PLATFORM COMMUNICATION SERVICES FOR ELECTRIC VEHICLES

Full Electric Vehicle Storyline & Services

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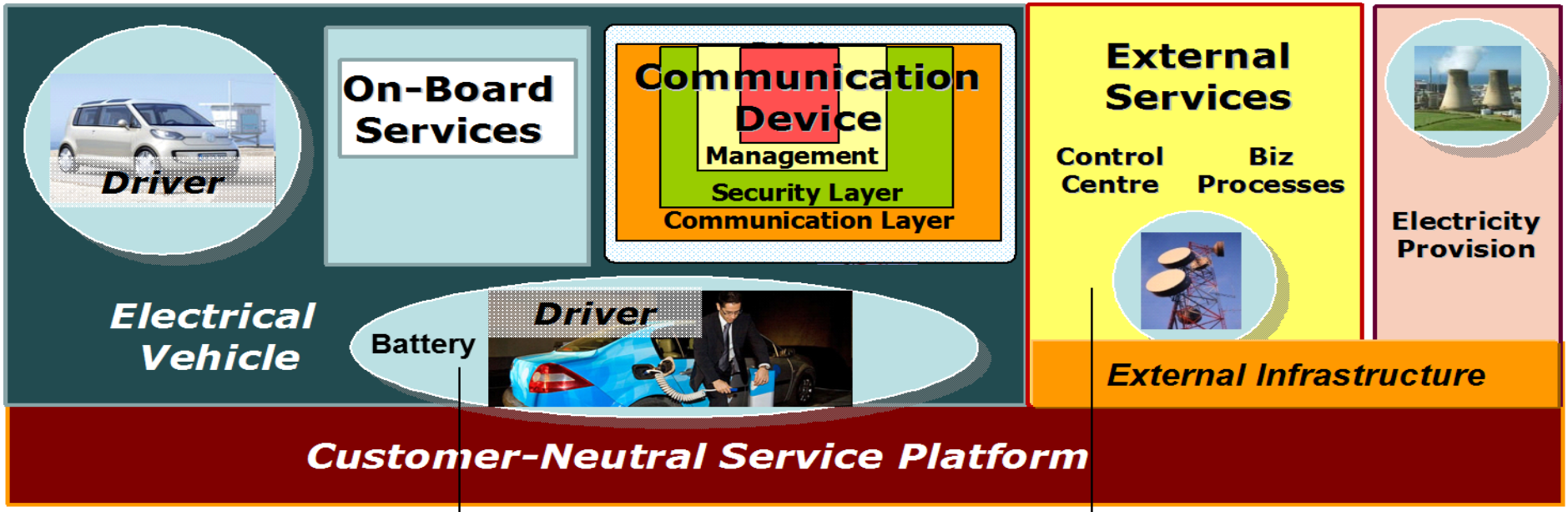
Introduction of ELVIRE Project

- Main Objective:
  - To Develop Platform Communication Services for Electric Vehicles
- Main Goals
  - Identify representative use cases.
  - Develop off-board ICT & Services Platform.
- Key indicators
  - EU Call: ICT-2009.6.1: ICT for Safety and Energy Efficiency in Mobility
  - Timeline: Jan 2010 – Dec 2012 (3 years);
  - Budget: ≈ 9,34 M€; 11 partners

ELVIRE Value Chain

EV Driver → EV Car → Communication → EV Service Provider → Charging Infrastructure → Utility



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ELVIRE Storyline Scenarios (4 Phase)

Drive with a Plan (Phase 1)

Charging (Phase 2)

Drive without a Plan (Phase 3)

Home (Phase 4)

The definition of end-user needs and service requirements is predicated on the identification of potential end-users of the EV service, and the scenarios in which they are likely to use the EV car

Phase 1: Drive with a Plan Scenario

Pre Drive Service → Get into the car → Review and check the route → Start driving → Continuous monitoring → Reach target destination

Scenario Name	Scenario Explanation
Pre Drive Service	John has an important meeting 100km from his office and therefore needs to plan his route to reach the destination on time.
Getting into the car	John gets into the car, the on-board system turns on, and he is identified by the system.
Check the route	John sets the target destination for his trip, he checks the route details. The energy plan has been calculated. The charge spot and switching locations are identified including their degree of availability.
Starting driving	John starts driving from his office to the business meeting, which is 100km away.
Continuous monitoring	The system compares the energy consumption with the battery level. While driving he will receive safety or range notifications, depending on the monitoring status.
Reaching target destination	John reaches the destination which is equipped with a charge spot. The system offers multimedia help on how to charge an FEV.

