JAPANESE SOFTWARE

STRATEGIES AND FRUSTRATIONS
STRATEGIC ISSUES

In explaining strategic competition in Japan's software market, any hypothesis must reconcile certain issues:

- Persistence of customization as the largest market despite government policies promoting standardization

- Existence of multiple platforms

- Strong support for localization and adaptation of foreign software

- Push to allow decompilation

- Greater user power and preference shift towards flexibility and open systems

- Compatibility of user's software requirements with basic Japanese management goals
THE COMPETITIVE ENVIRONMENT OF THE JAPANESE SOFTWARE INDUSTRY

Is being determined by several interrelated factors within an evolving technology. The most important seem to be:

- Large computer systems firms' administrative heritage

- Users' process and systems integration

- Constant foreign product innovation and development
COMPUTER SYSTEM COMPANIES’ ADMINISTRATIVE HERITAGE

- Historical ties have left multiple systems and incompatible platforms which are strategically difficult to change

- Successful government policies in computers and ICs have led to similar software initiatives

- Competitive advantage emerges from managing the international product cycle but promotes foreign entry

- "Competitive Compulsion" to defend existing customers and markets

- Hardware success has limited availability of software engineers and programmers
HISTORICAL EXPERIENCE AND EVOLUTION

Historically, Japanese manufacturers, including computer companies, have captured the growth in Japan to build experience and market share. In turn, the Japanese market for information services is growing:

However, not all segments are growing equally:

<table>
<thead>
<tr>
<th>Growth Rate 1990-91</th>
<th>Custom</th>
<th>Packaged</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mainframe software</td>
<td>5.5%</td>
<td>-8.8</td>
</tr>
<tr>
<td>Mini Computer software</td>
<td>22.1</td>
<td>36.3</td>
</tr>
<tr>
<td>Work Station software</td>
<td>33.9</td>
<td>18.2</td>
</tr>
<tr>
<td>PC software</td>
<td>18.9</td>
<td>3.7</td>
</tr>
</tbody>
</table>
In particular mainframe sales and mainframe software are growing much more slowly than minis, work stations, or PCs and their related software. Further, mainframes are being used more for data bases or distributed processing.

Yet, the mainframe software market is large (Yen 360 billion in 1991) of which Yen 352 billion is customized with growth for 1991-94 expected at 5.0% p.a. Customized mainframe software sales are likely to remain stable while growth opportunities are in downsizing and applications both custom and packaged:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Customized Market</td>
<td>562</td>
<td>12.2</td>
<td>7.1</td>
</tr>
<tr>
<td>Packaged (Yen billions)</td>
<td>29</td>
<td>3.2</td>
<td>13.8</td>
</tr>
<tr>
<td>Total</td>
<td>562</td>
<td>12.2</td>
<td>7.1</td>
</tr>
<tr>
<td></td>
<td>29</td>
<td>3.2</td>
<td>13.8</td>
</tr>
<tr>
<td>Mainframe</td>
<td>352</td>
<td>5.5</td>
<td>5.0</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>-8.8</td>
<td>7.2</td>
</tr>
<tr>
<td>Mini</td>
<td>85</td>
<td>22.1</td>
<td>7.3</td>
</tr>
<tr>
<td></td>
<td>2.4</td>
<td>36.3</td>
<td>11.8</td>
</tr>
<tr>
<td>Work Station</td>
<td>79</td>
<td>33.9</td>
<td>13.3</td>
</tr>
<tr>
<td></td>
<td>3.4</td>
<td>18.2</td>
<td>34.7</td>
</tr>
<tr>
<td>PCs</td>
<td>46</td>
<td>18.9</td>
<td>10.3</td>
</tr>
<tr>
<td></td>
<td>14.5</td>
<td>3.7</td>
<td>12.0</td>
</tr>
</tbody>
</table>
EVOLUTIONARY PARADIGM

Technology has progressed from mainframes and minis with dumb and then smart terminals to mainframes managing network servers which coordinate PCs and workstations. This is now progressing to systems without mainframes.

While the US is in transition towards form three, Japan is just beginning the switch to form two. Many Japanese feel it will remain there, while most American observers feel it will continue to evolve.

The answer to this issue is important since the two forms involve different strategies.
SOFTWARE’S STRATEGIC EVOLUTION

Classic market share/experience based strategies that lower equipment costs work well in a mainframe only world. Incompatible operating systems tend to be bundled with hardware to lock in customers, e.g. IBM, DEC, Unisys, Cray, NEC, Honeywell, Fujitsu, Hewlett Packard ...

In a managed network, PC, workstation world, a hub and spoke approach gives wider market access.

In a network server world heavily dependent on software and application requirements, the economic emphasis shifts to one's established user base. Acquisitions and strategic alliances then become important strategic variables.
LOCALIZATION AND CUSTOMIZATION

Given Japan's position in the cycle, localization and RISC based MPUs appear as key elements in the customization strategy including the integration of minis, workstations, and PCs into the overall system.

