Smart card Implementation in Educational Institutions

Improving performance with RFID-integrated ID cards

A case study of Maria Montessori Central school. India

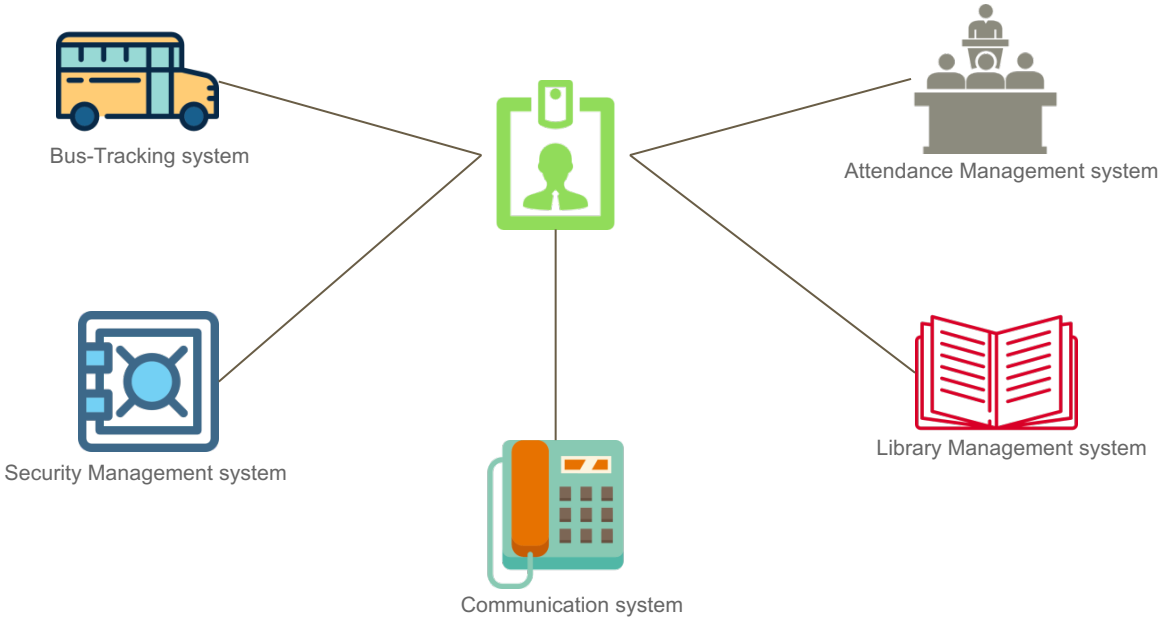
Contents

Organizational Background

Current Technology : Simple barcoded ID cards for scanning at the Security Gate at entrance

