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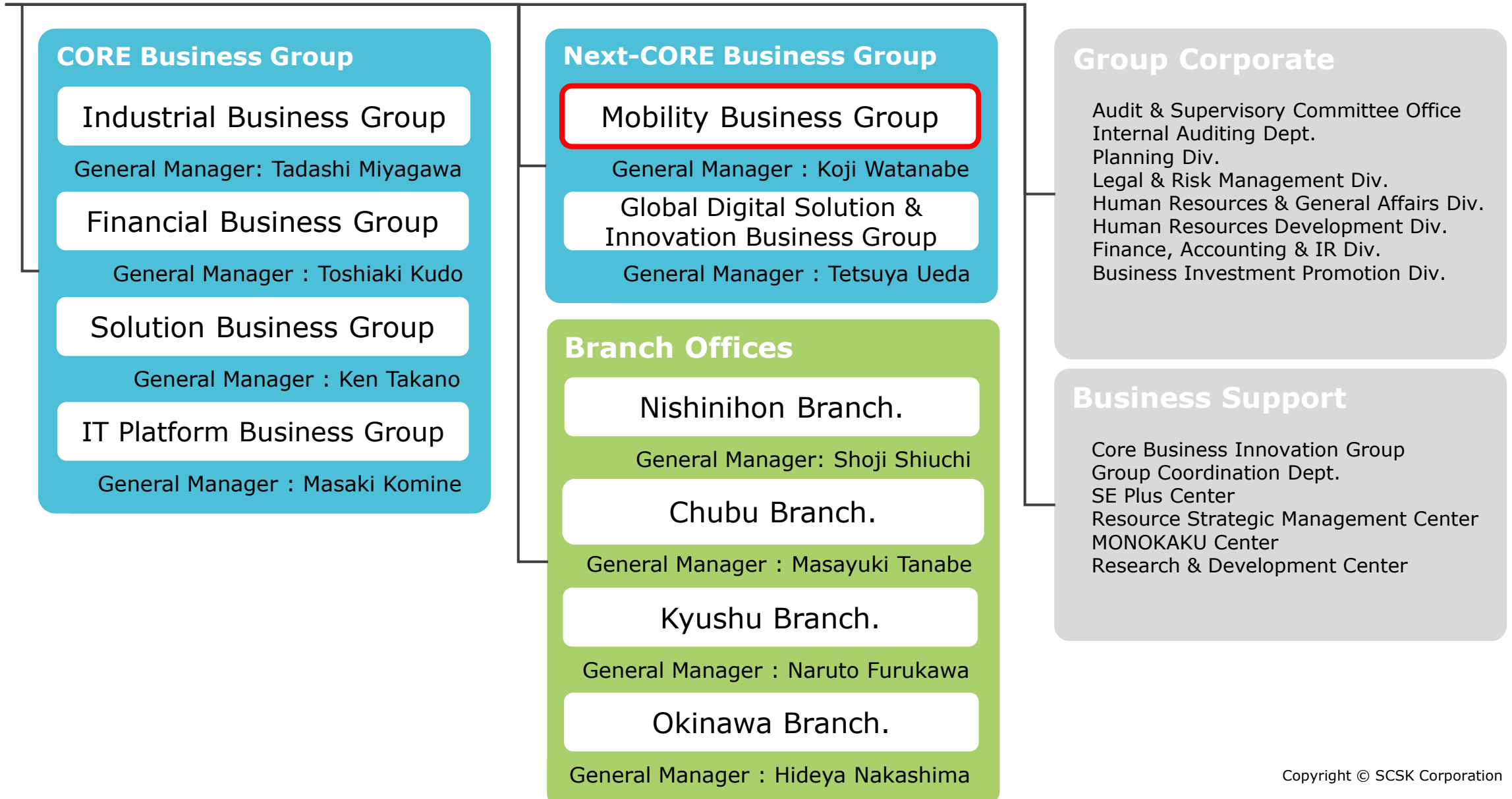


Mobility Business Strategy

SCSK Corporation
Mobility Business Group
Koji Watanabe
October 7, 2022

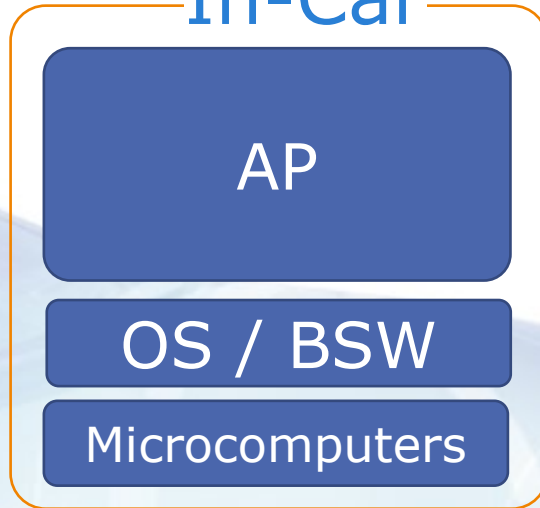
- Organization Chart
- Business Overview
- Business Group Material Issues
- Group Policies for FY2022

Organization Chart in FY2022



Overview of the Mobility Business

In-Car



1. Automotive software application development support business

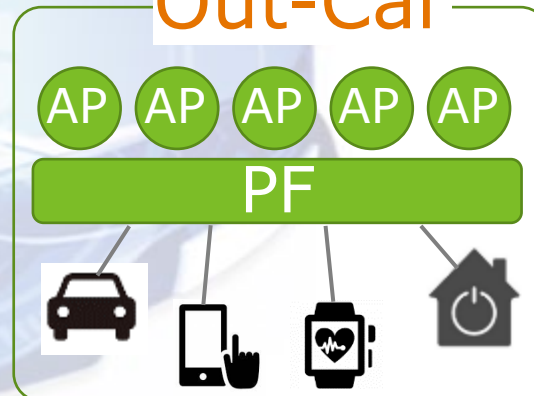
- 1980s- Support for embedded development of automotive software
- 2008- Development support based on model-based development approach

2. Automotive platform business (QINeS-BSW business)

- 2014- Development and sale of proprietary automotive OS products



Out-Car



3. Mobility services business

- ⇒ Planning, developing, and providing MX service in cooperation with the inside and outside of the car industries

Business Group Material Issues

-Pledge to Contribute to a Brighter Society-

Aiming to realize "Mobility Service Provider that contributes to Smart City" in 2030, we will develop our business centering on three service areas in rapidly changing mobility field :

① Software Supplier x ② Software Development Support x ③ Mobility Service Provider

As of June 2022



Shaping a mobility society with zero accidents and accessibility to transportation for all

Elimination of traffic accidents as a requirement for the future of automobiles, pursuit of a safe and secure society with accessibility to transportation for all



Realizing the world of our dreams through union of mobility and IT

Union of mobility and IT to create the world we dreamt of as children to make every day more fun and inspiring




