

## BMSI – Bosch Mobility Scope Italy

### Principal Academic Tutor:

Marco Cantamessa, DIGEP, Politecnico di Torino

### Academic Tutors:

Francesco Bruschi, DEIB, Politecnico di Milano

Cristina Pronello, DIST, Politecnico di Torino

Massimo Violante, DAUIN, Politecnico di Torino

### External Institution:

Robert Bosch GmbH Branch in Italy

### External Tutor:

Andreas Dausch, Robert Bosch GmbH Branch in Italy

### Team Members:

Matteo Savastano, MSc Management Engineering, Politecnico di Milano

Marco Camera, Ingegneria Gestionale, Politecnico di Torino

Surush Arafati, MSc Management Engineering, Politecnico di Milano

Prakash Subedi, Telecommunication Engineering, Politecnico di Milano

Dusan Lazarevic, Product Service System Design, Politecnico di Milano



### PROJECT DESCRIPTION by Marco Cantamessa

Technological innovation, matched to radical shifts in market trends, are leading the XX century “era of the car” to an emerging “era of mobility”. For a firm operating at the heart of the automotive value chain, such a transformation is potentially disruptive, since it does not only imply a shift in underlying technology, but also in its reference markets. Bosch inspired the BMSI (Bosch Mobility Scope Italy) project in order to gain insight on potential new markets and products where to direct the firm’s efforts. The project aimed at finding suitable intersections between the objective attractiveness of the market space and Bosch’s subjective potential

competitive advantage, taking into account its current and prospective portfolio of competencies and technologies. The BMSI project therefore had a dual objective, the former consisting in the identification and conceptualization at least one new and promising market-product dyad, the latter of proposing and experimenting a structured and replicable approach for conducting this type of investigation.

The student team worked on this relatively ill-structured and open-ended project brief by starting from a preliminary analysis supplied by the company, which contained a macro-segmentation of the “mobility market”. This segmentation included traditional automotive OEMs, emerging automotive OEMs, Mobility sharing providers, Logistics providers, and Connectivity providers. The team performed a broad study of the trends occurring in each segment (via a PEST analysis) and assessed both their industry-level attractiveness (using Porter’s five forces framework) and the fit with Bosch technologies and competencies, progressively weeding out alternatives that did not appear promising enough. Following a round of interviews with industry players, the team identified three somewhat promising areas, and conceived a range of innovative products and services per each such area, eventually selecting the most promising one.

The final part of the project consisted in a preliminary feasibility study of the selected alternative, i.e. a platform for last-mile logistics in rural areas, consisting in the use of a delivery van that moves across the territory and from which a fleet of rotary wing drones takes charge of the final “van-to-doorstep” leg of delivery. Monte Carlo simulations were carried out, in order to identify the most appropriate parameters for this system (e.g., number of drones, allocation of distance to be covered by the two modes, etc.) and to provide a preliminary list of technical requirements.

In the end, the dual objective mentioned above was achieved. First, the team conceptualized and made a preliminary simulation-based validation of the “van+drone” delivery concept, whose business case will be further examined by the firm. Second, the project can be seen as the prototypical instance of a process that Bosch – or other companies – may use when tackling strategic reorientation.

## **ABSTRACT**

Profound and dramatic changes in the customer needs and requirements are shaping the mobility industry and new business models based on innovative products and service systems are arising in the market. Incumbents, e.g. Bosch, are looking for new opportunities to expand their customer base and product service portfolio.

The project aims at defining the positioning of Bosch in the Italian mobility industry in the next 5-10 years. The approach is based on successive screening and developing of business opportunities for Bosch.

The mobility market has been splitted into five main segments. Key insights from the literature, participation at international conferences and interviews to key actors of the Italian mobility industry, have been part of the analysis of the attractiveness of each segment.

Considering Bosch internal capabilities and resources, together with the company managers and project supervisors, five innovative concepts of mobility solutions have been developed in the Logistic and Mobility Sharing segment. Ultimately, after having assessed each concept the Drone

Delivery Service in the rural area has been selected. Bosch will develop, manufacture and install the drones in third party logistic truck. Additionally, Bosch will develop the software and its cloud for managing the system. The market analysis and the economic feasibility have highlighted the viability of this solution. A Monte Carlo simulation in three Italian rural areas shows the optimal configuration of the delivery operations.

The project shows that drones have the potential to disrupt the last mile deliveries in rural areas in the next few years and Bosch has much to gain from entering this market.

