J CARD

Automatic Fare Collection System for Public Transport in Jabalpur City.
FARE COLLECTION SYSTEM

Electronic Ticketing Machine

Bus conductor using ETM and handling cash

Drawbacks

- Revenue Leakage
- Inconvenient
- User Inacceptance
- Duplication of Passes

PVC Passes

Pass for distinctly able person

A New Fare Collection System is required for Public Transportation in Jabalpur.
VISION OF THE PROJECT

Introducing AFC in public transportation system of city.

OBJECTIVES OF PROJECT

- Introduction of stage based automatic fare collection system in city buses.
- Introduction of card based parking fee collection in city.
- To make it a multi modal mobility card for the city.
- Making J card versatile and can be used to make payments and identity card for residents of Jabalpur.
DIFFERENT FARE COLLECTION SYSTEMS AROUND THE WORLD
AUTOMATIC FARE COLLECTION SYSTEM OF HONGKONG

OCTOPUS
CASE STUDY - HONGKONG

**Mass Transit Railway Cooperation Limited**

- Magnetic plastic card for AFC
- KCRC, KMBC, small scale non-transport applications

**Benefits**
- Reduced cash handling.
- Reduced faulty cash handling.
- Reduced card recycling cost.
- Improvement in overall service quality.
- Positive public acceptance.

**Limitation**
- Limited data capacity - inadequate for further service improvements

**Solution**
- Contactless smart card
- Integrated AFC

**Contactless Smart Card - All Public Transportation**

Octopus
CASE STUDY - HONGKONG

Creative Star Limited/Octopus Card Limited

- Hong Kong Yaumati Ferry (HYF)
- KMB
- KCRC
- MTR

Octopus

Technology
- Sony’s FeliCa
- Contactless
- 13.56 MHz RFID chip
- 212 (kbps)

Stages
- Front End Smartcard Processor.
- Local Data Processor.
- Service Provider Central Computer.
- Octopus Clearing House System.
AUTOMATIC FARE COLLECTION SYSTEM OF LONDON

OYSTER
Oyster

RFID, cloud based, off board smart card AFC system
### LEARNING
- Cost-effective and Convenient.
- Very Fast.
- Contactless.
- Fully integrated.
- Easy to use and versatile.
- Stage based financial settlement.
- Beneficial not only for the PT user but also for the PT operators.

### REQUIREMENT
- High degree of planning and co-ordination
- Consistent design standards and user interfaces
- Flexibility to ensure the particular business requirements of the Operator
- Extensive hardware and software development
# Different Technologies

<table>
<thead>
<tr>
<th></th>
<th>Magnetic Strip Card System</th>
<th>Mobile Phone System</th>
<th>Contactless Cards</th>
<th>Server based contactless cards</th>
<th>Cloud Based contactless cards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data storage</td>
<td>Travel product and available balance</td>
<td>Travel product</td>
<td>Travel Product and data for fare</td>
<td>All data stored in a central server system.</td>
<td>All data is stored in cloud.</td>
</tr>
<tr>
<td>Data updated</td>
<td>Contact with magnetic card writer</td>
<td>Contactless, mobile network</td>
<td>Card Writer</td>
<td>NFC device</td>
<td>NFC device</td>
</tr>
<tr>
<td>Validation</td>
<td>Contact with magnetic card reader</td>
<td>Bar code and QR code validator</td>
<td>Card Reader</td>
<td>Card Reader</td>
<td>Card Reader</td>
</tr>
<tr>
<td>Anti counterfeit</td>
<td>Security against counterfeiting</td>
<td>vulnerable to counterfeiting</td>
<td>Can be protected with some additional features</td>
<td>effective counterfeiting protection</td>
<td>effective counterfeiting protection</td>
</tr>
<tr>
<td>Closed System</td>
<td>Semi-Closed System</td>
<td>Open System</td>
<td></td>
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</tr>
<tr>
<td>Allows commuters to pay a fare and validates their access to travel</td>
<td>Allows commuters to pay a fare, validates their access to travel and also to make purchases.</td>
<td>Allow the user to pay for their travel using their existing credit, debit or pre-paid cards, mobile devices or any other enabled payment media.</td>
<td></td>
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<tr>
<td>Specific and only valid on that transit system.</td>
<td>Versatile.</td>
<td>No need for commuters to carry a transit specific card.</td>
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<tr>
<td>Data is predominately stored on the cards.</td>
<td>Data is stored on either server or cloud.</td>
<td>Back office account-based fare calculation.</td>
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<td></td>
</tr>
<tr>
<td>Lack flexibility</td>
<td>Flexible</td>
<td>More flexible.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Funds are locked up and dormant until needed to pay for a ticket</td>
<td>Funds are can be used to make various types of payments.</td>
<td>Funds are never locked up and can be used to make variety of payment.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Secure, easy to use and have reduced operating costs compared with paper tickets</td>
<td>Flexible secure, easy to use and have reduced operating costs compared.</td>
<td>Flexible, secure, easy to use, lower operational and capital cost.</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
Private Sector Entity

