TECHNICAL SPECIFICATION AND SCOPEOF WORK

Title of the Job: Survey, Design, Supply, Installation, Integration, Commissioning and Maintenance of Smart Campus Master RFID/NFC Identity Card Platform Integrated with Samarth ERP at Nalanda University.

1. Background

Nalanda University intends to establish a Unified Smart Campus Identity Ecosystem through a Master RFID/NFC Smart Card and Mobile Credential Platform.

The objective is to provide a single digital identity for students, faculty, officers, staff, researchers, scholars, visitors and service providers for seamless access to academic, administrative, library, hostel, mobility, attendance, security and campus services.

The system shall be designed as a future-ready Smart Campus solution supporting Net-Zero Campus objectives, digital governance, campus security and operational efficiency. Nalanda University is desires to implement the system in phase manner and 1st phase before the commencement of the new batch i.e. before August 2026. The various phases are tabulated in this document. Students population at present on Campus: 1500 and scalable upto 2500.

2. Purpose of RFP: **"One Person - One Identity - One Campus Card"**

The proposed Smart Campus Card shall serve as:

- Official University Identity Card
- Smart Attendance Card
- Library Card
- Hostel Card
- Access Control Card
- Printing & Photocopy Card
- Dining/Mess Authentication Card
- Transportation Card
- Visitor Management Credential
- Event Management Credential
- Cashless Campus Credential (Future)
- Digital Mobile Credential

The above said features to be implemented in phase manner as defined below:

Features	Phase 1	Phase 2	Phase 3
Access Control Card	Yes		
Smart Attendance Card	Yes		
Official University Identity Card	Yes		
Students Attendance Scheduler Module and its Mapping	Yes	Yes	
Library Card		Yes	
Hostel Card		Yes	
Printing & Photocopy Card			Yes
Dining/Mess Authentication Card			Yes
Transportation Card			Yes
Visitor Management Credential			Yes
Event Management Credential			Yes
Cashless Campus Credential (Future)			Yes
Digital Mobile Credential			Yes
Extra Credits Award against any activity like Best Performer, Green Practitioner etc			Yes

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3. Mandatory Integration with Samarth ERP

The bidder shall integrate the complete solution with the University's existing and future Samarth ERP ecosystem.

The integration shall support:

Student Lifecycle

- Admission
- Registration
- Course Enrollment
- Academic Credits
- Attendance
- Examination
- Hostel
- Library
- Alumni

Employee Lifecycle

- HRMS
- Payroll
- Leave
- Attendance
- Duty Roster
- Visitor Authorization

The bidder shall provide:

- Open APIs
- REST APIs
- Web Services
- Database Connectors

No proprietary lock-in shall be accepted.

4. Smart Academic Attendance System

4.1 Timetable-Driven Attendance

Attendance shall NOT merely be based on card tapping.

Attendance shall be accepted only when all the following conditions are satisfied:

Student Validation

The student:

- Is registered in the course
- Is enrolled in the semester
- Is assigned to the section
- Has not been debarred

Timetable Validation

Attendance shall be matched with:

- Academic Calendar
- Class Schedule
- Faculty Schedule
- Room Allocation
- Course Allocation

Location Validation as per the scheduler

Attendance shall be accepted only when recorded:

- In the designated classroom as per the scheduler
- In the designated lecture hall as per the scheduler
- In the designated laboratory as per the scheduler
- In the designated seminar room as per the scheduler

Time Validation

Attendance shall be accepted only within:

- Predefined check-in window
- Predefined check-out window

Example:

Class Timing: 10:00 AM – 11:30 AM

Valid Attendance Window:

09:50 AM to 10:15 AM

Attendance outside this period shall be automatically rejected.

4.2 Anti-Proxy Attendance Mechanism

The system shall support with the features of enable and disable option:

Level 1

RFID/NFC Authentication

Level 2

Photograph Verification

Level 3

Facial Recognition Verification (Optional)

Level 4

Faculty Validation

Level 5

Classroom Occupancy Validation

The system shall automatically detect:

- Duplicate attendance
- Card sharing
- Multiple attendance attempts
- Attendance in wrong class
- Attendance in wrong location

The solution shall specifically address proxy attendance concerns reported in RFID-only deployments.