Technology Description

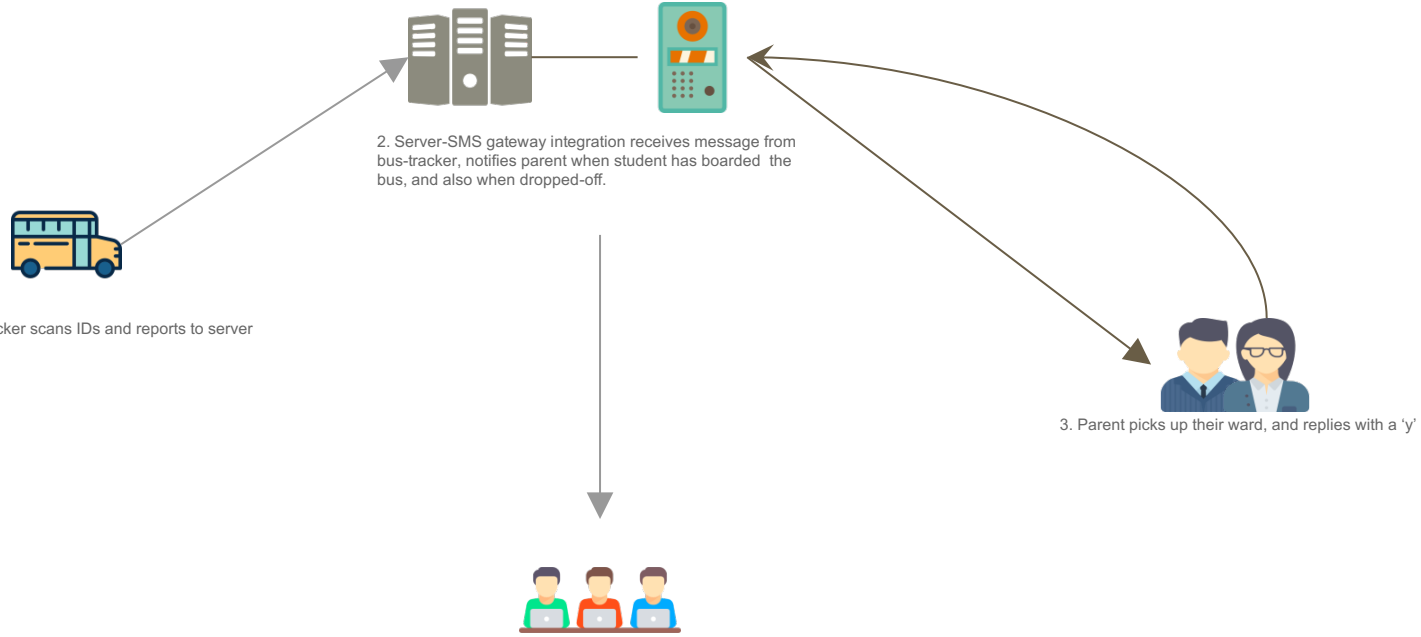
Proposed Technology: RFID-enabled ID cards for students and staff to replace current Barcode Technology



Scope for RFID technology in school units

Uses and Benefits

Bus tracking system



Other Applications

Library Management

-Handle the flow of books out of the library
-Saves time to process information

Attendance Management

- Rapid automated attendance management in classroom
- More time for lecture
- Staff attendance management
- Better resource allocation

Security Management

-helps crowd control
-Event triggering can be utilised to prevent unauthorized access
-track guest movement

Technology Analysis

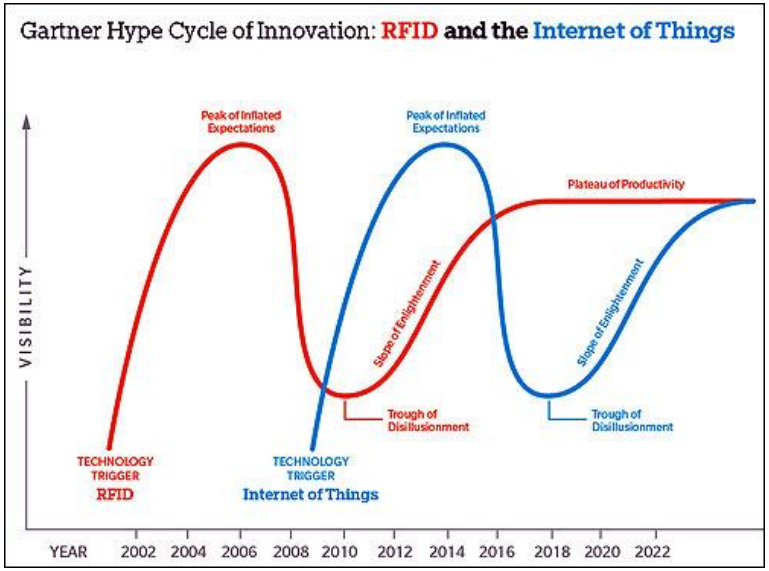
Easy to implement due to already existing underlying IT infrastructure:

1. School Management ERP (Edstem solutions)
2. Centralized Server
3. Communication System (SMS Gateway)
4. Barcode technology 

RFID Technology

Additionally, implement bus tracking hardware, and accommodate the system in the school management ERP

