DRIVE SWEDEN

P2x Partio – System Solution for Shared Cars

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1. Summary

Volvo Cars and Hertz Sweden performed joint project with intention to develop system solution for shareable digital car keys and to research and evaluate if developed solution enables Hertz to use private owned Volvo cars as extra supply for their rental fleet in feasible and viable way.

At the beginning project R&D development focus with plan to develop aftermarket accessory unit that could be retrofitted to some of the existing Volvo models. Assumption was that development and operative cost and technical complexity for needed solution could be kept feasible and that customers would be willing to pay for the digital key aftermarket solution.

The goal was also to develop system with capability to share car and car access seamlessly between Volvo owner, Hertz personnel and Hertz customers supporting above mentioned fleet car sharing use case.

Due unexpected technical complexity which increased development cost, Volvo decided to change digital key strategy and aftermarket accessory platform project was terminated. This impacted heavily Partio project and forced team to decide either cancel or to pivot the project. After few planning iterations team decided to continue and shifted focus to research needed user and service experience to validate value hypothesis. This would include identifying user needs, barriers and attitudes for sharing their car to rental companies.

To evaluate defined service experience and to validate business case assumption, the project team modified existing Volvo XC40 peer-to-peer car sharing service to support peer-to-rental-fleet sharing use case. This was used in pilot project with Volvo beta customers. Even though there were rather high interest towards the concept and the, only handful of Volvo drivers actually shared their car to Hertz during the pilots that were conducted.

Conclusion from the project and pilots were that there exists lot of uncertainty around rules, regulations and legislation what comes to sharing already owned car to car sharing services. For example lease car owners were not aware if their lease contract prevents or allows using car sharing services, there was also concerns for receiving compensation and how this would relate to income taxes etc.

There is also anxiety and high trust barrier for existing car owners to share their car with others, whom they basically consider as strangers. This anxiety can be reduced by using car sharing service as mediator compared to direct peer-to-peer car sharing. Responsibilities and terms of for service are better understood when sharing cars through mediator. Although pilot participants did not think that rental company is best possible instance for such mediator.

2. Background

In order to prepare the Swedish transport system for change, Vinnova and Drive Sweden have chosen to sponsor the development of systems to get private individuals to share their cars with others. This will lead to an increase in the utilization rate of the Swedish car park.

Current car models sold in Sweden do not provide capability to use mobile phone as digital car key. When the project was started the current mobility service providers did not also offer simple and secure way to share private owned cars to car sharing services.

3. Project set up

4.1 Purpose

Diverse mobility services and sharing economy has been seen as one of the automotive megatrends together with connectivity, electrification and autonomous driving. The purpose for the project was to develop a low cost system solution that would enable shareable digital digital car keys for car owners , rental company and its personnel and rental company customers, intention was also research, test and service and business opportunities within car sharing in car rental domain. Purpose was to test willingness for car owners to share their car to rental companies and understand right compensation model and levels. Purpose was also to evaluate if privately owned cars could be used as extra supply in the rental company fleet to backfill specific high peak demand times or seasons.

4.2 Objectives

The original objective for the project was to develop a system solution that would let Volvo owners to generate and share time restricted digital key securely to Hertz so that Hertz could then distribute digital further for their rental customers. Similar system solution could then be used in other peer-to-service business and use cases. The scope for the original project was to deliver aftermarket accessory unit that Volvo mechanics could install into some of the existing Volvo models at the Volvo workshop, a new kind of mobile app for Volvo drivers to support car sharing with trusted organizations and a cloud service at Hertz domain to support offering digital keys and seamless rental experience for Hertz customers.

During the project, the accessory platform development turned out to be more complex and resource intensive than what was originally assumed. Partially due increased development cost Volvo decided to terminate its accessory platform development and focus to develop built in solution for upcoming car models. This forced the project team pivot and the focus was shifted to research and customer needs, barriers and expectations for using privately owned car in peer-to-service car sharing domain and especially within rental business context.

