Considerations for developing managed apps & how to apply the considerations to SDK

Oct. 11, 2017 | SDK Development Team

John. Kim
OBIGO Inc.

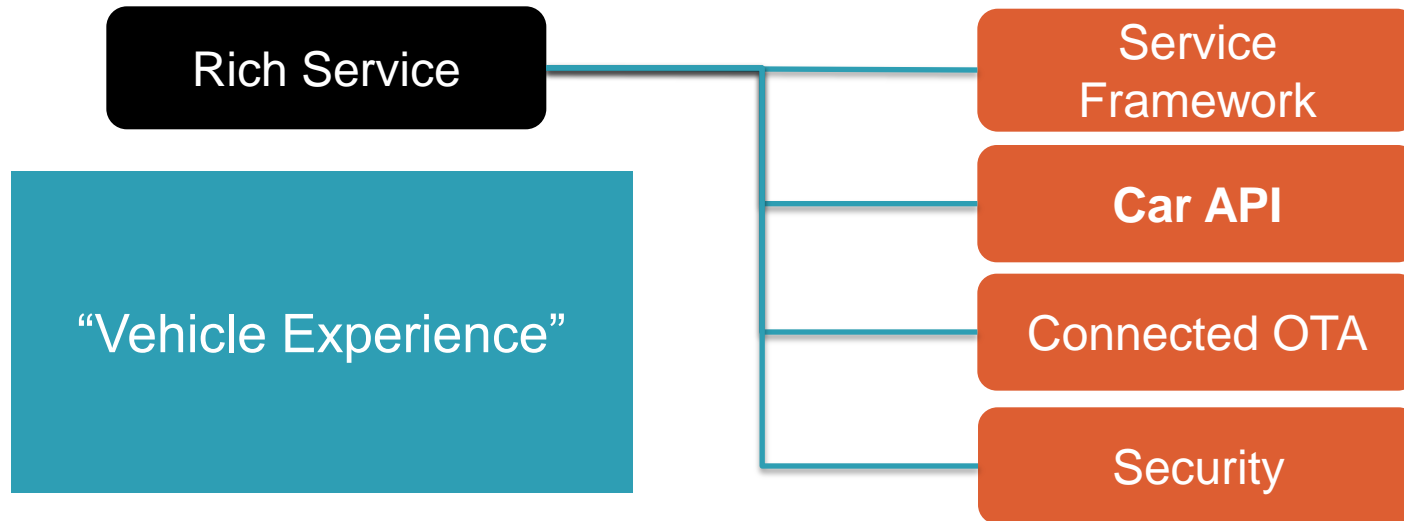# Agenda

- Trends and Background

- Lessons from Experience

- How It Works (incl Screen Shot)
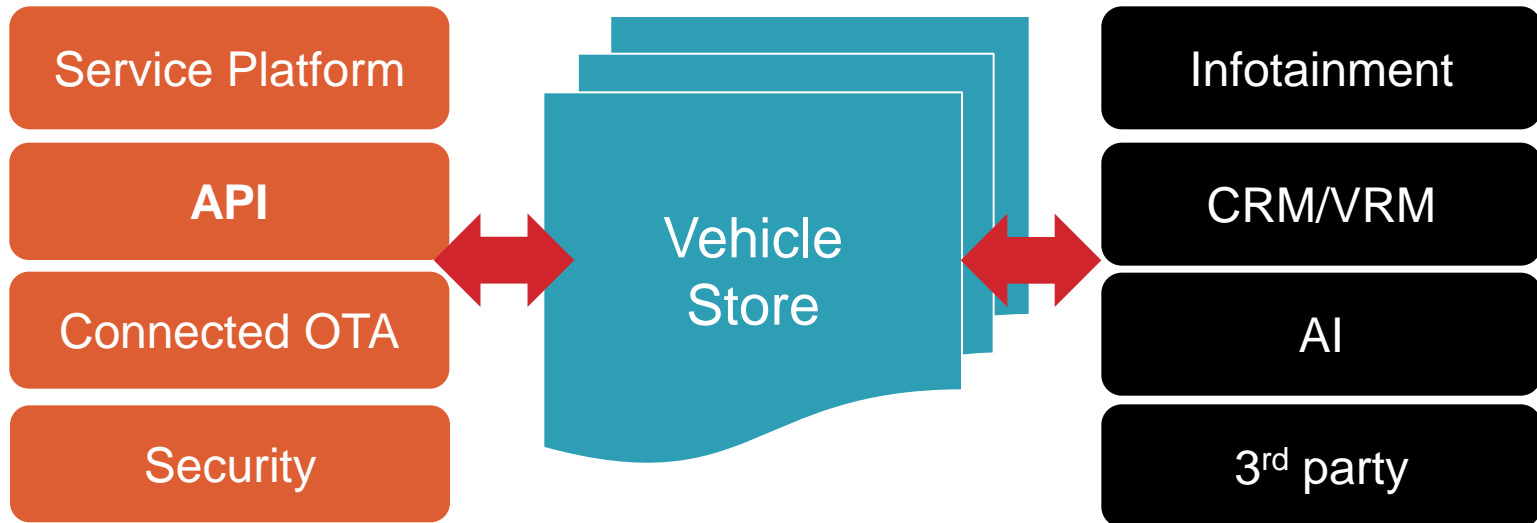
- Video Demo

