform with Parking System Integration. These include relevant stakeholders, institutional documents, and existing systems that define the boundaries, constraints, and functional expectations of the proposed platform.

Understanding the surrounding context is essential to ensure that the system addresses real user needs, integrates effectively with university infrastructure, and adheres to existing operational and policy constraints. Each identified object and source contributes to building requirements that are realistic, complete, and technically feasible.

This analysis serves as a foundation for the next phase of the project, the development of a structured requirements elicitation plan. Using the Kano model, we will gather stakeholder input that reflects both functional expectations and user satisfaction drivers, ensuring a user-centered and context-aware system design.

References

Pohl, K. (2015). Requirements Engineering Fundamentals, 2nd Edition. Rocky Nook, Inc.