Information & Telecommunication Systems Business Information Meeting
Effectively Utilizing Big Data

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Information &
Telecommunication Systems Business
Information Meeting
Effectively Utilizing Big Data

[ Contents ]

1. Big Data and Effective Use in Society
2. Hitachi’s Strengths and Basic Policy
3. Hitachi Data Systems’ Initiatives
4. Conclusion
1-1. Today’s Information Meeting

Fields of Future Focus (Announced in June 2011)

Leading company in Social Innovation Business

Global company recognized for its strong products and services

- Strengthen domestic businesses
- Expand global businesses

Fields of future focus

- Fused businesses
- Highly reliable cloud businesses
- Businesses for effectively utilizing Big Data

Today’s Information meeting
1-2. Society is Overflowing with Beneficial “Data”

**Big Data**

**Machine-originated data**
- Electricity meters
- Transportation information
- Communications logs
- SNS
- Twittering
- Movie, picture, voice and other content download
- Logistics tracking
- Environment and weather data
- Facility monitoring
- IC card utilization

**People-originated data**
- Smart phones
- GPS
- Video surveillance
- Twittering
- Mail and office documents
- Diagnostic images and electronic patient records
- People movement
- Internet-based purchasing
- Back office business data (Production management/inventory management, etc.)

- Transportation information
- SNS
- Movie, picture, voice and other content download
- Logistics tracking
- Environment and weather data
- Facility monitoring
- IC card utilization

**Personnel**
1-3. Increasing Data Volumes and Diversification

- From Peta/Exa Byte to Zetta Byte Era of all data in the world
- 80% of all data is unstructured
1-4. The Big Data Era Has Come!

**Future** Spread utilizing Big Data related Business

- Apply utilizing Big Data included unstructured Data to the actual business
- Enhance platform technologies for utilizing Big Data

**NOW** Launch utilizing Big Data related business

- Progress the development of high value service by informatized/intelligent Big Data globally
- Enhance various technologies for utilizing Big Data
Big Data Utilization Fields
- Data Generated by People

Retail field
One-to-One marketing

Medical field
Personalized medical care

Banking/insurance field
Banking and insurance services tailored to specific customer segments

Public administration field
Public opinion analysis, decision-making support
1-6. One-to-One Marketing Utilizing Big Data

Provision of products and services based on consumer behavior and actions

Optimized services

Companies
1-7. Big Data Utilization in the Medical Field

Advanced and personalized medical care utilizing various data

- Advanced medical care, new treatment development
- Personalized medical treatment based on genetic information
- Effective drug administration, side-effect prevention
- Lower medical costs
- Link with local medical treatment, legal compliance
### Big Data Utilization
**- Data Generated by Machines and Equipments**

<table>
<thead>
<tr>
<th>Field</th>
<th>Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance field</td>
<td>Preventive maintenance and operation services</td>
</tr>
<tr>
<td>Electricity field</td>
<td>Power supply-demand forecasting services</td>
</tr>
<tr>
<td>Transportation field</td>
<td>Crowd movement analytics and forecasting services</td>
</tr>
<tr>
<td>Communications field</td>
<td>Communications analysis services</td>
</tr>
</tbody>
</table>
1-9. Big Data Utilization in the Railway Field

Satellite imagery, geological and land utilization data, facility logs, 3D-CAD diagrams, rail line plans, etc.

- **Spatial information**
  - Railway line geography
  - Station buildings

- **Infrastructure information**
  - Rolling stock, railway facilities
  - Power, communications facilities

- **Activity information**
  - Railway operation
  - Movement of train station users

---

Information platform for 3D city spaces
(International standard terminology)

- **Development along railway lines**
  - Real estate management
  - Urban development in and around train stations

- **Facility management**
  - More efficient design and operation
  - Preventive maintenance planning

- **Services**
  - Improved services and sales
  - Emergency response plans
1-10. Big Data Utilization in the Smart City Field

Connect social infrastructure and lifestyles with services to create a safe, secure, comfortable and eco-friendly society

