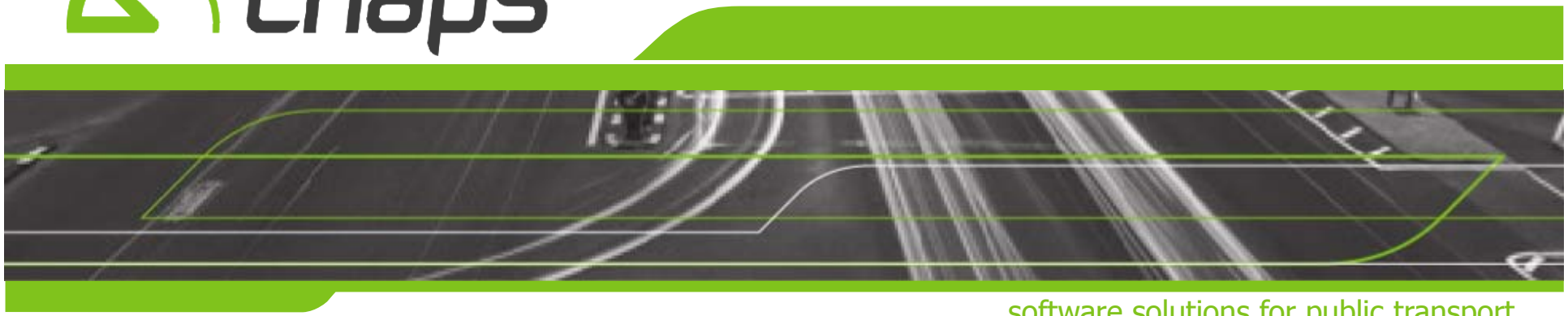
chaps



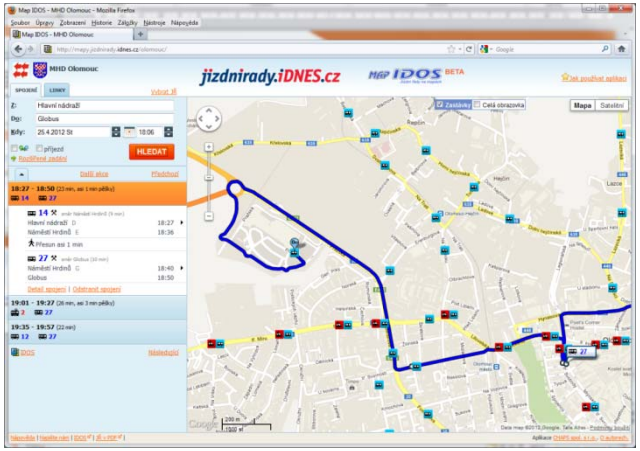
software solutions for public transport

Next generations of electronic fare management in public transport

Tomáš Chlebničan, CHAPS
Robust Satellite Positioning and ITS in Practice
Prague, 13.6.2014

CHAPS

- leader in the field of public passenger transport IT solutions in the Czech Republic
- established in 1993, HQ in Brno, Czech Republic
- major products and projects:
  - journey planner IDOS
  - ticketing and reservation system of Czech Railways
  - smart card of Czech Railways
  - stationary and mobile ticket vending machines
  - bus ticketing and reservation AMS
  - timetable construction SW
  - clearing and dispatching
  - ...



Let's assume we live in a world where:

- all data are available
- all data are accessible
- storage capacity is infinite
- services are completely reliable and accurate
- wireless internet connection is available anywhere at unlimited speed and capacity
- traffic has unlimited capacity and is congestion and accident-free
- everyone (always) carries a mobile device with him/her
- security is not an issue
- …

Travelling in such a world:

- plan a journey
- travel (according to the plan)

Travelling in a semi-ideal world:

- plan a journey in advance
- buy/book right electronic tickets when I want
- travel in line with the plan
- (pay after?)

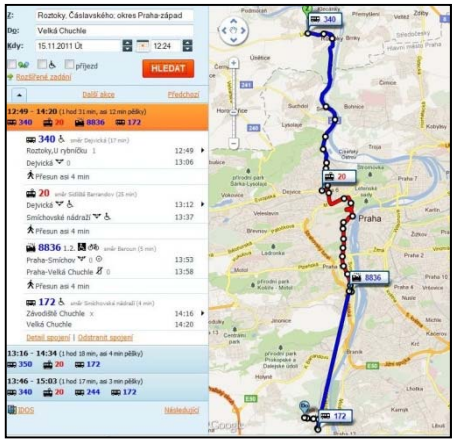
Travelling in a real world?! Not yet.

