ICT Market Opportunities in Japan

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Contents

ICT Market Overview

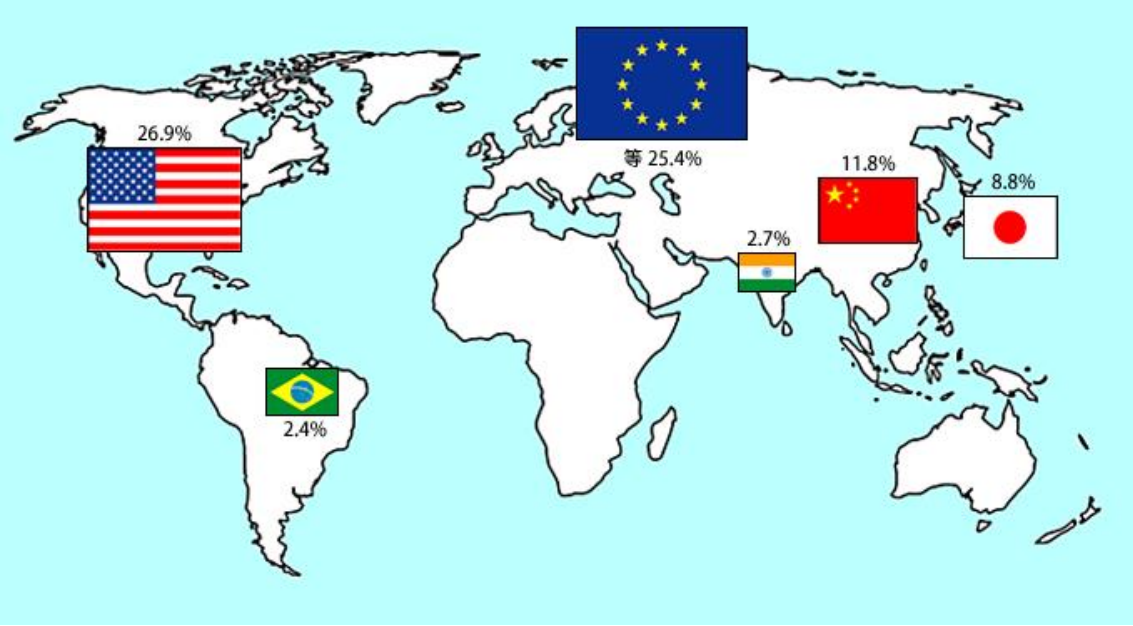
http://www.fxtradingweb.com/search/market+overview

IT and ICT Defined

- ***IT*** *(Information Technology): the study, design, development, implementation, support or management of computer-based information systems, particularly software applications and computer hardware (defined by Information Technology Association of America)*
- ***ICT*** *(Information & Communications Technology): The word "Communication" was added to include technologies related to electronics communications, i.e., network communications, wireless communications, etc.*
- *Japan's Ministry of Internal Affairs and Communications started using* ***ICT instead of IT in 2005*** *in their policy papers*

Global ICT Market

- According to Japan's Ministry of Internal Affairs and Communications, worldwide ICT market will reach above $3.9 Trillion in 2015.



<Source: http://www.soumu.go.jp/johotsusintokei/whitepaper/ja/h26/html/nc122110.html/>
<Source: 情報サービス産業協会：http://itjobgate.jisa.or.jp/world/>

ICT in Japan

- Japan as a single country is still one of the largest ICT markets (after U.S. and China) → over $340 Billion.
- Large Japanese companies have complicated networks that need to be managed effectively. They also have big data that need to be managed, analyzed, and utilized effectively and efficiently.
- Small to midsize Japanese companies want to utilize IT as a service (through cloud), because they lack their own IT resources.

ICT Evolution - The Big Picture

- Much of the data will be in the cloud.
- People will be accessing the cloud data using mobile devices.
- Network will become a platform between cloud and mobile devices.
- Increasing amount of data traffic will further evolve the network.
- Therefore, cloud infrastructure and services, BYOD and MDM (Mobile Device Management), network virtualization and SDx (Software Defined Everything), and IT security all become the key elements of ICT evolution.

ICT-Related Market Forecasts (Japan)

	2014	2015	2020
Smart Payment (50.2%*)	$ 542 billion	$ 582 billion	$ 874 billion
B2C E-Commerce (74.3%*)	$ 128 billion	$ 144 billion	$ 251 billion
Online Advertising (38.1%*)	$ 7.8 billion	$ 8.4 billion	$ 11.6 billion
Social Gaming (6.5%*)	$ 7.4 billion	$ 7.7 billion	$ 8.2 billion
IT Security (32.7%*)**	$ 5.2 billion	$ 5.5 billion	$ 7.3 billion
M2M (217.3%*)	$ 3.5 billion	$ 5.2 billion	$ 16.5 billion
Digital Publications (50.0%*)	$ 2.2 billion	$ 2.6 billion	$ 3.9 billion
Video on Demand (33.3%*)	$ 1.3 billion	$ 1.5 billion	$ 2.0 billion

($=100yen)

* **Expected Growth%: from 2015 to 2020**

** **Enterprise IT Security Market**

<Source: Nomura Research Institute: December 2014>

ICT Services: System Designs, Integration, Security Support, Facility Support, etc. (Japan)

01. Fujitsu ($33.0B/year sales)
02. NEC ($29.4B)
03. Hitachi ($20.3B)
04. NTT Data ($15.1B)
05. IBM Japan ($8.8B)
06. Otsuka ($6.1B)
07. Nomura Research ($4.1B)
08. Itochu Techno Solutions ($3.8B)
09. IT Holdings ($3.6B)
10. Sumitomo SCSK ($3.0B)

<$=100yen>

** Toshiba ($65.0B/year sales) is also one of the key ICT service providers in Japan*

＜Source: 四季報業界地図2016年版、東洋経済新報社>

Internet Portal Sites (Japan)

1. *Google Japan (Most popular portal site in Japan - 29.1%)*
2. *Yahoo Japan / Softbank (2nd most popular portal site in Japan – 27.3%)*
3. *Goo / NTT Resonant (11.1%)*
4. *MSN Japan (7.4%)*
5. *NEC / Biglobe (5.0%)*
6. *Others (20.1%)*

<Source: 日経業界地図2016年版、日本経済新聞出版社>

Software Companies (Japan)

01. Microsoft Japan
02. Fujitsu ($2.0B)
03. IBM Japan
04. Hitachi ($1.7B)
05. Oracle Japan ($1.6B)
06. TrendMicro ($1.2B)
07. NEC ($1.0B)
08. SAP Japan
09. VMware Japan
10. Adobe Systems Japan

<$=100yen>

＜Source: 四季報業界地図2016年版、東洋経済新報社>
＜Source: 日経業界地図2016年版、日本経済新聞出版社>

Areas of Interest
<Wireless and Mobile>

http://electronics.howstuffworks.com/cell-phone-buying.htm

Japan's Mobile Market Share: June 2015

- NTT DoCoMo : 45% (67,531,500)
- KDDI au : 29% (44,074,200)
- SoftBank : 26% (39,887,000)

- Total Number of Subscription: 151,492,700 (151.5 million)

<Source: http://www.losttechnology.jp/k-tai/>

Theoretical Download Speed Comparison

- **W-CDMA** (3G): 3.5 Mbps (Service speed is 384kbps by DoCoMo' FOMA)
- **HSDPA** (3.5G): 35 Mbps (Service speed is around 7.2 Mbps by DoCoMo's FOMA High Speed)
- **Mobile WiMAX**: 75~100 Mbps
- **4G-LTE** (KDDI au): Service speed is 100 Mbps
- **FDD-LTE** (Softbank 4G): Service speed is 187.5 Mbps
- **LTE-Advanced** (DoCoMo 4G): Service speed is 225 Mbps

Mobile Handsets including Smart Phones

Japan	Worldwide
1. Apple	1. Samsung
2. Sharp	2. Nokia (Microsoft)
3. Sony Mobile	3. Apple
4. Kyocera	4. Motorola (Lenovo)
5. Fujitsu	5. Huawei

＜Source: 日経業界地図2016年版、日本経済新聞出版社＞

BYOD in Japan

- **BYOD in Japan** (October 2012)
  - Actively BYODing: 6.9%
  - Plan to allow BYOD soon: 6.4%
  - No BYOD: 70.2%
  - Don’t ask don’t tell: 14.7%

