

CASE STUDY

Biometric Access Control SaaS Platform

Client: A Singapore-based biometric
technology company



From Manual Deployments to a Scalable SaaS Platform: Engineering the Client's Operations Backbone

The Client is a Singapore-based biometric technology company with over 20 years of industry experience. Their platform provides biometric access control, automated time and attendance management, and identity verification for businesses operating across construction sites, commercial offices, worker dormitories, banks, schools, and remote industrial environments such as mining operations and plantations. The Client's solutions serve industries that are subject to strict regulatory requirements, notably Singapore's Electronic Productivity Submission System (ePSS) and Biometric Authentication System (BAS) mandates for the construction sector.

When the Client's growing customer base began to expose the limits of their legacy deployment model, they turned to **NUS Technology**, a partner they already trusted from a prior engagement, to rebuild the platform from the ground up. That collaboration, which began in **June 2024**, remains ongoing today.

■ Industry
Biometric Technology / Identity & Access Management

■ Market
Global (headquartered in Singapore)

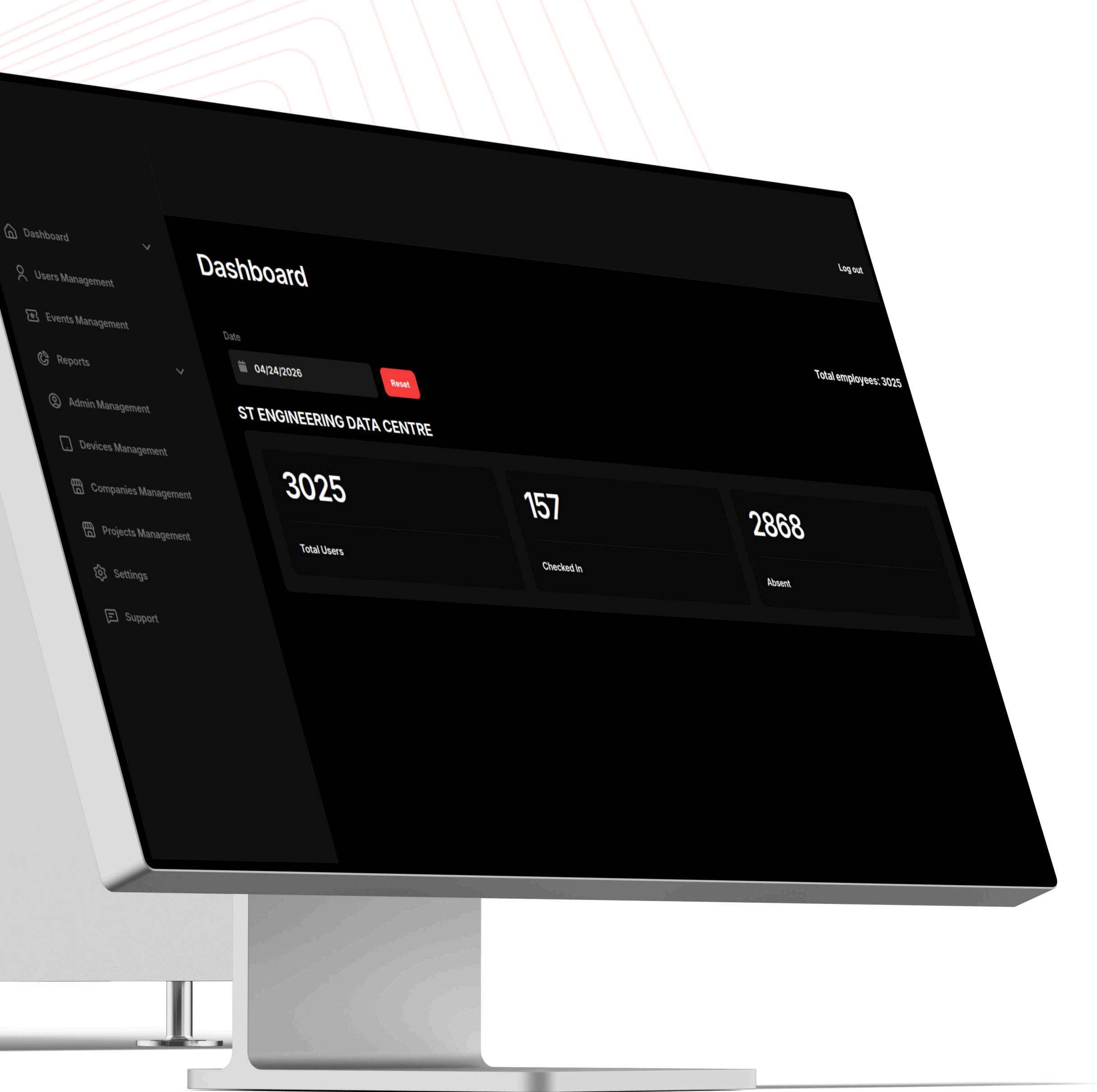
■ Partnership
Ongoing since June 2024

■ Frontend
ReactJS

■ Backend
Node.js, C#

■ Infrastructure
AWS EC2

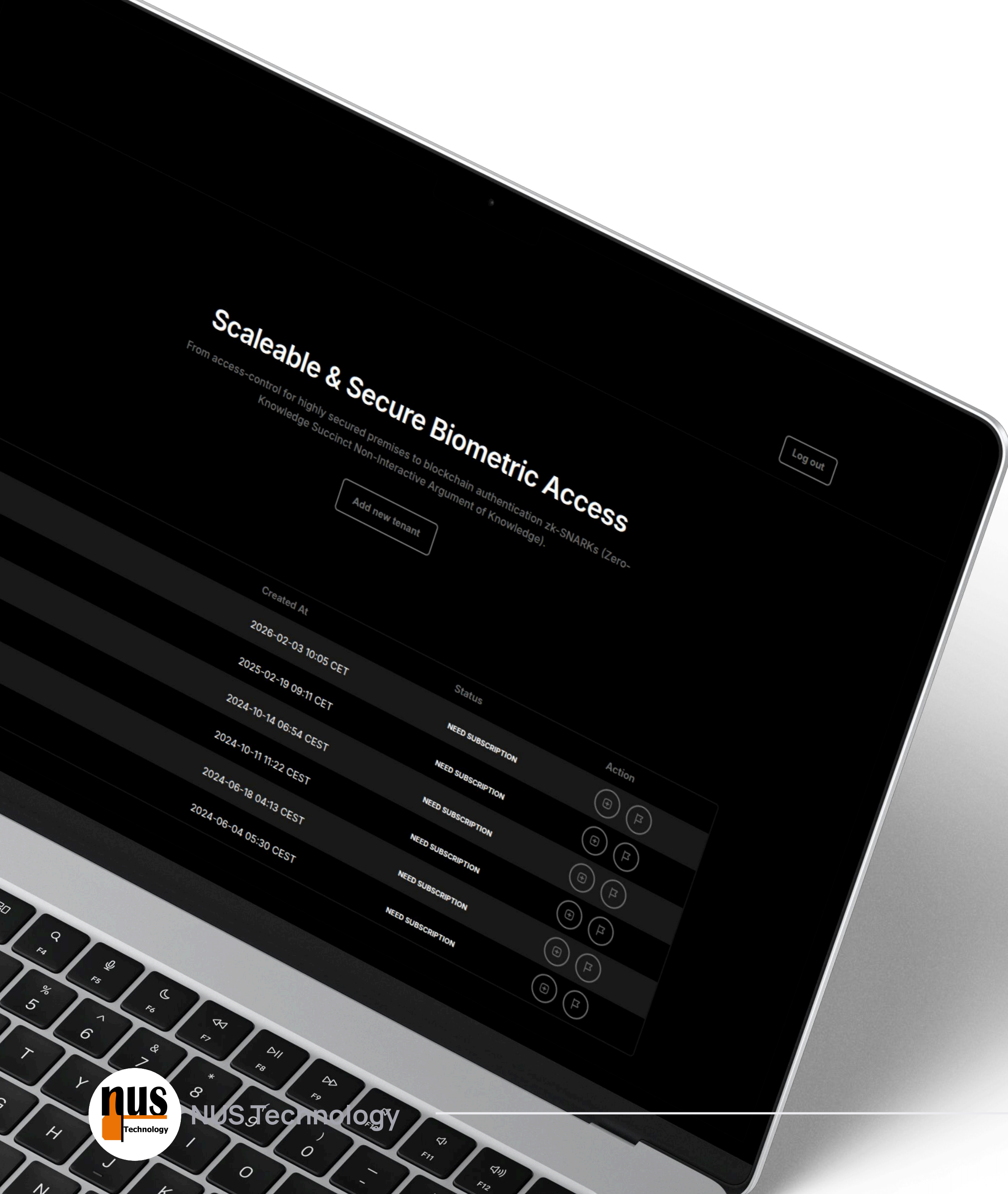
■ Intergrations
ZKTeco, Hikvision (Biometric Hardware Sync)