- Next-generation transportation systems
- Intelligent water systems

Automated operation
Supply-demand adjustment
People activity support

Smoothe grids
Green mobility

Smooth
Smart

Control Information

Systems fusing information and control for creating “smart and smooth” societies
1-11. Comfortable Services Effectively Utilizing Big Data

Create safer as well as more secure and comfortable services

Big Data utilization technologies

- Collection/storage
- Search/visualization
- Analysis/forecasting

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2-1. Steps for Effectively Utilizing Big Data

**Collection/storage**
- "Data accumulation"

**Search/use**
- "Easy searching"

**Find/forecast**
- "Analysis/forecasting"

**New uses**
- "Service creation"
2-2. Hitachi’s Strengths (1) Platform Strengths

Delivering world-class, advanced storage systems

- A powerful, global customer base
- Strategic business development with leading U.S. and European customers
- Provision of management systems integrating various data and IT platforms

Manufacturing ability as a manufacturing company to complete social infrastructure projects. Long building IT systems fused with social infrastructure, and operational and maintenance expertise.

Joint development with laboratory based on our business strategy
Hitachi’s Strengths (2)
IT and Social Infrastructure Technologies

Wide range of applications.
From company information systems to social infrastructure systems

Company business systems

Social infrastructure systems

Industry/distribution/finance/public administration
Communications
Electricity/railways roads/water…

Information system technologies and control system technologies

- Virtualization
- Large-scale, high-reliability databases
- High-speed transaction processing
- Security
- Simulation and analysis technologies
- Control systems middleware

Platforms and components

Information and telecommunications platforms

- Servers and storage
- Data centers
- Cloud
- High-speed networks

Control components and power electronics products

- Control servers
- High-voltage inverters
- EIC* integrated controllers
- UPS

*EIC: Electricity, Instrumentation, Computer

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2-4. What is Data Analysis?

- Trials to form relationships between “analysis” and “customers’ operations”
- Joint operations between mathematical analysis (IT) and determination of effectiveness (people)
- Leverage Hitachi’s expertise as a manufacturing company

Big Data Analysis Activities (Trials)

- Operational understanding + data receipt and survey
- Data cleansing
- Data pre-processing
- Mathematical analysis modeling
- Selection of optimized algorithms
- ROI and effectiveness evaluation
- Full-fledged system construction
- Large system implementation
- Utilization of Big Data processing platform
- Data analysis process database (Hitachi knowhow)
- Big Data analysis platform

Customer operations
Customer data

Operational understanding (Analysis and business KPIs)

Creation of analysis sequence matched to customer operations
Strategic Approach from “INFRASTRUCTURE CLOUD” to “INFORMATION CLOUD”

- **INFRASTRUCTURE CLOUD**
  - Scalably and effective large amount of data archive

- **CONTENTS CLOUD**
  - Total management of diversified data

- **INFORMATION CLOUD**
  - Making know-how formulated knowledge collaborated with customers

**Find/forecast**
- Analysis/forecasting

**Search/use**
- Easy Searching

**Collection/Storage**
- Data Accumulation

New Uses
- Service Creation

Initiative Policy in the Big Data Era 2-5.
2-6. Basic Policy (1)

Effectively Utilizing Big Data by INFORMATION CLOUD

- Expand the collaboration with advanced customers
  - Expand service business utilizing abundant know-how based on the experiences of building social infrastructure systems
  - Implement analysis and accumulation of knowledge by utilizing know-how as a manufacturing company

- Implement development and provision of products/services for Big Data

- Financial services
- Healthcare/medical care
- Manufacturing/distribution
- Water services
- Education
- Public administration
- Transportation
- Energy

Data accumulation
Easy searching
Analysis/forecasting
2-7. Basic Policy (2)

- Expand business in global market: Advanced utilizing Big Data
  - Implement by Global one team
- Aggressively implement collaboration with the experts of each industry
  - Management/IT consulting/Statistics mathematical principle etc
- Jointly develop with laboratory based on our business strategy
- Provide Security/IT governance proven by operation in Hitachi Group internal systems

