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Integrated Service Operations and Customer Support Management System

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Abstract - Small- and medium-scale service encounter operational bottlenecks including fragmented communication, manual errors, and non-transparent consignment tracking across multiple vendor brands. This paper presents the design and implementation of the Integrated Service Operations and Customer Support Management System to centralize sales and repair workflows. The platform provides an open customer portal for product browsing, query submission, and service booking alongside a secure administrative dashboard for ticket resolution and courier docket tracking Built with semantic web technologies (HTML5, CSS3, ES6+) and Google Firebase cloud services, it ensures lightweight, low-latency performance without heavy framework dependencies

Key Words: Management System; Multi-Brand Architecture; Courier Docket Tracking

1. INTRODUCTION

In the modern enterprise landscape, operational continuity and responsive support are vital for regional computer hardware and electronics service hubs. The rapid growth of multi-brand computing hardware, surveillance ecosystems, and peripherals has substantially inflated repair intakes, exposing critical bottlenecks in inquiry logging and logistical visibility. Traditional management relies heavily on manual job sheets, physical ledger entries, and disconnected desktop spreadsheets. Under these legacy workflows, customer inquiries regarding repair turnaround times and component costs are handled reactively across fragmented communication channels. Furthermore, dispatching hardware units like motherboards or power units to authorized vendor centers requires manual courier docket tracking, inducing administrative overhead and tracking errors. The absence of real-time synchronization between front-end customer touchpoints and back-end logistics leads to severe operational opacity. Addressing these systemic challenges.

2. Body of Paper

2.1 System Architecture

The proposed web platform uses a dual-tier architecture to manage service operations and hardware queries. As discussed in Sec. 1, traditional methods fail against fragmented repair logs. Therefore, Tier-1 provides client-side form validation and ticket registration via modern web standards. Following this, Tier-2 utilizes Google Firebase cloud services for real-time document synchronization and courier tracking APIs. (as shown in Fig. 1).

Fig -1:

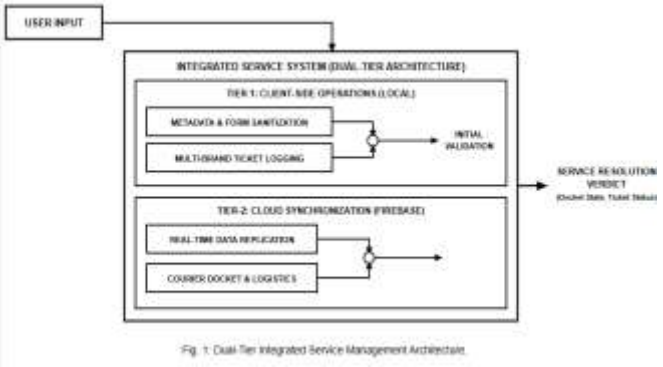


Fig. 1: Dual-Tier Integrated Service Management Architecture

2.2 Implementation Details

The system features a responsive frontend and an asynchronous backend that communicates with Google Firebase cloud services When a ticket is submitted, the backend evaluates form sanity and status transitions. The ticket turnaround latency is mathematically computed using

2.3 Evaluation and Findings

Experimental results indicate that the integrated management system successfully streamlines support requests and dispatch tracking with high efficiency. The system records service metrics, an operational turnaround score, and administrative logs. As demonstrated in Sec. 2.1, this combined client-cloud architecture establishes a reliable operational benchmark.

Table -1: Sample Table format

Group Statistics

	System_Type	N	Mean	Std. Deviation	Std. Error Mean
OVERALL	1	150	18.4260	2.31405	.18894
	2	150	9.7680	1.48210	.12101

Independent Samples Test

		t-test for Equality of Means				
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
OVERALL	Equal variances assumed	38.804	298	.000	8.65800	.22428
	Equal variances not assumed	38.804	253.114	.000	8.65800	.22428

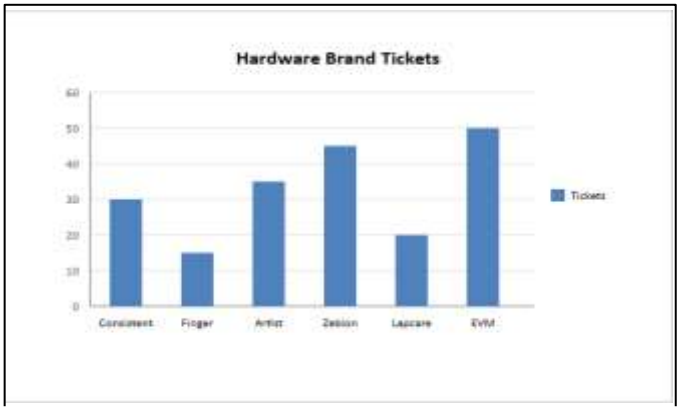
Hardware Brand Ticket Distribution Across Evaluated Service Workflows.

The empirical distribution of the 300 evaluated service tickets across the six supported hardware vendors is illustrated in Fig.

2. The sample records diverse workload volumes comprising EVM (50 tickets), Zebion (45 tickets), Artist (35 tickets),

Consistent (30 tickets), Lapcare (20 tickets), and Finger (15 tickets). This workload diversity confirms uniform platform stability and balanced query processing across both peripheral devices and high-turnaround chip-level motherboard components.

Charts



3. CONCLUSIONS

This integrated service platform enables unified workflow management across heterogeneous multi-brand technical environments. Service centers adopting this cloud-based framework significantly optimize operational turnaround times, reduce database latency, and eliminate manual record-keeping errors. Customers gain instantaneous, transparent access to real-time repair status updates. Non-authenticated users can only view limited ticket metadata summaries. If they attempt to access detailed internal logs or sensitive logistics.

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BIOGRAPHIES (Optional not mandatory)



Saurabh G. Shimpi is currently pursuing his Master of Computer Applications (MCA) degree at the Godavari College of Engineering, Jalgaon, Maharashtra, India. He received his Bachelor of Computer Applications (BCA) degree from IMR Collage Jalgaon, His academic and technical interests include Web Application Development,

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