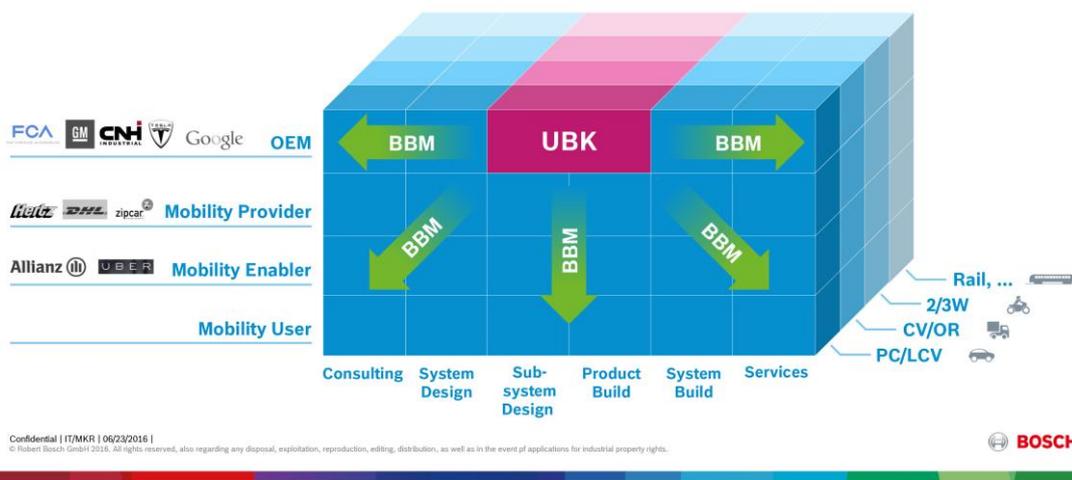
## SUBPROJECT DESCRIPTION

### Understanding the problem

During the last years the Automotive Industry has experienced a significant change from its original configuration of the last century. In fact, traditionally the market was almost completely constituted by OEM's and their supplier, whose main activity was to produce and supply all the required components to manufacture and assemble the final vehicle.

Nowadays, however, the Automotive Industry must be considered and analysed with a much wider view. It is in fact mutating toward a more complete and vast world, which is represented by the Mobility Industry. The direct consequence of this transformation is a significant increase of the number of players acting in the market, of the possible products and services to offer and of the means of transport that could be targeted.

As represented by the image below



the customers of this revised concept of Automotive Industry are not anymore constituted just by OEM, but there are also three other main segments. A first one is represented by Mobility Providers, which includes fleet operators, logistic companies and intermodal and public transports. A second one constitutes the Mobility Enablers, companies that provide products and services to improve the effectiveness or the efficiency of the mobility. As last, Mobility Users, actors that experience some mobility needs in general, from both the consumer and industrial perspective. Moreover, also the variety of products and services that a company could offer to the market has

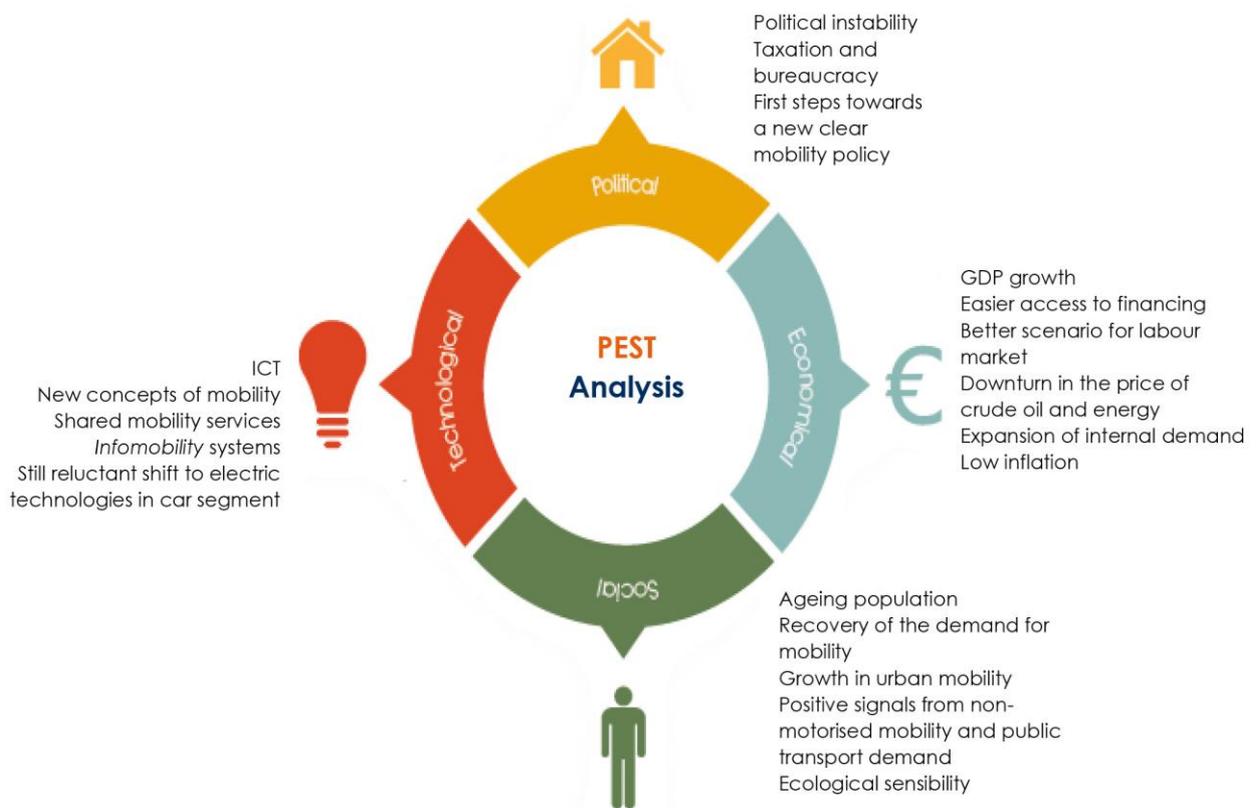
significantly increased, ranging from consulting to system design, system manufacturing and complementary services.

