No. K.14011/24/2012-UT-I (Pt.III)
Government of India
Ministry of Urban Development
Urban Transport –I Desk

Nirman Bhawan, New Delhi
15th February, 2016

OFFICE MEMORANDUM

Sub: Minutes of the roundtable discussion held on 03.02.2016 at New Delhi for acceptability of the standards & specifications of National Common Mobility Card (NCMC) - regarding.

The undersigned is directed to forward herewith Minutes of the roundtable discussion held on 03.02.2016 uner the chairmanship of Additional Secretary (Urban Development) in New Delhi for the acceptability of the standards & specifications of National Common Mobility Card (NCMC) prepared by NPCI for information/further necessary action.

Encl: As above.

(Pankaj Kumar)
Under Secretary to the Govt. of India
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E-mail: pankaj.kumar75@nic.in

1. National Cyber Security Coordinator (Dr. Gulshan Rai), National Security Council Secretariat, 3rd Floor, Sardar Patel Bhawan, Parliament Street, New Delhi, Telefax 23747965 email: ncsc@gov.in
2. Joint Secretary (Shri Rajesh Aggarwal), Department of Financial Services, Ministry of Finance, New Delhi.
3. DDG (Shri B.N. Shetty), NIC, Department of Electronics and IT, Electronics Niketan, 3rd Floor, CGO Complex, New Delhi (Tel:24305199, Fax: 24360020), E-mail: bnshetty@nic.in
4. Dr. (Prof.) Rajat Moona, Director General, C-DAC, Pune.
5. MD, National Payments Corporation of India (NPCI), 13th Floor, R-Tech Park, Nirlon Complex, Off Western Express Highway, Goregaon (E), Mumbai – 400063, skgupta@npci.org.in
6. Shri Shashi Verma, Director (TfL), ShashiVerma@Tfl.gov.uk
7. Head, Electronics & IT, BIS.
8. The Managing Director, Delhi Metro Rail Corporation Ltd., Metro Bhawan, Fire Brigade Lane, Barakhamba Road, New Delhi-110 001.email: prashantrao@dmrc.org
9. The Managing Director, Chennai Metro Rail Ltd., Admn. Building, CMRL Depot, Poonamallee High Road, Koyambedu, Chennai-600107.
10. The Managing Director, Bangalore Metro Rail Corpn. Ltd., 3rd Floor, BMTC Complex, K.H. Road, Shanthinagar, Bangalore-560 027. Email: Shankar@bmrc.co.in,

Contd...2/-

11. The Managing Director, Kochi Metro Rail Ltd.,8th Floor, Revenue Tower, Park Avenue,Kochi-682 011.Kerala.
12. The Managing Director, Hyderabad Metro Rail Ltd., Metro Rail Bhawan, Saifabad, Hyderabad-500 004.
13. The Managing Director, BMTC.
14. The Managing Director, DTC.
15. Ms. K. Vijaylakshmi, Additional Chief (Metro Mono & UMTA), MMRDA, Mumbai.
16. Mr. D Mohanty, CGM (New Business), State Bank of India, cgm.newbusiness@sbi.co.in
17. Mr. Siddharth Mehta, VP, Axis Bank, siddharth4.mehta@axisbank.com
18. Mr. Kusal Roy, GM- Payments & Unsecured Loans, ICICI Bank, kusal.roy@icicibank.com/roy.sudipta@icicibank.com
19. MD, DIMTS, Kashmere Gate, New Delhi. m.ramsekhar@dimts.in/ manish.kumar@dimts.in
20. Mr. Ted Archer, Alliance Management, EMVCo. Sectt., ted@alliancesmanagement.com
21. Senior Consultant (Shri Manish Choffle), Ernst & Young Pvt. Ltd. Ey, HT House, 18-20 Kasturba Gandhi Marg, New Delhi 110 001.

Copy to:

1. PSO to Secretary (UD), MoUD.
2. PPS to Addl. Secretary, MoUD.
3. PPS to OSD (UT) &EOJS.
4. PS to Dir (UT-I).
5. Director (NIC) to upload on the MoUD's website.

Minutes of the roundtable discussion held on 3rd February, 2016 at Nirman Bhawan, New Delhi under the chairmanship of Additional Secretary (Urban Development) to discuss the draft 'Standards & Specifications of the National Common Mobility Card (NCMC)' prepared by the National Payments Corporation of India (NPCI)

List of the participants is at **Annex-I.**

2. After welcoming the participants, AS (UD) shared with the participants the background of the NCMC and action taken by the MoUD so far. He thanked Dr. Gulshan Rai, NCSC from National Security Council Secretariat (NSCS) and Shri Shashi Verma, Director from Transport for London (TfL) for sparing their valuable time for attending the meeting.

3. The participants were briefed about the discussions held on January 6 & 7th 2016 convened by MoUD to obtain the feedback on process of developing specifications for NCMC and way forward.

4. It was conveyed to the participants that the purpose of the roundtable discussion was to chalk out the path for rolling out of the specifications of NCMC and resolve any further issues which the stakeholders may have. Thereafter, Shri S.K. Gupta, CPO, NPCI made a presentation on the 'Standards & Specifications' being developed by them and Shri Shashi Verma shared the features of the mobility card being used in London.

5. Mr. Gupta in his presentation stated that the specifications developed by NPCI, support both - stored value card and account based transaction. He stated that this hybrid model is more suitable for India. He also stated that, in future, NFC mobile based transaction will also be possible as per these specifications. A copy of the presentation made by Shri S K Gupta is attached as **Annex-II**.

6. Shri Shashi Verma, Director of Customer Experience, Transport for London made a detailed presentation on the mobility card being in operation in London. A copy of the presentation is attached as **Annex-III**. Summarising his presentation, he stated that there is a need to take a holistic approach towards business design before finalising the technical specification of the Card. In this exercise, one should first point out what is the requirement in Indian perspective and what is being designed. The banks cannot perform the role of an operator. The banks can at the most share the burden. As single journey is going to remain in India so we have to continue with the token system also. He stressed that business design should come before technical expectations and technology questions should start with the widest possible net being cast.

7. Dr. Gulshan Rai, National Cyber Security Coordinator (NCSC) stated that before accepting the Standards & Specifications of the NCMC we should try to find out whether we want that the card should be used across the various disciplines / sectors or we should go for one sector and thereafter extend it to other sectors in the country. Financial institutions may be one of the principle stakeholders but it cannot be the primary stakeholders. He stated that he supports the views/ suggestions given by Shri Shashi Verma in his presentation. These questions raised by Mr. Verma need be considered before rolling out the specifications.

8. Dr. Rajat Moona said that EMV specifications are standards and if we add to these specifications, they no more remain the standards. It was mentioned that we can have our own Standards, why can't that be EMV plus. Further BIS representative said that standards can always be updated. We have to see whether these are implementable and fulfil our requirements.

9. Representatives from ICICI bank requested the chair that a separate meeting should be convened with the bankers to discuss the risk management part of the Card. However he said that ICICI bank can support the account based system if a cover of deposit of Rs 200 approx. is provided in the account.

10. Representative of SBI Bank said that banks can be a part of a solution to the mobility issue, they can complement the operator. The banks should not be the primary players. He also mentioned that EMV is not static but an evolving standard. They supported the views of Shri Shashi Verma and the TfL model.

11. The World Bank representative stated that we should first seek opinion of the operators what they want from the NCMC. Whether they have any objection that should be cleared because they are the main stakeholders who have to implement and make the Card successful. She offered that the World Bank is ready to facilitate MoUD and NPCI for TfL association for design architecture of the Card.

12. Representative of DIMTS stated that regarding bus operations GPRS connectivity will remain an issue in the near future too. Hence tap n go facility may not be successful on bus operations. The fare policy in buses is different from the Metros. There are so many passes and concessions to the different category of passengers. Bus travel is not a direction oriented like metros. As the bus transport is heavily subsidised and the cost of the ticket is from Rs.5 to Rs.15, in this scenario what will be the motivation for the commuters to buy the cards having a reserve of Rs.200/300 in bank account.

13. Representative from Verifone stated that the new terminals being deployed by BMTC for Bangalore are all contactless. Also nearly all acquirers are favoring new deployments of terminals are contactless. In future, the terminals will also accept transactions through NFC enabled mobile phones. The NPCI specifications support both stored value and account based transactions and determination of card specifications can be made as required by evolving market requirements. Terminals will support both specifications.

14. NPCI stated that the standards & specifications have been prepared on the guidance and directions of the Govt. of India. It is based upon the stored value feature and is a futuristic model also. We have kept the option open as it supports both EMV and EMV+ specifications. In various meetings with the stakeholders, they have agreed to adopt the same model.

15. AS (UD) concluded the meeting with remarks that the Govt. of India's approach is to prepare such a specification wherein any bank / operators / Govt. and Non-Govt. agencies etc. can equally participate in a transparent manner and the system should be robust and scalable. There is no point in manufacturing an item which cannot be sold in the market. He requested NPCI to consider using the expertise of Shri Shashi Verma from TfL to synthesize and documentise the specification so that the Card should be developed without any security and business concern and it should be a simplified card from the customer perspective. He further stated that NPCI should find out answers to following questions regarding EMV+ card:

(i) Why should banks adopt this EMV+ card?

(ii) Why should the transport operator adopt this card? Will it be secure and cost effective to the operator?

(iii) Why should customer have this card? Will it be secure and cost effective to the customer?

