NeXTrust

SUSTAINABLE • TRUSTED • COLLABORATIVE • NETWORKS

NexTrust Pilot 4.1 Case Study:

Pooling underutilized-existing transport equipment in a trusted, multi-vehicle collaborative delivery network: efficient appointed-time-deliveries to end consumers in metropolitan cities of Germany and Belgium

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1. Introduction and Objective

E-commerce is a booming business sector. The impressive growth has created a significant impact on the delivery component of e-commerce supply chain, also called “last-mile” delivery. The e-commerce boom has led to a continuous expansion of delivery fleets of the traditional parcel networks, which must fulfil the so-called last mile deliveries to end customers. The logistics sector uses predominantly small delivery vehicles, such as 7.5 tons lorries as well as smaller delivery vans with a weight of up to 3.5 tons.

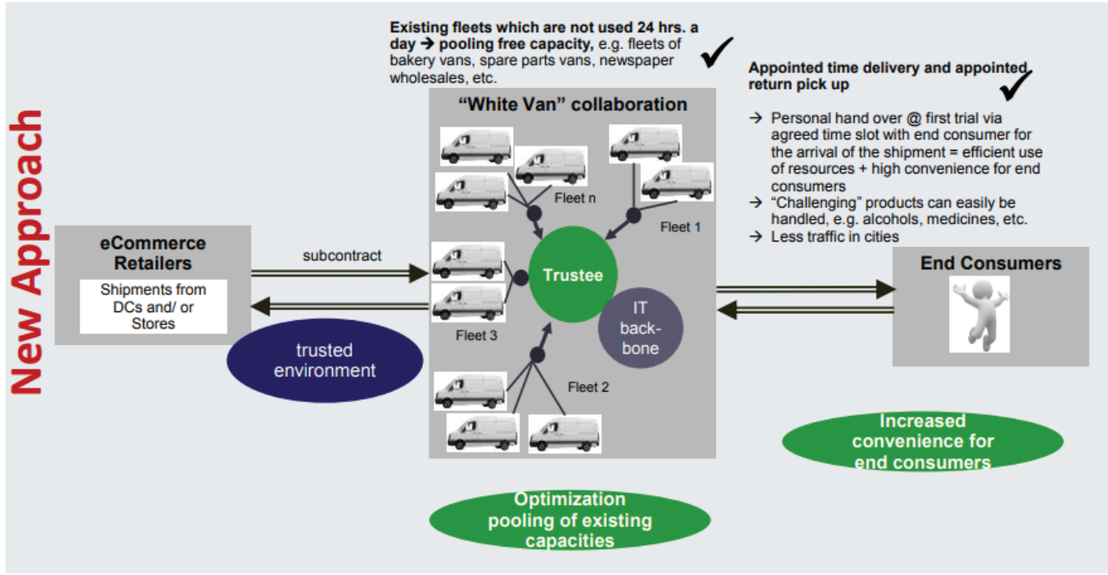
The massive growth of e-commerce has greatly increased urban congestion and pollution. Customer expectations have risen in terms of delivery convenience. This has created a major challenge as customers want their parcels delivered to them within a relatively narrow time window. This can lead to several delivery attempts by parcel carriers before they finally reach the recipient. One reason is that these networks typically run deliveries during work hours when people are not at home.

These delivery structures of standard parcel carriers today do not focus enough on (1) the “being at home” of the shipment recipients and (2) on enabling appointed deliveries to end customers. Several attempts to deliver packages at homes make the e-commerce business very expensive, because of rising costs for the environment and logistics. There are already ideas to change from home delivery to “multi-channel”-options such as delivery to a store (collect & go) or to a parcel collection point. These solutions will only partially solve the home delivery issues. Nevertheless, last mile delivery of e-commerce companies still remains inefficient in terms of costs and asset utilization.

The expansion of delivery fleets to meet the growing demand as well as network inefficiencies increase congestion and air (especially fine particle) pollution. At the same time, a considerable number of underutilized delivery vehicles are available in the market. The NexTrust pilot wants to pool company owned vehicles outside of their regular working hours for e-commerce deliveries.

