Platforms for the Development of Digital Television Broadcasting and the Internet in Japan

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I. Introduction
A. Overview of IT, DTV, and the Internet in Japan

Communications Industry: GDP (Value Added, 1995 prices)

Bill JPY

Communications Industry (Percentage of Value Added in GDP)

%
IT Investment of All Industries (1995 Prices)

Percentage of IT Investment in Total Investment of All Industries
Average Annual Expenditures on Communications by Households

<table>
<thead>
<tr>
<th>Year</th>
<th>Expenditures (JPY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>78,123</td>
</tr>
<tr>
<td>1995</td>
<td>83,565</td>
</tr>
<tr>
<td>1996</td>
<td>90,046</td>
</tr>
<tr>
<td>1997</td>
<td>99,266</td>
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<tr>
<td>1998</td>
<td>102,611</td>
</tr>
<tr>
<td>1999</td>
<td>118,327</td>
</tr>
<tr>
<td>2000</td>
<td>124,362</td>
</tr>
<tr>
<td>2001</td>
<td>132,864</td>
</tr>
<tr>
<td>2002</td>
<td>141,372</td>
</tr>
<tr>
<td>2003</td>
<td>145,332</td>
</tr>
<tr>
<td>2004</td>
<td>149,370</td>
</tr>
</tbody>
</table>

Percentage of Communications Expenditures by Households in Total Expenditures

<table>
<thead>
<tr>
<th>Year</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>2.1</td>
</tr>
<tr>
<td>1995</td>
<td>2.3</td>
</tr>
<tr>
<td>1996</td>
<td>2.5</td>
</tr>
<tr>
<td>1997</td>
<td>2.6</td>
</tr>
<tr>
<td>1998</td>
<td>2.8</td>
</tr>
<tr>
<td>1999</td>
<td>3.1</td>
</tr>
<tr>
<td>2000</td>
<td>3.4</td>
</tr>
<tr>
<td>2001</td>
<td>3.6</td>
</tr>
<tr>
<td>2002</td>
<td>3.9</td>
</tr>
<tr>
<td>2003</td>
<td>4.0</td>
</tr>
<tr>
<td>2004</td>
<td>4.0</td>
</tr>
</tbody>
</table>
I. Introduction
   B. Objective of this presentation

Impact of the introduction of Digital Television (DTV) in Japan

Possibilities of processing DTV content by using the power of computer and storage technologies

DTV’s competition and coordination with the Internet

II. Digital Broadcasting and the Internet in Japan
   A. Start of DTV in Japan (1/2)

1. Terrestrial DTV

Digital terrestrial television started at the end of 2003.

By 2011 analog television will be terminated.

regulated by Ministry of Internal Affairs and Communication (MIC)
II. Digital Broadcasting and the Internet in Japan
A. Start of DTV in Japan (2/2)

2. Other DTV’s

1996: CS broadcasts
1998: cable TV
2000: BS broadcasts

Accumulated Shipments of DTV Receivers

<table>
<thead>
<tr>
<th>Year</th>
<th>Shipments (Thousand)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003. IV</td>
<td>500</td>
</tr>
<tr>
<td>2004. I</td>
<td>1,000</td>
</tr>
<tr>
<td>2004. II</td>
<td>1,500</td>
</tr>
<tr>
<td>2004. III</td>
<td>2,000</td>
</tr>
<tr>
<td>2004. IV</td>
<td>2,500</td>
</tr>
<tr>
<td>2005. I</td>
<td>3,000</td>
</tr>
<tr>
<td>2005. II</td>
<td>3,500</td>
</tr>
</tbody>
</table>
II. Digital Broadcasting and the Internet in Japan
B. Terrestrial TV in Japan (1/4)

1. Statistics

Terrestrial TV’s revenue:

80% of all revenue for broadcasting

Per capita (per consumer) annual revenue: JPY30,000 (US$250)

Japanese households watch TV 3 hours per day.
II. Digital Broadcasting and the Internet in Japan
B. Terrestrial TV in Japan (2/4)

2. Regulation

DTV considered to replace analog with digital content

- not a new service
- few changes in rules or regulations
- no new entry
II. Digital Broadcasting and the Internet in Japan
B. Terrestrial TV in Japan (3/4)

3. Economics

monopolistic status

no new licenses

average profits quite high

broadcasters in urban areas can bear costs for DTV transition

those located in rural areas may not

II. Digital Broadcasting and the Internet in Japan
B. Terrestrial TV in Japan (4/4)

4. Impact of DTV transition explained from technological aspect

a. noise reduction

b. realization of HDTV

c. spectrum saving

d. possibility of interactive TV
II. Digital Broadcasting and the Internet in Japan
   C. Impact of DTV

Possible to process DTV content after they are broadcast
desirable to prepare environment for content processing

DTV and the Internet may be competitive and complementary

Convergence of broadcasting and telecommunications.

III. Platforms for Efficient Utilization of DTV
   A. Restrictions on content utilization with DTV in Japan (1/2)

1. Rigid restrictions on utilizing content

   All DTV programs are broadcast scrambled
   B-CAS card required for viewing
   Copy-once requirement
III. Platforms for Efficient Utilization of DTV
A. Restrictions on content utilization with DTV in Japan (2/2)

2. Implications

Possible for a broadcaster to introduce pay TV

no broadcaster intends to introduce pay TV

“TiVo” in U.S.