(iv) What value NPCI will offer to all the concerned stakeholders?

(v) NPCI should prepare a logic flow chart of all the activities to be performed while the card is used in the system.

16. There being no other item, the meeting concluded with vote of thanks to the Chair.

*****

ANNEX- I

List of participants of the Round Table discussion held on 03.02.2016 at 10.30 AM at Conference Room (Room No.123-C), Nirman Bhawan, New Delhi under the chairmanship of Additional Secretary (Urban Development) regarding acceptability of the standards & specifications of National Common Mobility Card (NCMC).

S.No.	Name & Designation, Organization	
1.	Shri D.S. Mishra, Additional Secretary, MoUD	Chairman
2.	Shri M.K. Sinha, OSD (UT) & EOJS, MoUD	
3.	Shri R.K. Singh, Director (UT-I), MoUD	
4.	Shri A.A. Rao, ADG (Media), MoUD	
5.	Shri Pankaj Kumar, US (UT-I), MoUD	
	NSCS	
6.	Dr. Gulshan Rai, NCSC	
7.	Col (Retd) S.C. Tyagi	
	Special Invitee	
8.	Shri Shashi Verma, Director of Customer Experience, Transport for London	
	NIC	
9.	Dr. B.N. Shetty, DDG, NIC	
	C-DAC	
10.	Dr. Rajat Moona, DG	
11.	Dr. Mahesh Chandra	
12.	Shri Shivraj Dagaoi	
13.	Ms. Savita Kashyap, Joint Director	
14.	Shri V.B. Taneja, Consultant	
	DMRC	
15.	Shri Prashant Rao, Executive Director	
	MMRDA	
16.	Ms. K. Vijaya Lakshmi, Addl. Chief (Metro, Mono, UMTA)	
	KMRL	
17.	Shri Arun Kumar, Addl. GM (F&IT)	
	APSRTC/CIRT	
18.	Shri Y. Srinivasa Rao, Senior Manager	
	DIMTS	
19.	Shri Manish Kumar	
20.	Shri Pushpinder Singh	
	NPCI	
21.	Shri S.K. Gupta, Chief Project Officer	
22.	Shri Sanjay Chandak, AVP	
23.	Shri Vipin Surelia	
24.	Shri Ashish Kar	

25.	Shri Shantanu Shike
26.	Shri Manish Choffle, EY
	BIS
27.	Shri Narendra Singh, Head (Electronics & IT)
28.	Shri Manikandam, Scientist 'C'
	Axis Bank
29.	Shri Siddharth Mehta, VP
30.	Ms. Daisy Fernandes, AVP
	ICICI Bank
31.	Shri Sudipta Roy, Joint GM
32.	Shri Inderanil Ghosh, JGM
33.	Shri Aseem Goel, Chief Manager
	State Bank of India
34.	Ms. Manju Agarwal, DMD(CSNB)
35.	Shri Ravi Prakash, CGM (New Business)
36.	Shri Sagar Mazumdar, DGM
37.	Shri Harsh Srivastava, GITC
	VERIFONE
38.	Shri Vinayak Prasad
39.	Shri Sankar Kumar
	Others
40.	Ms. Rakhi Basu, World Bank
41.	Shri Ravi Jain, PayCraft, Mumbai
42.	Shri Johny Cheg, Payment Consultant, Gemalto Ltd.
43.	Shri Atul Singh, Regional Sales Director, Gemalto Ltd.
44.	Shri Prakash S. , Vice President, FIME
45.	Shri Shankar U., Project Head, FIME
46.	Ms. Bhavna Gandhi – Sabti, Account Manager, Consult Hyperion
47.	Shri Alex Lithgon Smith, Senior Consultant, Consult Hyperion

Annex-II

04-02-2016

NPCI
भारतीय राष्ट्रीय भुगतान निगम
NATIONAL PAYMENTS CORPORATION OF INDIA

RuPay

National Common Mobility Card

I Pay with RuPay

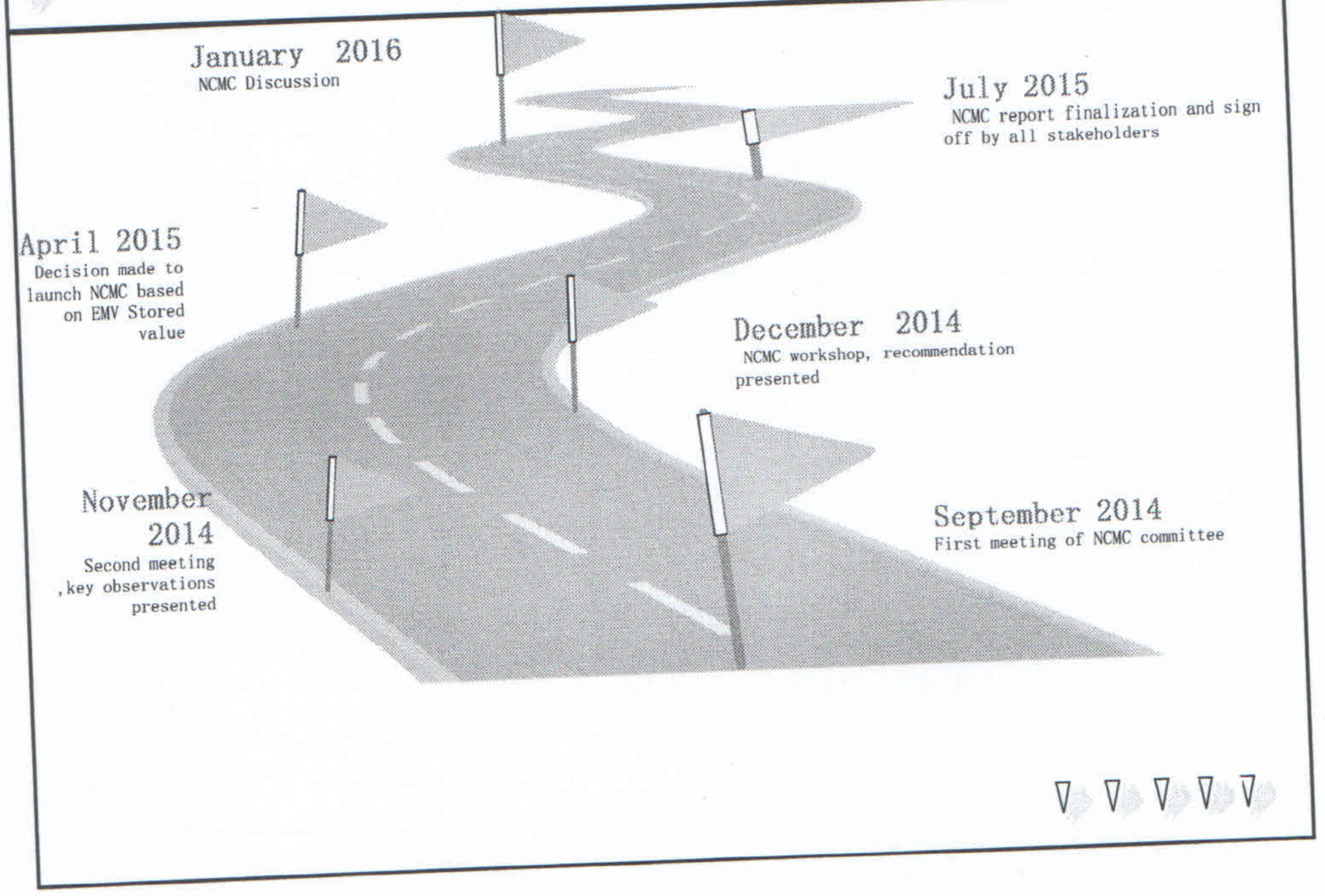
Background

NPCI
भारतीय राष्ट्रीय भुगतान निगम
NATIONAL PAYMENTS CORPORATION OF INDIA

- The Ministry of Urban Development (MoUD), Government of India, envisaged the development of an interoperable cashless fare payment mechanism for transit
- A committee constituted under the chairmanship of Shree D.S. Mishra, AS, MoUD, also consisting of NPCI, leading banks, transit operators, CDAC, DFS, Visa
- Various existing models such as closed loop models (Octopus, Oyster), EMV account based model (TFL), EMV open loop with stored value model were deliberated upon
- The committee considered all possible models, discussed pros & cons of each such model and made the following key recommendations –
  - Choose an EMV open loop model that supports stored value, pass and single ticket transit transactions
  - Engage an indigenous domestic payment card network for developing the ecosystem
  - Initiate the work on designing the metro gates/ validators by CDAC indigenously to minimize the dependency on international players
  - Dedicate the standards and specifications to the Nation
  - Align the system with other Government initiatives such as Make in India, Design in India, Pradhanmantri Jan Dhan Yojna and Aadhaar based eKYC
  - Enable 'Off-Us' transactions in the transit eco system
  - Initiate regional pilots initially, with local transit operators In due course, ensure single common card (i.e. NCMC) acceptance across all PTOs, other transit modes, retail networks and e-commerce

