

Digital Business Platform

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Overview of Digital Business Platform Unit

Digital Shift

Provide value in a society featuring digital inclusion

Customer Value

Process Innovation,
Upgrading

Customer Experience



Operational Excellence

Digital
Services

- Design & Services
(Digital assets)
AI, biometrics/images, cloud, security

Platform

- NEC Digital Platform
Intelligence, architecture, engineering,
AI analytics, biometrics/images,
NEC Cloud IaaS ...

Software
Resources

- SW resources that support digital businesses
 - Human resources for digital
 - Human resources for IT services

Organizational Structure

Digital Power (horizontal) and Deliver Value (vertical)



Digital Business Platform Planning Div.

Business Design Div.

Cyber Security Strategy Div.

AI Analytics Div.

Digital Platform Div.

Service Platform Div.

Emerging SI Technology
Development Div.

Service and Platform SI Div.

Project Management Office

Software Engineering Div.

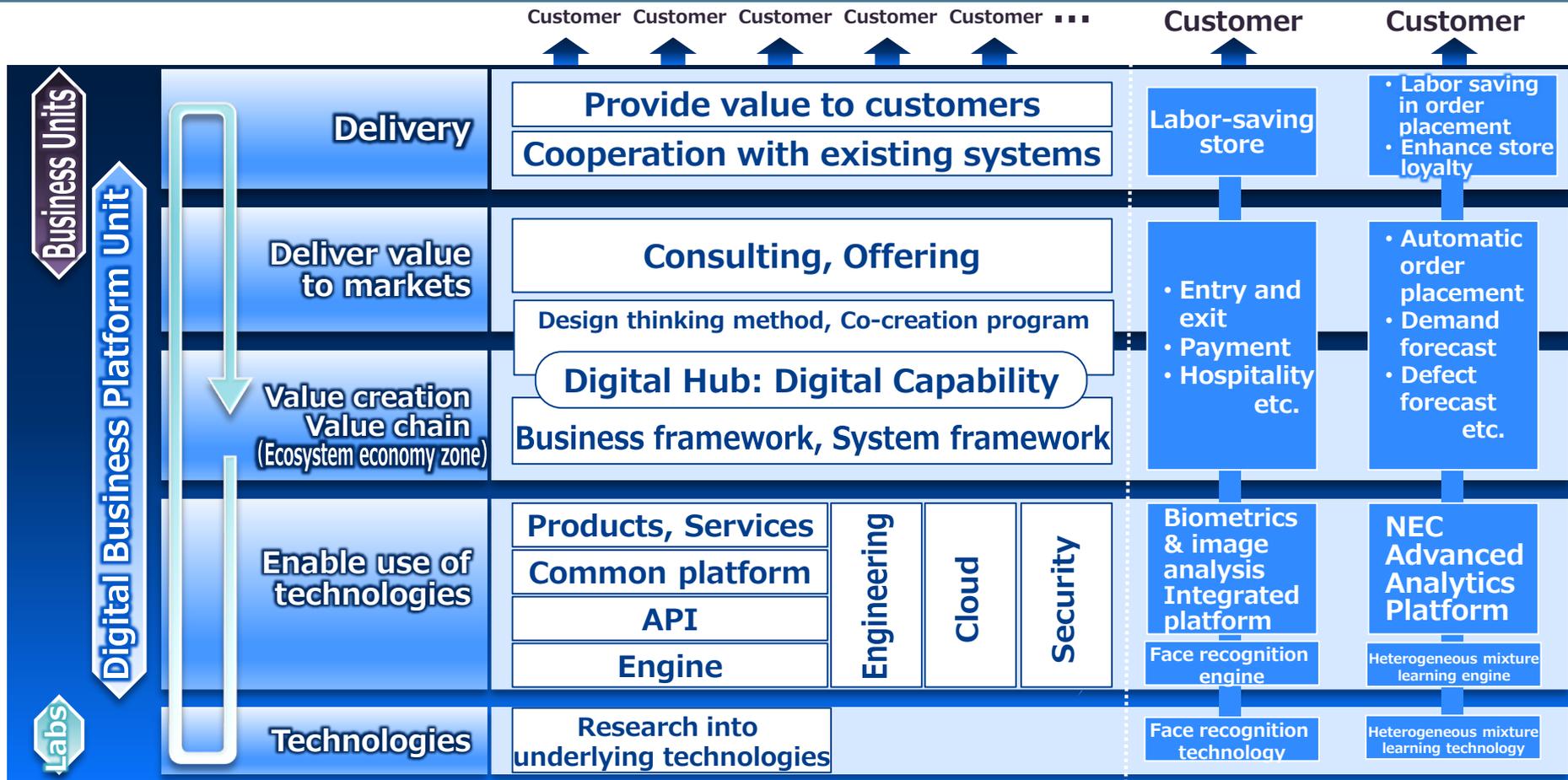
[Related companies in Japan]