THE CHALLENGE

A Deployment Model That Couldn't Scale

The Client's original platform was built on vanilla PHP. Every time a new client signed on, the team had to manually clone the entire PHP project, configure a separate instance, and deploy it independently. What started as a workable process became an operational bottleneck as the client list grew.



- **Manual Tenant Provisioning:** Onboarding each new client required cloning an entire codebase, setting up a dedicated environment, and configuring it from scratch. A single client onboarding could consume a full day of engineering time, effort that could have been spent on product development.
- **Maintenance Nightmare:** With dozens of isolated PHP instances running in parallel, every bug fix or feature update had to be applied individually across all deployments. A single patch could take days to roll out completely, and inconsistencies between environments were inevitable.
- **Performance Limitations:** The legacy PHP stack was not optimized for the real-time data demands of biometric access control. Slow response times affected the user experience, particularly at construction sites and offices managing hundreds of daily check-ins through connected biometric devices.

The Client needed a partner who could replace this fragmented approach with a unified, modern platform, one that could serve every client from a single codebase while maintaining the flexibility each deployment required.

THE SOLUTION

A Unified Multi-Tenant SaaS Platform

NUS Technology was brought in to build the Client’s new application from the ground up, drawing on the trust established during a prior collaboration. Rather than patching the legacy system, we designed a modern architecture that fundamentally changed how the Client operates and delivers its product.

Log out

Total employees: 3025

2868

Absent

 NUS Technology

Log out

Dashboard

Users Management

Events Management

Reports

Admin Management

Devices Management

Companies Management

Projects Management

Settings

Support

Device management

Create Access Level

Search Device

Site Entrance (1)