Phase 2: Charging Scenario

Connect to Charge Spot → Charge → Monitoring of charging process → Problem during charging → Support call / Hotline → Stop charging process and enter car

Scenario Name	Scenario Explanation
Connecting to charge spot	John leaves the car and connects the car to the charge spot. Charging process starts.
Charging	The car is charged according to the regular charging program. John can decide to change the charging program (e.g. to shorten the charging cycle)
Monitoring of charging process	The charging process is monitored by the service provider. John can always check the charging status via his mobile device.
Problem during charging process	John is suddenly notified by the service provider that an unexpected failure / problem has occurred, and that the charging process was interrupted.
Supporting call / Hotline	After the business meeting John calls the support hotline to get further details why the charging process was interrupted. John is informed that the energy provider needed to reduce the load on the grid temporarily, because it was a period of peak demand in the area.
Stop charging process and enter car	John decides to return to the car and pulls out the charging cable.

Phase 3: Drive without a plan Scenario

"Smart" Navigation → Continuous Monitoring → Low Energy Notification → Driving Extension Scenario → Drive Directions to BSS → Battery Switching

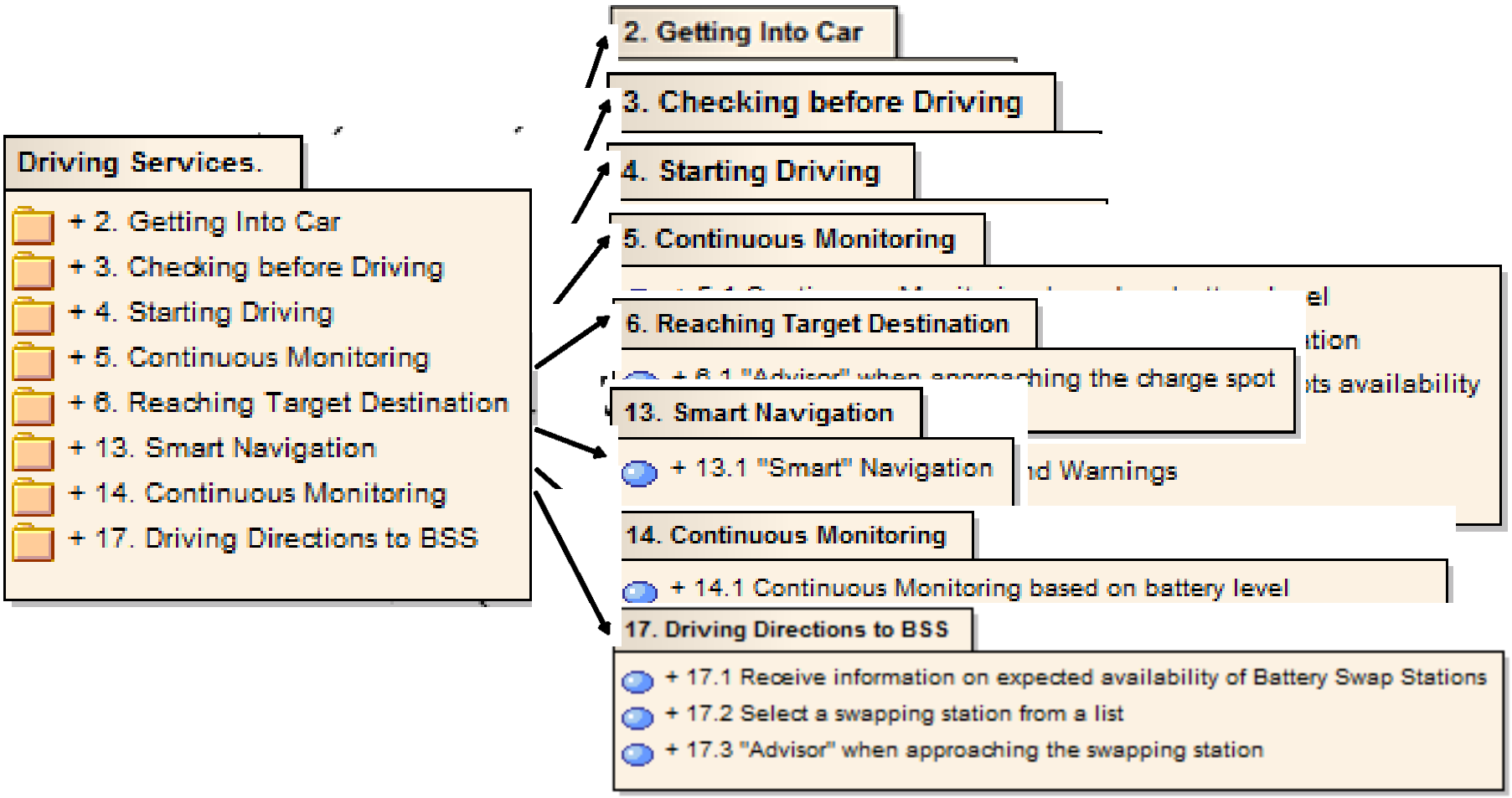
Scenario Name	Scenario Explanation
"Smart" navigation	John is driving home without a plan, since he roughly remembers the route. The system analyses his typical mobility patterns and tries to predict the target destination.
Continuous monitoring	John is supported by a system which continuously monitors his current energy consumption and remaining driving range. While driving he will receive safety or range notifications, when necessary.
Low energy notification	The system is indicating that the battery level is getting low. The system automatically starts scanning the surroundings for energy supply infrastructure.
Driving extension scenario	The system finds and displays the following options: He can decide whether to drive to a near by battery switch station, or to a charging spot for a fast charge.
Driving directions to Battery Switch Station	John decides to switch the battery since he does not want to be late for dinner. After selecting this option, the system indicates the way to the next battery switch station.
Battery switching	His depleted battery is exchanged with a fully charged one. John continues driving with the certainty he has enough energy to get home.