NCMC Key Milestones

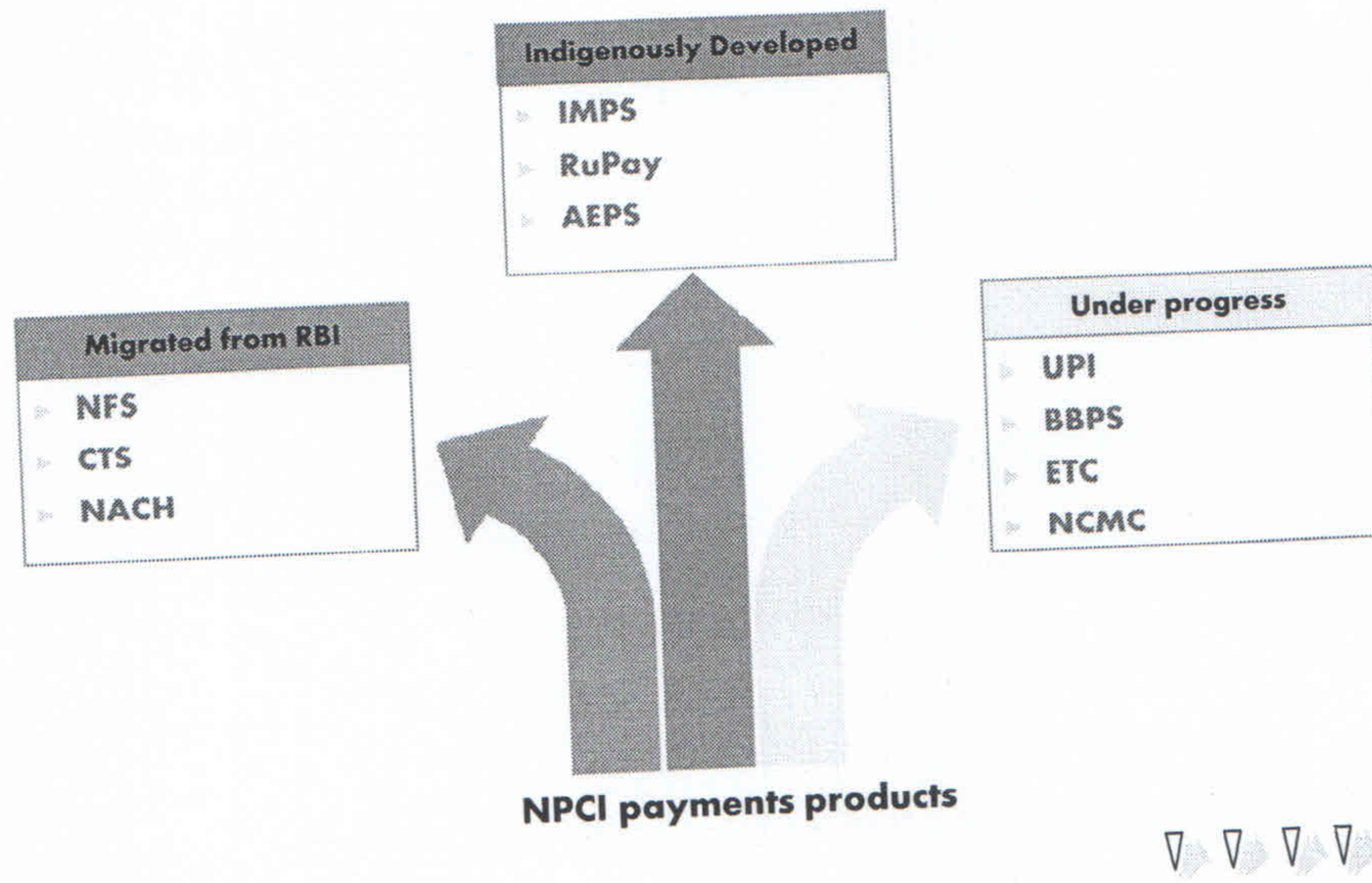
NPCI भारतीय राष्ट्रीय भुगतान निगम NATIONAL PAYMENTS CORPORATION OF INDIA



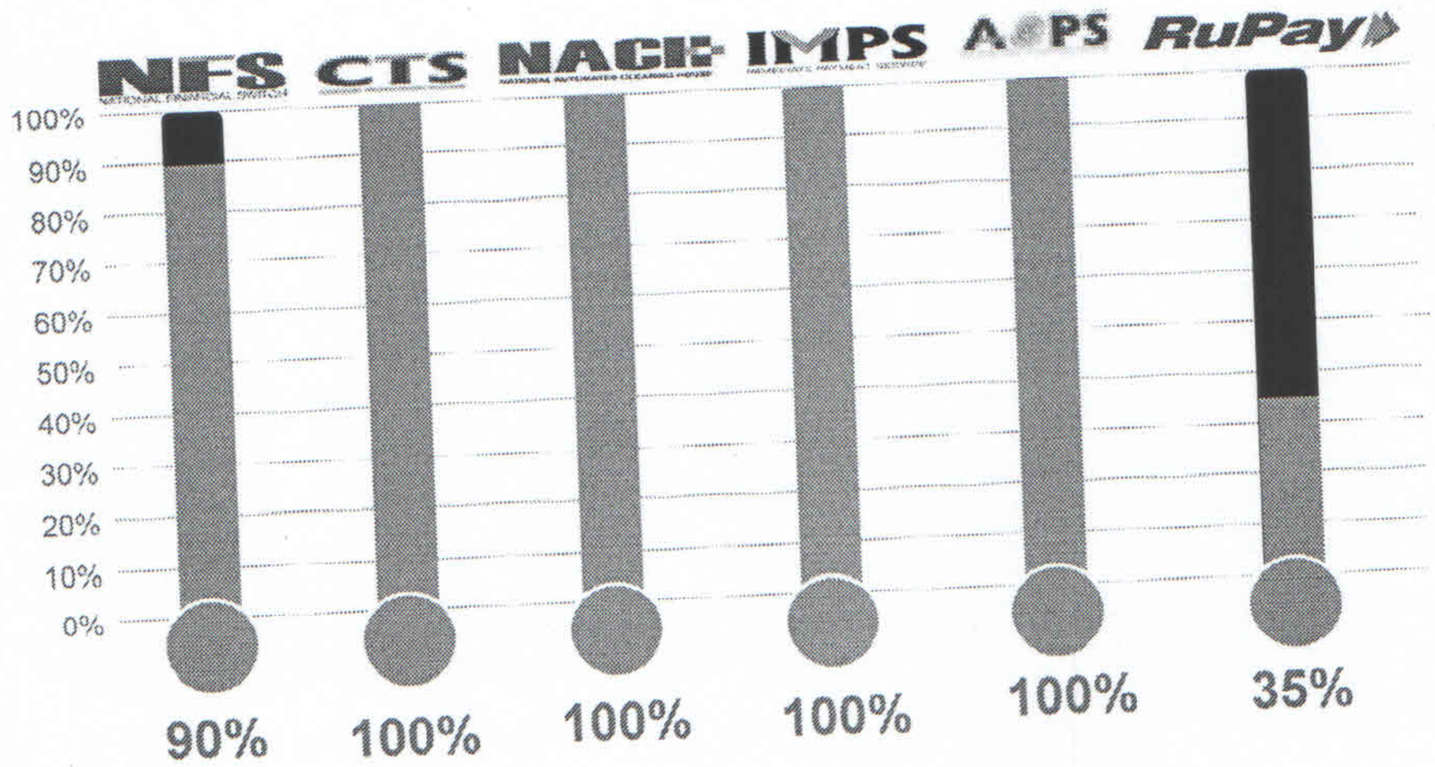
National Payments Corporation of India

Umbrella organization for retail payments in India

NPCI भारतीय राष्ट्रीय भुगतान निगम NATIONAL PAYMENTS CORPORATION OF INDIA

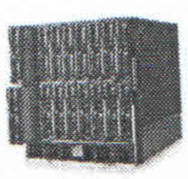


Market Share



Robust and Scalable Systems

Installed capacity of 50 mn daily online transactions
Currently process 15mn online transactions daily



Network uptime – 99.999 %
Aggregated downtime : 21 min. in last 3 years

Installed capacity of 40 mn daily offline transactions
Currently process 5mn offline transactions daily