Given this complex and dynamic environment, the goal of the project is to define which could be the future positioning of Bosch in the Italian Mobility Market in a time horizon of 3-5 years. Traditionally Bosch has been always focusing just on OEMs, providing them components designed and manufactured internally. The idea is to enlarge in some way the customer base of the company towards the new segments of the Mobility Industry, adding then to the product portfolio some additional innovative and profitable products/services. It is clear that the general aim of the project is quite vast and includes a considerable number of possible alternatives, given the complexity and dynamicity of the context. The process adopted throughout the project is therefore designed to progressively divide and select possible interesting and promising directions, in order to achieve at the end a specific viable solution.

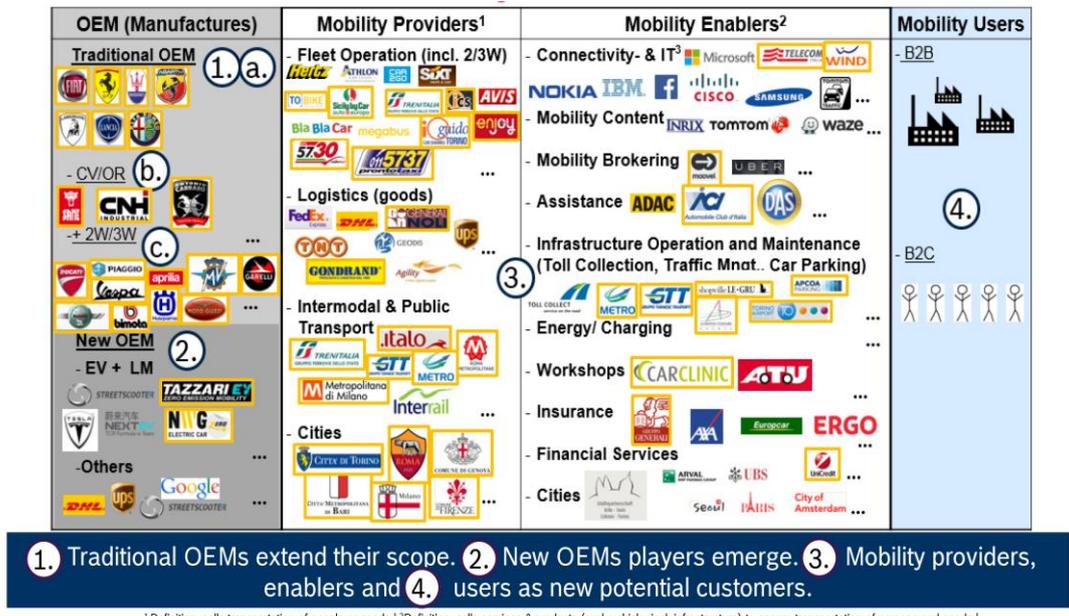
### Exploring the opportunities

Given the complexity and the vastness of the project, the first step was related to the necessity of “cutting the elephant” in to comprehensive and measurable pieces. In order to do so, the team carried out a significant research phase with the aim of developing a clear and complete insight of the Italian Mobility Industry.

A PEST analysis was performed and all the main trends were depicted and interpreted, in order to qualitatively predict the possible evolution of the industry.