5. Smart Classroom Attendance Devices

The bidder shall provide:

Fixed Readers

For:

- Lecture Halls
- Classrooms
- Laboratories

Portable Readers

For:

- Field Visits
- Workshops
- Outdoor Classes
- Conferences

Tablet-Based Attendance

Faculty mobile attendance verification.

6. Campus Access Control System

The Master Card shall function as:

Entry Authorization Credential

For:

- Main Gates
- Academic Buildings
- Libraries
- Laboratories
- Hostels
- Faculty Offices
- Sports Facilities
- Auditorium
- Convention Centre
- Data Centre
- Electrical Substations

Features:

- Role Based Access
- Time Based Access
- Department Based Access
- Emergency Override
- Anti-Passback

7. Library Integration

The system shall integrate with:

- KOHA
- RFID Library System
- Samarth Library Module

Features:

- Entry Monitoring
- Book Issue
- Book Return
- Self Check-In
- Self Check-Out
- Resource Usage Analytics

The concept aligns with leading university “One Card” initiatives where a single RFID credential supports library access and campus services.

8. Smart Printing & Photocopy Management

The Master Card shall support:

- Secure Printing
- Print Release Authentication
- Departmental Quotas
- Student Quotas
- Research Printing Allocation

Features:

- Follow-Me Printing
- Printer Usage Reports
- Sustainability Dashboard
- Paper Consumption Tracking

9. Hostel & Residential Management

Features:

- Hostel Entry/Exit
- Visitor Authorization
- Curfew Monitoring
- Occupancy Analytics
- Emergency Muster Reports

10. Smart Mobility & Transport Module

Integration with:

- E-Buggies
- E-Shuttle Services
- Bicycle Sharing System
- Parking Management
- EV Charging Facilities

Features:

- Boarding Authentication
- Usage Analytics
- Route Analytics

11. Net-Zero Campus Analytics Integration

Considering Nalanda University's Net-Zero Campus mission, the platform shall provide:

- Classroom Occupancy Analytics
- Building Utilization Analytics
- Transport Utilization Analytics
- Carbon Reduction Metrics
- Paper Saving Metrics
- Sustainable Mobility Reports

The dashboard shall support sustainability reporting and decision-making.

12. Visitor Management System

The platform shall support and to be integrated with the exiting portal of visitor management portal:

- Pre-Approved Visitors
- QR Visitor Passes
- Temporary RFID Cards
- Event Access Control
- VIP/VVIP Protocol Management

13. Mobile Identity Platform

The system shall support:

- Android Credential
- iOS Credential
- NFC Mobile ID
- QR Identity
- Digital Wallet Integration

Physical card and mobile credential shall coexist.

14. Technical Specifications

The smart card shall support:

Technology

- RFID
- NFC
- Dual Interface Smart Card

Standards

- ISO 14443
- ISO 7816
- MIFARE DESFire EV3 or Higher

MIFARE Classic cards shall not be accepted due to known security limitations. Secure smart card technology is mandatory.

15. Cyber Security Requirements

Mandatory compliance:

- ISO 27001
- CERT-In Guidelines
- OWASP Standards
- Government Cyber Security Guidelines

Features:

- AES Encryption
- PKI Support
- Audit Trail
- Role Based Access
- Multi-Factor Authentication
- Disaster Recovery

16. AI & Analytics Requirements

The system shall provide:

- Attendance Analytics
- Classroom Utilization Analytics
- Space Optimization Analytics
- Student Engagement Analytics
- Academic Risk Identification
- Security Incident Analytics

17. Eligibility Criteria confirming to the set norms in tender PQC.

The bidder shall have:

- Experience in Smart Campus Projects.
- Turnover as per the set criteria
- OEM Authorization Certificate.