- Future Works & Summary

GENIVI®

Trend & Background

GENIVI®

Market Trends

- Toward Vehicle Experience beyond mobile experience

GENIVI®

Market Trends

- Toward Rich Service

Service Platform		Infotainment
API	Vehicle Store	CRM/VRM
Connected OTA		AI
Security		3rd party

SDK for in Vehicle Service
Based on Open Standard (HTML5)

GENIVI®

Market Trends

- Service Application Required

Market Trends

- Eco System is the Key to the Problems

Seamless Environment	→ Work in Runtime	Framework+ SDK
Performance	→ Understanding Automotive domain	
	→ Leverage engine Technology	
	→ Equivalent performance	
Integration	→ Middleware interaction	

GENIVI®

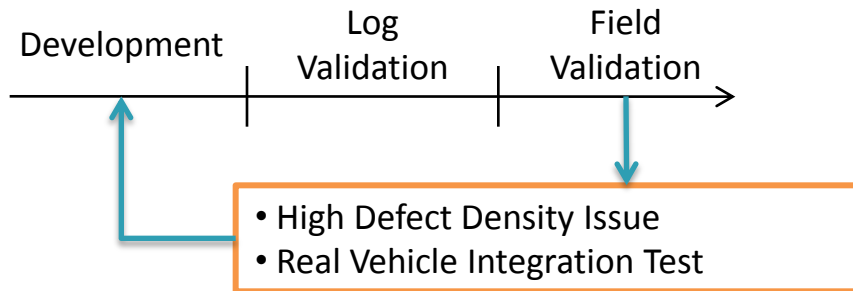# Lessons from Experience

GENIVI®
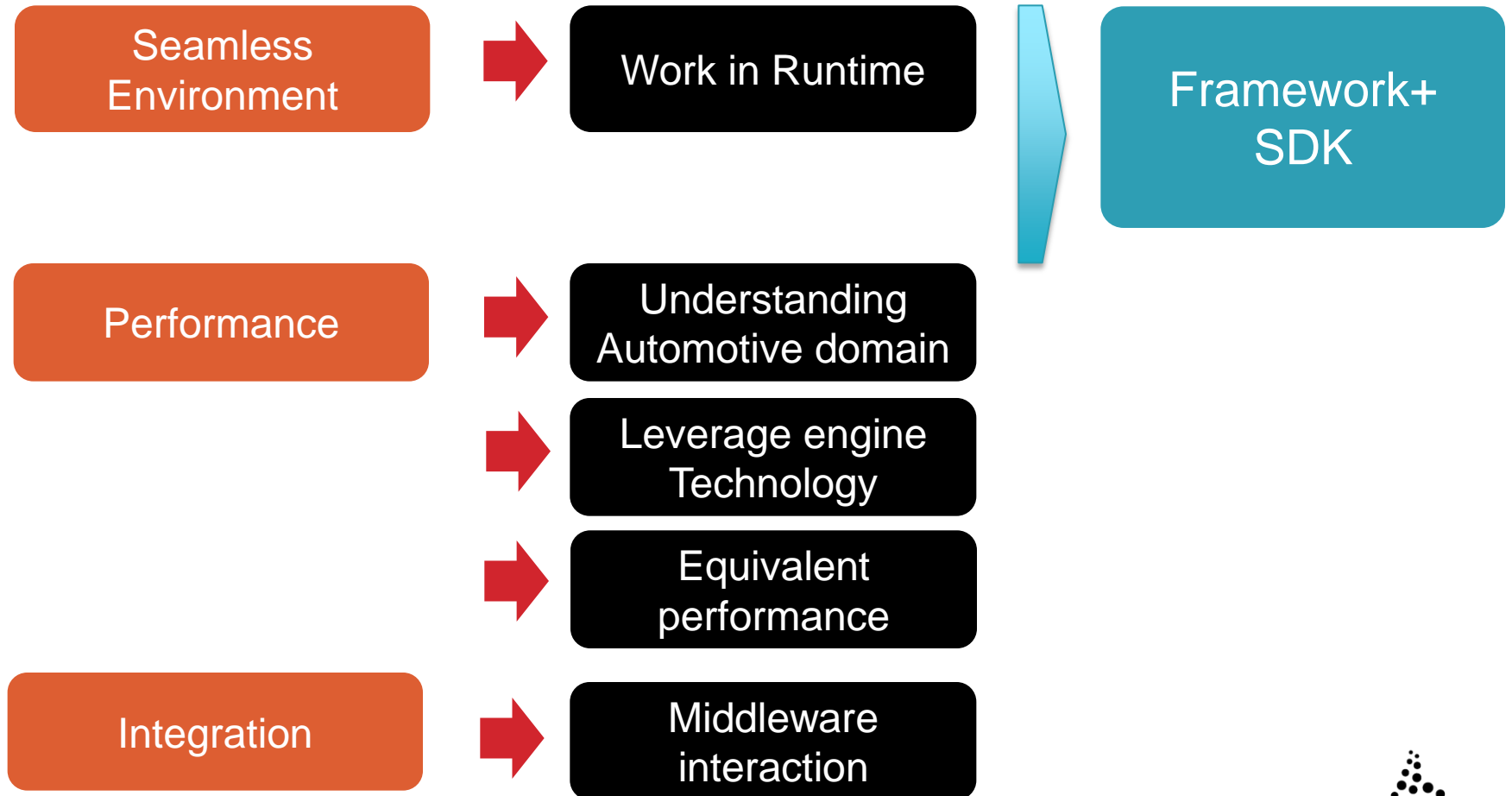
Lessons - Project Analysis

- Postmortem
  - Commercial Project Analysis for SDK
- Focus on Development Environment & Process
  - Defect Triage : Types, Category, Density, ….
  - Validation Process : Reason Why, Improvement, …

GENIVI®

Lesson Learnt (1/2)

- Defect & Validation Analysis
  - Find Issue Earlier at Development Phase as Seamless [IDE]

  - Critical Issues emerge at SOP (In Vehicle Test) [Vehicle Simul.]

Development | Log Validation | Field Validation

• High Defect Density Issue
• Real Vehicle Integration Test

  - Resource Congestion(Peak, Duration) [CPU/TREND]
    - Memory and CPU

  - Visual Inspection [Different Types of Envi.]
    - Brightness, Contrast, Theme, Ambient API, HMI Tool

GENIVI®

Lesson Learnt (2/2)

- Defect & Validation Analysis
  - Network Strength [NW TEST]
    - Strong/Weak/Offline/Poor(Intermittent)

  - Rarely Reproducible Issue [Macro Test]

  - Recovery when malfunctioned or Crashed [OOM]

  - Various Input or Interrupt [Bezel | Rear View Camera]
    - Different Vehicles Environment

GENIVI®

How It Works - ScreenShot or Demo (SDK Features)