Integration of internal and external wisdom for Hitachi
Established in 1989, headquartered in Santa Clara, California, U.S.A. (Approx. 5,300 employees as of September 30, 2011)

Customers: 82% of Top 100 companies Fortune Global 1000®

Alliances with over 300 solution vendors

A leader in virtualization technologies based on the delivery of more than 19,000 controllers

Accounts for approx. 90% of consolidated revenues in the storage solutions business
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Q2 FY11: 25% y/y growth; Highest revenue quarter in Hitachi Storage business history! (consolidated and in U.S.$)
- 26% 1HFY11 y/y growth
- 18% FY10 y/y growth
- Eight consecutive record quarters

Expanded portfolio
- Leader in storage virtualization
- File and content – fastest growing segment; 100% y/y growth trailing 12 months
- Software and services revenue mix – from low 20s in FY02 to near 50% in FY10

Recent acquisitions
- BlueArc – File & Content
- ParaScale – Scale out
- Shoden Data Systems – South Africa
3-2. Consistent, Record-Breaking Growth

HITACHI STORAGE BUSINESS CONSOLIDATED REVENUE RESULTS

<table>
<thead>
<tr>
<th>Quarter</th>
<th>FY2009</th>
<th>FY2010</th>
<th>1H FY2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>$709M (¥69B)</td>
<td>$779M (¥82B)</td>
<td>$1.053B (¥87B)</td>
</tr>
<tr>
<td>Q2</td>
<td>$914M (¥82B)</td>
<td>$882M (¥80B)</td>
<td>$1.046B (¥87B)</td>
</tr>
<tr>
<td>Q3</td>
<td>$804M (¥74B)</td>
<td>$861M (¥74B)</td>
<td>$1.028B (¥83B)</td>
</tr>
<tr>
<td>Q4</td>
<td>$74B (¥80B)</td>
<td>$87B (¥74B)</td>
<td>$1.078B (¥84B)</td>
</tr>
</tbody>
</table>

-12.0% y/y +18.1% y/y +26.0% y/y
+4.6% y/y +6.3% y/y +13.4% y/y
+6.3% y/y +11.0% y/y +15.2% y/y
+10.5% y/y +19.0% y/y +25.2% y/y
### 3-3. HDS State of the Business

TOTAL HDS CONSOLIDATED REVENUES: US $1.078B (Q2); US$2.092B (H1)

<table>
<thead>
<tr>
<th>KEY METRICS</th>
<th>Q2 FY11 Y/Y% GROWTH</th>
<th>H1 FY11 Y/Y% GROWTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>HITACHI CONSOLIDATED REVENUE</td>
<td>25%</td>
<td>26%</td>
</tr>
</tbody>
</table>

**HDS Y/Y% GROWTH IN FOLLOWING AREAS***:

<table>
<thead>
<tr>
<th>AREAS</th>
<th>Q2 FY11 %</th>
<th>H1 FY11 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMERICAS</td>
<td>21%</td>
<td>15%</td>
</tr>
<tr>
<td>EMEA</td>
<td>30%</td>
<td>39%</td>
</tr>
<tr>
<td>APAC (excluding Japan sales)</td>
<td>36%</td>
<td>40%</td>
</tr>
</tbody>
</table>

**HARDWARE**

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>QUARTERLY GROWTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENTERPRISE STORAGE**</td>
<td>High 40s</td>
</tr>
<tr>
<td>MODULAR STORAGE</td>
<td>Mid single digits</td>
</tr>
<tr>
<td>FILE &amp; CONTENT (includes storage drag)</td>
<td>High 80s</td>
</tr>
</tbody>
</table>

**SOFTWARE**

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>QUARTERLY GROWTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOFTWARE</td>
<td>High 20s</td>
</tr>
</tbody>
</table>

**SERVICES**

<table>
<thead>
<tr>
<th>QUARTERLY GROWTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid 20s</td>
</tr>
</tbody>
</table>

*HDS UNCONSOLIDATED BASIS

**THE HARDWARE AND SOFTWARE NUMBERS DO NOT INCLUDE ANY OEM REVENUE

All numbers based on actual F/X rates.
An Information-Centric World, Governments, Enterprises, Organizations, Person, Consumer...Creating, exchanging, consuming, enhancing data

The world had 486 exabytes of data in 2008. Doubling in 18 months.

