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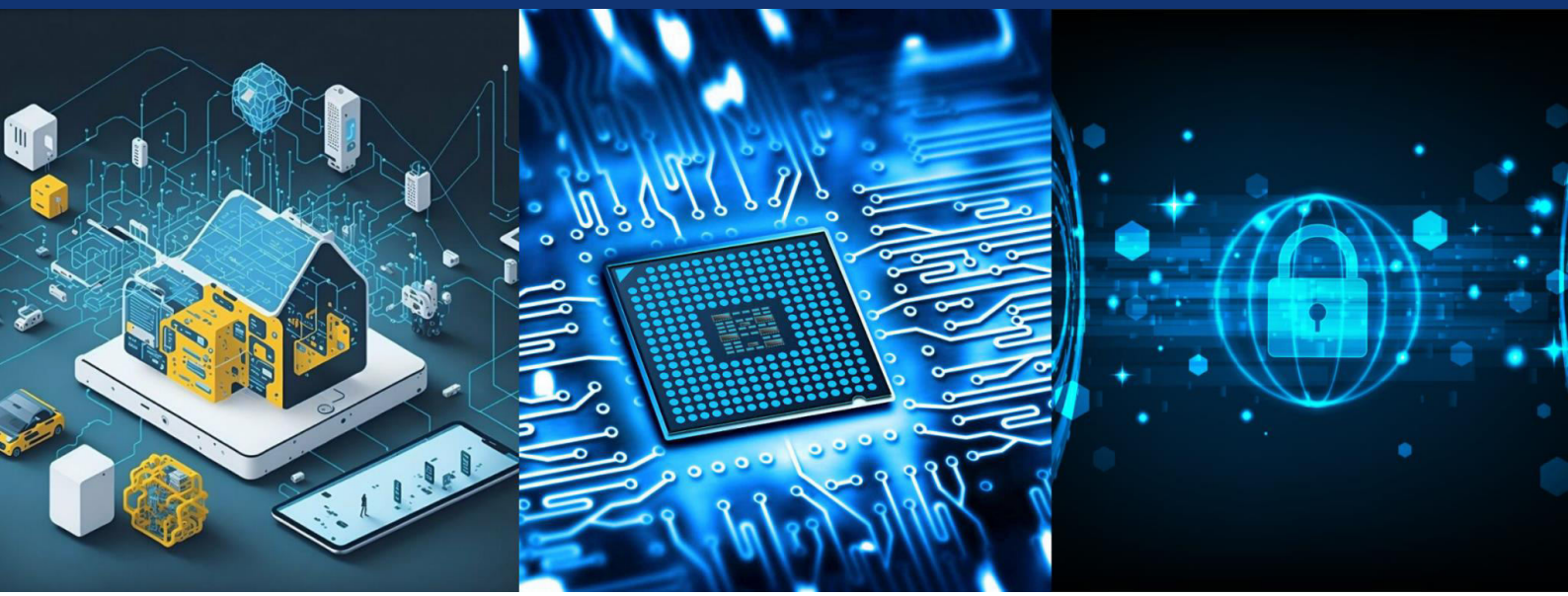