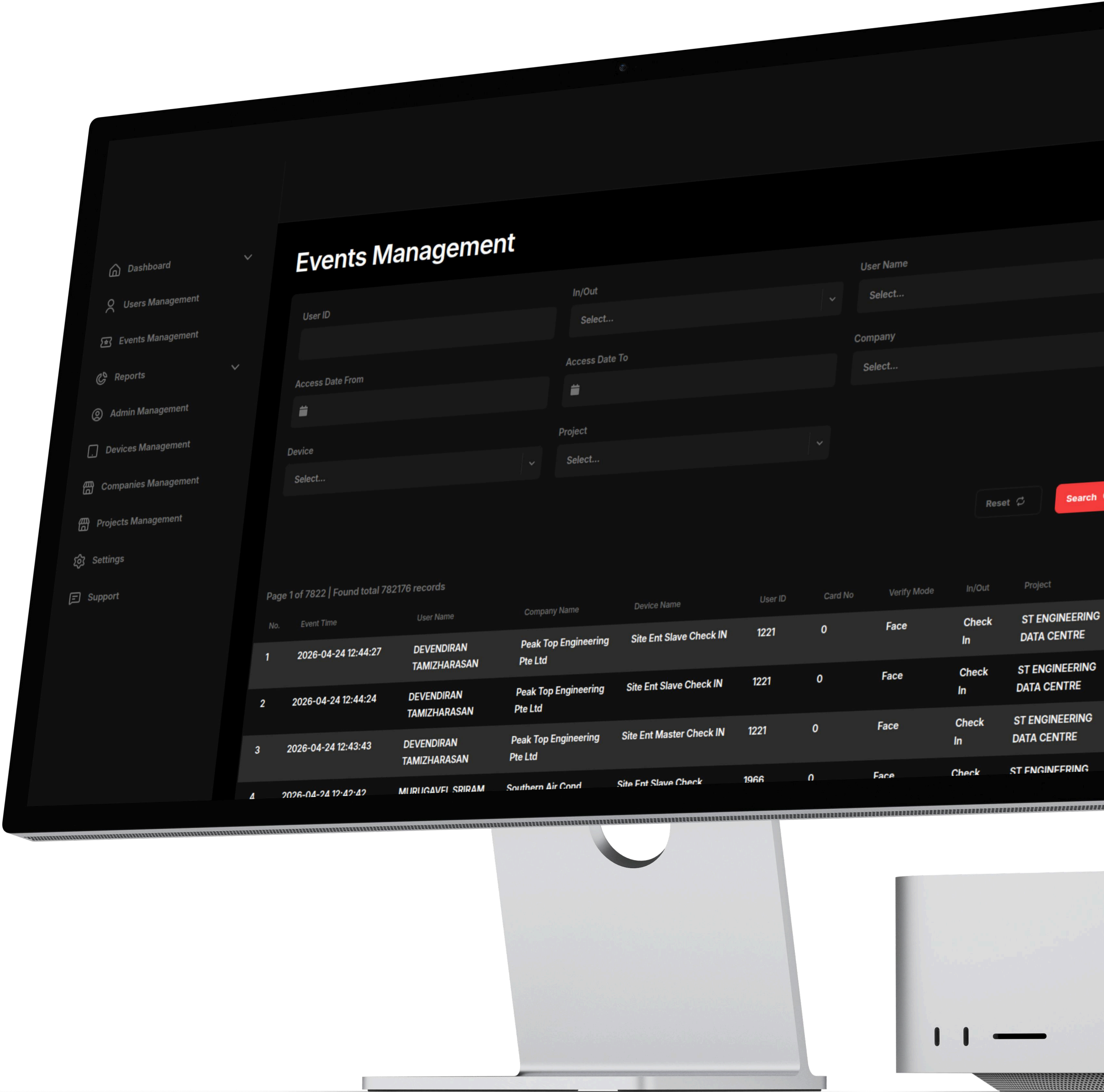
S.No.	Device Name	Function	Serial No	Status	Action
1	Site Ent Master Check IN	Master	CHR7244800004	Online	Push Pull Edit Delete
Slave Group Out					
1	Site Ent Slave Check IN		CHR7244800005	Online	Up to master Edit Delete
2	Site Ent Slave Check OUT		CHR7244800001	Online	Up to master Edit Delete
3	Site Ent Slave Check OUT		CHR7244800008	Online	Up to master Edit Delete
4	test device		CKJF202460059	Online	Up to master Edit Delete

One Codebase, Every Client

The core architectural decision was replacing dozens of isolated PHP instances with a single Node.js application serving all tenants. NUS engineered a multi-tenant system with robust data isolation, ensuring that each client’s biometric records, access logs, and configuration remain completely separated while running on shared infrastructure. This eliminated the need to clone and configure a new project for every client, whether that client is a bank in Singapore, a construction firm managing ePSS compliance, or a mining operation in a remote plantation.

Automated Tenant Provisioning

What previously required a full day of manual setup, creating accounts, configuring environments, provisioning resources, was reduced to an automated workflow. New clients can now be onboarded in under an hour through a streamlined process that creates their tenant, sets up their workspace, and connects their biometric hardware with minimal manual intervention.



Deep Hardware Integration

Biometric access control lives at the intersection of software and hardware. NUS built direct integrations with ZKTeco and Hikvision biometric devices, enabling the platform to pull attendance data, manage device configurations, and synchronize access control events in real time. The Client supports a multi-device strategy, allowing clients to deploy fingerprint scanners, facial recognition terminals, and card readers from different manufacturers, all managed from a single control plane. These are not surface-level API connections; they handle the complexity of managing diverse hardware fleets across multiple client sites, including remote locations where connectivity relies on SIM card routers rather than fixed broadband.

Dashboard

Users Management

Events Management

Reports

HDB Report

Time Attendance

Detailed Access

Daily Entry Exit Report

Master List

Person Attendance R...

Date Attendance Report

BCA Reports

Admin Management

Devices Management

Companies Management

Projects Management

HDB Report

Name

Select...

Project

Company

Select...

User Id

Card No.

Trade

Select...