Unstructured data is growing at 10x structured data

By 2014 there will be 1 billion applications

E-discovery and search across all applications, media, archives, devices...

A world of Analytics to turn discovered data into usable information!

Management and governance of data for 10, 20, 50, 100 years, more, forever?

Must repurpose data every 5 years for new applications & devices? Billions, trillions of objects?

Backup-less vs. Archive data...always on, always available, always ready.

Cloud of content and information

Scale...Scale...Scale...Scale...Scale...Scale
INFORMATION ANYWHERE, ANYTIME, ALL THE TIME... FOREVER

- ALL DISCOVERABLE AND SEARCHABLE
- INDEPENDENT OF APPLICATION
- INDEPENDENT OF MEDIA
- INTEGRATED AND MEANINGFUL
- GOVERNED FOREVER
HDS Strategy: The Path to the Information Center

3-6.

**INFORMATION CLOUD**
- Analytics Integration
- Business intelligence
- Big data

**CONTENT CLOUD**
- Search, discover, integrate independently of applications
- Content on demand
- Archiving as a service

**INFRASTRUCTURE CLOUD**
- Virtualization, mobility
- Integrated management
- Data center convergence
- Infrastructure and platform as a service

Data, Storage, File, Server, Network Virtualization

**SINGLE VIRTUALIZATION PLATFORM FOR INFRASTRUCTURE, INFORMATION AND CONTENT**

**Infrastructure**
- Converged solution stacks
- Converged platform for storage and compute
- Heterogeneous virtualization

**Data Intelligence**
- Data lifecycle management
- Index, search, and discover independent of application
- Integrated meta data management

**Information Analytics**
- Analytical search
- Derived data integration
- Data analytics independent of application and media

Results in cost savings, efficiency, seamless access to information for business insight and competitive advantage
3-7. The Infrastructure Cloud

- Infrastructure and Platform as a Service
- Rapid, On-Demand Deployment
- Elastic Scalability for Private, Hybrid and Public
3-8. Inside the Content Cloud

DISCOVERY & SEARCH ACROSS APPLICATIONS

CONTENT CORE

MULTI APPLICATION INDEXING
AUTOMATED TIERING / ARCHIVING
CONTENT REPURPOSING
DATA LIFECYCLE MANAGEMENT
VIRTUAL CONTAINERIZATION

CONTENT & DATA VIRTUALIZATION

CONTENT INDEPENDENT OF APPLICATION & MEDIA

CENTRALIZED GOVERNANCE

MASSIVE SCALABILITY & PERFORMANCE

3D

uVALUE

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3-9. Healthcare Content Cloud in Use Today

KLINIKUM WELS SOLUTION ARCHITECTURE

ADMISSION  X-RAY  LAB  PHYSICIAN

DEPARTMENTS

HOSPITAL HEALTH PORTAL

INFORMATION CLOUD
CONTENT CLOUD
INFRASTRUCTURE CLOUD
SINGLE VIRTUALIZATION PLATFORM

METADATA LAYER
CONTENT VIRUTALIZATION LAYER
SEARCH, INDEXING, DATA LIFECYCLE MGMT
STORAGE & DATA VIRTUALIZATION LAYER

SECONDARY SITE

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Imagine the Possibilities – Access to Integrated Patient Data

ACROSS MULTIPLE APPLICATIONS

- Generations of applications and media
- Cumulative effects of growing data
- Moving petabytes of data – lifecycle management
- Repurpose billions to trillions of objects
- Protect, delete billions to trillions of objects
- Discover and correlate meaningful trends and analytics
Scalable Content Cloud – Today!