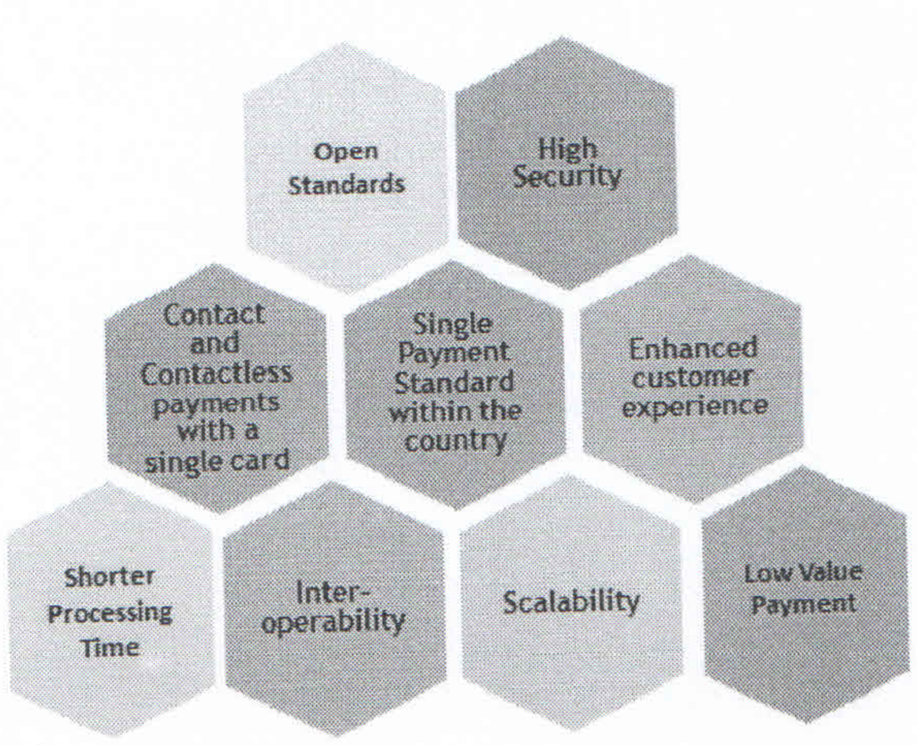
Certifications –

- **PCI – DSS**
- **ISO 9001**
- **ISO 27001**
- **ISO 22301**

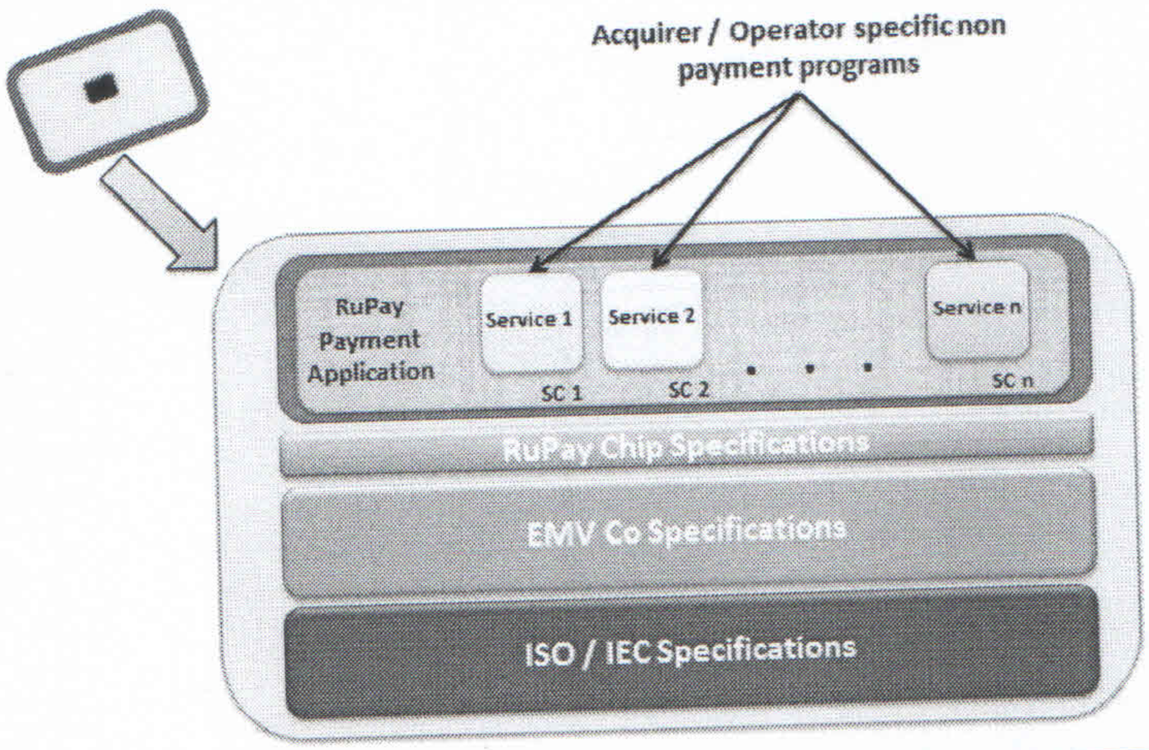
All certificates obtained in 2014 and valid till 2017

NPCI infrastructure - State of the Art, Scalable, robust

Key Objectives of qSparc



The Architecture



Single Contactless Product catering to retail payment and transit. Product is scalable to support many other business use cases

04-02-2016

Key Features

NPCI
भारतीय राष्ट्रीय भुगतान निगम
NATIONAL PAYMENTS CORPORATION OF INDIA

1 Versatile

Supports both **Account based** and **Card based** payment models

2 Transit

Cashless and contactless ticketing across various transit operators

Performance <500 mSec using PKI and symmetric key mechanism

3 Service Area

Reserved space on card for acquirer / operator specific program implementation

-Closed / open / semi closed loop implementation

4 Multi-level Wallets

qSPARC spec. supports creation of wallets in the card at two different levels - Global and Local

5 Standard Payment

EMV based Contact and Contactless Payment transactions supported

The Spirit of NCMC Mandate

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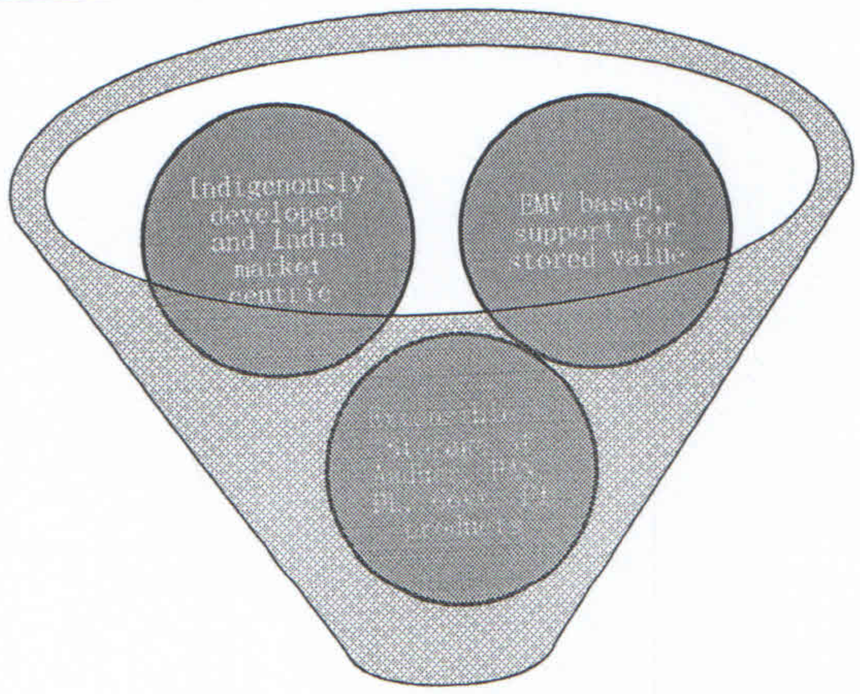
NATIONAL PAYMENTS CORPORATION OF INDIA



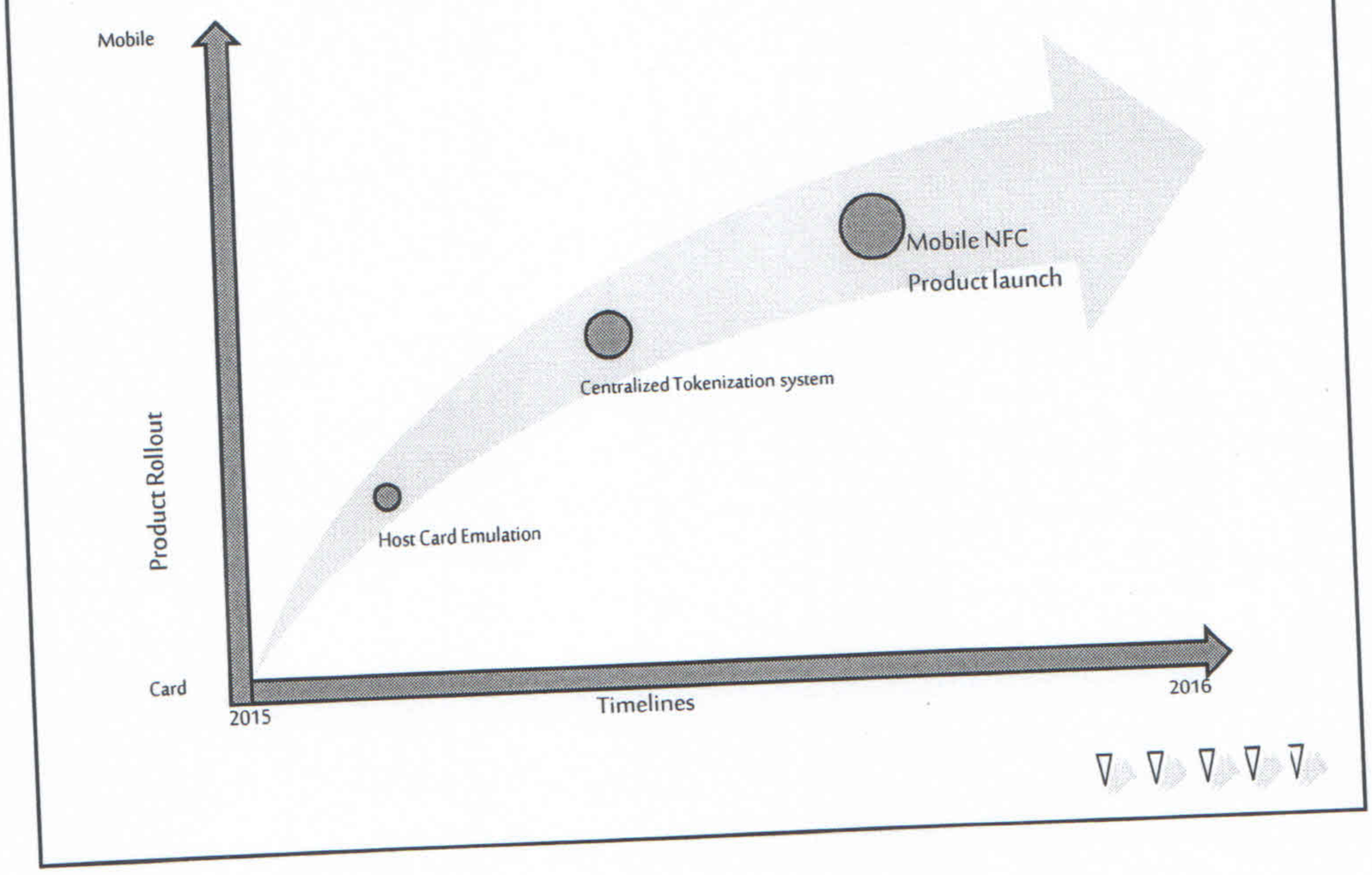
NCMC specification
EMV +
Support for local services
Wallets
Passes