- NEC Solution Innovators
- NEC Communication Systems
- Infosec

[Related companies overseas]

- NEC Advanced Software Technology (Beijing)
- NEC Soft (Jinan)
- NEC China Soft (Japan)
- NEC Telecom Software Philippines

(Supplement) Process to Deliver Value and Organizational Functions



Trends in Digital-related Markets

- **IT domain**

The 2nd Platform is diminishing, the 3rd Platform and innovation accelerators are expanding

- **Non-IT domain**

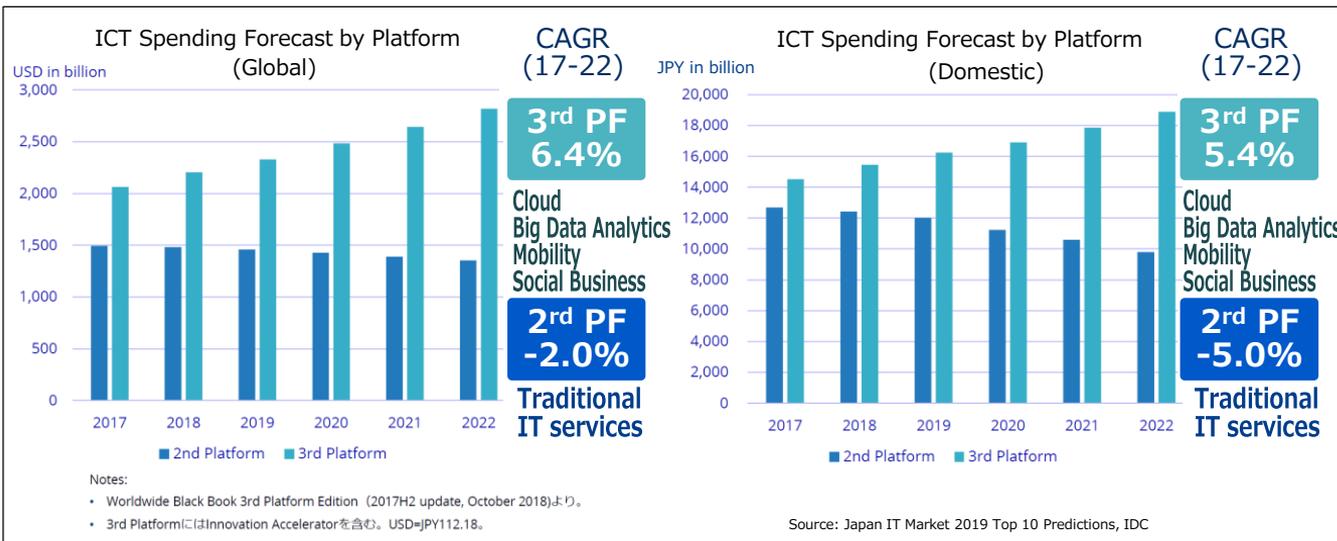
Digitalization will create new markets and value further

Global

3rd PF : CAGR **6.4%**
2nd PF : CAGR **-2.0%**

Japan

3rd PF : CAGR **5.4%**
2nd PF : CAGR **-5.0%**



Innovation Accelerators

Spending in Domestic AI Market CAGR(2018-2023) **46.4%**

Source: IDC, "Forecast for the domestic AI systems market 2019-2023"

Spending in Domestic IoT Market CAGR(2018-2023) **13.3%**

Source: IDC, "Forecast for the domestic IoT per industry/usecase 2019-2023"