BLUEARC + HDS
FILE AND CONTENT MOBILITY, INTELLIGENT TIERING AND HOLISTIC SEARCH

HDS DATA ANALYTICS, BUSINESS INTELLIGENCE, MASSIVE SCALE-OUT LEVERAGE PARASCALE

INFORMATION CLOUD

CONTENT CLOUD

INFRASTRUCTURE CLOUD

SINGLE VIRTUALIZATION PLATFORM FOR INFRASTRUCTURE, INFORMATION AND CONTENT
3-12. An Integrated Hitachi Vision: Big Data / Analytics

HITACHI, LTD. CLOUD SOLUTION
(SERVICE DELIVERY)

INFORMATION CLOUD
Information Virtualization

CONTENT CLOUD
Content Virtualization

INFRASTRUCTURE CLOUD
Data, Storage, File, Server, Network Virtualization

BIG DATA MANAGEMENT
MACHINE TO MACHINE NETWORK
EQUIPMENT MANAGEMENT
COOPERATION WITH CONTROL SYSTEMS

ENTERPRISE SYSTEMS

SOCIAL INFRASTRUCTURE INTELLIGENCE

FINANCE
PUBLIC
DISTRIBUTION
MEDICAL
ELEC. POWER
RAILWAY
TRAFFIC
SECURITY
HDS Business Execution of the Vision

STRONG GLOBAL REVENUE GROWTH

TRUSTED BY 82% OF THE TOP 100 FORTUNE GLOBAL 1000®

INTEGRATED R&D INVESTMENTS

STRONG INTEGRATION ACROSS HITACHI COMPANIES

KEY 2011 ACQUISITIONS

RESPECTED BUSINESS CULTURE
### 3-14. HDS Growth Strategy

#### Business Model Shift to Software and Services
- Invest aggressively in software intellectual property and portfolio depth

#### Leveraging our Partnerships
- Strengthen channel, alliance and systems integrator programs

#### Market and Global Expansion
- Integrated strategy for structured and unstructured data including Big Data, cloud, managed services
- Vertical markets (e.g. Health and Life Sciences, Telco, Media, Entertainment)
- Strong emerging market growth in BRICs and Africa
Revenue Targets: Storage Solution Business

FY09 (Actual) [¥93/$] 3.3 (¥304 billion)
FY10 (Actual) [¥83/$] 3.9 (¥322 billion)
FY11 (Forecast) [¥77/$] 4.4 (¥335 billion)
FY15 (Target) [¥80/$] 6.0 (¥450 billion)

<As of Jun. 2011> <New Target> [¥75/$]
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4-1. Conclusion

FY2015 Business Targets

Revenues: ¥2.3 trillion / Operating income ratio: 8%
Overseas revenues: ¥800.0 billion / Overseas revenue ratio: 35%

- Strengthen domestic businesses
- Expand global businesses

Fields of future focus

- Fused businesses
- Highly reliable cloud businesses
- Businesses for effectively utilizing Big Data
Conclusion: Driving Continuing Growth in the Information & Telecommunication Systems Business

Effectively Utilizing Big Data

Create a new world with Big Data

INFORMATION CLOUD

Accumulate, integrate and efficiently utilize large volumes of diverse data

ONE PLATFORM FOR ALL DATA

CONTENT CLOUD

&

INFRASTRUCTURE CLOUD

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Cautionary Statement

Certain statements found in this document may constitute “forward-looking statements” as defined in the U.S. Private Securities Litigation Reform Act of 1995. Such “forward-looking statements” reflect management’s current views with respect to certain future events and financial performance and include any statement that does not directly relate to any historical or current fact. Words such as “anticipate,” “believe,” “expect,” “estimate,” “forecast,” “intend,” “plan,” “project” and similar expressions which indicate future events and trends may identify “forward-looking statements.” Such statements are based on currently available information and are subject to various risks and uncertainties that could cause actual results to differ materially from those projected or implied in the “forward-looking statements” and from historical trends. Certain “forward-looking statements” are based upon current assumptions of future events which may not prove to be accurate. Undue reliance should not be placed on “forward-looking statements,” as such statements speak only as of the date of this document.