To keep the overall system technologically current by using more advanced or specialized foreign software there appear to be at least three parts to the adaptation process:

- Localization to Japanese language and format
- Conversion to the mainframe/MPU platform of the systems company
- Customization to the user's unique process and requirements
USERS' PROCESS AND SYSTEMS INTEGRATION

- Tacit learning, permanent employment, and captive customers

- Desire to maintain special or unique systems and process advantage of which software is a key part, including proprietary data bases

- Software development as part of competitive evolution from imported technology and product, including the evolution and integration of suppliers and customers into a network and technical process
USER ATTITUDES

- Conservative mainframe mentality

- Cost conscious but risk averse; so systems change/improve on incremental evolutionary basis as organizational integration is high

- Strong supplier relations at basic systems level for manufacturing and sales with new technologies for networks or new functions

- Little interest in pushing EDP innovations. Want to maintain technical parity with a lag and have fully reliable debugged product

- Expect low personnel turnover with good tacit knowledge at supplier and user level. Further, among largest firms (>Y500 bil), 58% have established IS or plan IS within their group

- Software development efficiencies achieved by user/industry commonalities

- Developers part of users' industry and dependent users' economic success
USER REQUIREMENTS

- User attitudes towards software providers reflect growth in market segments. While cost is always a concern the shift is from emphasis on user and industry knowledge, experience, and contacts to a need for flexibility, neutrality and technical expertise.

- Basic systems for sales and manufacturing are established but need is growing to use IS for planning and competitive advantage.

- Currently only 16% of companies see such software needs but 57% see shift coming. Networking needs will rise to 8% from 2%.

- Conversely firms primarily requiring manufacturing and sales support will drop from 57% to 3.5%.

- Those needing software for internal information will remain about 23%.
MITI’S USER SURVEY

<table>
<thead>
<tr>
<th>Increased desire for:</th>
<th>Decreased importance of:</th>
</tr>
</thead>
<tbody>
<tr>
<td>respond user demands 27% to 29%</td>
<td>continuous contact user 24% to 10%</td>
</tr>
<tr>
<td>advice systemization 31% to 40%</td>
<td>know business details 36% to 29%</td>
</tr>
<tr>
<td>expert a technology 12% to 19%</td>
<td>experience user/industry 51% to 27%</td>
</tr>
<tr>
<td>engineers and Yen 12% to 19%</td>
<td>good social reputation 10% to 5%</td>
</tr>
<tr>
<td>experience systems integration 9% to 15%</td>
<td></td>
</tr>
<tr>
<td>neutral &amp; independent of manufacturers 4% to 9%</td>
<td></td>
</tr>
<tr>
<td>able relate IS to strategy 3% to 22%</td>
<td></td>
</tr>
</tbody>
</table>
HUB AND SPOKE HYPOTHESIS

- At this stage competition takes place within new growth segments but not between basic systems or operating platforms which are used by the core customers and for which market shares remain relatively stable. The high growth segments (networks, WS, and PCs) are at the center of a hub and spoke diagram representing the industry structure while the systems' market (mainframes and minis) are along the outside of the wheel.

- New high growth segments are dominated by foreign high performance software, sometimes incorporating downsizing and open systems. For example, in work stations, HP and Sun Systems have a 38% market share and are the largest suppliers.

- Yet, customization persists as a way to control customers and market share for systems and hardware, necessitating localization and conversion of software innovations and upgrades along the spokes.
FUTURE COMPETITIVE DYNAMICS

- Continuation Hub and Spoke Structure and persistence user/industry emphasis

- Push towards JVs and exclusive licensing with foreign firms in new technologies and formats to try to tie or control entry and use in Japan to gain market advantage in total systems and hardware.

- Production emphasis will be to maintain parity in technology including localization, conversion, and customization of foreign software. This implies little independent R&D except for games and MPUs but may include attempts at decompilation too. Effectively this will subsidize the entry and presence of foreign vendors in the Japanese market.

- Excepting games and RISC MPUs will not build own large innovative technical infrastructure to create software or to be international

- Management pressure will be reducing costs per line or unit of code not increasing revenues or the user base (stage 3).
- Fragmented operating systems and software application pattern will persist and standardization will not occur except for some work stations as they move towards UNIX and open standards using hybrid MPUs.

- Strong Yen will continue and perhaps will get stronger making self development of software very expensive and internationally uncompetitive. Indeed, the added cost of localization and customization will keep even converted foreign software high cost. This will mean that only software incorporated in a competitive manufacturing system like steel or automobiles or leveraging off of games (such as graphics or animation) will be competitive.

- Only globalization of Japan's major firms may force international standardization.

- Industry will be composed primarily of profitable niche players, mostly affiliated with foreign firms developing new software products and established systems/hardware producers adapting such products to their platforms and customer bases.