Phase 4: Home Scenario

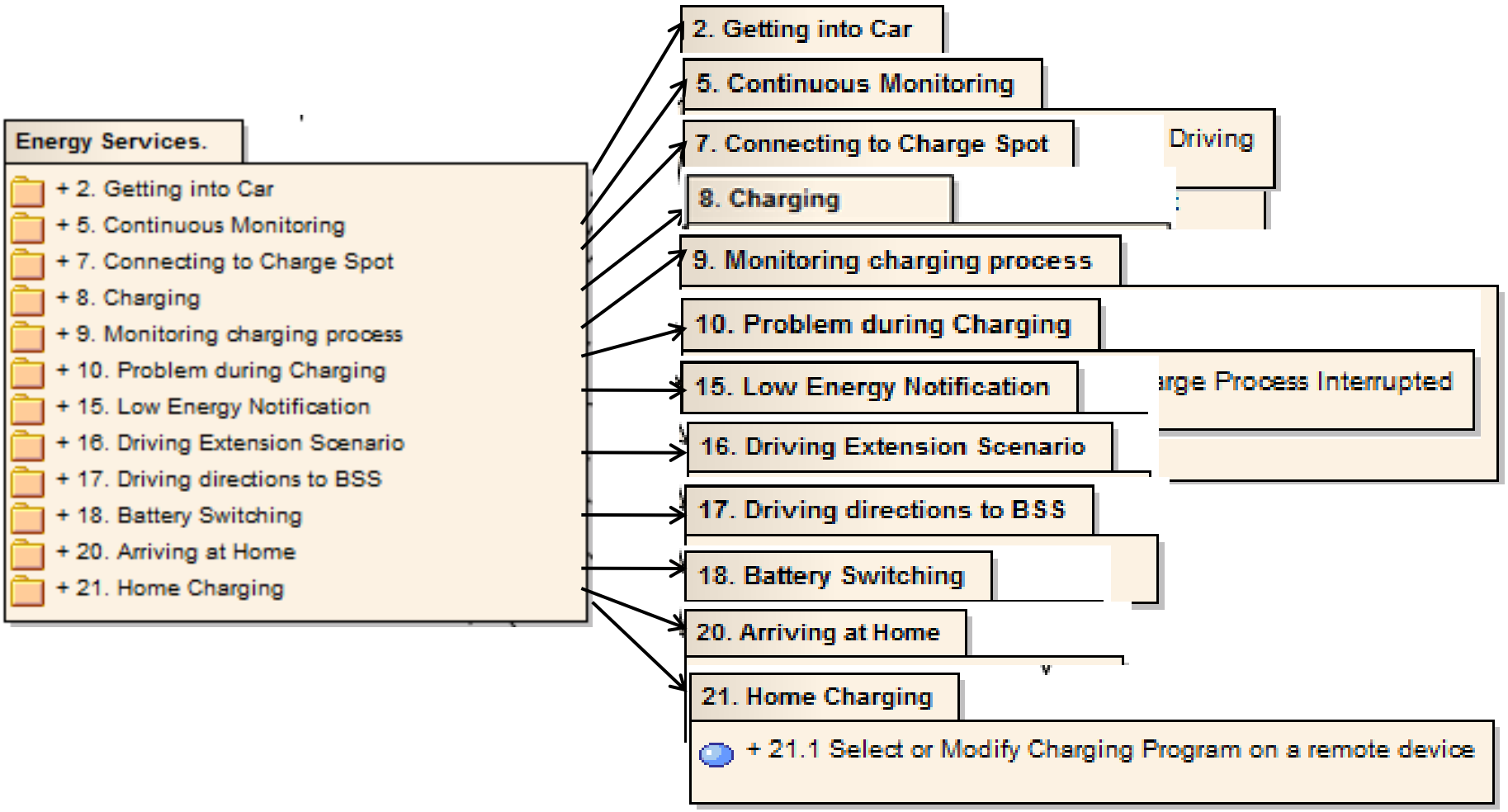
Resume Driving → Arrive at Home → Home Charging → Receive / Review Bill