Successively, the market was divided in five main segments: Traditional OEMs, New OEMs, Mobility Sharing, Logistics and Connectivity.



<sup>1</sup> Definition: sells transportation of people or goods | <sup>2</sup> Definition: sells services & products (excl. vehicle, incl. infrastructure) to ensure transportation of persons and goods | <sup>3</sup> e.g. Telematics, mobile devices, software, IT, network operator, Big Data, cloud services data security, ect.  
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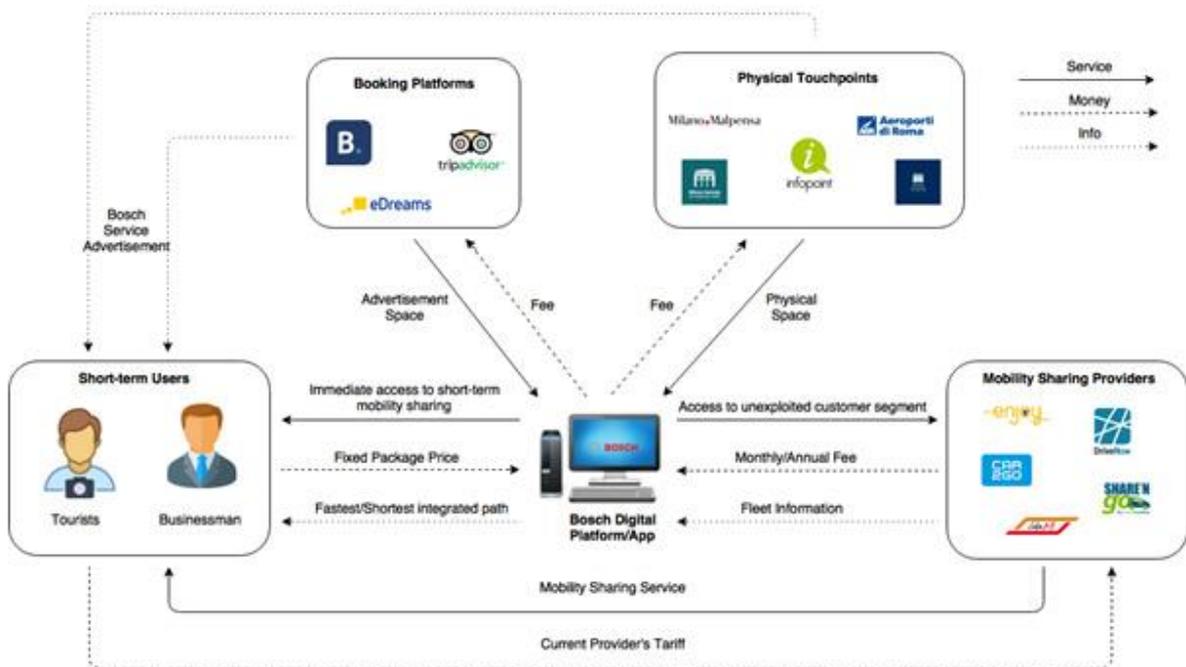
Once identified, the segments were deeply analysed in order to understand their needs and requirements, the specific rules of competition and the critical drivers of success, adopting the Porter's 5 Forces model, the supply chain analysis and the KSF analysis.