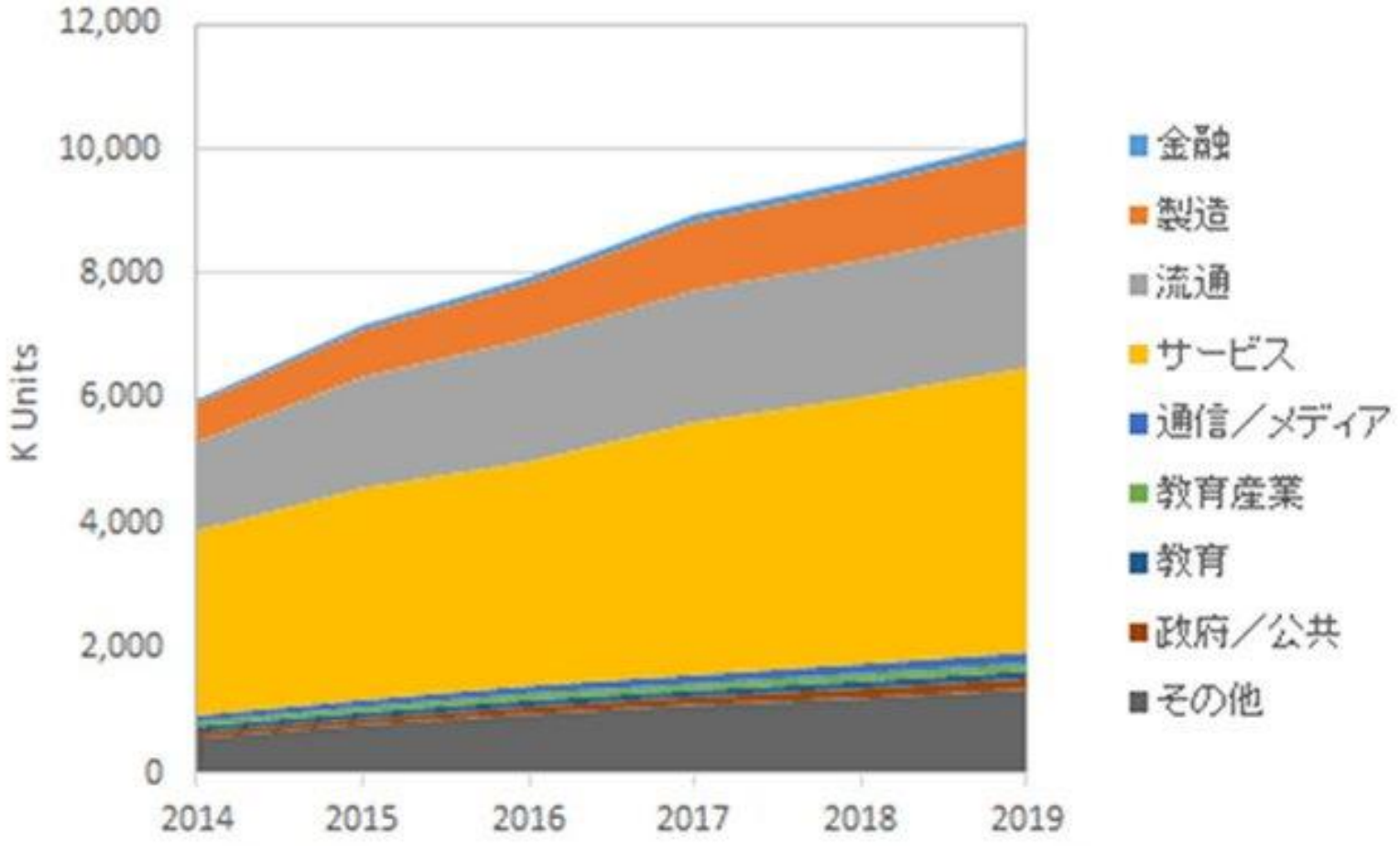
<NikkeiBP: November 2012>

- **BYOD in Japan** (June 2015)
  - Actively BYODing with Smartphones: 10.5%
  - Actively BYODing with Tablets: 4.5%

- **BOYD in Japan** (2019 Forecast)
  - Actively BYODing with Smartphones: 17.9%
  - Actively BYODing with Tablets: 10.7%

<IDC Japan: June 2015>

Number of Smartphones Used for BYOD in Japan 2014 ~ 2019



Note: 2014年は実績値、2015年以降は予測値
Source: IDC Japan, 6/2015

BYOD Solution Providers in Japan

- **NTT PC Communications:** Secure Remote Access and Smart User Interface
- **Cybernet Systems:** Integrated cloud platform for managing the BYOD devices
- **Soliton Systems:** MDM with cloud user authentication, Dynamic Mobile Exchange Gateway by Excitor of Denmark, etc.
- **Fujitsu BSC:** Application Management, MDM, and Network Management (VPN, etc.)
- **Basic Co., Ltd.:** Oracle VM (Virtual Machine) VirtualBox Desktop Virtualization, Dedicated Browser, etc.
- **Macnica Networks:** MDM by McAfee

Areas of Interest <Gaming>

http://i.ebayimg.com/00/s/ODIxWDU4NQ==/z/odkAAOSwDk5T0S6Q/$_32.JPG?set_id=880000500F

Gaming Industry in Japan

- Social gaming market size in Japan is forecasted to grow to $8.2 billion in 2020, which is expected to lead the Japanese gaming market segment.
- Mixi, which used to be Japan's King of SNS, re-emerged with a very popular social game (Monster Strike), and Kadokawa (Japanese publisher) teamed up with DMM.com (Japanese video promotion company) to come up with Kankore (another popular social game).

<Source: Nomura Research Institute: December 2014>

Gaming Industry in Japan

- Gaming hardware market size in Japan is forecasted to be around $0.8 billion in 2020.
- Sony's PlayStation 4 became popular in Japan and overseas when it was introduced in 2014, even more so than Xbox, etc. But the gaming hardware market itself is expected to shrink overtime.
- Gaming software market size in Japan is forecasted to be around $1.7 billion in 2020, which is also expected to shrink overtime.

<Source: Nomura Research Institute: December 2014>

Gaming Software (Japan)

1. *Nintendo (19.1%)*
2. *Level 5 (16.0%)*
3. *Bandai Namco (12.6%)*
4. *Capcom (8.3%)*
5. *Pokemon (7.4%)*

** 39.86 million game software products sold in 2014*

＜Source: 日経業界地図2016年版、日本経済新聞出版社＞

Gaming Market Forecast (Japan)

	2014	2015	2020
Social Gaming (6.5%*)	$ 7.4 billion	$ 7.7 billion	$ 8.2 billion
Gaming Hardware (- 47%*)	$ 1.6 billion	$ 1.5 billion	$ 0.8 billion
Gaming Software (- 23%*)	$ 2.3 billion	$ 2.2 billion	$ 1.7 billion

($=100yen)

* **Expected Growth%: from 2015 to 2020**

- As social gaming will become more and more popular, game-specific hardware and software will become more and more obsolete.
- Companies providing social gaming products need to use it as one of the media mix channels, and come up with marketing strategies to make money through other businesses related to gaming, i.e., character toys, movies, etc.

<Source: Nomura Research Institute: December 2014>

Areas of Interest <SNS and Social Media>

http://www.lunametrics.com/blog/2012/07/09/5-advantages-social-media-management/

Social Media Landscape 2015

http://www.fredcavazza.net/2015/06/03/social-media-landscape-2015/

Social Media in Japan

- 60 million SNS users estimated as of the end of 2014 (about 60% of all Internet users in Japan)
- 65 million and 70 million SNS users as of the end of 2015 and 2016 predicted respectively
- Twitter continues to be popular in Japan, but is said to be losing popularity globally (photo and video sharing becoming more popular)
- Line (free messenger app) is very popular in Japan
- Line started offering closed services for business users

<Source: 四季報業界地図2016年版、東洋経済新報社>

SNS Usage in Japan

	2012	2013	2014
LINE	20.3%	44.0%	55.1%
Facebook	16.6%	26.1%	28.1%
Twitter	15.7%	17.5%	21.9%
Mixi	16.8%	12.3%	8.1%
Mobage (DeNA)	12.9%	11.4%	8.6%
Gree	11.8%	10.0%	6.9%
One of the Above	41.4%	53.0%	62.3%

*** Based on the survey conducted on 1,500 people (13 y/o to 69 y/o) in Japan by the Ministry of Internal Affairs and Communications**

<http://www.soumu.go.jp/main_content/000357569.pdf>

Areas of Interest <FinTech>

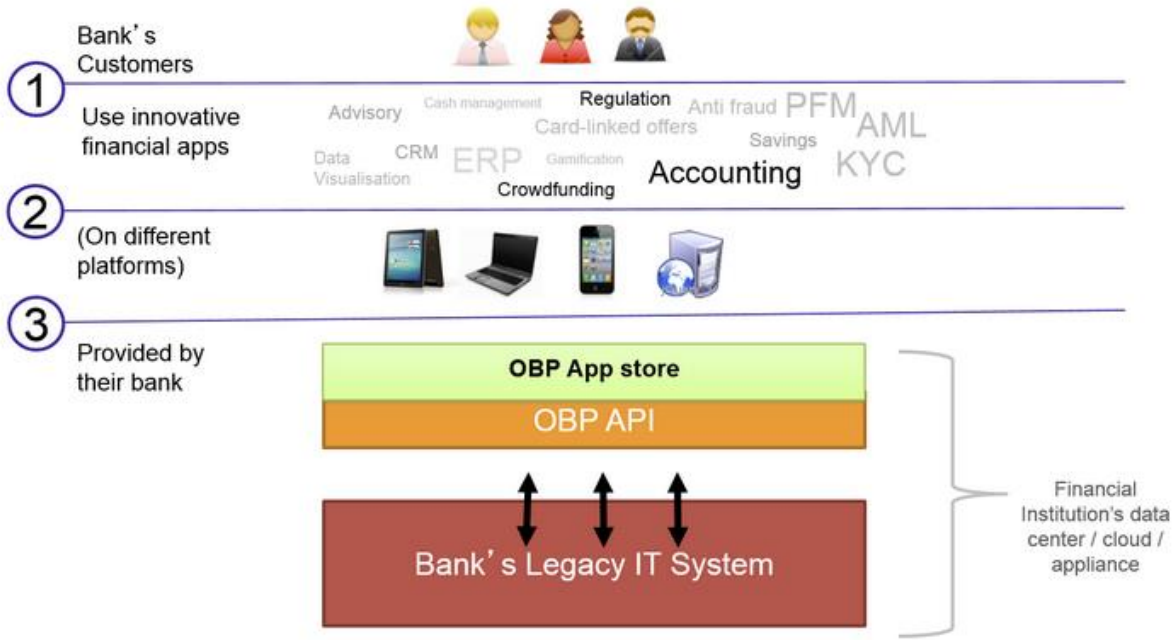
http://www.spiked-online.com/newsite/article/us_firms_and_the_dash_for_cash/14468#.VfNsiXmFOM8

Accounting/Bookkeeping, Lending/Financing, Personal Asset Management, Payments, Financial Investigation Services, VC Investment Management and Advisory Services, Crypto Currencies, Personal Investment Management, APIs for Improved Banking Infrastructures, Domestic and International Funds Transfer/Remittance Services, Personal/Consumer Online Banks.

http://sugai-webpay.hatenablog.com/entry/2014/12/11/221355

What's Lacking in Japan's FinTech (1)

- VC Investment Management and Advisory Services, such as the one offered by Addepar in the U.S.
- APIs for improved banking infrastructure, such as what Plaid in the U.S. and Open Bank Project in Germany provides



(https://openbankproject.com/for-banks/)

What's Lacking in Japan's FinTech (2)

- Domestic and international funds transfer/remittance, such as the services offered by Xoom in the U.S., WorldRemit in UK, Paym in UK, and TransferWise in UK.
- There are funds transfer/remittance services offered in Japan by large traditional banks and financial institutions. But they are costly, not user friendly, and not available 24/7.
- Personal/Consumer online banks, such as Simple Finance in the U.S.
- Online banking services offered by Japan's large traditional banks and financial institutions are complicated and have UIs that are not user friendly.

http://sugai-webpay.hatenablog.com/entry/2014/12/11/221355

Smart (Cashless) Payment Market Forecast (Japan)

	2014	2015	2020
Credit Cards (42%*)	$ 470 billion	$ 497 billion	$ 705 billion
Debit Cards (0%*)	$ 6 billion	$ 5 billion	$ 5 billion
Prepaid Cards (39%*)	$ 20 billion	$ 23 billion	$ 32 billion
Electronic Currency (131%*)	$ 40 billion	$ 49 billion	$ 113 billion
Carrier-Initiated Payment (157%*)	$ 6 billion	$ 7 billion	$ 18 billion

($=100yen)

*** Expected Growth%: from 2015 to 2020**

- Electronic Currency in this case includes prepaid public transportation cards that can also be used for shopping, etc. It also includes cellular wallets (embedded IC chips).
- Carrier-Initiated Payment means you pay water, utility, and other recurring charges to the telecom service carrier together with the telecom service fees, and the carrier will take care of the payments for you on your behalf.

