Survey Paper on Smart PS Lounge: Real-Time Session Booking and Business Insights for PlayStation Cafés

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***Abstract*— Smart PS Lounge is a unified platform that streamlines how PlayStation cafés advertise availability, accept reservations, process digital payments, and reason about business performance. Unlike ad-hoc phone or walk-in workflows, the system exposes real-time seat and slot visibility, instant booking with integrated checkout, and owner dashboards for utilization, revenue, and engagement trends. This survey paper consolidates the solution requirements and architectural decisions behind Smart PS Lounge, positions them against related work in mobile ticketing, remote queuing, cloud booking, and game analytics, and summarizes practical design trade-offs observed for short, time-boxed sessions common to gaming venues. We formalize the problem, present a three-tier architecture with well-defined data and API contracts, and outline algorithms for session allocation, waitlisting, and dynamic pricing heuristics. We also discuss security and privacy considerations for payment flows, data retention policies, and threat modeling. Finally, we provide an evaluation plan—including metrics, test scenarios, and instrumentation hooks—and enumerate limitations and future directions such as deeper IoT telemetry, recommendation, and multilingual user interfaces.**

Keywords— PlayStation café management; real-time availability; online booking; digital payments; business intelligence; dynamic pricing; NFC/BLE; geofencing; Spring Boot; Thymeleaf; MySQL

I. INTRODUCTION

Gaming hubs deliver higher-end hardware and social play, but fragmented processes (calls, in-person holds, cash payments) produce uncertainty, no-show risk, and weak visibility into demand and revenue. A unified, web-based platform can expose live seat inventory, automate reservations and payments, and surface BI dashboards (utilization, peak-hour heatmaps, LTV/retention signals) for owners while improving discovery and trust for players through reviews and loyalty. This paper surveys enabling technologies and presents a reference design aligned to your "Smart PS Lounge" goals—real-time session booking, geofenced validation, and analytics-guided operations.

A. Objectives

The primary objectives of this survey are:

- Provide real-time seat/slot visibility and instant, conflict-free booking.
- Enable secure online payments and automated confirmations.
- Offer BI insights (utilization, revenue, peak load, cohort behaviour) to guide dynamic pricing and staffing.
- Deliver a clear, mobile-first UX for search, compare, and reviews.
- Maintain user profiles (history, ratings, loyalty points).
- Add system-health monitoring hooks for PC/console uptime alerts.
- Ensure scalability, privacy, and role-based access across single/multi-branch cafés.

II. LITERATURE REVIEW

The increasing demand for gaming hubs and PlayStation cafés has created the need for a seamless, technology-driven booking and management system. Traditional walk-in reservations and manual booking processes often result in inefficiencies, long wait times, and customer dissatisfaction. To address these challenges, various technologies have been explored in research, including AI-driven queue management, cloud-based booking systems, and data analytics for optimizing user engagement. Several studies have introduced online reservation frameworks, dynamic pricing models, and cancellation protection mechanisms that enhance user experience and operational efficiency. Additionally, machine learning algorithms have been leveraged to predict customer behavior and automate resource allocation, while NFC and BLE technologies have improved real-time authentication and access control. By integrating these advancements, a robust PlayStation café management system can be developed, providing real-time availability updates, instant bookings, secure transactions, and personalized gaming recommendations. This literature survey examines existing solutions and their applicability to creating an innovative, data-driven platform for PlayStation café owners and gaming enthusiasts

[1] Android QR-Based Smart Bus Pass with Cloud Renewal
Vaidianathan. Sb

proposed an Android-based smart bus pass application that simplifies public transportation pass management. The system features QR-based validation for quick authentication and secure fare transactions. Cloud integration ensures seamless data storage and easy pass renewals. While effective for public transport, this system does not address PlayStation café-specific needs. Implementing mobile-based pass systems in gaming cafés could enhance session check-ins, automate payment processing, and improve overall user convenience.

[2] AI-Powered Virtual Queueing for Wait-Time Optimization
Deoraj et al.

proposed an AI-powered virtual queueing system designed to eliminate physical waiting lines and improve service efficiency. The system utilizes predictive analytics to estimate wait times and dynamically adjust queue priorities based on demand. Automated notifications inform users of their position in the queue, enhancing time management. However, the system does not address gaming-specific session reservations. Integrating virtual queueing into PlayStation cafés could enhance session allocation, reduce wait times, and optimize customer experience.

[3] AI-Driven Train Scheduling and Load Balancing
Rasanga et al.

proposed an AI-powered train management system that optimizes railway scheduling and passenger load balancing. The system utilizes predictive maintenance algorithms to monitor train performance and prevent unexpected failures. RFID-based ticketing and cloud-based data integration enhance passenger experience and streamline operations. However, this approach does not address gaming session optimization. Applying AI-driven scheduling to PlayStation cafés could improve session availability, predict peak hours, and enable smart pricing strategies.

