Implementing EMV Contactless On The Gautrain Rapid Rail Ticketing System
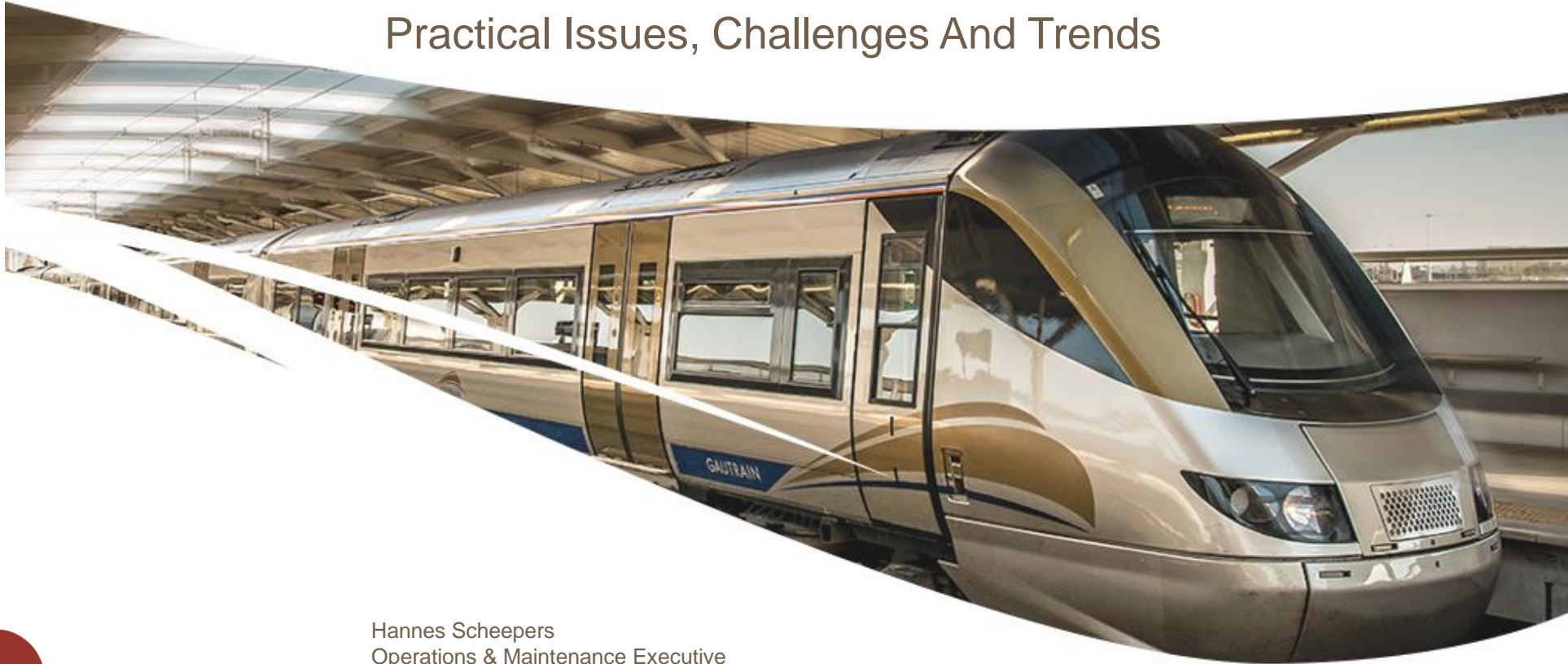
Practical Issues, Challenges And Trends

Hannes Scheepers
Operations & Maintenance Executive
Bombela Concession Company

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Concession Company (RF) (Pty) Ltd
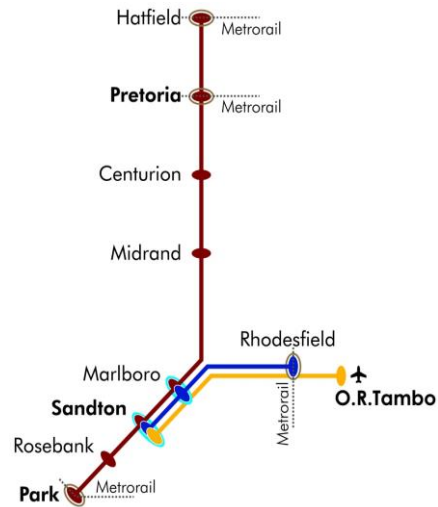
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Implementing EMV Contactless On The Gautrain Rapid Rail

EMV Contactless Functionality Was Implemented On 31 October 2019 On The Gautrain Rapid Rail System In South Africa. - An Open Account Based Ticketing Option In Parallel With An Existing Card Centric Fare Collection System .

