NEC Product Portfolio Presentation

NEC Europe
NEC brings together and integrates technology and expertise to create the ICT-enabled society of tomorrow. We collaborate closely with partners and customers around the world, orchestrating each project to ensure all its parts are fine-tuned to local needs. Every day, our innovative solutions for society contribute to greater safety, security, efficiency and equality, and enable people to live brighter lives.
NEC Corporation Profile

Leading social value innovator

Company Name: NEC Corporation
Established: July 17 1899
Chairman: Kaoru Yano
President: Nobuhiro Endo

Provides telecommunications, Public solutions and Enterprise business solutions

- Around **100,000** employees worldwide
- **€21 billion** (*1) net sales
  
  (*1) Exchange rate €1=140 JPY
- **232** consolidated subsidiaries
- Headquarters: **Tokyo, Japan**
- **116** years of brand success
The early days

Established: July 17th 1899
- First international joint venture company in Japan. Founded with the Western Electric Company in the US (presently Alcatel-Lucent)
- Focus on the production and export of telephones and switching equipment

Aims:
- Formerly known as the Nippon Electric Company. Nippon means “State of Japan”
- Founded with the strong will “To be the electric company representing Japan, leading the industry worldwide.”

Slogan: “Better Products, Better Services”
The integration of computers and communications “C&C”

“To [be able to] talk and see...any person, at any time [and] any place on the earth in the early days of the next century.”

“All technology, communications, computer and television will be, and should be, integrated.”

“It’s important to help developing countries to be able to participate in such a world telecommunications system.”

*NEC Chairman, Koji Kobayashi*
Innovation milestones

**Computers**
- 1955: Crossbar switching systems
- 1980: World's first digital signal processors
- 1995: 64-bit RISC microprocessors
- 2002: First mobile phone application processor with parallel processing
- 2004: New power-saving server: ECO CENTER
- 2008: Small footprint high performance computer
- 2007: Single-chip vector processors for super computer
- 2011: High Performance Vibration sensor
- 2013: Next-generation network technologies

**Networking technology**
- 1980: Swiss satellite communications earth station
- 2005: The thinnest cellular phone terminal in the world
- 2006: World's first 40-Gbps reconfigurable optical add/drop multiplexer (ROADM) for next-generation optical networks
- 2012: In building small cell solution for Enterprise and public area

**Electron device technology**
- 1899: Desktop telephones
- 1974: Mainframe computers: ACOS Series
- 1980: World's first digital signal processors
- 1995: 64-bit RISC microprocessors
- 2004: First mobile phone application processor with parallel processing

**High-performance, trustworthy IT technologies**
- 2008: New power-saving server: ECO CENTER
- 2013: Small footprint high performance computer

**Big data & social solutions**
- 2002: World's fastest computer: Earth Simulator (for JAMSTEC)
- 2004: 64-bit RISC microprocessors
- 2005: The thinnest cellular phone terminal in the world

**Innovative device & nano technologies**
- 1899: Desktop telephones
- 1974: Mainframe computers: ACOS Series
- 1980: World's first digital signal processors
- 1995: 64-bit RISC microprocessors
- 2004: First mobile phone application processor with parallel processing

**Next-generation network technologies**
- 2005: The thinnest cellular phone terminal in the world
- 2006: World's first 40-Gbps reconfigurable optical add/drop multiplexer (ROADM) for next-generation optical networks
- 2012: In building small cell solution for Enterprise and public area

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NEC’s global scope

Business activities in over 140 countries and territories

Our affiliates, offices, and laboratories: 58 countries and territories

Our Regional Headquarters:
NEC Europe

NEC Asia Pacific

NEC China

NEC Corporation of America

NEC Corporation of Latin America

Headquarters in Tokyo
NEC Corporation

Marketing & Service affiliates
Manufacturing affiliates
Liaison Offices
Branch Offices
Laboratories

*Data as of 31 March 2015

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NEC’s sales by sector

**Telecom carrier:**
- Microwave communications systems
- TOMS (OSS/BSS)
- Submarine Systems

**System Platform:**
- Server
- Super computer

**Public sector:**
- Satellite Communications
- Fingerprint Identification
- Disaster Prevention

**Enterprise:**
- Global Supply Chain Management
- Retail Systems for Stores

**Others:**
- Smart energy

**Turnover:**
€21 billion
($24.5m)
(¥2,935.5 billion)*
NEC in EMEA

Revenues in EMEA: €1,050 million (*)

(*) Including all NEC Group Company in EMEA sales

Employees: 1,200 employees
(includes 100 in R&D)

Locations: 31 countries

- Regional HQ
  - EMEA HQ: London
- Sub-regional HQs
  - NEC Neva: Moscow
  - NEC Eastern Europe
  - NEC Turkey: Istanbul
  - NEC Saudi Arabia: Riyadh
  - NEC Africa: Johannesburg

Locations:
- NEC Neva, Moscow
- NEC Turkey, Istanbul
- NEC Saudi Arabia, Riyadh
- NEC Africa, Johannesburg
- NEC EE Budapest
- London: Regional HQ
Our Solutions
Public sector portfolio