Developing mobility as a new key industry for Japan

Supply of production processes and work environments matched to the times to empower production sites offering good work-life balance, development of mobility business to expand scope outside of automobile production and create foundation as a key industry




Making eco-friendliness the norm

Provision of software platforms that support a sustainable society where eco-friendliness is the norm




Cultivating diverse specialists who will shape the future of mobility

Cultivation of human resources in diverse fields who can connect mobility and society to create our future of dreams



Promoting value through equality and building ties of joy

Ongoing creation of value that earns accurate appraisals from all stakeholders



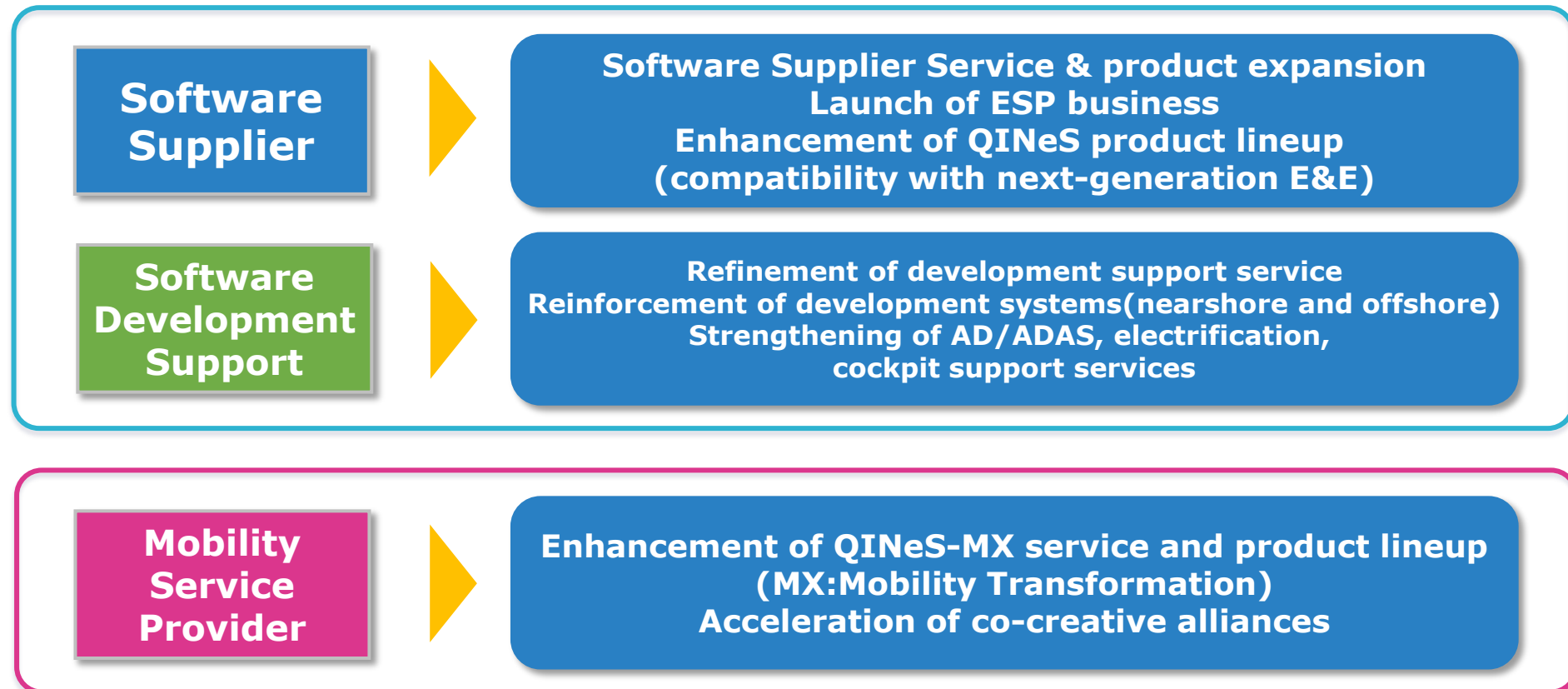
Living up to trust and expectations of society through information management and systems

Just action based on high ethical standards and a strong sense of responsibility to realize governance recognized as effective by all stakeholders