Month

04/2026

Export To Excel

Page 1 of 121 | Found total 3025 records

S.No	User Name	User PIN	FIN/NRIC/ID	Nationality	Trade	Company
1	KOH THONG HNG	1003	S7964680F	Malaysia	Site Management Team	NAKANO SIN LTD
2	Visitor 2	2			Site Management Team	NAKANO SIN LTD

2026-02-03 10:05 CET

2025-02-19 09:11 CET

2024-10-14 06:54 CEST

2024-10-11 11:22 CEST

2024-06-18 04:13 CEST

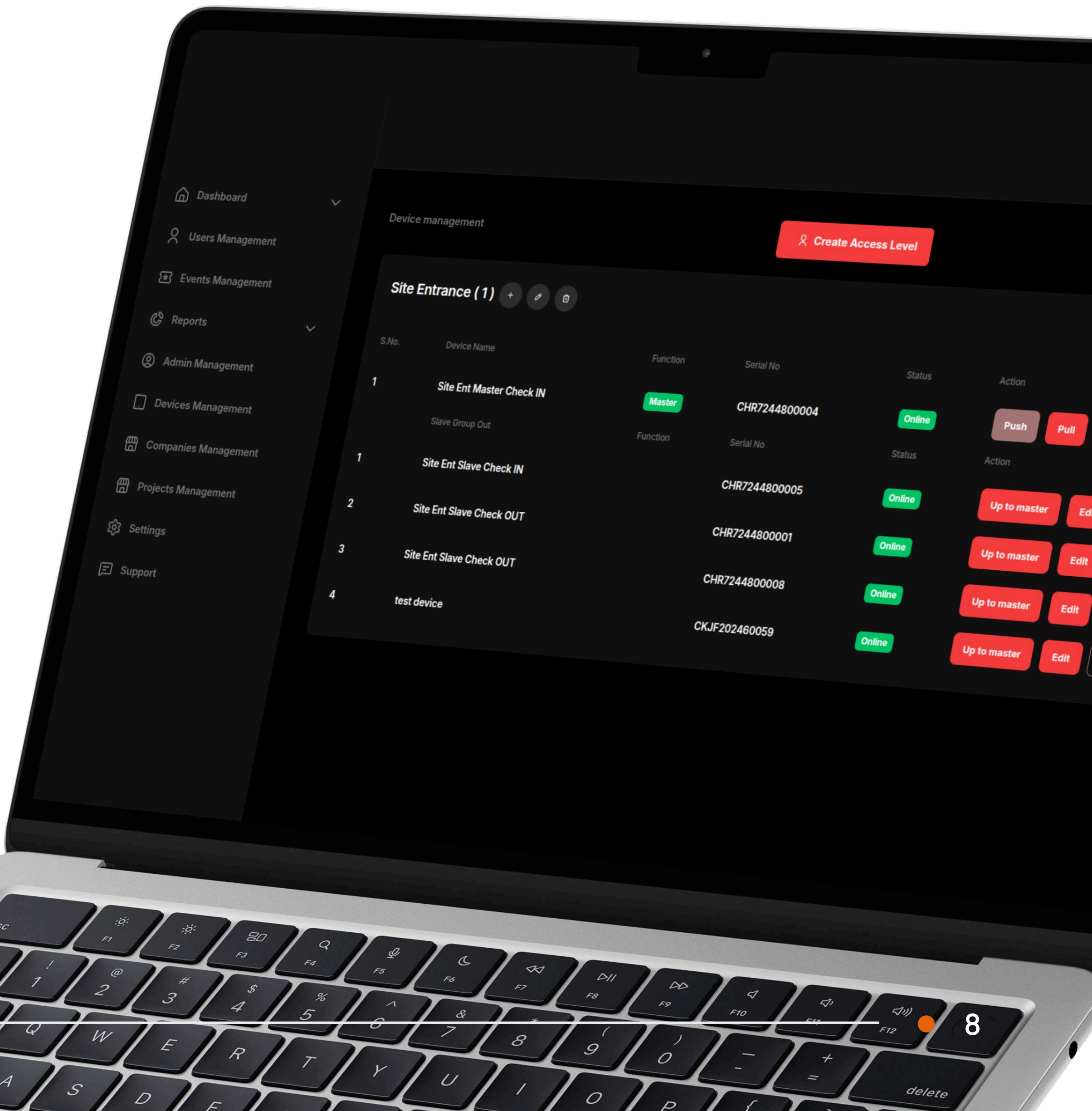
2024-06-04 05:30 CEST

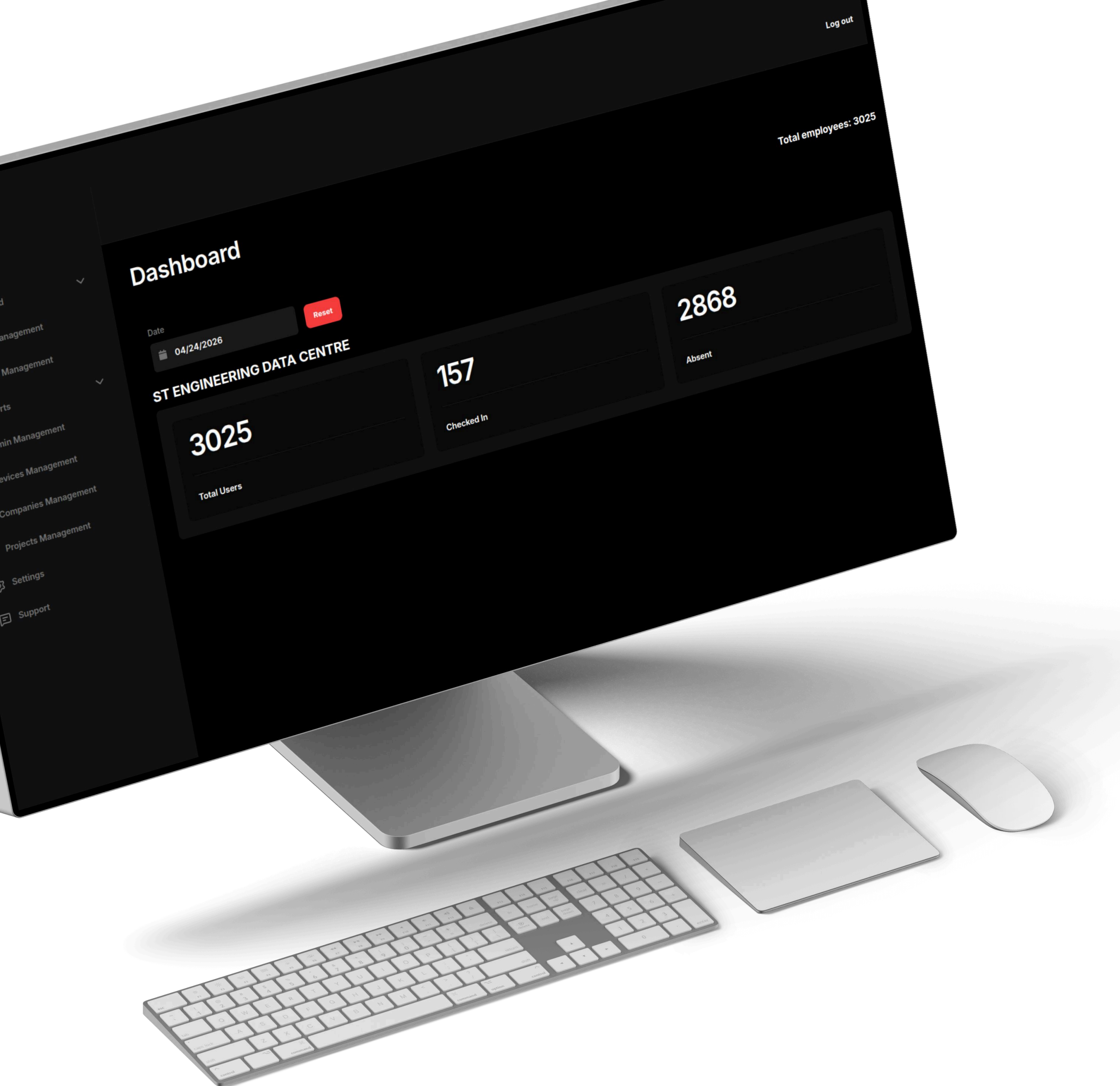
Built for Regulated Industries

The Client’s platform serves clients in sectors with strict compliance requirements. In Singapore’s construction industry, for example, contractors must submit biometric attendance data through the government’s ePSS system and comply with BAS standards. NUS designed the reporting and data architecture to support these regulatory workflows natively, generating BCA-compliant reports, work permit expiry tracking, and daily entry-exit logs directly from the platform, without requiring manual data wrangling.