<Source: Nomura Research Institute: December 2014>

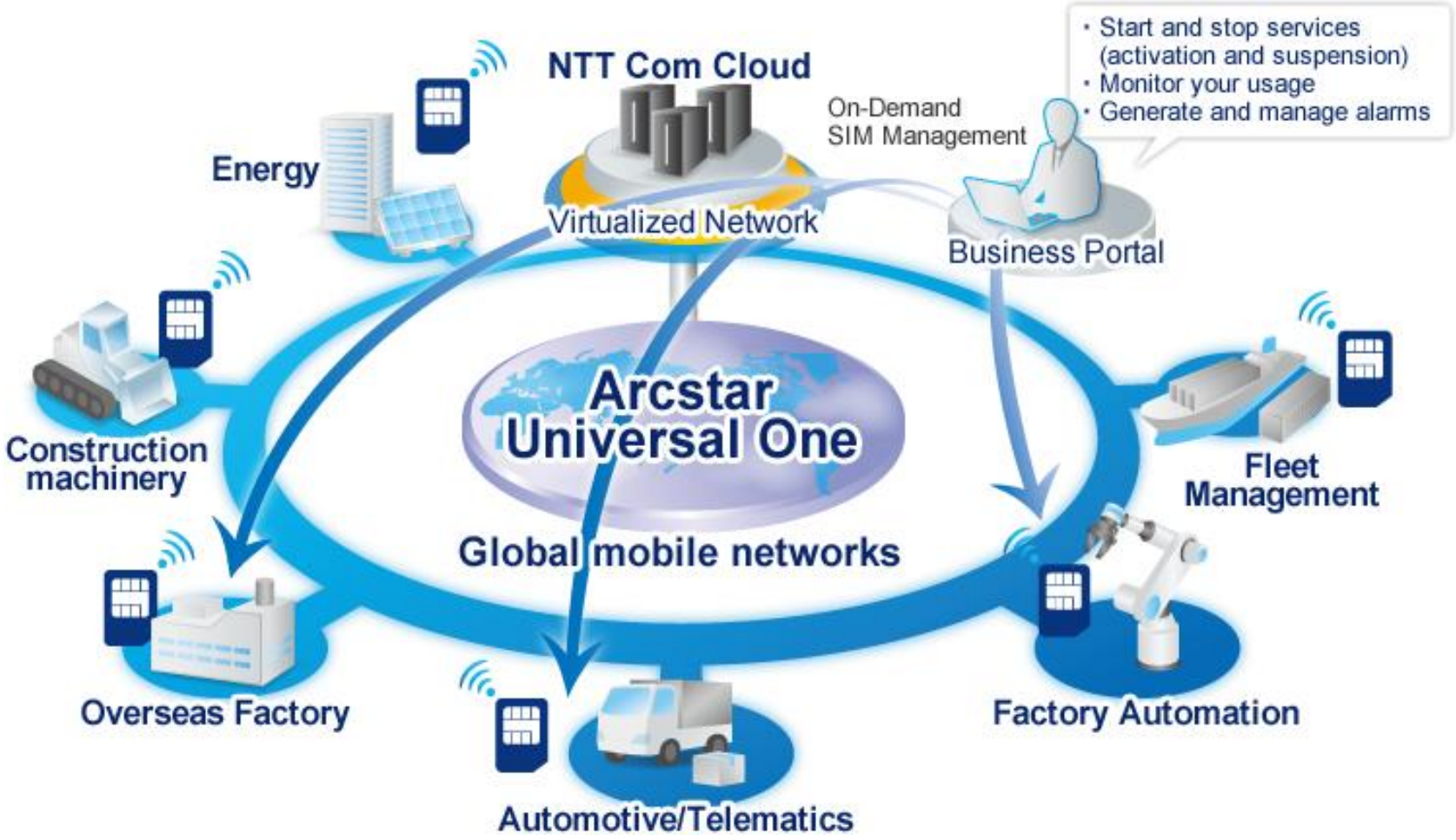
Areas of Interest <M2M and IoT>

http://www.genco.com/insights/how-is-the-internet-of-things-changing-logistics/

M2M drives IoT

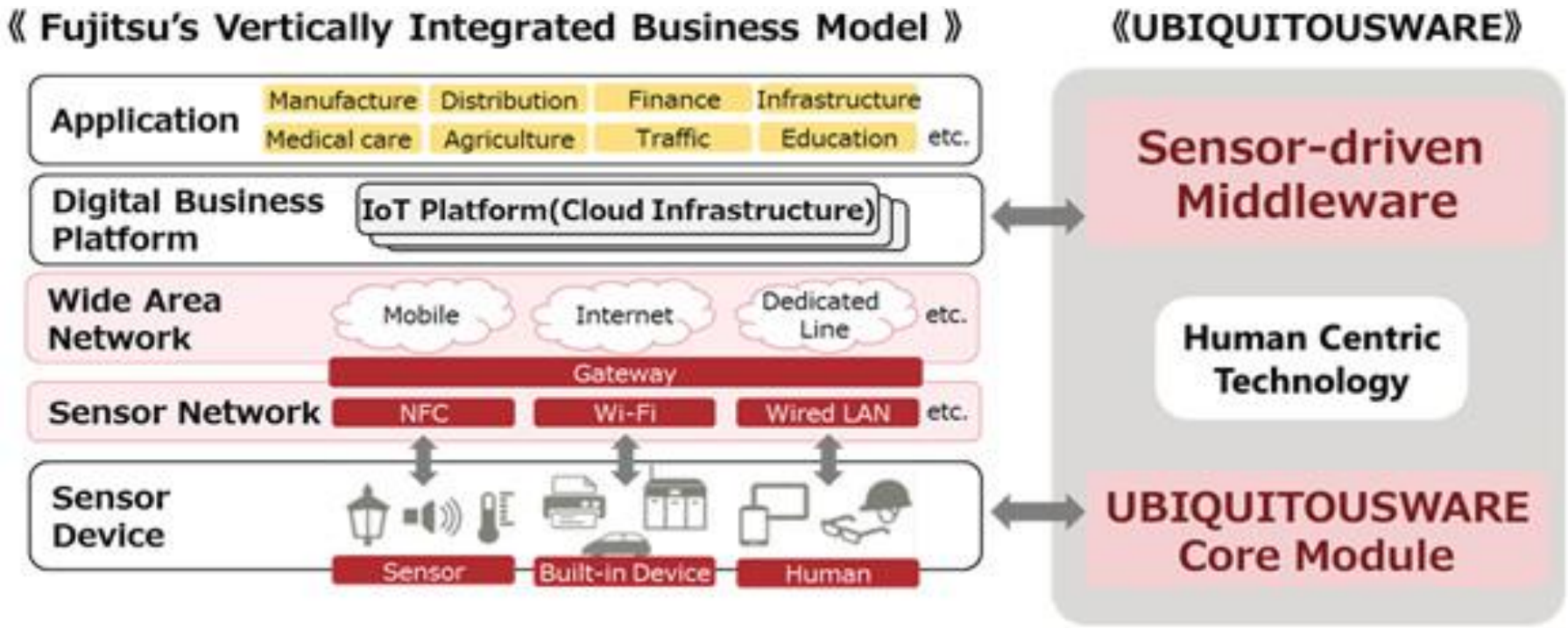
- M2M (Machine-to-Machine) is where “Machines” use network resources to communicate with remote application infrastructure for the purposes of monitoring and control, either of the “machine” itself, or the surrounding environment. (Telefonica, May 2013)
- The IoT (Internet of Things) will consist primarily of machines talking to one another (M2M), with computer-connected humans observing, analyzing and acting upon. (ZDNet, Jan 2013)

M2M/IoT Example in Japan (1)
NTT Communications



(http://www.ntt.com/aboutus_e/news/data/20150129.html)

M2M/IoT Example in Japan (2) Fujitsu UbiquitousWare



(http://www.fujitsu.com/global/about/resources/news/press-releases/2015/0511-01.html)

Overview of Japanese ICT Market

- **ICT-Related Market Forecasts (Japan)**

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($=100yen)

* **Expected Growth%: from 2015 to 2020**

** **Enterprise IT Security Market**

<Source: Nomura Research Institute: December 2014>

M2M Market Forecast in Detail (Japan)

	2014	2015	2020
Energy/Smart Grid (239%*)	$ 1.8 billion	$ 3.1 billion	$ 10.5 billion
Security (63%*)	$ 0.7 billion	$ 0.8 billion	$ 1.3 billion
Automotive (67%*)	$ 0.3 billion	$ 0.3 billion	$ 0.5 billion
Distribution/Logistics (25%*)	$ 0.3 billion	$ 0.4 billion	$ 0.5 billion
Medical/Healthcare (544%*)	$ 6.0 million	$ 9.0 million	$ 58.0 million
Others (500%*)***	$ 0.4 billion	$ 0.6 billion	$ 3.6 billion

($=100yen)

*** Expected Growth%: from 2015 to 2020**
**** Security and Surveillance**
***** Others include agricultural, manufacturing and machinery**

<Source: Nomura Research Institute: December 2014>

Expected IoT Evolution in Japan

- **2015 ~ 2016**: Distributed data processing architecture (strategic edge server placement for real-time big data analysis, etc.) vs. cloud-based data processing architecture (for environmental monitoring, etc.).
- **2017 ~ 2018**: Linkage between IoT data (data obtained through IoT sensors, etc.) and corporate data (inventory data, purchasing data, etc.)
- **2019 ~** : Linkage between your company's IoT data and other companies' IoT data for strategic collaborations.

<Source: Nomura Research Institute: December 2014>

IoT Evolution Challenges

- IoT architecture needs to become smarter to intelligently manage all of the many terminal devices (sensors, etc.) that may have varying capabilities to last (battery life, etc.) or communicate (limited range, etc.)
- Unified security throughout the IoT architecture is not feasible, as different IoT devices have different CPU capabilities, memory capacities, etc.
- As more and more “things” get connected to the network, security becomes more critical. According to the survey conducted by HP in July 2014, 70% of the respondents said they had security issues with their IoT architectures.

