Stories of Parking & Ecosystems

Master Thesis 2019 Presentation

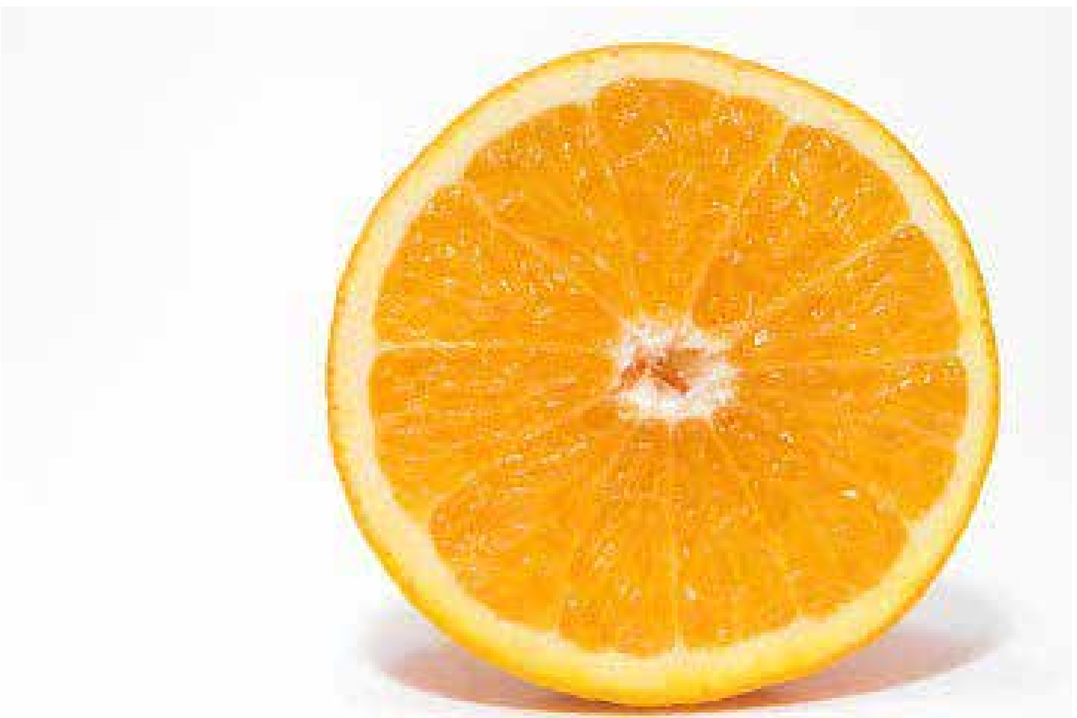
Himanshu Singh, MAID
Department of Design,
Anhalt University of Applied Sciences

“Progress is only possible by passing from a state of undifferentiated wholeness to differentiation of parts.”

Ludwig von Bertalanffy

Father of Systems Thinking

Systems in everyday objects-



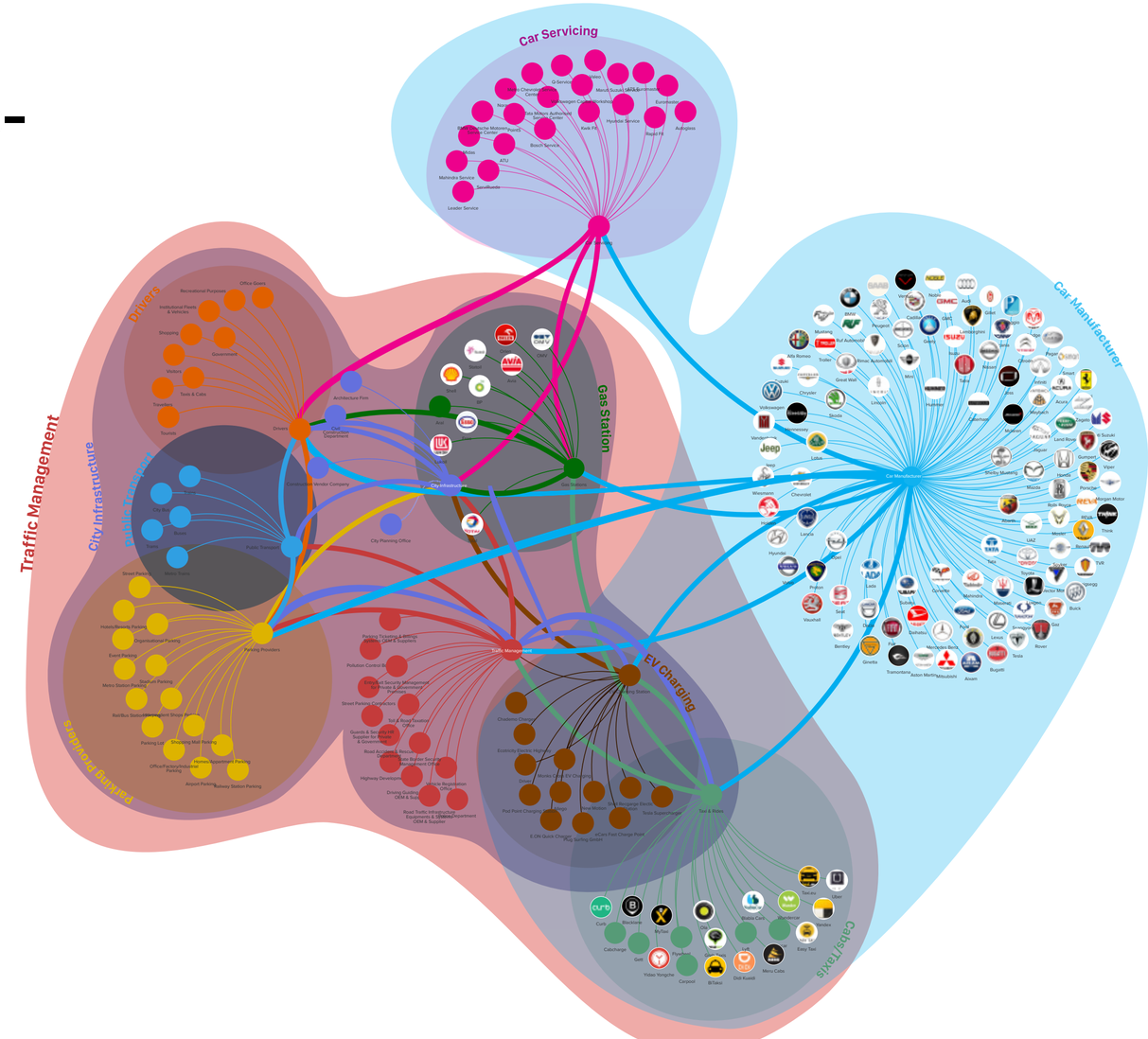
Master Thesis Topic:

1. Designing Process for Ecosystem Product Service Systems & Platforms Based Disruptive Ventures
2. Application of Above Method to Solve the Problem of Finding Parking in Social Spaces in a Smart Cities

Ecosystem of City Car Traffic-

Gigamapping is an elaborated extensive mapping across multiple actors and layers of connections with the goal of investigating relations between seemingly separate categories, hence establishing boundary on the conception and framing of an ecosystems.

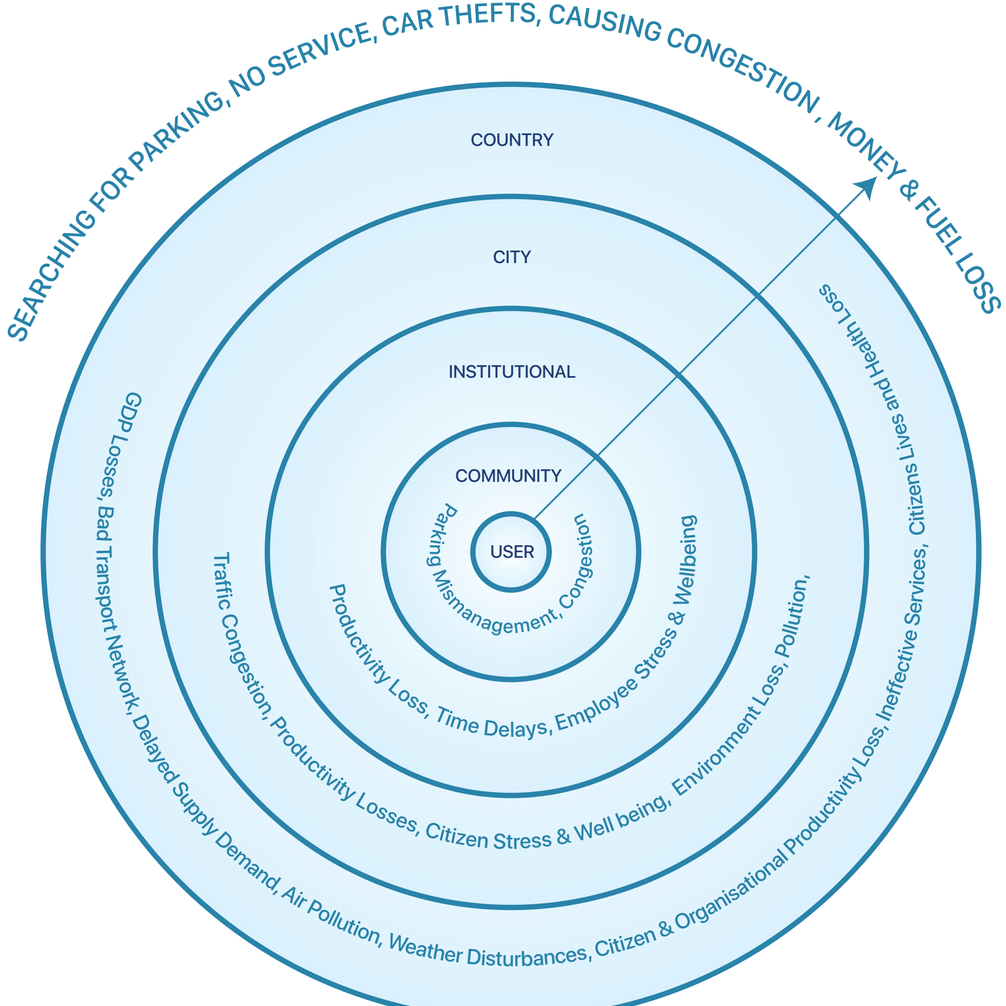
Nordic Gigamapping Design Method + Jay Wright Forrester Systems Dynamic (systems modelling tools by Donella Meadows)



Actors-
Car Manufacturer
Car Servicing
Cabs/Taxis
EV Charging
Traffic Management & DMV
Gas Station
City Infrastructure
Civil Construction
Public Transport
Parking Providers
Drivers

The Nested Problem-

A problem that is affecting not only an individual citizen driver, but also causing a massive impact on national GDP and environment.



Questions-

Every time we travel, if we waste 50% of our time in bad parking related traffic congestion, we will end up losing a significant amount of our lifespan on the road

Imagine how much carbon footprint we are creating because of traffic congestion; some cities are forced to try ban cars schemes to fight air pollution

Imagine how much efficiency we are losing when employees arrive late and stressed out of a battle faced in traffic congestion

What happens when electric cars go mainstream, this fight for parking will get accompanied by a new kind of fight, a struggle to find a spot for charging

Are we prepared for these shortcomings and challenges, are our cities are smart enough to tackle these problems on their own in future? This could be a bottle neck in adoption of electric cars by apartment dwellers of metro cities, who are helpless and are forced to park on the road or in an unorganized place near their apartment buildings.

How can we make sure that everyone has a spot for charging and parking or both at the same time

Are cities running out of parking spaces or we have enough parking spaces but are unorganized and inaccessible most of the times

What happens to parking spaces when the owner of the spot goes to office, or when there is a holiday for business establishment, what happens to parking spaces available after 5 pm. at these offices and business establishments such as shops, malls, office, restaurants, museums etc.

Why are we building automated expensive parking lots in the prime locations of the cities wasting a valuable real estate that can be used for building offices and community centers, is there a solution to this problem?

Are we seeing the problem from a right perspective, or there is more to it, how this is connected to other factors or systems, is this a standalone problem or a node of a bigger network of problems

How can we comprehend and learn about this situation and what others are doing for this? If we think of building a system for a city then who owns it, controls it and who will be the stakeholders and how it will benefit lives of citizens of a city?

Data Findings-

Germany-

With a global ranking of 20 and 589 car owners per 1000 citizens, Germany faces the problem of traffic congestion and air pollution caused by it. The top 10 cities of Germany that face these issues are Berlin, Hamburg, Munchen, Koln, Frankfurt, Stuttgart, Dusseldorf, Leipzig, Nurnberg and Bremen.

As per a study done by INRIX, German drivers lost 5.1 billion € in the year 2018 and wasted120 hours because of traffic congestion. The slowest city was found to be Berlin with an average speed of 17km/h.

India-

As per a survey done by BCG (Boston Consulting Group) in Delhi, it was found that 45% Delhi citizens use car to commute everyday. Traffic Congestion in Delhi during peak it rises to levels exceeding 120% rate. In Delhi 19% citizens use Public transport, 45% use cars, 5% use ridesharing, 5% use taxis, 26% use motorbikes to travel everyday.

Rate of Traffic Congestion in India's cities-

Delhi - 129%
Mumbai 135%
Bangalore - 162%
Kolkata- 171%
Traffic congestion costs four major Indian cities costs around 19 billion euros per year.

(SOURCE: INRIX Parking Study: July 2017)

Design Research (Scientific Papers)

Donald Soup and Robert Hampshire, they found 15% of traffic is cruising for a paking space and that's leading to congestions and jams[1]

High cost of free parking[2]

Cruising for finding parking[3]

1. https://www.researchgate.net/publication/325247222_What_Share_of_Traffic_is_Cruising_for_Parking?_sg=JYPda1rlx7bFN1lBrUNs_xQpETA3XZHRXWmEtmwevq7Jt48FKcKNMMmLGS9PZRvgPtu7CWMxp4Gkg7EQwZ3g_QvFiXaDksh1oEyEM1T9.y5enYho-HHYECqLm__qLd977_pDD3xh8Y173qvFxtH4WQMEjboB6AsXMtwVWVfx7EDfXM5tSPL8fOhHwmhqxWQ

2.https://www.researchgate.net/publication/235359727_The_High_Cost_of_Free_Parking?_sg%5B0%5D=dfcDDJj6fJsANr5cuAEZxXkDGMswlBjoBFzUAwyq3JWAvcFakTeoN2pzRUf0RbQTwoOGzVXZ3mSLOA.HUmiMpANITBZRXv0Jazbihn76TOtMpNqgVx7QhhVBZIsyCwU-kSHQJLhWZ6AjVdwFrLJJpakMF3GvQJS1QSUPA

3. https://www.researchgate.net/publication/222745846_Cruising_for_parking

Design Research (Survey & Interviews)

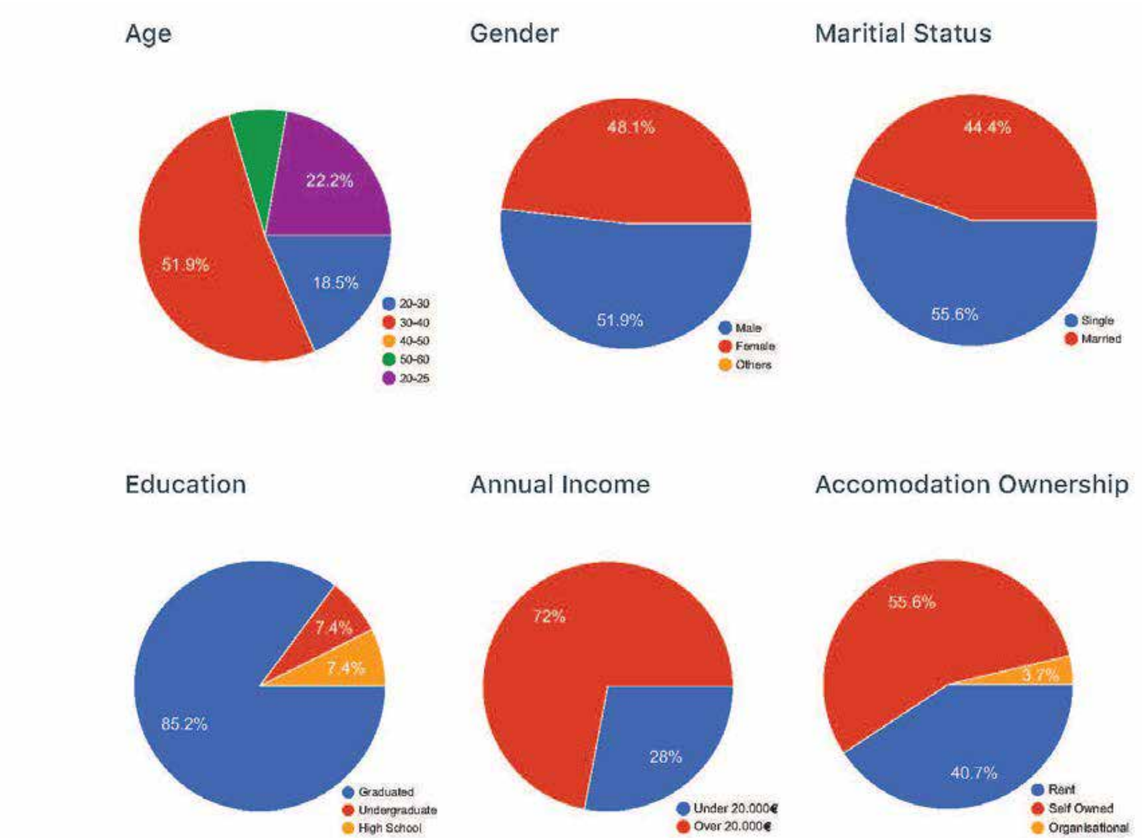
Age- 20 to 60 years old

Sex- Male, Female

Nationality- Brazil, Crotia, Indonesia, Italy, Lebanon, Trinidad, USA, Russia, Germany, India

Maritial Status- Single & Married

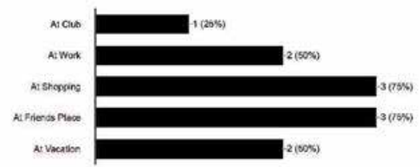
Education- High School, Graduate, Undergraduate



Design Research (Survey & Interviews)

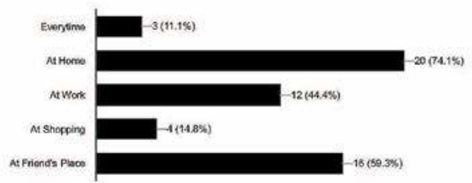
What mode of transport do you use in your daily life?