Domestic Security Service Market CAGR(2018-2023) **4.3%**

Source: IDC, "Forecast for the domestic information security market 2019-2023"

NEC's Strengths in Digital Services Businesses

Advantages



Biometrics And images

World's No. 1 in face/fingerprint/iris recognition

Results from the international benchmark tests by the U.S. National Institute of Standards and Technology (NIST)



AI

- White Box-type AI
- NEC the WISE (26 types) + OSS machine learning library (data use lifecycle)



Cloud

Managed cloud services /leading company

IDC Japan's announcement in Feb. 2019



Cyber security

- High security ability
 - ▶ Industry-govt-academia and int'l cooperation
 - ▶ Strategic functions, 2 specializing affiliates
- Research into security technologies (encryption, security AI, etc)

Capability

Biometric authentication technology with global track records

Multimodal authentication × Real-time image analysis

Integrated platform for biometric authentication and image analysis

Case

NEC Group's policy on AI and human rights
(Announced in April 2019)

NEC Academy for AI

NEC advanced analytics platform (Lifecycle)

Case

Case

Industry leading multi-cloud (AWS/Azure, etc.)

Coping with hybrid cloud (NEC Cloud System)

Japan-made cloud providing high availability (NEC Cloud IaaS)

High-class human resources for security

- CISSP
- Registered information security specialists
- Infosec
- Cyber Defense Institute

Cyber security intelligence

Cyber security factory

Case

NEC's Strengths in Technologies

Advantages



Co-Creation

- NEC Customer Experience Solutions
- NEC Future Creation Hub

- Cope with **tens of millions of users** such as **companies, govts and carriers**



Engineering & Resources

- Software Factory
 - # of PJ: over **2,600**
 - Accumulated #: over **5,000**
 - Users: over **36,000**

Capability

Design thinking framework

(Organize service design)

Consulting

Startup labs

(Agile-type prototyping environment)

Open
(OSS promotion center)

Combination
(Organize digital SI)

AI system for SI support
(Use of quantum technology)

Case

Software Factory

(Secure & portable)

Agile Framework

(

- open-perspective
- neo-lightning

)

Project management

(Data White Paper, AI forecast: PRAS)

Dynamic resource
(WARTS)

Biometric Authentication and Image Analysis

Provide 1,000 systems to more than 70 countries and regions in the world

Society

Individual

Experience



Authentication Security Payment Marketing Hospitality

Integrated platform

Travel experience with “special hospitality” owing to the town-wide linkage through face recognition and IoT (Smart hospitality)



Hospitality,
Tourist
information

Airport



Hospitality,
Keyless,
Hands-free
payment

Hotel



Hospitality,
Hands-free
payment,
Entry without
waiting

Theme Park



Hands-free
payment

Shops, Restaurants

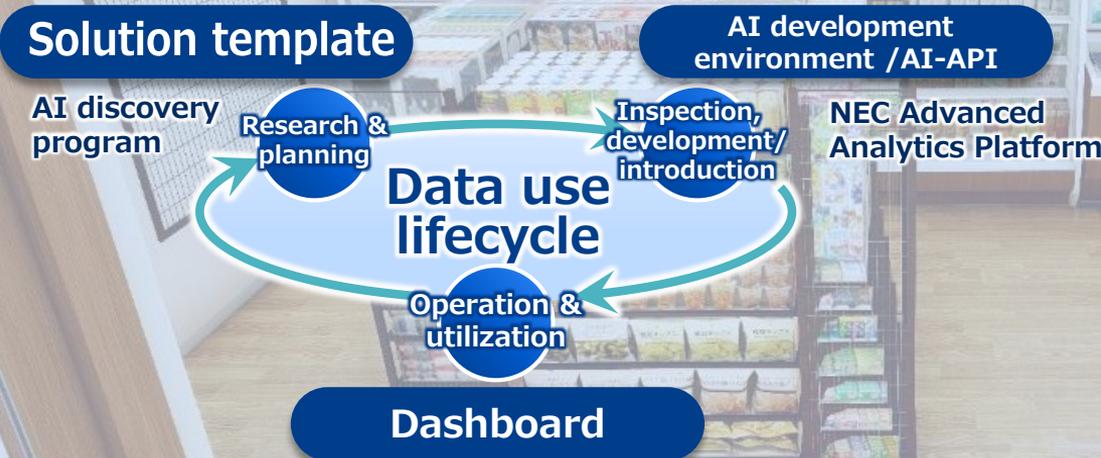
Digital platform that links experience together
from the customer's standpoint
(AI, IoT, Cloud, Security)