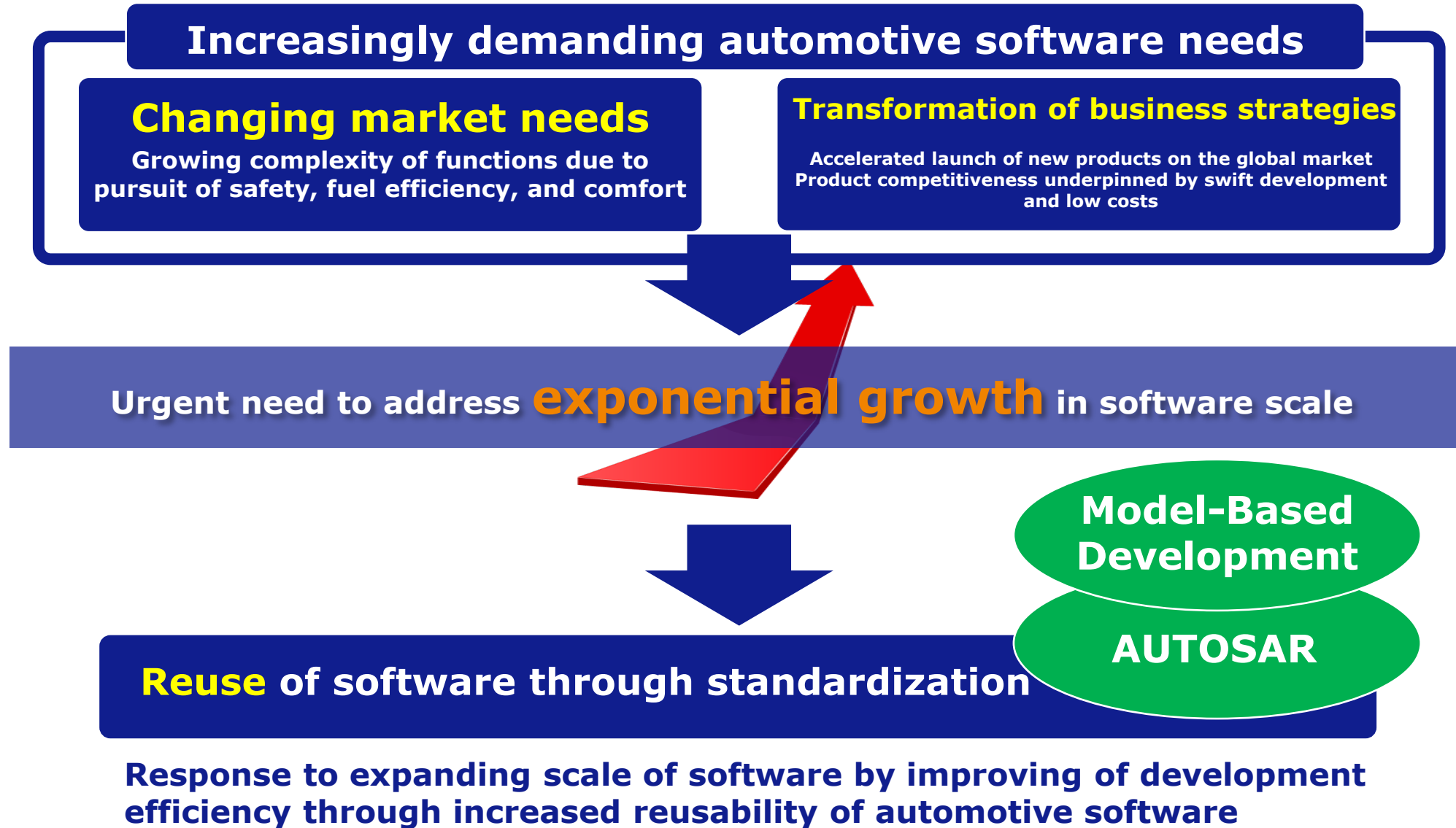
<Business Group Slogan>

“Create Our Future of Mobility Society”

Evolution into a mobility service provider that contributes to Smart City



- Automotive Software around 2013
- Three Strategies of Automotive Software Business
- QINeS-BSW Business
- Business Development Bases and Staff Expansion
- Automotive Software Development Achievements



Three Strategies for Automotive Software Business

Step1 : Expansion of domestic market using model-based development

2014- Start of application of safety standards

- Rise of embedded development of automobiles (country-specific models)
- Compatibility with functional safety standards (ISO 26262)

Evolution of development methodologies

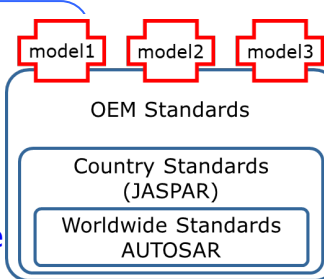
Expansion of domestic market using model-based development
(growth from Chubu regions to nationwide)

Step2① : Growth of business with AUTOSAR-compliant BSW

2015- (hypothesis)

- Sharing of software components
- Globally shared models (AUTOSAR)

Trend toward standardized software



- *Maximization of share among Japanese manufacturers through software distribution
- *Development of completely made-in-Japan embedded software (expansion of global market share)

Step2② : Broadening of operations pertaining to outside of vehicles (connected technologies)

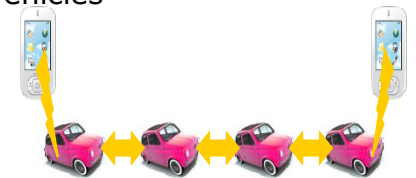
2015-

Growth of share in Smart City field in conjunction with increases in roles of automobiles

Power infrastructure (Smart Grid)



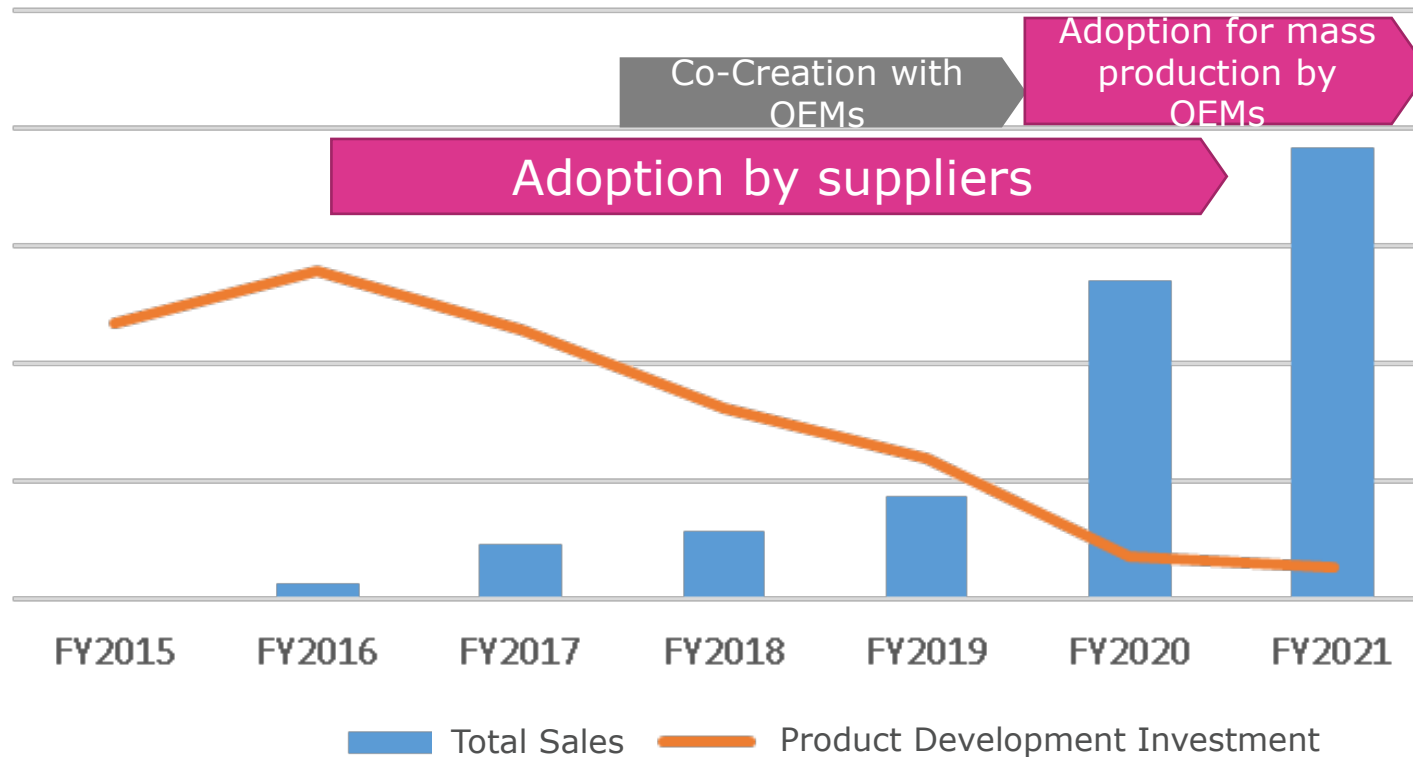
Communications between vehicles and roads and other vehicles



Start of product development in FY2014
Commencement of sales activities in FY2016

QINeS-BSW Business Status (Conditions, Results, and Unexpected Issues)

Product Development Investments and Sales



Product Development

Development of principal BSW modules

Development matched to OEM specifications

<Became well-known in the automotive industry>

- Adoption for BSW mass production
- Provision of services combining applications (model-based development) and platforms (BSW)