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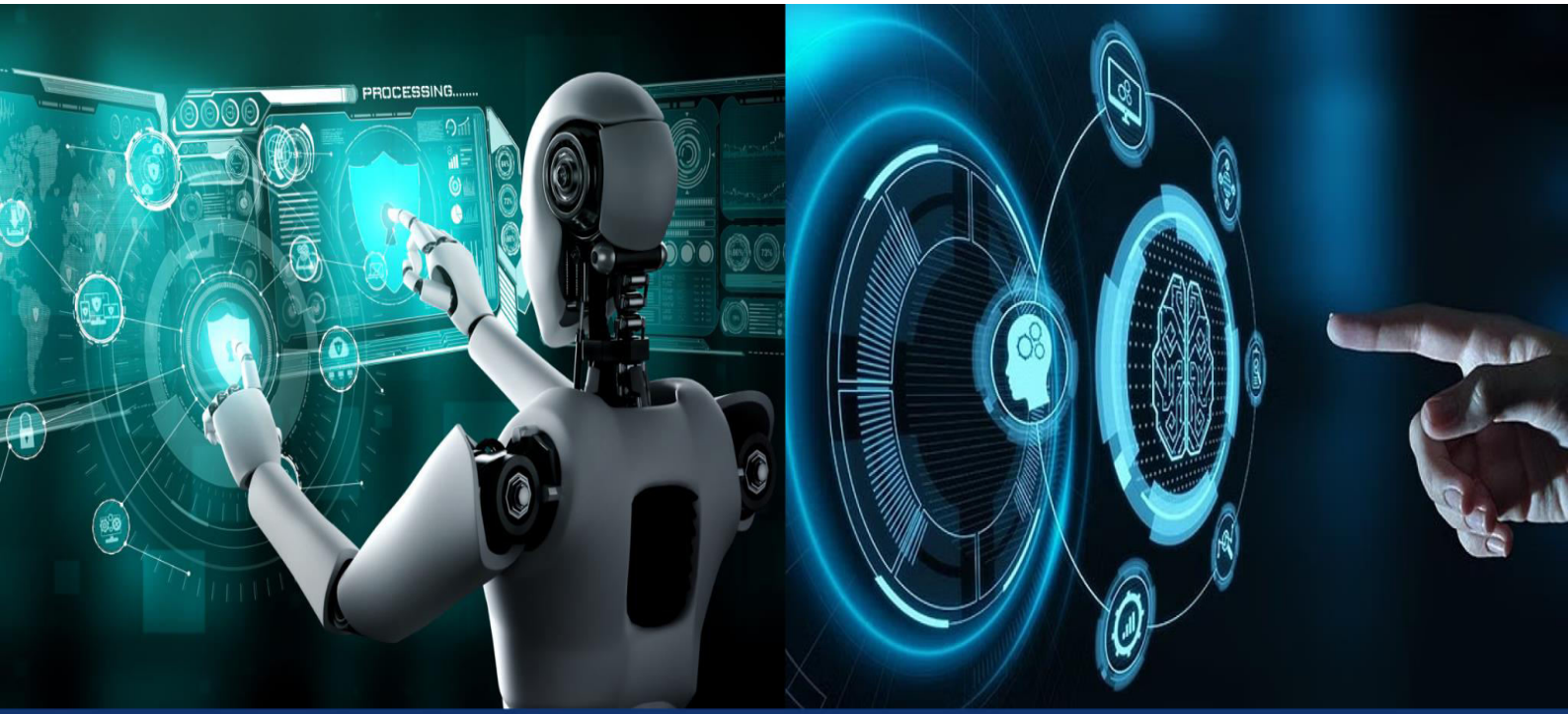

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Univent: A Comprehensive Event Management System

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ABSTRACT: The creation of Univent's mobile application aims to simplify event planning and execution, in addition to making it easier to create, find (for booking) and enroll. The frontend of Univent is built upon React Native, which emphasizes user friendliness and is responsive across multiple platforms. Node.js and Express are used to build the backend, while PostgreSQL is utilized for optimal data management. With Supabase, the system can provide real-time updates and facilitate the synchronization of event data in real time. Univent has incorporated razor pay to guarantee the secure payment processing of paid events. The company. Furthermore, the system offers a safe payment method for image storage that includes ImgBB and Cloudinary. The paper focuses on the system architecture, development methodology, technological innovation, and management of digital events by Univent. Read the details here.

KEYWORDS: Event Management, Mobile Application, React Native, Cross-Platform Development, Node.js, Express.js, PostgreSQL, Supabase, Real-Time Synchronization, Payment Processing, Razorpay, Secure Transactions, Image Storage, ImgBB, Cloudinary, System Architecture, Development Methodology, Technological Innovation, Digital Event Management

I. INTRODUCTION

The Univent project provides a complete mobile application solution which enhances event management through its streamlined features for event creation and discovery and registration and participation functions. As a product of the Full-Stack Mobile Development Internship the application implements contemporary technology solutions to deliver unified experiences for event creators and participants. The frontend component uses React Native with Expo for platform compatibility and interface responsiveness alongside a Node.js and Express.js backend which manages API requests and authentication and event management features. The database component of the project utilizes PostgreSQL which Supabase manages for storing and retrieving structured data as well as updating it in real-time. Supabase Auth provides secure authentication management alongside usability features to handle session management and ensure user safety. The application implements Razorpay for payment processing and ImgBB and Cloudinary to store event media efficiently.

