Introduction

The following is a presented as an opportunity for Revvable to increase it's product offering in the vehicle service market. Several strategies are applied to illustrate the synthetization process. Given a one week effort, it is not meant to be complete but rather illustrative of the process. The process is aspirational in nature, allowing stakeholders to conscientiously pick the level of ceremony required to create product. The goal of such process is an attempt at improving product market fit while minimizing the risk of a poorly performing product.

The solution presented is focused on addressing preventative maintenance in routine maintenance. In other words, we want our customers to address vehicle maintenance issues proactively and confidently during routine maintenance.

If time permits, collision repair and elective upgrades will be covered extemporaneously towards the end.

Leadership Strategy

Leadership is the ability to set and execute on vision. Leadership is not limited to a role, and ideally, is shared by every member of the organization, making it an intrinsic attribute of the organization's culture. The goal of leadership is to provide direction in a way that every organization member feels responsible for and bought in.

Vision

Vision is comprised of 9 key elements: Mission, Values, Principles, Goals, Strategies, Roadmap, Milestones, Objectives and Tactics.

A vision describes the organization's desired future position. It defines the reason for existing and its outlook for internal and external audiences. A vision speaks to the greater good of the broader world. It is hopeful and aspirational. Vision is always dynamic, evolving and is never static in nature. The higher-level aspects tend to be less dynamic since they are long term in nature.

Mission
The mission is the core of what an organization does and its reason for existence. A mission affirms its core by describing its goals, the strategy to reach such goals and the values that guide the decisions required to reach the goals.

Values
Values are qualities or standards that govern the behavior of a person, group, organization or market. Values describe what is important, intrinsic and act as the foundation for principles. Values are influenced by a wide range of factors such as background, experiences, education, and environmental conditions. Values will evolve and change with the passage of time while some remain hard fast until existence seizes to be.

Principles
Principles are rules or beliefs that govern our behavior and actions.5   Principles represent what is desirable and positive for a person, group, organization or market. They are to help determine whether

actions are leading us in the right direction or not. 3 Principles are what we stand for; they direct our operation and act as a compass in making decisions. In other words, they govern our behavior. These principles, which emerge as a belief or rule based on values, can even influence the direction of the whole society.

Goals

A goal is a desired and observable result envisioned, planned and committed to achieve within an extended period, typically at a year or more. When written out, goals are typically broad statements rather than a step-by-step process. They are long-term endeavors that provide direction. A goal is comprised of objectives and will therefore take longer to achieve than an objective. A goal describes what is to be achieved, when it is to be achieved and what will be observed when the goal is successfully achieved.

Strategies

A strategy is the approach taken to achieve a goal. Aspirations are more appropriate as part of your envisioned future or as part of your strategy, not as part of the core ideology.

Roadmap

A roadmap provides a series of high-level milestones organized across a timeline.

Milestone

A milestone is used to mark important moments in time. It is a noteworthy accomplishment, benchmark or target indicated along a roadmap timeline. Milestones are useful for highlighting key dates such as a major deadline or release. A milestone is a necessary stepping stone on the path to success. A milestone is defined with specific stakeholders in mind. These stakeholders are vested in the moment in time.

Objectives

An objective is a precise target, an individual action taken or an individual/measurable step in a process completed along the way towards accomplishing a goal. An objective is something that can be accomplished at a well-defined point in time typically within a quarter. Progress is observed as these objectives are fulfilled.

Tactics

A tactic is the approach taken to achieve an objective.

Quantum

Connect: By connecting, a system can establish a communication channel allowing thoughts and ideas to flow between stakeholders.

Observe: By observing, individual stakeholders can monitor the flow of information.

Contextualize: By contextualizing, multiple observations are coalesced together towards a conclusion.

Conscientize: By conscientizing, stakeholders are able to act on their contextualized observations.

Customer Experience

An important value, if not the most important value, is that of the customer experience. The sole goal is to continuously create value for our customers. From this value, a business is viable.

Vehicle Service Market

The proposed service is a solution that enables customers to proactively address vehicle issues during routine maintenance, eliminating downtime and managing maintenance related costs.