<Source: Nomura Research Institute: December 2014>

Areas of Interest <Data Centers>

http://www.hostnexus.com/technology/data-center-tour.php

Japan's Data Center Market - The Big Picture -

- After the Great Earthquake and Tsunami of 2011, more and more Japanese companies started using data centers for securing their business continuity.
- Some of the advantages for setting up data centers in Japan include: 1) stable government, 2) stable infrastructure, 3) availability of talented manpower, 4) large market, 5) many global companies, and, 6) gateway to Asia.
- In addition to the fact that Japan is a large market, many Japanese companies are expanding globally, which means if you can work with those companies, you may be able to expand globally with them.

Japan's Data Center Market - The Big Picture -

- Many Japanese companies would like to keep their data in Japan. Therefore if you would like them to use your data center services, you should set up your data centers in Japan.
- Many Japanese data center service users are not capable of managing the IT themselves, and would outsource their IT management to system integrators. Therefore, it may make sense for data center service providers to partner with such system integrators to expand business in Japan.

Data Center Service Providers in Japan (1)

1. Data Center Services offered by System Integrators

- These SIs provide system development and system integration services.
- They also manage and maintain their customers' IT operations using their own or someone else's data centers.
- Companies in this category include NTT Data, Nomura Research Institute (NRI), and Itochu Techno Solutions.

Data Center Service Providers in Japan (2-3)

2. Data Center Services offered by Hardware Equipment Manufacturers

• Some of the hardware equipment (servers, etc.) manufacturers in Japan are also providing their data center services. Companies in this category include Fujitsu and NEC.

3. Dedicated Data Center Service Providers

• Many of the companies in this category own their own data centers and the majority of their revenue come from providing the data center services. Companies in this category include Bit-isle and Sakura Internet.

Data Center Service Providers in Japan (4-5)

4. Data Center Services offered by Telcos

• Japanese telcos (NTT, KDDI, Softbank, etc.) are providing the data center services out of their own existing data centers, with strong network infrastructure.

5. Less Expensive Data Center Services offered by Cloud Service Providers

• Cloud service providers such as Amazon and Google are offering PaaS and IaaS services in Japan.

Types of Data Center Services in Japan

1. Housing Services (mostly by Dedicated Providers)

• Customer-owned servers housed in the data centers

2. Hosting Services (mostly by Dedicated Providers)

• Service providers leasing out servers to customers

3. System Management Services (mostly by SIs and Hardware Manufacturers)

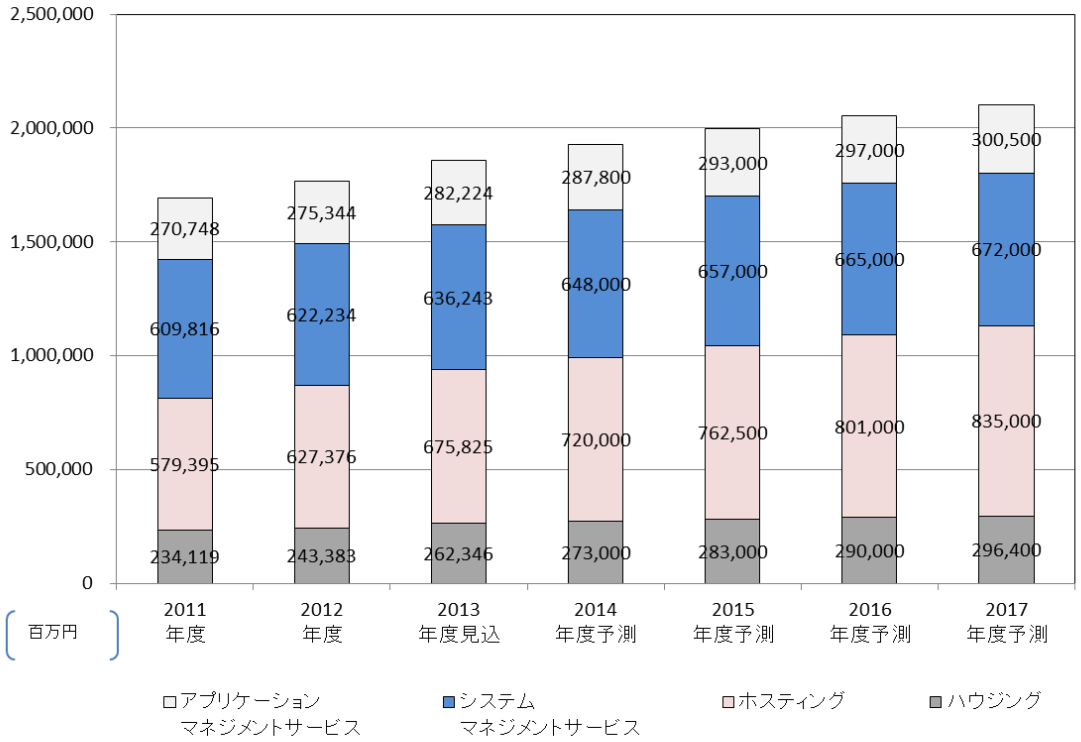
• Hardware and network management and maintenance services

4. Application Management Services (mostly by SIs and Hardware Manufacturers)

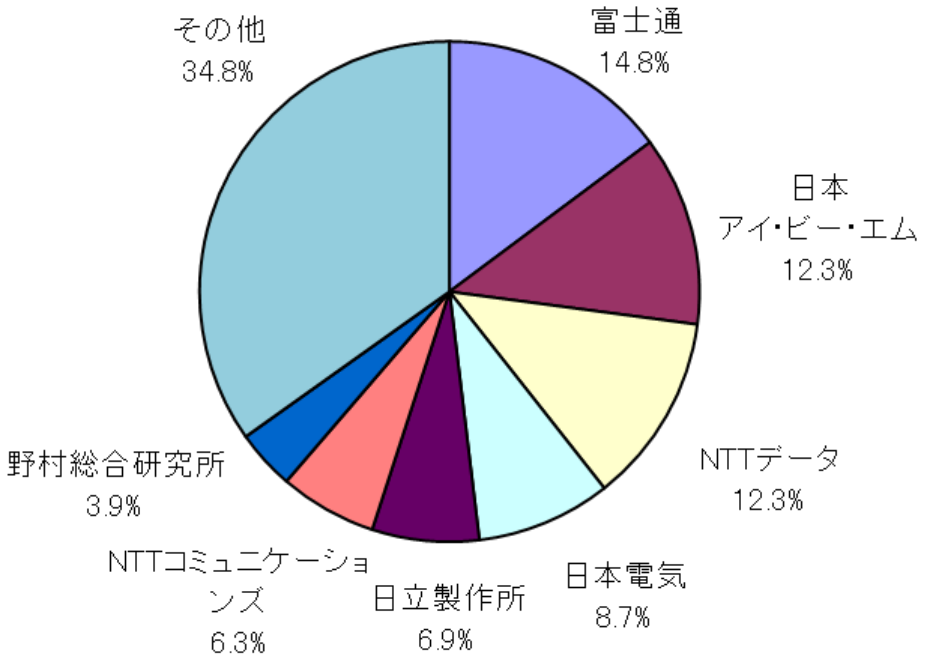
• Application management and maintenance services

5. Cloud Services (mostly by Cloud Service Providers)

• PaaS and IaaS services



- According to the Data Center Service Market Forecast in Japan by Yano Research, 2013 market size was $18.6B, which is expected to grow to over $21B in 2017 ($=100yen).
- Forecasted average annual growth % between 2011 and 2017 for hosting services is 6.3%, housing services is 4.0%, application management services is 1.8%, and system management services is 1.6%.



According to JETRO, in 2013, Fujitsu had the largest share (14.8%) in the data center service market in Japan, followed by IBM Japan (12.3%), NTT Data (12.3%), NEC (8.7%), Hitachi (6.9%), NTT Communications (6.3%) and NRI (3.9%).

Some of the Data Center Service Providers in Japan

- **NTT PC Communications**: Disaster recovery with data segmentation services, etc.
- **NTT West**: Data backup for business continuity and disaster recovery, etc.
- **Itochu Techno Solutions**: IaaS, PaaS, and cloud hosting services
- **NEC Biglobe**: Data backup for business continuity and disaster recovery, etc.
- **Hitachi Information Systems**: Resource on demand cloud services, etc.
- **Fujitsu FIP Systems**: Data backup for business continuity services, etc.
- **Sakura Internet**: Virtual private server services, IaaS, cloud hosting, etc.
- **Uniadex**: Virtualized data center services, rack housing, cloud hosting, etc.
- **Broad Center by Tokai Communications**: Colocation and managed services
- **Broadband Tower**: Cloud service (IaaS, PaaS) and hosting services
- **Kagoya Japan**: Server rental and maintenance in the Western part of Japan
- **CEC**: Server housing, colocation, IaaS, disaster recovery, etc.
- **K-Opti.com**: Disaster recovery (data backup) service, etc.
- **Kanden (Kansai Electric Power) System Solutions**: Colocation, housing, hosting, etc.
- **Kyuden (Kyushu Electric Power) Infocom**: Colocation, housing, hosting, etc.
- **SkyArch Networks**: For hybrid cloud offerings working together with AWS
- **Bit-Isle**: Colocation, server rental, and server housing services

Some of the North American Companies that have Set Up Data Centers in Japan
(including Colocation and Partnerships)

- Equinix
- Savvis/CenturyLink
- Internap
- ViaWest
- KVH
- Emerson Network Power
- Verizon
- Akamai
- OpenText
- Amazon Web Services
- Salesforce.com
- Verio
- Google
- Microsoft
- IBM
- Apple

U.S. Data Center Service Providers in Japan

1. Equinix

- 100 data centers in North America, Europe, and APAC.
- Equinix has 4 data centers in Tokyo, and one in Osaka.
- Equinix entered Japan in June 2000, currently generating about $100M ($=100yen) with about 60 employees in Japan.
- Equinix is operating successfully in the U.S., and decided to expand globally to generate more revenue.
- In Japan, Equinix strategy is to work with those Japanese companies that are expanding globally, so that Equinix can also grow globally with them.
- Equinix Japan partners include K-Opti.com and Kanden Energy Solutions.