The team develops the product using Agile methods that include GitHub version control plus automated testing with Jest and Mocha to ensure software quality while Postman checks API responses. Our team used a sprint-based development system to add essential features while making UI and UX changes plus backend updates. Univent uses Supabase live synchronization to show users latest event information and registration updates without delays. The system design focuses on easy expansion by using effective API methods and database optimization to support large user numbers. Univent connects event planners with attendees to provide a user-friendly system for handling digital events. This report examines how the platform works and explains its technical setup. It also describes the development process and future upgrades that will improve the platform's performance.

II. SYSTEM MODEL AND ASSUMPTIONS

Univent uses a contemporary full-stack development framework to deliver operational efficiency and expandability while enabling smooth platform interconnectivity. Through the combination of React Native with Expo the application receives an interface that adjusts to display optimally on Android and iOS platforms. The combination of React

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Native's component-based architecture enables efficient rendering and smooth animations while Expo provides developers with a managed workflow and over-the-air updates and native API access without forcing extensive native code writing. The application started with React Context API for state management until it adopted Zustand which enhanced performance through reduced re-rendering frequency while ensuring better state preservation. The application adopts modern UI guidelines through ShadCN, React Native Paper and Gluestack to provide users with an easy-to-use interface.

Furthermore, the backend utilizes Node.js and Express.js to build a fast yet solid server framework that executes API demands with high efficiency. Supabase provides management of the PostgreSQL database which establishes the main database infrastructure through foreign key constraints and real-time data synchronization for optimized data management. Supabase Auth provides safe user authentication which incorporates email-based login together with session control features. Razorpay operates as the chosen platform for secure payment processing of paid events whereas ImgBB and Cloudinary work together to deliver optimized cloud-based image storage that boosts loading speed. The RESTful API backend architecture receives testing through Postman and automated testing through Jest and Mocha for reliability purposes. The deployment through Vercel enables smooth version management and scalability because it supports continuous integration and deployment (CI/CD).

III. LITERATURE REVIEW

Univent's development started from research-tested industry standards related to full-stack mobile development as well as cloud-based event management and secure payment processing. Research on React Native shows how it helps developers create apps across platforms which allows them to reuse code and deploy applications swiftly while maintaining optimal performance. Studies prove Node.js together with Express.js excel at asynchronous request management which makes them best suited for high-performance backend solutions. PostgreSQL stands out as an advanced relational database because extensive research shows its combination of robustness with ACID compliance and effective processing of complex queries. The real-time database features of Supabase attract developers in literature because they minimize development costs while simplifying authentication procedures. Research on Razorpay payment processing demonstrates the importance of encryption together with tokenization and financial security regulation compliance in payment security. The research identified ShadCN along with React Native Paper and Gluestack as the suitable tools for delivering a modern and accessible user-friendly design to users. Univent implements these technologies to match modern digital event management requirements and overcome scalability limitations and enhance security measures and real-time system responsiveness.

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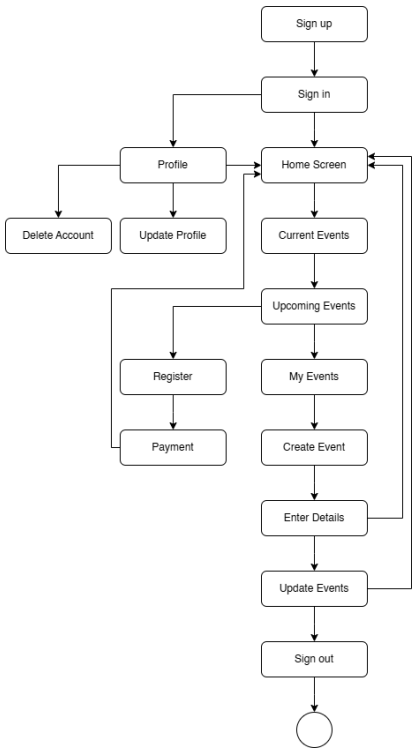