The proposed product is comprised of several components including an onboard Diagnostic ECU, observing and reporting vehicle events to a cloud related service. A maintenance application is provided to dealers, enabling service technicians to report further observations specifically resolutions. These data streams allow a machine learning model to be trained with diagnostic events and resolutions.

ECUs integrate performance sensors around mechanical or electrical components. For example, an oil pressure sensor converts the pressure reading into a digital format that is then available to the system.

OBD

Current market solutions leverage the OBD vehicle interface by listening to generalized diagnostic codes. Approximately 1% of events are available through the OBD. Since events are mapped to generalized diagnostic codes, ECU and Vehicle context is significantly impacted.

Maintenance Service

The proposed service creates a value chain across the ECU manufacturers, vehicle manufacturers, dealerships and consumers.

ECU Manufacturer

The feedback loop to ECU manufacturers is delayed by years. The proposed solution allows an ECU manufacturer to be tapped directly into a vehicle's data stream, allowing real-time performance updates.

Vehicle Manufacturer

A vehicle manufacturer stands to gain the most value by being able to contextualize vehicle and component performance at the customer level and across vehicle models. A manufacturer can for example, predict that under certain conditions, a vehicle will need a specific preventative maintenance. A manufacturer can also hold their component manufacturers to agreed on standards. In the end, a vehicle manufacturer brand is fortified by delivering high quality vehicles.

Dealer

For fleet customers, a dealer can sell a maintenance plan or warranty having the certainty of knowing how much the maintenance will cost. Significant financial products can be created by anticipating repairs. A dealer will also be better able to manage their parts inventory.

Consumer

For regular consumers, the vehicle owner, the proposed service eliminates downtime due to unforeseen maintenance issues. A vehicle's performance is under constant monitoring. Whenever routine maintenance is needed, a consumer can shop around for the best value amongst qualified dealers.

Customer Journey (Activity Concepts by Stakeholder)

The customer journey is specific to a consumer. This experience needs to be extended to include those in the value chain. Maintenance is one of many activities to be considered in the customer experience.

Product Features by Actor

A potential solution will involve a diagnostic ECU (D-ECU) within the vehicle along with a client library used by other ECUs to publish their diagnostic data. Within the D-ECU these messages aggregated and/or forwarded to the cloud. Once a message is received by the Vehicle Service in the cloud it is processed. Any required notifications are also sent out.

In the dealership, a service technician reports the resolutions for all vehicles serviced. Collectively, the diagnostic data collected from the vehicle along with the reported resolution are used to train a machine learning model that assesses the vehicle performance and the required vehicle maintenance.

Diagnostic ECU (D-ECU)

The diagnostic ECU is custom hardware unit built to manage diagnostic events. It is to be built on an ARM processor running Ubuntu RTOS. By leveraging SOAFEE standards, the exact same code can run in the cloud to simulate and verify the code (twinning).

Customer Experience Micro Services

The customer experience micro-services are the services required to support the proposed solution. The most important is the vehicle service that supports all D-ECUs.

SaaS Architecture

The SaaS architecture illustrates how the customer experience micro services can be deployed on AWS. It also identifies the key technologies required for such deployment.

Landscape & Ecosystems

Landscapes and ecosystems track the environments required to support the various phases of the product lifecycle. These environments are largely aspirational; however, they provide an idea of where we would want to be at scale.

Project & Resource Plan

Collision Repair and Elective Upgrades

Need an integration with manufacturers' PLM (product lifecycle management).

Collision

Feature: Quote Repairs

Feature: Identify Damage Parts

Election Upgrade

Feature: Identify Upgrade Path

Preventative Maintenance

Leadership Strategy

Vision, Customer Experience, Market Analysis, Product Development, Program Management

Strategy

- Vision
- Quantum
  - Connect, Observe, Contextualize, Conscientize
- Customer Experience (Cx)
  - Create Value
- Product Development Lifecyle
- Program Management (Agile)
  - Kanban
  - SaFE
  - LeSS

- Platform
- 5-7 levels of Why
- Risk Management
- SWOT: Strength, Weakness, Opportunity, Threats
- Value -vs- Effort

Product Development Lifecycle

Ideate

Idea Generation
- Suggestions
- Pain Points
- Regulations
- Competition
- Market Studies
- Opportunities