4.3 Project period
- Project discovery and development was mostly performed during 2017 and 2018
- Accessory platform development project was running throughout 2018 and got cancelled November 2018
- Deciding to pivot and modify XC40 Car Sharing to support P2x Partio pilot was developed from December 2018 to early 2019
- Pilot was started on Q1/2019 and after short period it was jointly decided to ramp pilot down due low participant volume

4.4 Partners
Project was done in collaboration between Volvo Cars and Hertz Sweden.

4. Method and activities
First phase of the project was following agile development practices, this required alignment between accessory platform HW delivery schedule and software running on accessory platform. After pivot the project team changed working methods towards digital service discovery with big emphasis on user experience design.

Identified candidate user groups were interviewed, Facebook was used to perform A/B test to measure interest towards different value proposition options – convenience vs. cost. At the end of the we also did pilot with Volvo beta user group, goal was to validate if idea on sharing private car for rental company would give enough value for customer compared to hassle and also fulfill rental company needs for profitable business.

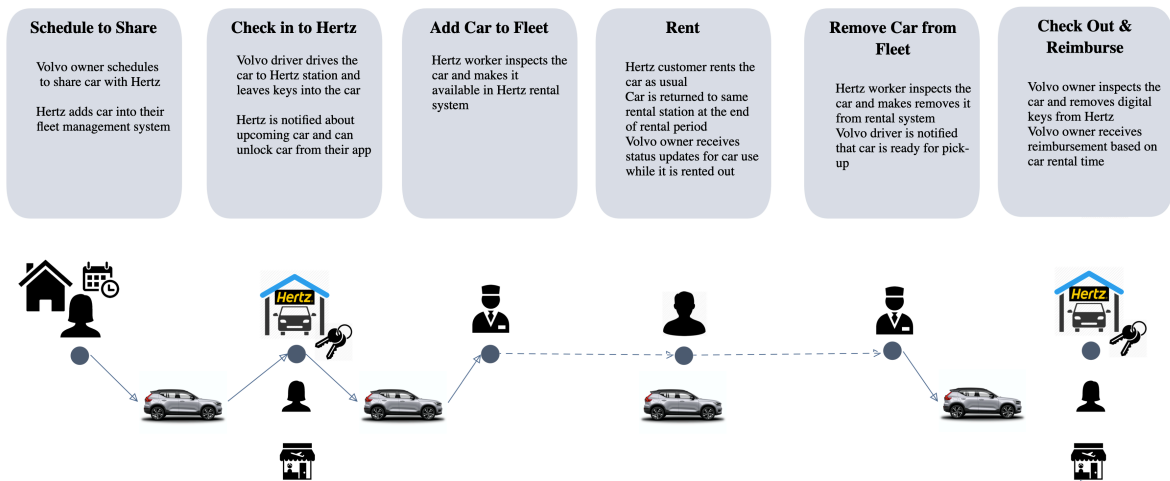## 5. Service Flow for sharing private owner car to Hertz

This chapter and following diagrams describe peer-to-service car sharing concept for Partio project in high level.

Main idea was to let Volvo owners to share their car to Hertz while they were traveling from Gothenburg (Landvetter) or Stockholm (Arlanda) airport and then let Hertz to rent received car to their customers like any other car in their fleet. Assumed value proposition for Volvo owners was that instead of need to pay for expensive parking at the airport while traveling owners would receive free parking, free car wash and extra compensation when their car was rented by Hertz.