U.S. Data Center Service Providers in Japan

2. KVH

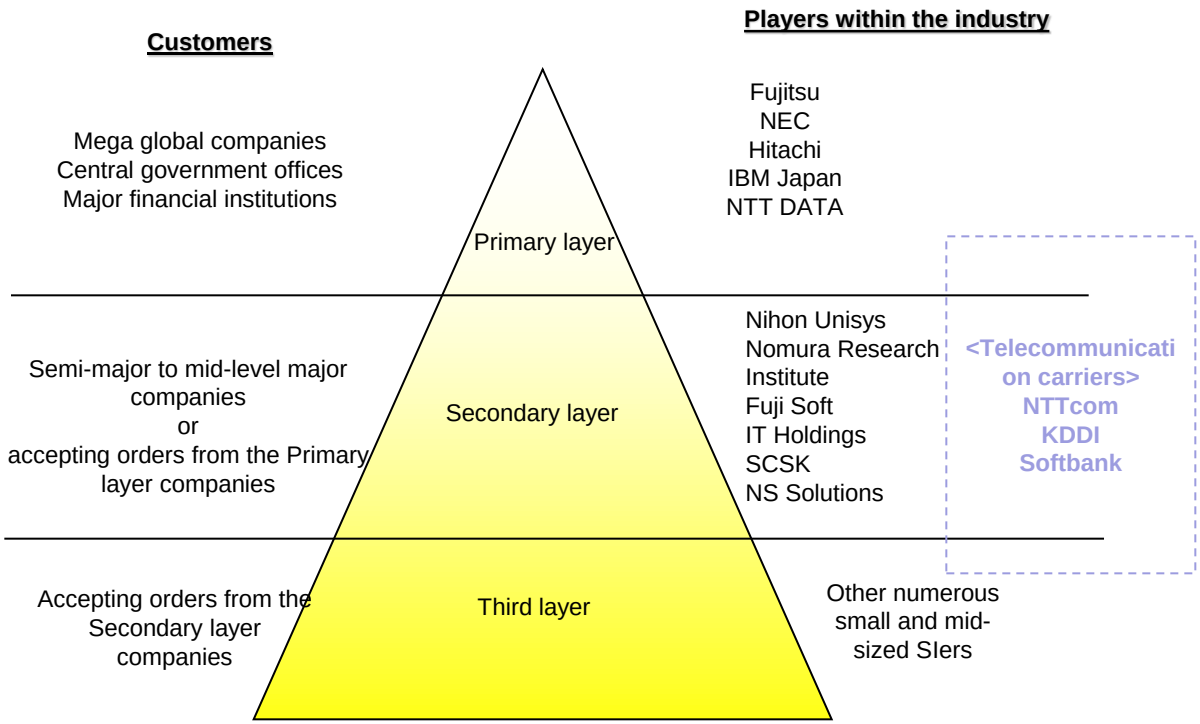
- Founded by Fidelity Investments of the U.S., now HQ'd in Tokyo.
- KVH has 4 data centers in Tokyo, and 2 in Osaka.
- KVH entered Japan in April 1999, currently generating about $200M ($=100yen) with about 550 employees in Japan.
- KVH offers IT infrastructure services including data communication, IT management and cloud services. KVH is expanding business in Asia, with data centers in Hong Kong, Singapore, and Korea.
- KVH is specialized in providing low-latency, high-security services to financial institutions.
- KVH has many bilingual staff in Japan who can serve multinational enterprises in Japan.
- KVH Japan partners include Cisco and HP.

U.S. Data Center Service Providers in Japan

3. Verizon

- Verizon is looking to expand their business in APAC.
- Verizon has a data center in Tokyo and Osaka.
- Verizon entered Japan in December 1997, currently generating about $78M ($=100yen) with about 100 employees in Japan.
- In Japan, Verizon strategy is to work with those Japanese companies that are expanding globally, so that Verizon can also grow globally with them.
- Verizon Japan partners include Accenture and VMware.

Partnerships with System Integrators

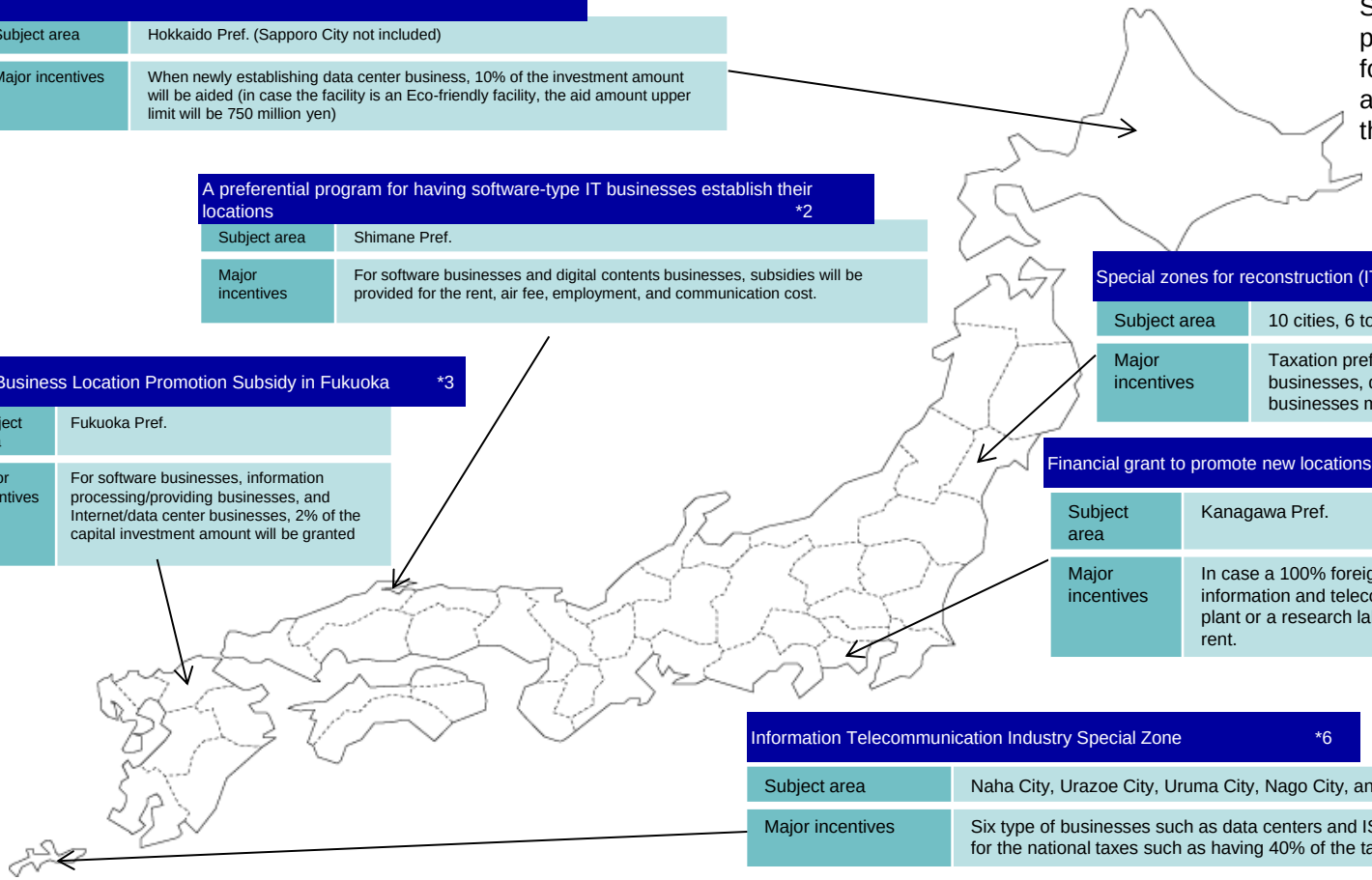


Name of company	Consolidated net sales
Hitachi, Ltd.	9,616.2 billion yen
Fujitsu Limited	4,762.4 billion yen
NEC Corporation	3,043.1 billion yen
NTT DATA Corporation	1,343.7 billion yen
Nomura Research Institute, Ltd.	385.9 billion yen
IT Holdings Corporation	346.6 billion yen
SCSK Corporation	288.2 billion yen
Nihon Unisys, Ltd.	282.6 billion yen

- Many Japanese companies outsource their IT infrastructure development, management and maintenance to system integrators. And the system integrators use their partner data centers to provide services to their customers. Fujitsu, for example, uses 62 partner data centers in addition to 4 of their own when providing the system integration services. System Integrators in Japan tend to be open to exploring new partnerships with data center service providers.

Regional Incentives for Setting Up Data Centers in Japan

[Selection criteria]
Selected major municipalities which positions IT business area as a focus area and have initiatives for actively inviting these businesses to their local areas



A subsidies system for promoting the establishment of business locations based on Hokkaido Code on Industrial Promotion *1

Subject area	Hokkaido Pref. (Sapporo City not included)
Major incentives	When newly establishing data center business, 10% of the investment amount will be aided (in case the facility is an Eco-friendly facility, the aid amount upper limit will be 750 million yen)

A preferential program for having software-type IT businesses establish their locations *2

Subject area	Shimane Pref.
Major incentives	For software businesses and digital contents businesses, subsidies will be provided for the rent, air fee, employment, and communication cost.

The Business Location Promotion Subsidy in Fukuoka *3

Subject area	Fukuoka Pref.
Major incentives	For software businesses, information processing/providing businesses, and Internet/data center businesses, 2% of the capital investment amount will be granted

Special zones for reconstruction (IT industry version) *4

Subject area	10 cities, 6 towns, and 1 village in Miyagi Pref.
Major incentives	Taxation preferential measures will be applied if software businesses, data centers, and digital contents-related businesses make new investments, etc.

Financial grant to promote new locations of foreign businesses *5

Subject area	Kanagawa Pref.
Major incentives	In case a 100% foreign-affiliated company (in the manufacturing or information and telecommunication industry) newly establishes a plant or a research lab, subsidies will be provided for the monthly rent.

Information Telecommunication Industry Special Zone *6

Subject area	Naha City, Urazoe City, Uruma City, Nago City, and Ginoza City in Okinawa Pref.
Major incentives	Six type of businesses such as data centers and ISP, etc., can have the preferential treatment for the national taxes such as having 40% of the taxable income for corporate tax deducted, etc.