- PAN, GST and statutory registrations.

18. Operation & Maintenance

The bidder shall provide:

- Minimum One Year Comprehensive AMC.
- 24×7 Support.
- Helpdesk.
- Preventive Maintenance.
- Annual Security Audit.
- Resident Engineer Support (Optional).

19. Deliverables

- Smart RFID/NFC Cards
- Card Personalization System
- Attendance Readers
- Access Controllers
- Library Integration
- Printing Management Software
- Mobile Application
- Samarth ERP Integration
- API Documentation
- Training
- O&M Manuals
- Sustainability Analytics Dashboard

20. Repetition Order and Extension order:

The BOQ quantities mentioned are tentative and may vary based on the final design, site survey, and technical assessment carried out by the vendor. The quantities shall also depend upon the replication of the system in other areas such as rooms, halls, classrooms, meeting rooms, discussion rooms, libraries, laboratories, and other facilities, subject to confirmation by the University at the same approved rates.

The University reserves the right to increase or decrease the quantities, including placement of repeat orders up to 100% of the original quantity or any part thereof, at the same rates, terms, and conditions for implementation across its Rajgir Campus.

Accordingly, this tender is primarily intended as a rate contract to determine the unit rates of the associated items required for the implementation of the "One Card – One Solution" system across the University.

The project shall be executed on a turnkey basis with end-to-end responsibility of design, implementation, integration, commissioning, training and maintenance resting with the selected bidder. The proposed reference of TS are for the understanding on requirements.

Access control software		
	Compliance	Remarks, if any
1.The software system design shall be object oriented, and shall support Server- Client Architecture.		
2.The system shall have a simple, easy to use graphical user interface.		
3.It is vitally important that the access and alarm functionality of the system shall in no way be impaired during periods when database information is being downloaded to Access control device or vice versa		
Functional Features of ACS software:		
The ACS software system shall have the modules that connect the controllers on TCP/IP or RS-485, scans all the units defined for any events/alarms, and downloads any settings configured by the operator.		
Software Architecture should store its data in Postegre – SQL Database		
SQL, My SQL, Oracle, Postgre Sql database Integration with 3rd Party Application should support		
Integration with a wide range of devices such as biometric, smart card, PIN and Proximity.		
1024 Acces Level, 100000 person support		
128 Antipass back Rule should support		

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Navigation window to facilitate easily access to employee details, remote controlling of controller operations & operating modes etc.		
Configurable alarm-to-relay linking downloaded to field controllers for local operation		
Configurable automatic, time scheduled report generation and Email		
Communication monitoring, Device Online /offline status on Realtime		
On screen help and /or manual		
Support for different category like employee/ visitors etc.		
Login and authority rights to the software for each operator - User fields updating, deletion & addition		
Should support 10000 user Login and 3000 Roles can be defined		
User defined database fields per card user.		
Access card enable and disable, Expired card deletion		
Database backup, restore, export, import using Password protection		
Access group definition, assignment, activation, deactivation		
It should define different transaction status like access denied, access granted, Egress pressed, invalid time or expiry date for card user, anti-pass back violation etc.		
Export of report to CSV, PDF, Excel format		
Basic Time attendance feautre		
Basic Visitor management feature		
Should have flexibity to add Video Encoding devices , Alarm and Video Intercom devices		
The access control system software shall, as a minimum, support the following features:		
a. User records /events retrieval up to 3 years		
b. 128 time schedules and multiple Shift Capability.		
c. Multiple alarm categories.		
d. Configurable time zone-and Access Level		
e. History/audit trail should support		
f. variable card format defining capability should be there within the system		