Idea from Hertz point of view was to receive extra supply for their fleet from private owned cars and that those would provide remedy on high demand seasons when complete rental fleet is usually almost rented out. Value proposition hypothesis was that receiving and handling private cars as extra supply could be performed with minimum operations overhead or additional costs and that these cars could be offered to Hertz customers in same way than any other car in their fleet.
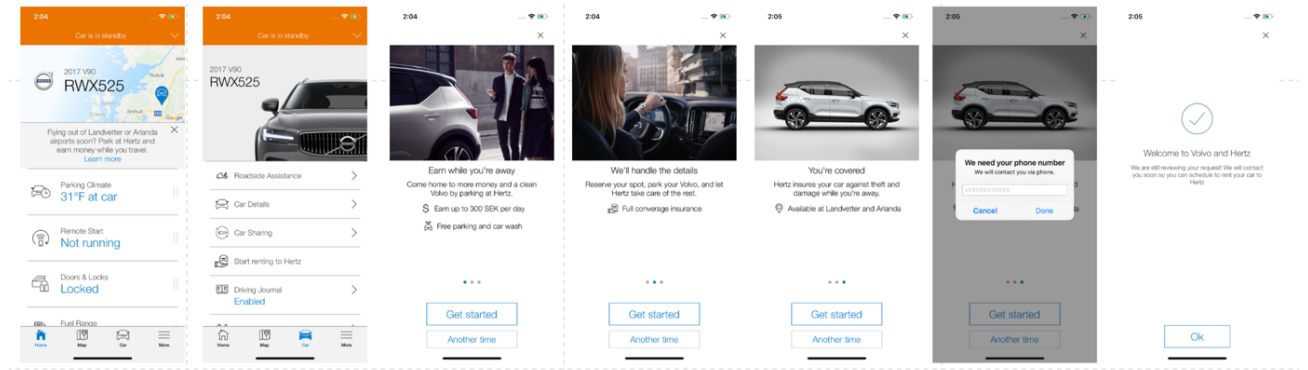
Following diagram describes key steps in the service flow. Service onboarding, aka. first time use is not shown below but UI screens fot that are presented in the following diagram.
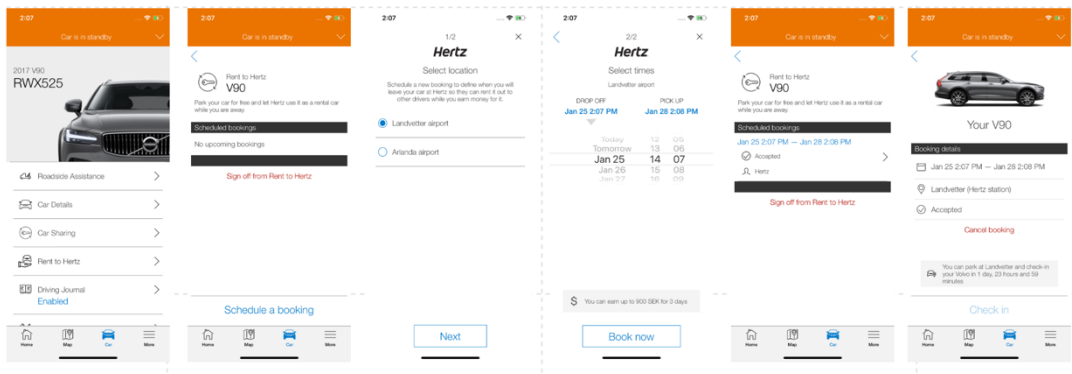
User Journey

Service Onboarding

Service promotion and additional information about the service is shown for relevant users in Volvo on Call application. This happens for example if user has upcoming flight from supported airports (Arlanda or Landvetter) in their phone calendar and they have car that supports P2x capability. User phone number is captured. In urgent cases before, during or after car sharing Hertz may contact Volvo owner directly via phone call
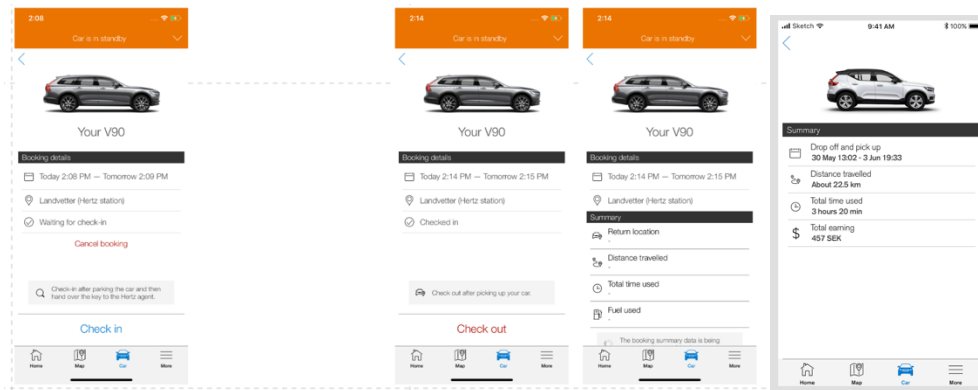

Schedule Share

User can schedule car share to Hertz from Volvo on Call application. First step is to select drop-off location, second step is to select drop off date and time and last step is to set pick up date and time. User can also view scheduled shares and their details as well as cancel to share their car to Hertz if their plans change.