Account based vs Stored Value

Account Based Model	Stored Value
➢ Account balance and pass info maintained only at the backend.	➢ Account balance and pass info also stored in the card
➢ Debit for transit at the back end. Passenger allowed to travel pending balance validation	➢ Debit for transit from the card itself. Passenger can't travel if balance not available
➢ Depends on reliable, persistent network connectivity since amount check done at the back-end	➢ No network connectivity needed for card authentication or amount authorization. Both done simultaneously at the terminal
➢ Liability and risk shared by banks	➢ Low risk and liability on banks for delinquent transactions
➢ More suited for mature markets with reliable network connectivity and higher risk appetite	➢ More suited for developing markets with unreliable network connectivity and low risk appetite
➢ More suited for credit cards based market or with markets having a significant data on customers	➢ Suitable for all kinds of markets including prepaid centric markets with low customer data
➢ Individual investments needed by the transit operators to manage the back end	➢ No such additional overheads, central agency manages the back-end
➢ Current popular implementations require support for multiple kernels, business arrangements, operational arrangements with multiple payment schemes	➢ Proposed model on standard specification involving single kernel, single set of busness arrangements and operational arrangements with a single network

NPCI Specifications support both Card based and Account based model

NFC – Strong tailwinds of growth



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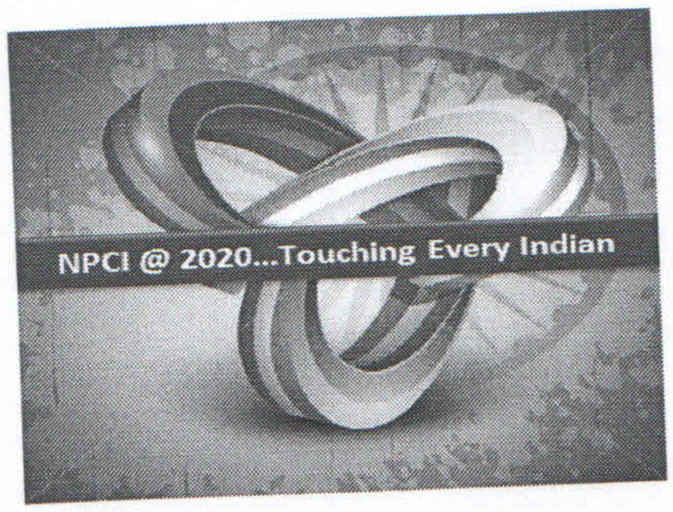
NPCI aims to touch

every Indian by 2020 with

one or the other electronic payment product

and support the

RBI's Vision of a "Less Cash" society



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Annex-III

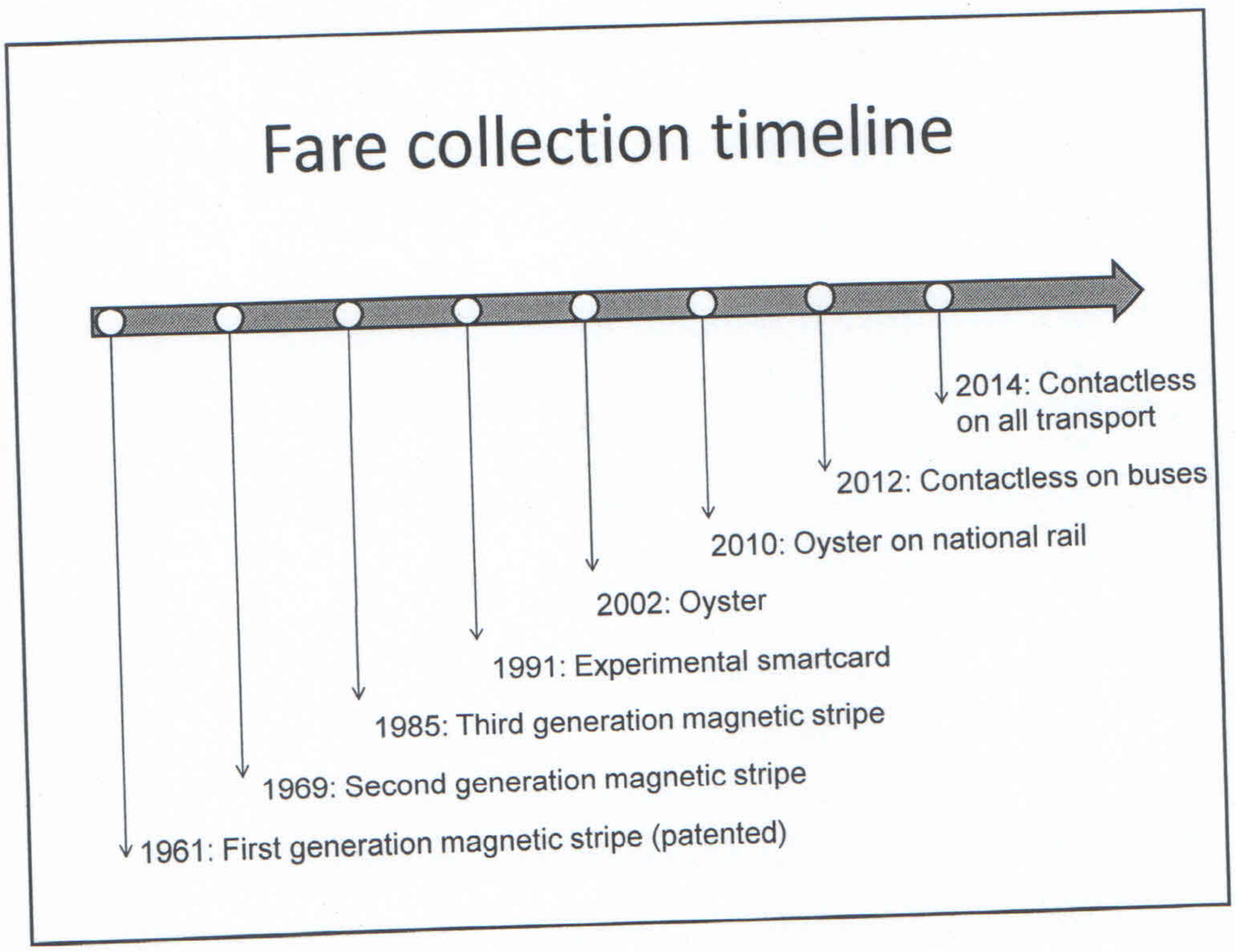
2/4/2016

National Common Mobility Card
Learnings from London

Shashi Verma

Director of Customer Experience

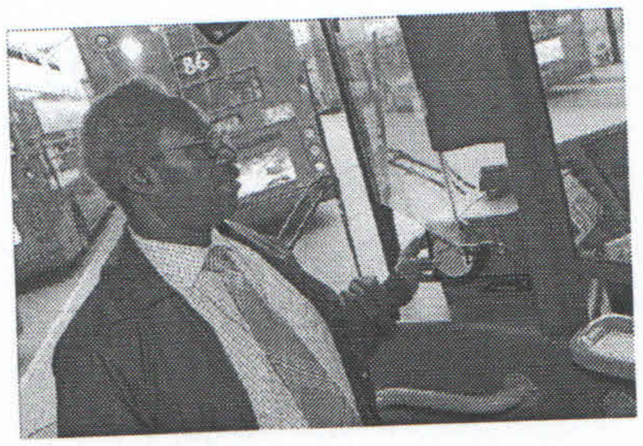
Transport for London

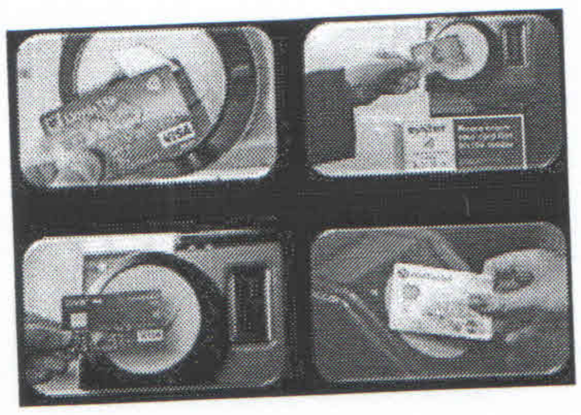


Where are we today?