<Significant delays in planned growth>

- Reduction of selling prices due to competition
→ 80%–90% reduction from anticipated prices

- Growth of systems integration operations in BSW field
→ Lack of skills among customers resulting in difficulty in sales
→ Human resource development to bolster systems integration support staff

- Additional measures for specific OEMs
→ Additional development processes as required to meet the needs of specific OEMs

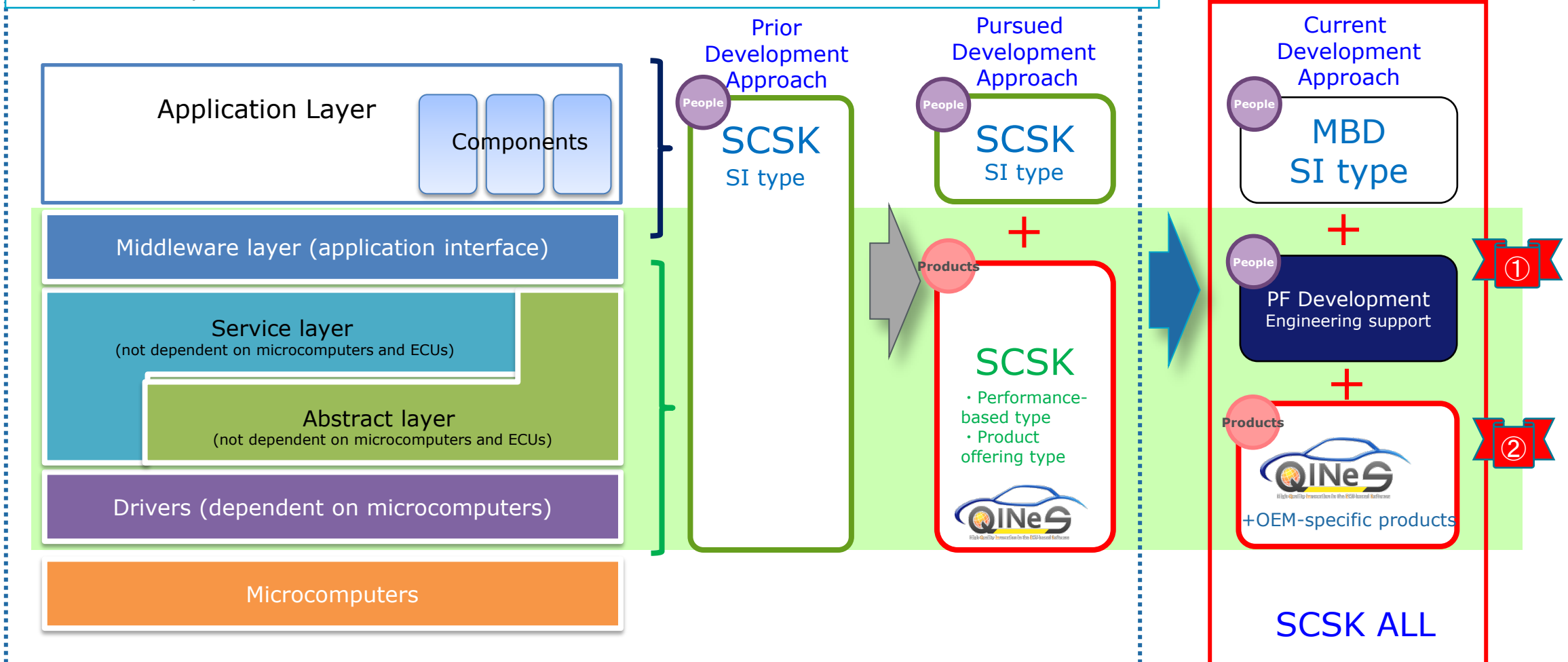
- Semiconductor shortage, COVID-19 etc.

QINeS-BSW Business (Unexpected issues from Development Perspective)

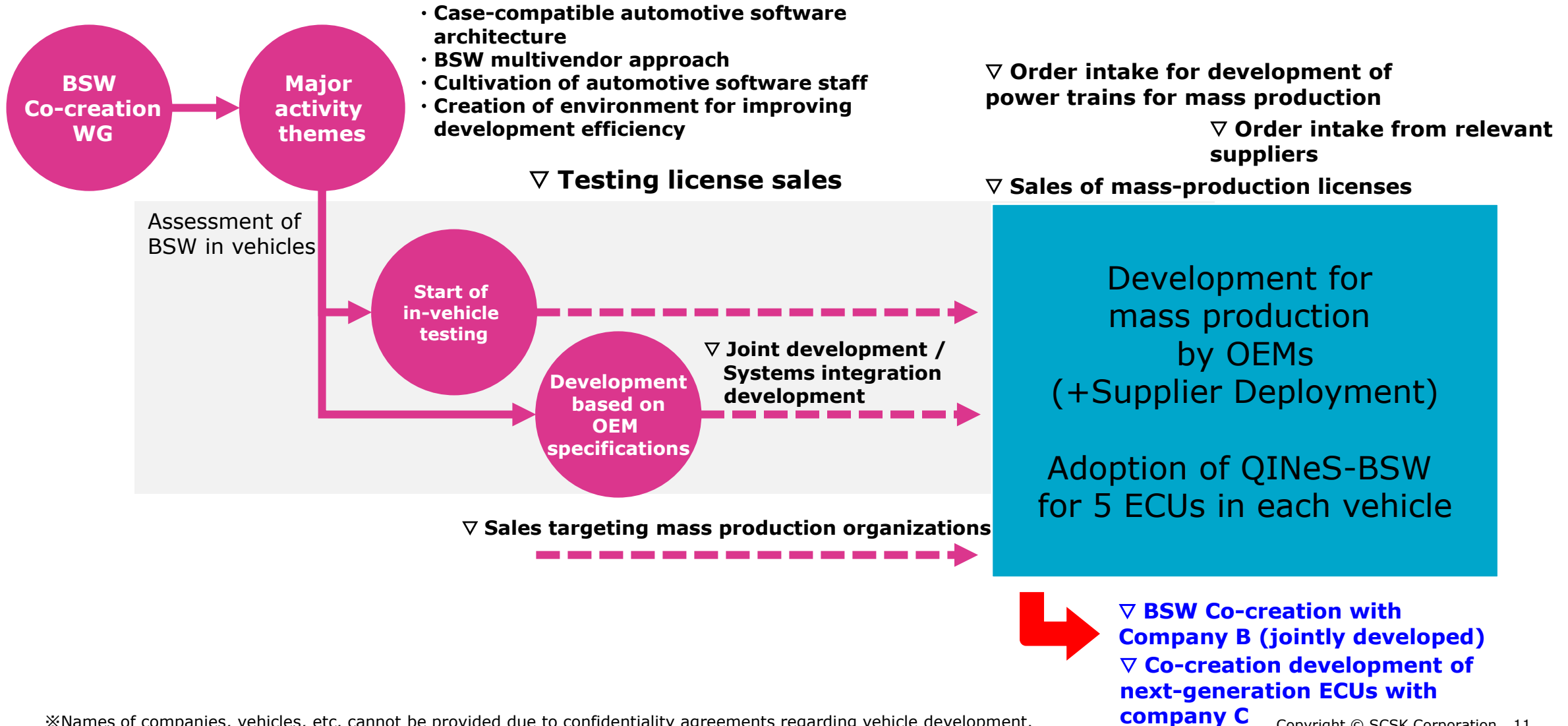
Step2① : Growth of business with AUTOSAR-compliant basic automotive software