Modern Stack for Real-Time Performance

The migration from PHP to Node.js and ReactJS was driven by operational requirements, not technology preference. The biometric access control workflow demands fast response times: when a worker scans their fingerprint at a construction site gate, the system must validate, log, and respond within seconds. The new stack reduced average page load times by approximately 40%, delivering the speed and responsiveness that the legacy platform could not.





THE RESULT

Operational Transformation

The transition from a manually-managed PHP deployment model to a unified SaaS platform fundamentally changed the Client's operational capacity:



Onboarding Speed

New client provisioning dropped from roughly a full day of engineering effort to under an hour. This freed the Client's team to focus on business growth rather than repetitive setup tasks.



Maintenance Efficiency

Bug fixes and feature updates now deploy once and propagate to all clients instantly. Patch rollout time was reduced by an estimated 80%, eliminating the inconsistencies that plagued the multi-instance model.



Platform Performance

The modern Node.js backend delivers approximately 40% faster page loads and improved responsiveness across all client environments, supporting real-time biometric data processing at scale.



Infrastructure Simplification

Managing a single application instead of dozens of cloned instances reduced server overhead and operational complexity, cutting infrastructure management effort by roughly 60%.



Scalability

The Client can now onboard new clients without proportional increases in infrastructure complexity or engineering overhead. The platform is built to grow with the business across its diverse verticals, from Singapore construction firms to remote mining operations.



NUS Technology

Created At	Status	Action
2026-02-03 10:05 CET	NEED SUBSCRIPTION	<button>+</button> <button>✖</button>
2025-02-19 09:11 CET	NEED SUBSCRIPTION	<button>+</button> <button>✖</button>
2024-10-14 06:54 CEST	NEED SUBSCRIPTION	<button>+</button> <button>✖</button>
2024-10-11 11:22 CEST	NEED SUBSCRIPTION	<button>+</button> <button>✖</button>
2024-06-18 04:13 CEST	NEED SUBSCRIPTION	<button>+</button> <button>✖</button>
2024-06-04 05:30 CEST	NEED SUBSCRIPTION	<button>+</button> <button>✖</button>

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Settings

Support

Events Management

User ID

In/Out

User Name

Access Date From

Access Date To

Company

Device

Project

Page 1 of 7822 | Found total 782176 records

No.	Event Time	User Name	Company Name	Device Name	User ID	Card No	Verify Mode	In/Out
1	2026-04-24 12:44:27	DEVENDIRAN TAMIZHARASAN	Peak Top Engineering Pte Ltd	Site Ent Slave Check IN	1221	0	Face	Check In
2	2026-04-24 12:44:24	DEVENDIRAN TAMIZHARASAN	Peak Top Engineering Pte Ltd	Site Ent Slave Check IN	1221	0	Face	Check In
3	2026-04-24 12:43:43	DEVENDIRAN TAMIZHARASAN	Peak Top Engineering Pte Ltd	Site Ent Master Check IN	1221	0	Face	Check In
4	2026-04-24 12:42:42	MURUGAVEL SRIRAM	Southern Air Cond	Site Ent Slave Check	1966	0	Face	Check