Hand over car to and pick-up car from Hertz

When user arrives to the airport and leaves car to Hertz parking lot they need to "check in" their car from Volvo on Call application. This informs Hertz that car has arrived and is ready for pick-up. After receiving car back from Hertz, Volvo owner needs to perform "check out", this removes car sharing information from Hertz systems. When user performs check out, statistics for how car was used during the sharing session is shown. Compensation information was not implemented during the project.

Results and Deliverables

Project Successes

Name	Description
Testing interest with Facebook ads	Created 2 different advertisements to describe idea in Facebook advertisement, measure views and clicks to gather insights from interest towards sharing service. Reached 126k users with Facebook advertisements. Click through rate was 1,5% for ad
Manual pilot to share car to Hertz	Email recruitment of Volvo beta community members to join pilot that would allow them to share their car with Hertz. Hertz did not rent out cars to their end customers during this phase. 277 beta users were invited, where 25 shown interest and 6 shared their car to Hertz.
Digital pilot in Volvo on Call application using modified XC40 Car Sharing service	Modified existing Volvo XC40 peer to peer car sharing service to support sharing cars between Volvo drivers and Hertz. Solution let Volvo owners to sign-in for the service and schedule share through digital channels. Back-office was built based on email exchange and phone calls between Volvo and Hertz. Presented promotional banner in Volvo on Call for selected 200 users, where 15 signed up for the service but only one shared their car with Hertz.

Unexpected Events

Description	Impact	Actions Taken
Interest towards this kind of service was high when it was described to customers, but converting users to actually share their car was hard.	Did not reach out enough users to conduct successful pilot	Pilot was closed
Project to build aftermarket HW module that would enable shared digital keys were closed during the development of pilot project due complexity.	Original objective to develop a seamless system solution for sharing cars between car owners and Hertz was not possible. This also made original pilot setup impossible.	First it was researched if Volvo XC40 car sharing solution would be option to implement digital keys for, but it was found out that there was not enough volume to use only XC40 cars. This resulted that digital key part was removed from pilot project.

6. Conclusions, Lessons Learnt and Next Steps

Lessons Learned

Description	Recommendation
Qualitative research to measure interest for services that require high trust, like car sharing, doesn't fit well.	It is better to define assumptions and execute small incremental mini-pilots to have quick feedback loops from customers.
There is lot of uncertainty within sharing economy services that causes users to be cautious to enroll this kind of services. For ex. it was unclear for most people if company / lease car is legal to share.	Develop better FAQ material and make it easily available. Work collaboratively with law makers to ensure that experiments and pilot were possible to perform. There was also collaboration with RISE and Swedish tax authorities to clarify current regulations for car sharing services. Bring leasing companies into discussion early in the project.
It's important to agree and document who "owns" the customer in services where	Jointly define principles for customer journey and use RACI method to clearly

complete value stream is delivered by multiple organizations.	define who is accountable for customer experience.
We should have tested multiple pricing models to learn what level of compensation and what kind of value triggers customers to share their car with rental companies.	
People are concerned about privacy when sharing their car to someone, but they would still want to have an option to track and get updates where car is and how it is being used.	More research and testing is needed to understand good balance for transparency and for sharing services.
People are very cautious to let "strangers" to drive their car. Attitude for sharing car to stranger is way more reserved than letting someone to rent and stay at your home (AirBnB).	

Concept of sharing privately owned or leased car to service provider organization or mediator company to receive some type of customer is still valid. Further research and experimentation should be conducted to identify product opportunities and potential business cases. Key is that selected scenario satisfies all 3 stakeholders, users sharing their car, service provider receiving car and service end user.

For the consumer, a winning business case must provide enough confidence and trust combined with high user value. For the service provider the received car must be easy to integrate seamlessly into existing service processes. This ensures continuous business model and that there are no hidden costs involved.

At the beginning of the project, we assumed that it would feasible to offer shared cars to renters in same way than other cars in Hertz fleet and renters would not notice if car was shared or if it belonged to Hertz rental fleet. Handling shared cars turned out to be too much hassle to be efficient.

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