Evaluating Payment Methods for MaaS

- MassMarket – London 2019

Agenda

- Global and U.S. Payment Stats
- Importance of Payments in MaaS
- Payment Methods to Consider
- Emerging Payment Methods
- Single Payment Apps/Cards
- Challenges not Addressed

Global and U.S. Payment Stats & Trends

STATISTICAL OVERVIEW

Global Payment Trends

World Population - 2019

7,714,576,923

World population has doubled (100% increase) in 40 years from 1959 (3 billion) to 1999 (6 billion). It is now estimated that it will take another nearly 40 years to increase by another 50% to become 9 billion by 2037.

Worldometers

Mobile Payment Platform

PayPal 250M

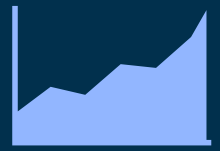
Alipay 1B+

WeChatPay 1B+

Chinese competitors WeChatPay and Alipay state they have over 1 billion daily active users.

Merchant Savvy

Contactless Payments

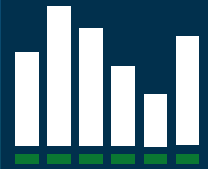


91%

Public Transit is reaping the benefits of contactless technology where 91% of all payments are contactless.

Merchant Machine

Number of Smartphones



66.7%

The number of smartphone users will continue to grow exponentially.

WorldoMeters U.N. data,.

Mobile Wallet Users

2.1B

Consumers worldwide will make payments or send money in 2019. 30% increase compared to 2017.

businesswire.com

Mobile Apps

31%

Mobile apps accounted for global digital commerce volumes in 2017.

GCI Analytics

Japanese Market

70%

Prefer Cash

Consumers still prefer to use cash, mainly due to security concerns with mobile payments.

McKinsey & Company.

U.S. Payment Trends

Contactless Acceptance

100M

Number of contactless Visa cards in the U.S. projected in 2019. Transit is helping the move to contactless.

paymentsource 12/28/18

Cash is Still "King"

31%

In an average week, roughly 3 in 10 adults said they make zero purchases using cash.

The Pew Research Center

Use of Mobile Payments

2017	48.1M
2018	55.0M
2019	61.6M

In 2018 20.2% of the U.S. population used mobile payments for their transactions.

eMarketer, Oct 2018

Most Popular Mobile Payment App

23.4M

Starbucks app beats 2nd placed Apple Pay in 2018 and expected to maintain its lead into 2022.