Dashboard

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Device management

Create Access Level

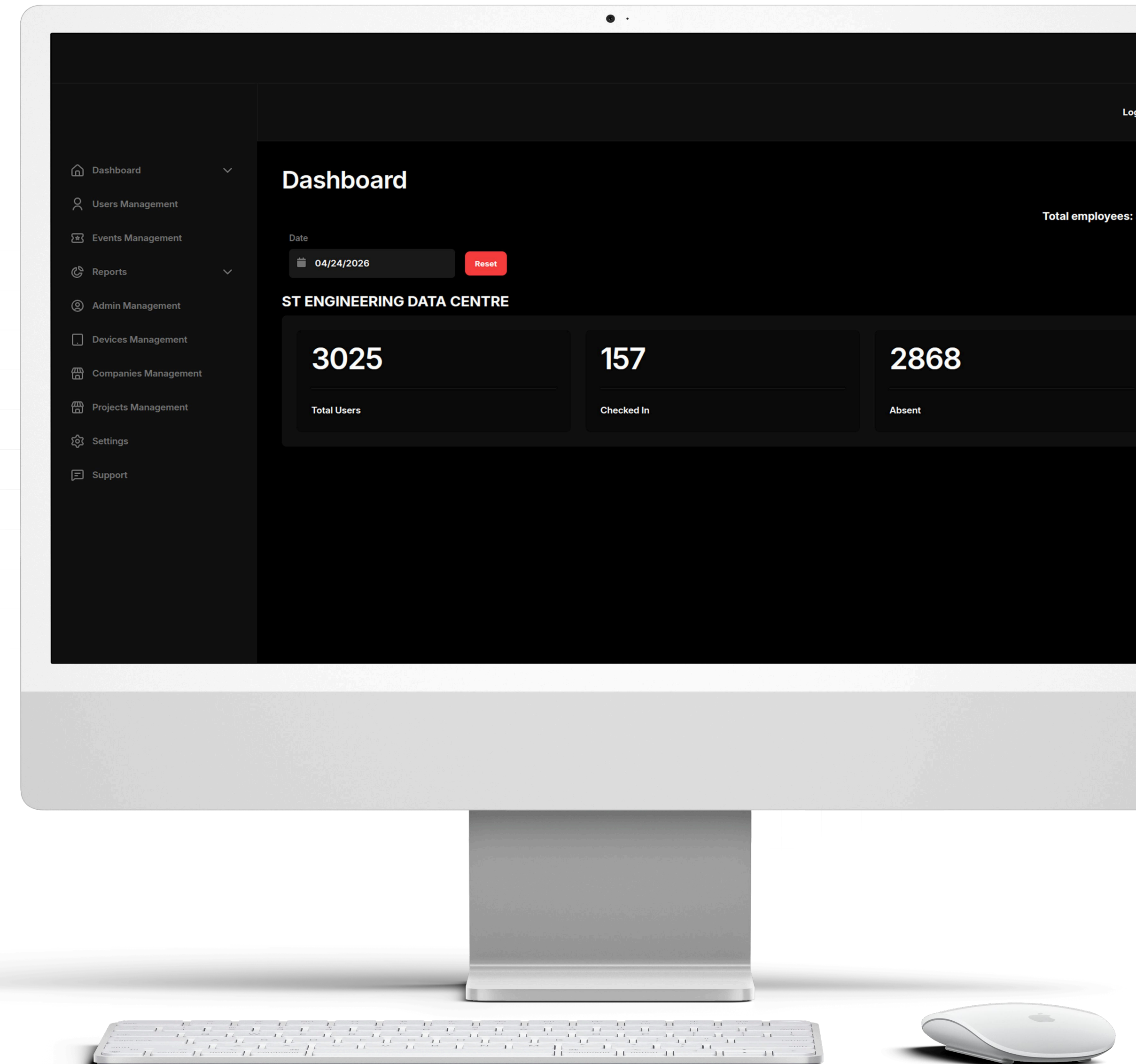
Site Entrance (1)

S.No.	Device Name	Function	Serial No	Status	Action
1	Site Ent Master Check IN	Master	CHR7244800004	Online	PushPullEditDelete
	Slave Group Out	Function	Serial No	Status	Action

The NUS Difference: Built on Trust, Designed for Scale

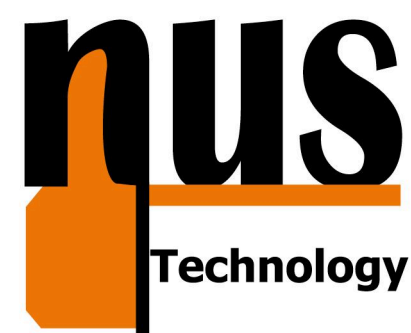
NUS Technology was selected for this engagement based on demonstrated reliability from a previous project. That trust proved well-placed: NUS didn't just deliver a new codebase, we designed the system that the Client's entire operation runs on. From automated tenant provisioning to deep hardware synchronization with biometric devices from multiple manufacturers, the platform reflects how the Client actually operates, not how off-the-shelf software thinks they should.

The partnership, ongoing since June 2024, continues to evolve. As the Client expands into new verticals and geographies, NUS remains the engineering partner behind a platform that manages physical security and workforce compliance for businesses across industries and borders.



THANK YOU

For Reading Our Case Study



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