When you are not using your Parking Space then where would you most likely be?



How would you describe your travel to office or in daily life in your car ?

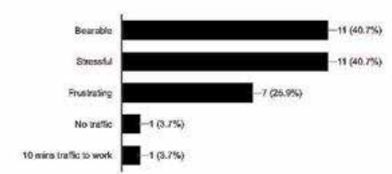
When do you use free parking ?



What type of fuel does your vehicle runs on?

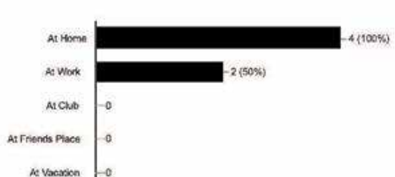
If asked to share your Parking Space/Spot when not in use, what would be your major concerns?

How would you describe your experience with traffic while travelling in your car?



What are your motivations behind using your own car instead of public transport?

Please State the place's where you own Parking Spaces



Would you be interested in sharing your Parking Space on shift basis to take action against air pollution, traffic and congestion, while making some profits?

Have you ever got late for somewhere due to traffic problems or lack of parking spaces?

Design Research (Investigation)

Persona & Interview

Hemant Singh

Meetings are necessary for Hemant's work life; clients, vendors, workers, factory, meeting all of them everyday is a part of routine.

Obstacles-
Visiting in remote Industial areas is not possible with Public Transport, big factories and establishments are on borders of city areas, managing a tight business meeting schedule with several locations in a day.

motivations
wants to expand business
meet clients
participate in business activities
and events

knowledge
entrepreneur
lifestyle shoes designer
car driving since 30 years
mobile and apps avid user
user of autotech. and
manufacturing tech.

challenges
keeping up with lots of
meetings at different locations
scheduled in a day
meeting with family social needs
participating in events

needs
managing business
meeting clients, vendors and
associates
family and friends
events and travel

"Parking should be reserved before arriving at the destination and easy to book"

goals
meetings, events
keeping update with tech.,
design and business
expanding business
getting more clients

Hemant on a holiday at friend's place

influencers
social media, internet
business friends, collagues,
clients, tech. & business events,
footwear trends, fashion,
manufacturing trends, politics &
laws

pain points
finding quick parking
finding a spot next to destination
carrying business materials,
participate in events, business
meetings, visits to factory,
clients and vendors

background
Hemant Singh
lives in New Delhi,
from Delhi, India.
Business owner at Mansi Footwears
Pvt. Ltd., Shoe Designer,
Entrepreneur

interests
factory optimisations
improvising productivity
expanding business
getting more clients and ventures
business management
latest trends in footwear designs

Problem Statement:

How might we develop a solution for a car driver to help him find a Parking Space near his destination before he arrives, respecting driving time, traffic and congestion.

Design Method-

1. HOD (Hands on Deck) Method
2. MVP (Minimum Viable Product based on MVE)
3. Exponential Design

HOD (Hands on Deck) Design Method-

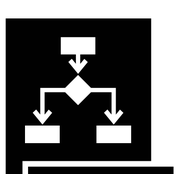
A design process that lies at the intersection of empathy, sustainability and systems thinking for designing solutions to real world problems with digital tools and technologies.
Hands On Deck design process is based on the contextual inquiry method by theatrical performance of a given problem situation. To investigate and comprehend human behaviours, interactions and events while designing for a service. To emphasize this explorative aspect, we use the phrase "Investigative Rehearsal".
Similar techniques include bodystorming, service walkthrough, service simulation and role-play.

Ref:
1. Forum's Theater of Oppressed
2. Donald Norman, Theory of Emotional Design

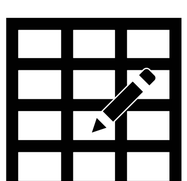
Plan

Play

Record



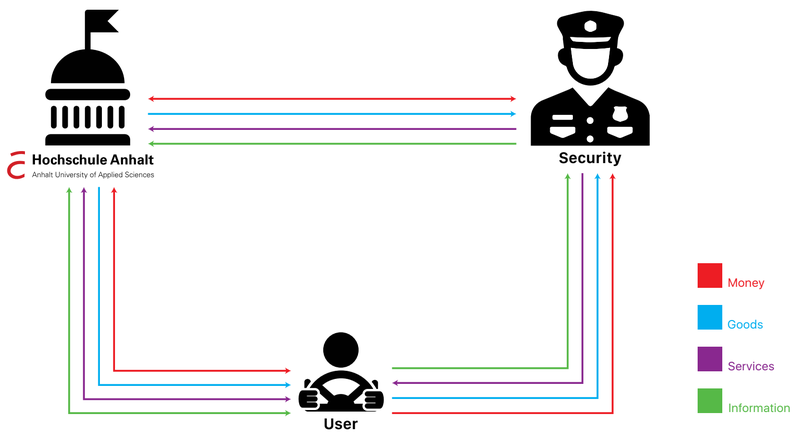
Algorithm Design



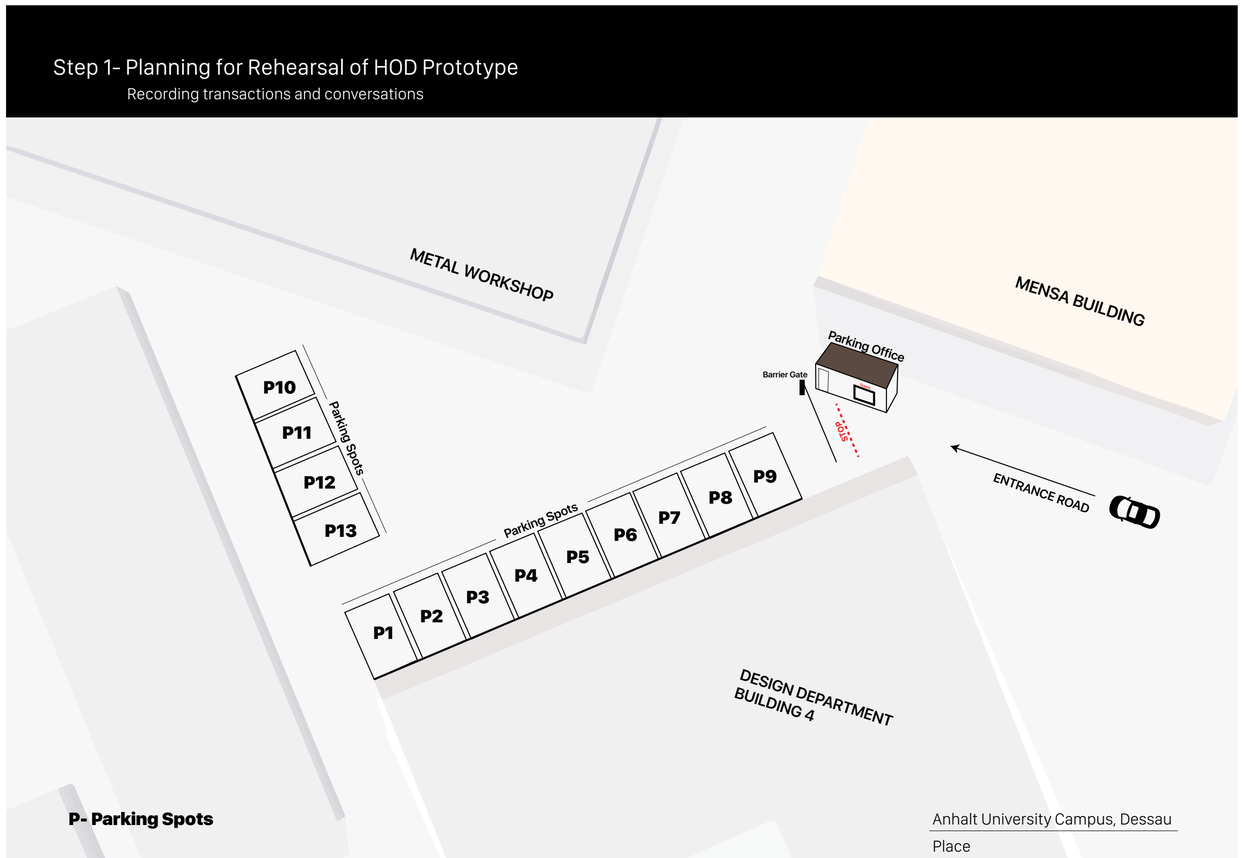
Digitisation Canvas

Prototype

HOD (Plan)-



By using simple tools for planning, we can come up with plans that can not only help to conduct the process but also help come up with materials to brief the participants.



HOD (Record)-

The Recording Canvas helps to record the events of play, with it's behaviours, interactions and conversations.

Step 2- Recording HOD Prototype

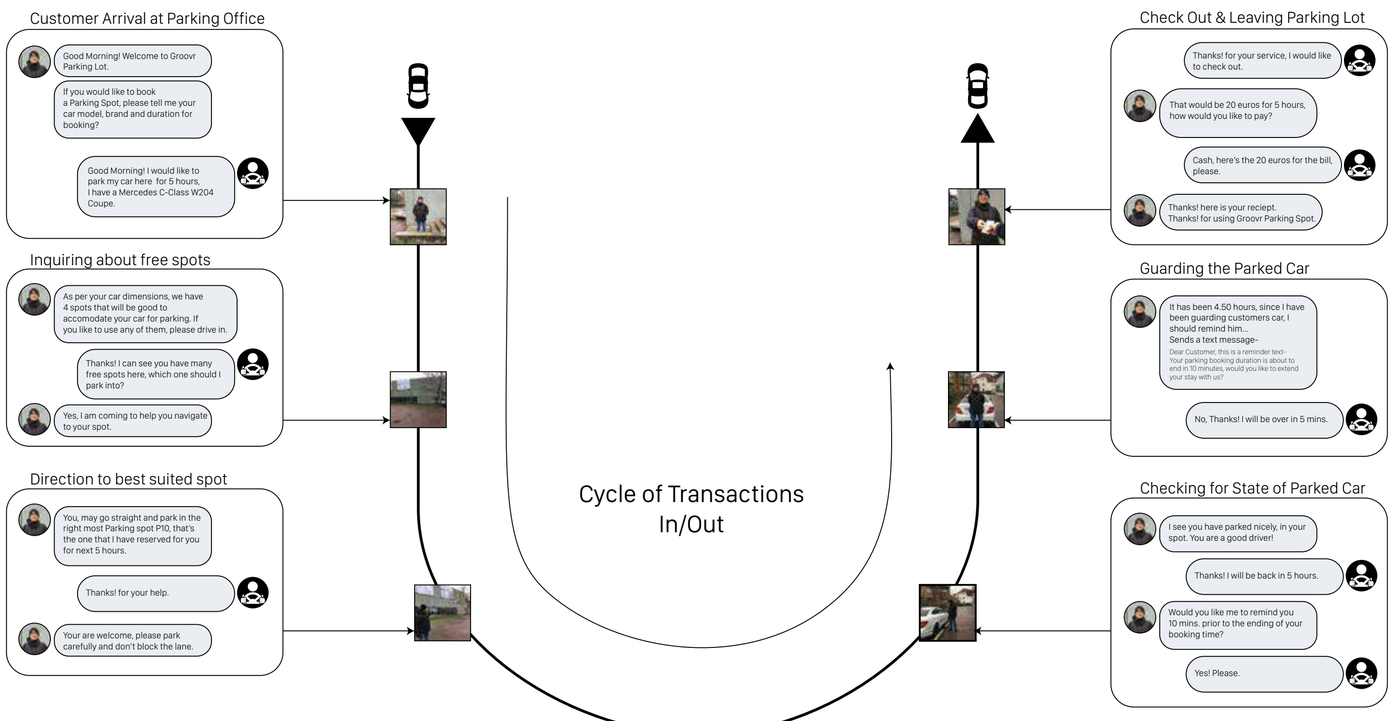
Recording transactions and conversations

Parking Service

Prototyped Experience

Anhalt University

Participants, Place



HOD (Algorithm Design)-

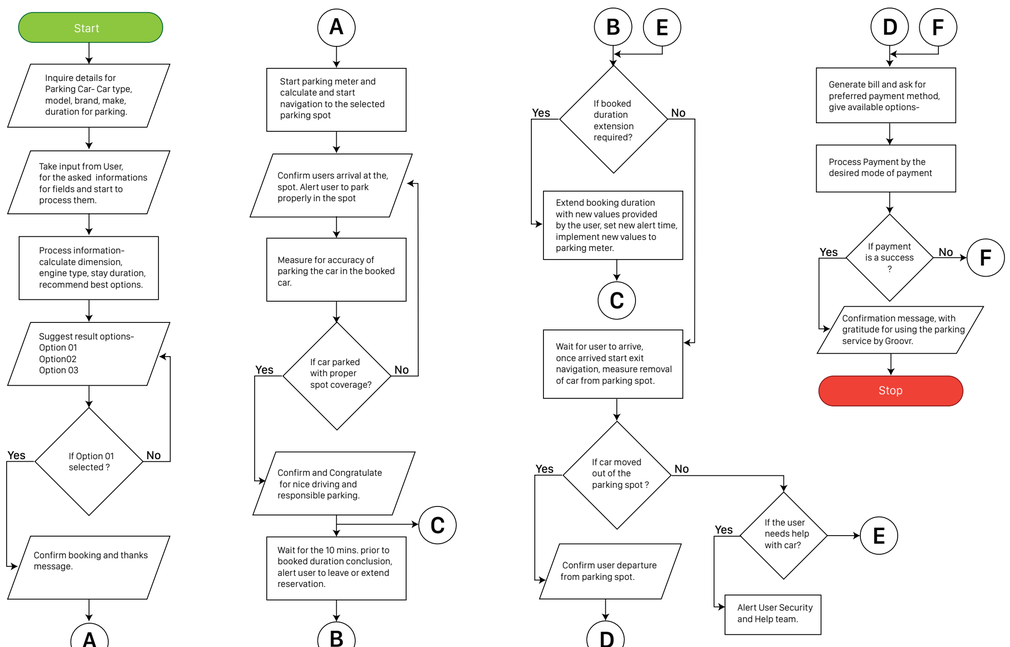
Algorithmic Thinking is a way of analysing and solving complex problems and systems, through clearly defined steps. Breaking down operations in small events classified into categories, can not only prove to be advantageous in comprehension of a system as a whole, but also helps to design systematic solutions to the most complex problems of our world.

Step 3- Discovered Algorithm for System Design

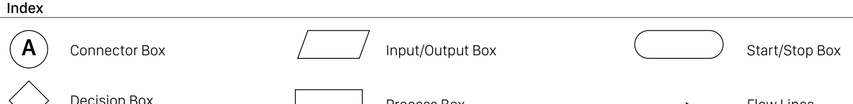
Algorithmically Mapping of HOD Activity

Algorithmic Thinking & Mapping

Algorithmic Thinking is a way of analysing and solving complex problems and systems, through clearly defined steps. Breaking down operations in small events classified into categories, can not only prove to be advantageous in comprehension of a system as a whole, but also helps to design systematic solutions to the most complex prob-lems of our world. Algorithmic Thinking lays the foundation of building a computational system or program. The predefined steps like- Input/Output, Process, Decision aligns with the basic principles of computer systems operations.
We use this method of Thinking and Mapping to investigate while comprehending various steps involved in our rehearsed prototype, HOD. This method also enables us to make informed design decisions about prospective solutions based upon our findings.



Index



HOD (Digitisation Canvas)-

The Digitisation Canvas helps to bring clarity to context by investigating into sensory and behavioural aspects of user journey. It also, provides space for prototyping a solution to thus found problem.