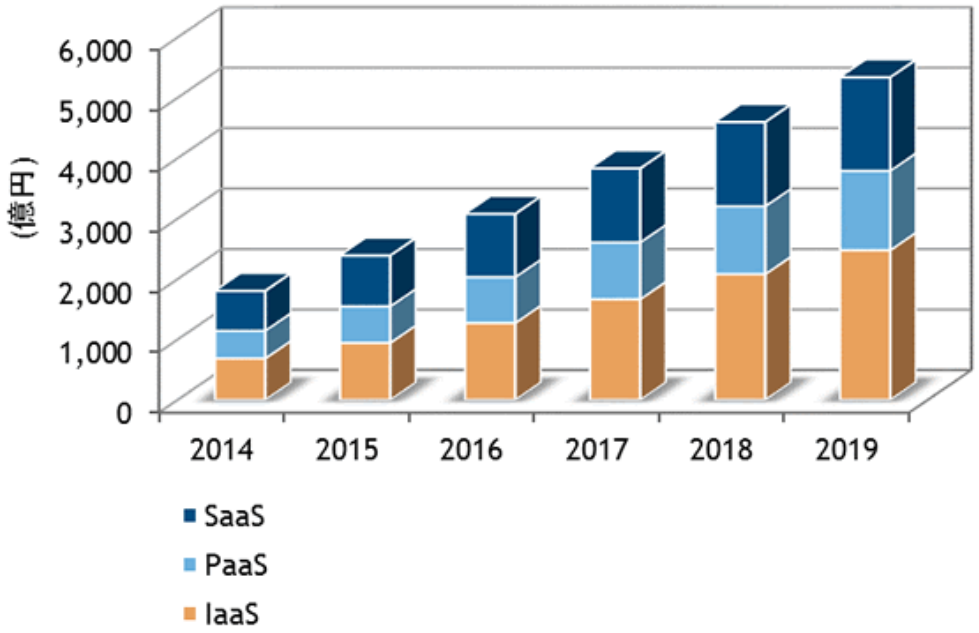
Among the municipalities which position IT industry as a focus area and invite these businesses are Hokkaido, Okinawa, and Shimane, etc.

Source *1 : Web site of Hokkaido government (http://www.pref.hokkaido.lg.jp/kz/ssg/sgr/yugu/sinhojoseido.htm)
*2: Shimane Prefecture's location information Web site for IT businesses (http://www.shimane-style.com/subsidy/)
*3: Fukuoka Prefecture's business location information Web site (http://www.kigyorichi.pref.fukuoka.lg.jp/preferentiall/)
*4: Web site of Miyagi Prefecture government (http://www.pref.miyagi.jp/soshiki/jyoho-i/hukkoutokku-it.html)
*5: Web site of Kanagawa Prefecture government (http://www.pref.kanagawa.jp/cnt/f470403/)
*6: Web site of Okinawa Prefecture government (http://www.pref.okinawa.jp/tokku/about/special_economic-zone/communications/index.html)

Areas of Interest <Cloud Computing >

Public Cloud Market Size Forecast (Japan)

- 2014: $1.80 Billion
- 2017: $3.70 Billion
- 2019: $5.30 Billion ($=100yen)



<Source: IDC Japan, January 2015>

Private Cloud Market Size Forecast (Japan)

- According to IDC Japan on Sep 9, 2015, Japan's private cloud market size was estimated to be about $6.2 billion, which increased by 42.4% compared to 2013.
- Japan's cloud market size is forecasted to grow to about $18.6 billion in 2019.
- IDC Japan includes in the private cloud category 1) On-premise private cloud, 2) Hosted/Dedicated private cloud, and 3) community cloud services.
- IDC Japan predicts that on-premise private cloud will decrease, and hosted/dedicated private cloud and community cloud services will increase in Japan.

<Source: http://cloud.watch.impress.co.jp/docs/news/20150909_720307.html>

Some of the Cloud Services in Japan

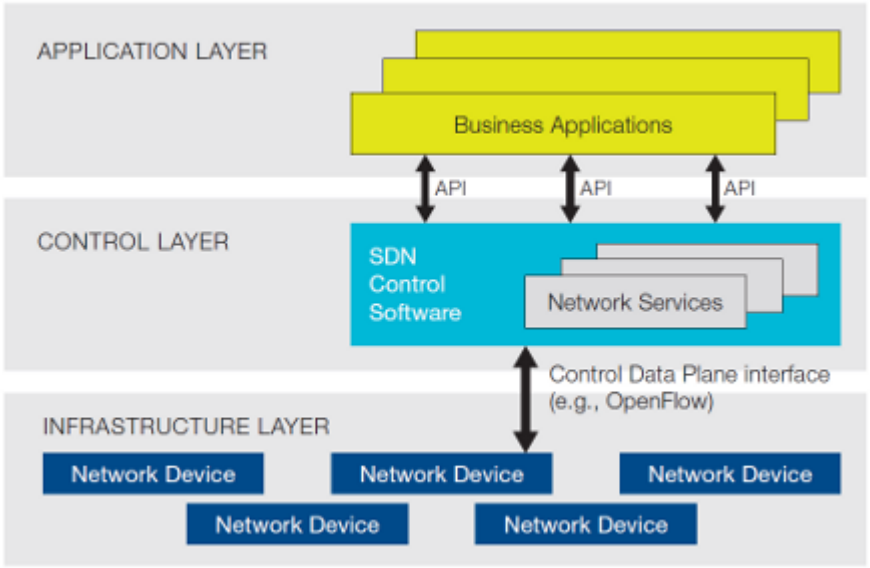
- Salesforce.com, Force.com
- Google Apps, App Engine
- Yahoo Cloud Computing & Data Infrastructure Service
- Amazon Web Services (AWS)
- Microsoft Windows Azure
- IBM Bluemix (PaaS), SoftLayer Cloud, etc.
- Nihon Unisys ICT Services
- NTT Communications Biz Hosting
- Sony Bit Drive Managed Intranet for SMB
- SoftBank White Cloud (Partnered with Google to provide Apps on White Cloud)
- KDDI Mobile Cloud Services (Partnered with NEC)
- Nifty IaaS for Enterprise Cloud Hosting
- IIJ GIO (IaaS, PaaS, SaaS at all levels of enterprise infrastructure)
- Teijin InfoCom Virtual Hosting Service
- NEC / Biglobe Mobile Cloud Services, Corporate Book Keeping Solutions, etc.
- Fujitsu Trusted Service Platform, IaaS On Demand Virtual System Service, etc.

About Cloud Services in Japan

- Private cloud market (on-premise private cloud, hosted/dedicated private cloud, and community cloud services) is much larger than public cloud market (SaaS, PaaS, IaaS).
- Many Japanese companies would look into using the cloud services, when their existing IT systems become obsolete and need to be replaced.
- According to IDC Japan, in 2014, 58% of the private cloud users in Japan was using on-premise cloud. This will change, however, and less than 50% of the private cloud users in Japan in 2016 will be using on-premise cloud.

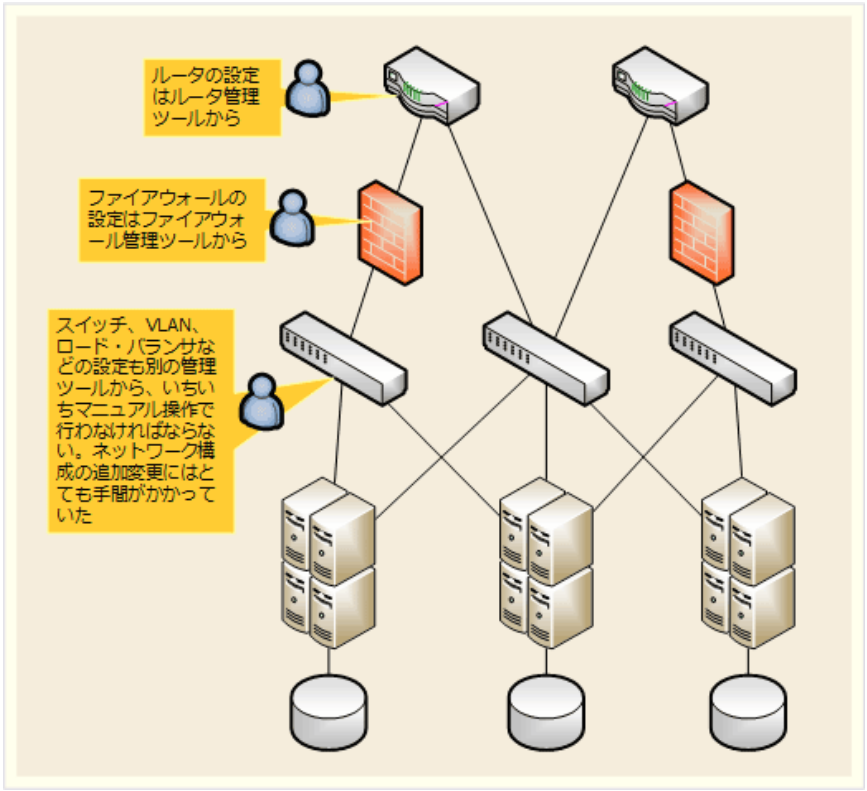
<Source: http://cloud.watch.impress.co.jp/docs/news/20150909_720307.html>

Areas of Interest <Network and SDx>

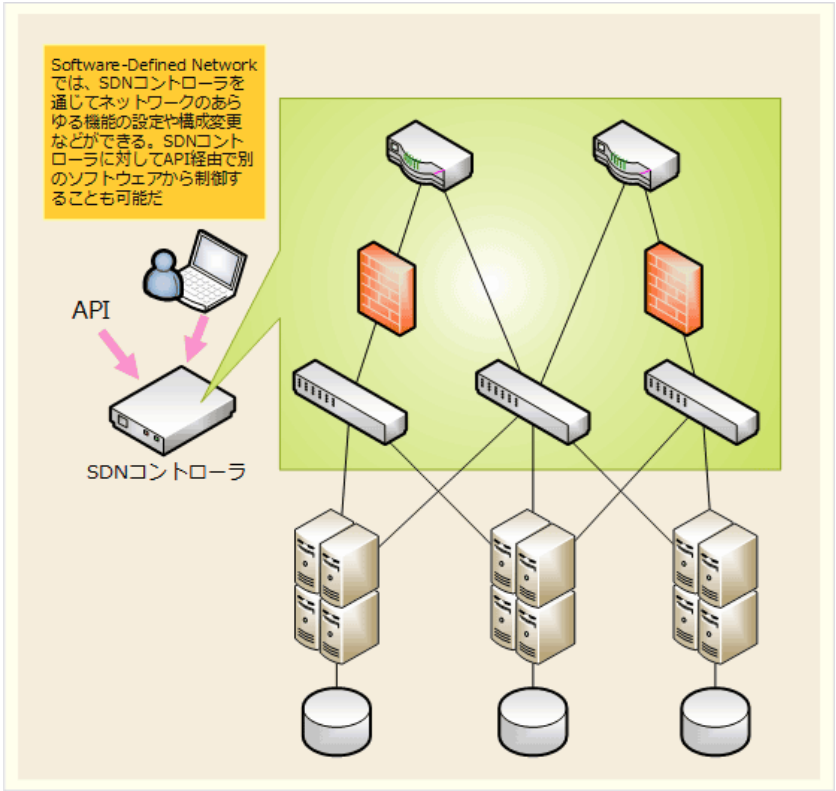


http://www.networkcomputing.com/networking/searching-for-an-sdn-definition-what-is-software-defined-networking/a/d-id/1233625?