Merchant Savvy

Smartphone Ownership

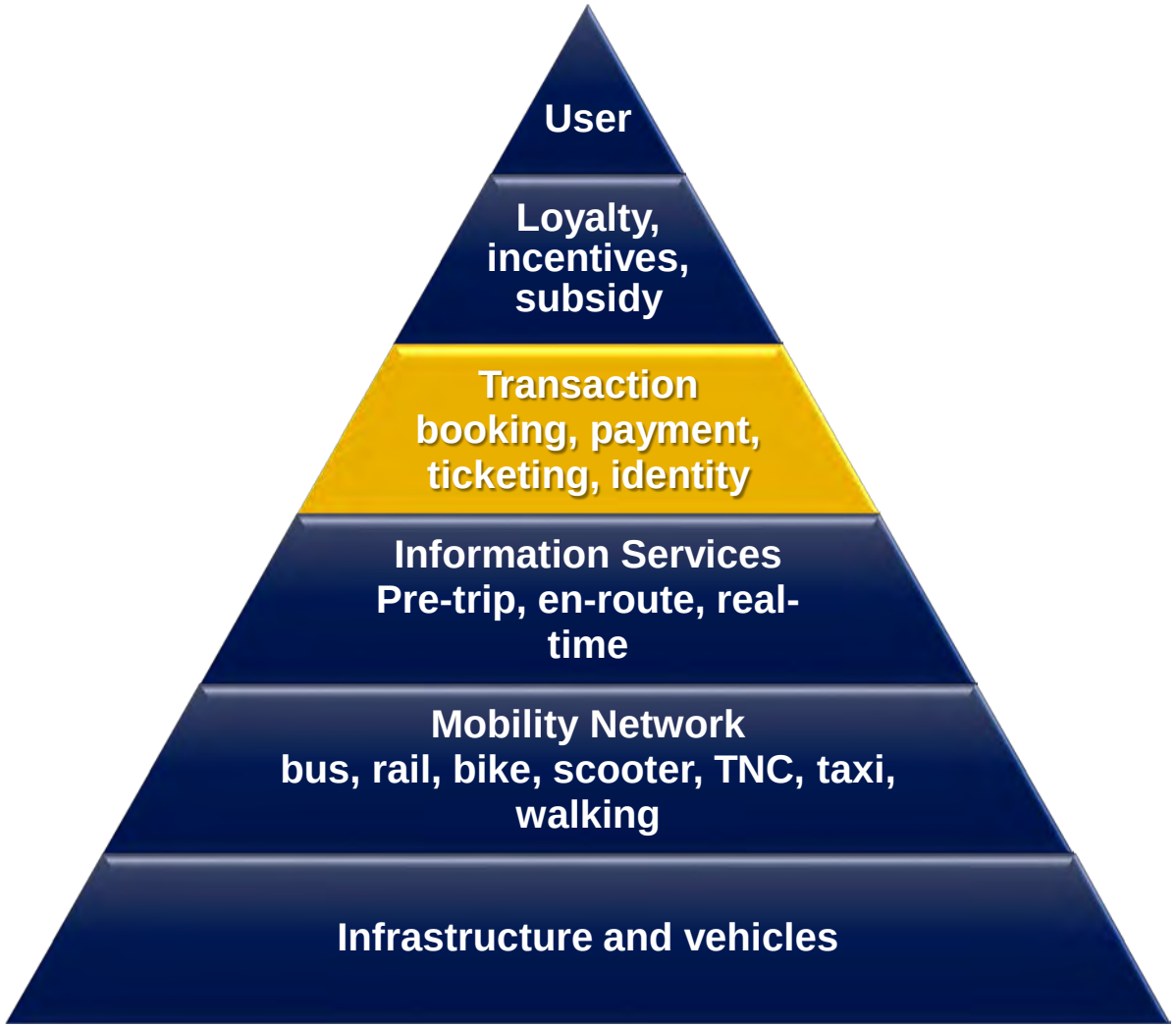
77%

However, a high percentage of US consumers still shun mobile payments.

Merchant Savvy

Why are payments important for MaaS?

ACCESSING REQUIREMENTS



Mobility Network

JOURNEY TO MOBILITY AS A SERVICE

While technology will connect vehicles, infrastructure and various modes of service, single payment transactions and identity are the nexus for any digital transformation of transportation. Payments must be routed to all participating parties to cover the cost of the service while providing a frictionless experience for the end user.

Essential Requirements

Payments and identity are a must for MaaS to be successful:

- Account-based solution is a corner-stone for payment acceptance
- Validating consumers identity digitally is vital to calculating the cost of the journey
- Payment for the journey needs to be based on consumer choice

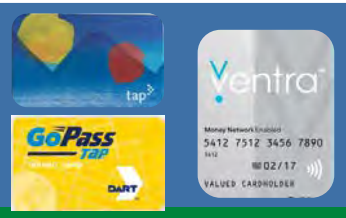
Maximizing digital payments to solve market challenges

- Multiple payment solutions are needed to meet consumer needs
- Robust back office to support key components in aggregating and managing payments and services

Which payment methods should be considered?

CURRENT PAYMENT ACCEPTANCE

Potential MaaS Payment Methods

Contactless Devices	Mobile Wallets	P2P Payments	Closed Loop	QR Codes	Other Payments
o- Credit Cards o- Debit Cards o- Key Fobs - Smartwatches o- RFID o-NFC	- Apple, Samsung, Google - Transit Mobile Wallets	- PayPal, Venmo, Zelle (moving linked accounts to another)	- Transit systems (i.e. TfL, La Metro, DART, CTA, TriMet,) - Retail Cards	- WeChatPay - AliPay - Starbucks (protected by tokens; fraud is minuscule)	- Blockchain (i.e. bitcoin) - Open Banking APIs - Cryptocurrency - Real-Time Payments
					

Cash to Mobile

(i.e. PayNearMe, Apple Cash)

Are emerging payment methods “hyped solutions” or disruptions?

