

Case study: Security risk in smart car production

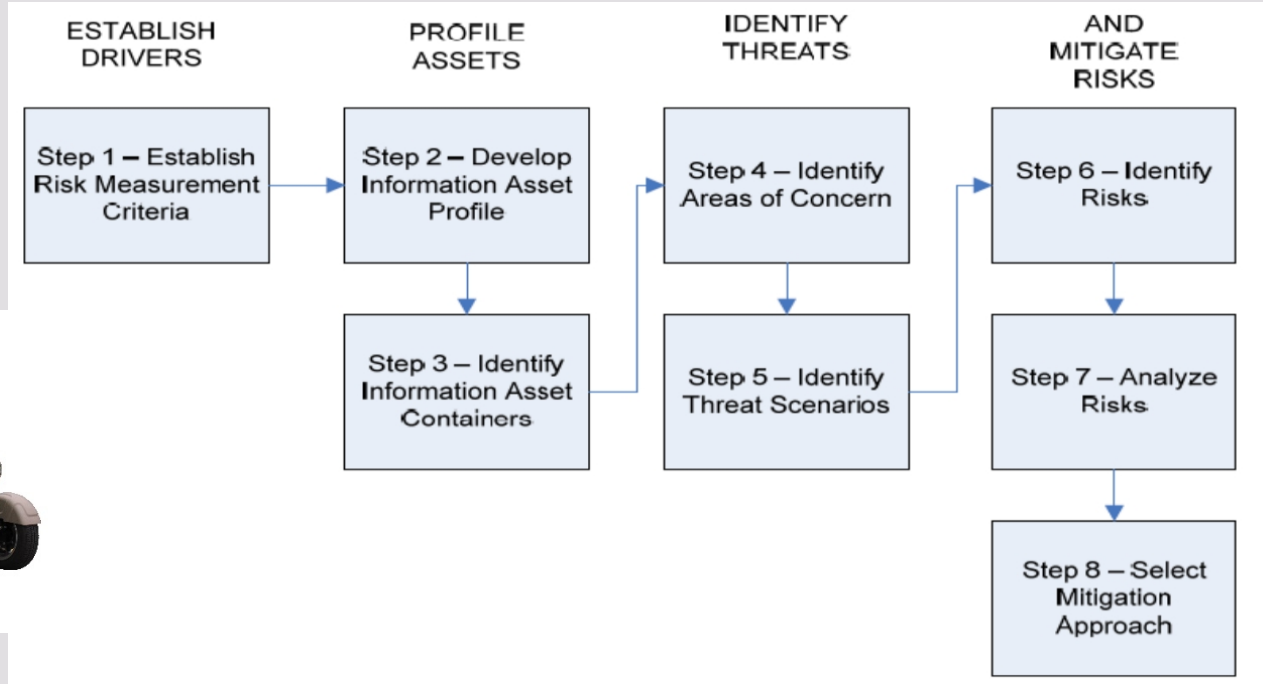


SAM EV, Wikimedia Commons

- Please form groups of four students!
- Read the description of the digitized customization of car production!
- **Identify three information assets** critical for production and operation of the smart cars!
 - Assets are data bases, computerized machinery, communication facilities, control computers, resource access, program code, configurations.
- **For each asset, find at least two information security/privacy threats** that endanger production or car operation!
- For the threats found above, each group should discuss how the consequences of a threat will hit. Use the ENISA template to assess likelihood and damage.
- Sort your results in a list – from highest risk to lowest risk.



Risk analysis approach



OCTAVE Allegro Roadmap, from Caralli, R. A., Stevens, J. F., Young, L. R., & Wilson, W. R. (2007).
Introducing OCTAVE Allegro: Improving the Information Security Risk Assessment Process.
Software Engineering Institute, Carnegie Mellon University.