Step 4-Physical Experience Digitisation

Transforming a physical service into a digital service

Parking Experience in a Service Play at Anhalt University, Dessau

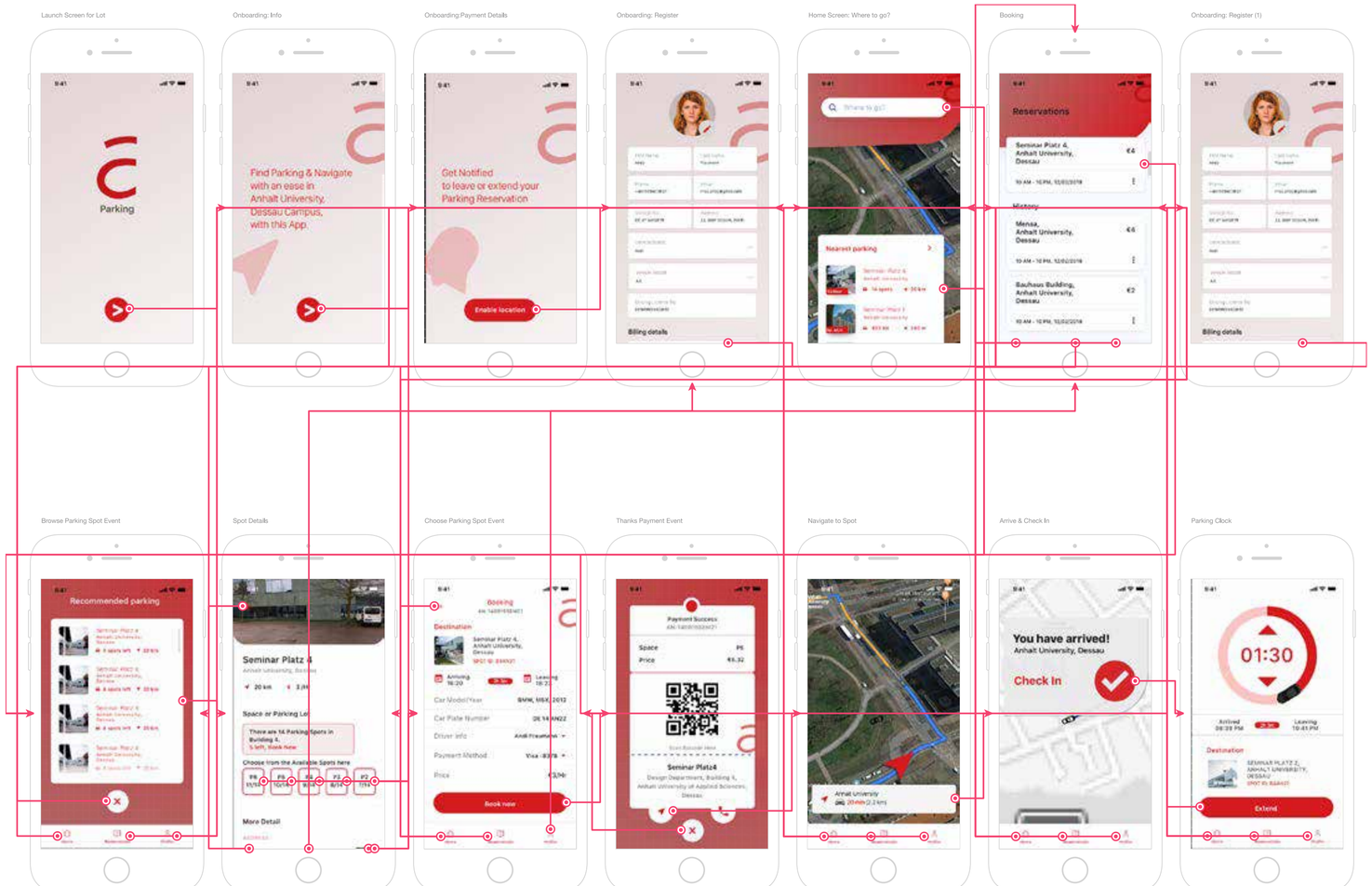
Prototyped Experience

			Surface Elements	Step 1	Step 2	Step 3	Step 4	Step5	Step 6
Real Experience	VISCERAL	DESIGN (Product, Service)		Cars, Parking Lot Office, Barrier, Road Signs, Traffic	Speed Bump, Branding, Brand Boards, Staff, Uniform, Road Markings	Computers, Stationary, Glass Window, Billing Machine, Printers, Ticket, Parking staff	Parking Spots, Spot Markings, Ticket, Parking Staff Instructing Navigation	Mobile Phone, Cellular Service, Sms Service, Notification from Staff, Security	Billing, Reciept, Parking Staff, Speed Bump, Barrier, Uniform, Road Markings
		SENSORY (Touch, Feel, Sight, Smell, Hear, Taste)		Smells- Burning petrol Hear- Car Engine, Horn, Stereo Feels- Impatient, Frustrated Sight- Cars Ahead, Que Touch- Steering	Smells- Burning petrol Hear- Car Engine, Horn, Office Radio, Staff Voice Feels- Cold, Valued, Impatient Sight- Barrier, Window Touch- Steering, Window button	Smells- Burning petrol Hear- Car Engine, Horn, Office Radio, Staff Voice Feels- Valued, Satisfied, Relief Sight- Barrier, Staff, Window Touch- Parking Ticket, Staff Hand	Smells- Burning petrol, Garbage, Smoke Hear- Car Engine, Voice Feels- Fun, Impatient, Stress Sight- His Spot, Staff, Touch- Window Button, Door Knob, Keys, Office Bag	Smells- At work Hear- Phone sms tone Feels- Valued, Satisfaction Sight- Mobile Phone Touch- Mobile Phone	Smells- Smoke, Petrol Hear- Car Engine, Horn, Office Stereo, Voice Feels- Gratitude, Satisfaction Sight- Staff, Printers, Bill, Ticket, Window, Barrier Touch- Hand, Ticket, Money
	BEHAVIOURAL	ACTIVITY (Journey, Play)		Driver driving in a que to reach to Parking Spot, reaches to the Parking Lot's Office.	Stops at the Parking Office Window, Lowers his car window, Inquires about free Parking Spot for his car.	Reserves a spot for his car for 4 hours duration, enters into the parking lot, gets direction to his reserved spot.	Drives to the instructed Parking spot and parks the car in that spot, gets inspected for parking accuracy.	The Parking Lot guy patrols and guards the car for safety, reminds the driver 10 minutes prior to ending of reservation time.	Driver arrives at the spot, drives his car to the parking lot office, stops and makes the payment for parking charges and leaves the parking lot.
	REFLECTIVE	PURPOSE (Motivations, Memory, Reflections)		Motivation- Park his car Memory- Congestion at the Parking Office Reflection- Getting stuck in congestion, wasting time on the way to work.	Motivation- Get a ticket & Parking spot Memory- Conversation with Parking Lot Staff Reflection- Conversation and job performance of Lot staff with colleagues or administration.	Motivation- Park his car Memory- Navigation Reflection- State and Location of reserved spot and time of navigation to the spot in a car.	Motivation- Work at Office Memory- Parking accuracy feedback from Staff, spot location for the parked car Reflection- Assessment of his parking and driving, navigation instructions	Motivation- Works at Office Memory- Time duration of parking spot reservation Reflection- Assessment of Reminder Service by the Parking Staff.	Motivation- Reach home Memory- Payment for Parking and Bills Reflection- Assessment of Cost effectiveness, Service quality, conversation with Parking Staff, Billings and Paying with cash.
	EXPERIENCED EFFECTS	Cost Effectivness		Congestion at the Parking lot, fuel wastage	Fuel loss in stopped at window in inquiring with Parking Lot staff	Fuel loss in reservation process and slow manual navigation from the staff	Fuel loss in slow instructions for parking right, before leaving for office	Money savings by reminding to leave in alloted time, without billing more	Stopping at window for billing and conversation, loss of fuel, high price for parking charges
		Time Saving		Stuck in Congestion with other colleagues of office, time & productivity loss	Stopping at window of Parking Lot Office for inquiring and decision making	Time wasted in slow navigation and reservation process	Time wasted to comply with Parking lots parking guides instructions	Reminder service, sms conversation with the staff, time wasted	Stopping for billings at window, loss of time
		Eco-Friendly		Congestion at the Parking lot, unwanted fuel emission by car	Stopping at window, car engine running, emission	Stopping at window, car engine running, emission	Slow manual navigation to comply with parking lot parking guides, emission	Reminder for leaving on time, saves office energy bills	Stopping for billing at window, car engine running, emission
		Usability		Congestion at the Parking lot, driver stuck with frustration	Stopping at window, conversation and instructions for parking	Human assistance in booking and navigation for parking	Human assistance for parking in the right way	Human conversation and reminders for leaving on time	Human Conversation for billing and payments.
		Accessibility		Congestion in the feeders lane to Parking lot, difficult and delayed accessibility	Human assistance for finding a spot and reserving it	Human assistance for finalisation of booking and navigation to the parking spot	Human assistance for accessing and parking the car in the right way	Human assistance and reminders for leaving and extending the reservation	Human assistance for billings and payment process
		Privacy		NA	Lowering car window to access the Parking Staff for further processes	NA	NA	Sudden SMS from the Parking Staff	Lowering car window to access the Parking Staff for further processes
Proposed Digital Experience	VISCERAL	DESIGN (Product, Service)		Mobile Phone, Groovr App Service	Mobile Phone, Groovr App Service, Parking Spot Reservation Service	Mobile Phone, Groovr App Service, Parking Spot Reservation & Navigation Service	Mobile Phone, Groovr App Service, Navigation & Parking Right Gamification Service	Mobile Phone, Groovr App Service, Parking Security & Spot Reservation Management	Mobile Phone, Groovr App Service, Parking Spot Management, Automatic Billing
		SENSORY (Touch, Feel, Sight, Smell, Hear, Taste)		Smells- House smell at Home Hear- App starting sound Feels- Smart Sight- Groovr Mobile App Touch- Mobile Phone Screen	Smells- House smell at home Hear- Voice Assistant Feels- Valued, Smart, Sight- Groovr Mobile App Sreen Touch- Mobile Phone Screen	Smells- Car Perfume Smell Hear- Navigation Assistant, Car Stereo Feels- Entertained, Informed Sight- Navigation Screen, Road Touch- Steering Wheel and Buttons on wheel	Smells- Parking Lot Smell Hear- App Assistant Voice Feels- Satisfied, Winner, Admired Sight- Cars in lot, Mobile App Screen Touch- Car Door Knob, Mobile Phone	Smells- Office Smell Hear- Office Noise, Notification tone Feels- Assisted & Cared for Sight- Mobile Phone, Office Touch- Mobile Phone Screen	Smells- Parking Lot, Car Perfume Hear- Notification, Car Engine Feels- Smart, Satisfied, Valued Sight- Cars in lot, Mobile Phone Screen Touch- Car Door Knob, Mobile Phone Screen
	BEHAVIOURAL	ACTIVITY (Journey, Play)		Takes out his mobile phone, opens the Groovr App for reserving a Parking Spot in office Parking Lot before leaving in his car.	Checks for available options and chooses his favourite parking spot under a tree in the parking lot.	Finalises his favourite parking spot, reserves it and leaves for office in his car, while following the Groovr Navigation for shortest and fastest route possible.	Reaches to his office, drives to his parking spot and gets guided by the gamification app to park in a right fashion, gets compliments for driving skills.	Leaves the car and goes to work, at the time of ending reservation gets friendly reminder for leaving or extending the reserve time for the parking spot, chooses to leave.	Arrives in the lot, gets inside his car and starts driving back to his home, fees for parking gets automatically deducted from his Groovr App account.
	REFLECTIVE	PURPOSE (Motivations, Memory, Reflections)		Motivation- Going for Work Memory- Mobile Interaction Reflection- Easy to reserve a parking spot before leaving for the preferred destination by use of a simple app, no waiting lines, not getting stuck in congestion and pollution, done from the comfort of home.	Motivation- Reserve a Parking Spot near office Memory- Trend of availability of Parking spot in the Parking lot of the Office building Reflection- Can choose where he wants to park from a range of available options of spot in the Parking lot from the comfort of his home	Motivation- Finalise reserving a Parking Spot before leaving Memory- Getting his lucky spot under tree shade Reflection- Lucky to find the favourite parking spot under a tree shade, will save the car from getting covered in snow, if the weather gets worse	Motivation- Reaching office in time and Parking Memory- Choosing best route to the reserved Parking Spot at the office Reflection- Getting guiding navigation to reach at office Parking spot by the shortest and fastest route possible. No stopping at barriers, entertaining gamified Parking with accuracy in the spot	Motivation- Concentrate at work without worrying for vehicle safety Memory- Friendly notification reminding to leave or extend reservation to stay Reflection- Hassle free stay extension and reminders for expiring reservation, without getting a ticket or fines or conversing with anyone	Motivation- Reach home after office as fast as possible Memory- No stopping for payments, just drive Reflection- Faster checkout using digital payment methods automatically, no need for stopping anywhere while driving in thoroughfare lanes.
	EXPERIENCED EFFECTS	Cost Effectivness		No extra cost as customer has already a mobile phone with internet	No extra cost involved	No extra cost involved	No extra cost involved	No extra cost involved	Cheaper Cost as compared to building office and hiring staff to manage Parking Lot
		Time Saving		Can be done simultaneously with any other activity, time savings	Browsing and deciding and booking done in a minute, time savings	Done with driving to office, no extra time spent, no stopping and speed bumps, time savings	Automated Gamified Parking assistance, time savings	Subtle notification on mobile phone Groovr app, time savings	Automated billing and money deductions, no stopping, time savings
		Eco-Friendly		No emissions	No emissions	Driving while following shortest route to destination, no stopping, less emissions	Automated guiding navigations, driving time reducation, less emissions than before	Automated security, automated notifications	No stopping, less emissions
		Usability		Easy app bookings from comfort of home or any place	App provides details of all the spots available to the driver, with some clicks	Easy reservations made to the best options, sat-navigation for best route	Driving & Parking Assistant with voice commands for easy operations	Subtle automated notifications without doing anything on mobile phones via App	Automated Billings and Payments, hassle free check outs
		Accessibility		Easy reach to reserving a parking spot via mobile phone, touch or voice	See all the available options in the parking lot choose from any one, special consideration for handicapped people	Reserve your favourite spot and get assisted with navigation on voice commands	Gamified parking experience, assisted navigation till booked parking spot	Notification for leaving on time, find your car with your app	Easy billings and payments automatically done without any hassles or needed action
		Privacy		Done from anywhere, even from home, without coming in public space	No revelation about your identity while booking any parking spot	No revelation of identity while navigating to your spot, driver remains anonymous	Anonymous to public	Anonymous to public	Bank detail sharing for payment processing via automated system over SSL

Ref: Norman Donald's 3 levels of Design, Some Rights Reserved © 2019. Himanshu Singh

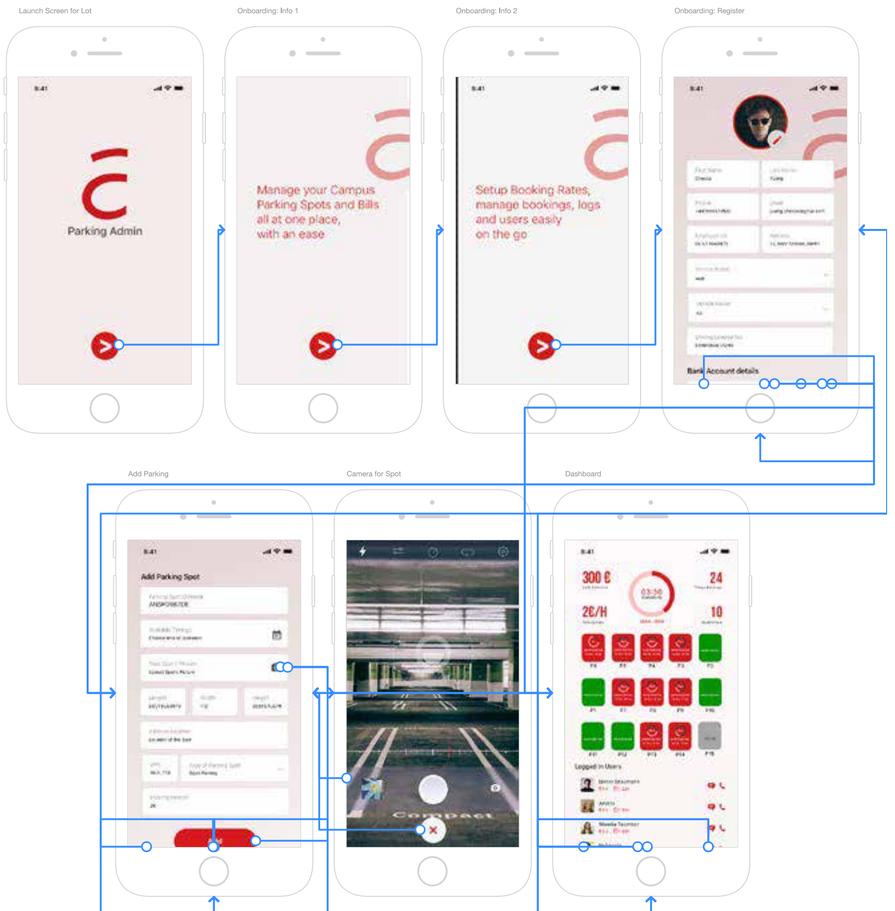
HOD Prototype (User)-

A design process that lies at the intersection of empathy, sustainability and systems thinking for designing solutions to real world problems with digital tools and technologies.



HOD Prototype (Admin)-

A design process that lies at the intersection of empathy, sustainability and systems thinking for designing solutions to real world problems with digital tools and technologies.



HOD Findings-

Following HOD Design Process brought new insights about Parking Management Process and Customer Experience. Our major findings after this design journey can be-

Reservation
To manage a Parking Spot effeciently, reservation before arriving to the destination supported with right navigation design proves to be a solution to the congestion at the Parking Space.

Information
By sharing the information about available Parking Spots, we give freedom to User to plan his itineraries.

Navigation
Effective navigation design helps User to avoid the last moment problems of finding the spots and creating congestion at the Parking Space.

User Experience
There is a plenty of room for improvising of User Experience with Parking Spaces. The challenge that remains, is to help User park his car in the right way to avoid mismanagement at the Parking Space.

Security
User have a concern for security while parking his car in a parking spot, while the University has its own security compliances.

Convinence (Bill Payments)
Automatic Payments can prove to be a great feature of this service, we need to come up with better and faster process for checkout, billings and payments.

Access
In cases of University Parking was full, Users couldn't find any Parking Space and felt helpless in that situation.

Availability
There is an acute need to scale this prototype to expand the availability of more Parking Spots to the Users.