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Gautrain Rapid Rail System

Other Gautrain Services In Addition To Rail:

- Park and Ride at Stations

- A limited Bus Feeder

- Kiss and Ride

- Facilities to integrate with other transport service providers

- The Bombela Concession Company has a Public Private Partnership (PPP) concession contract with Gauteng Provincial Government
  - To operate (and maintain) the Gautrain System

- The Gautrain Management Agency was created to oversee the PPP contract and is the sponsor of the EMV Project via a variation

Gautrain Rapid Rail System

- A seamless / frictionless experience for Gautrain specific services are offered

- The legacy AFC system provided for intermodal discounts where business rules incentivise Rail Usage

- Strict Performance Targets are consistently achieved

- Gautrain Service and Performance compares favourably with International Public Transport Performance Standards

FY Ending	2016	2017	2018	2019
Trn Availability	**99.73%**	**99.57%**	**99.41%**	**99.85%**
Trn Punctuality	98.34%	98.71%	98.16%	98.70%
Bus Availability	**98.95%**	**99.58%**	**99.23%**	**99.71%**
Bus Punctuality	95.90%	95.08%	95.89%	95.54%

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Why EMV?

"Public Transport Agencies , Regulators And Operators Are Confronted
With A Significant Suite Of Ticketing Technology Solutions In An
Industry That Is Innovative And Disruptive Of Nature"

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Gautrain Rapid Rail System

Why EMV

- Regulatory requirement in South Africa to accept a prepaid EMV card with a defined data structure (referred to as NDoT).

- Improve / enhance the service offering and experience for users of the Gautrain

- Opportunity to improve access to the Airport link (legacy AFC constraint service offering)

Took advantage enhance the legacy system:

- Mobile product purchases and reloads (Support of new Website and App)

- Developing a local test system

- Virtualisation of the legacy back-office in order to provide redundancy and flexibility