Scenario Name	Scenario Explanation
Resume driving	John resumes driving home with a full battery.
Arriving at home	John arrives at home and connects his car to the charge spot at home.
Home charging	The car is charged according to the regular charging program and could be connected to the Customer Service Centre or not, depending on the contract the customer has with the service provider.
Receiving / Reviewing bill	John can review his bill online.

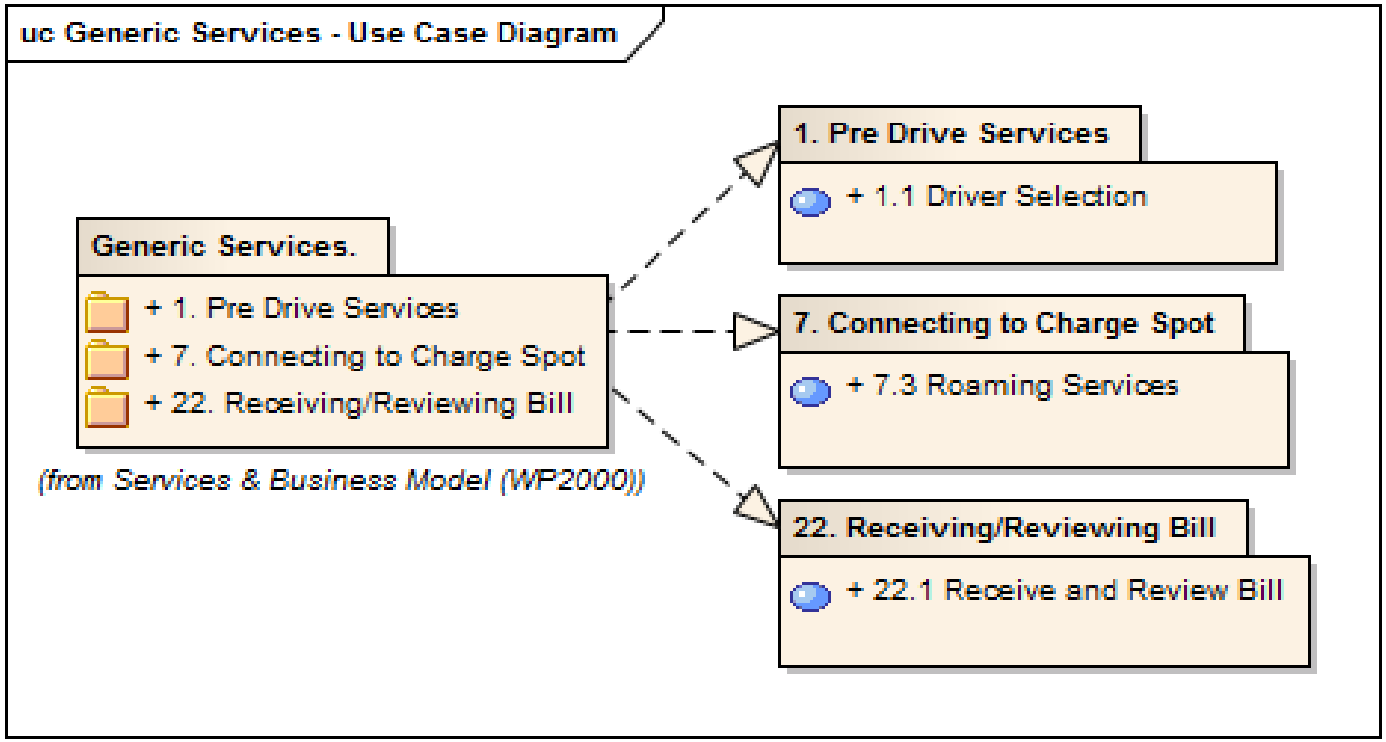
Driving Services - Use Case Diagram



Energy Services - Use Case Diagram



General Services - Use Case Diagram



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