Simulator Overview
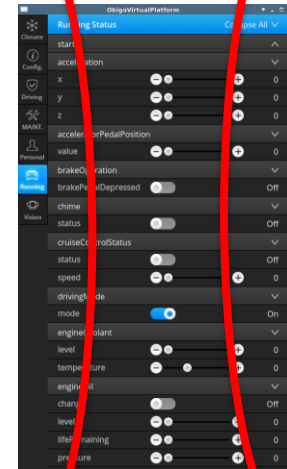
• Bezel Keys
- Menu
- Media
- Apps
- Back
- Tel
- Home
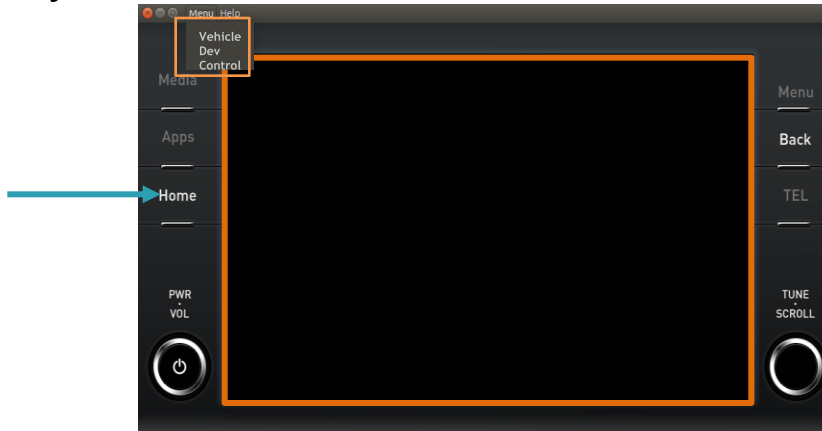
• Input
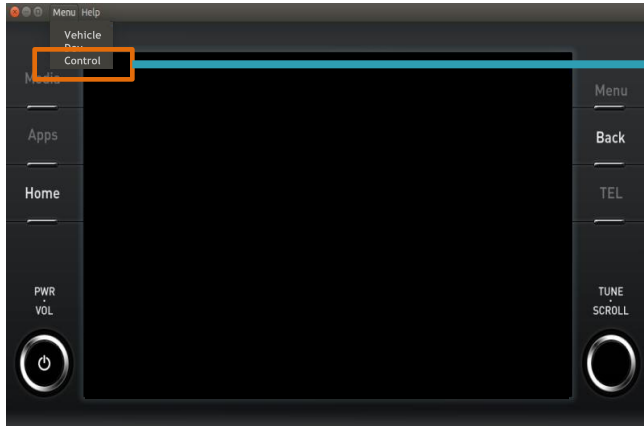- Knob
- Wheel switch

• Vehicle simulation

• Developer mode
- Launcher
- Dev
- Usage

GENIVI®

Simulator Vehicle Control

- ## Knob
  - Climate Control
  - Configuration and Identification
  - Driving Safety
  - Maintenance
  - Personalization
  - Running status
  - Vision and Parking

- ## Wheel Switch
  - Volume up/down
  - Page up/down
  - Mode
  - Call
  - VR
  - Next / Previous
  - Back / Ok