Oyster delivered and hugely successful

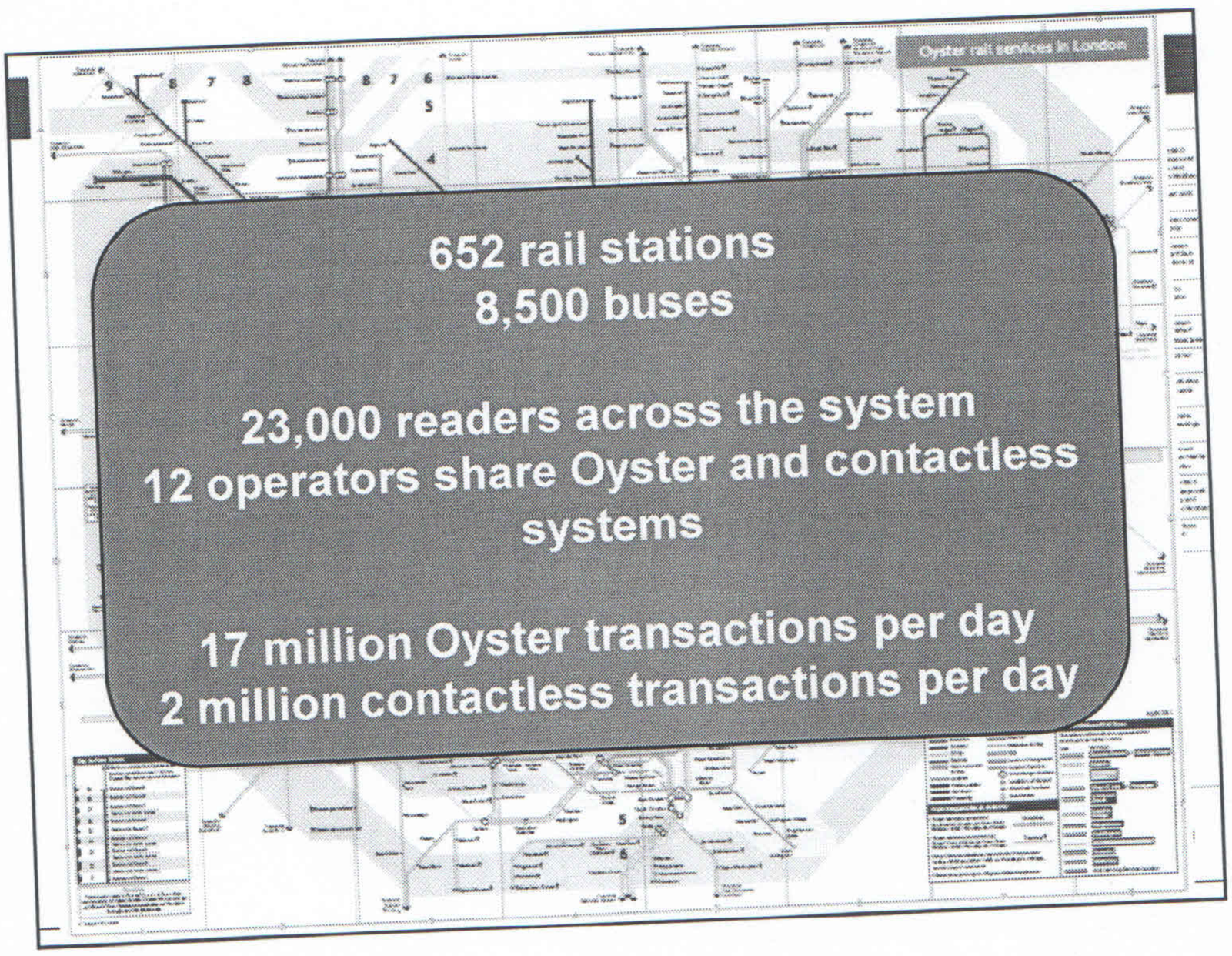
- No more paper tickets on buses
- Transport integration across London with Oyster on national rail since 2010



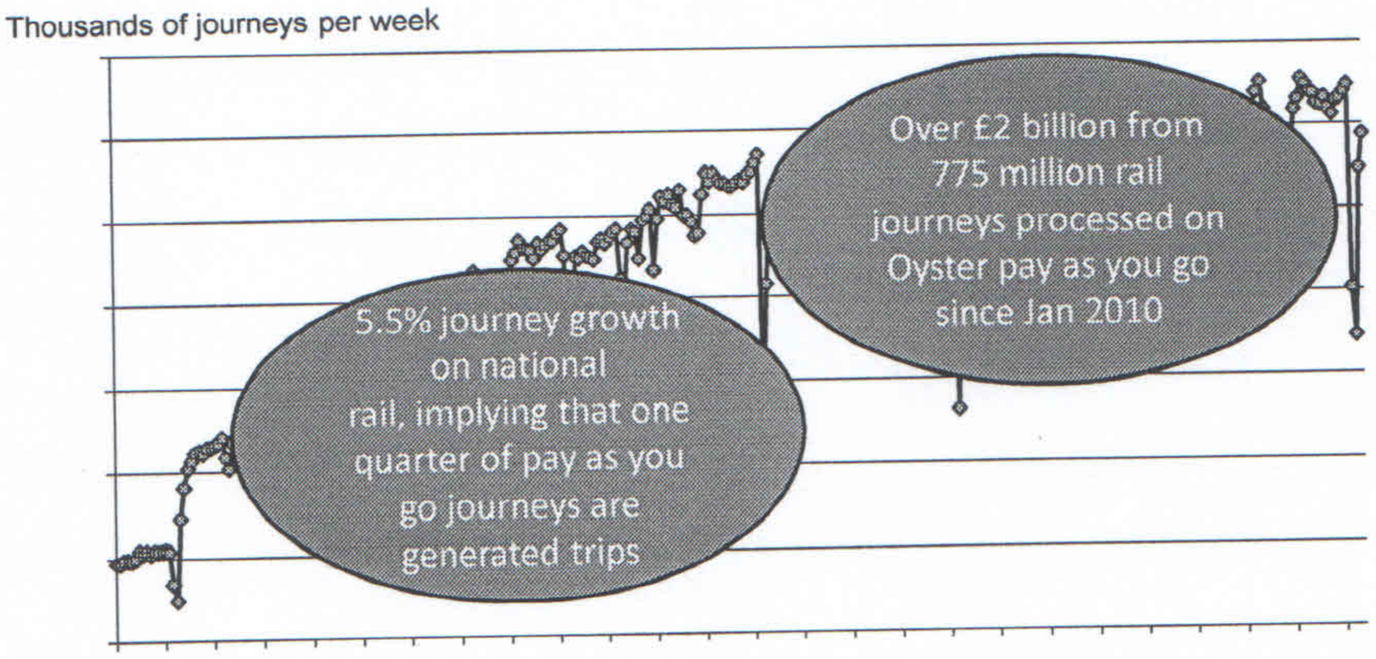


Contactless payments accepted everywhere in London

- 25% of pay as you go journeys
- Over 9 million cards used
- 25,000 new users every day



Spread of Oyster on national rail



Oyster success factors

Clear business need

Simple "Best Value" promise to customers

All value on card underwritten by TfL

All technology controlled and guaranteed by TfL

Complicated technology invisible to customers

Works on 12 operators but run by one organisation

All of the above leading to **trust**

Oyster: basic systems

Pay as you go
Capping
Passes (zonal)
Passes (modal)
Discounted products
Free products

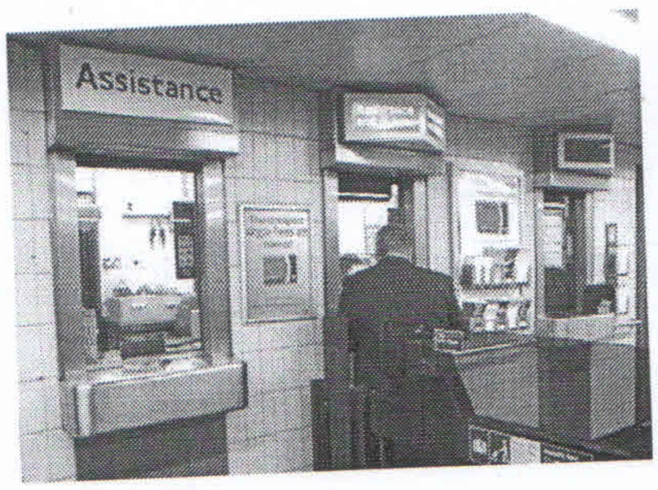
Valid on:
- Underground
- Overground
- National rail
- Buses
- Trams
- Light rail
- River boats
- Cable car

£

Reconciliation
Accounting
Settlement
Clearing

But... Challenges remained

- **Despite the visible success of Oyster, ticketing is still a difficult business model**



- **Need to think from first principles about models for revenue collection**

Open loop cards

Proposition
Bank/credit company issued
Money comes from bank account
No data on the card

Advantages
No retail
- No need to issue card
- No need to top up

Challenges
Can we make the technology work at required speed
How do we compute fares with no data on the card
How do we manage risk of non-payment