Global Safety Division

- **Urban Surveillance**: Camera infrastructure, facial recognition, analytics & control
- **Critical Infrastructure**: Real-time crowd surveillance & flow management
- **Facial & fingerprint recognition**: Platform for training, testing, simulating and validating
- **Forensic biometrics**: Collect, transmit, analyse & store sensor and IT data to create actionable intelligence
- **Inter-agency situation awareness**: Police/intelligence services
- **Access control, intruder**: Borders (air, land, sea)
- **Targeted digital marketing**: Forensic biometrics

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Select global public safety customers

Fingerprint recognition

- National id cards
- Voter registration in Bolivia

Use by law enforcement agencies in 20 countries (incl. US, Australia, Brazil)

Facial recognition

- Airports
- Law enforcement
- Illegal immigration checks by naval personnel
- Terracotta warrior analysis
- VIP guest recognition

Industry awards

- Ranked #1 in multi-vendor tests in 2014 & 2010
- Customer Value Leadership Award 2014
Real Time Surveillance – NeoFace Watch

Real-time surveillance and recorded video analysis using fixed/mobile CCTV and smart devices.

Quick detection from low quality images.
Face Recognition in your business today

About NEC

Business activities in over

167 countries and territories

~26.3 Billion USD in FY2015 sales

Rank 1st globally by
for Face Recognition.

R&D history of over

40 years in Biometrics

Global Safety Division with

5 Regional Competence Centres

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NIST Results 2017

NIST FIVE DATASET
SPORTSARENA ENTRANCE & CONCOURSE, 2MP CONSUMER GRADE CAMCORDER

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NEC is...

WATCHLIST MONITORING / IDENTIFICATION
- 2.5 x’s more accurate than Eyedea
- 3.3 x’s more accurate than Morpho
- 3.4 x’s more accurate than 3M Cognet
- 4.7 x’s more accurate than Neurotech.
- 7 x’s more accurate than Cognitec

FORENSIC INVESTIGATIONS
- 2.1 x’s more accurate than Eyedea
- 3.4 x’s more accurate than Morpho
- 2.9 x’s more accurate than 3M Cognet
- 5.5 x’s more accurate than Neurotech.
- 12.6 x’s more accurate than Cognitec
Face Recognition in your business today
Add intelligence to airport areas

- Accuracy
- Speed
- Mature Platform
- Enterprise Architecture
- Credibility
- Integration Hooks
- One Platform
Face Recognition in business today
Markets and Verticals

Traditional
- Long sales cycles
- RFP tender process
- Biometrics well understood
- Local consultant / expertise
- May be an extension of current system
- Links to multiple 3rd party systems
- Often involves well planned industry benchmark
- Well defined expectations

Emerging
- Shorter sales cycle
- More reactive procurement model
- Driven by ROI
- Less expertise
- Guidance and trials needed
- Likely to be standalone
- Often involves ad-hoc benchmark
- Variable expectations

- Policing
- Military
- Border Control
- Transportation
- National ID
- Passports
- Driving License
- Banking
- Retail
- Gaming
- Hospitality
- Flow
- Large Search
- Healthcare
Face Recognition in your business today

Common challenges

• Many people on one image need to be analysed simultaneously - **Cost effective GPU power**
• Normal behaviour = not looking at the camera
• CCTV images are lower quality than static photos
• Many environmental variables
• Fast moving people traffic = maybe split-second to see the face
• Split second to adjudicate - **Alerts make easy**
Face Recognition in your business today
Better Solutions - Transport Management

Track passenger from check-in to boarding
Verify identity where needed

Measure queue times to allow efficient staff allocation
Face Recognition in your business today
Real Time NeoFace Watch solution

- CCTV infrastructure often unsuited to Face Recognition
  - Additional cameras required
- Less expertise in the Emerging markets need guidance
  - Bosch cameras proven track record in NFW
- Often large estates
  - More cameras over a longer sales cycle
- Opens additional opportunity, Demographics, Queue management
Case study- Long Range Facial Recognition - Mirror reflection

- Person recognized in mirror reflection at 30 meters.
Case study - Recognition in dark environment

Image captured with phone camera

Recognized person
Case study - Recognition in dark environment using PTZ Camera

- Usage of PTZ Camera to recognize person at 30 meters through glass
Case study - Recognition through the windshield using Box Camera

- NeoFace processed images from IP camera and was capable to
- Obtain high recognition scores. This confirms
Case study- Recognition at long distance with Box Camera

- NeoFace processed images from camera with 50mm varifocal lens and was capable to obtain high recognition scores. This was possible at a distance of 27 meters under difficult conditions for lighting and shades.
Case study- Recognition at long distance with Box Camera

- NeoFace processed images from camera with 50mm varifocal lens and was capable to obtain high recognition scores. This was possible at a distance of 27 meters under difficult conditions for eyes closed and partial obstruction of face.

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Case study- Recognition at long distance with Box Camera

- NeoFace processed images from camera with 50mm varifocal lens and was capable to obtain high recognition scores. This was possible at a distance of 27 meters under difficult conditions as enrollment photo is of poor quality.