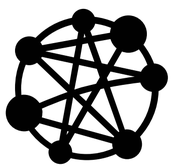
Accessibility
How might we make sure that we have some Parking Spots equipped with tools and services that can enable them serve physically challenged and disabled people.

“It is easier to map a Mc. Donald’s burger to the Big Bang, but is it beneficial for our process?”

MVP (Minimum Viable Product based on MVE)

A design process that explores into the systems and actors, to help design services with a minimal viable approach and makes us decide the minimum viable ecosystem that we are designing for.

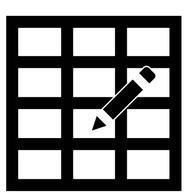
Gigamap



MVE

Actors

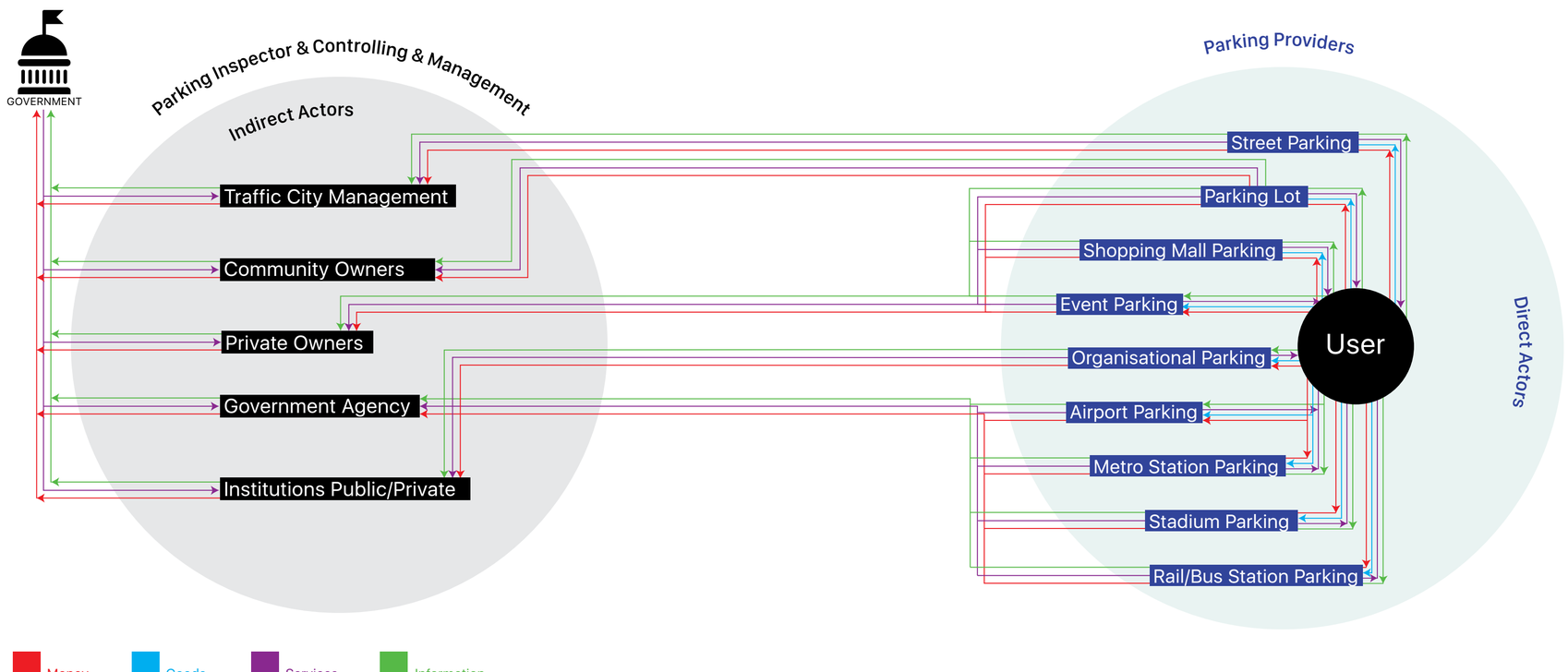
Prototype



Findings

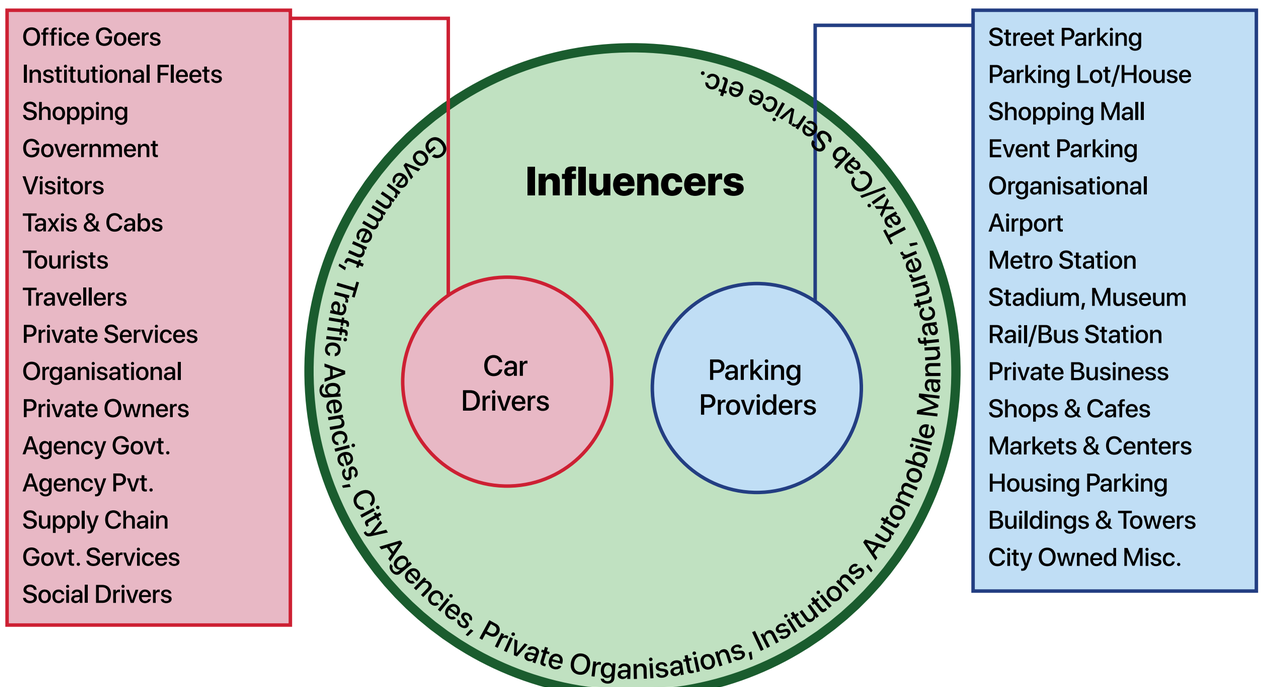
MVP (MVE)

Post revisiting the Gigamap, we design an ecosystem with the minimal actors and map the flow of MGSI among them. We also found out that relationship that every actor is having with the government and at what hierarchy the actor lies in the ecosystem. This process helps to find out actors that will be key participants in the Service Design for the stated Problem.



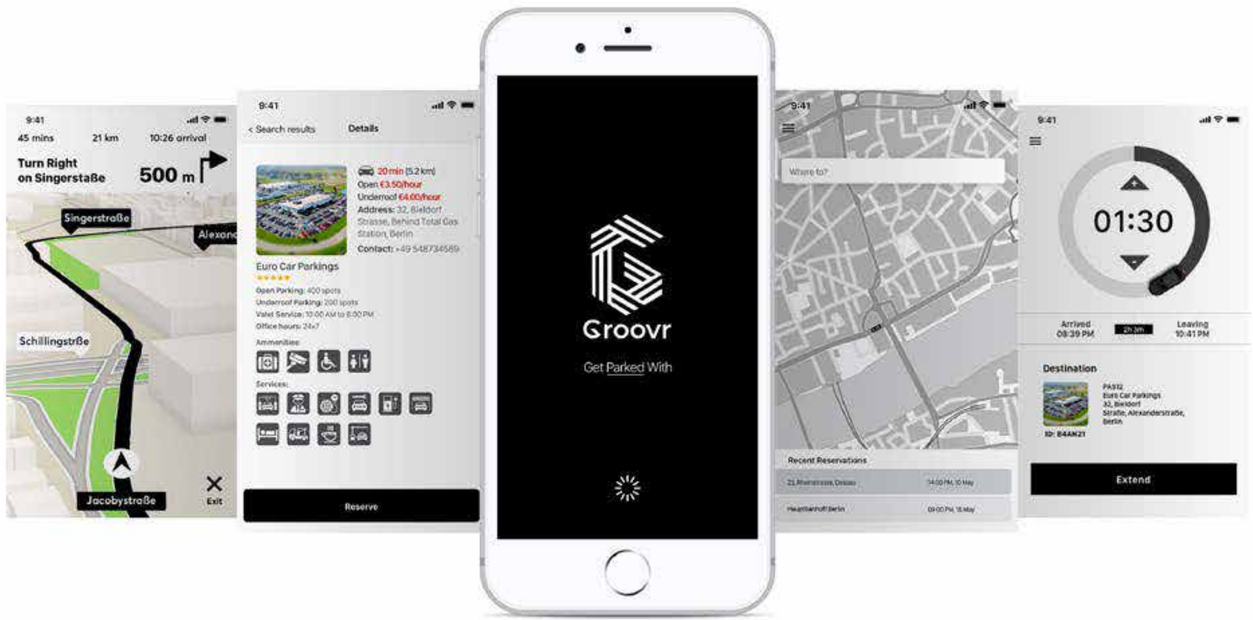
MVP (Actors)

With the help of MVE and Gigamap, we find the minimal actors that are important for our Service and there roles in the ecosystem. This later helps us to design services for selected users and facilitate them with functions and access in the system. The whole Minimal Viable Ecosystem can be categorised into three roles Car Drivers, Parking Providers and Influencers, who are government agencies and big players.



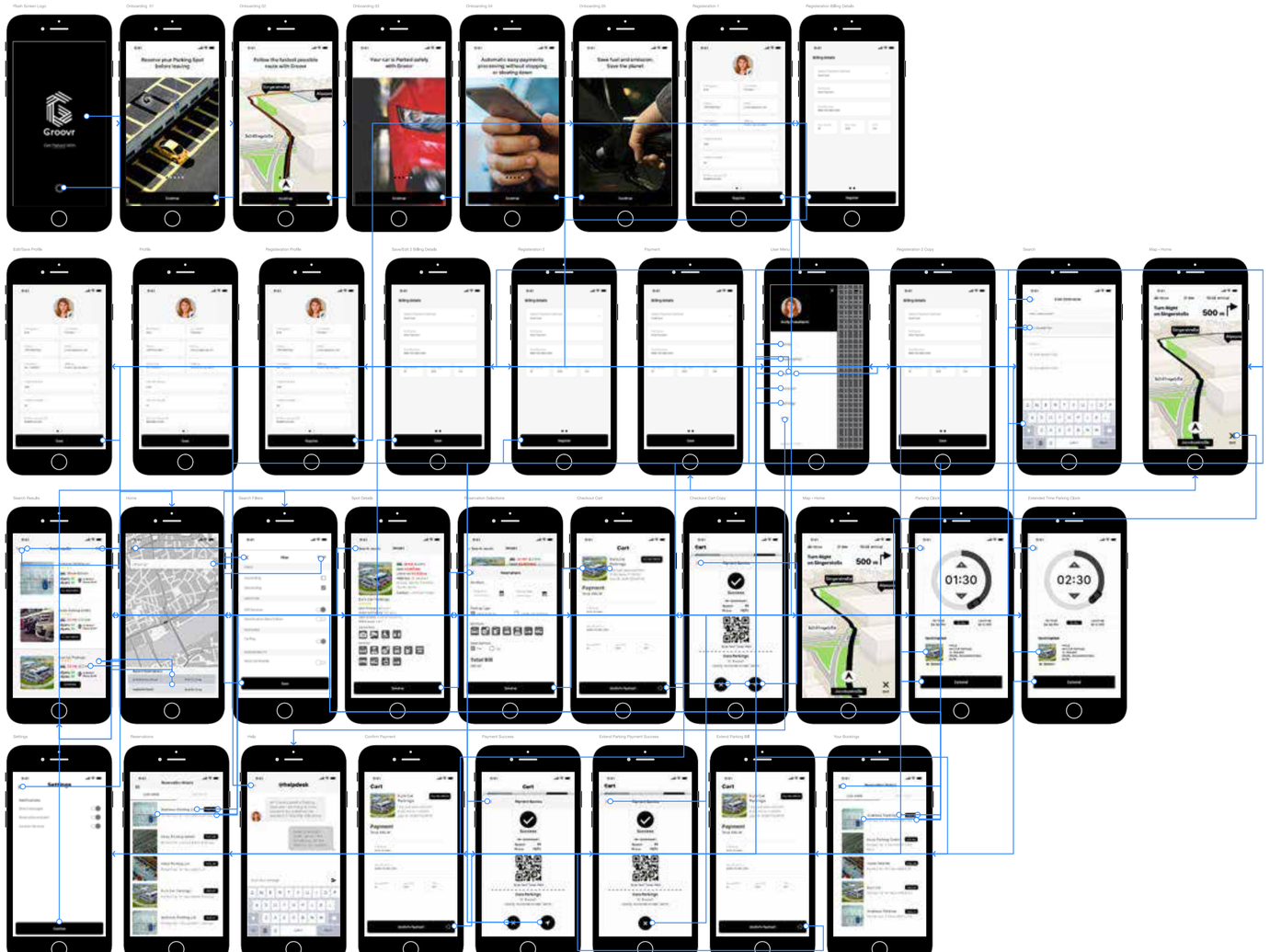
MVP (Prototype User)

Following the Protoype process, I came up with UX design for two Apps following the MVP research. User App (on left) allows a user to find Parking Spots near to his destination and navigate to the Spot and manage his reservationswith Parking Clock feature.



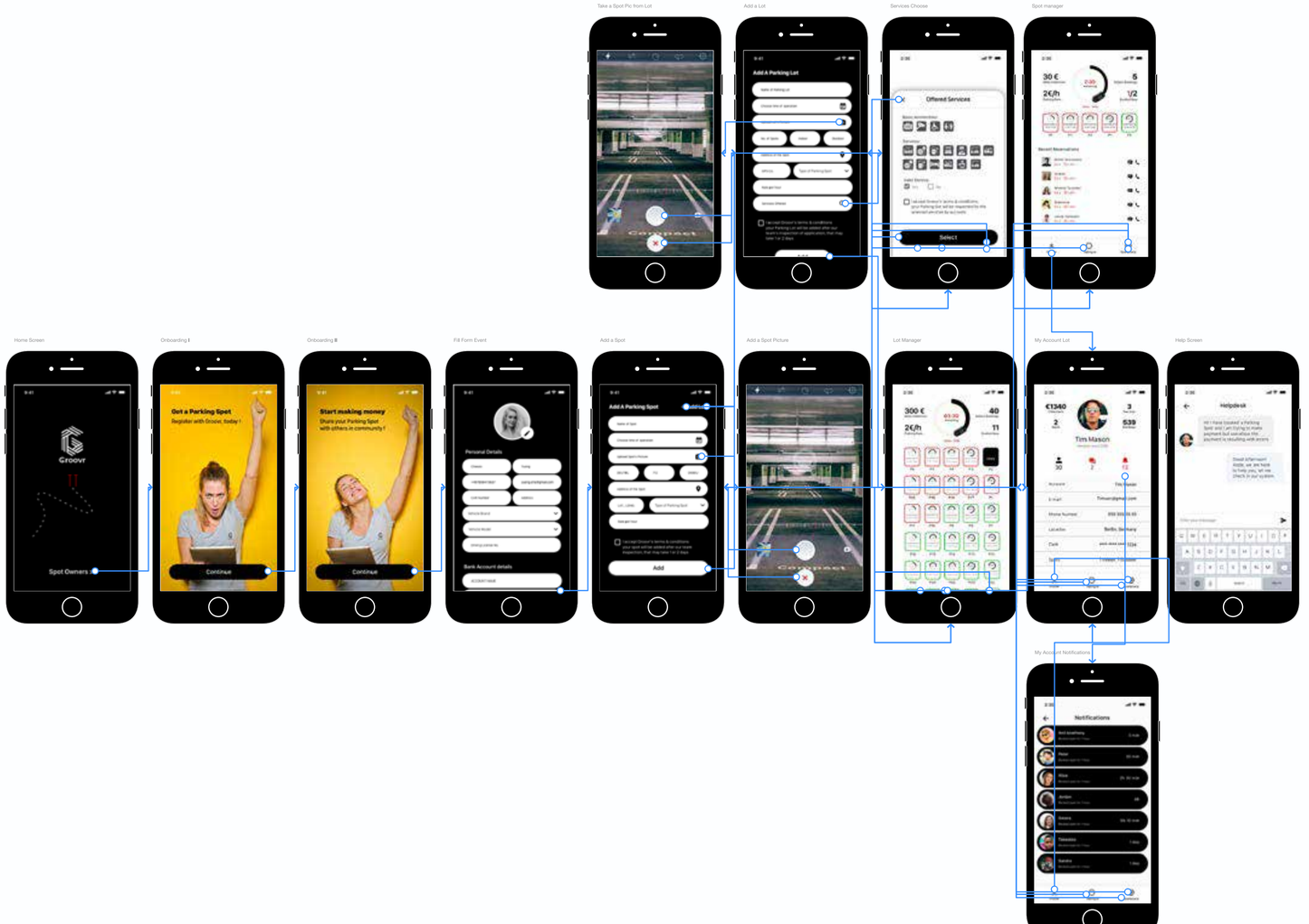
MVP (Prototype User)

Following the Protoype process, I came up with UX design for two Apps following the MVP research. User App allows a user to find Parking Spots near to his destination and navigate to the Spot and manage his reservations with Parking Clock feature.