GENIVI®

Video Demo

Cockpit Vehicle API Simulation

- Running Status : Vehicle Speed > Gear mode
- Light Status : Head > Right Turn > Left Turn > Brake > Fog > Hazard > Park
- Engine Oil : Level (0 → 50)
- Fuel : Level (60 → 100)
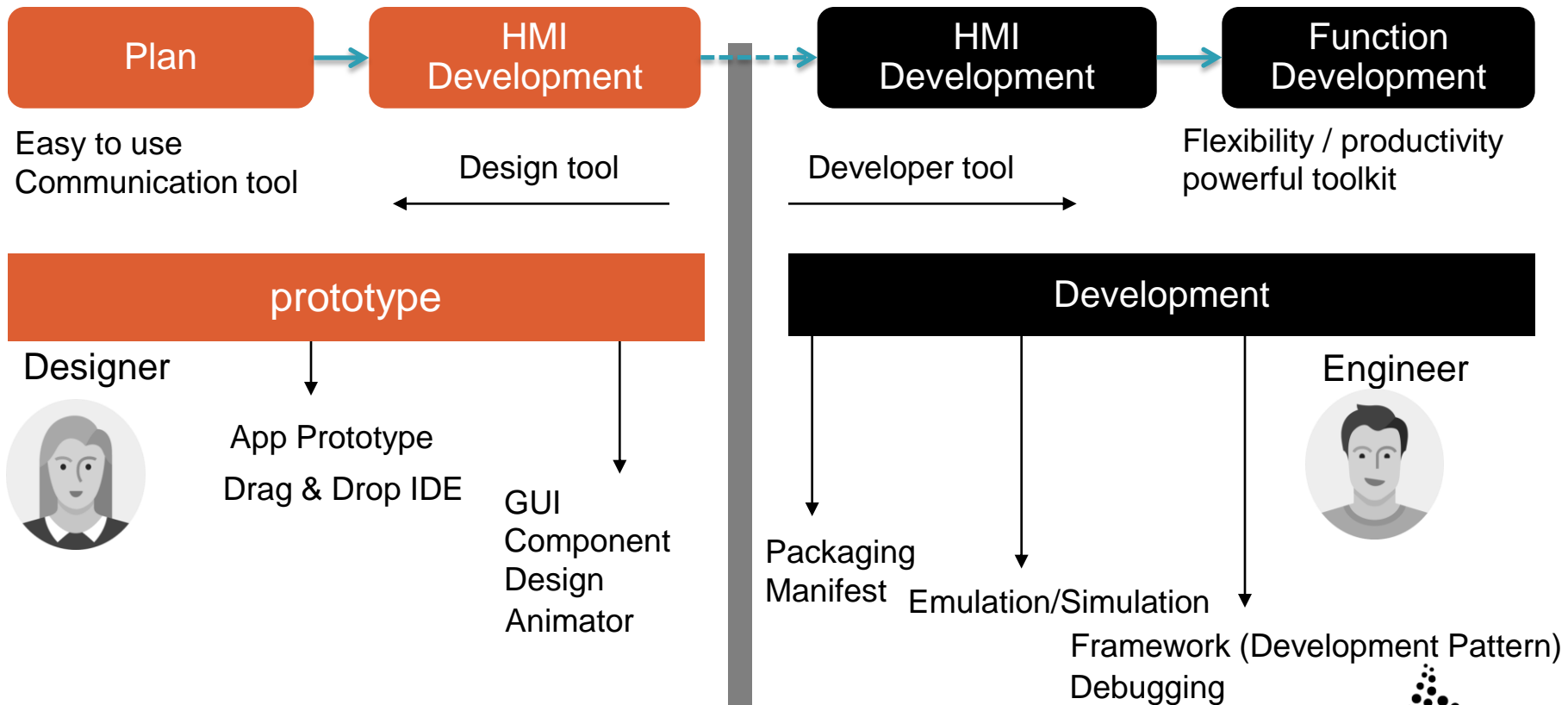- Parking Brake (Inactive → Active)