Invigorate community and realize society where people can live a prosperous life

[AI and Analytics] Usecase (Seven-Eleven Japan)

Labor-saving store on 20th floor of Mita International Building, Tokyo (Opened in December 2018)

- Walkthrough entry by face recognition
Empty-handed payment
- Customer support with "PaPeRo i"
- Non-stop store supported by IoT
- Demand forecast by AI



- ### Achievements (6 months)
- # of visitors Up 15%
 - Sales Up 40%
 - # of face registrants Over 3x

- ### Voice from users (questionnaire)
- Effective time use, higher convenience Use frequently 70%*
 - Satisfied with lineup ... Over 80%
- * Workers on upper floors

Realize consistent evolution through data use lifecycle

[AI and Analytics] NEC Academy for AI



Comprehensive initiative toward human-led AI society where people can use AI effectively and safely

Human resources that can understand AI correctly and return its benefit as social value

School

Industrial world

NEC Group's methodology to foster HR for AI

Literacy education

Relearning (Lifelong learning)

Fostering policy for AI resources

Certification system for AI resources

- Established “NEC Group Policy for AI and Human Rights”
 - 1) Fairness, 2) Privacy, 3) Transparency, 4) Accountability, 5) Proper use, 6) Development of AI and fostering of human resources, and 7) Dialogues with multiple stakeholders
- Provide opportunities from training courses to the learning environment on a one-stop basis
- Realize open innovation through opportunities for learning, exercising and networking

[Security] Cyber Security Factory

Realize a world where everyone can use digital devices and services safely

Security By Design

Consider security from planning and design phases

Make properly

Secure development and building

Proper data generation



Sustain normal

Proper environment sustaining

Proper data distribution



Defend against attacks

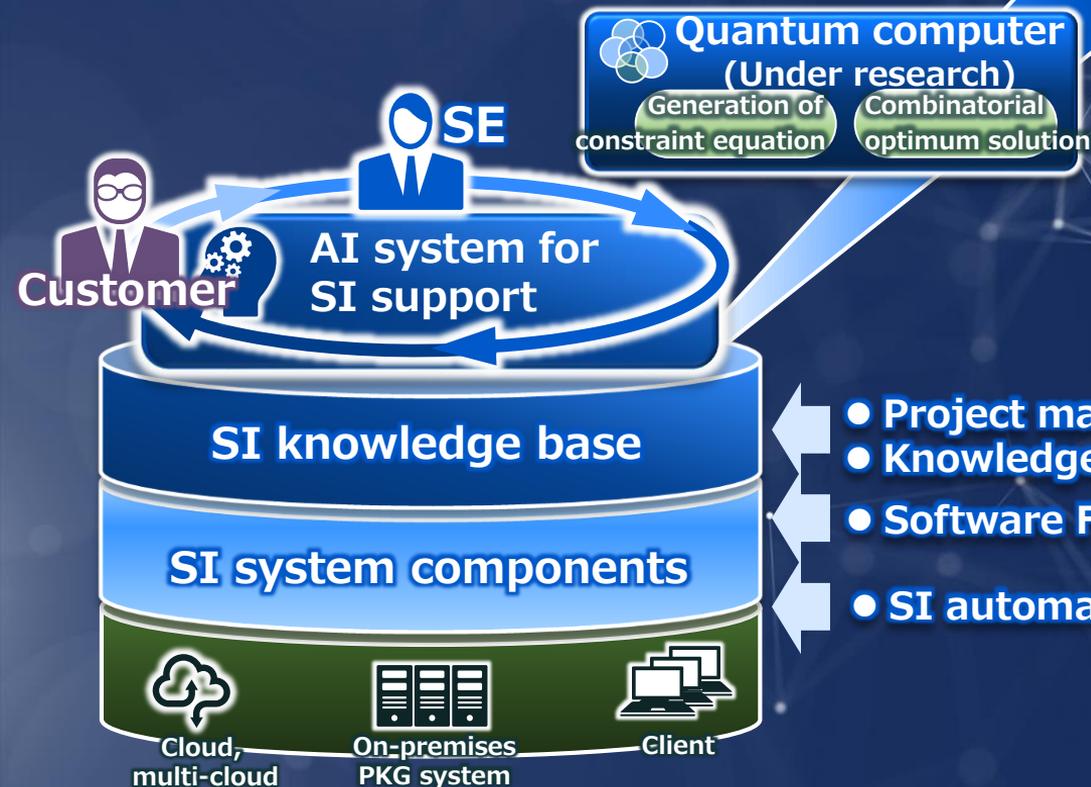
Abnormality detection
Investigation
Recovery