MVP (Prototype Admin)

Admin App helps Admin Users to add Parking Spots and Lots to the system. Admin users can set the Parking Rates, Operation Timings, Taking Spots offline/online and manage their Parking Business with this App. They can also list services that they would like to provide with their Spots.



MVP Findings-

More Parking Spaces
Parking Lots are mostly located at far end locations of cities and are far from desired location for Parking by the City Drivers, to sum up this gap, we need to bring more Parking Spaces from hidden locations that comprises of Individuals, Private Owners, Shops, Restaurants, Cafes, Road Side Offices, Buildings, Housings.

Standardisation of Spots
For a better User Experience, standardisation of Parking Spot quality must be done to result in an uniform better customer experiences. By using a Hardware we can make sure the Spots have similar embedded User Experience for Drivers, with the researched features for the system.

Communication
Chatbots for User support in helpdesk, minising load of support requests from numerous Users.

Social
Chat among Users, Sharer & Driver, can help social interactions and connections formations, while reducing the cost for support service.

User Experience
Parking User Experience must be improvised while inspiring the Users to Park car in right placement, so as not to cause congestion at the Spot.

Security
Hardware security for safety and privacy assurance of both User types. Alarm system for alerting neighbours in case of nuisance.

Convinence
Wallet service for easy transaction and automated transaction without any pause or breaks. Automated Checkout system without driving inturruption, chats among Users during trips.

Access
Looking for Social Parking Spaces in the Housing, Road Side Business, Individuals and Office spaces. Democratising access to hidden and privately owned Parking Spots by Sharing feature can help suffice needs for Parking in heavily congested areas.

Availability
Automated Checkin and Checkout, can serve in efficient usage of Spots, while making them available in real time. Features like taking offline and online can take care of Users Privacy and Needs for self.

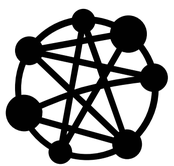
Accessibility
Standardising Disabled/ Handicapped support in the Spot category. Making sure all Spots have a standard designed support system at Handicapped Parking Spots. A Voice Chat assistant PAM (Parking Assistant Manger) introduction for busy and disabled Users.

Bad Parking Behaviour
It was observed while research and testing MVP, that users are parking in a wrong way and this is leading to traffic jams and congestions, specially in inner city areas. Something needs to be done for changing driver behaviours with Parking.

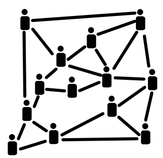
Exponential Innovation

A design process that considers systems thinking to come up with ecosystem disrruptive innovation solutions based on Product/ Service System Design.

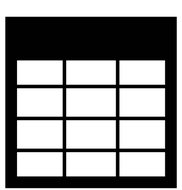
Gigmap



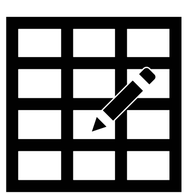
Aggregation Model



Value Chain Map



PESTEL

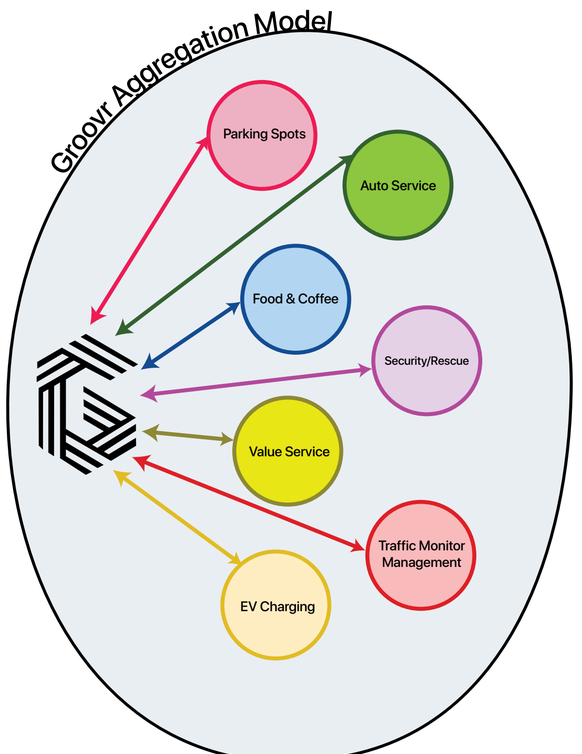


New Ecosystem

Prototype

Exponential Innovation (Aggregation Model)

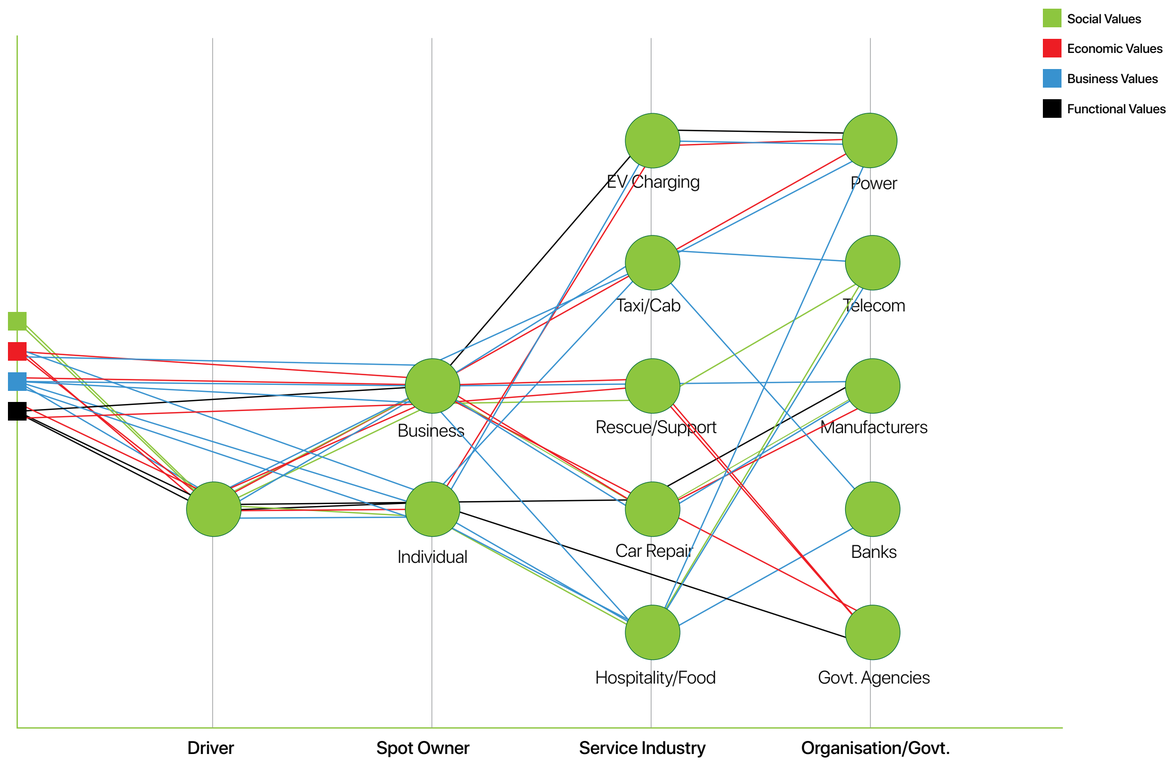
Aggregation Model is a tool for Business Modelling, where a business collects information about a particular good/ service provider and make the provider their partners and sell their services under its own brand. The modelling for Aggregation is based on the vision and mission statement of the Platform. While aggregating actors gain from the aggregator by getting exposure to new opportunities and operational benefits, aggregators are interested in getting more actors on the Platform. For designing Groovr's Aggregation Model, I have considered operational benefits, growth, value added services and value co-creation parameters.



Exponential Innovation (Value Chain)

Value Chain Map is a tool to map the exchange of values among identified actors of a business ecosystem and visualise the network of value exchange. Values are of various kinds social, business, functional and economical. Social values could be a gain in reputation while business value can be operational benefits, sales, productivity or money savings. In case of Groovr ecosystem, I identified the key actors who are needed for operational, value addition, outsourcing and management of Groovr Ecosystem.

Then sorted them in 4 categories- Driver, Spot owners, Service Industry (Vendors & Partners) and Organisation & Govt. (Partners, Vendors & Clients) and mapped the lines of connections that form the network of value exchange.



Exponential Innovation (PESTEL)

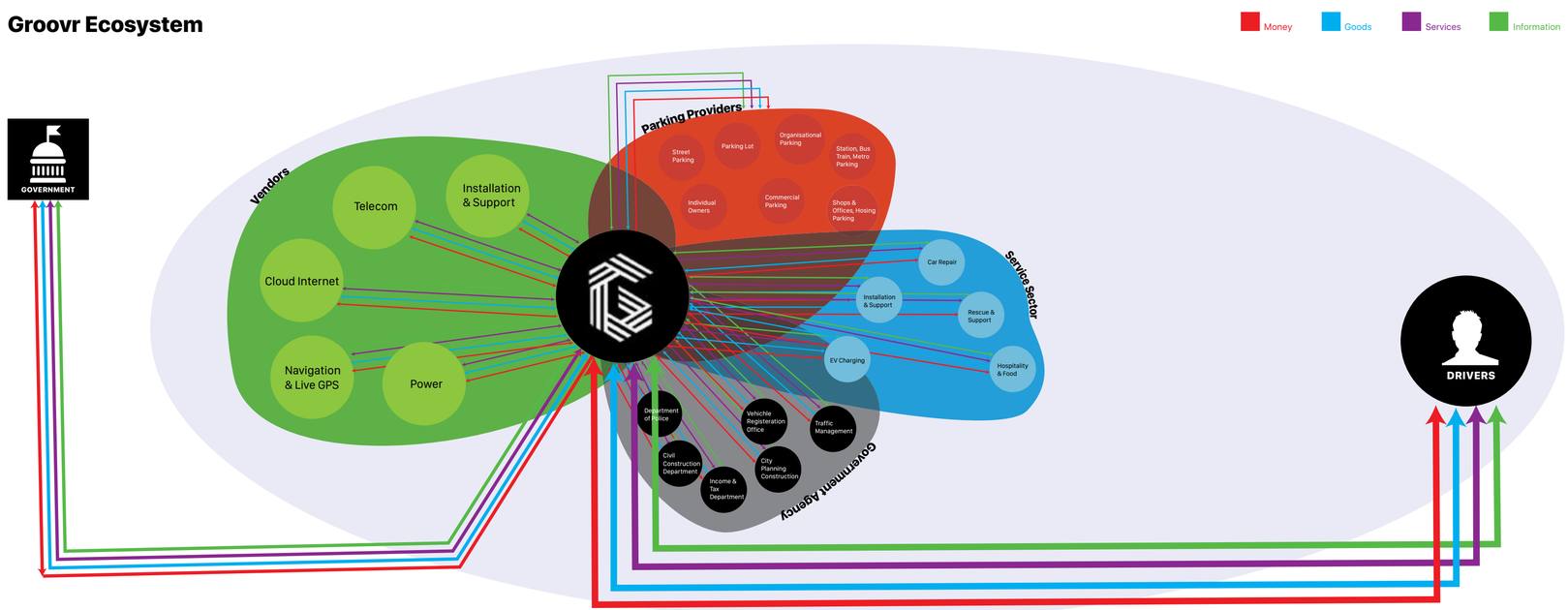
A PESTEL analysis is a business design tool used that is used to analyse the macro-environmental factors that may have a profound impact on an organisation's performance. This tool is used to test the viability of a venture or business idea in a market.
I have used PESTEL analysis here to test the impact of environment from different perspectives on Groovr venture.

P	E	S	T	E	L
Co-operative Generating Jobs Creating Opportunities Bringing Structure in City Traffic Helping Government Agencies to monitor traffic Reducing Air Pollution Reducing City Traffic Congestion Parking Management in City Improving City's Productivity Smart City EV Charging Future Mobility	Reducing traffic congestion Helping reduce Air Pollution Helping EV Adoption EV Charging support Citizens driving behaviour change by Design Solar Powered device for sustainability	Sharing Parking Spots with social community People helping each other save time and money by sharing their Parking Spots Connections building through sharing interactions Better social surroundings without badly parked cars, congestion and air pollution Booking Parking for guests while hosting a party. Friends sharing Spots with each other	Artificial Intelligence Machine Learning Cloud Computing IOT Electronics Hardware Mobile Devices Data Centers Cellular Network City WAN Bluetooth Wifii	Generating Opportunities Reducing Average Cost of Parking by using Automation & IOT Smart City Reducing Traffic Congestion in City Smart City Improving City's Productivity Future Mobility	Traffic Management office Road Taxation Department Company registrar Laws Patent & trademark office Spot Acquisition Contract User Contract Business Contracts Intellectual Property Laws

Exponential Innovation (New Ecosystem)

In this step of Exponential Innovation, we design a new ecosystem following our learnings from Gigamap, Aggregation Modelling, Value Chain Mapping and PESTEL analysis. This ecosystem is based on key actors that are interacting with Groovr in accomplishing its goals.
The new ecosystem comprises of actors from 5 major categories- Vendors, Spot Owners and Parking Providers, Service sector, Government agencies and the User.

Groovr aggregates these actors on its platform to build network of connections of flow of money, goods, services and information for the benefit of the platform.



Exponential Innovation (PSSD Blueprint, User)

The Product Service System Design Blueprint helps to prototype a system of PSS. This canvas investigates the actions, events, products, services involved in each and every event or transaction of the service journey. By designing this blueprint for Driver/User, I have visualised a complex chain of interactions that happens on ecosystem of Groovr devices and services.

Product Service System Design Blueprint

Groovr PSS, User Driver — Name of Product Service System
Dessau, EU — Place
Himanshu Singh — Name