Key Stakeholders
- Customer
- CXM
- Growth

Artifacts
- Goals
- Strategies
- Ideas

Conceptualize

Key Stakeholders
- Growth
- CXM
- PdM
- Visual Designer
- PM
- Technical Lead

Activities
- Define Market Op
- Define Cx
- Define Feature

Artifacts
- MRD
- Customer Journey
- Roadmap
- Epics
- Features
- UI/UX

Engineer

Key Stakeholders
- PdM
- PM
- Technical Lead
- Developer
- SRE
- Field Test

Activities
- Implement Feature

Artifacts
- Architecture
- Design
- Interfaces
- Stories
- PRs
- Deployments

Manufacture

Key Stakeholders
- Manufacturer
- 3rd Parties

Activities
- Source Parts
- Create Parts
- Assemble
- Provision
- Validate

Artifacts
- Components
- Hardware

Go To Market

Key Stakeholders
- Field Test
- Customer Support
- Marketing
- SRE

Activities
- Create Docs
- Train CxS
- Train Field Ops
- Train SRE

Artifacts
- Data Sheets
- Landing Pages
- Assets
- Manuals
- Documentation

Produce

Key Stakeholders
- Customer
- Field Ops
- CxS
- SRE

Activities
- Use Product
- Observe SaaS
- Observe Cx
- Support Customer
- Address Issues

Artifacts
- Metrics
- Issues
- RCA

Maintain

Key Stakeholders
- CxS
- SRE

Activities
- Support Customer
- Assess Feature
- Assess Growth

Artifacts
- Pain Points
- Suggestions
- Feedback

4

Program Management (Scrum)

5

Product

Vehicle Service Market, Maintenance, Customer Journey

Vehicle Service Market

Maintenance
- Routine
- Unplanned
- Preventative

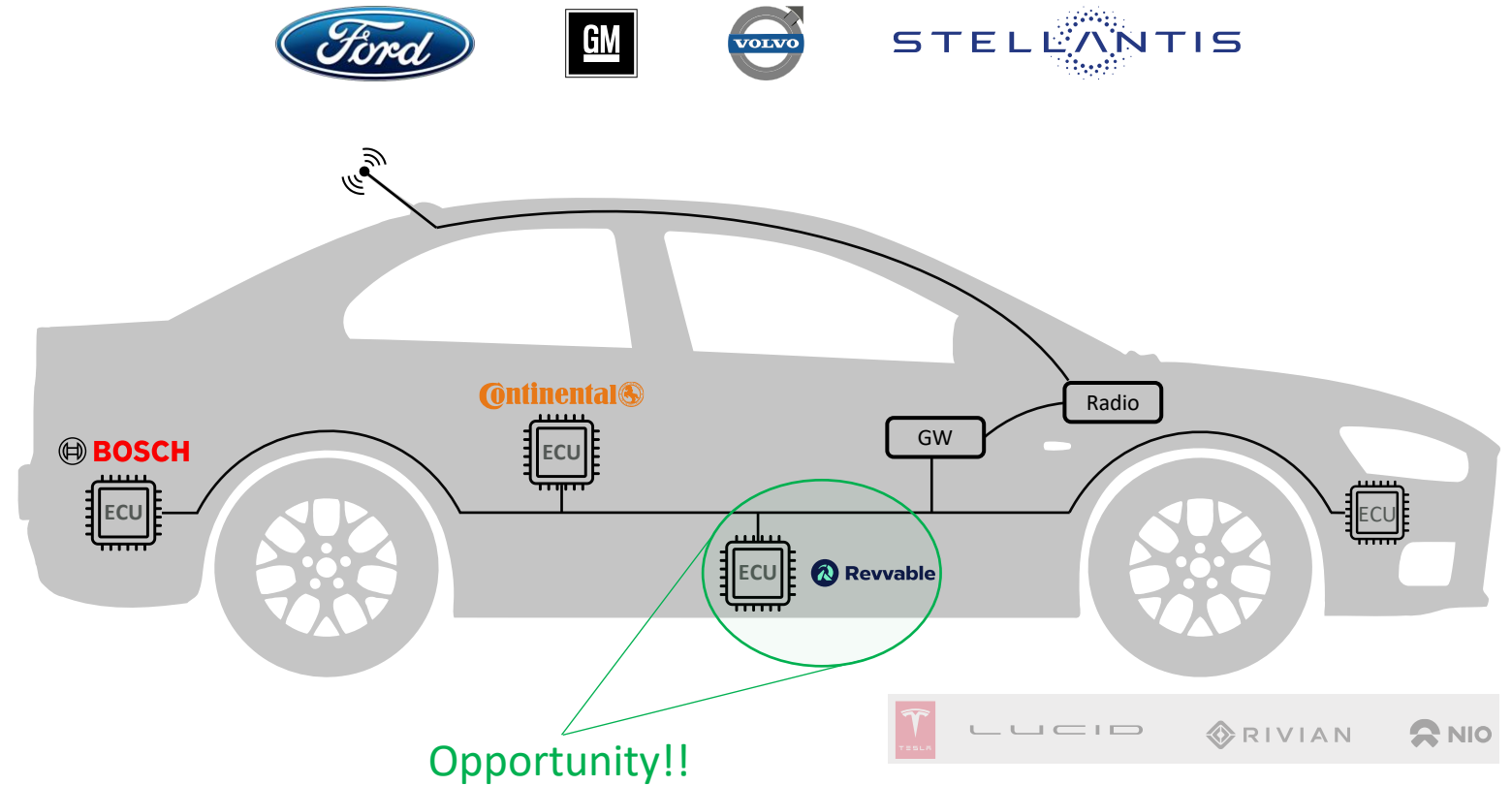**Fleet Maintenance Providers**
- samsara
- Fleetio
- motive (Formerly KeepTruckin)
- GEOTAB
- OBD