REVIEW OF EMERGING SOLUTIONS

Hyped Solution or Disruption

- **Cryptocurrencies:** continues to be an unpredictable experiment with the lack of merchant acceptance and money laundering concerns **(hyped or disruption)**
- **Blockchain:** likely to gain further traction as current pilots could be built using a simple database model

  (hyped or disruption)
- **Real-Time Payments (RTP):** financial network to clear and settle payments in real time – can this innovation go beyond real-time to predictive

  (hyped or disruption)

Blockchain: Concepts in Transit

Source: Transport System Catapult

Use Case: Decentralized MaaS Network			
Blockchain Value	**Source and static** details of transport services used by passengers, established through consensus, provides trusted information needed for payments	**Customizable transparency** ensures algorithms that provide customers with journey options is fair, open and transparent. This ensures new entrants, and big small operators can compete	Community established **smart contracts** hold the rules for revenue apportionment and customer mobility packages. These self-execute when journey legs are completed, further boosting trust for all network members, and reducing costs
Beneficiaries	Transport operators, transport authorities and passengers		
Key Challenges	- Ensuring the network is set up in a way that ensures cartel like behavior cannot occur - Throughput and latency - Permanent vs. right to be forgotten through 'erasure' of personal data		

Use Case: Decentralized Ride Hailing			
Blockchain Value	**Disintermediation** allows big and small vehicle fleet operators alike to serve mobility customers more directly, reducing inefficiency in the system and increasing competition	**A single version of the truth** through a shared immutable database with smart contracts ensures transparency on rules of operation, fares and driver and passenger behavior increasing trust	**Consensus** between drivers, customers and regulators who may not trust each other or have different incentives creates trusted marketplace with sustainable, meritocratic value creation
Beneficiaries	Drivers, transport authorities and passengers		
Key Challenges	- Achieving a user experience equal to that of centralized ride hailing offerings - Throughput and latency - Permanent vs. right to be forgotten through 'erasure' of personal data		

Who is using a single payment transaction in the MaaS ecosystem?

EXAMPLES OF PRIVATE/PUBLIC MAAS PAYMENTS

+ Whim

- Single payment platform
- No app toggling
- Uses APIs
- Offers 3-tier service
  - Pay-as-you-go
  - Subscription service
  - Unlimited access
- Offers local transit, bike, car rental, car share
- Finnish law requires any transportation provider to make its full ticketing functionality available to a third party

+ La Metro

- Single payment platform (some modes)
- Uses APIs
- Layered cloud-based system with legacy backend platform
- Currently a card solution
- Offers various options:
  - Earn rewards
  - Wallet concept
- Modes: bus, BRT, bike, train
- Regional platform
- Mobile and transit card integration on the

+ DART

- Single payment platform (some modes)
- Uses APIs and SDKs
- Offers various options:
  - Cash to mobile
  - Incentives (fare capping)
  - mWallet
  - Admission tickets
  - Events & Offers
- Modes: bus, train, streetcar, microtransit, Uberpool, Bird
- Multi-agency platform
- Mobile and transit card integration on the