- Departure from labor-intensive business model: Sales of products and services for automotive software development

High anticipations for development combining applications (model-based development) and platforms



▽ Proposal to OEMs of co-creation activities for realizing software-first approach including adoption of QINeS-BSW



※Names of companies, vehicles, etc. cannot be provided due to confidentiality agreements regarding vehicle development.

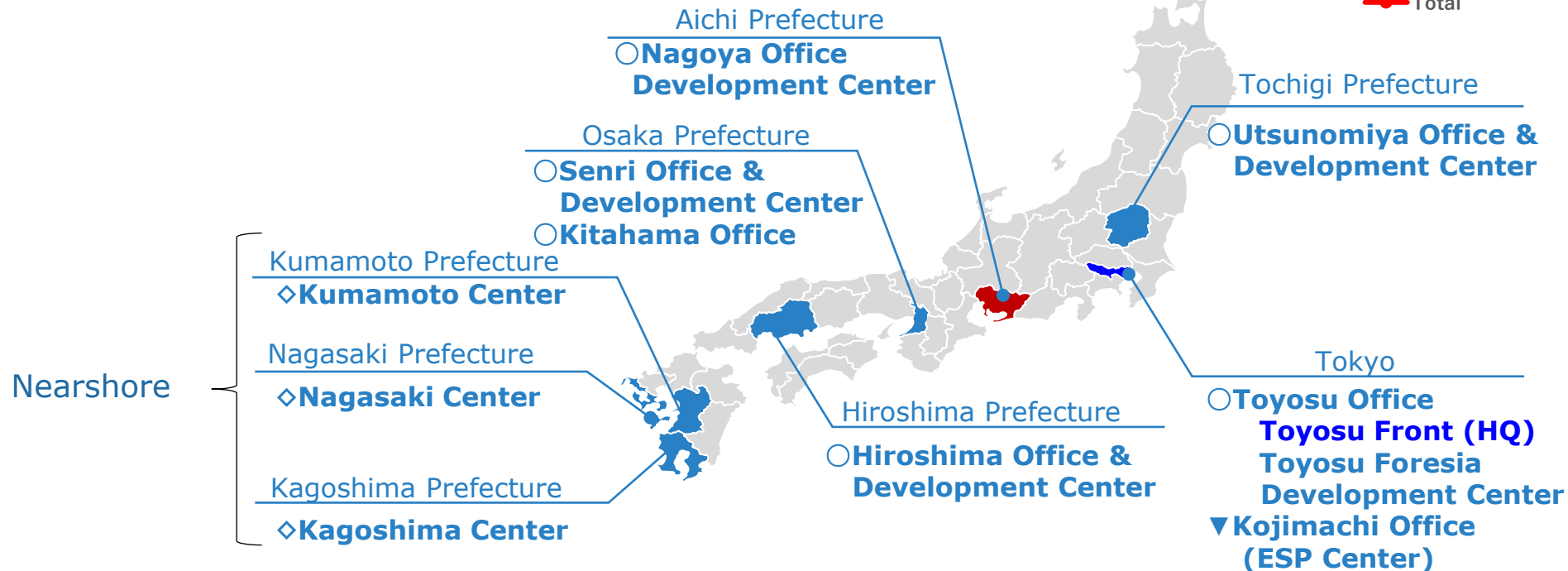
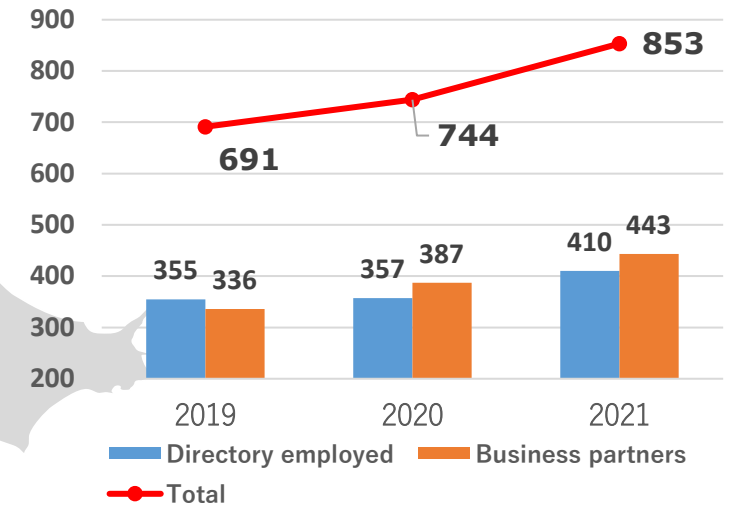
Business Development Base and Staff Expansion