Opportunity!!

Maintenance Service

Customer Value Chain

ECU	Manufacturer	Dealer	Consumer

ECU

Ideas
- Report Diagnostics

Value
- Performance Data

Manufacturer

Ideas
- Aggregate Model
- Onboard Vehicle Model

Value
- ECU Guarantees
- Risk Management
- Failure Analysis
- Safety Management
- Diagnostic Feed
- Contextual Feed
- Brand Equity

Dealer

Ideas
- Sell Service
- Service Vehicle
- Train Model

Value
- Planned Revenue
- Service Contracts
- Fleet Management
- Advanced Diagnostics

Consumer

Ideas
- Schedule Service
- Request Quote

Value
- Zero Downtime
- Warranty Coverage
- Value Shopping

Value (vertical axis): High, Value, Low
Effort (horizontal axis): Low, Effort, High

Customer Journey (Activity Concepts by Stakeholder)

Engage	Acquire	Convert	Retain	Advocate

Engage

Marketer
- Build Brand
- Educate Consumer

Channels
- Web
- Car Show

Acquire

Consumer
- Research Vehicle
- Install Mobile App
- Manage Account
- Pre-Order Vehicle
- Request Quote

Channels
- Store
- Web
- Mobile App
- Phone/SMS
- Email

Convert

Salesperson
- Qualify Consumer
- Sale Vehicle
- Sale Warranty
- Quote Sale
- Configure Options

Consumer
- Finance Vehicle
- Purchase Vehicle

Dealer
- Order Vehicle
- Ship Order
- Deliver Order
- Transfer Ownership

Channels
- Email
- Mobile App
- Phone/SMS

Retain

Dealer
- Service Vehicle
- Support Consumer
- Message Consumer

Consumer
- Drive Vehicle
- Service Vehicle
- Upgrade Vehicle
- Request Service

Vehicle
- Report Events

Manufacturer
- Assess Vehicle

Channels
- Vehicle
- Web
- Mobile App

Advocate

Consumer
- Review Vehicle
- Review Dealer
- Blog Experience
- Recommend

Channels
- Web
- Mobile App
- Blog

Product Features by Actor

Vehicle

Diagnostic ECU
- Listen for Conn.
- Aggregate Event
- Forward Event
- Notify Driver
- OTA