Threat agents



Adi Karahasanovic: Automotive Cyber SecurityThreat modeling of the AUTOSAR standard, Master Thesis, Chalmers, 2016

	AGENT LABEL	DEFINING MOTIVATION	PERSONAL MOTIVATION
EXTERNAL	Hacktivist	✓ Ideology	✓ Ideology
	Competitor	✓ Organizational Gain	✓ Personal Financial Gain
	Cyber Vandal	✓ Dominance	✓ Dominance
	Data Miner	✓ Organizational Gain	✓ Personal Financial Gain
	Online Social Hacker	✓ Personal Financial Gain	✓ Personal Financial Gain
	Script Kiddies	✓ Personal Satisfaction	✓ Personal Financial Gain ✓ Personal Satisfaction
	Government Cyber-warrior	✓ Dominance	✓ Ideology ✓ Personal Financial Gain ✓ Personal Satisfaction
	Organized Crime	✓ Organizational Gain	✓ Personal Financial Gain ✓ Coercion
	Radical Activist	✓ Ideology	✓ Ideology
	Sensationalist	✓ Notoriety	✓ Personal Satisfaction
	Cyber Terrorist	✓ Ideology	✓ Ideology
	Car Thief	✓ Personal Financial Gain	✓ Personal Financial Gain ✓ Personal Satisfaction
	Information Partner	✓ Organizational Gain	✓ Personal Financial Gain
INSIDER	Government Spy	✓ Ideology	✓ Ideology ✓ Personal Financial Gain ✓ Personal Satisfaction
	Internal Spy	✓ Personal Financial Gain	✓ Ideology ✓ Personal Financial Gain ✓ Coercion
	Disgruntled Employee	✓ Disgruntlement	✓ Disgruntlement
	Reckless Employee	✓ Accidental	✓ Accidental
	Untrained Employee	✓ Accidental	✓ Accidental
	Outward Sympathizer	✓ Personal Satisfaction	✓ Personal Satisfaction



Auto-EL-Moto AB – Production details

Customers order a car on-line. Every car gets produced within 3 weeks after ordering.

Each car model has customizable features, optional equipment and functions. The car models are: Model A, Model B, Model XC, Lift 550, LuxPlus, SUV light.

Auto-EL-Moto AB deploys just-in-time production. Car parts are ordered from suppliers in real time and will be shipped within short time. Order, logistics and billing are digitized.

Car production is performed using software-customizable robots that can assemble individual models and configurations in series of one car.

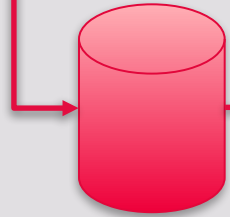
The cars contain several computer systems that control car function, driving, entertainment, communication and battery charging as well as the connected car services. Software and configuration gets loaded into the ´computers after assembly. Updates are possible through GSM and Wifi.