Fig 3.1 Use Flow Diagram

IV. CONSUMER BEHAVIOUR AND BUSINESS TRENDS

The event management industry witnesses major behavioral changes from consumers because digital platforms and mobile applications now provide them instant access to event discovery and booking and participation. Users now expect personalized recommendations combined with secure payment options and instant updates as mobile-first event solutions have become widespread because of convenience demands. People choose event management applications based on how easy they are to navigate and how quickly they can register and receive real-time notifications. Event platforms have adopted secure payment gateways such as Razorpay to accommodate rising cashless transactions and digital wallets which facilitate smooth financial transactions for paid events. User behavior now heavily depends on social media integration because consumers use peer reviews and influencer marketing and social sharing to find and participate in events. Univent needs to address the preferences of its Gen Z and Millennial user base by offering visually engaging interactive features that provide easy accessibility because these groups now lead the digital event market.

Organizations enhance their business operations through digital event solutions because these tools help them plan more efficiently while lowering expenses and improving participant engagement. Businesses across all organizational types including corporate event planners as well as independent organizers have started using cloud-based event management systems because these platforms help them plan their events more efficiently and track participants while making data-based decisions. The transition to hybrid and virtual events has driven organizations to adopt Univent and similar cloud-integrated scalable platforms that deliver real-time synchronization features and automated notification systems. Businesses utilize AI-powered analytics together with machine learning capabilities to understand consumer preferences while predicting attendance trends and optimizing their marketing methods. The event technology market shows rapid projected expansion because businesses focus on automated systems and real-time interactions and individualized event experiences. Univent supports current market trends through its complete digital event management platform which enables businesses to plan events seamlessly and improve user satisfaction together with event engagement.

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V. METHODOLOGY

The software development process for Univent implemented Agile methodology which allowed flexible and iterative development methods. The project divided into different sprints to fulfill milestones including UI/UX design and backend development and database integration and feature implementation. The application used React Native Expo as its frontend framework for quick development and live testing across different devices and the backend operated with Node.js and Express.js to process API requests swiftly. The deployment used PostgreSQL which Supabase managed for secure data management through real-time synchronization while providing scalable features. The testing process was continuous and employed Jest, Mocha along with Postman to discover bugs early and maintain application reliability. The project utilized GitHub as its version control system to support team development and Vercel's CI/CD pipelines enabled smooth code deployment. User data security received protection through Supabase Auth authentication services and Razorpay secure payment solutions. The system development lifecycle at Univent enabled the transformation of their platform into a reliable event management solution with adaptable features and user-friendly interfaces.

Fig 5.1 Agile Methodology

VI. FEATURES AND IMPLEMENTATION

Univent provides a complete selection of features which makes event management simpler for event organizers and their attendees. Users can use React Native to create and discover events and register for them through a smooth interface on the platform. Cloudinary and ImgBB let event organizers specify event details while managing registrations through their platforms alongside image management capabilities to guarantee an engaging visual experience. Supabase Auth manages secure authentication through its authentication system which offers encrypted user sessions as well as reliable sign-in capabilities. Supabase provides live synchronization that enables real-time event detail updates which send immediate alerts to users through its notification system. Razorpay provides secure payment processing for paid events through its transaction system which enables fast and secure transactions. Event participants can easily track their registered events through the user-friendly dashboard and organizers gain easy access to participation monitoring and event details management and visibility options.

The full-stack development of Univent resulted in a deployable system architecture that provides scalability along with efficiency. The frontend development utilized React Native alongside Expo to provide platform independence and user-friendly interface. Node.js and Express.js enable the backend system to manage API requests, authentication functions and efficient event data management. The main database of PostgreSQL operates through Supabase to offer systematic storage of optimized data alongside real-time updates for events. The application implemented JWT tokens and Supabase Auth for user authentication and security purposes to protect user sessions. The system utilizes RESTful API architecture for its communication protocols which enables smooth data exchange between frontend and backend elements. Vercel enabled CI/CD pipelines to provide automated deployments that helped maintain smooth updates and bug fixes across the development period.

