Digital Business Platform

Hiroshi Kodama, Executive Vice President
Overview of Digital Business Platform Unit

**Digital Shift**

> Provide value in a society featuring digital inclusion

**Customer Value**

- 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

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**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.

[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

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(Supplement) Process to Deliver Value and Organizational Functions

Customer

Delivery

Provide value to customers
Cooperation with existing systems

Consulting, Offering
Design thinking method, Co-creation program

Digital Hub: Digital Capability
Business framework, System framework

Value creation
Value chain
(Ecosystem economy zone)

Enable use of technologies

Products, Services
Common platform
API
Engine

Biometrics & image analysis
Integrated platform
Face recognition engine

NEC Advanced Analytics Platform
Face recognition technology
Heterogeneous mixture learning technology

Technologies

Research into underlying technologies

Security
Cloud
Engineering

Labor-saving store

Labor saving in order placement
Enhance store loyalty

• Entry and exit
• Payment
• Hospitality etc.

• Automatic order placement
• Demand forecast
• Defect forecast etc.

• Labor saving in order placement
• Enhance store loyalty

Digital Business Platform Unit

Business Units
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

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**Global**

<table>
<thead>
<tr>
<th>Platform</th>
<th>CAGR (17-22)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3rd PF</td>
<td>6.4%</td>
</tr>
<tr>
<td>2nd PF</td>
<td>-2.0%</td>
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**Japan**

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**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”

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**Notes:**
- 3rd Platform: Innovation Accelerators & SaaS, USD=JPY112.18.

**Source:** Japan IT Market 2019 Top 10 Predictions, IDC
**NEC’s Strengths in Digital Services Businesses**

### Advantages

<table>
<thead>
<tr>
<th>Biometrics</th>
<th>AI</th>
<th>Cloud</th>
<th>Cyber security</th>
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<tr>
<td><strong>World’s No. 1 in face/fingerprint/iris recognition</strong>&lt;br&gt;Results from the international benchmark tests by the U.S. National Institute of Standards and Technology (NIST)</td>
<td><strong>• White Box-type AI</strong>&lt;br&gt;<strong>• NEC the WISE (26 types)</strong>&lt;br&gt;<strong>+OSS machine learning library</strong>&lt;br&gt;(data use lifecycle)</td>
<td><strong>Managed cloud services/leading company</strong>&lt;br&gt;IDC Japan’s announcement in Feb. 2019</td>
<td><strong>• High security ability</strong>&lt;br&gt;- Industry-govt-academia and int’l cooperation&lt;br&gt;- Strategic functions, 2 specializing affiliates&lt;br&gt;- Research into security technologies (encryption, security AI, etc)</td>
</tr>
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### Capability

<table>
<thead>
<tr>
<th>Biometric authentication technology with global track records</th>
<th>Multimodal authentication × Real-time image analysis</th>
<th>Integrated platform for biometric authentication and image analysis</th>
</tr>
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<tbody>
<tr>
<td><strong>NEC Group’s policy on AI and human rights</strong>&lt;br&gt;(Announced in April 2019)</td>
<td><strong>NEC Academy for AI</strong>&lt;br&gt;<strong>Industry leading multi-cloud</strong>&lt;br&gt;(AWS/Azure, etc.)</td>
<td><strong>NEC advanced analytics platform</strong>&lt;br&gt;(Lifecycle)</td>
</tr>
<tr>
<td><strong>Coping with hybrid cloud</strong>&lt;br&gt;(NEC Cloud System)</td>
<td><strong>Japan-made cloud providing high availability</strong>&lt;br&gt;(NEC Cloud IaaS)</td>
<td><strong>Cyber security intelligence</strong>&lt;br&gt;<strong>Cyber security factory</strong></td>
</tr>
<tr>
<td><strong>High-class human resources for security</strong>&lt;br&gt;- CISSP&lt;br&gt;- Registered information security specialists&lt;br&gt;- Infosec&lt;br&gt;- Cyber Defense Institute</td>
<td></td>
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NEC’s Strengths in Technologies

**Advantages**

- **Co-Creation**
  - NEC Customer Experience Solutions
  - NEC Future Creation Hub

- **Engineering & Resources**
  - Cope with tens of millions of users such as companies, govts and carriers
  - Software Factory
    - # of PJ: over 2,600
    - Accumulated #: over 5,000
    - Users: over 36,000

**Capability**

- **Design thinking framework**
  - Organize service design

- **Consulting**
  - Open (OSS promotion center)
  - Combination (Organize digital SI)

- **Startup labs**
  - Agile-type prototyping environment

- **Software Factory**
  - (Secure & portable)

- **Agile Framework**
  - open-perspective
  - neo-lightning

- **Project management**
  - (Data White Paper, AI forecast: PRAS)

- **Dynamic resource**
  - (WARTS)

Case
Biometric Authentication and Image Analysis

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

Experience Boarding
Society
City Group (Town - Living)
Enterprise (Company)
Individual Mobile (Individual)

Authentication Security Payment Marketing Hospitality

Integrated platform

Public Safety (State - Safety & Security)

National ID

Crime investigation and monitoring

Crime investigation and monitoring

Police, Local Government, Shopping Street

Better vaccination rate

Safe and Comfortable management of large events

Asian Games

Public Safety

Foreign Government etc.

Gavi, Simprints

Large Scale Event

Unmanned store

Optimized for customers Loyalty

Enterprise

Strict identification

Safe and security for condo residents

Face recognition, Empty-handed payment

Anabuki Construction, Fulltime System

Mobile money transfer and payment service, User identification

Mobile money transfer and payment service, User identification

Line Pay

Security

Payment

Marketing

Hospitality

Case

Boarding Narita Airport

Hospitality Invigoration of community

Nanki Shirahama Airport, Surrounding Facilities

Taiwan 7-Eleven

Hotel, Shopping Street

Crime investigation and monitoring

Crime investigation and monitoring

Taiwan 7-Eleven

Love and Security

Better vaccination rate

Large Scale Event

Mobile money transfer and payment service, User identification

Line Pay

Better vaccination rate

Large Scale Event

Mobile money transfer and payment service, User identification

Line Pay

Better vaccination rate

Large Scale Event

Mobile money transfer and payment service, User identification

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

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] Use case (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**
- **Non-stop store supported by IoT**
- **Customer support with “PaPeRo i”**
- **Demand forecast by AI**

**Solution template**
- **AI discovery program**
- **Research & planning**
- **Inspection, development/ introduction**
- **AI development environment /AI-API**
- **NEC Advanced Analytics Platform**
- **Operation & utilization**
- **Dashboard**

**Data use lifecycle**
- **Realize consistent evolution through data use lifecycle**

**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%*
  - *Workers on upper floors
- **Satisfied with lineup** 
  - Over 80%
[AI and Analytics] NEC Academy for AI

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

- 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

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

NEC Group’s methodology to foster HR for AI

- Literacy education
- Fostering policy for AI resources
- Certification system for AI resources
- Relearning (Lifelong learning)

School
Industrial world
[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

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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”
Toward a society where everyone shines with digital power

Accelerate customers’ digital shift

Strategic targets (2018→2020)

- Ratio of Digital Projects*: 30%
- Digital Usecases (AI, Biometric Authentication): Accumulative 3,000
- Digital Human Resources: Accumulative 3,000 people
- Digital Usecases (AI, Biometric Authentication): 1,700
- Digital Human Resources: 1,600 people

* 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.