FAT Test Platform France

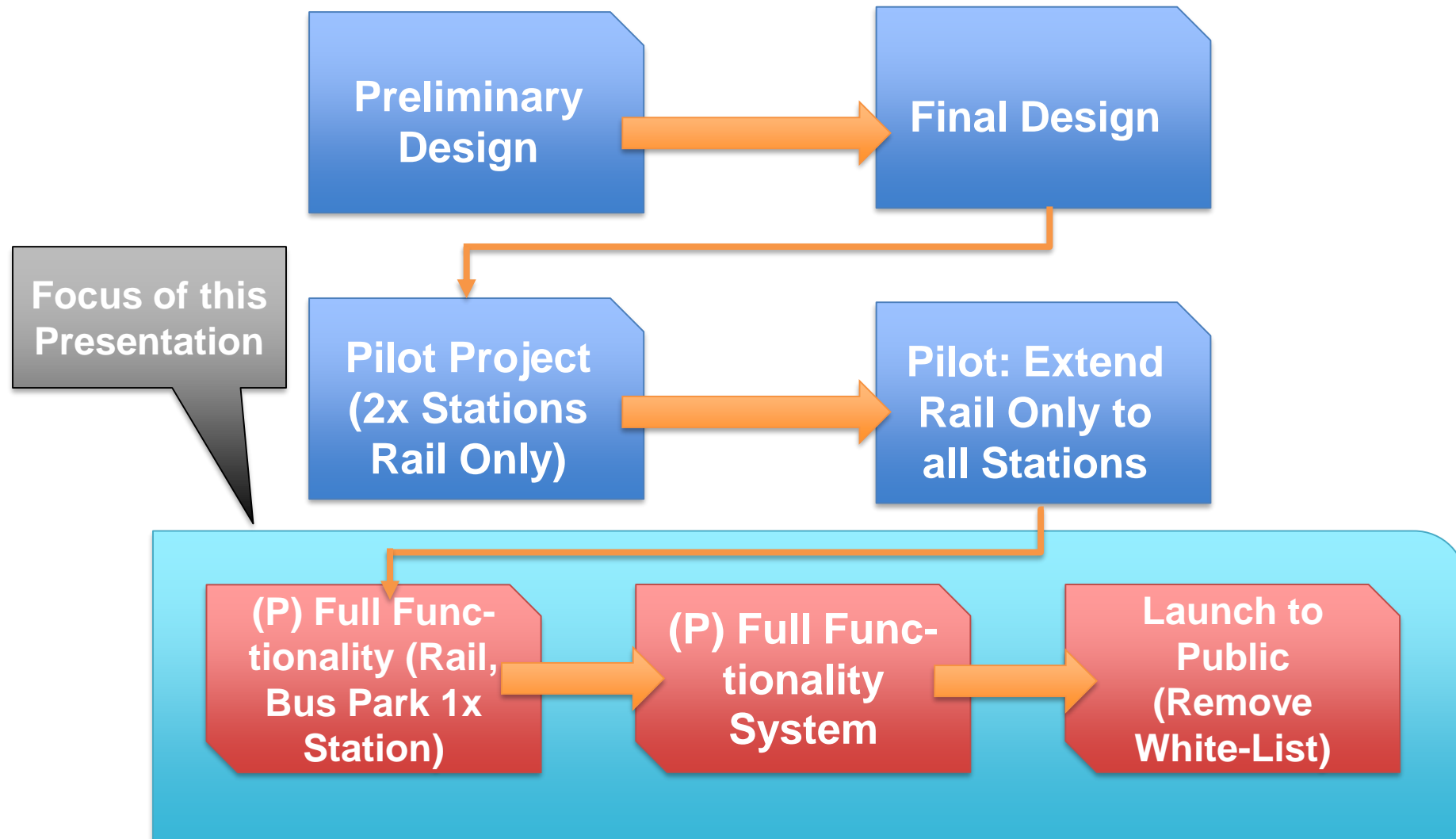# The EMV Project

Update on EMV

Gautrain has have presented in 2018 on this project (Anthony Usmar)

"Lessons learned on contactless and Mobile – an African Perspective"

- The new web and App just implemented
- The EMV project was in a limited pilot phase
  - Listing of project challenges certification
  - Online/Off-line auths
  - Transaction times

Project Lifecycle Summary

EMV Full Functionality

Full Functionality that an EMV card **must** behave exactly as the CSC (PAYG) of the legacy system / **must** satisfy all use-cases

Limitations of a Pilot:

- Sufficient testing of International contactless cards not possible.

- Real life scenarios not also apparent during Stress testing of Ticketing System

Addressing Snags when patches are installed:

- Thorough testing / verification prior to making it available on the full system.

- Slow sign-off by all entities before agreeing to closure of issues.

Launch Readiness

Several Clarification And Coordinating Workshops Were Held With The PPP Entities

Launch Readiness

Technical Readiness

- Critical System Snags resolved
- Switch-over from pilot to full system (Removal of whitelist from equipment)
- SP to assure all AFC equipment rebooted and is ready to accept EMV and NDoT (with value) contactless cards.
- SP to **issue a statement** that the AFC system is Ready for Launch (Milestone)
- Activity report (every 3 hours) on EMV usage distributed to key stakeholders
- Website EMV functionalities activated

Operational Readiness

- Refresher training for station and bus operational staff as well as the call centre staff
- All cards exceptions are communicated and updated
- Technical and Operational support is strengthened on day1

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Launch Readiness

Marketing and Communications Readiness

- "Ambassadors / Promotors" were trained and deployed 10 days before Launch
- Information brochures developed and available
- **Main focus was on user education on EMV and card clash**
- Promoting registration on the web site before using EMV – to enable targeting EMV communique's

Commercial Readiness

- EMV addendum to the Merchant Agreement with the Acquiring bank in place
- **Cyber Security Insurance concluded**
- **Risk Matrix and mitigations agreed**
- A number of contractual prerequisites agreed
- **Compliance to Protection of Personal Information Act (POPIA) SA's GDPR equivalent**

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The Aftermath

"When One Cannot Define Where The Problem Is"

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Main Problem Areas

System Bugs and….   **Remarks**

Day 1:

- No parking exit allowed (certain EMV cards)   Patch installed

Day 7 and day 8:

- Power failures that powered down the EMV / AFC back-office servers uncontrolled   Unrelated to EMV / UPS problem

Day 10:

- Detected EMV transactions not being processed (also day 9 and 8)   EMV server memory increased

Day 19:

- An increase in fare-gate loss of comms expanding to System-wide problem on Day 22   Deny list "too big" for fare-gates.