3rd Party ECU
- Publish Diagnostic
- Authenticate ECU
- Connect to D-ECU

SaaS

IAM
- Authorize Op

Vehicle Service
- Process Diag.
- Assess Perf.
- Notify Dealer
- Notify Consumer

Dealer

Service Technician
- Report Resolution

Service Agent
- Schedule Maint.
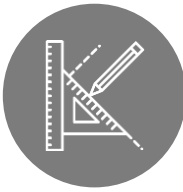
Consumer

Consumer
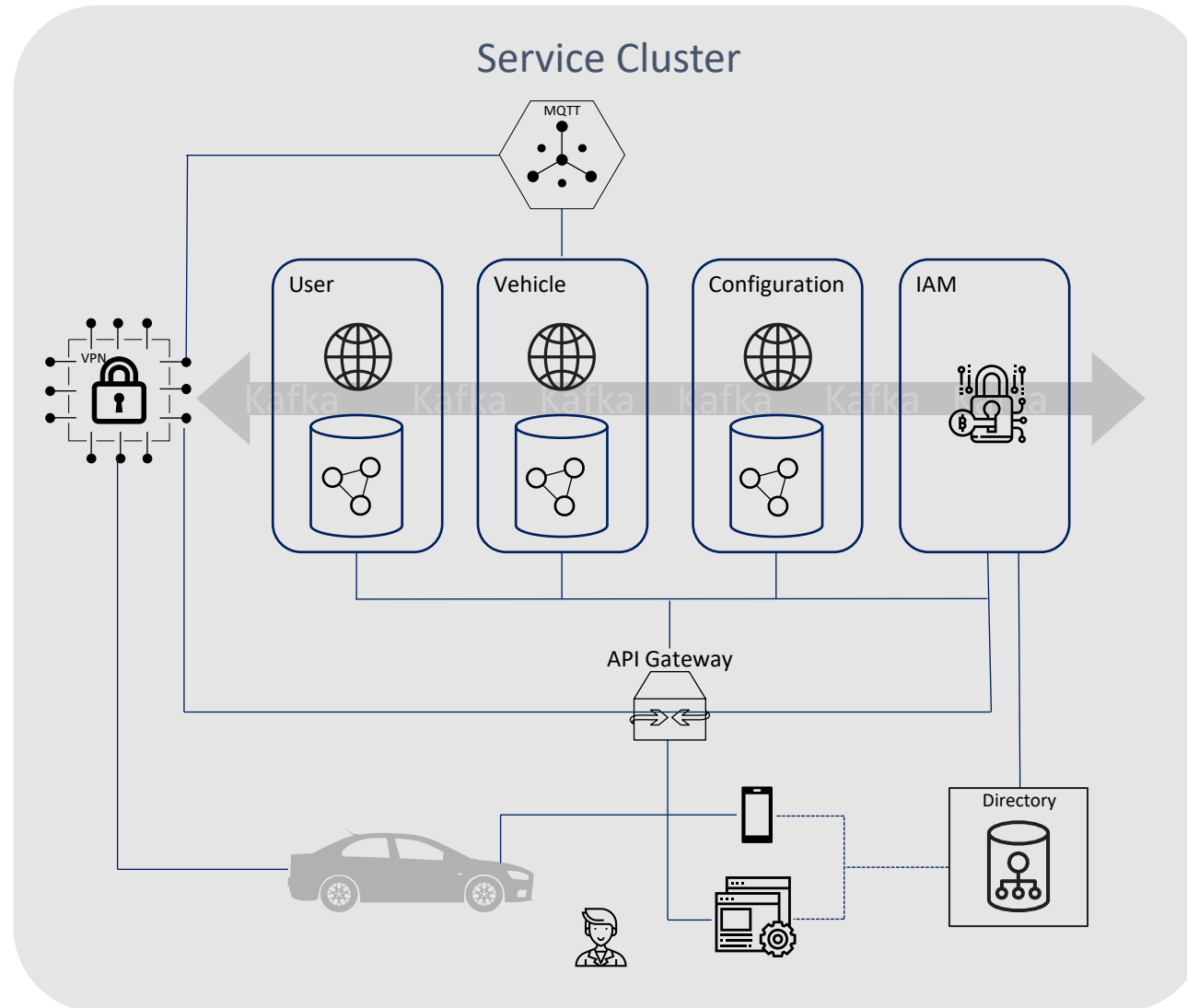- Authenticate
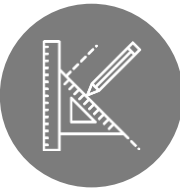- Acknowledge Msg
- Request Quote
- Schedule Maint.

