MaaS, Connect to Future Smart Mobility

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Challenges and Trends

- Urbanization
- Aging Population
- Climate Change and Global Warning
- Road Safety

Source: Arthur D. Little, The Future of Mobility 3.0
Challenges and Trends

- AI & IoT (AIOT)
- Big Data
- Cloud computing
- Driverless vehicle
- Edge computing
- 5G deployment

- People’s mobility habits are evolving dramatically
- Mobility behavior are being transformed driven by technology
- Mobility systems are under pressure from an increasing variety of socio-demographic categories
- The traditional model of car ownership is in decline, making way for a new sharing culture

Source: Arthur D. Little, The Future of Mobility 3.0
Challenges and Trends

Emerging Transport Paradigm

Digital Technologies

Collaborative Consumption

Vehicle Automation

Demographic Change

Collaborative Consumption and Vehicle Automation

- Already disrupted taxi industry
- Both competes and complements public transport—depends on market and demographic (Rayle et al., 2016)
- Ownership model—
  - Own and share model (Musk, 2016)
  - Universal automated taxi service (Enoch, 2015)
- Impacts on network efficiency unclear

Source: Emerging transport technologies and the modal efficiency framework: A case for MaaS, 15th International Conference on Competition and Ownership in Land Passenger Transport
Challenges and Trends

Demographic Change and Digital Technologies

- Youth licencing decline across developed countries (Delbos and Currie, 2013)
- Mixed evidence—due to education/employment or symbolism/ideology
- Difference between sharing information and sharing space
- Aging population—transport disadvantage
- Digitalisation of economy—Fourth industrial revolution

Source: Emerging transport technologies and the modal efficiency framework: A case for MaaS, 15th International Conference on Competition and Ownership in Land Passenger Transport
MACES-Future Smart Mobility

User-Centered
Integrated and Service-Oriented

MACES
Mobility as a Service
Autonomous
Connected
Electrification
Sharing
What is MaaS?

- Mobility-as-a-Service is a user-centric, intelligent mobility management and distribution system, in which an integrator brings together offerings of multiple mobility service providers, and provides end-users access to them through a digital interface, allowing them to seamlessly plan and pay for mobility.

- Enjoying Freedom of Mobility without owning a vehicle

- To solve the problem of the gap and service shortage of public transport and to reduce private vehicle ownership.

Source: The importance of user perspective in the evolution of MaaS, Glenn Lyons (2019)
MaaS Requirements

- A wide range of transport modes are available in the city;
- Majority of the transport operators provide open data including real-time data to a third party;
- Majority of the transport operators allow a third party to sell their service;
- Majority of the transport operators offer e-ticket or e-payment to access their services.
Modal Efficiency Framework

Source: Emerging transport technologies and the modal efficiency framework: A case for MaaS, 15th International Conference on Competition and Ownership in Land Passenger Transport
Why MaaS and Why Now?

- Unused potential of ICT
  - Providing better, real-time information (public transport and complementary services)
  - Intermodal trips
  - Facilitating access to all transport services (unified gateway)

- Tackling shortcomings of public transportation (PT)
  - Transport of heavy goods, remote locations, off peak hours etc.
  - Providing an alternative to car depended trips and car ownership

- Is there a need for more real-time information and integration? What about habit formation?
  - Habit formation is difficult with free-floating services (car sharing, bike sharing, etc.)
Why MaaS and why now?

◆ Decreasing the environmental burden of transportation
  ■ Limiting fossil fuel dependency
◆ Reducing congestion
  ■ Better usage of existing capacity
◆ Digitization
  ■ Digital transformation and personalization

Just car-sharing is not MaaS

MaaS is not an app. The app is just the digital interface.

An intermodal journey planner is not MaaS

Just ride-hailing is not MaaS

MaaS is not just monthly subscription packages

Level of MaaS Integration

Levels of MaaS Integration

<table>
<thead>
<tr>
<th>Level 0</th>
<th>No integration: no operational, informational or transactional integration across modes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1</td>
<td>Basic integration: Informational integration across (some) modes</td>
</tr>
<tr>
<td>Level 2</td>
<td>Limited integration: informational integration across (some) modes with some operational integration and/or transactional integration</td>
</tr>
<tr>
<td>Level 3</td>
<td>Partial integration: some journeys offer a fully integrated experience</td>
</tr>
<tr>
<td>Level 4</td>
<td>Full integration under certain conditions: some but not all available modal combinations offer a fully integrated experience</td>
</tr>
<tr>
<td>Level 5</td>
<td>Full integration under all conditions: full operational, informational and transactional integration across modes for all journeys</td>
</tr>
</tbody>
</table>

Source: The importance of user perspective in the evolution of MaaS, Glenn Lyons (2019)
MaaS in Taiwan