Technology Analysis



- RFID technology is currently entering the plateau of productivity.
- Need to adopt the technology by 2017 to gain a competitive advantage.
- Successfully implemented in various schools globally
- No prominent privacy-related risks of adoption involved in India

Barcode v/s RFID

RFID	BARCODE
• No Line of Sight required (30 ft approx) • Memory storage possible • Read, Write, Update, Modify • Very durable • Completely automated • No human capital, no human error • Several simultaneously scanned • Can cope with harsh environments • High security, allows data encryption • Capable of event triggering	• Requires Line of Sight • No memory storage • Read-only • Easily damaged • Requires manual scanning • Human capital, thus susceptible to error • Only one scanned at a time • Cannot withstand harsh environments • Low security, easily replicated • No event triggering capabilities

Technology Maturity

Current Barcode technology can be completely and easily replaced by the RFID technology.

RFID technology allows additional capabilities like Event Triggering to authenticate access to certain areas

RFID also withstands a considerable degree of wear and tear

Processes automation, thus reduced workforce

Good alternative to cut labor costs and provide real-time data accuracy information for security enforcement -especially for tracking students in buses.

Thus, less investment in hardware, workforce, time to increase overall organizational productivity.

Technology Impacts

Current Barcode System Components

- School Management ERP
- Computers/Laptops
- Communication Gateway
- Barcoded ID cards
- Barcode scanner

RFID-integrated System Components

- School Management ERP
- Computers/Laptops
- Communication Gateway
- Passive RFID enabled ID cards
- RFID scanner
- Bus tracker module

Cost:
$730 per scanner
$3 per ID card
$300 per s/w change

Time:
Installation-2 weeks
Card creation-2 weeks
s/w integration-3 weeks

Operational Risks

Operational Risks:

- Time
- Cost
- Staff conflict
- Stakeholder management

However, adoption has a positive impact on competition thus no significant competitive risks.

Adoption Analysis Summary

Adoption Cost and Value

Barcode Technology
No of ID cards required = 1620
Cost of 1 ID card =$2
Cost =$3240

Workforce to monitor scan=8
Approx cost = $1200

No of barcode scanners =7
Cost of barcode scanners=$40
Cost = $280

Approx 1200 students requested for new ID cards in year 2 =1200
Cost for new ID cards=$2400

Total Cost = **$7120**

RFID Technology (2 year projection)
No of ID cards required = 1620
Cost of 1 ID card =$3
Cost =$4860

Workforce to monitor scan=0
Approx cost = $0

No of barcode scanners =27 (25 buses+2 premises)
Cost of barcode scanners=$700
Cost = $18,900

Durable ID cards, thus no cost of replacement
Software and Hardware installation = $600

Total Cost = **$24,360**

Risks of Adoption

Risk	Likelihood (on a scale of 5)	Approach	Cost to Solve
Time	4	1. Have proper IT planning in place	3 months
Cost	5	1. Obtain government and other private funding for exclusively for technology implementation in schools 2. A small portion of funds can be collected from student fees as monthly installments accounting towards a security-fee	$24,360
Staff Conflict	3	1. Conduct staff meetings to clearly address the areas in which staff would be monitored, and the intentions	NIL
Stakeholder management	3	1. Clearly list out the sources of funding from various agencies, and present it during a stakeholder meeting, and strive to gain support 2. Bring awareness on the impact of RFID technology adoption	NIL

Other Approaches

- Continue using barcode technology - authenticate users manually to enter certain areas by manually scanning the ID cards and allowing access. Risk - Increased workforce, time, cost.

- School bus tracking facility- manually scan student ID cards before entry into bus. Bus attendant is given a hand held device connected to server, to manually enter into the system when the student gets off the bus. Risk- Increased workforce(25 bus attendants), hardware requirements (25 handheld devices), human error, accuracy compromised.

Thus, RFID is a more feasible option that increases the simplicity and accuracy by reducing manual intervention and time.

Thank you!