Engineering

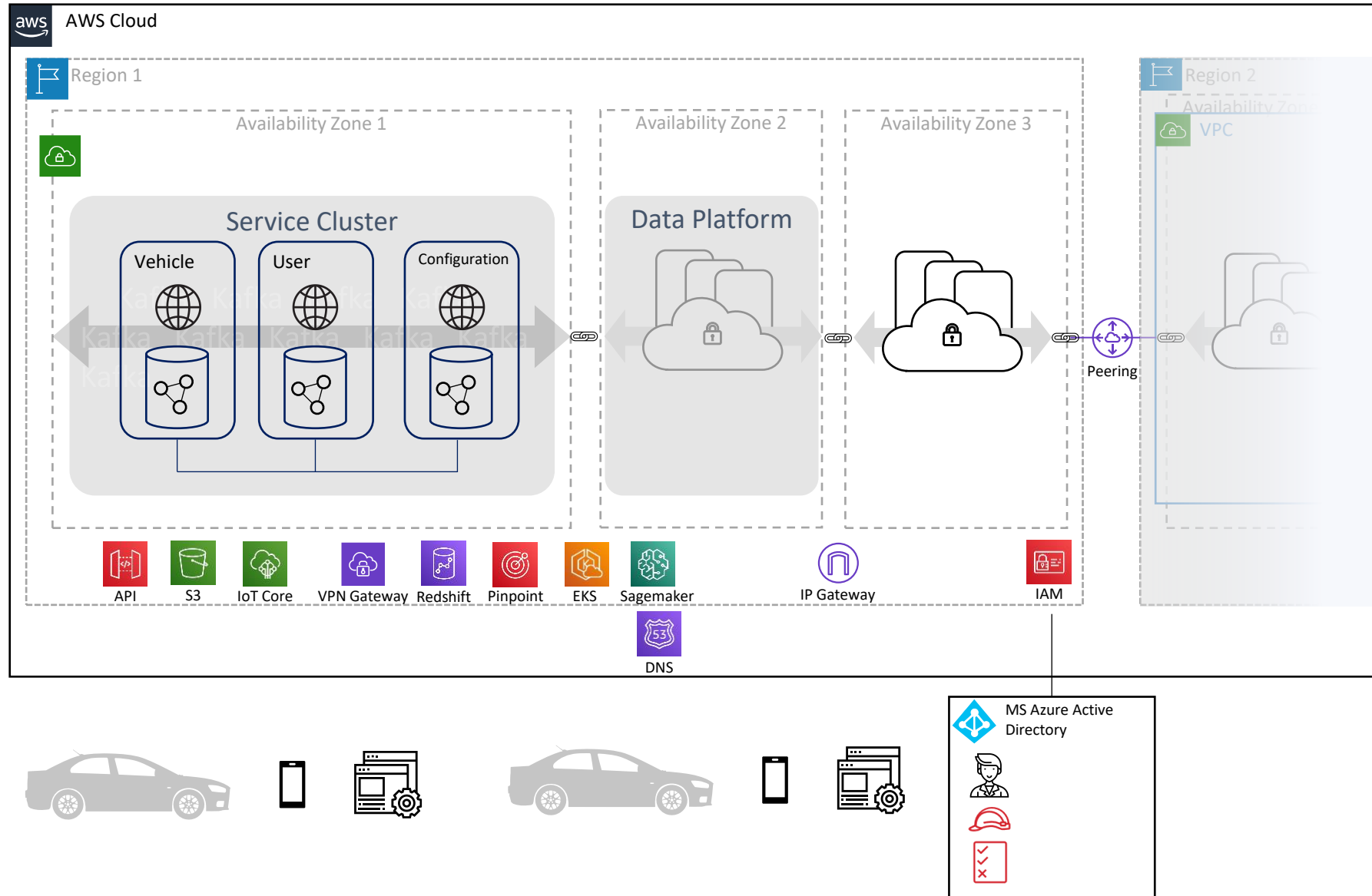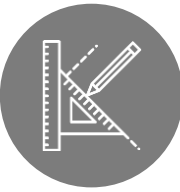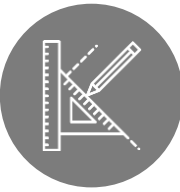Frontend, SaaS, Embedded, Data