[4] Cloud Passenger Experience with Demand-Based Pricing
Vadivel et al.

proposed a cloud-based passenger experience management system that enhances efficiency in bus fare ticketing. The system leverages AI-driven demand-based pricing and predictive analytics to optimize service allocation. Cloud storage ensures seamless ticketing and secure data management. While beneficial for public transportation, this system does not explore session-based gaming applications. Adapting similar cloud-based infrastructure to PlayStation cafés could enable real-time booking updates, demand-driven pricing, and enhanced operational efficiency.

[5] Taxonomy of Game Analytics for Engagement and Monetization
Su et al.

proposed a comprehensive classification of game analytics, focusing on areas such as player behavior, game development, distribution strategies, and monetization techniques. The study highlights how machine learning and business intelligence tools can optimize player engagement and revenue generation. It discusses the significance of predictive analytics in player retention and the use of real-time data for game performance evaluation. However, the study lacks practical implementation in PlayStation café management, where session-based gaming analytics could enhance operational efficiency.

[6] Online Event Booking with Real-Time Availability
Gigool et al.

proposed an online event booking and management system that automates scheduling and improves real-time availability tracking. The system integrates AI-driven demand forecasting and secure authentication protocols to streamline reservations. The study also explores automated notifications and user feedback mechanisms to enhance service quality. However, it does not specifically address PlayStation café requirements, such as session-based gaming, dynamic pricing, and gaming resource optimization.

[7] Micro-Location Mobile Ticketing via NFC/BLE
Ferreira et al.

proposed a micro-location-based mobile ticketing system using NFC and BLE technologies to automate fare validation in public transportation. The system ensures seamless authentication and eliminates the need for physical tickets. Cloud-based transaction management enhances security and efficiency. While this technology improves urban mobility, it does not consider gaming session authentication. Integrating NFC/BLE technology into PlayStation cafés could streamline check-ins, prevent unauthorized access, and automate session tracking.

III. EXISTING SYTEM

Most cafés accept bookings via calls or walk-ins. Owners manually verify seat availability and record sessions; users pay in person; history, loyalty, or cross-branch coordination is limited. This raises double-booking risk, produces opaque queues, and yields poor demand visibility and under leveraged pricing.

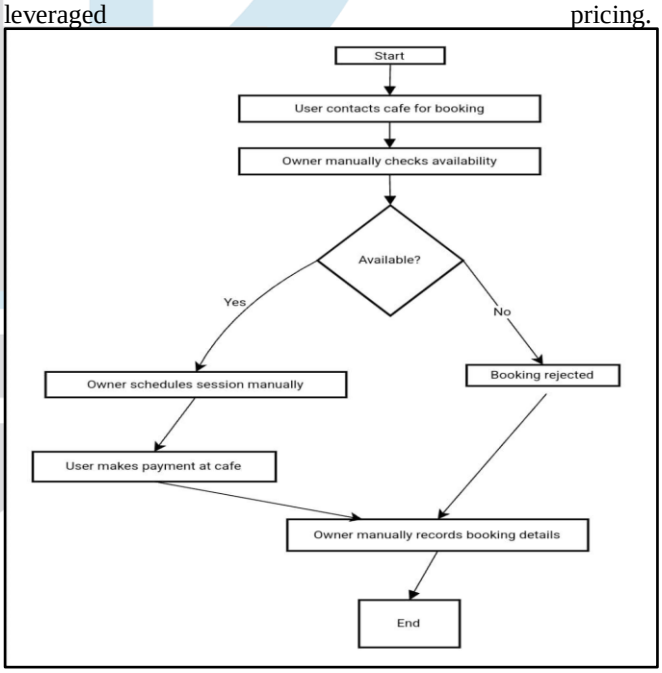

Figure 1. Existing System Activity Diagram

IV. PROPOSED SYSTEM

The proposed system is an innovative and user-friendly platform designed to bridge the gap between PlayStation cafes and gaming enthusiasts, offering a seamless experience for both users and cafe owners. The platform allows cafe owners to register their facilities and provide detailed information, such as the number of available PCs, operational time slots, and the games they offer. Users can search, filter, and compare cafes based on location, ratings, PC specifications, and available games, ensuring they find the perfect match for their preferences. Real-time availability and a waitlist system enable users to effortlessly check for free PCs and book sessions, with instant booking confirmations sent to both users and cafe owners. The platform also maintains user profiles, displaying booking history and session details, while allowing users to rate and review cafes

to help others make informed decisions. A loyalty program rewards frequent users, enhancing retention and engagement. Geofencing features provide location-based recommendations and automatic booking validation, ensuring users are notified of nearby cafes and their bookings are confirmed upon arrival. Secure payment processing is handled via Razorpay, offering a hassle-free transaction experience. The backend, powered by Spring Boot, ensures robust API capabilities, while the frontend, built with Thymeleaf and Tailwind CSS, delivers a visually appealing and interactive interface. MySQL is used for efficient data storage, and Postman ensures reliable API testing during development. Additionally, provides cafe owners with valuable insights into user engagement, booking patterns, revenue trends, and dynamic pricing decisions. This comprehensive technology stack creates a dynamic, efficient, and enjoyable platform for both users and PlayStation cafe owners, revolutionizing the way gaming sessions are discovered, booked, and managed.