Connected factory & production on- demand



Operation:
On-board diagnostic
data collection;
Connected services;
Updates



Web shop
configurator



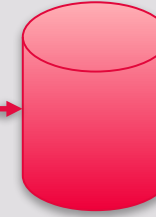
Production
planning &
procurement



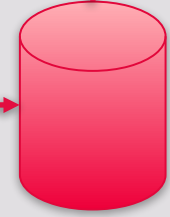
Logistics &
warehouse
management



Configuration
& execution
of assembly
lines, assembly



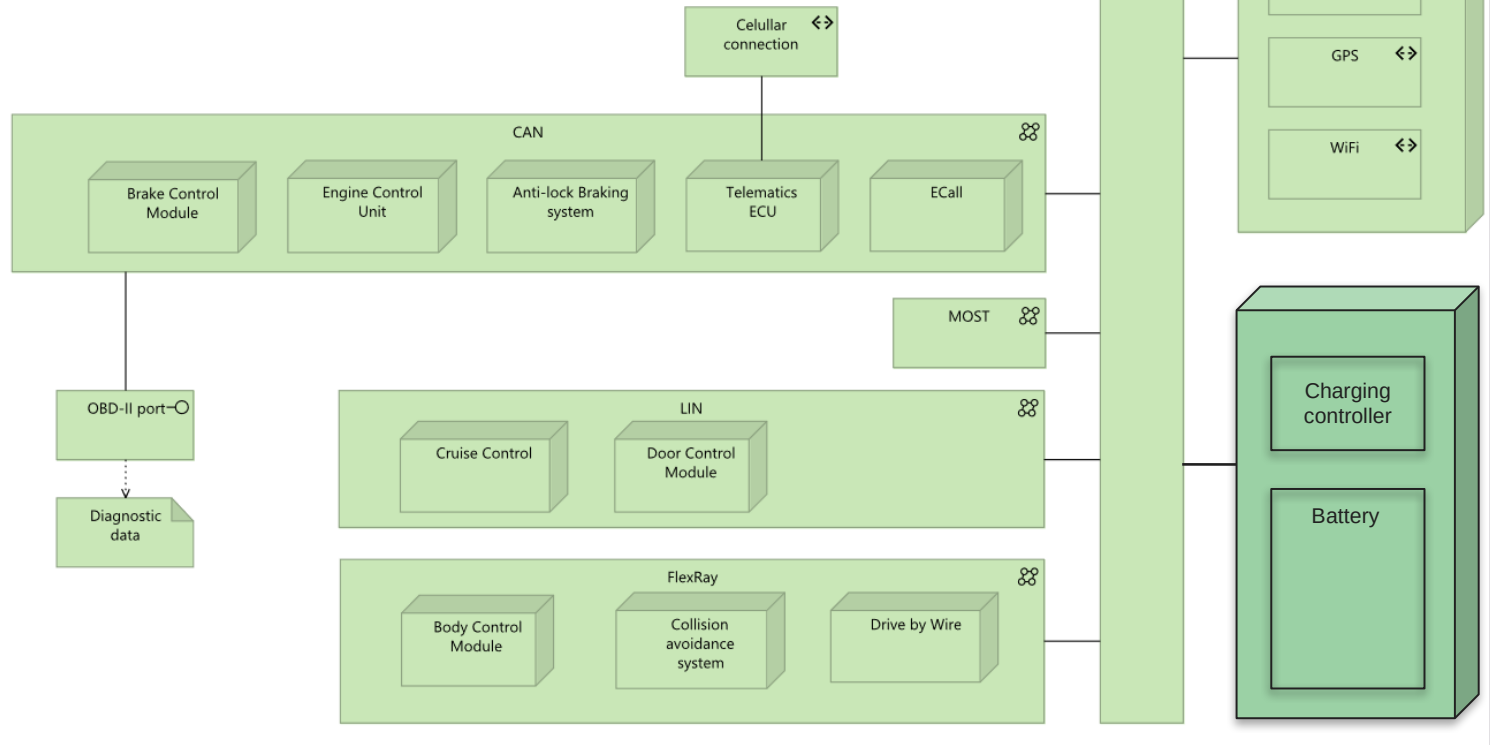
Software
installation,
Connection
to services,
Quality
Assurance