Travelling in a semi-ideal world:

- John decides where he wants to travel
- John plans a journey on his iPad
- John (somehow) pays tickets and immediately receive them on his iPhone
- according to the plan John gets onto the tram 123 and easily catches train IC 321
- during the ticket control in the tram and also in the train John shows electronic tickets on his iPhone and they (somehow) pass!
- accident happens and due to delay John won't catch a connecting flight, but his travel companion (yes, app in his iPhone) reschedules (and eventually rebooks all tickets) John's journey
- John arrives (a little later) to his final destination (and wonders why he had to pay prior the journey)

John’s journey behind the curtain, part 1:

- decision – up to John ☺
- journey planning
  - data
  - journey planner engine
  - journey planner app
- ticket payment
  - electronic „shop“
  - safe (and if possible simple and fast) payment method
  - electronic version of the ticket
- travelling
  - tram/train on time
- ticket control
  - fraud-free
  - fast and comfortable for traveler/conductor



John's journey behind the curtain, part 2:

- accident!
  - information/data about the accident
  - train delayed (plan x reality)
  - travel companion
    - requires data from different sources
    - requires „intelligence" to correctly interpret data
    - requires access to different services (ticketing, reservations, payment, …) for rescheduling
- last mile
  - exhausted John is finally at his final destination
  - journey cost John 62 coins, took 7 hours, earned 740 miles in his frequent flyer program, his iPhone was on 3G 54% of time and transferred 87 MB of mobile data, …
  - John still wonders why he had to pay in advance…

John's idea of post payment:

- since John lives in a semi ideal world why he has to pay in advance?
- what about monitoring of John's (mobile device) movement, vehicle movement and payment according to how did John travel?
- is it necessary to check-in and check-out?
- what about automatic post-travel John's bank account charge?
- why not optimize tickets based on a real journey?
- how long can John travel „for free"?

Let's have a closer look...

John's idea of post payment:

- since John lives in a semi ideal world why he has to pay in advance?

Answer:

- historical reasons
- more convenient for carriers/operators
- if nothing unforeseen happens, price known in advance

John's idea of post payment:

- what about monitoring of John's (mobile device) movement, vehicle movement and payment according to how did John travel?

Answer:

- location of John ('s mobile device) in sufficient quality
- location of vehicles in sufficient quality
- it is possible to match above locations
- … then we know how John travel
- … then we know what vehicles John travelled in
- … then we can calculate the price
- … then we can split the price accordingly to each operator
- … ???

John's idea of post payment:

- is it necessary to check-in and check-out?

Answer:

- depends on the „ideality" of John's world
- with high quality location data – not needed!
- with low quality location data – not needed/helpful
- with no data – ??
- also depends on density of vehicles (trains x urban)
- multiple operators make things more complicated

John's idea of post payment:

- what about automatic post-travel John's bank account charge?
- why not optimize tickets based on a real journey?
- how long can John travel „for free"?

Answer:

- possible, but requires John's trust
- after the journey we know „all"
- optimization also possible!
- multiple single tickets x seasonal ticket x seasonal pass
- group discount
- charge after X hours/days/months

Travelling in a real world:

- impossible to plan (whole) journey
- electronic tickets not available, ticket offices needed
- post-payment is (usually) not possible
- real journey is often different from the plan

Reasons:

- not available/accessible data
- insufficient IT development
- HW equipment outdated
- quality of location data
- legal issues (personal data protection)
- …

Where are we at?

- „everyone" has a mobile device – true
- data are available/accessible – false
- quantity of data is not a problem – true
- mobile device could be an ID – true
- security is not an issue – false
- (fast) mobile data coverage is sufficient – false
- strong competition (SMS tickets) – true
- tickets bound to person (mobile device?) – true
- complicated payment – true
- tested and robust technology – false
- legal issues (personal data protection) – TRUE

Somewhere between, but heading right direction…

Thank you for your attention!

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