Factors that could cause actual results to differ materially from those projected or implied in any “forward-looking statement” and from historical trends include, but are not limited to:

- economic conditions, including consumer spending and plant and equipment investment in Hitachi’s major markets, particularly Japan, Asia, the United States and Europe, as well as levels of demand in the major industrial sectors Hitachi serves, including, without limitation, the information, electronics, automotive, construction and financial sectors;
- exchange rate fluctuations of the yen against other currencies in which Hitachi makes significant sales or in which Hitachi’s assets and liabilities are denominated, particularly against the U.S. dollar and the euro;
- uncertainty as to Hitachi’s ability to access, or access on favorable terms, liquidity or long-term financing;
- uncertainty as to general market price levels for equity securities in Japan, declines in which may require Hitachi to write down equity securities that it holds;
- the potential for significant losses on Hitachi’s investments in equity method affiliates;
- increased commoditization of information technology products and digital media-related products and intensifying price competition for such products, particularly in the Components & Devices and the Digital Media & Consumer Products segments;
- uncertainty as to Hitachi’s ability to continue to develop and market products that incorporate new technologies on a timely and cost-effective basis and to achieve market acceptance for such products;
- rapid technological innovation;
- the possibility of cost fluctuations during the lifetime of, or cancellation of, long-term contracts for which Hitachi uses the percentage-of-completion method to recognize revenue from sales;
- fluctuations in the price of raw materials including, without limitation, petroleum and other materials, such as copper, steel, aluminum, synthetic resins, rare metals and rare-earth minerals, or shortages of materials, parts and components;
- fluctuations in product demand and industry capacity;
- uncertainty as to Hitachi’s ability to implement measures to reduce the potential negative impact of fluctuations in product demand, exchange rates and/or price of raw materials or shortages of materials, parts and components;
- uncertainty as to Hitachi’s ability to achieve the anticipated benefits of its strategy to strengthen its Social Innovation Business;
- uncertainty as to the success of restructuring efforts to improve management efficiency by divesting or otherwise exiting underperforming businesses and to strengthen competitiveness and other cost reduction measures;
- general socioeconomic and political conditions and the regulatory and trade environment of countries where Hitachi conducts business, particularly Japan, Asia, the United States and Europe, including, without limitation, direct or indirect restrictions by other nations on imports and differences in commercial and business customs including, without limitation, contract terms and conditions and labor relations;
- uncertainty as to the success of alliances upon which Hitachi depends, some of which Hitachi may not control, with other corporations in the design and development of certain key products;
- uncertainty as to Hitachi’s access to, or ability to protect, certain intellectual property rights, particularly those related to electronics and data processing technologies;
- uncertainty as to the outcome of litigation, regulatory investigations and other legal proceedings of which the Company, its subsidiaries or its equity method affiliates have become or may become parties;
- the possibility of incurring expenses resulting from any defects in products or services of Hitachi;
- the possibility of disruption of Hitachi’s operations in Japan by earthquakes, tsunamis or other natural disasters, including the possibility of continuing adverse effects on Hitachi’s operations as a result of the earthquake and tsunami that struck northeastern Japan on March 11, 2011;
- uncertainty as to Hitachi’s ability to maintain the integrity of its information systems, as well as Hitachi’s ability to protect its confidential information or that of its customers;
- uncertainty as to the accuracy of key assumptions Hitachi uses to evaluate its significant employee benefit-related costs; and
- uncertainty as to Hitachi’s ability to attract and retain skilled personnel.

The factors listed above are not all-inclusive and are in addition to other factors contained in Hitachi’s periodic filings with the U.S. Securities and Exchange Commission and in other materials published by Hitachi.