Legacy Network and SDN



Legacy Network



Basic SDN Concept

<Source: http://www.atmarkit.co.jp/ait/articles/1304/08/news098.html >

SDN and NFV

- SDN is an approach to networking that separates the control of the network from the data forwarding. SDN centralizes this control logic to simplify and automate the orchestration of the distributed network.
- NFV (Network Function Virtualization) creates a logical, virtual network, by separating network functions (load balancing, firewalls, intrusion detection, etc.) from the hardware that deliver them.
- SDN is the architecture that enables NFV.
- SDN can be used to achieve NFV through direct fabric programming or the creation of direct paths through the network fabric (virtual and physical) to isolate private networks from one another. However, this form of NFV has been less popular than network virtualization using overlays.

(Source: SDx Central 2014)

SDN Use Cases

- Public & Private cloud
- WAN Traffic Optimization
- Dynamic WAN Interconnects and Re-Routes,
- Automated Network Management
- Service Chaining
- Network Analytics
- Automated Malware Quarantine,
- Granular Flow-based DDoS Mitigation

(http://connectedtechnbiz.wordpress.com/2014/09/27/how-is-the-sdn-landscape-shaping-up-part-2/)

From SDN/NFV to SDx

- SDx (Software Defined Everything) includes software-defined networking (SDN), network function virtualization (NFV), software-defined computing, software-defined security, software-defined data centers (SDDC), software-defined storage (SDS) and software-defined storage networks.
- *"As network operators realize the impact of SDN on other parts of their infrastructures, we hear more conversation about SDx. For network operators, this means they should think more broadly than just networking when making SDN decisions. For vendors, this means they need to learn to explain how your SDN solution fits in a broader SDx context." (Matthew Palmer, SDx Central)*

SDx Market in Japan

1. SDDC (Software Defined Data Center) Market

   2014: $51.78M → 2019: $460.14M

2. Telco-related SDN Market

   2019: $554M

3. Telco-related NFV Market

   2019: $754M

<http://www.idcjapan.co.jp/Press/Current/20150331Apr.html>

Expected SDx Evolution in Japan

- **2014 ~ 2015**: Different technologies and solutions exist in chaotic mix. It started out with SDN in 2013, and we started hearing SDS (Software Defined Storage) and SDDC (Software Defined Data Center) in 2014.
- **2016 ~ 2017**: Network architectures will be built using multiple different SDx solutions (SDN, SDS, SDDC, etc.). SDx will be used in the critical network infrastructure. Orchestration between on-premise and public cloud networks will become seamless.
- **2018 ~** : SDx technologies will become mature and the users will be able to choose the appropriate SDx products from multiple different vendors, and combine them with standardized controllers, etc.

<Source: Nomura Research Institute: December 2014>

SDx Evolution Challenges

- Better security needed especially for SDx controllers.
- Better record keeping (log management) of all the accesses to the SDx systems needed for mandatory system audits, compliances, etc.
- Better orchestration of hardware (often supplied by multiple different vendors) and integration of API needed for a complete system control without creating any security holes.

<Source: Nomura Research Institute: December 2014>

Areas of Interest <Big Data>

https://twitter.com/datasciencectrl/status/551885906962317312

Big Data in Japan

→ **According to the 2014 survey by NRI in Japan (810 total responses), Big Data was not utilized much at all.**

- Fully Utilizing Big Data : 7.3%
- Utilization Trial Stages : 3.2%
- Actively Considering to Utilize : 2.6%
- Gathering Info about Big Data Utilization : 25.7%
- Decided Not to Utilize Big Data : 6.2%
- No Actions related to Big Data : 53.8%
- Do not know what Big Data is : 1.2%

<Source: Nomura Research Institute: December 2014>

Big Data in Japan

→% of people fully utilizing big data or on utilization trial stages are:

- In Large Companies (over 1,000 employees) : 19.6%
- In Midsize Companies (300~999 employees) : 5.9%
- In Small Companies (1~299 employees) : 2.2%

→% of people with no actions related to big data are:

- In Large Companies (over 1,000 employees) : 38.7%
- In Midsize Companies (300~999 employees) : 63.5%
- In Small Companies (1~299 employees) : 65.5%

<Source: Nomura Research Institute: December 2014>

Big Data in Japan

→ **Those who are actively analyzing big data in Japan, they are doing so for:**

- CRM Data Analysis : 61.3%
- Analysis of Sensor Data from Factory Machineries, etc. : 23.6%
- Analysis of Data obtained from SNS (Twitter, Facebook, etc.) : 17.0%
- Call Center Voice Data Management : 17.0%
- GPS and Other Location Data Management : 17.0%
- Monitoring Employee Email Log and Sales Reports : 16.0%
- POS (Point of Sale) Data Analysis : 15.1%
- Cargo Tracking and other Logistics Data Management : 14.2%
- Analysis of Web Log and Click Stream Data from EC Websites : 12.3%
- Analysis of Demographic Data, Psychographic Data : 5.7%

<Source: Nomura Research Institute: December 2014>

Big Data in Japan

→ **Those who are actively considering to utilize big data in Japan, they are looking to do so for:**

- CRM Data Analysis : 21.7%
- Analysis of Web Log and Click Stream Data from EC Websites : 17.9%
- Cargo Tracking and other Logistics Data Management : 17.9%
- Analysis of Demographic Data, Psychographic Data : 17.0%
- Call Center Voice Data Management : 17.0%
- GPS and Other Location Data Management : 17.0%
- Analysis of Data obtained from SNS (Twitter, Facebook, etc.) : 11.3%
- POS (Point of Sale) Data Analysis : 11.3%
- Analysis of Sensor Data from Factory Machineries, etc. : 10.4%
- Monitoring Employee Email Log and Sales Reports : 9.4%

<Source: Nomura Research Institute: December 2014>

Big Data in Japan

→ **Those who are actively utilizing big data, on utilization trial stages, and actively considering to utilize big data in Japan, they see the following as difficulties:**

- Lack of personnel with data analytic skills (data scientists) : 60.4%
- Lack of personnel who can lead big data projects : 47.9%
- Not easy to measure ROI : 27.1%
- Not clear which corporate division takes initiative : 24.0%
- Not easy to set up infrastructure for collecting necessary data : 18.8%
- Not enough budget : 13.5%
- Not easy for data analysis div and operations div to collaborate : 12.5%
- Upper management not interested : 10.4%
- Not easy to go around Japanese privacy laws : 10.4%

<Source: Nomura Research Institute: December 2014>

Areas of Interest <IT Security>

http://www.valiantsolutions.com/information_security.php

IT Security Solutions

- Firewalls, VPN, UTM (Unified Threat Management), IDS (Intrusion Detection Systems), IPS (Intrusion Prevention Systems), Vulnerability Analysis, Access Control and Authentication, Filtering, Anti-Virus, Anti-Spyware, Anti-Phishing, Data Leakage Detection, Encryption, Email Security, etc.
- Cloud Security, BYOD Security, Data Center Security, and the Security against Targeted Attacks, DDoS (Distributed Denial of Service) and APT (Advanced Persistent Threats) are in great demand in the Japanese market.

IT Security Market Forecast (Japan)

	2014	2015	2020
IT Security Tools (14%*)	$ 2.7 billion	$ 2.8 billion	$ 3.2 billion
IT Security Services (52%*)	$ 2.5 billion	$ 2.7 billion	$ 4.1 billion
Total (33%*)	$ 5.2 billion	$ 5.5 billion	$ 7.3 billion

($=100yen)

* **Expected Growth%: from 2015 to 2020**

- IT Security Tools include hardware appliances and on-premise software solutions.
- IT Security Services include IT security solutions that are provided as cloud (SaaS, etc.) and those that are provided as outsourced services.

<Source: Nomura Research Institute: December 2014>

Japan's IT Security Market (1)

- Japan's IT security market is forecasted to grow from $4.9 billion in 2013 to over $7 billion in 2020.
- Many of the data leakages happened in Japan lately were not caused by the attacks from the outside, but were the results of internal mishandling and mismanagement of such critical data.

<Source: Nomura Research Institute: December 2014>

Japan's IT Security Market (2)

- Japanese companies need to not only tighten their internal security by themselves, but with their affiliates and all the other companies in their larger corporate network.
- IT security vendors are expected to provide solutions that will allow their customers to create such strategic and extensive security architecture.

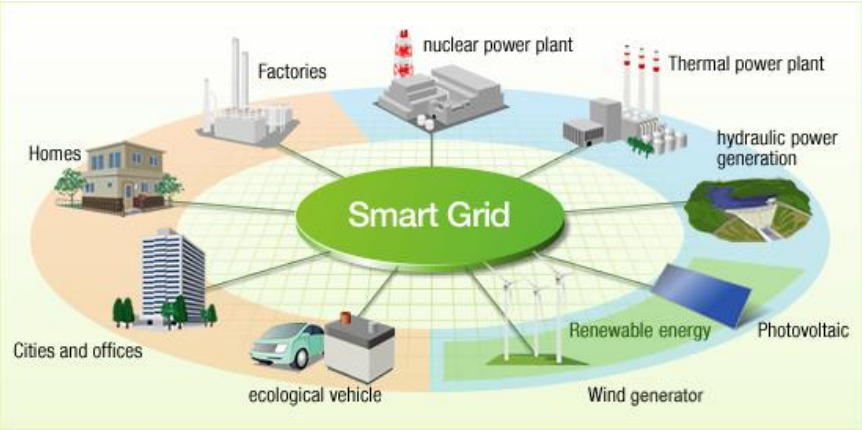
<Source: Nomura Research Institute: December 2014>

Japan's IT Security Market (3)

- Targeted attacks in Japan are becoming more complex and are difficult to detect before coming into the corporate systems. Attacks are also coming into smart devices and embedded devices.
- Effective network monitoring and management tools are needed to deal with such security problems, but the Japanese companies sometimes lack the resources (operators) that are capable of handling such tools. IT security vendors are therefore expected to provide services to help the companies handle and utilize such network monitoring and management tools.