Rating of User/Customer

	Discover 01	Search & Reserve 02				Navigate 03		Arrival 04		Play & Check In 05		Extend Reservation 06	Find My Car 07		Play & Check Out 08	
Sketch Picture Image/Icon Recordings																
Events/Steps																
Line of Action																
Front End: User/Driver Actions (Call, Email, Chat, Meet, Home Visit, Press...)	User finds Groovr App Advertisement on Facebook and clicks on it, to discover more about this Parking sci-fi cool thing, downloads App and registers with 10€ deposit in Groovr wallet.	User decides to visit his friend and opens Groovr App to reserve a Parking Spot near his friend's house.	User searches for a Parking Spot on Groovr App in area Alexander Street, Berlin	User goes through search results and chooses to reserve Matthias Parking Spot, fills details in pop up reservation panel and presses Reserve.	Confirmation Panel pops up, with option to navigate. User touches the navigation round button on Groovr App.	User starts his car and sync phone with Car System, chooses to navigate.	User follows navigation to the Parking Spot. While speeding his car at 120km/h, User gets alert on the navigation screen to slow down and flashes correct speed for his car to drive.	Users arrives at the Parking Spot and spot's status light is turned into white light, he starts to face the car in the direction of the Parking Spot entrance.	Groovr App loads Groovr Play Screen as User brakes before the spot. User chooses to enter, and chooses default game.	User starts driving into his Parking Spot while the game car is collecting all the coins on the screen.	User makes a wrong turn and game tells to stop as in this way he won't be able to keep car straight, User reverses and goes in again, stopping right before the Groovr Spot, Groovr shows win message, and takes him to Parking Clock, User gets out, leaves.	User decides to extend his Parking reservation while sitting in a meeting, he opens Groovr App on iwatch and selects time to extend, touch presses the Reserve button and confirms the extension.	User recieves reminder to leave and 10 mins. later decides to leave, he forgets where he Parked his car, while walking towards the Parking Street.	User opens Find My Car, feature on the iwatch Groovr App in controls, and navigates near the spot. User is near the spot but not able to see his car.	He touches his watch again and the Spot starts to glow and he hears a beep sound. User finds his car and gets inside and sync his phone, ready to leave.	User starts to take his car in reverse and gets out of the spot.	User drives out of the Groovr Spot and drives to next street.
Front End: Product Actions (Clicks, Swipe, Touch, Press, Rotate, Pull...)						Matthiyas Groovr Spot is set to lit in Red Light mode, that stands for On Hire.	Matthiyas Groovr Spot is set to lit in Red Light mode, that stands for On Hire.	Matthiyas Groovr Spot is set to Arrival Mode that make the Red Light booked mode into White light for Arrival Mode.	Groovr Spot is turned into sensitive mode and both LED lights are turned into blue color.	Groovr Spot starts changing colour from White to Green as User drives in.	Groovr Spot starts changing colour from White to Green as User drives in. Groovr Spot, however, turns lights off when User leaves the Spot.	Groovr Spot continues to be in resting mode with lights off.	Groovr Spot continues to be in resting mode with lights off.	Groovr Spot continues to be in resting mode with lights off.	Groovr Spot wakes up with glowing 3 times light in Red and a honking beep. Then it turns into white.	User mobile screen shows a pop-up with his paused Groovr Play screen, the car moves out of the spot as he drives out with a link to book next spot and PAM.	The car moves out of the spot as he drives out of the Parking Spot. A thanks screen pops up on his phone with a link to book next spot and PAM.
Front End: Service Actions (Booked, Ordered, App, Fill information, Touch on Website or App...)	From landing on the App Landing page of website, User Registers on Groovr User App on his mobile phone.	User starts using Groovr App service	User uses Groovr App service to search for Parking spot in Alexander Street.	User uses Groovr App service on his mobile phone and searches and choose Matthiyas as Spot for Parking his car near his friends place.	User confirms his reservation for Matthiyas Spot and chooses to navigate to it.	User connects the iPhone to the car system and emoules the Groovr navigation to Matthiyas Spot.	User follows his car display navigation screen and drives to Matthiyas Spot, while speeding the screen flashes 70 km/h, correct speed, User slows down.	The App & Carplay App screens flash arrived messages, with a link to Find Spot and Groovr Pay.	User chooses Groovr Play and choose default Parking Assistant Game.	User starts playing game of collecting coins on both screens, the car drives while watching the screen of his mobile as he drives, he starts collect them by hitting them on mobile screen with his car.	User starts playing game of collecting coins on both screens, the car drives while watching the screen of his mobile as he drives, he starts collect them by hitting them on mobile screen with his car.	User is reminded on Mobile and watch to leave on time and he is late to meet by User and he decides to extend his reservation on his iwatch Parking clock, from Groovr Parking iwatch App,by one hour.	iwatch App sends User reminder 20 mins. earlier to leave and when User is late and decides to leave, the App is resting at the Parking Clock screen while the Phone is in his pocket.	User uses iwatch App to Find his car's parked location, the App guides him near to his Parking Spot.	User uses his Groovr iwatch App near the Parking Spot to signal him to enable him to locate it.	User mobile screen gets alerted with a pop up with his paused Groovr play screen, the car moves out of the spot as he drives out of the Parking Spot.	A thanks screen pops up on his phone with a link to book next spot and PAM.
Line of Interaction																
Front End: Product (Touch, Press, Click with Product.....)						Groovr Spot installed at Matthiyas Spot's status indication light is turned into Red Light from Green Light.	Groovr Spot installed at Matthiyas Spot's status indication light is turned into Red Light from Green Light.	Groovr Spot at Matthiyas is now turned into arrived mode and the lights are white now.	Groovr Spot turns into white and now into blue light indication.	Groovr Spot at Matthiyas Spot turns Green from White Color identication.	Groovr Spot at Matthiyas Spot turns Red from Green quite few times and turns off after User left the Spot.	Groovr Spot is in resting mode.	Groovr Spot is in resting mode.	Groovr Spot is in resting mode.	Groovr Spot is in resting mode.	Groovr Spot turns into sensitive mode.	User interacts with Groovr App thank you screen and chooses to talk to PAM.
Front End: Service (Groovr App and Websites, Call, Email, Chat, Meet, Home Visit, Support.....)	The App service verfies User's mobile phone with sms and his Driving License number, Facebook and Citizen Card.	Groovr App loads on Users phone screen with animation and shows some on boarding slides and asks to register	User touches PAM icon on the Phone and start talking with voice assistant, he asks to find a Parking Spot in Alexander Street, Berlin.	User finds the search results on his App and touch selects, Mathiyaas Spot. The reservation form pops up from bottom and User fills the registeration form and confirms his choices.	User confirms the reservation on the reservation form after filling details and the App books Matthiyas Spot for the User, User chooses to navigate to the Spot on the confirmation screen.	The User connects Phone to Car and selects to navigate now on confirmation screen on the Phone. The car display starts showing navigation screen.	The navigation screen on car display and phone is showing map route, when User starts racing car at 120km/h, User is alerted through voice, alert to slow down and a speed of 70 km/h is displayed on car and mobile screen in green.	The App interface flashes a screen that User has arrived at his destination with two buttons for Find Spot and Groovr Play	When ready to park, User is flashed with screen with two buttons, namely, Groovr Play and Parking Assistant. User chooses Groovr Play and selects default Game..	Groovr App loads the default game Spot Runner and User starts driving, while watching it on the Carplay Screen.	Spot Runner shows User coins in the spot that User collects by drive over them, while trying to Park right. User mistakes are corrected by Groovr Assistant on Carplay and Spot LEDs. User recieves parked message and is navigated to Parking clock.	User receives to leave notification on his mobile and Iwatch, from Groovr App. User interacts with his iwatch App and touch presses the + button, and sets 10 mins. The clock adds 10 mins, User presses it for 6 times and presses Reserve button.	iwatch Groovr App flashes with a notification to leave in 20 mins. on the screen.	Iwatch navigates User to controls menu, where User touches Find My Car button, a navigation screen opens and guides User to his Parking Spot.	User presses Signal button on the navigation screen on his Groovr iwatch App. Connects the Phone App to Carplay App in the car.	User chooses to unpause his paused Parking Game on Groovr App.	User touches PAM button at Thanks screen.
Front End: Touchpoints (Frontend Staff, Security, Call Center, Support, Sales Team...)	Groovr Facebook, Groovr Website, Groovr App, Groovr Wallet	Groovr App	Groovr App	Groovr App	Groovr App	Groovr App, Groovr Carplay	Groovr App, Groovr Carplay App	Groovr Carplay, Groovr App, Groovr Spot, Groovr Iwatch App	Groovr Carplay, Groovr App and Groovr Spot	Groovr Carplay, Groovr App and Groovr Spot	Groovr App, Groovr Carplay and Groovr Spot	Groovr Iwatch App	Groovr Iwatch App	Groovr Iwatch App	Groovr Iwatch App, Groovr Spot, Groovr App, Groovr Carplay	Groovr App, Groovr Iwatch App, Groovr Spot, Groovr Carplay App.	Groovr App, Groovr Iwatch App, Groovr Spot, Groovr Carplay App.
Line of Visibility																
Back End: Product (Sleep, Updates, Sync, Refresh, Connect, Listen...)				All Groovr Spots ping the Center's server with status of every Parking Spot, the algorithm in Center's server logs to populate a search results page.	The system notices Users booking and instructs to take Matthiyas Spot off the available options of Parking Spots in Alexander Strasse. The Spot starts to glow Red light.	Groovr Spot at Matthiyas is glowing red light.	Groovr Spot at Matthiyas is glowing red light.	Groovr Spot gets arrival instruction from Groovr cloud server, the Spot is turned into arrived mode and confirmation request is sent back to the cloud server.	Groovr Spot gets mode change request from the cloud server to sensitive mode, rightnow Groovr Spot's ultrasonic sensors start measuring distance to car, the car's identification is done. Phone joins Sensorsync network.	The camera start video mode and AI algorithm senses the distance, angle, and speed with help of Ultrasonic sensors feed. An algorithm calculates the probable park time and distance to crash and sends to phone & server.	The Ultrasonic sensor measures distance and warns with Red light if distance is not safe or close. The camera feed algorithm predicts users follow through and predicts crash and sends information to Users phone and cloud.	Groovr Spot is in resting mode.	Groovr Spot is in resting mode.	Groovr Spot is in resting mode.	Groovr Spot receives instructions to glow and blow horn via Sensor Sync from iwatch. Groovr iPhone App gets Synced with Groovr Spot via Sensor Sync	Groovr Spot starts sensing the Car's presence, notices the car number plate and checks with the available slots database under the same user, starts measuring the distance of the car from Groovr Spot and predicting the drive follow through on Groovr App.	Groovr Spot goes back into Green light mode stating that it is free.
Back End: Service (Back-end Algorithms, Softwares, Website, App Back-end, Servers...)	The algorithm verifies his car details with link, results are matched before confirmation of an account.	Groovr App loads on phone, the App with permission from User, starts logging the mobile GPS data.	Groovr performs its database search and matches with its real time availability and show matches for available Parking Spots in Alexander Strasse to user.	The search algorithm is triggered by PAM and App interface and it populates a result on the Users mobile phone.	The App tells the Center's database to take Matthiyas Spot available status to booked and contacts the navigation server with route request.	Groovr App connects with Groovr Carplay App and map syncs from Groovr cloud server to Users car and mobile phone and navigation is set on route to Matthiyas Spot.	Groovr App & Groovr Carplay are connected with the route streaming Groovr cloud server and showing him navigation route.	Groovr App and Carplay App gets a confirmation message from Groovr cloud server of arrival, the App and Carplay send a arrival confirmation back to server.	Groovr App sends ready to park confirmation message to cloud server, cloud server is again sent with a message request to turn sensitive mode ON, Groovr App receives ON confirmation from cloud server.	Groovr App recieves information feeds from Groovr Spot via Sensorsync and from cloud server, the information is processed and displayed.	Groovr App recieves information feeds from Groovr Spot via Sensorsync and from cloud server, the information is processed and displayed in Groovr Play.	Groovr Iwatch App sends request for extending time by 1 hour to cloud server and receives confirmation and reports it back to the App.	Groovr Iwatch App runs Parking Clock in background and notifies User when it is time to leave as per his settings in Privacy. User didn't choose to extend this time.	Groovr Iwatch App sends a location and navigation request to cloud server, the server sends back the route details and Groovr App is fed with this data.	Groovr Iwatch App sends instruction to the Groovr Spot to Glow. The Phone App gets synced to Carplay App.	Groovr App interacts with Groovr Spot via sensor sync and shows information recieved from the Spot sensors and passes them with many algorithms before sending them to the Parking game on the App screen.	Groovr App is out of Sensor sync and working with only with with Groovr cloud servers.
Back End: Humans (Delivery, Account, Office work, Backend Admin...)	User's Registeration emails are synchronized to the Accounts Department, an employee verifies his details and confirms his application, User registered.	Employee in Center Station, notices App Download in Analytics and new user registerati-on.	Employee in Center Station, manages availab-lity and surge pricing has a control over what options User gets on his screen.	Employee in Center Station, manages availab-lity and surge pricing has a control over what options User gets on his screen.	Employee in Center Station, notices Users booking and instructs to take off the available options of Parking Spots in Alexander Strasse.	Employee in Center Station, manages book-ings notices this new route request confirmed screen on Central Display.	Center's route is now part of Users traffic visualisa-tio screen among 100's and 1000's of other routes.	Employee in the Center Station, notices Timely Arrivals values changes in the CMS.	Employee in the Center Station, notices Parking Now values changes in the CMS.	Employee in the Center Station, notices Parking Now values changes in the CMS.	Employee in the Center Station, notices Parked values changes in the CMS.	Employee in the Center Station, notices Parked Extension values changes in the CMS.	Employee in the Center Station, notices Parked Extension values changes in the CMS.	Employee in the Center Station, notices Find My Car analytics values changes in the CMS.	Employee in the Center Station, notices Find My Car User success analytics values changes in the CMS.	Employee sitting in Center notices the checkout on the CMS screen in infographics.	Employee sitting in Center notices the available spots on the CMS screen in infographics.

Groovr PSSD Blueprint, All Rights Reserved ©2019, Copyright Himanshu Singh, Anhalt University, Dessau-Germany.

Exponential Innovation (PSSD Blueprint, Spot Manager)

In this blueprint, I have visualised the journey of a Spot Manager into the ecosystem of Groovr products and services. The journey elaborates the onboarding and registeration of a User as a Spot Manager, it further describes the events of installation of Groovr Spot and coming online in Groovr network.

Product Service System Design Blueprint

Groovr PSS, Spot Manager — Name of Product Service System
Dessau, EU — Place
Himanshu Singh — Name

Rating of User/Customer

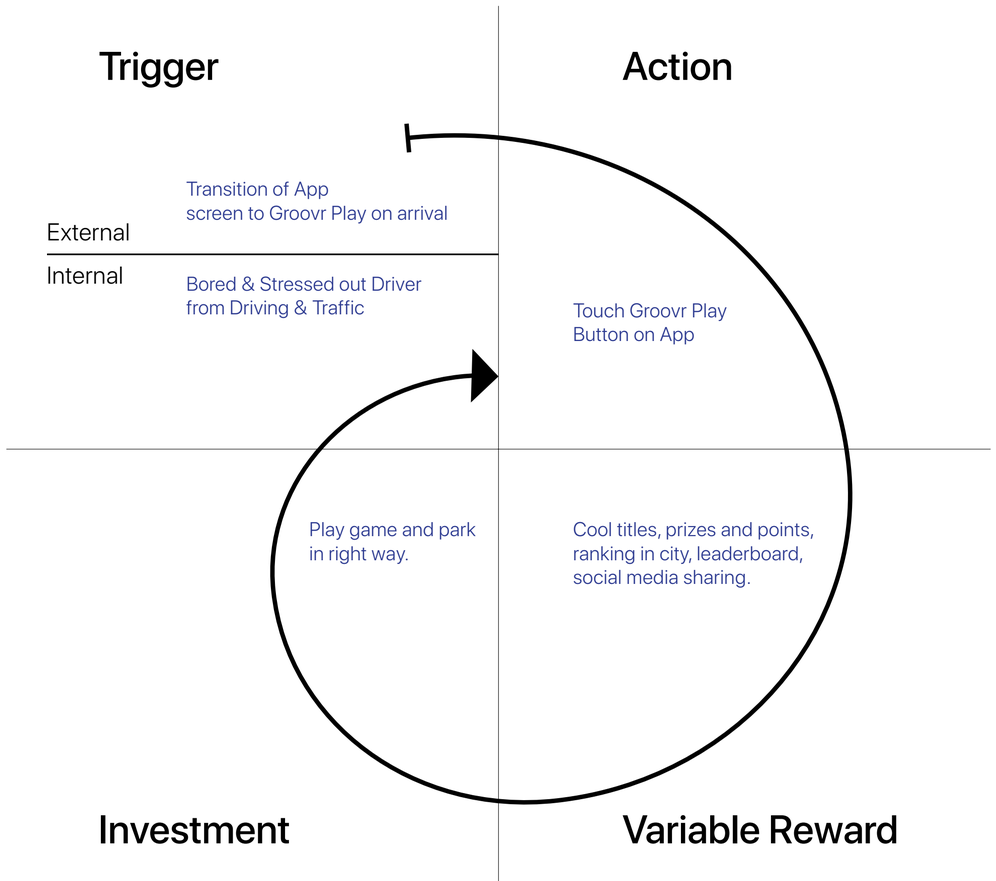
	Discover 01	Register 02	Add Spot 03	Buy Groovr Spot 04	Installation 05	Join Network 06	Monitor Spot & Money 07
Sketch Picture Image/Icon Recordings							
Events/Steps							
Line of Action							
Front End — User Actions (Call, Email, Chat, Meet, Home Visit, Support...)	User discovers Groovr Spot Manager add on Facebook and gets curious about it, he decides to navigate to Groovr website and learn more about it.	After exploring through some pages on Groovr's website, User decides to register for the service and clicks the Register link.	The link asks him to download Groovr Spot Manger on his iPhone and register with it. User downloads the App and installs on his Phone and Opens the App.	User registers with Groovr Spot Manager on his iPhone.	User links his bank account details and uploads his picture and other details.	User adds his Parking Spot on the Groovr Spot Manager App and uploads all the documents and pictures.	User receives a confirmation message for registeration and navigates to the Buy Groovr Spot Product Page, where he explores about Groovr Spot and its features in detail.	User makes a purchase for Groovr Spot and gets a buying reciept with billing name, delivery address and billing address, tax number etc.	Customer receives his Groovr Spot by mail person and told to wait for 48 hours for the installation team to come install or go ahead and install it by himself.	Groovr sends a person to install Groovr Spot in Users Parking Space. The person installs Users Groovr Spot and connects it with the network.	User registers with new Groovr device on to the Groovr network and pairs his Phone App with his Groovr Spot and checks the controls.	User starts sharing his Parking Spot and making new connections and money.
Front End — Product Actions (Clicks, Swipe, Touch, Press, Rotate, Pull...)										Groovr Spot connects to internet.	Groovr Spot glows Green, Red while trying to test Parking.	Groovr Spot when booked becomes Red and when available turns Green. When someone arrives it turn white.
Front End — Service Actions (Booked, Ordered, App, Fill Information, Touch...)	User navigates from Facebook to Groovr.de website.	User uses Groovr.de website to register for Spot Manager.	User downloads and installs Groovr Spot Manager App from App Store.	User registers on Groovr Spot Manager App	User takes pictures with phone and adds more information on his iPhone.	User is using Groovr Spot Manager App to add a new Parking Spot on the system, he fills details and uploads all documents and pictures and registers.	User completes successfully his registeration on Groovr App and navigates to a new screen to buy Groovr Spot.	User buys Groovr Spot on his Phone.	Customer receives his package for Groovr Spot by a partner for shipping and delivery of website orders.	The service person installs Groovr Spot and connects it with Users home wifi network.	The device test on Groovr Play section of Groovr App, helps User to test his newly bought Groovr Spot.	User manages his account and monitor his earnings from Groovr Spot Manager Apps Dashboard Screen.
Line of Interaction												
Front End — Product (Mobile, Button, Screen, Work life, Social Media										Groovr Spot blinks with Red light.	Groovr Spot starts functioning and reacts to cars movements and iPhone App and Carplay App of User.	Groovr Spot, works with sync with Users App and devices while gets charged from Solar Power for self-sustainability.
Front End — Service (Call, Email, Chat, Meet, Home Visit, Support...)	User interacts with Groovr's advertisement on Facebook and navigates to Groovr.de website.	From Guided tour of the website, User navigates to Register as Spot Manager Page of the website and clicks the Register link.	User Registers for Spot Manger on website and he is navigated to the App Store that installs Groovr Spot Manager App on his iPhone. User opens the App on his iPhone.	User goes through the onboarding slides of Groovr App and registers as a Spot Manager.	User goes through the registeration form and fills all details on his iPhone and takes pictures with his phone and uploads documents and touch presses Register button.	User successfully creates his account and now clicks Add Spot button and arrive at Add Spot Screen, fills form and take pictures of Spot, adds details, rates and presses upload btn.	User registeration gets accepted and he gets his link to buy a Groovr Spot, he clicks on the link to navigate to Groovr Spot products page.	User on the Groovr Spot website browsing on his iPhone buys the Spot and receives purchase receipt.	Groovr Delivers Customers order for a Groovr Spot and he is asked to wait for 48 hours.	The Technician has a different software on his laptop where he is checking the connection details of the device.	User checks his Groovr Spot's functionality with Carplay and iPhone Apps.	User uses Spot Manager and Groovr User App on his iPhone.
Front End — Human (Security, Call Center, Support, Reception...)									A delivery person delivers Users Groovr Spot by mail, User receives the Package and waits for 48 hours for installation by Groovr service team.	Service person installs the Groovr Spot device on the Users Parking Space.	The service person helps User to register without any difficulty.	In case of repair Groovr sends service person to make sure Users Spot never goes offline.
Line of Visibility												
Back End — Product (Updates, Sync, Refresh, Connect, Listen, Watch...)										Groovr Spot goes through configuration settings as per geo-location and surroundings on the Spot.	Groovr sends details of Spot as logged by it on the first time to the Center Station for quality testing and receives driver and settings online via internet to update.	Groovr Spot sends parking data with Groovr cloud servers for a proper management of the Spot.
Back End — Service (Back-end Algorithms, Softwares, Website, App Back-end, Servers...)	Groovr.de website logs Users location, device, network and basic details from his browser.	Groovr.de website logs Users browsing behaviour and navigation pattern and starts listing content that User might be interested to know about the Spot Manger Program.	Groovr.de website logs Users redirection to App Store and App Store logs App page visit, App download and license etc.	Groovr App analytics logs new User registeration and case upload for consideration.	Groovr App sends information to Center Station and creates an Application Case with all the documents in it and puts it for verification from Employee.	Groovr Spot Manager App creates a Spot Manager Spot Registeration Case for review by the Employee from Sports Addition Department.	Groovr System logs new application for adding a new Spot and confirms it, User is generated a link for buying a new Groovr Spot, he is sent an email by the automated system. User clicks buy link, the App sends website analytics log his visit and behaviour on the website.	Groovr Spot website logs Users purchase and sends an order email to the shipping department.	Groovr System logs successful delivery of Groovr Spot to the User.	Groovr System receives join request from a new device on the network.	Groovr System registers Users Groovr Spot on Groovr network.	User shares his device data for further research and development purposes for Groovr ecosystem of devices.
Back End — Human (Delivery, Account, Sales, Departments, Shipping...)						Employee in Center Station sees Groovr Spot Addition Cases number changes on CMS.	Employee in Center Station sees Groovr Spot Addition Cases number changes on CMS.	Employee in Center Station sees Groovr Spot Sold units number changes on CMS.	Employee in Center Station sees Groovr Spot Delivered units number changes on CMS.	Employee sees Groovr Spot request to join network from the Center Station.	Employee sees the change in available spots and successful installation numbers on CMS.	Center manages Groovr Spot partially for User while working timings set by user.