Technology Service Provider:
Manage, as a technology service provider, end-to-end cloud based implementation, operations and maintenance of Prepaid Semi-Closed Payment Instrument ecosystem - including software implementation on cards, front end devices, middleware, back-end system, reporting, MIS.
**Private Sector Entity**

- Bank/payment settlement partner
- AFC Partner
- Lead Bidder

**Government Sector Entity**

- JCTSL
- JMC

- Principal facilitator
- Co-branding partner
- Advocacy with citizens and various establishments like offices, factories, apartments
- Support use of cards for various tax payments, water charges, recreation / library facilities, pay&park, etc
- Promote use of cards through publicity means at its disposal.

**PPP Structure**

- Merchant Aggregator.
- Manage Non-Financial Use Cases.
- Invest in the front-end ecosystem.
- Distribution & Marketing.
- Service Outlets.
- Principal user via city buses.
- Provide 10% discount to customers to encourage use of cashless payments via J-Card RFID cards vs. use of cash based tickets.
- Take financial responsibility for damage to AFC installations due to vandalism or acts of god or acts of its staff / employees.
- Ensure all passes are only on J-Card cards.

- Principal Issuer of financial value on semi-closed prepaid instrument
- Principal Acquirer of transactions on various devices in system.
- Settlement of funds (T+1).
- Facilitate opening of required CBS accounts against proper KYC.
- Payment Gateway services for load of card against credit / debit / prepaid / wallets.
Public Sector Entity

Private Sector Entity

Government Sector Entity

Private Sector Entity

JMC

JCTSL

AFC Partner

Bank/payment settlement partner

Lead Bidder

Public Private Partnership

User Fee Based Built, Operate and Transfer type.

Public Service:

1. Automatic Fare Collection in Public Transportation
2. Paying for Parking Lots
3. Entries in Gardens and Parks
4. Municipal Taxes
5. Paying for Public Utilities
6. Bill payments in retail shops
J CARD - AUTOMATIC FARE COLLECTION SYSTEM IN PUBLIC BUSES
PREPAID SYSTEM

Semi-closed, Stage based, prepaid System

Online mobile wallet with 2-F authentication

Offline RFID card and Online Mobile Wallet

RFID Customer Card & NFC Merchant Device

Free funds transfer
SETTLEMENT FLOW

JCTSL

SI

ESCROW

Operators

J CARD

Technology

Scosta CI

Contactless

RFID chip.

64kb

Stages

Front end smartcard processor

Data on cloud

Wallet
PRESENT SCENARIO

Implementation as passes in city buses and at ISBT.
J CARD IN CITY BUSES

J Card as passes
All the city buses passes have been converted into JCARD.

Convenient and beneficial as passes can be renewed on same card.

More than 4000 cards are in circulation.
J CARD AT ISBT
For vehicular parking
Convenient and Secure parking system for operators, public and beneficial for authority.

Total 2000 cards have been issued and 1600 are the daily users.

J Card as parking token, totally paper-free parking system
CHALLENGES

- Phase I - ISBT Parking System
  - Initial inacceptance by operators.
  - Technological difference between BTMS of ISBT and JCard.
- Phase II - Conversion of existing bus passes
  - Device handling and inacceptance by conductors.
  - Backend system (types of passes, reissuance, renewal).
- Maintaining transparency

INTERVENTION

- Capacity building and training:
  - Conductors
  - Ticket Checkers
  - Operators and issuer
  - Parking operator.
- Customization of Front End devices.
  - Parking tokens.
  - Customized ETM machines (still to be finalized).
- Customization of backend system.
  - Integration of different systems.
  - Policy for passes (issuance, renewal, backdate issuance etc).
- Data Management.
CARD INSPECTION ON CITY BUSES
BENEFITS

- Reduced card recycling cost (from 300 rs per person per year to 85 rs per person per year).
- 100% reduction in card duplicity.
- Reduction in cash leakage.
- Increased transparency and accountability.
- Increased security and reliability.
WAY FORWARD

- Wallet Launch.
- Development of wide network of J Card issuance centres (shops, kiosks, public places, government department, etc).
- Phase III - Launch of AFC on all route
  - Banking Partner, present financial.
  - Development of front end devices (According to NPCIL guidelines).
- Revival of financial model.
- Integration with all the municipal corporation payment system.
THANK YOU