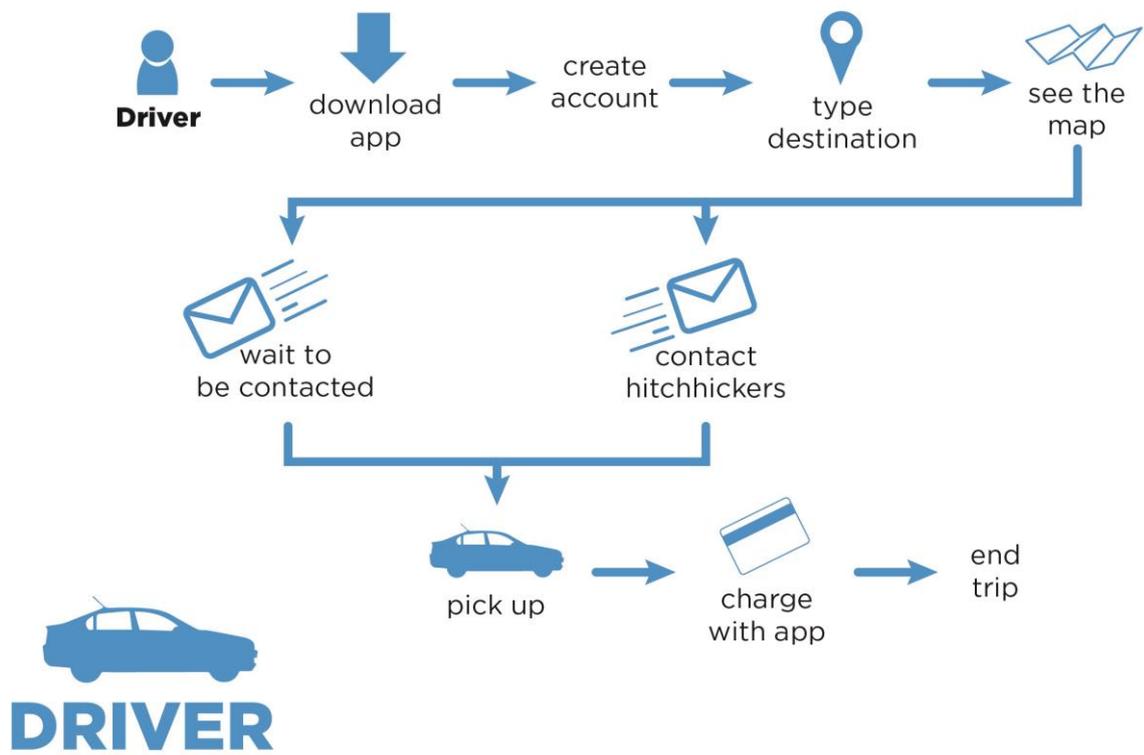
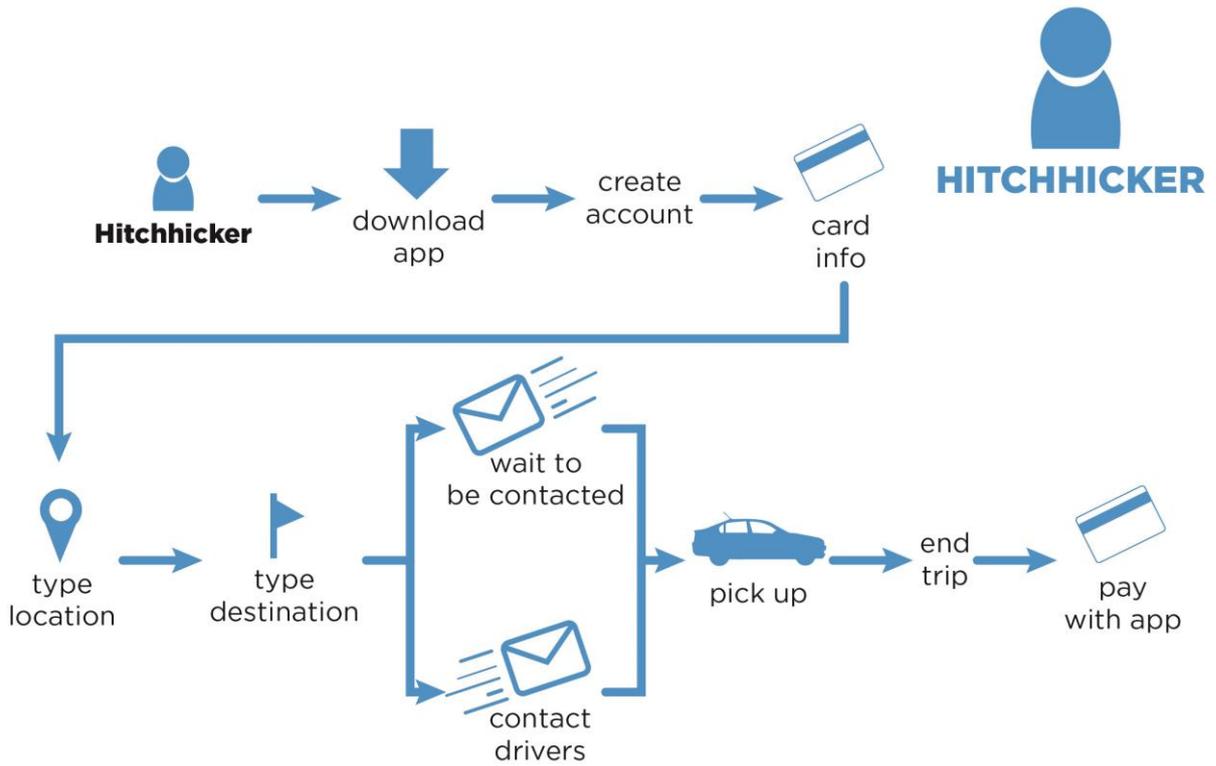
At the end of this research phase, the team had a complete view of the Italian Mobility industry and of its main segments. Thanks to this information, it was possible to target some specific customer groups, specifically Mobility Sharing and Logistics, considering both the potential profitability and the interest of Bosch in entering new segments.