Mobility Business Bases

- MBD+PF development functions
- ◇ MBD functions

Automotive software development staff

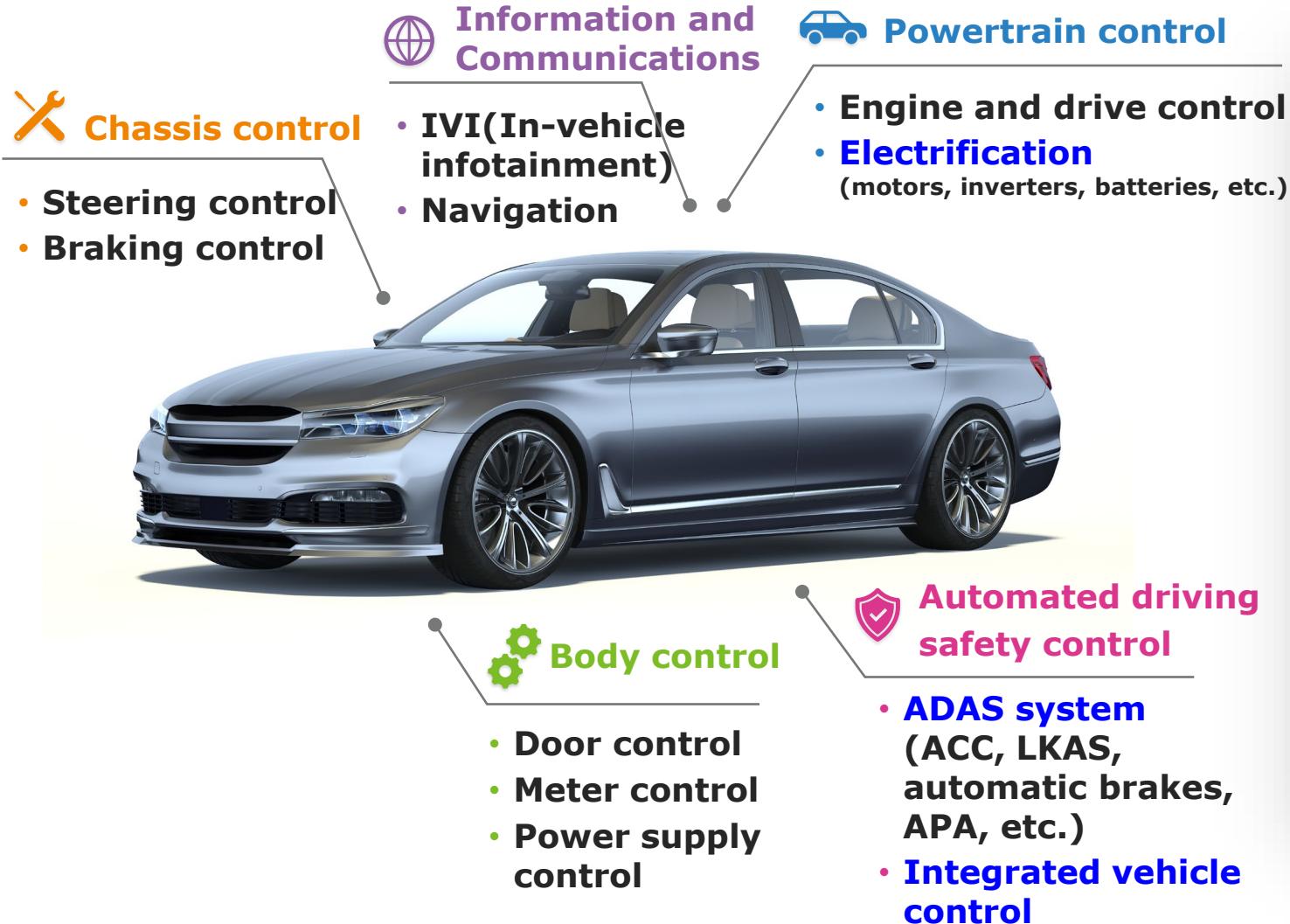
Approx. four times larger than in FY2013
(200 → more than 800)



○ Overseas cooperative offshore



Successfully Developed Automotive Software Functions



Automotive Software Systems Engineers

Automotive software engineers (including partners)	: 850
Model-based development engineers	: 252
Model-based software engineering consultants	: 6
BSW integration engineers	: 158
ISO26262 engineers	: 37
A-SPICE assessors	: 41

As of the end of July 2022

- Changes in the Mobility Market
- Vision for 2030
- Evolution into Mobility Service Brand
- SDV (Software Defined Vehicle) Supplier Business
- New Approaches Toward Automobile Manufacturing

<Eco-Friendly and Comfortable Beyond-MaaS Society>

Era of the SDV(Software Defined Vehicle)

- Changes in automobiles: **Electrification and safety equipment as standard**, shift from focus on mechanical provisions and control to software
- Changes in SW architecture: V-OS (**integration and decentralized control**), enhancement of networks, security-ready
- Changes in automobile production: Transition for experiments to **simulations**, model-based development, acceleration of reuse
- Changes in approaches toward automobiles: Shift from ownership to use
- Changes in automobile selling methods: Subscription models, sales of service functions
- Changes in after-sales support: Acceleration introduction of electronic equipment

Advent of Beyond-MaaS Society

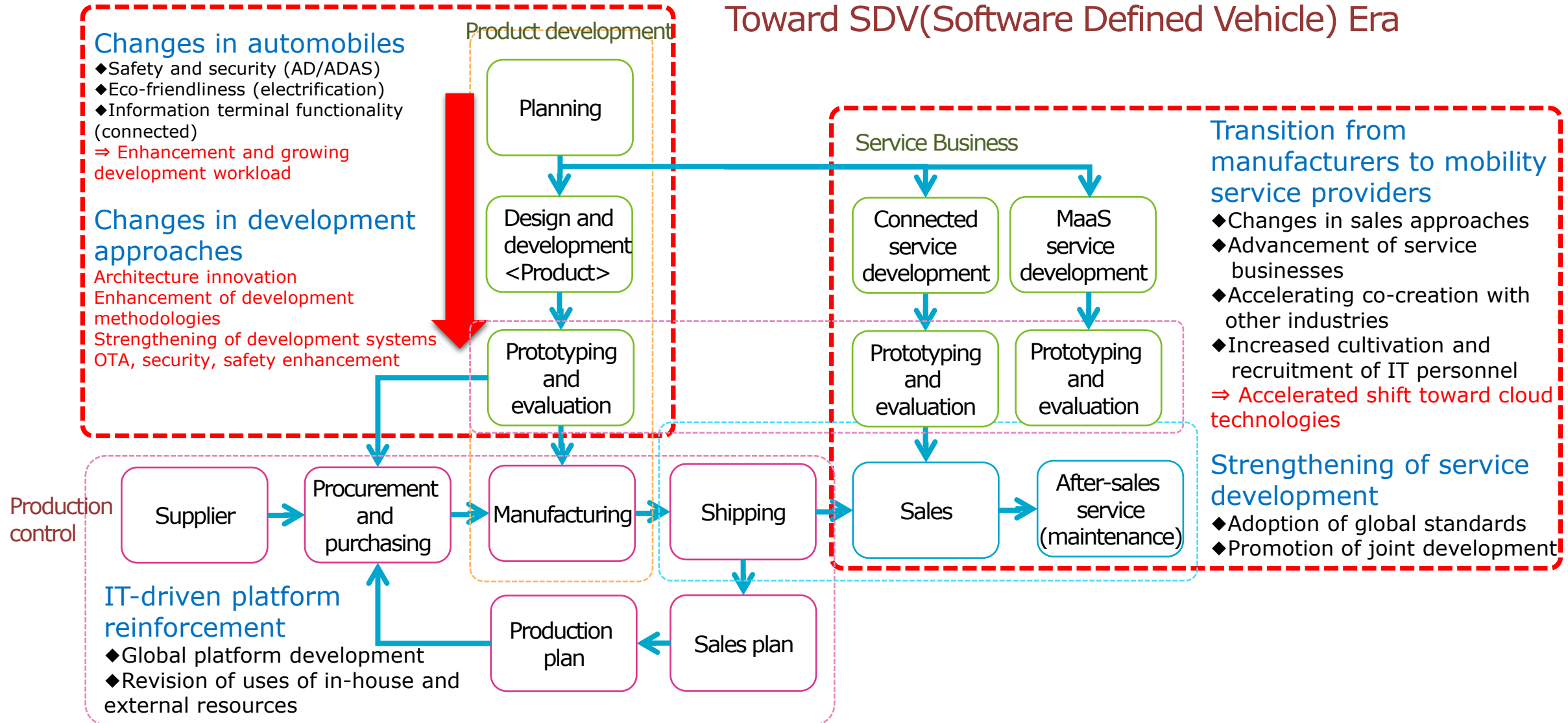
- Changes in mobility options and value

Core of SCSK's mobility and automotive software businesses = Enhancement of automobiles = SDV