Tender Specification for Face Reader			Compliance Y/N
Sr No.	**Technical Specification**		
1	Operation system Linux	Linux	
2	Screen	7 inch touch screen, Ratio: 16:9, Resolution: 1024 × 600	
3	Camera	,2 Mega pixel wide-angle lens, WDR	
4	Fingerprint recognizer	Support	
5	Indicator	Support	
6	Face anti-spoofing	Support	
7	Recognition mode	Face: 1:1 and 1:N, Fingerprint: 1:1 and 1:N	
8	Face capacity	10000	
9	Fingerprint capacity	10000	
10	Face recognition duration	＜ 0.2 s per person	
11	Face recognition distance	0.3 to 3 m	
12	Card capacity	50000	
13	Card type	Support M1 card, Felica card, and DESfire card reading module	
14	Card swiping duration	＜ 1 s	
15	Card swiping distance	0 to 3 cm	
16	Event capacity	1,50,000	
17	Interface	Network × 1, RS-485 × 1, Wiegand × 1, USB × 1, alarm output × 1, alarm input × 2,lock ×1, door contact × 1, exit button × 1, tamper × 1	
18	Network	10/100/1000 Mbps self-adaptive	
19	Wi-Fi	Support	
20	Working voltage	12 VDC/2 A	
21	Working temperature	-30 °C to +60 °C (-22 °F to +140 °F)	
22	Working humidity	0 to 90% (No condensing)	
23	Protection level	IP65	
24	Tamper	Support	
25	Support multiple Face upto 5 People sam time		
26	Adjusts supplement light brightness manually provision should be there		
27	Face recognition should support in dark environment also		
28	Face recognition should happen from distance: 0.3 to 3m		
29	It should support Deep learning algorithm		
30	It should support minimum 10,000 face capacity, 10,000 fingerprint capacity, and 150,000 event capacity		

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31	Should work in Multiple authentication modes	
32	Face recognition duration should have ＜ 0.2 s/User; face recognition accuracy rate ≥ 99%	
33	It should support Imports card and user data to the device via TCP/IP communication	
34	It should support CCTV integration for Capture linkage and captured pictures saving in case of any alarm	
35	Can Connects to one external card reader or access controller via RS-485 protocol	
36	CanConnects to external access controller or Wiegand card reader via Wiegand protocol	
37	Should have option to connects to secure door control unit via RS-485 protocol to avoid the door opening when the terminal is destroyed	
38	Two-way audio with client software, indoor station, and master station	
39	Should support Remote live view via RTSP protocol; encoding mode: H.264	
40	NTP, manually time synchronization, and auto synchronization	
41	Audio prompt	
42	Watchdog design and tamper function	
43	Supports 6 attendance status, including check in, check out, break in, break out, overtime in, overtime out on GUI	
44	Supports multiple languages	
45	Supports Centerlized connection with software	
46	Configuration can be done via web browser	
47	Product Warranty should be minimum 2 Years	
48	System should have CCTV integration, so in case of any event Admin will get the Pop-up in Command room and aligned CCTV should be live	
49	System should support MAP configuration so in case of any event Admin should know the exact place of Event on site MAP	

At present the number of programs may be assumed approx. 20 and it should have expansion modules. There are two major courses – PG Graduate and PhD. There are seven major schools and it may go upto 10 in near time.

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Tentative Requirement for Phase 1 and classrooms details

Teaching Block	Floor	Class Room No	Door Type- Single or Double Leaf	No of Gate	No of FRT Access Control Device=No of Gate	No of EM Lock = No of Door LeafX No of Gate
4	0	1	2	2	2	4
4	0	2	2	2	2	4
4	0	D01	1	1	1	1
4	0	D02	1	1	1	1
4	1	3	1	3	3	3
4	1	4	1	3	3	3
4	2	5	1	3	3	3
4	2	6	1	3	3	3
5	0	1	2	2	2	4
5	0	D01	1	1	1	1
5	0	D02	1	1	1	1
5	1	2	1	3	3	3
5	1	3	1	3	3	3
5	2	4	1	3	3	3
5	2	5	1	3	3	3
6	0	1	2	1	1	2
6	0	2	2	2	2	4
6	0	4	1	2	2	2
6	0	5	1	2	2	2
6	1	6	1	2	2	2
6	1	7	1	2	2	2
					45	54

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