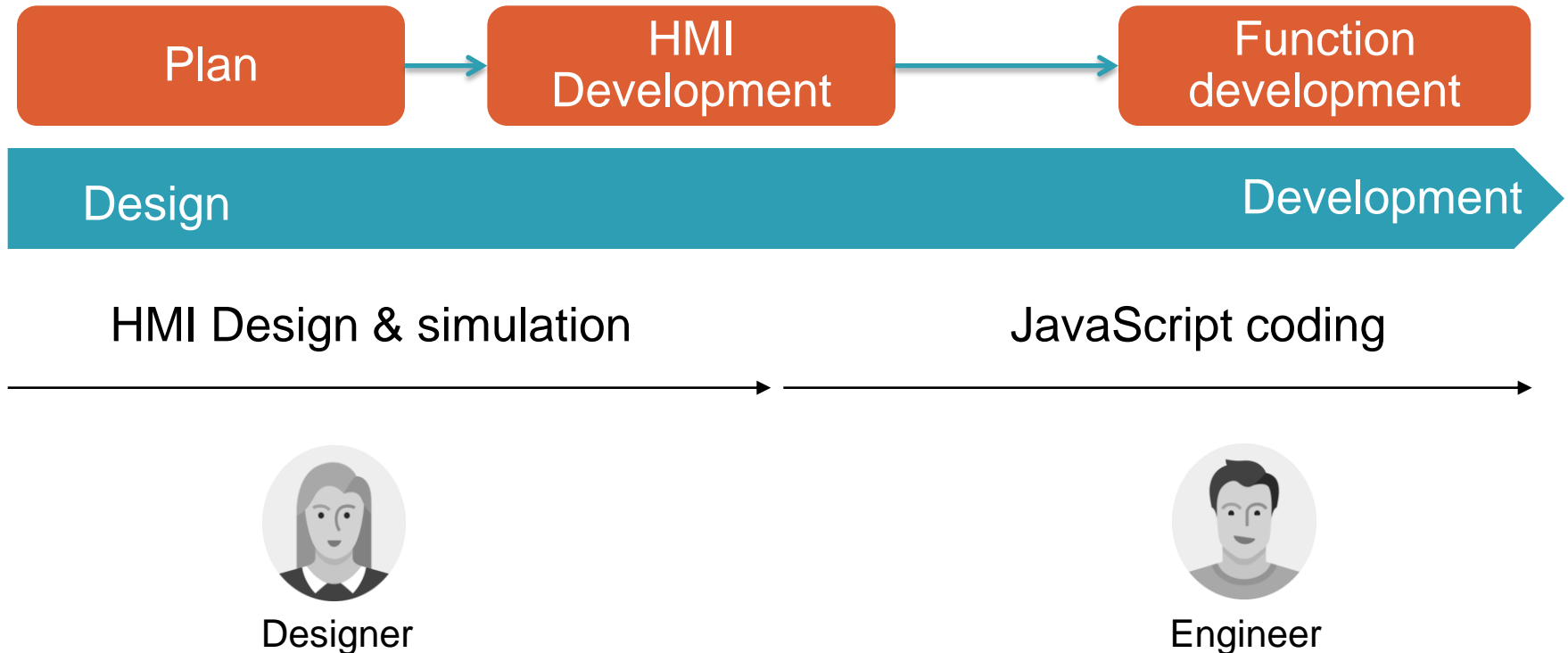# Network Signal – Weak and Intermittent

GENIVI®

Future Works & Summary

Future work

- Extension of SDK Coverage
  - Design tool
  - Development tool

Plan	HMI Development		HMI Development	Function Development

Easy to use
Communication tool

Design tool ←⎯⎯⎯⎯

Developer tool ⎯⎯⎯⎯→

Flexibility / productivity
powerful toolkit

prototype	Development

Designer

App Prototype

Drag & Drop IDE

GUI
Component
Design
Animator

Packaging
Manifest

Emulation/Simulation

Framework (Development Pattern)
Debugging

Engineer

GENIVI®

Future work

- Seamless developing process

| Plan | → | HMI Development | → | Function development |

Design   **Development**

HMI Design & simulation   JavaScript coding