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Acceptance of EMV

Contactless Bank Cards Take Up On Gautrain System
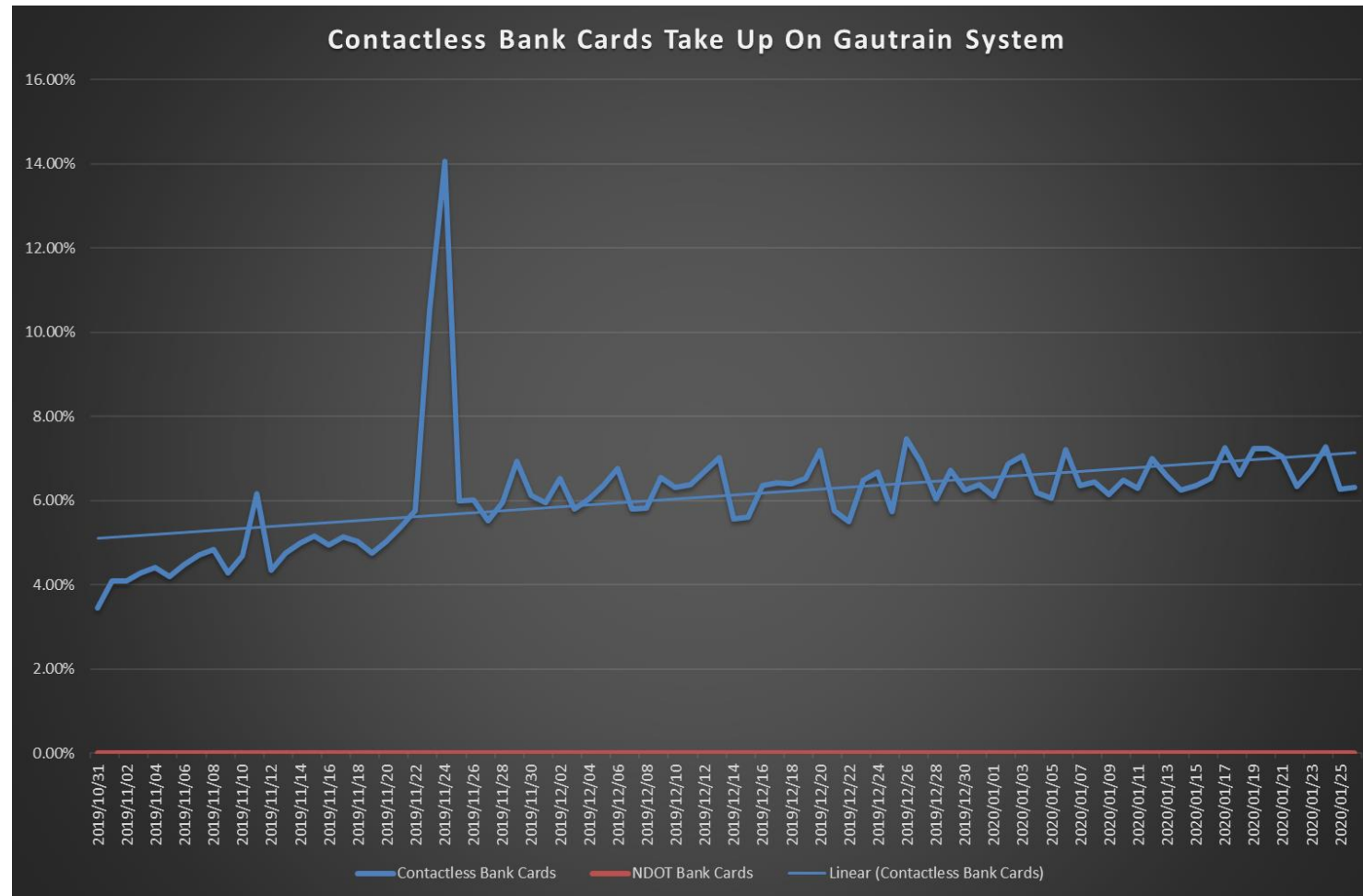
Stabilising EMV - Settlement