This pilot case has its focus on the societal and mobility challenge of e-commerce by building a collaborative trusted network around multiple, independently owned vehicles, tapping and pooling this “underutilized” pool of existing transport equipment. These fleets are typically in use for eight to ten hours per day; while vehicles are theoretically capable to run 24 hours. Especially in the evening hours the vehicles are available when the end customer wants to receive their goods.

This pilot case network uses the existing asset capacity more efficiently and improves the last mile delivery service from the receiver perspective, offering “appointed” deliveries, meaning agreed upon delivery dates/limited time windows to end customers that will lead to an increased efficiency of home delivery. With this e-commerce innovation, the project could achieve a real breakthrough in last mile delivery, which might then be scaled and even replicated across Europe.



Trusted collaborative multiple vehicle delivery network !

The envisioned Trusted collaborative, multiple vehicle delivery network, compared with the situation of today, is visualised above.

2. Application of Pilot

The envisioned delivery network will have an impact on ecological, economical and societal issues in relation to e-commerce and parcel delivery. In order to evaluate, manage and control this impact, key performance indicators (KPIs) have to be established and measured. In accordance with the KPIs of the entire NexTrust project the aim was to:-

- reduce deliveries (due to the reduction of unsuccessful delivery attempts)
- reduce GHG emissions
- increase load factors

The pilot KPIs are not only supposed to be used to manage the delivery network during the pilot case and to evaluate the performance after the pilot case, but also offer the opportunity to act as guidelines while designing the pilot. Based on the pilot’s objectives and the essential NexTrust KPIs, the following pilot KPIs were identified as relevant:-

- Increasing average usage time of vehicles
- Decoupling growth of delivery fleets and growth of amount of shipments
- More rapid renewal of existing vehicle fleet
- Reducing unsuccessful attempts of delivery
- Reducing urban congestion and maximum peaks of traffic

2.1 Partners

The task leader for this pilot case is FIEGE Logistik, one of Europe’s leading logistics providers, with a long-standing reputation as a pioneer in contract logistics and e-commerce. The following NexTrust partners were also involved:-

- GS1 Germany
- Kneppelhout Korthals
- Pastu Consult
- TRI-VIZOR NV
- Vlerick Business School
- Vrije Universiteit Amsterdam

2.2 Timeplan

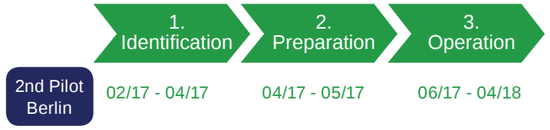
The first pilot case was in Dresden, Germany. The focus was to improve the IT platform and the trustee concept under real market conditions.

	1. Identification	2. Preparation	3. Operation
1st Pilot Dresden	06/16 - 09/16	10/16 - 12/16	01/17- 03/17

The second large pilot in Berlin, Germany tackles the findings of the first pilot and additionally handles the challenges in transport planning in a bigger metropolitan city in Germany. The focus within this pilot is:

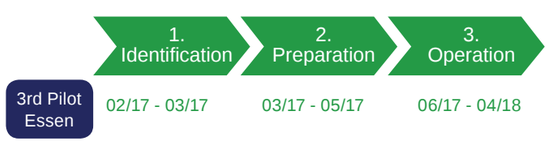
- Enhancement of the parcel volume.
- Building up a collaborative network with no separating of vehicles and driver and especially building up findings in the new approach.
- Increasing vehicle utilization
- Offering full-time jobs instead of part-time jobs for drivers
- Starting with one branch (newspaper industry) and later on enhancement to other branches

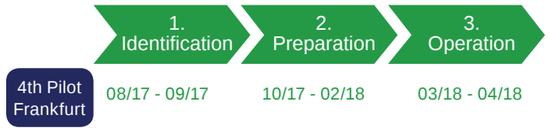
The findings are described in the deliverable D4.3 “Large pilot case in market conditions”



Two additional pilot cases were carried out in Essen and Frankfurt. The idea behind these pilots was to combine newspaper delivery with parcel deliveries. The focus within these pilots was:

- Optimization of an existing delivery system through the up to date IT-platform
- Increasing the utilization of the white fleet through the combination of multi products
  - Reducing empty millage
  - Increasing load factor and especially increasing the drop density of each tour
- Offering full-time jobs (with full paid health insurance cover) instead of part-time jobs for drivers
- Increasing the visibility of the delivery process through track & trace for the end consumer as well as for the trustee
- Opportunity for entering a new business model for the newspaper industry
  - Chance to compensate the dropping core business (newspaper) with a rising product





2.3 Methodology

For the development of the pilot design, a three-step methodology was used:

1. Identification of opportunities
2. Preparation of implementation
3. Operation model pilot case

Building a trusted collaborative vehicle delivery network is a highly complex task. This complexity arises from the entrance in an, until then, unknown market. The CEP market (Courier, Express, Parcels) is highly competitive. LSPs who compete in this market strive to improve their competitive ability and assure their position. Among others, this leads to entrance barriers regarding the availability of information and underlying operational and business models. The competitiveness of the CEP market also affects distinctive dynamics and vitality of offered products and services.

The product and service design is especially complex, because it does not only have to be aligned to the offered services within the market to compete with other players, but it is additionally shaped by retailers as well as customers. In addition the envisioned delivery network is supposed to be collaborative and open. Therefore it includes approaches of the sharing economy and can be regarded as a unique parcel delivery network in the CEP market. On this basis a purely theoretical design of a trusted collaborative vehicle delivery network, which will be able to compete in the CEP market is highly ambitious.

To gain profound and substantiated confidential information as per the pilot design of a trusted collaborative vehicle network results on advantages and disadvantages and on how to design the envisioned network, this pilot case will be executed as experimental study in terms of applied research. This research is executed according to the three step methodology mentioned above.

The first step strives to identify opportunities for the envisioned network. It therefore reviews the general and basic conditions of the CEP market and concepts of the sharing economy. Furthermore it explores the suitability of electric mobility for CEP delivery. On this basis the potential in terms of delivery assets, foremost vehicles, is analysed. The identification of opportunities also refers to the analysis of retailers and customers’ preferences and with that to the identification of reasonable services and products.

With this background the second step outlines the general preparations for implementing the delivery network as a pilot case. This step picks up the structure and findings of the first step and shapes the design of the delivery network. Primarily, this step sets the strategic and operational outline for the delivery network.

Step three defines the technical structure and assets of the delivery network. The design of the envisioned network follows a deductive structure. Following overall or universal structures and concepts of relevant markets, the design of the network is defined in detail resulting in a full operative business model. This business model is then tested within the pilot case. The results of the pilot case, depicted and evaluated by KPIs and lessons learned, will then inductively be used to improve the delivery network and to set it up to be market-ready.

Identification Phase:

- The initial tasks included analysis of the delivery fleet network, capturing data of vehicle and fleet requirements, analysis of vehicle/fleet types, such as company owned fleets, rental fleets, leasing companies, parcel networks, courier/express delivery companies
- The technological IT backbone had to be identified including an Order Management System (OMS) for collecting and coordinating the shipment orders, Transport Management System (TMS) including tracking & tracing, efficient capacity planning system for the vehicles and driver’s network, mobile hardware /software, e.g. GPS systems inside the vehicles, scanners/ mobile devices.
- Decisions about IT architecture and the usage of standard components were made
- The Trustee function and role was agreed in terms of rules of engagement, mutual agreement covering entry-exit, gain sharing formula, projected collaboration P&L (anti-trust compliant) of the collaborative network

Preparation Phase:

- Service concept for end consumer delivery
- Specification of service offer and requirements, such as type of deliveries/order, dimensions and weights per parcel, packaging requirements
- Specification of desired delivery service for consumers, home delivery and multi-channel options
- Prototype of technological IT backbone - based on an innovative process engine, the pilot case will develop a customised IT backbone tool to manage and operate efficiently the trusted collaborative delivery vehicle network.
- Programming and testing of full functional IT backbone prototype
- Generation of “dummy” orders for the tests and comprehensive testing for all software and hardware components