Retail transaction model

Individual transaction < £30
Cumulative transactions <60

Yes → **Approved**

No →

Banks take liability for up to £60 of unauthorised spend

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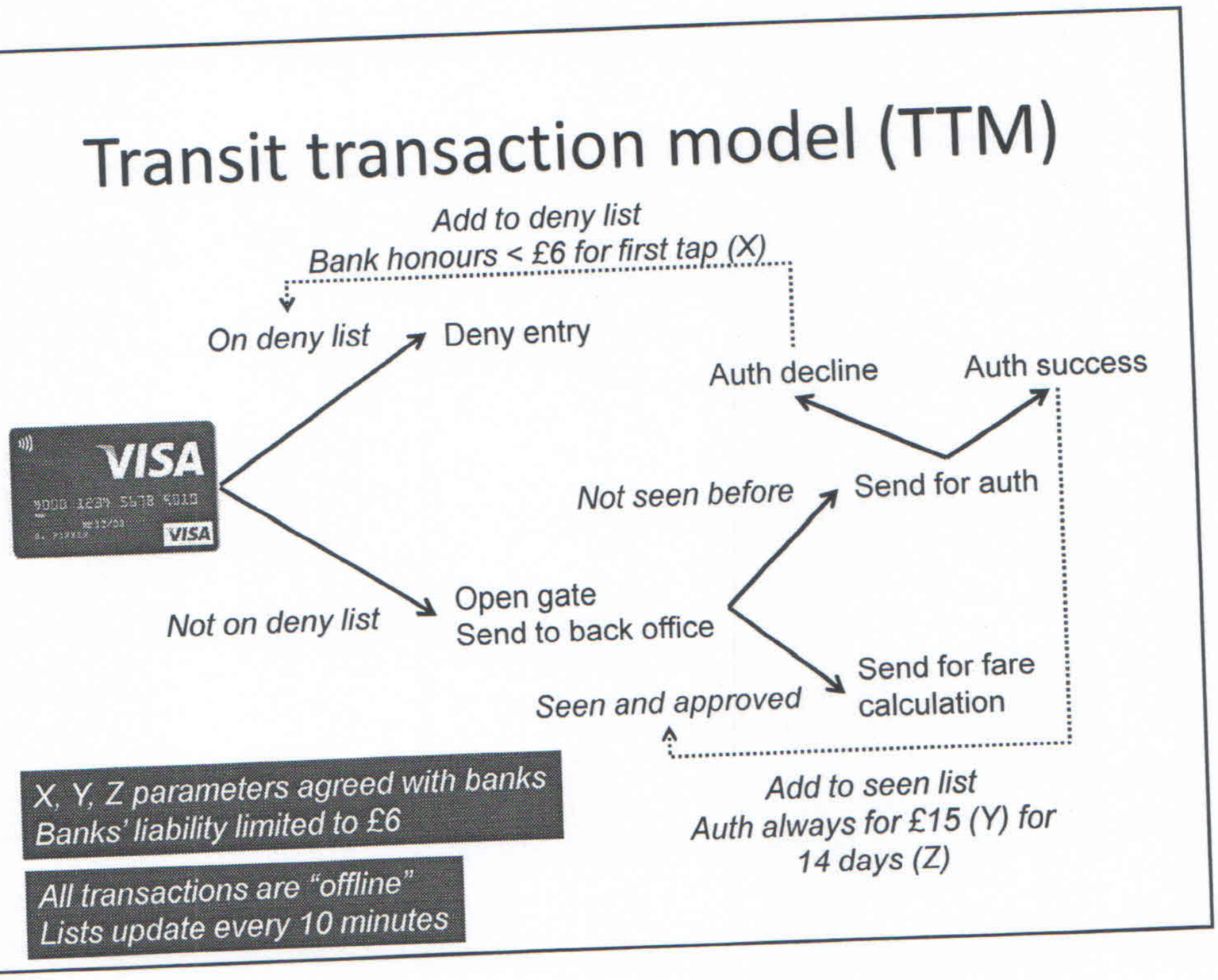
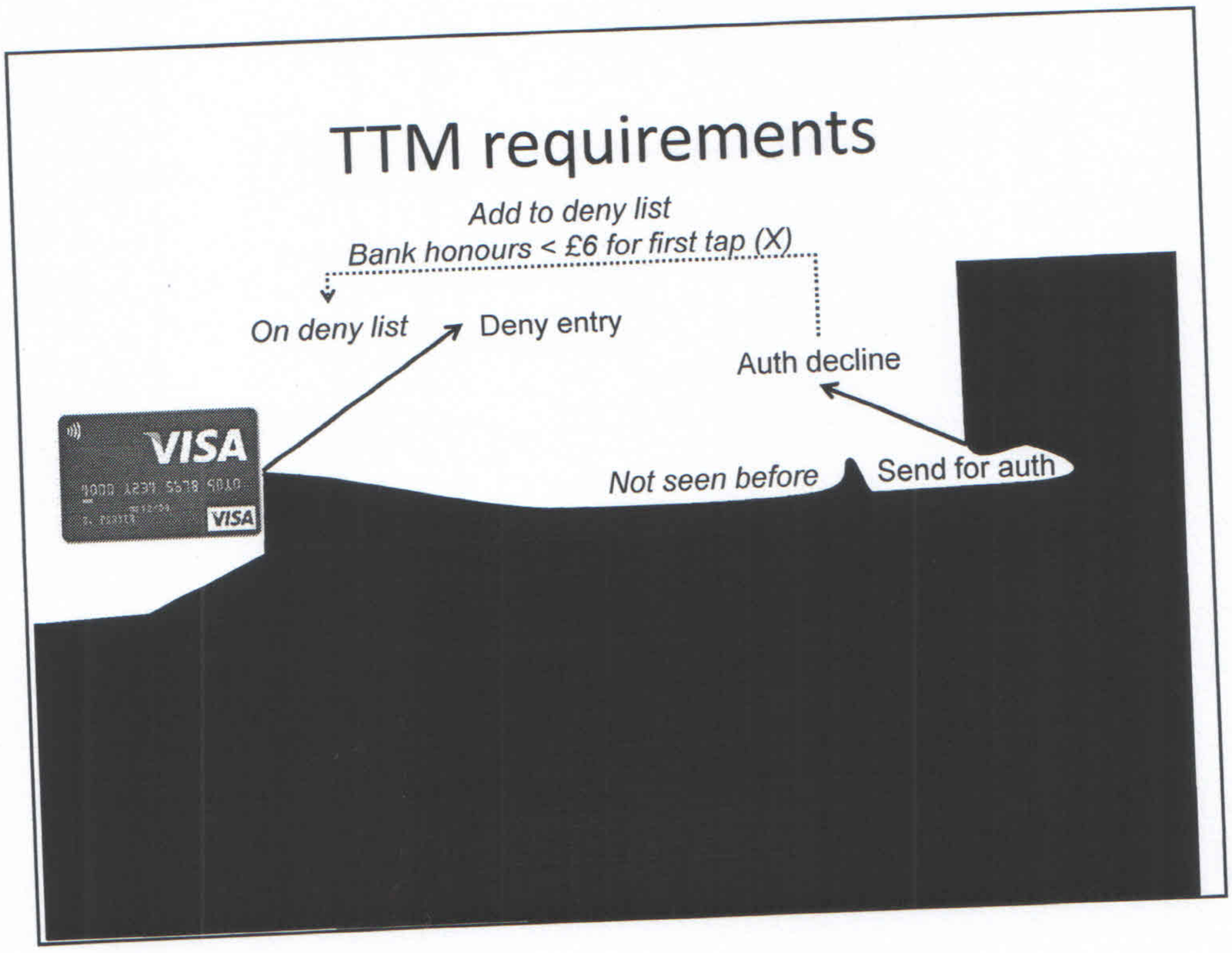
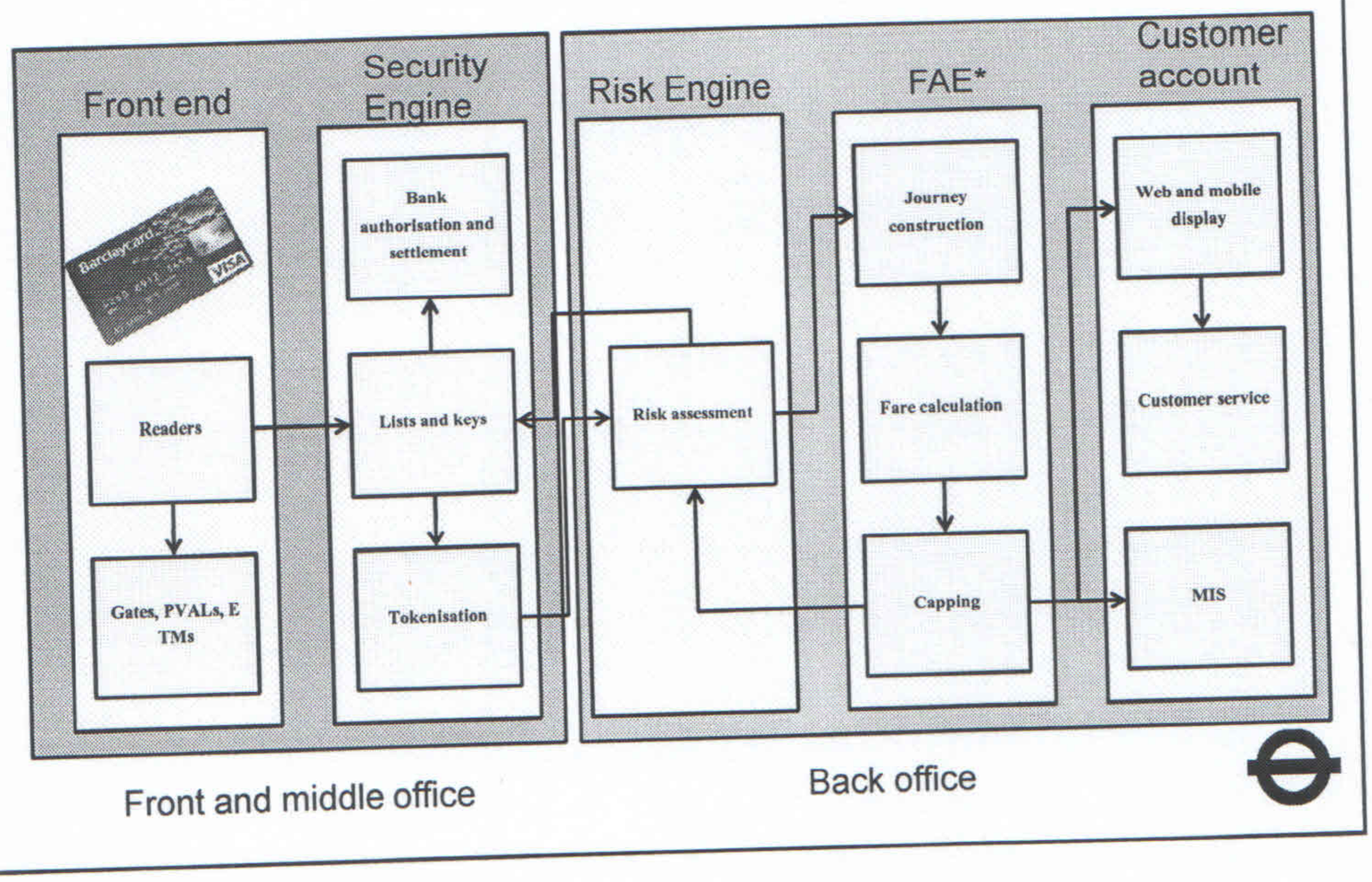
Transit transaction model (TTM)