<Source: Nomura Research Institute: December 2014>

Areas of Interest
<Smart Grid and Green IT>



http://www.hitachi.com/environment/showcase/solution/energy/smartgrid.html

Smart Grid in Japan

- After the great earthquake of March 2011, people became more aware of the importance of smart energy generation and management.
- Technologies and solutions for managing the clean, but often unstable and unpredictable renewable energies (solar, wind, etc.) are much needed.
- Ideas of smart grid have been expanded from power generation and distribution, to smart homes, smart cars and IoT in general.
- Crossover collaborations have become active between companies domestically (Mitsubishi Heavy Industry and Hitachi, etc.) and internationally (Toshiba and Landis+Gyr, Osaki and SMB United, Toko and WGN, Fuji Electric and GE, Panasonic and Itron, Mitsubishi Electric and Echelon, etc.).

Smart Grid in Japan (Major Players)

1. Power Generation:

Mitsubishi Heavy Industry, Hitachi, Mitsubishi Electric, GE, Meidensha, Toshiba, Fuji Electric, IHI, Siemens, etc.

2. Power Distributions:

Hitachi, Toshiba, Mitsubishi Electric, Fuji Electric, Meidensha, Toko, GE, Siemens, ABB (Switzerland), etc.

3. Smart Meters:

SMB United (Singapore), Osaki, Toshiba (Landis+Gyr), Enegate (Kansai Electric), Toko (with WGN of the USA), Fuji Electric, Mitsubishi Electric (with Echelon), Panasonic (with Itron), GE, etc.

4. Batteries:

Panasonic, Toshiba, GS Yuasa, Eliiy Power, etc.

5. Information Technologies surrounding Smart Grid:

IBM Japan, NTT, Fujitsu, Hitachi, Toshiba, NEC, etc.

<Source: 日経業界地図2016年版、日本経済新聞出版社>

Japan's Smart City Project

- *Joint Project between azbil, E-Solutions, Itochu, SAP, NEC, NTT Communications, LG, Kaneka, Kawasaki Heavy Industry, Kokusai Kogyo, JX Nippon Oil & Energy, Shimizu, Sharp, Sumitomo, Sekisui House, Seven and i Holdings, Tsuneishi, Tokyo Gas, Toshiba, Toppan, Nikken, HP, Hitachi, Future Design, Mitsui, etc.*

(http://www.smartcity-planning.co.jp/participants/index.html)

Japan's Smart City Project

- *For the Development of Effective Energy Management System*
- *For the Development of Smart Building (which does energy control and management by itself)*
- *For the Development of Smart Home with Effective Demand Response*
- *For the Development of Electric Vehicle and Intelligent Transport Systems*
- *For the Development of Smart Power Supply (which effectively supplies under different weather conditions, varied demand, etc.)*

International Smart Grid Expo 2016 (March 02 ~ 04, 2016, Tokyo)

1. Electricity, Energy Devices and Infrastructures:

Superconductive Cables, Voltage Regulators, Large-Size Storage Batteries, Electricity Distribution related Devices, AC/DC Hybrid Wiring Systems, Wind Power Generation Systems, Solar Heat Utilization Systems, Gas Engine Cogeneration Systems, Heat Pump Systems, Water Heaters, Power Conditioners, Inverters, Rapid Chargers, Charge Stands, Switches, Photovoltaic Power Generation Systems, Solar Thermal Power Generation Systems, Fuel Cell Cogeneration Systems, Gas Turbine Cogeneration Systems, Thermostats, etc.

2. IT, Communication Devices and Infrastructures:

Smart Meters, Communication Units, Home Wireless Systems, HAN (Home Area Network) related Devices, Displays, Control Panels, Monitoring & Security Cameras, Electricity Meter IC, Optical Fiber, Wireless Radio Devices (Narrow/Broad Range), Intelligent Home Appliances, Sensors, etc.

3. ICT Control Services:

Grid Electricity Distribution and Storage Systems, Various Security Systems, Mobile Data Control Services, Other IT systems and services, Building and Home Network Systems, Electricity Usage Information Services, Various Software for Electricity Control

Areas of Interest
<Medical and Healthcare IT>

http://earth911.com/recycling/hazardous/medical-sharps/

Why Medical and Healthcare IT in Japan?

1. Rising Healthcare Costs:

   - 2008: $348 Billion
   - 2009: $353 Billion
   - 2012: $392 Billion
   - 2020: $472 Billion (Forecast)
   - 2025: $523 Billion (Forecast)

($=100yen)

<Source: http://www.soumu.go.jp/johotsusintokei/whitepaper/ja/h25/html/nc123120.html >

2. Growing elderly population

3. More people interested in utilizing IT medical/healthcare resources

Japan's Aging Population

- Japanese and non-Japanese companies are looking at Japan to develop medical and healthcare technologies and products for the aging population (Japan as the initial test market).
- Apple built an R&D in Yokohama, GE and Medtronic to build R&D in Japan.
- Senior care solutions in the context of IoT.
- Large companies to acquire medical and healthcare venture startups - Not so many good startups in Japan.

Medical Information Management Systems in Japan - Areas that are covered -

- Electronic Medical Records
- Medical Services Ordering Systems
- Medical Accounting and Book Keeping
- Medical Picture Archiving and Communication Systems (PACS)
- Radiological Information Systems (RIS)
- Clinical Examination Systems
- Nursing Support
- Hospital Building Management
- Logistics and Distribution Management
- Physical Checkups
- Dental Care, etc.

Medical Information Management Systems in Japan - Product Examples -

- Fujitsu MedicalBRAINS
- OSG Medical Information Management System
- MERIS by Toho Medical Supply
- Aso-Group's Medical Information Management System
- Well Net Link by Asahikawa Medical College
- Media Labo's Medical Information Management System
- Medical Information Management System by Sakura KCS / Fujitsu Shikoku Systems

Areas of Interest
<Telecom Acquisitions and Partnerships>

Telecom Acquisitions and Partnerships

NTT Acquisitions and Partnerships

- ***OpSource*** (USA): SaaS Enabler
- ***Ooyala*** (USA): Online Video Platform
- ***Eye-Fi*** (USA): Wireless SD Cards for Video/Photo Uploading
- ***Exact Target / CoTweet*** (USA): Social Media and Email Marketing
- ***Vigilent*** (USA): Energy Management for Data Centers
- ***Dimension Data*** (South Africa): IT Service Provider
- ***Keane*** (USA): Boston-based IT Services
- ***Intelligroup*** (USA): IT Consulting and Outsourcing
- ***Ubitus*** (Taiwan): Software Platform Provider
- ***Kongregate*** (USA): Online Games
- ***Cloudera*** (USA): Hadoop Enabler
- ***Virtela*** (USA): Cloud Networking Provider
- ***RagingWire*** (USA): Data Center Services

Telecom Acquisitions and Partnerships

SoftBank Acquisitions and Partnerships

- ***Yahoo*** (USA)
- ***Sprint*** (USA)
- ***Ustream*** (USA): Interactive Broadcasting Platform
- ***Twitter*** (USA)
- ***Zynga*** (USA): Social Network Game Developer
- ***DeNA*** (Japan): SNS
- ***GungHo*** (Japan): Online Games
- ***RockYou*** (USA): Social Network Game Developer
- ***RenRen*** (China): Chinese Social Networking Site
- ***Alibaba*** (China): Online Marketplace
- ***Hootsuite/Seesmic*** (USA): SNS Management Tool
- ***Supercell*** (Finland): Mobile Game Developer
- ***Brightstar*** (USA): Mobile Device Wholesaler

Telecom Acquisitions and Partnerships

KDDI Acquisitions and Partnerships

- ***Skype*** (USA/Luxemburg)
- ***GREE*** (Japan): SNS
- ***Jupiter Telecom*** (Japan): Cable TV Service Provider
- ***Tonchi.com*** (Japan): Augmented Reality Application
- ***Rekoo Media*** (China): Social Game Developer
- ***DMX*** (Hong Kong): Digital Media Software and Solutions
- ***Black Net*** (Bangladesh): Internet Service Provider
- ***Twilio*** (USA): Cloud Communication, Voice API
- ***Telenor Connexion*** (Sweden): M2M Service Provider
- ***Microfinance International*** (USA): Solution Provider focused on Financial Institutions
- ***ScaleOut*** (Japan): Big Data Analytics
- ***LUXA*** (Japan): E-Commerce (Time-Limited Sale of Name Brand Products)

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ICT Companies and JETRO

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Japan External Trade Organization

ICT Companies and JETRO

→ Following JETRO Clients (North American ICT Companies) have opened up offices in Japan with JETRO's Help Lately

- Acquisio: High-powered performance media solution for digital marketers (Speaker at JETRO Canada seminars 2015)
- Adroll: Marketing platform for targeted ads
- Audiokinetic: Audio pipeline solution (middleware) for game developers and publishers
- Averna: RF, broadband, and audio/video testing services and equipment
- Bazaarvoice: Customer feedback management platform for e-commerce merchants
- DiCentral: Electronic data interchange for supply chain management (Speaker at JETRO Texas seminars 2015)
- IMS Research: Market research and consultancy services for the global electronics industry (recently acquired by IHS)

JETRO
Japan External Trade Organization

ICT Companies and JETRO

→ Following JETRO Clients (North American ICT Companies) have opened up offices in Japan with JETRO's Help Lately

- Kurion: Nuclear and hazardous waste management
- Language Cloud: Cloud tools and analytics for language instructions
- Luminex: Biological testing technologies
- Neonode: Optical touch screen solution for handheld devices, Swedish HQ
- Nutanix: Server/Storage appliance
- OIA Global: Transportation and logistics management solution
- Redknee Solutions: Monetization and subscriber management platform (cloud-based and on-premise)
- Responsys: Marketing tools and solutions provided by cloud
- Service Source International: Cloud-based recurring revenue management platform

JETRO
Japan External Trade Organization

ICT Companies and JETRO

→ Following JETRO Clients (North American ICT Companies) have opened up offices in Japan with JETRO's Help Lately

- Sigma Systems: Unified Catalog-driven Business Support Systems / Operating Support Systems products for telecom, media and high-tech companies
- Startech.com: Manufacturer of computer parts, cables, audio-video devices and KVM/server management products
- Steel Wedge: Cloud-based sales and operations planning solutions
- Switch Lighting: Cost-effective long-lasting LED light bulbs
- Tanium: Endpoint security and systems management
- ViXS Systems: Global fabless semiconductor company
- Wireless Glue Networks: M2M energy management software platform

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ICT Companies and JETRO

→ Companies that are likely to succeed in Japan have products that are

- *Technologically Advanced*
- *Unique*
- *Dependable*
- *Flexible*
- *Scalable*
- *Compatible*
- *Adaptable*
- *With Cost Advantages*
- *Easy to Use*
- *Customizable*
- *With Japanese Interface*

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