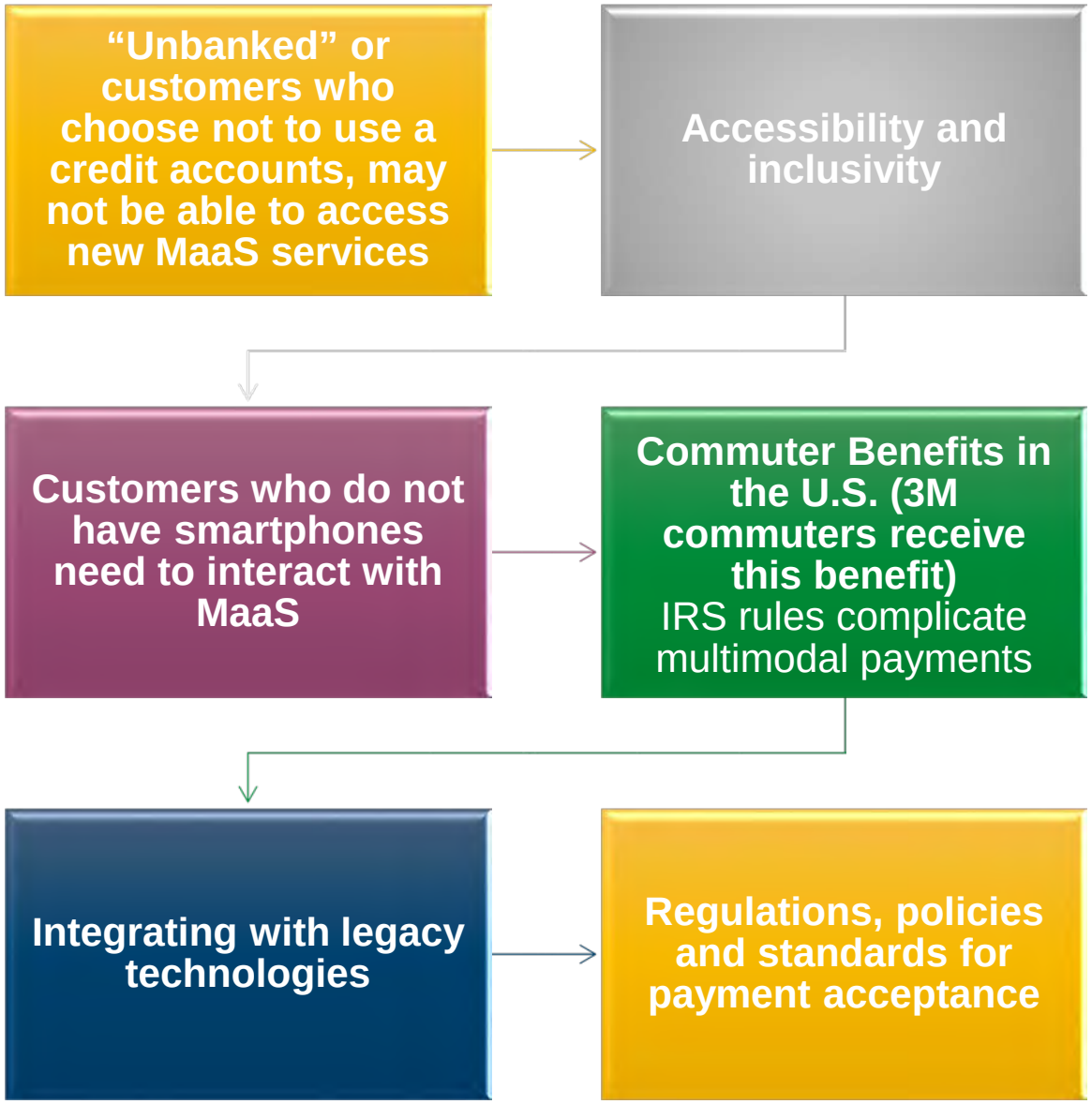
+ Uber

- Single payment platform
- Uses API and SDKs
- Cash option (some cities)
- Earn Uber Cash
- Modes: (1) TNC and (1) scooter/ebike option. Also provided shared ride in some areas
- RTD-Denver: first transit agency to fully integration public transit modes into Uber app

What challenges haven't been addressed?

OUTLINE USE CASE CHALLENGES

Challenges Not Yet Addressed



What are some key takeaways?

TRENDS AND KEY DRIVERS

Key Takeaways

- There are many ways to implement payments into MaaS
- Payments are now integrated into a host of devices such as smartwatches, fitness bands and cars for the connected traveler
- New channels of payments are gaining prominence and acceptance rates are rising
- Customers expect to buy anytime, anywhere, and anyway they choose while using whichever channel and payments method that suits them
- Payments industry is rapidly transforming into a system dominated by mobile devices, AI and even IoT enabled cars
- Emerging technologies such as AI can be leveraged efficiently by integrating with backend infrastructure for greater agility


“Innovation is the ability to see change as an opportunity – not a threat. “
- Steve Jobs

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THANK YOU

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