TTM requirements

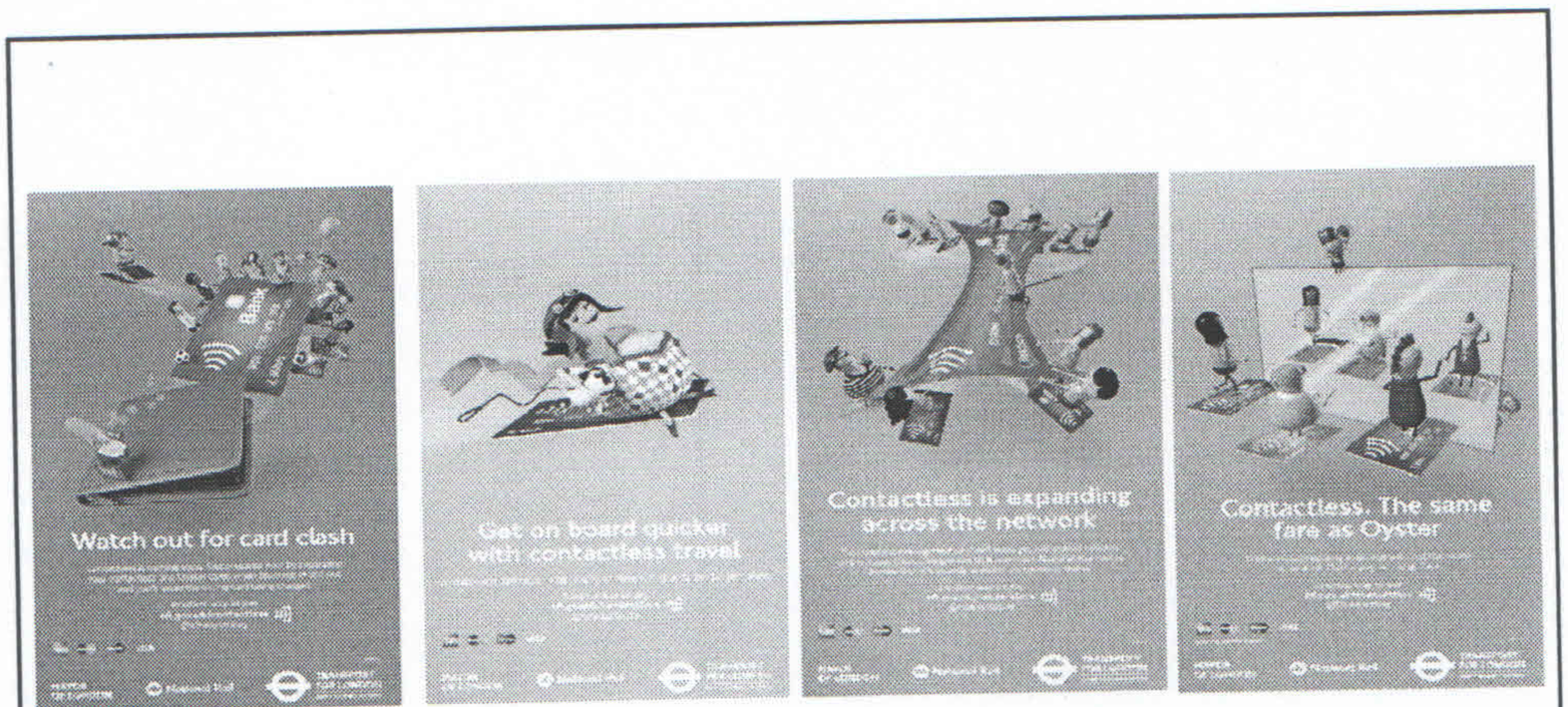


Overall architecture



Bus launch: Dec 2012

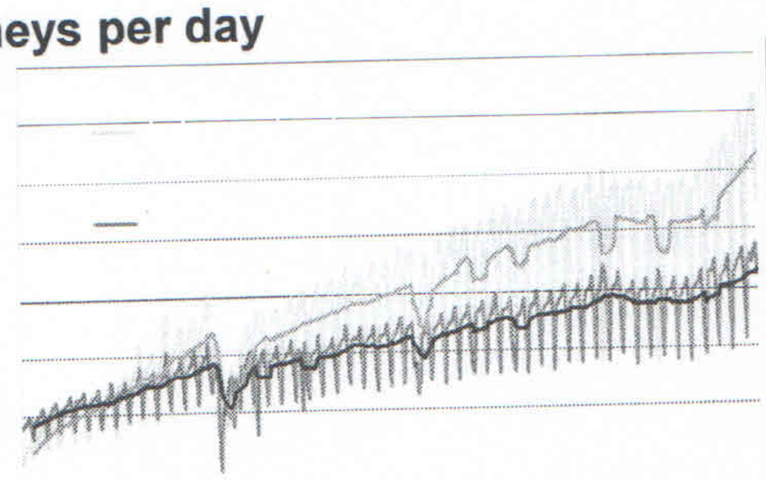
Tube launch: Sep 2014



Visually attractive customer campaign
… but
Most marketing done by the payments industry

Contactless journeys since launch

Journeys per day

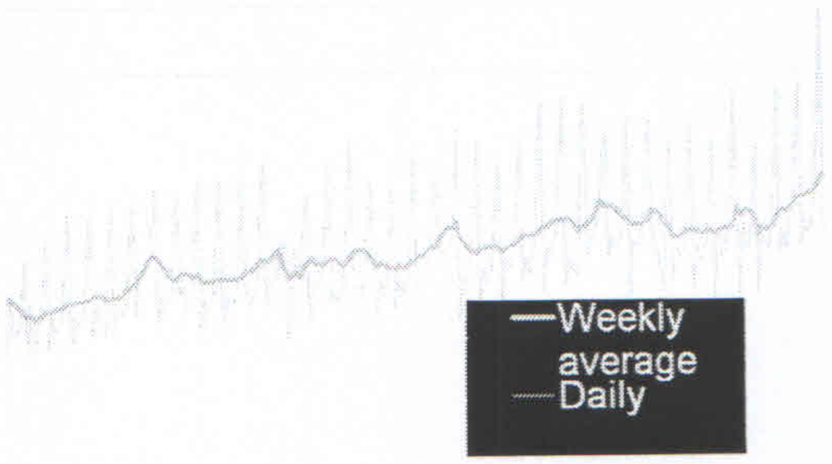


Over 300 million journeys made

1 in 4 pay as you go journeys now made using a bank card

New users continue to show up

New contactless cards used per day



Over 9 million cards from 80 countries used so far on London's transport system

Contactless success factors

Simple, modular architecture
Simple business rules implemented at reader
All complication pushed to back office
Agreement with banks on risk sharing
Simple customer messaging
All leading to **trust**

Experience from other national standards

- OV-Chipkaart (Netherlands): Most successful system but largely controlled by one entity (Translink)
- Calypso (France): No inter-operability achieved but more supplier diversity
- ITSO (UK): Limited inter-operability but low take-up due to complexity
- Germany: Various attempts to create a standard but no success
- EU-IFM: No success so far
- UTFS (USA): No success so far
- N-DOT (South Africa): EMV based application with no success so far

Some thoughts on NCMC

- Business design should come before technical specs
  - What business problem is this trying to solve – or is it just trying to emulate what others have done
  - Who is the scheme operator – one or many, national-citywide-operator specific, payment industry or transport industry
  - What are the scheme rules and commercial agreements, including fare types
- Technology questions should start with the widest possible net being cast
  - What broad technology is needed to support the scheme – role of open loop and closed loop
  - With open loop, what standards already exist to support
  - With closed loop, what transit optimisation is needed

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