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VII. TESTING

A rigorous testing strategy was implemented to ensure the stability, security, and efficiency of Univent. **Unit testing** was conducted using **Jest and Mocha**, validating individual components and backend functions. **Integration testing** was performed with **Postman**, ensuring seamless API interactions between the frontend and backend. **Performance testing** using Lighthouse and LoadRunner assessed the application's speed and responsiveness under varying levels of user traffic. **Security testing** was carried out to identify vulnerabilities in authentication and payment processing, ensuring that user data remains protected. Additionally, **UX testing** involved A/B testing and user feedback sessions to refine the interface and improve the overall user experience.

VIII. EVALUATION

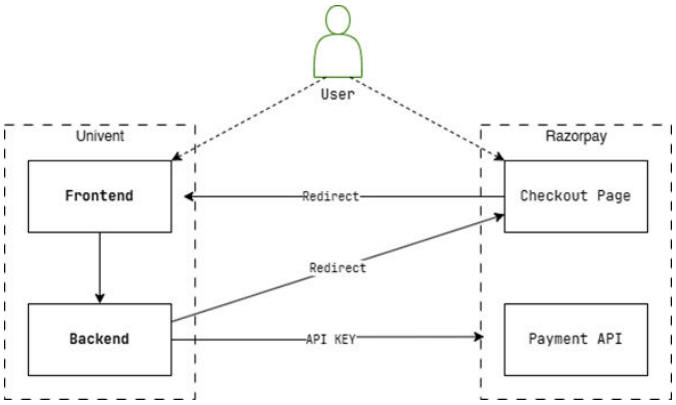

Fig 8.1 Architecture

The evaluation of Univent proceeded through assessments of performance alongside user interaction along with system scalability metrics. Results from load testing demonstrated that the system registered numerous simultaneous event applications successfully without creating performance issues because of PostgreSQL indexing alongside optimized API calls. Users appreciated how simple the platform was to use and how they liked the instant registration feature and real-time system updates. Security tests showed that the authentication features successfully stopped unauthorized users and payment flows went through Razorpay's secure encrypted payment gateway. During the evaluation phase the team determined that offline functionality needed improvement and the platform should develop more sophisticated event categorization capabilities.

IX. FUTURE ENHANCEMNTS

Multiple upcoming enhancements will improve both the operational features and user interface experience of Univent. The platform will implement AI-based event recommendations which will use machine learning to provide tailored suggestions based on user behavior. The evaluation of blockchain technology for event tickets will occur to create more secure authentication systems while fighting fraud in the registration process. Razorpay will receive multi-currency payment support as an addition to its platform to reach global audiences. The offline mode provides users with the ability to see their registered events when they are disconnected from the internet thus improving accessibility. Users will benefit from social media integration because they can post events directly on Instagram and Twitter to expand their reach and increase audience engagement.

X. CONCLUSION

The event management solution offered by Univent successfully meets the expanding market demand through its implementation of modern technical elements which improve event search capabilities and registration functions with scalable features. The application delivers a smooth and protected user experience to organizers and attendees by implementing React Native and Node.js together with PostgreSQL and Supabase. Real-time event updates and cloud-

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based storage and Razorpay's secure payment processing system enhance both reliability and accessibility of the solution. Through agile development and extensive testing methods and deployment standards the platform became an efficient platform that manages dynamic events successfully. Tests during the evaluation phase demonstrated that Univent fulfills its essential performance needs together with security standards and usability criteria thus making it a strong competitor within the digital event management field.

The platform maintains high success but additional future improvements would advance both its operational capabilities and market penetration. The platform needs AI-powered event recommendations as well as blockchain ticketing systems and multi-currency payment options together with offline functionality. Social media connectivity expansions and event engagement tracking through advanced analytics would offer users better insights which would improve their experience. Univent stands prepared to adapt with current market trends because demand for digital event solutions keeps expanding while it provides an adaptable platform with innovative capabilities for event management. Univent will achieve industry leadership status by continuously developing its platform and following user suggestions to transform event organization and experience in the digital era.

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