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The Future Evolution of Japanese-US Competition in Software: Policy Challenges and Strategic Prospects

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Report Summary

A two year study of the Japanese software industry was conducted by a team from Columbia University, the University of Washington and the University of Victoria under the sponsorship of the Center on Japanese Economy and Business at the Columbia Business School. The project received support from the Japan-US Friendship Commission, the Center on International Business Education and Research (CIBER) at the University of Washington and from their respective universities. Based on their research and analysis, including interviews with and questionnaires from users, developers, and systems producers, the team has concluded that despite the claims of many industry observers the Japanese software industry is not going to converge with its US counterpart by a delayed but rapid move towards the extensive use of packaged software.

Rather, large Japanese customers' software strategies will continue to emphasize customization, even for PCs. The packaged software that is purchased will be heavily customized, often doubling or tripling its total installed cost. This strategy is seen as necessary by large corporate customers partly due to the fact that the cost of complete conversion to the new open systems is perceived as being even more expensive as well as time consuming and risky. But equally important and more positively, customization is seen as an integral part of these firms' strategies to maintain their global competitive advantage and the security of their unique corporate information and proprietary operating systems.

Trends flowing from this fundamental conclusion include the long-term fragmentation of the Japanese software industry, continued foreign dominance of the Japanese packaged software market, directly and through strategic alliances, and the export of proprietary Japanese software systems in the form of foreign direct investment and technological assistance in industries like steel, autos and consumer electronics. These results indicate that Japanese firms for various reasons are institutionally committed to certain rules and routines with respect to software usage and development that appear very difficult to change, even when they may not be seen as optimum to outside analysts in terms of current software and computer technology. In most cases, such decisions relative to software usage and development are related to firms' commitment to other routines as a way to maintain their competitive advantage in their own businesses. Further in terms of cost, such an approach is not as expensive as one might assume since software costs are usually a relatively small percentage of the total cost of producing a product or service and relative to the potential differences in productivity between the customized and non-customized solutions.

It is therefore the economics of the customers' businesses rather than the economics of the software industry that determines large organizations' demand for and usage of software. To maintain and control this system, most large software buyers have created software development subsidiaries. These subsidiaries are part of these parents' vertical keiretsu. They in turn try to reduce their development costs per software system developed for the keiretsu while maintaining their tacit expertise within the group by selling their customized software to other members of the group. Such software development subsidiaries and affiliates are among the very largest software companies in Japan and serve several functions. In addition to helping control costs, they offer careers to specialized EDP personnel outside the parent firm's

personnel system. They also expand the firm's software user base to reduce the overall cost of maintaining a proprietary software system. While most large customers buy their operating and middleware systems from hardware vendors or specialized software developers, they usually develop their own proprietary application systems, either internally or through their software development subsidiaries, rather than purchasing standardized packages. Even when application packages are bought, they are generally extensively customized. This situation has forced most software developers and systems integrators to specialize by industry. In turn, their dependence on specific customers in particular industries, each with their own large proprietary systems, has made software demand sensitive to developments in such customer industries and has created difficulties in rewriting code for the newer open systems. It has also made large numbers of existing programmers and software engineers heavily specialized with limited skills or interest in developing more generalized packaged software solutions or learning new programming languages. These institutional arrangements work to perpetuate the existing structure and customization.

US software developers have on the whole benefited from this structure and have been effective in capturing and dominating large segments of the Japanese packaged software market. This has been a logical extension of the benefits of their large global user bases. In turn, this stiff foreign competition in packaged software in combination with large clients' demand for customized software and the success of Japanese game developers has attracted Japanese programming and software engineering resources in three directions: one, developing and maintaining large proprietary systems, two, localizing and adapting foreign packaged software, and three developing and promoting game related software. These powerful trends work against the allocation of resources to the development of other packaged software.

Thus the Japanese software industry has failed to become competitive except in games primarily due to users' preference for customized software despite initial expense combined with large systems producers' desire to maintain historically different operating platforms. This has frustrated MITI's initiatives for the industry, even though it has followed its time tested development model. At the same time, large users' and systems suppliers' preference for the present situation, i.e. customization, has helped foreign software developers to successfully penetrate and dominate new high growth sectors like network servers and workstations by pursuing a hub and spoke strategy that both builds their Japan and global user bases and improves their economics, further undermining the Japanese software industry. The project team forecasts these various trends will continue.

If you are interested in more information about this study and its conclusions, please contact Professor William Rapp, Project Director, Chair Economic Relations with Japan, Centre for Asia Pacific Initiatives, 131 Begbie, University of Victoria, Victoria, BC, Canada V8W 2Y2; 604-721-7020 (fax: 3107), e-mail: capisec@uvvm.uvic.ca.

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