Operation Phase:

1st Pilot

- Setting up the start of the pilot phase with customers in defined German metropolitan areas
- Run the pilot in real market environment
- Constant monitoring of results and findings, inclusive consumer feedback analysis (communication to end consumers EU pilot)
- Evaluating the first pilot phase
- Fine-tuning of technological IT backbone

2nd Pilot

- Real market pilot phase 2 – roll out
- Roll out the pilot phase with customers in other metropolitan area
- Constant monitoring of results and findings, inclusive consumer feedback analysis
- Evaluating the second pilot phase
- Fine-tuning of technological IT backbone

3rd and 4th Pilot

- Shaping the business model by combing newspaper delivery with parcel deliveries

- 2.4 Target Groups

WP4.1 has 3 different target groups:

- Retailers
- White van fleet owners
- End customer

3. Results and Impacts

The following tables give an overview of the important facts and figures of the pilots:

KPI	Pilot Dresden
Success rate of a delivery attempt • Appointed delivery time	• 100 % (+19% points compared to market standard)
• Customer Rating	• NA

KPI	Pilot Berlin
Success rate of a delivery attempt • Appointed delivery time • Silent upgrade	• 99 % (+18% points compared to market standard) • 81%
• Customer Rating	• 4, 5 stars of 5 stars

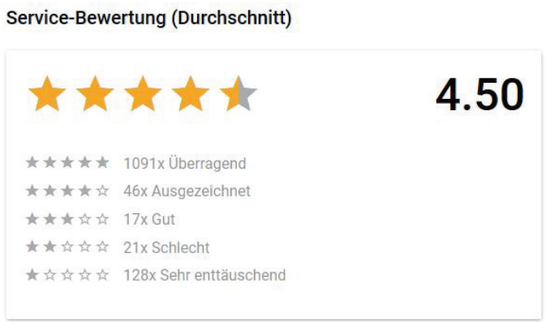
KPI	Pilot Essen
Success rate of a delivery attempt • Appointed delivery time	• 98 % (+17% points compared to market standard)
• Customer Rating	• NA

KPI	Pilot Frankfurt
Success rate of a delivery attempt • Appointed delivery time	• 97 % (+16% points compared to market standard)
• Customer Rating	• NA

4. Lessons Learnt

Over all the pilots the lessons learned are:

From the end customer perspective the focus on selectable time slots and same day delivery was the right decision. The end customer has rated our service in total with 4.5 stars out of 5 stars:



Approximately 9.9 % of end customers have rated the service.

One aspect which should be considered additionally in the future is that most of the retailers do not want direct communication between the parcel provider and the end customer via e-mail. The majority of retailers prefer to only have direct communication coming from them. Therefore it is necessary to have a direct integration of the time slot booking in their web shop. However, the effort for integration was quite high for the period of the pilot. Nevertheless the retailers were very interested in the approach and the uniqueness of the concept was confirmed.

The potential of using underutilized vehicles is high. The average vehicle usage is only one hour a day (net time of usage per day). The success of the pilot depends on the ability to make use of this untapped potential. The first feedback from retailers and vehicle owners indicates that the design of the pilot is able to acquire sufficient resources and customers to join the network.

5. Conclusions

With the lessons learnt from the Pilots, the conclusion is to focus on 2 roles:

1. Platform operator
2. Trusted network with an advanced 4PL

These main duties contribute to the level of success, especially on the vehicle owner's side as there is only a limited willingness to take over business responsibility of a new business model. But nevertheless Fiege showed with the pilots that they were able to demonstrate and validate the positive impact of the innovative business model ANGEL. The first KPI's results show that the success rate of a delivery attempt can be increased by 17% (from 81 % to 98 %). Additionally, this has a significant impact on the reduction of greenhouse gas emissions and NOx particle.

Further FIEGE Logistik Stiftung & Co. KG will prove the adaptation of NexTrust ecommerce model under market conditions. Fiege will build up a business case, focusing on the rollout in the biggest metropolitan areas in Germany. Fiege will work on the right adaption of the organization model (100% owned by Fiege or build up a joint venture of different/more partners).

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