The government acts as enabler

Mature ICT Technology

Mobile APP

E-ticket Online Payment

One-stop service

Train

MRT

Light rail

Bus

Ferry

Taxi

Ride Sharing

E-Bike

Bicycle

Taipei-Yilan MaaS Project

Kaohsiung MaaS Project

Policy + Integrated Services + Customer Oriented. = MaaS
UMAJI Service Concept (1/2)

To C

User-centered Service
Trigger behavior change

產業資源

交通運輸業
零售通路業
飯店餐飲業
旅館住宿業
觀光服務業
物流服務業

商品上架

資料整合

公開運輸路線
班次
旅行時間預測
車輛動態資料
（GPS）
停車場資訊
電子票證資料
（E-pay）
道路偵測資料
（VD,CCTV）
E-tag資料

開放資料

 Improve PT experience

旅程規劃、D2D運輸服務

Increase stickness

預約獎勵、套裝行程等

Reduce car dependence

無縫交通運輸網絡
UMAJI Service Concept (2/2)

Transport Network Optimization
Solve the problems of "transfer gap" and "insufficient service" between destinations.

User Behavior Learning Mechanism
Provide tailored solutions through customers’ behavior and preference learning.

Incentive-triggered Behavior Change
Conditional incentives to stimulate behavior change, incl. changes of vehicle, time & destination selection.

Journey Planner
Provide multiple POI selections, local recommendations and the most optimal route to transfer the planner.

Personal Secretary
Work as your “life & demand-responsive” secretary with dynamic event and LBS-based info push notification.

Travel Condition Assessment
Offer travel suggestions (vehicle, route, depart time) based on real-time traffic & weather info.

EC Platform
Enjoy one-time payment for online checkout and serve with diverse bundle services, incl. dining, accommodation, travel, shopping and transportation.

Platform Construction and Operation

Stores (Suppliers) Management

Advertising Management

Sustainable Business Model
Prepare the trip ➤ On the trip ➤ End the trip

Facebook
Google
Validation
Questionnaire
Successful

Where to go

旅運規劃

建立行程

Where to go

旅運規劃方案

訂票線上付款

隨行秘書

随行秘書

私の優惠券

累積點數

満意度問卷

顧客行為分析

You can use QR code to complete everything
UMAJI Service Function (1/2)

POI

Journey Planner

Mobile Secretary
UMAJI Service Function (2/2)

- **Buy Ticket**
  - 訂票者：王大明
  - 起點站：市府轉運站 → 羅東站
  - 票種張數：全票 1 張
  - 乘車時間：2017/12/1(五)

- **Pay Online**
  - 訂單代號：A12345678
  - 交易狀態：未付款
  - 客運：首都客運
  - 路線：1570[台北 - 羅東]
  - 乘車日期：2017/12/1(五)
  - 票數：全票 1 張
  - 總票價：TWD 120

- **My tickets**
  - 訂單編號：123456789
  - 乘車時間：2017/12/30
  - 金額：300

- **QR Code**
  - 台北 → 宜蘭
  - 首都客運乘車券
  - 票號：345678901
  - 乘車時間：2017/10/02
  - 金額：300

**Q: 什麼是UMAJI Service Function？**

UMAJI Service Function是一個手機應用程式，允許使用者在線訂購客運車票。使用者可以通過這個應用程式訂購客運車票，並在線支付。應用程式支援訂購全票、半票和兒童票。使用者還可以查看和管理他們的訂單和票據。這個應用程式適用於手機和平板電腦。
Future Plan

◆ MaaS cannot exist without the digitization of transport services – and digitization is without doubt the biggest challenge the transport sector has ever faced.

◆ User-centric service is the key for the success of MaaS

◆ Transform UMAJI app as
  ■ Open platform for all service
  ■ Agile system and service development

◆ App users are all very picky
UMAJI Future Plan-Better User Experience

Seamless Mobility Service

Better Journey Planner

AI Customer Analysis

Easier Payment Service
• HSR, traditional rail, metro, light Rail, intercity buses
• Monthly public transit ticket
• Sharing mobility (U-bike, Wemo, i-Rent)
• Car-pooling & taxi-pooling
• On-line payment and QR code ticket apply to all transport modes
UMAJI Future Plan (2/4)

- Predicted destination & traveler information
  - Observe & learn user’s travel pattern
  - Predict user’s next destination and mode
- Suggestive tile
  - Provide alternative mode and incentives
- Explore
  - Multimodal journey plan
  - Turn by turn navigation for driving
  - Step by step trip details for public transit
UMAJI Future Plan (3/4)

- Customer behavior analysis and learning
- Targeted promotion according to preference
- Point system to trigger behavior change
- Commodity development
UMAJI Future Plan (4/4)

- Set up mobile ticketing standards;
- Points system to raise customer loyalty;
- Expand cross-industry alliance;
- More flexible commodity combination
Mobile Ticketing Standard

Why need to create mobile ticket standard?

- Mobility Service
- Information Exchange
- Integration
MaaS API Standard

Open API Platform
Thanks for your attention

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