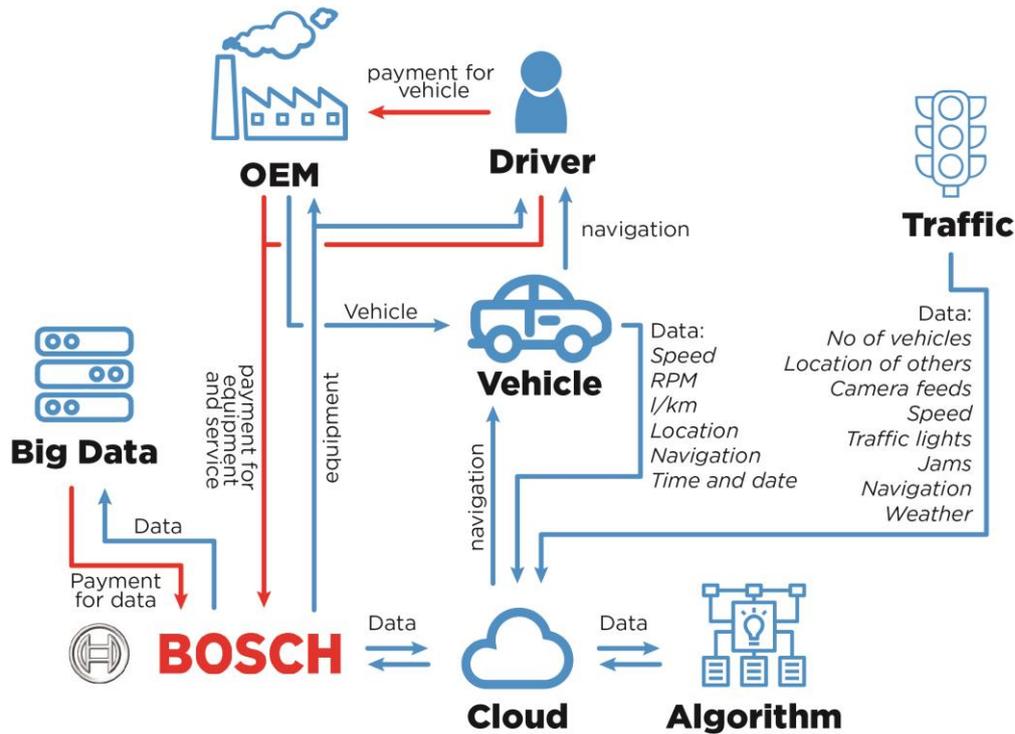
The subsequent phase was aimed at going deeper with the understanding of the two segments selected, in order to identify some latent needs and spot new innovative business models and technologies. With this goal, the team took part to four conferences in Lisbon, Maastricht, Lainate and Aachen, and interviewed some companies in the field like FCA, Uber, ToBike and Up2Go (image below).



Putting together all the information from the research, the team was able to develop five concepts of new product/services. In particular, these possible solutions were Short-term Mobility Sharing, Real Time Carpooling, Big Data Navigator, Car Sharing in Small Towns and Delivery Drones:



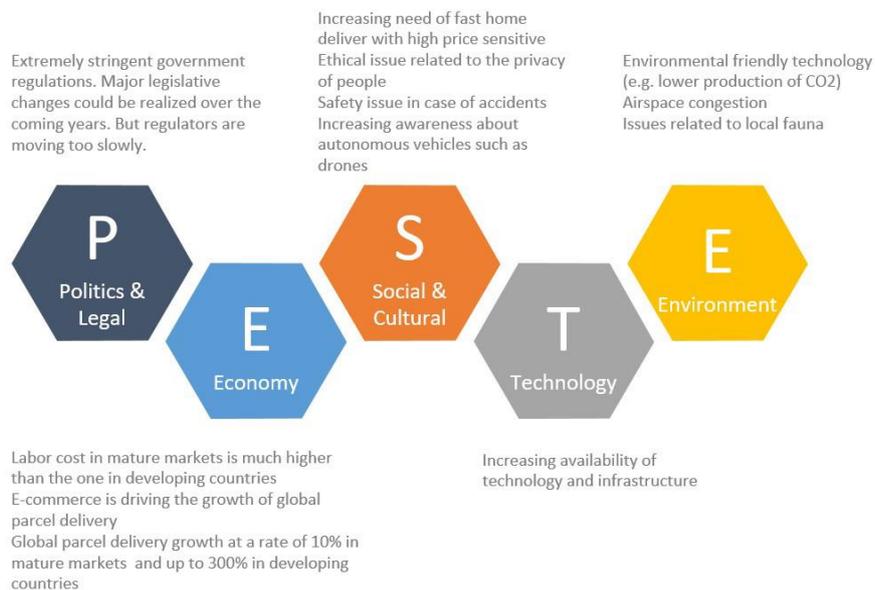




At the end, considering the potential market dimension and the fit with Bosch core competences, the team opted for the latter.