Groovr PSSD Blueprint, All Rights Reserved ©2019, Copyright Himanshu Singh, Anhalt University, Dessau-Germany

Exponential Innovation (Behaviour Design, Nir Eyal)

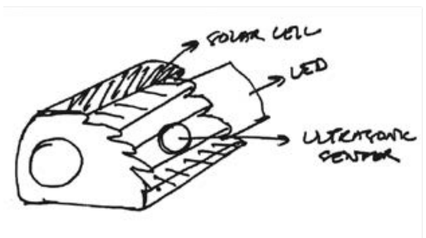
Nir Eyal's behaviour design model comes with 4 steps-

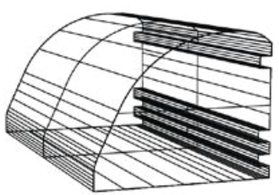
i. Trigger
ii. Reward
iii. Action
iv. Investment

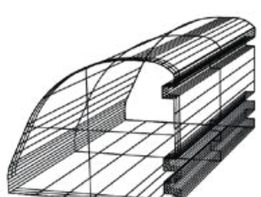


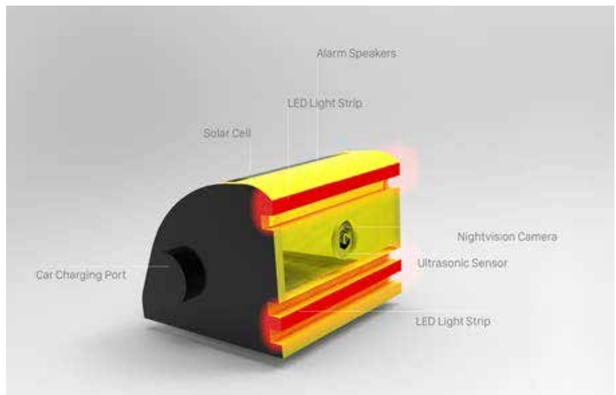
Exponential Innovation (Groovr Spot, Product Design)

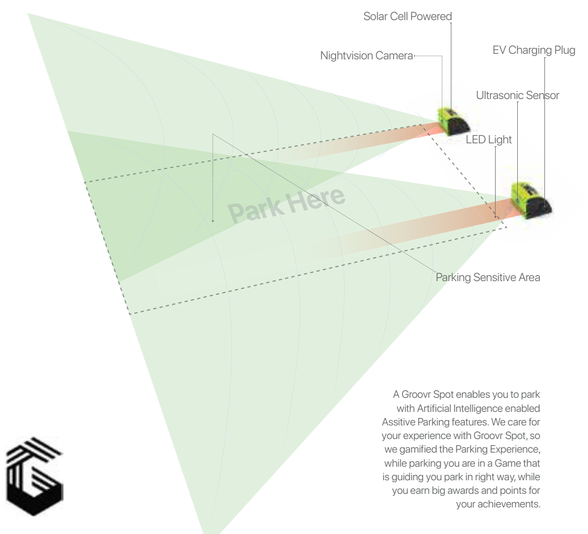
Taking inspiration from the form of the iconic Bauhaus and principles of minimalism. I sketched this product Groovr Spot and used some software to rebuild the curved shape. With further exploration of forms and functional aspects of the product, I came up with a low fidelity 3d model of the product as a Prototype.











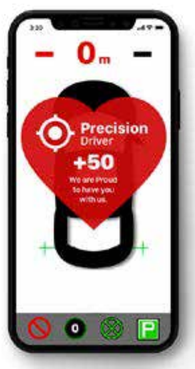
Exponential Innovation (Behaviour Design, Gamification Prototyping)

Following Nir Eyal's Hooked Model, I designed a gaming experience for Users as a prototype for behavioural design product. Groovr's gamification environment is created with interaction in between Groovr Spot, Groovr App and cloud servers.

Arrival & Play

As soon as User chooses to Play, a default game Spot runner loads on the screen guiding the user, while he collects coins.

Park & Check-In

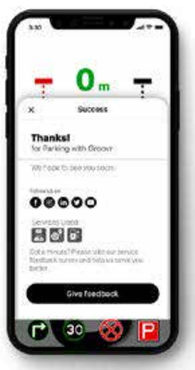


As the User gets all the coins and park his car right. He receives a title of Precision Driver with 50 points in Groovr money.

Play & Leave

At the time of leaving Parking Spot User can continue his paused game or he can play another car reverse game.

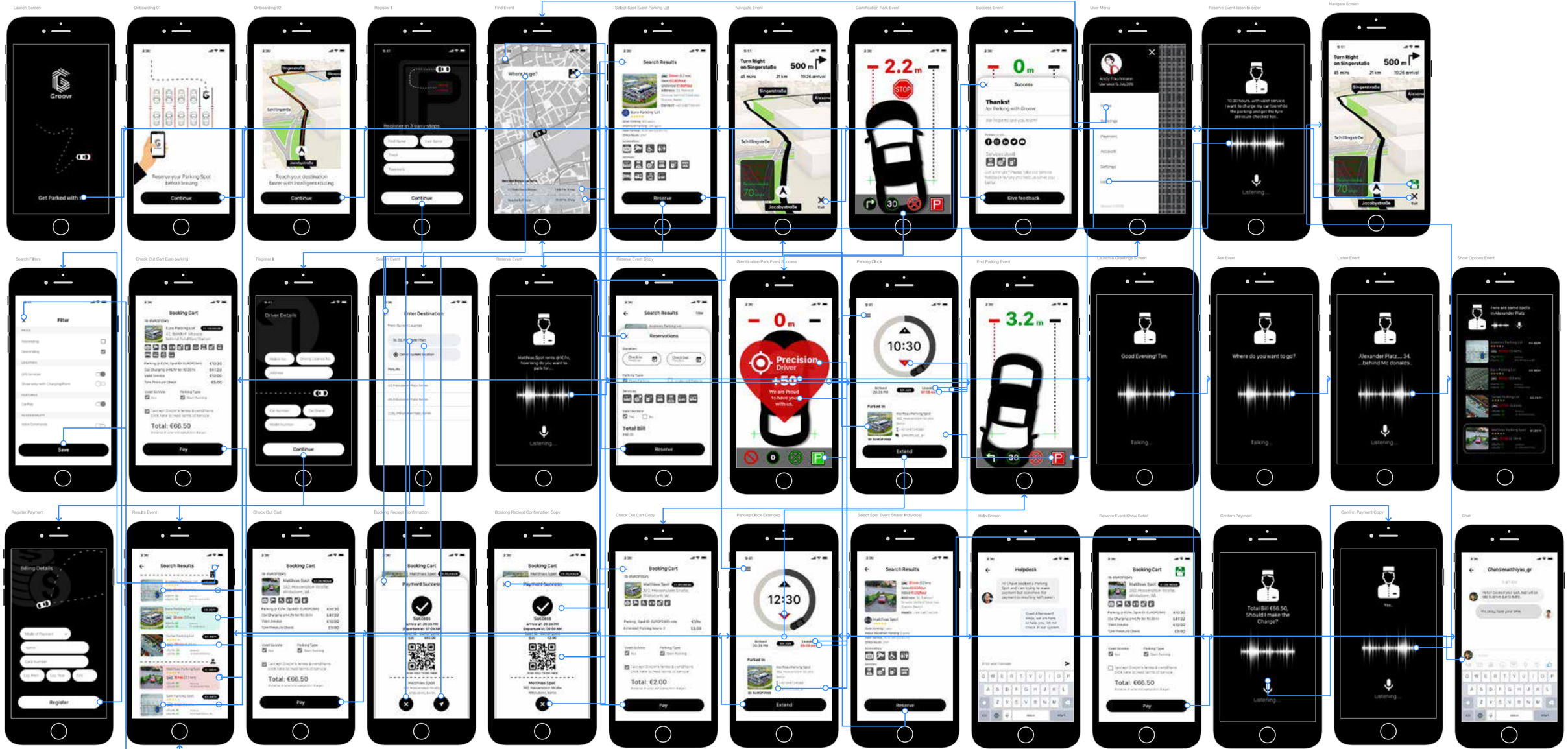
Check-out



As the User leaves the sensitive Parking Spot area, he is checked out of the system and receives a greeting and confirmation.

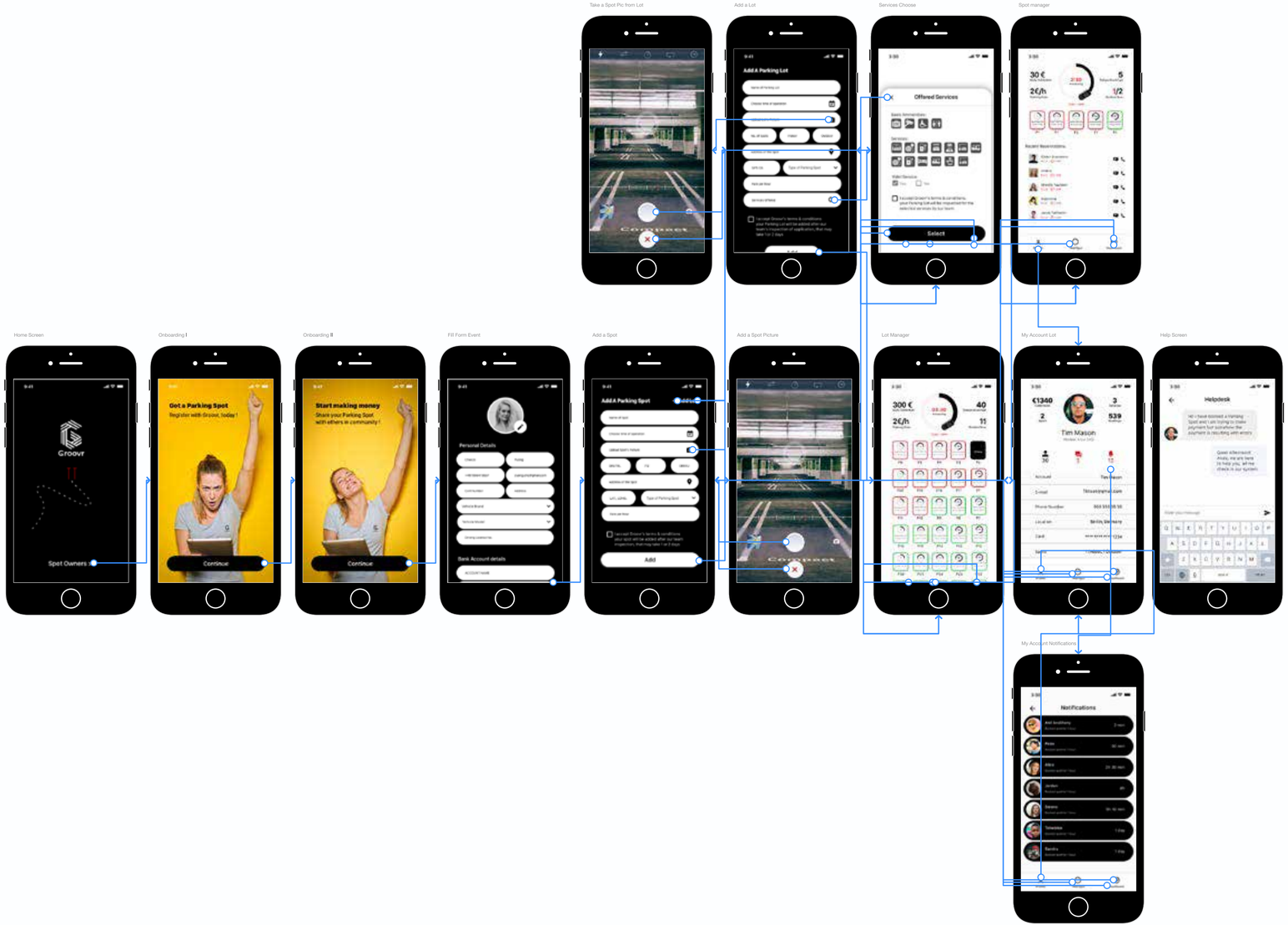
Exponential Innovation (Groovr App)

Groovr User App or Driver App, lets drivers to book Parking Spots before leaving, the App also guides Driver with AI based navigation route that is calculated following algorithms on traffic and congestion pattern. This App features Parking Clock that lets User to extend their stay. PAM is added to this App for driving accessibility and inclusivie support for disabled drivers. Groovr App opens the door to Groovr Play for gaming and assisitive parking experience.


Launch Screen
Groovr
Get Parked with
Onboarding 01
Reserve your Parking Spot before leaving.
Continue
Onboarding 02
Reach your destination faster with intelligent routing
Continue
Register I
Register in 3 easy steps
Continue
Find Event
Where to go?
Select Spot Event Parking Lot
Search Results
Reserve
Navigate Event
Turn Right on Singerstraße
500 m
45 mins
21 km
10:26 arrival
Gamification Park Event
2.2 m
STOP
Success Event
0 m
Success
Thanks!
for Parking with Groovr
Give feedback
User Menu
Reserve Event listen to order
Listening...
Navigate Screen
Search Filters
Filter
Save
Check Out Cart Euro parking
Booking Cart
Total: €66.50
Pay
Register II
Driver Details
Continue
Search Event
Enter Destination
Reserve Event
Listening...
Reserve Event Copy
Search Results
Reservations
Total Bill
Reserve
Gamification Park Event Success
0 m
Precision Driver
+50
We are Proud to have you with us.
Parking Clock
10:30
Extend
End Parking Event
3.2 m
Launch & Greetings Screen
Good Evening! Tim
Talking...
Ask Event
Where do you want to go?
Talking...
Listen Event
Alexander Platz.... 34. ...behind Mc donalds..
Listening...
Show Options Event
Here are some spots in Alexander Platz
Register Payment
Billing Details
Register
Results Event
Search Results
Check Out Cart
Booking Cart
Total: €66.50
Pay
Booking Reciept Confirmation
Payment Success
Booking Reciept Confirmation Copy
Payment Success
Check Out Cart Copy
Booking Cart
Total: €2.00
Pay
Parking Clock Extended
12:30
Extend
Select Spot Event Sharer Individual
Search Results
Reserve
Help Screen
Helpdesk
Reserve Event Show Detail
Booking Cart
Total: €66.50
Pay
Confirm Payment
Total Bill €66.50, Should I make the Charge?
Listening...
Confirm Payment Copy
Yes..
Listening...
Chat
Chatcinemathiyas_gr

Exponential Innovation (Spot Manager App)

Spot Manager App let's Individual and Business Users to share their Parking Spots or Lots with Groovr Ecosystem. The App also lets Owners to Chat with their Drivers and provide any support instantly.