Designer   Engineer

GENIVI®

Future work

- Rich Service
  - AI APIs
  - ADAS APIs
  - Cloud APIs
  - Commerce APIs
  - …

Future Service

| AI |
| ADAS |
| Cloud |
| Commerce |
| … |

GENIVI®
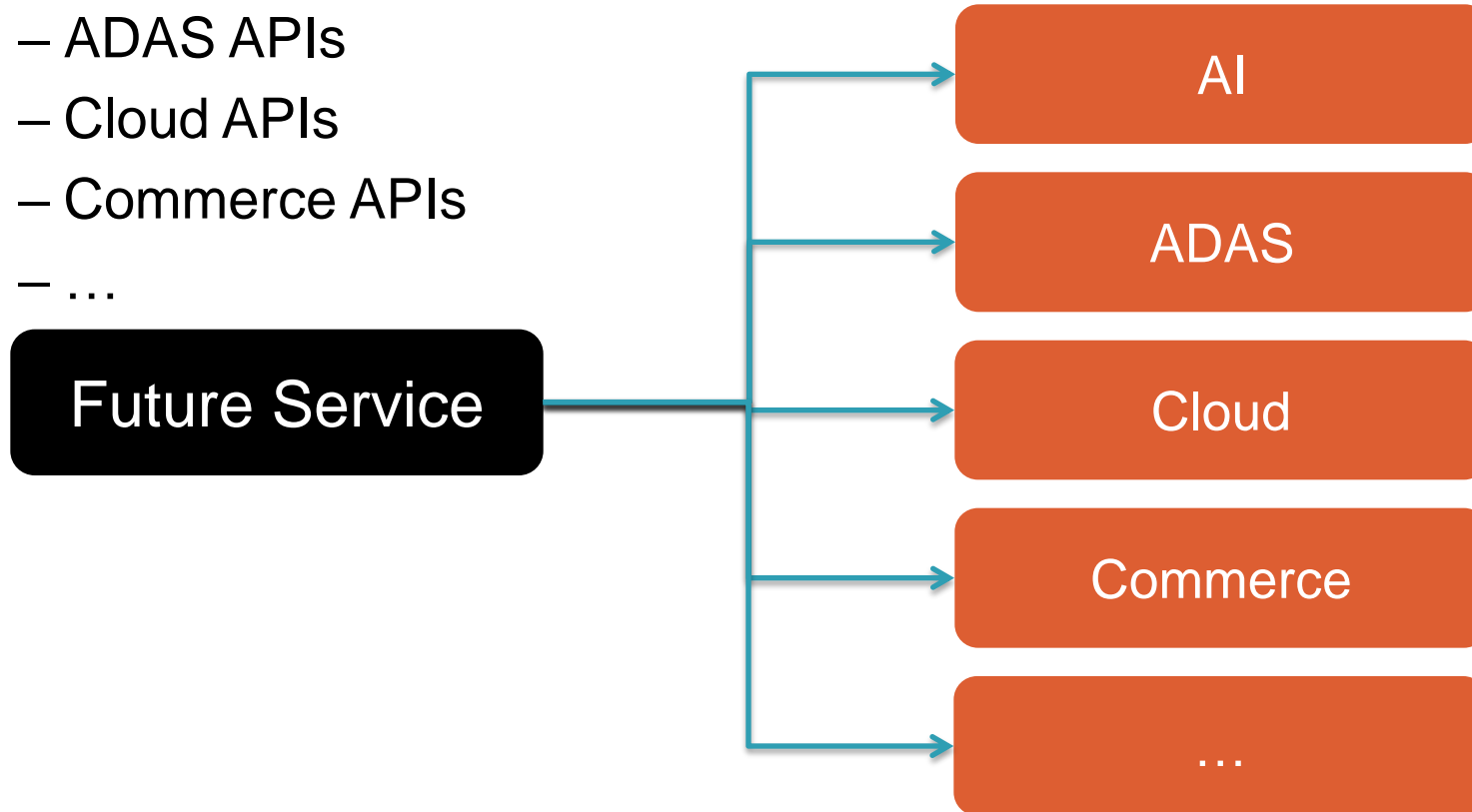
Future work

- Application Quality Managing
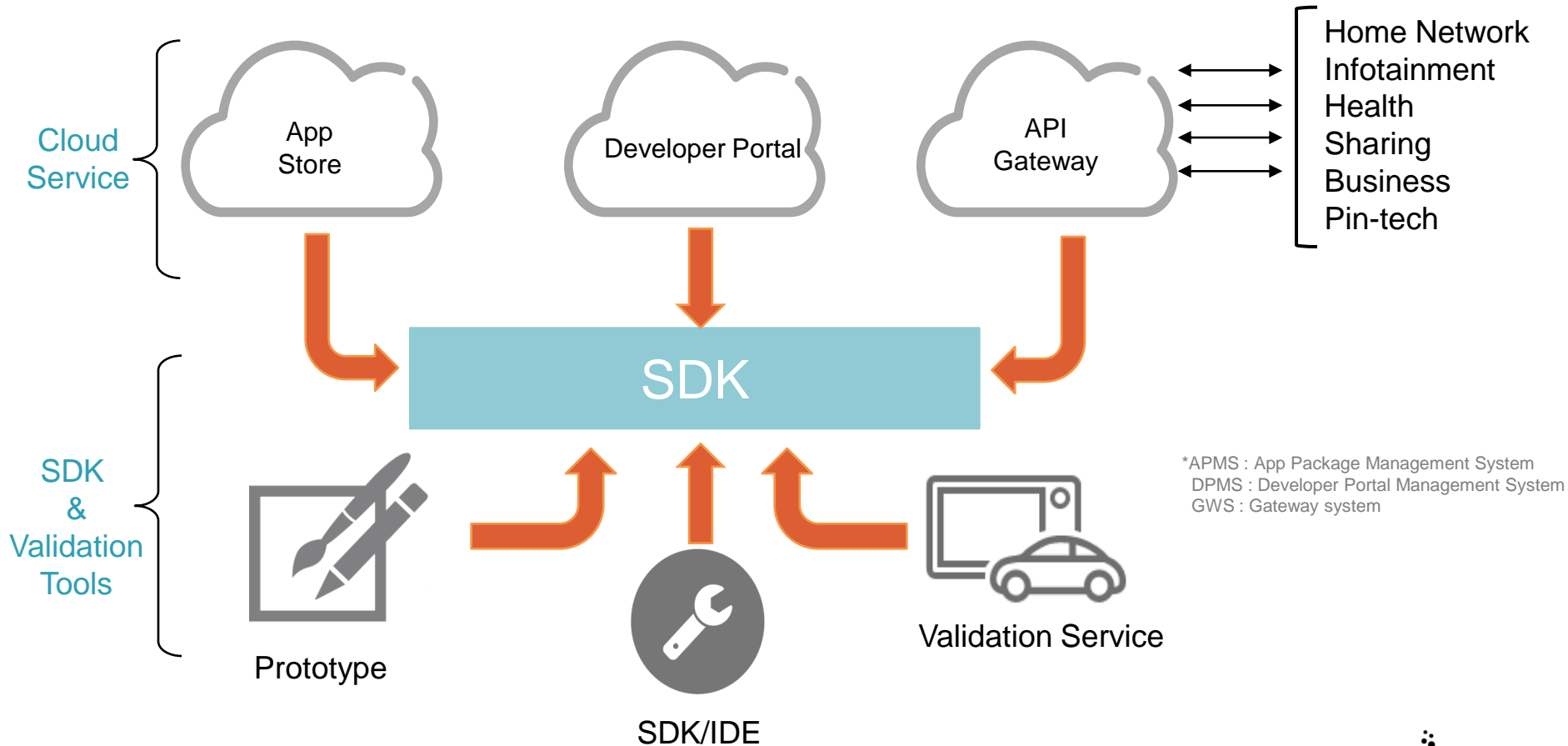
Command Line Interface

Configuration management

Test Framework

Code coverage

Continuous Integration
Application Quality Managing

GENIVI®

Future work

- Seamless Development Environment

Cloud Service: App Store, Developer Portal, API Gateway

API Gateway connects to: Home Network, Infotainment, Health, Sharing, Business, Pin-tech

SDK

SDK & Validation Tools: Prototype, SDK/IDE, Validation Service

*APMS : App Package Management System
DPMS : Developer Portal Management System
GWS : Gateway system

GENIVI®

Summary

- Continue
  - Lessons from Experience and Analysis Upcoming Projects
  - Research with Collaboration via Standard Org (GENIVI, W3C)

- Expand Capability
  - Enhance In Vehicle Simulation and Emulation
  - Service API

GENIVI®

Thank you!

This work was supported by **Institute for Information & communications Technology Promotion(IITP)** grant funded by the Korea government(MSIT) *-R7117-16-0098 : Development of HMI Framework and Application Development Tool based on Analysis of Fetched Vehicle Data*

Visit GENIVI at http://www.genivi.org or http://projects.genivi.org

Contact us: help@genivi.org

GENIVI®