Bicycle & Scooter Sharing Technology

COMODULE

Kristjan Maruste
Connecting light vehicles, the most important vehicle segment of the 21st century.

- Bikes produced annually 133M
- 20M in EU
- 18M in US

Average price of a bicycle has climbed 24% in last 5 years
Complete connectivity platform.
We create the innovation Tier 1 layer.
Cloud

Connects sharing operator with the vehicle and the user.

Hardware

Connects vehicle with the user and the cloud.

Smartphone Application

Connects user with vehicle and operator.
World market leader in bicycle connectivity

Signed customer contracts:
49,000 units

In discussions:
90,000 units

*countries where COMODULE powered vehicles have been sold
Bike Sharing in the World
04 The Need for Commute Transportation (World Economic Forum, 2017)

- Paris has car-free Sundays & older cars are banned on weekdays
- Madrid plans to ban cars from 24 of its busiest streets by 2020
- Athens: diesel cars planned to ban from center by 2025

“Car-centric model is impractical due to space management & health implications”

- Oslo plans to ban all cars by 2019
- London plans to ban diesel from its roads by 2020
- Hamburg is developing car-free “green network”
- Brussels: car-free Sundays
How is the situation right now?

**PAST**

Where were we?
- Bicycling in Dutch, German & Danish cities increased up to 43% between 1975 and 1995
- Until 2010 there were bike sharing programs in approximately 125 cities worldwide with more than 139,300 bicycles on four continents

**PRESENT**

Where are we now?
- Europe 150,000 public bikes in 31 countries operated by 472 cities/systems
- In North and South America there are approximately 24,000 bikes in 34 cities/systems in 3 countries
- Asia 460,000 bikes, operated in 10 countries by 108 systems

**FUTURE**

Where are we going?
- Within the next five years bike-sharing systems will exceed the number of 700 worldwide
- The number of users will rise from 643,000 to 2.3 million
What makes a successful bike sharing program?

**Success stories**

<table>
<thead>
<tr>
<th>Where</th>
<th>Bikes</th>
<th>Stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hangzhou, China</td>
<td>78 000</td>
<td>2 700</td>
</tr>
<tr>
<td>Paris, France</td>
<td>20 000</td>
<td>1 200</td>
</tr>
<tr>
<td>London, England</td>
<td>11 000</td>
<td>750</td>
</tr>
<tr>
<td>New York City, USA</td>
<td>6 000</td>
<td>330</td>
</tr>
<tr>
<td>Montreal, Canada</td>
<td>5 200</td>
<td>460</td>
</tr>
</tbody>
</table>

**Common factors**

- High number of bikes & stations
- Concentrated in the heart of the city
- Collaborations of local business sponsors and municipalities

**Why others fail?**

- Lets test with small numbers first
  - Will not become a habit
  - Frustration of not having a vehicle when you need it
  - No infrastructure flexibility

**New trends**

- Free floating vehicle sharing
  - Electric scooters in Paris, Berlin, Barcelona, Madrid
  - Dockless bicycle boom in China. Millions of bikes on streets. Next target UK.
What About Tartu?
- Great city for cycling
- Some infrastructure but distributed
- Some hills
- Lot of students
- Connecting residential areas with wide cycling paths to city center
- Parking infrastructure improvements
Bike Sharing Infra
Product | Extreme Complexity In One Solution

Station Based

+ • Complete control
  • Good safety

- • Very expensive
  • Unflexible

Free-Floating

+ • Minimum control
  • Inexpensive

- • Variable safety
  • Very flexible
Hybrid System

+  -
  
  - Good control  
  - Good safety  
  - Affordable  
  - Flexible
Product | Extreme Complexity In One Solution

- Universal Parking Infrastructure
- Controlled Free Parking
Card
+
- Quick and Easy
- Unflexible

Mobile App
+
- Flexible
- Tedious
Product | Extreme Complexity In One Solution

Public Transport Card & Mobile app
Product | Extreme Complexity In One Solution

**Mechanical Bike**

+ Cheap
  - High Numbers

- Shorter Distance
  - Unattractive

**Electric Bike**

+ Experience
  - Long Distances

- Expensive
  - Low Numbers
Hybrid Frame
COMODULE | Use cases

Tartu Demo

- Fully integrated anti-theft
- Geofencing
- RFID compatibility for integration with public transport
- Proximity beacon
- Electric or mechanical
- Parking with universal infrastructure
- Mobile app for non-residents
This is our passion

Digital Transformation of eMobility

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COMODULE | Be in control of your fleet

Tracking & Management

- Live vehicle tracking & management
- Daily management all in one view
- Lock/Disable vehicles from control centre
- Connect with extra services
- Easy servicing

Support & Control

- Detailed vehicle overview
- Backtrack vehicle history
- Over the air vehicle updates
- Off-site vehicle controls & support

Diagnostics & Planning

- Device list overview
- Current status
- Quick diagnostics helps to lower downtime
- Notifications
Autonomous
Tesla case study.

Connected
coModule IoT innovation enabler.
02 COMODULE I Who we are?

Experts of Connectivity

- Internet of Things solutions for vehicle manufacturers
- Outstanding understanding of the industry:
  - 5 companies showcased coModule at Eurobike 2016
  - 150+ companies as contacts for market understanding

Smart & Agile Team

- Business and core engineers from electric formula championship team
- Experienced in automotive and automation industry
- 6 years co-working experience
- 16 Professionals Listed by Forbes “30 under 30”

Award-Winning Technology

- Connected Coboc bicycle which won Eurobike Gold Award
- Autonomous e-bike prototype

World Class Support

- System integration with industry-leading partners
- Venture capital investment from HTGF, Germany
- Ready for NB-IoT (new industry standard)