- Promotion of the use of open and cloud technologies (**merging of control technologies and cloud technologies**)
- Ongoing development of business through approach similar to that in enterprise field

Technical Keywords: SOA(service-oriented architecture), DOA(data-oriented architecture), Virtualization, Commonization, Outsourcing, OpenAPI, Security simulated, MBD(model-based development), MBSE(model-based systems engineering)

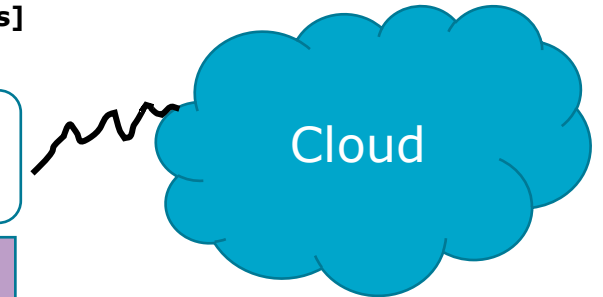
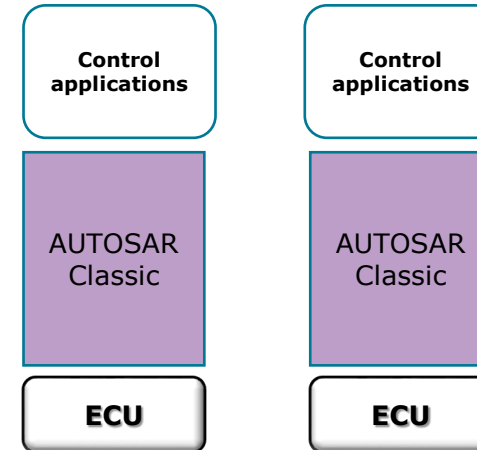
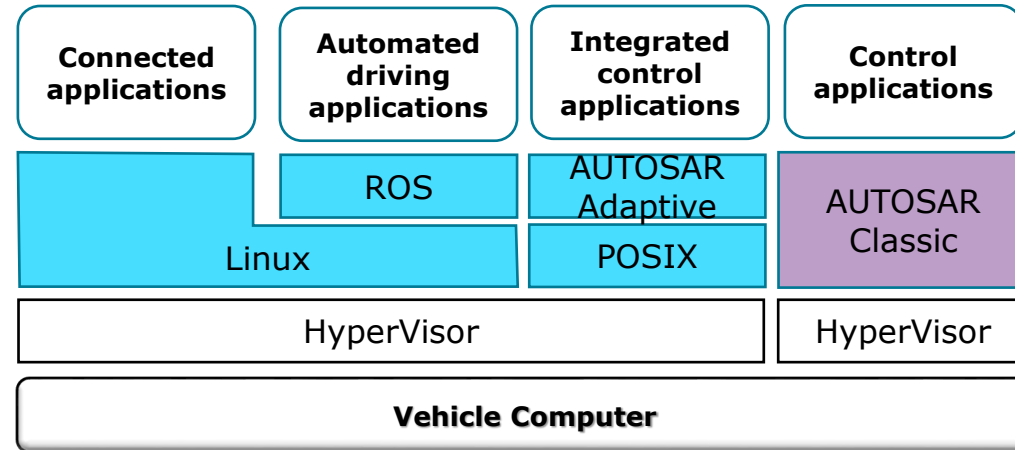
Toward SDV(Software Defined Vehicle) Era



Initiatives for Developing Vehicle OSs (Technologic Considerations and Key Points)

Directives for Next-Generation Automotive Software Architecture

[Components of Vehicle OSs]



Utilization of strengths of SCSK with automotive software (application and platform) and cloud technologies

Technical Considerations

- Integrated ECUs, model-based software engineering, service-oriented architecture, data-oriented architecture
- Autosar-CL/AP(S2S), Linux, virtualization
- Security
- AI (Embedded AI, Edged AI)

Key Points

- Establishment of application requirements
- Integration and verification of diverse technologies and products
- IF Definition (service-oriented architecture, S2S, data-oriented architecture cloud)
- Development process establishment (AP/PF/Cloud)
- Tool chain
- Human resource development and education

“Create Our Future of Mobility Society”

