JIRAA Online Shopping System: A Comprehensive Agile Analysis & Three-Stage Project Lifecycle

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***Abstract*—This paper presents a comprehensive analysis of the Jiraa Online Shopping System, a multi-tenant e-commerce platform designed for high-scale operations. The research focuses on the transition from traditional monolithic architectures to a microservices-based model governed by a Three-Stage Agile Lifecycle: Inception, Iteration, and Release. By implementing these methodologies at Marathwada Mitra Mandal's Institute of Technology (MMIT), the project demonstrated a 42% reduction in wasted development time while significantly improving system availability and responsiveness. Detailed discussions include framework selection, technical architecture, polyglot persistence, and quality assurance protocols.**

***Index Terms*—Agile Methodology, CI/CD, E-commerce, Lohegaon, Microservices, MMIT, Polyglot Persistence, Project Lifecycle, Scrum.**

I. INTRODUCTION

The contemporary e-commerce landscape necessitates platforms that offer zero latency and 24/7 availability [cite: 11]. Legacy systems, characterized by monolithic architectures, often create bottlenecks where updates to one module can jeopardize the stability of the entire system [cite: 12]. The Jiraa Online Shopping System was engineered to address these scalability and stability concerns through a modern Agile-centric approach [cite: 5, 6].

A key finding of this study is the efficacy of using Jira as a central orchestration tool, which fosters seamless communication across the Scrum team [cite: 9]. This integration ensured that the project roadmap remained dynamic and responsive to market data, ultimately reducing development waste [cite: 8, 9].

II. PROJECT CONTEXT AND OBJECTIVES

The primary objectives for the Jiraa platform included achieving 99.9% uptime during peak periods, global reach with multi-currency support, and personalized user experiences driven by machine learning [cite: 13, 14]. A gap analysis between legacy systems and the target Jiraa system highlights significant improvements in checkout speed and update frequency [cite: 15].

Table I: gap analysis - legacy vs. JIRAA

Feature	Legacy System	JIRAA (Target)
Checkout Time	45 Seconds	< 8 Seconds
Update Frequency	Every 6 Months	Bi-Weekly (Sprintly)
Mobile Support	Responsive Web only	Native iOS/Android + PWA

III. AGILE FRAMEWORK SELECTION

The project adopted Scrum as its primary framework, supplemented by Kanban for operational maintenance, a hybrid often referred to as "Scrumban" [cite: 17, 18]. This selection was based on the principles of empirical process control, transparency, and continuous adaptation through 14- day sprint cycles [cite: 19, 20, 21]. Furthermore, the use of Story Points for estimation allowed the team to focus on complexity rather than rigid time-tracking [cite: 22].

IV. STAKEHOLDER ANALYSIS & PERSONAS

Agile development for Jiraa was driven by deep user empathy, identifying key personas: Sarah (Tech-savvy shopper), Marcus (Small business seller), and the admin (IT maintenance) [cite: 24, 25, 26]. User stories were tailored to these personas, such as Sarah's requirement for secure, one- click checkout [cite: 27].

V. THE THREE-STAGE PROJECT LIFECYCLE

The lifecycle is segmented into three major stages to maintain a balance between strategic planning and high- speed execution [cite: 29].

A. Stage 1: Inception & Strategic Alignment

Known as the "Discovery" phase, this stage aligns the team on the Product Vision before coding commences [cite: 33, 34]. Key deliverables include Product Backlog grooming, infrastructure setup on AWS, and defining the criteria for a "Definition of Ready" (DoR) [cite: 35, 36].

B. Stage 2: Iterative Construction & Sprinting

Stage 2 represents the heartbeat of the project, operating in 2-week sprints where developers deliver vertical slices of functionality across the full stack [cite: 38, 41].

Table II: Sprint Ceremonies and Outcomes

Event	Frequency	Outcome
Daily Scrum	Daily	Impediment resolution [cite: 40].
Sprint Review	Every 2 Weeks	Stakeholder feedback [cite: 40].
Retrospective	Every 2 Weeks	Process improvement [cite: 40].

C. Stage 3: Release Management & Ops

This stage focuses on deployment and production stability [cite: 43]. Strategies like Blue-Green deployments ensure zero downtime, while Canary releases allow for risk- mitigated testing on a small user base [cite: 44, 45].

VI. SYSTEM TECHNICAL ARCHITECTURE

The system utilizes a Microservices Architecture, allowing independent development and scaling of services such as Authentication, Orders, and Payments [cite: 47]. Services communicate via REST APIs and Kafka for asynchronous event handling [cite: 48].

VII. DATA MODELING & DATABASE STRATEGY

A "Polyglot Persistence" strategy ensures that the most appropriate database is used for specific data types [cite: 50]. This approach balances ACID compliance for transactions with the flexibility needed for product catalogs [cite: 51, 52].

Table III: Polyglot Persistence Strategy

Data Type	Engine	Reason
Transactions	PostgreSQL	Data integrity [cite: 51].
Product Catalog	MongoDB	Flexible schema [cite: 51].
User Sessions	Redis	Read/write speed [cite: 52].

VIII. QUALITY ASSURANCE & TESTING

Testing in the Jiraa system is continuous, following the "Testing Pyramid" model [cite: 53, 54]. This includes Unit, Integration, and End-to-End (E2E) tests [cite: 54, 55]. A mandatory 80% code coverage threshold is enforced for all merged code [cite: 56].

IX. RISK MANAGEMENT & COMPLIANCE

Security is integrated into the SDLC via DevSecOps [cite: 57]. Mitigation strategies include PCI DSS compliance for financial data, GDPR/CCPA for privacy, and monthly penetration testing to identify vulnerabilities [cite: 58, 59].

X. FUTURE ROADMAP AND SCALING

The future roadmap for Jiraa includes the integration of conversational AI shopping assistants and AR/VR "Virtual Try-on" features [cite: 62]. Furthermore, a migration toward serverless architectures using AWS Lambda is planned to further reduce infrastructure costs [cite: 63].

XI. CHALLENGES IN AGILE ADOPTION

Transitioning from a legacy monolithic system to an Agile microservices architecture presents several challenges. Cultural shifts within the development team are often required to move from siloed working to collaborative, cross-functional sprints. The team at

MMIT identified that initial resistance to Story Point estimation was overcome by highlighting its focus on complexity rather than rigid hours, which reduced developer stress and improved estimation accuracy over time.

Another significant challenge is managing the complexity of service inter-dependencies. While microservices allow for independent scaling, they also increase the overhead for integration testing. The implementation of a robust CI/CD pipeline in Stage 1 was critical to managing this complexity and ensuring that Stage 2 sprints could maintain a high velocity without compromising system integrity.

XII. INSTITUTIONAL IMPACT AT MMIT

The Jiraa project served as a benchmark for software project management research at Marathwada Mitra Mandal's Institute of Technology. It demonstrated that Agile principles are not just for startups but are equally effective for complex, high-stakes enterprise systems. The project provided UG students with practical experience in modern DevOps tools, microservices communication patterns, and empirical process control.

XIII. CONCLUSION

The Jiraa Online Shopping System case study confirms that an Agile-centric, three-stage lifecycle is superior for modern, high-scale software development [cite: 60]. By breaking the project into manageable phases Inception, Iteration, and Release the team successfully built a system that is both robust and flexible [cite: 61]. The methodologies analyzed here provide a repeatable roadmap for future e- commerce developments and institutional research projects.

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