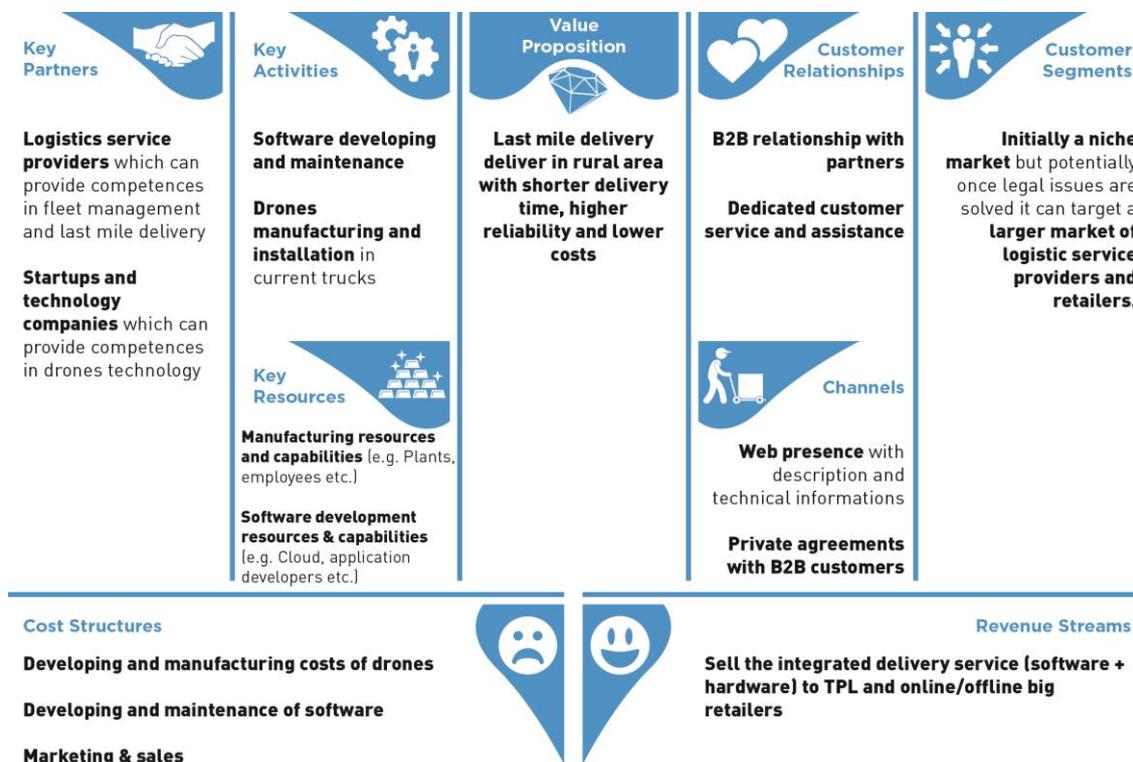
### Generating the solution

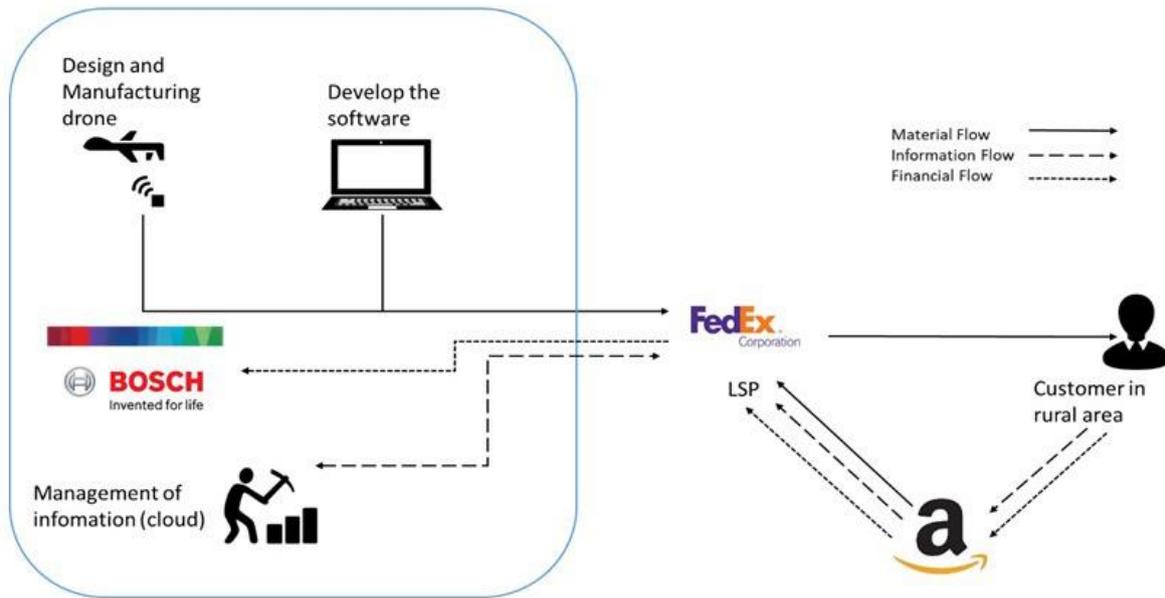
Many applications of drones in different industries are already common today. However, the usage of drones in logistics are still at early stages. This vision will become reality within the next ten years. The speed at which different countries will adapt depends mainly on three factors: labour cost, regulation and public acceptance.



Size, growth, difficulties facing by incumbents, and new business models provides many reasons for studying the future development of the last mile delivery both in urban and rural area. The global parcel delivery market amounts to more than 70 billion €. The growth rate ranges around 10% in mature and up to 300% in developing markets. In the last mile delivery, which represents about 50% of the total parcel delivery cost, incumbents are facing difficulties due to the increasing labour cost. The competition among large e-commerce players has risen. Thus, consumers preferences are considered more and more important and last-mile delivery is a key differentiator in terms of price and time.

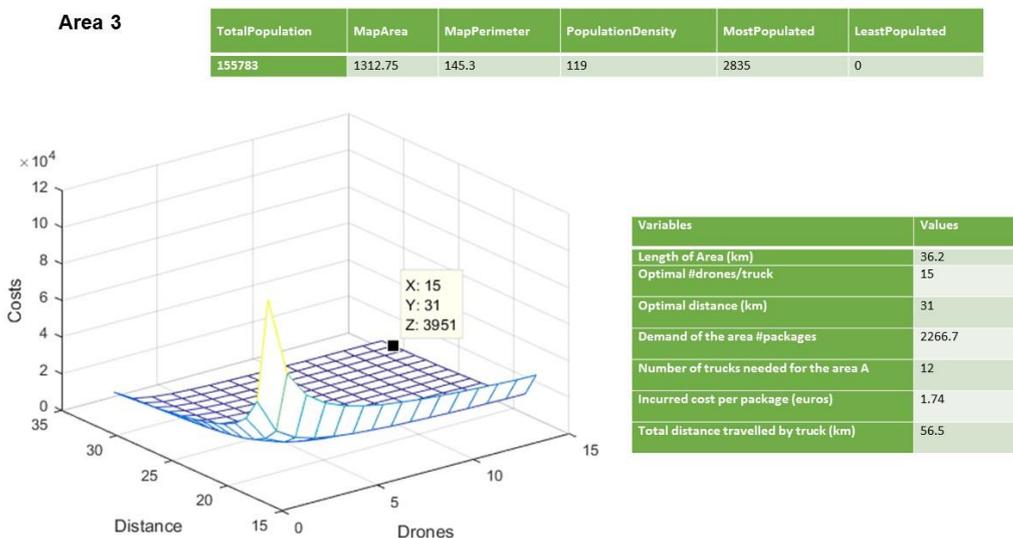
Bosch drone delivery service aims at providing a service which support TPL to deliver parcel in rural areas with shorter delivery time, higher reliability and lower costs. . Bosch will develop, manufacture and install the drones in TPL truck. Additionally, Bosch will develop the software and its cloud for managing the system. Daily operations will instead be managed by TPL.





Under certain assumptions, the economic feasibility analysis shows the viability of the solution. It can be a relevant source of competitive advantage for any TPL, with a reduction of costs of approximately 4 €/parcel and greater potential revenues due to shorter lead time in comparison to their traditional service.

The team developed a mathematical model able to take as input some exogenous variables to describe the rural area under investigation and provide as output the optimal configuration of the drone delivery service, based on variables like number of drones per truck, maximum distance covered by each drone and total number of trucks needed. A Monte Carlo Simulation was then performed for three rural areas in Italy, highlighting the potential cost reduction of the proposed solution.



**TAGS**

Bosch, Italian Mobility, Logistics, Drones