Take a Spot Pic from Lot
Add a Lot
Services Choose
Spot manager
Home Screen
Onboarding I
Onboarding II
Fill Form Event
Add a Spot
Add a Spot Picture
Lot Manager
My Account Lot
Help Screen
My Account Notifications
Groovr
Spot Owners
Got a Parking Spot
Continue
Start making money
Personal Details
Bank Account details
Add A Parking Lot
Add
Offered Services
Select
Tim Mason
Helpdesk
Notifications

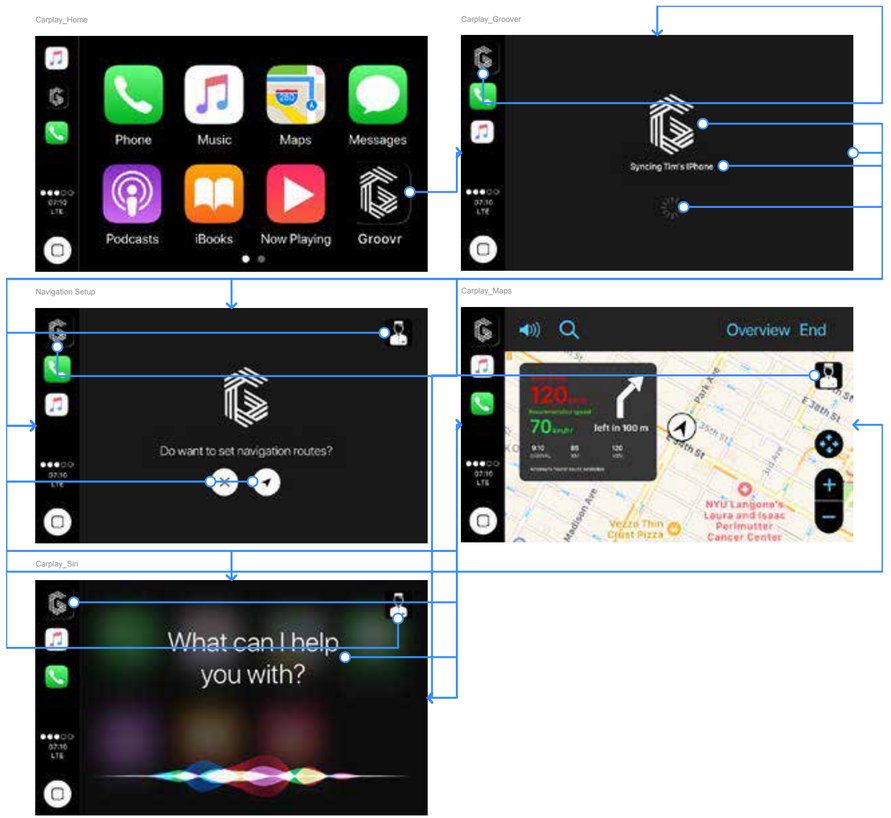
Exponential Innovation (iwatch App)

Groovr iwatch App let's a user to reserve a Parking Spot from the comfort of his iwatch. The iwatch App also has features like Find My Car, EV Charge status and Find Parking Spot, if you can't find your Spot, you can make the Spot glow lights and honk for you.

The iwatch app with all important functions screens and navigations.

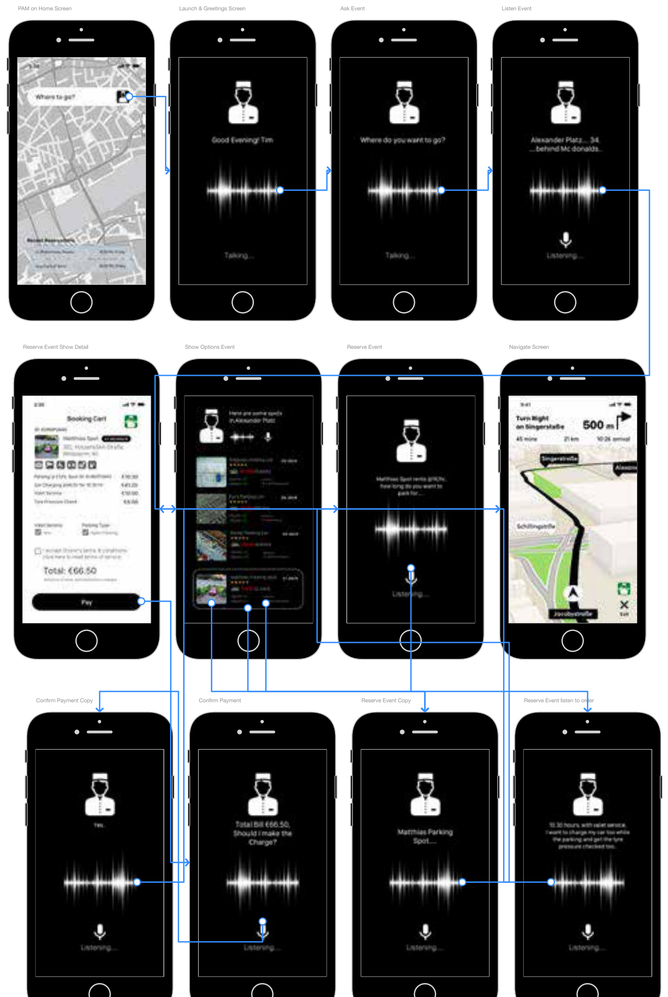
Exponential Innovation (Carplay App)

Groovr Carplay App allows a User to use Groovr navigation on his car's display, that uses Apple Car Play feature. A User can sync his mobile as he usually does and open Groovr App to automatically syncs map and settings from Groovr cloud server. This App also has a link to PAM for making any other request.



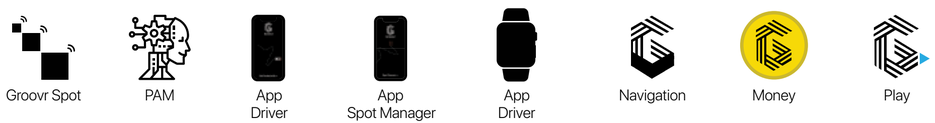
Exponential Innovation (Groovr PAM)

PAM (Parking Assistant Manager) is an exclusive AI that is developed from learning form Groovr ecosystem of services and products. PAM can answer your questions, follow your commands while using Groovr products or services. PAM can understand your Parking requests and show you the best options available to you, it can also take orders for reservation and complete transactions for you. So, while you are busy driving, PAM can take care of all your Groovr interactions.

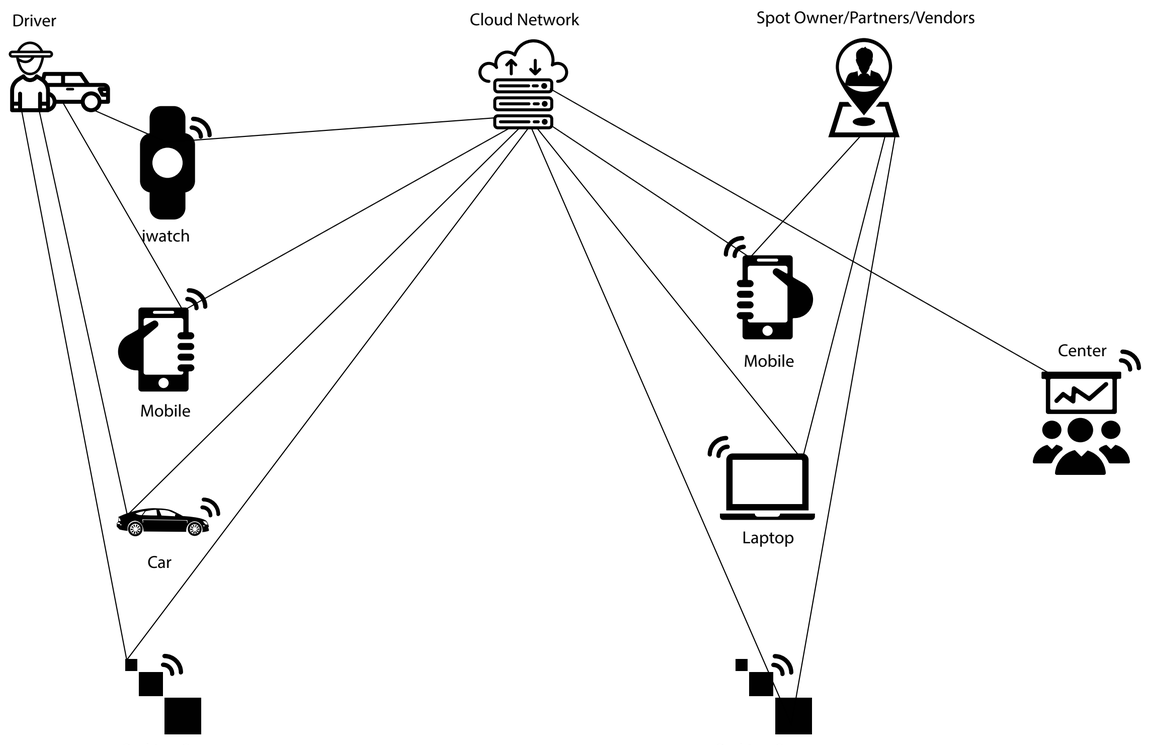


Exponential Innovation (Groovr Systems Design)

The ecosystem of Groovr's experiential products & services

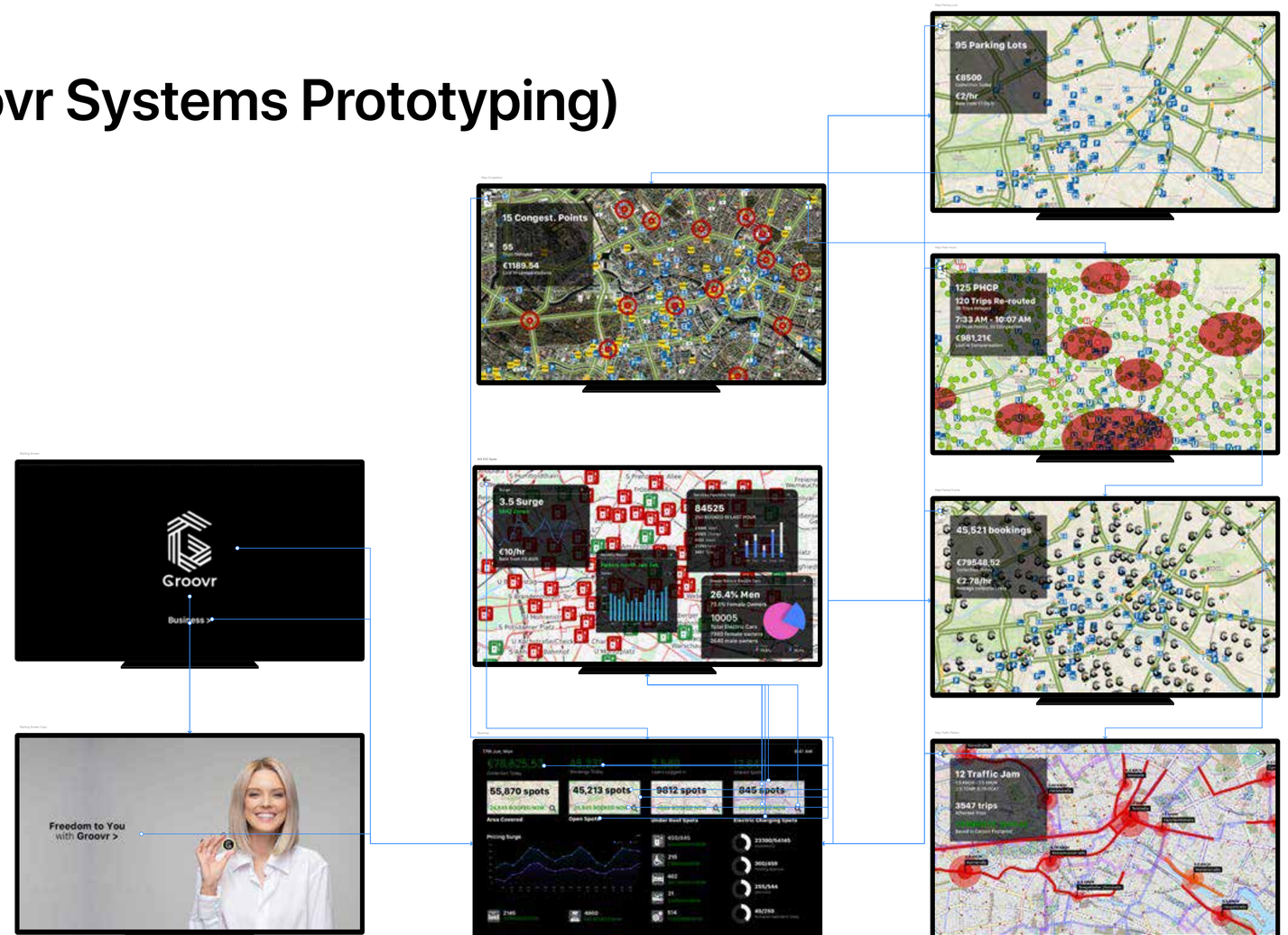


The Groovr Ecosystem of devices and network comprises of three main actors Driver, Spot Manager and the CMS. Driver interacts with Groovr by five touchpoints iwatch, mobile phone, car, Groovr Spot and CMS.



Exponential Innovation (Groovr Systems Prototyping)

To visualise Groovr's Central Monitoring Station's main display, we have to consider the data types that we have with us from the sensors mounted in Groovr Spot to various partners and vendors from the ecosystem.

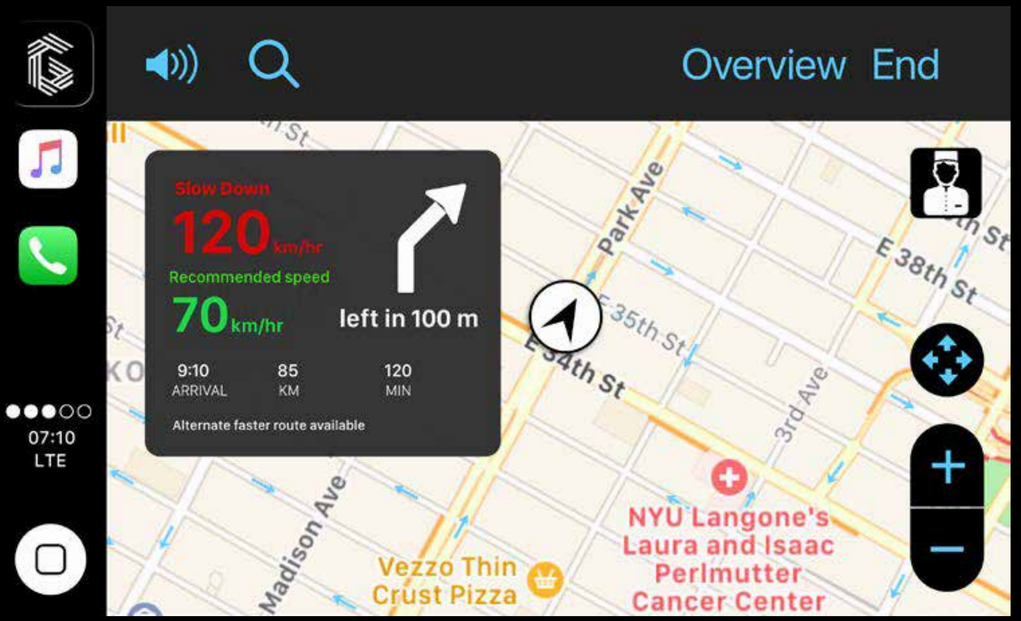


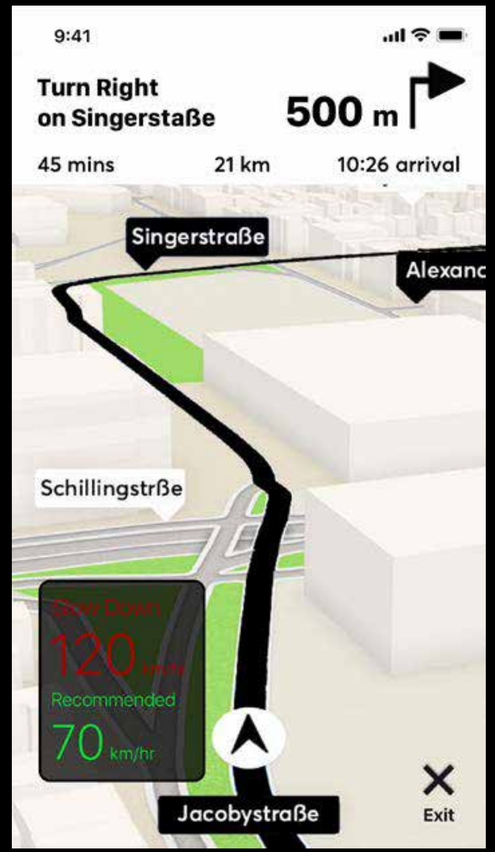
What happens next?

Machine Learning algorithms applied on the continous data stream from trips, booking, driving behaviours, parking bahaviours, traffic and congestion patterns, trips duration, driving, route types with time, fuel and money costs etc.

Data Streams-

GPS via Parking Spot (Precise location)
Trips- Spot to Spot
Pattern- Congestion, Traffic, Driving
Navigation- Spot to Spot
Fuel, traffic, congestion- Spot to Spot
Interactions- Spot to Spot
Network of Drivers- From to Where?
Booking Surges- Area wise
Peak hours patterns- Area wise





What happens next?

Controls- DEMOCRATISED
Profits- DEMOCRATISED
Board Room- DEMOCRATISED
Brand- DEMOCRATISED
Ownership- DEMOCRATISED
Participation- DEMOCRATISED
Access- DEMOCRATISED

Why?

Driving in a city is a systematic activity, we must not let individual driving behaviours cause traffic and congestions.

We want to inspire the behaviour of every driver in a city to bring a change in the way people drive in a city.

Thanks! for your time

“Good Design is diving into and then reducing complexity.”

-Himanshu Singh