Cyber Security Factory

- Provide one-stop services, such as the introduction and foundation of a security system, operation and monitoring on a 24/7/365 basis, and emergency response to an incident
- Develop and introduce a "threat analysis system" using AI

Optimize SI knowledge with AI



Challenges

- **Shortage of 430,000 IT engineers expected for 2025***
 - Short supply of advanced IT specialists
 - Urgent need of IT system renewal by 2025
- **Combination of a huge quantity of SW and services**
 - e.g. Various and a large quantity of OSS (approx. 500 types) at present

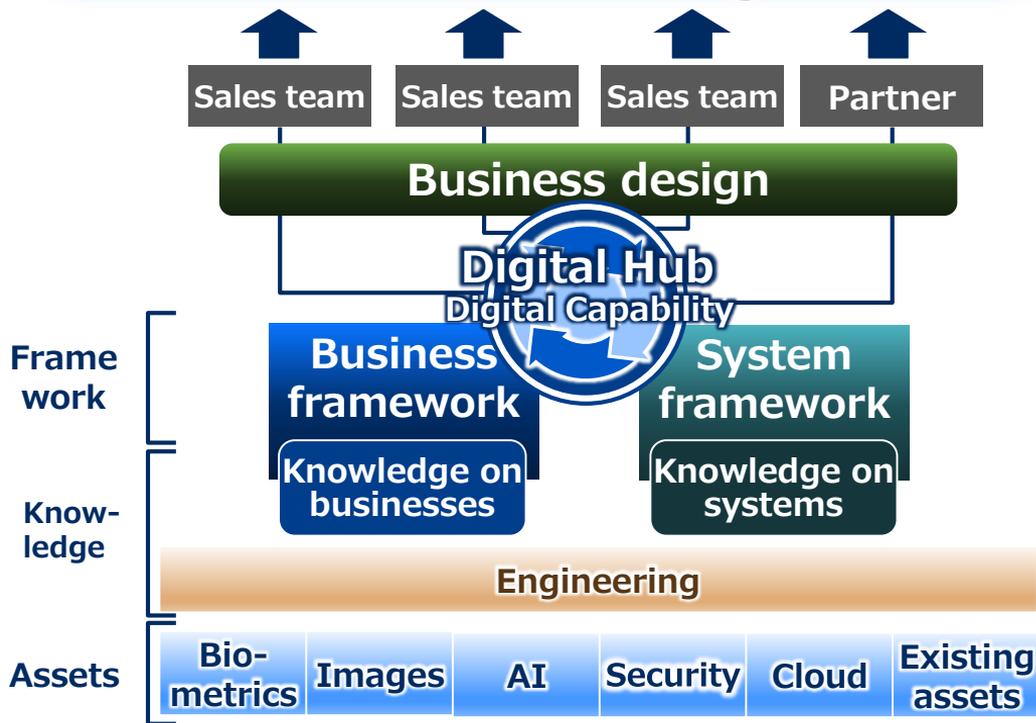
* METI, Report on Digital Transformation: Overcoming of "2025 Digital Cliff"

- **Project management (Data White Paper)**
- **Knowledge, PKG, service**
- **Software Factory**
- **SI automation (CASSIOPEIA)**

Toward a society where everyone shines with digital power

Accelerate customers' digital shift

Strategic targets (2018→2020)



* Classified the domestic SI and service business into SoE/Bimodal/SoR using IDC's definition of the 3rd platform. Of them, projects falling under SoE/Bimodal are regarded as digital projects.