<Evolution into No.1 Mobility Service Provider that contributes to Smart City>



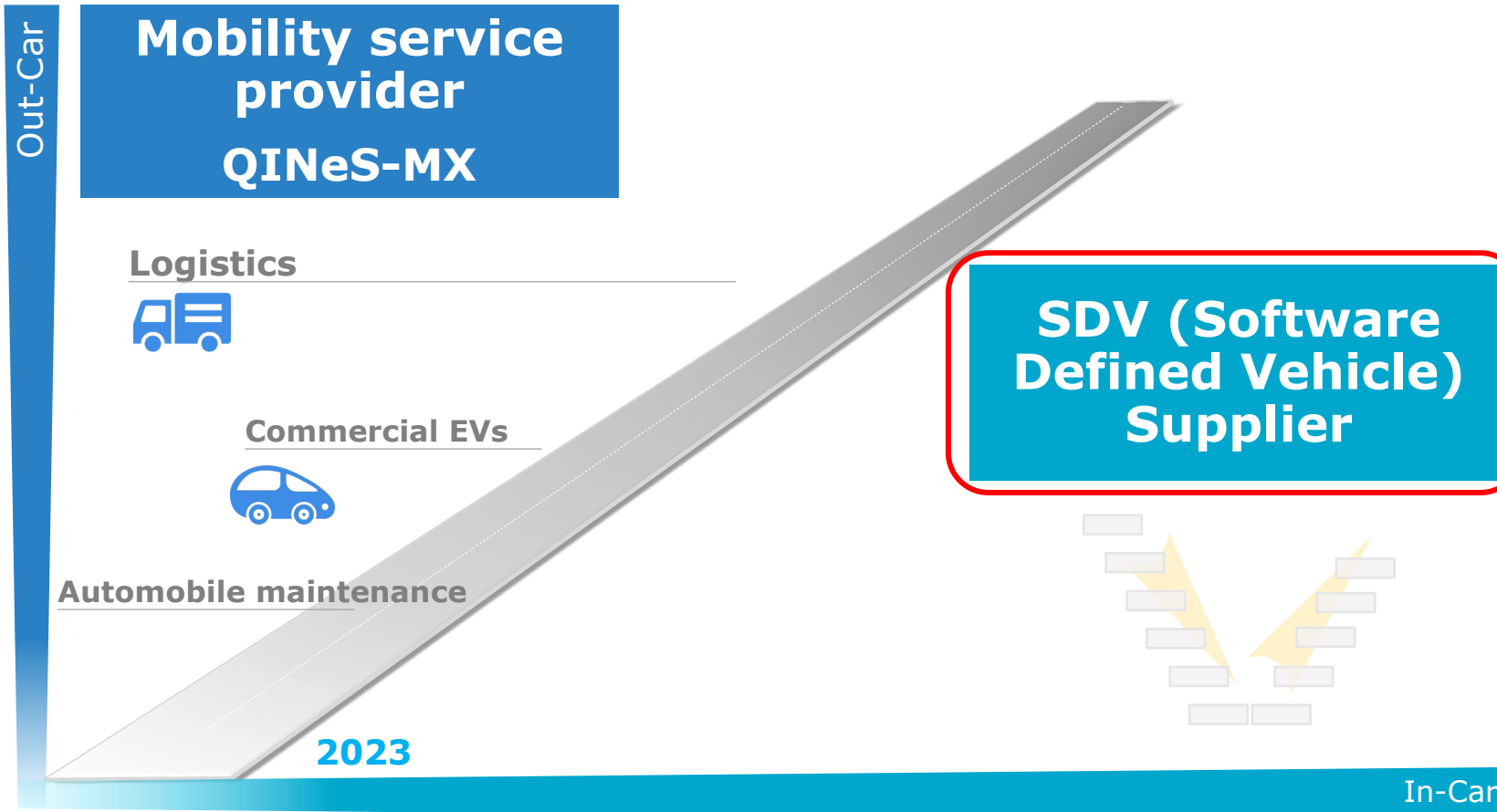
Materiality of SCSK

- Building trust for a safe and secure society
- Innovating for a blighted society
- Creating an inclusive society
- Global environmental contributions



Development of QINeS service brand

Net Sales Target for 2030
More than ¥100.0 billion



※MX: Mobility Transformation



※A trademark registration application has been submitted for the new logo

Expansion of QINeS from a product name to a brand name

Exploration of new fields with track record and trust gained in model-based development and AUTOSAR product development by keeping in step with automotive software development trends



<Pursuit of net sales of ¥100.0 billion after 2030>



**Mobility service
provider**

QINeS-MX service
※MX: Mobility Transformation

New business entity: Development of software defined vehicle supplier business

Products

Software Tier1

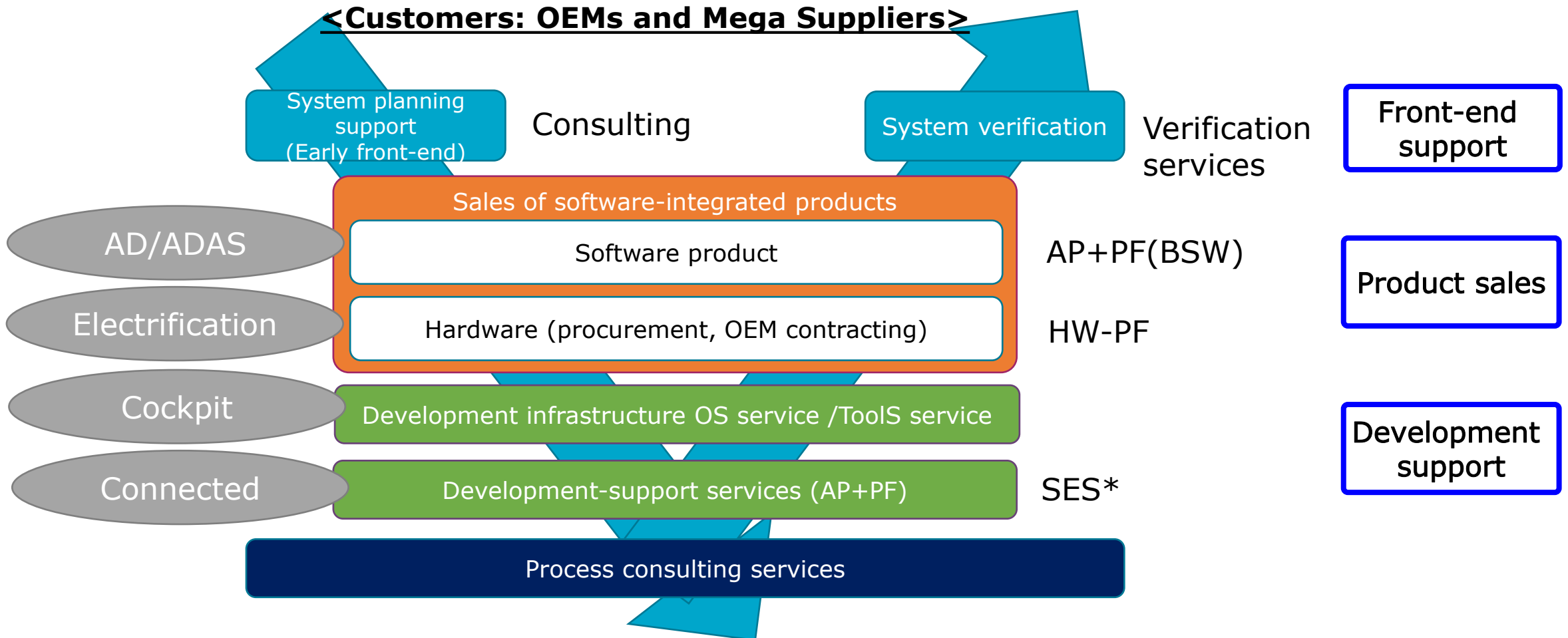
Early front-end process consulting
+ software product sales



**Software development
support**

Development of applications (model-based development) and platforms (BSW)
Global Development Centers

Development of high-revenue business model built on engineering services and product sales



*System Engineering Service

Supply of SCSK products and services and enhancement of development support services in response to market changes (evolution of automobiles)

V-Model Development Process and Goals of OEMs and Suppliers

Next-Generation Architecture Development

- Architecture for automated driving and connected technologies
- Architecture that can withstand a decade of augmentation
- Reusability and safety that contribute to higher development productivity
- BSW multivendor approach

System requirement definition

System tests

Software requirement definition

- Software Package
- Development processes and tools necessary for next-generation architecture (Automation, parallel processing)

Comprehensive software tests

Software structure design

Integrated software tests

Software specifics design

Standalone software tests

Software implementation

Major SCSK Products and Services

Software Tier1

- ESP service
- Next-generation E&E services
- SW goods/HW-PF goods

Software development support

- SW development and support
- Development infrastructure construction
- Process development and implementation support
- Specification accommodation (FS, CS)*

*FS: Functional Safety Standard
CS: Cybersecurity Standard

End

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