Contactless Bank Card Payment Failures And Debt Settlement
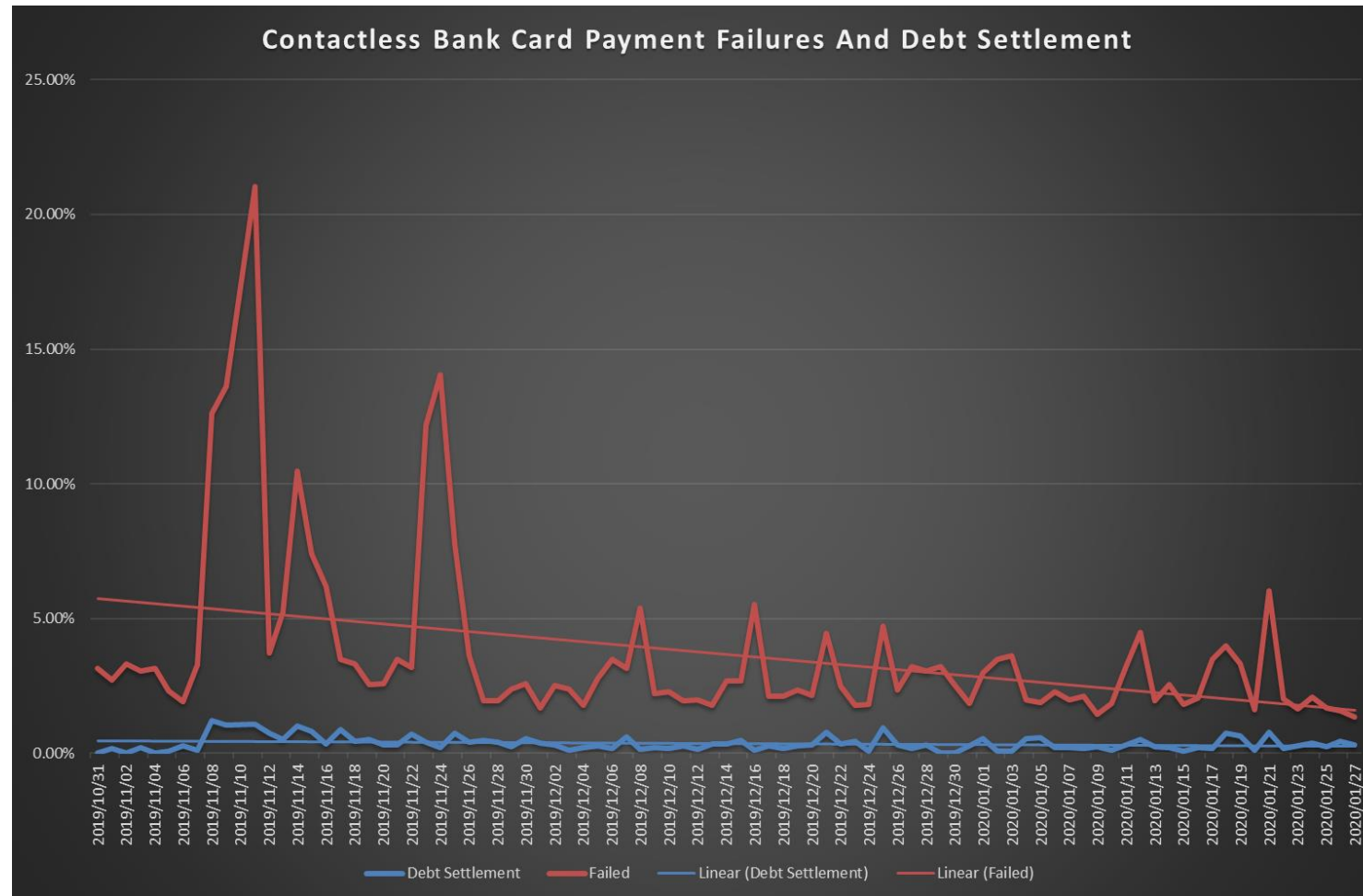
Impact of EMV Sales Channel
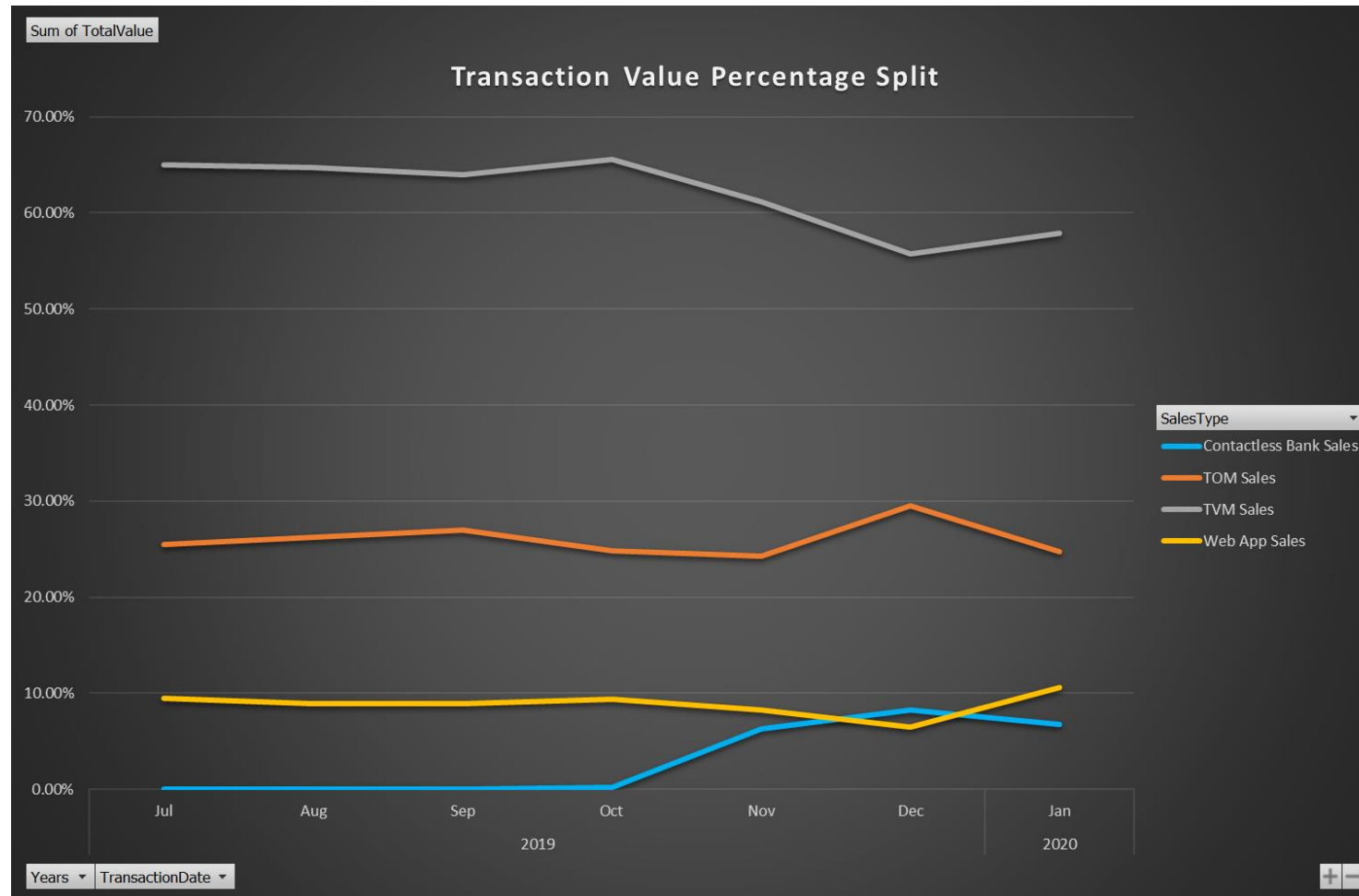
Closing Remarks

"Moving From A Closed To An Open System Is Daring And Unsettling"

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Closing Remarks

Opening up of a Fare Collection System increase the number of potential points of failure

- Improved monitoring and exception reporting.

Acquiring bank issues:

- Reduce the non-settlement (Mid Feb'20 – expect a reduction of 70%)
- EMV cards not accepted as yet
- SLA to be updated wrt performance

Next Phase of the Project

- Further Improvement to back-office controls and monitoring
- Further API development (3rd Party Access)
- Finalising the Test Platform in SA
- Develop capability of a frequent-user scheme / product

Collaboration campaign planned to promote EMV use

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THANK YOU