A. Implementation Workflow

- **Account & Venue Onboarding**

  Users and café owners register/login. Owners add branches, PC counts/specs, supported games, and time-slot grids; roles and access are enforced.

- **Discovery & Context-Aware Recommendations**

  Players search/filter by location, ratings, PC specs, titles, and see geofenced "nearby" suggestions to reduce search friction and surface the best local options.

- **Live Inventory, Holds & Waitlists**

  Real-time slot/seat availability is streamed to clients; soft holds prevent double-booking; oversubscribed slots route to a waitlist that auto-promotes when seats free up.

- **Pricing & Policy Engine**

  Base prices combine with peak-hour/weekend rules; analytics inform dynamic pricing and cancellation windows to balance utilization and fairness.

- **Secure Checkout & Booking Finalization**

  Users pay via Razorpay; payment intents and confirmations are recorded and instant booking receipts are issued to both parties.

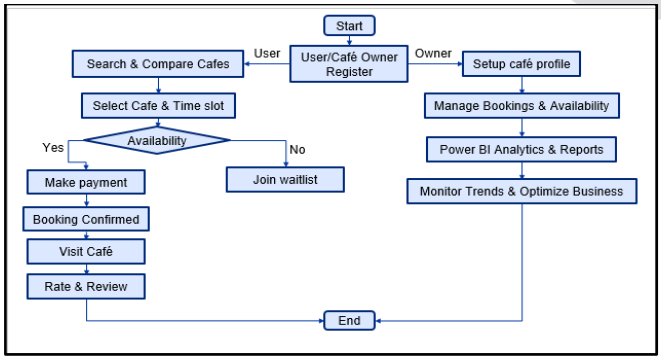

Fig 2. Proposed System Acitivity Diagram

V. CONCLUSION

Converging live availability, reliable payments, and BI transforms cafés from manual, error-prone operations into predictable, insight-driven businesses. The proposed architecture fits undergraduate capstone scope yet leaves room for advanced capabilities—recommendation, dynamic pricing, and proactive maintenance—that can materially raise revenue and user satisfaction.

VI. FUTURE SCOPE

The roadmap prioritizes personalization with next-best-title and session recommendations, including cohort-based bundle offers. Pricing adapts via demand forecasting with guardrails (caps, floors, and fairness checks). Operational reliability is strengthened by lightweight IoT agents for PC thermal/network telemetry and auto-ticketing. Native mobile apps enable push passes, offline QR, and wallet integrations, while trust and safety are reinforced through reputation-aware cancellation/refund policies and abuse detection. Global readiness includes multilingual UX, local payment gateways, and GST/e-invoice compliance. Engagement grows through gamification—streaks, badges, tiered loyalty, and party-booking incentives.

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REFERENCES

[1] R. Sivakani, M. Gandhi, S. Manikandan, V. Sb, "An Android-Based Smart Bus Pass Application," *IRJET*, vol. 10, no. 4, pp. 1231–1235, 2024.

[2] S. Deoraj, O. Aroba, M. Essop, "Investigating a Virtual Queueing System…," ResearchGate preprint, 2024.

[3] K. R. R. Silva, D. A. J. Y. J., A. M. Herath, "SmartRail—Optimized Train Management System…," ResearchGate, 2024.

[4] M. Vadivel, V. B. Marin, "Cloud-Based Passenger Experience Management…," ResearchGate, 2024.

[5] Y. Su, P. Backlund, H. Engström, "A Comprehensive Review and Classification of Game Analytics," *J. Internet Services and Applications*, 2021..

[6] C. Gigool, L. Gonsalves, C. Correia, "Online Event Booking and Management System," *IRJET*, vol. 8, no. 8, pp. 2671–2674, 2021.

[7] M. C. Ferreira, T. G. Dias, J. F. e Cunha, "Anda: An Innovative Micro-Location Mobile Ticketing Solution Based on NFC and BLE," 2021.

[8] Z. Sadreddini, "A Novel Cancellation Protection Service in Online Reservation System," *Proc. IEEE ICC Workshops*, pp. 1–6, 2020.

[9] G. N. Yannakakis, J. Togelius, *Artificial Intelligence and Games*, Springer, 2018.

[10] M. Seif El-Nasr, A. Drachen, A. Canossa (eds.), *Game Analytics: Maximizing the Value of Player Data*, Springer, 2013.