Diagnostic ECU (D-ECU)

Customer Experience Micro-Services

SaaS Architecture

Landscapes & Ecosystems

Engineering | Manufacturing | Go to Market | Production | Maintenance

Component

API Gateway
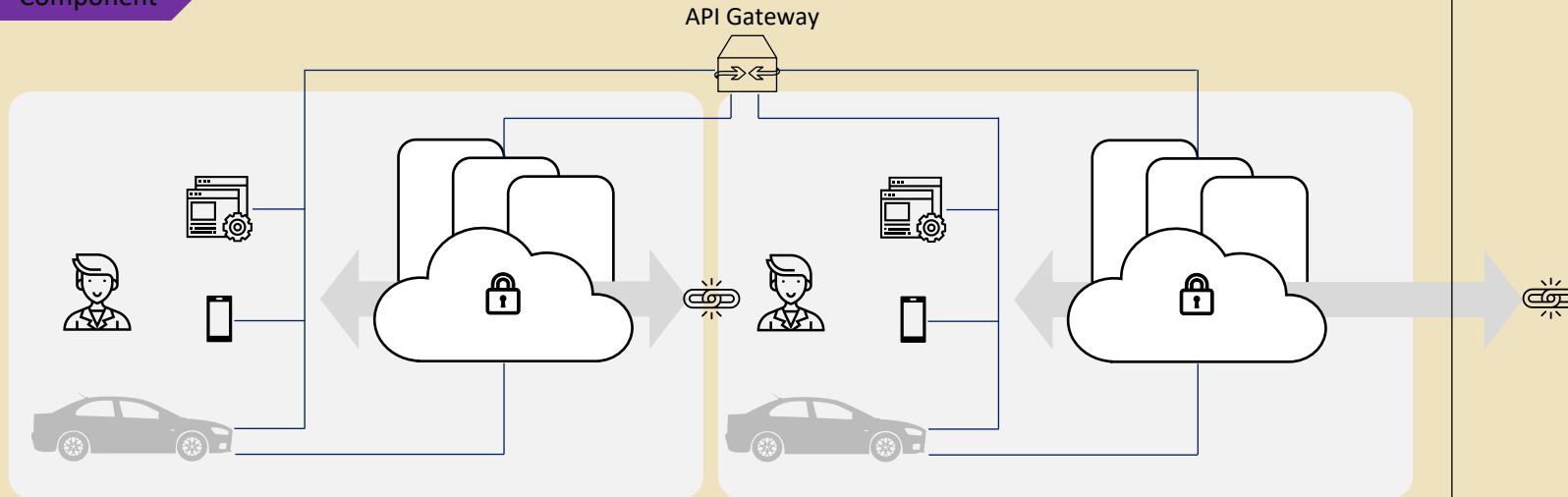
Sub-System

Project & Resource Plan

Component	Task	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
D-ECU Hardware													
1 Elec E	Design Board	███	███										
1 Mech E	Design Enclosure	███	███										
3rd Party	Manufacture Board			█									
1 EE	Validate Board				██	██							
3rd Party	Manufacture Enclosure			█									
D-ECU Service													
1 EE	Bring Up Board			██									
1 EE	OTA	███	███										
8+ EE	Pub/Sub	███	███	███	███	███	███	███	███	███			

Project & Resource Plan (continued)

Component	Task	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
2 QA	Validate System									▓	▓	▓	▓
Vehicle Service													
1 BE	Design Protocol	▓	▓										
2 BE	Simulate D-ECU		▓	▓	▓								
3 BE	Process Diagnostic												
1 BE	Notify User							▓					
2 FE	Report Resolution		▓	▓	▓	▓	▓	▓					
Diagnostic													
1 ML	Simulate Data	▓	▓	▓									
1 ML	Design/Train Model		▓	▓	▓	▓	▓	▓					

Project & Resource Plan (continued)

Component	Task	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
Go-2-Mkt													
	Provision ECU's												