Potential benefits of applications software for DTV content blocked by restrictions

<Figure 1>

III. Platforms for Efficient Utilization of DTV
B. Platforms for DTV applications (1/6)

1. Present state of DTV

lot of content but no applications software

like computers in earlier days

little applications software but with a lot of analog content

H. Onuki 9/20-21/2005
III. Platforms for Efficient Utilization of DTV
B. Platforms for DTV applications (2/6)

2. Preparing environment for transactions of content with a copyright

Business codes

Database and network system

III. Platforms for Efficient Utilization of DTV
B. Platforms for DTV applications (3/6)

3. Transactions system for DTV content

Transacting goods and services

market mechanism

differences between (ordinary) goods and services and content

Content can be copied with or without modification.
III. Platforms for Efficient Utilization of DTV

B. Platforms for DTV applications (4/6)

4. Degree of complexities in transactions of content

Cost of transacting digital content is high.

III. Platforms for Efficient Utilization of DTV

B. Platforms for DTV applications (5/6)

5. System for transactions of digital content to be built on copyright laws

Many “rights” in relation to content

Status of rights to be attached to content

Information set: descriptor

Database of descriptors of content

Record of transactions of real estate
III. Platforms for Efficient Utilization of DTV

B. Platforms for DTV applications (6/6)

6. Example of simple descriptor of DTV news content

<Figure 2b>

III. Platforms for Efficient Utilization of DTV

C. Status of broadcasters (1/2)

1. Monopoly in the supply of broadcast content

little incentive to let DTV content be utilized with applications software for the benefit of consumers
III. Platforms for Efficient Utilization of DTV
C. Status of broadcasters (2/2)

2. Recent trend:
Content on IP-TV (August 2005)
by commercial broadcasters
Disclosure obligation of DTV content by direct
governmental regulations
Information and Communication Council (July 2005)
DTV content to be supplied via the Internet

IV. Competition and Coordination of DTV and the Internet
A. Vertical Structure of DTV and the Internet (1/2)

1. Vertical structure in communications
industry
Division of labor viewed vertically
<Figure 3>
IV. Competition and Coordination of DTV and the Internet
A. Vertical Structure of DTV and the Internet (2/2)

2. Competition and growth

Activities competing and substituting within single layer
- twisted copper pair to optical fibers
- telephony from traditional voice transmission to new IP-packet transmission

Best to promote competition layer-wise

![Annual Sales of Media Contents Chart]

Annual Sales of Media Contents

<table>
<thead>
<tr>
<th>Year</th>
<th>Text (Trill JPY)</th>
<th>Voice (Trill JPY)</th>
<th>Video (Trill JPY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>5.3</td>
<td>1.0</td>
<td>4.6</td>
</tr>
<tr>
<td>2002</td>
<td>5.1</td>
<td>0.9</td>
<td>4.8</td>
</tr>
<tr>
<td>2007</td>
<td>5.0</td>
<td>0.9</td>
<td>4.9</td>
</tr>
</tbody>
</table>
IV. Competition and Coordination of DTV and the Internet
B. Monopoly in the infrastructure layer (1/3)

Legal and economic basis of supply of infrastructure layer not clearly established

1. Wired communication

NTT supplies large portion of communications infrastructure

“given” at the time of privatization

IV. Competition and Coordination of DTV and the Internet
B. Monopoly in the infrastructure layer (2/3)

2. Wireless communication

Spectrum assigned by MIC without charging economic values

far from being competitive or with free entry
IV. Competition and Coordination of DTV and the Internet
B. Monopoly in the infrastructure layer (3/3)

3. Implications of monopoly

Monopolistic profits

Internal cross-subsidization in upper-layer competition

C. Policies for fair competition at level-playing field (1/6)

1. Designation of “monopoly-front service”
   
to be determined by the government

regulate supply of services located at front level

so that monopolized group function as if a competitive group
IV. Competition and Coordination of DTV and the Internet
C. Policies for fair competition at level-playing field (2/6)

2. Vertical separation

Monopolistic operator be vertically separated from competitive activities

structurally or in accounting

No regulation on competitive activities

supply of monopoly-front service be open to all purchasers

3. Regulation of monopoly

Monopolistic operator must act as price taker in supply of infrastructure
IV. Competition and Coordination of DTV and the Internet
C. Policies for fair competition at level-playing field (4/6)

4. Implications

Most difficulties and complexities in communications industry arise from that every activity must use some infrastructure (including space), which cannot be supplied competitively without governmental regulations.

<Figure 5>

IV. Competition and Coordination of DTV and the Internet
C. Policies for fair competition at level-playing field (5/6)

5. Public corporations for infrastructure supply

a. Short-run behavior of monopolistic operator to simulate short-run service market

b. Long-run behavior of monopolistic operator to simulate competitive capital market

_Prohibited_ from maximizing rate of return from investment
IV. Competition and Coordination of DTV and the Internet

C. Policies for fair competition at level-playing field (6/6)

6. Policy recommendations

Enforce monopoly-front and the price-taker requirements