Order fulfilment
Car delivery
Billing
Car registration



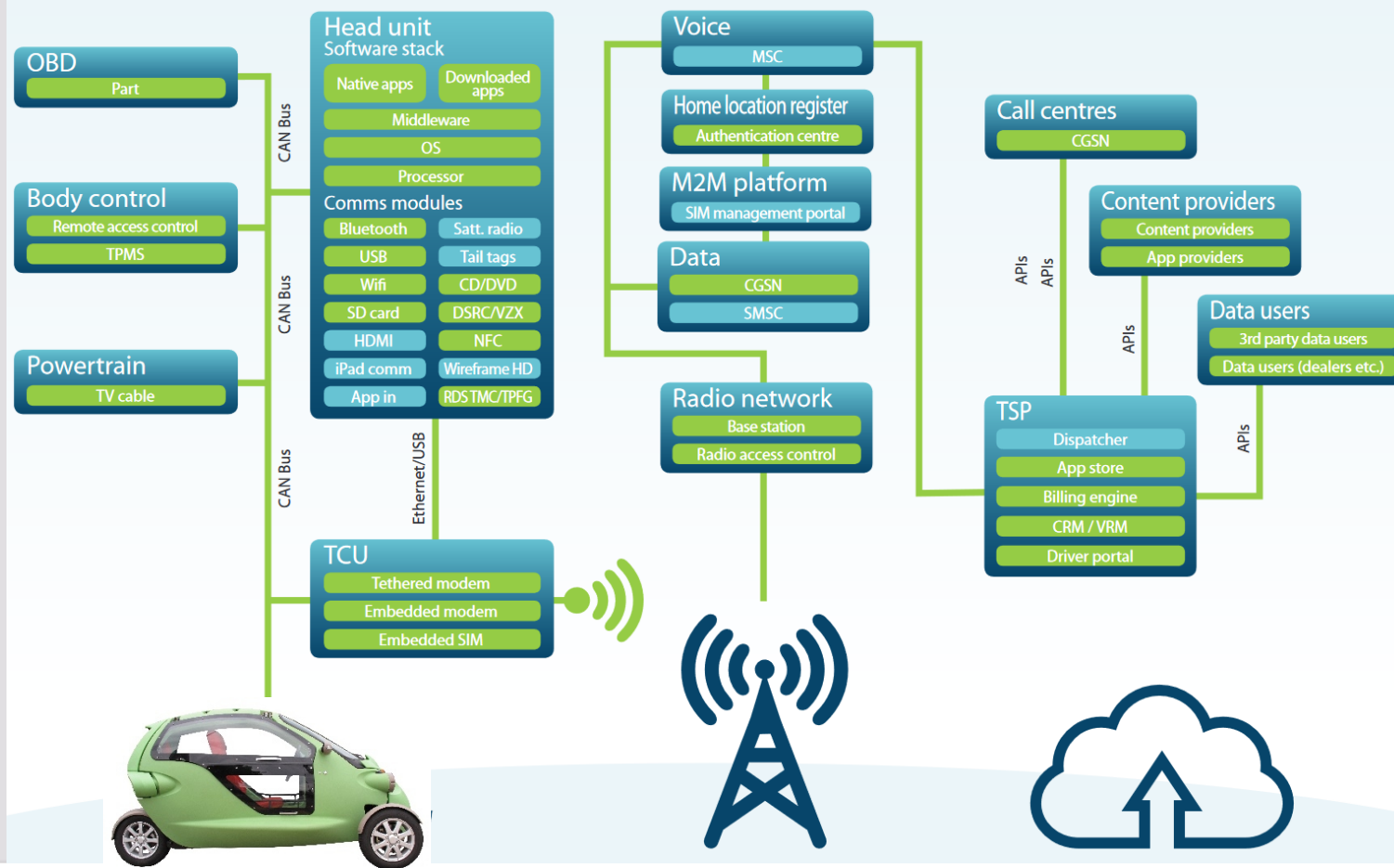
In-vehicle data systems



Based on: Chris Blommendaal: Information Security Risks for Car Manufacturers based on the In-Vehicle Network, University of Twente Master Thesis, 2015



Connected vehicle services



Inventory of valuable information assets

Company: Auto-El-Moto AB

Asset	Value contribution	Type (data, software, process, production, communication, service production)
1.		
2.		
3.		



Asset1:

Risk1:

Likel Imp	Negli	V low	Low	Med	High	V High	Extr
None							
Minor							
Med							
High							
V High							
Extr							

Three levels of risk are normally adequate: low, moderate, high



Asset1:

Risk2:

Likel Imp	Negli	V low	Low	Med	High	V High	Extr
None							
Minor							
Med							
High							
V High							
Extr							

Three levels of risk are normally adequate: low, moderate, high



Likel Imp	Negli	V low	Low	Med	High	V High	Extr
None							
Minor							
Med							
High							
V High							
Extr							

Three levels of risk are normally adequate: low, moderate, high



Likel Imp	Negli	V low	Low	Med	High	V High	Extr
None							
Minor							
Med							
High							
V High							
Extr							

Three levels of risk are normally adequate: low, moderate, high



Likel Imp	Negli	V low	Low	Med	High	V High	Extr
None							
Minor							
Med							
High							
V High							
Extr							

Three levels of risk are normally adequate: low, moderate, high



Asset3:

Risk2:

Likel Imp	Negli	V low	Low	Med	High	V High	Extr
None							
Minor							
Med							
High							
V High							
Extr							

Three levels of risk are normally adequate: low, moderate, high



Prioritized risk list

Asset	Threat	Priority

