

The Strategies for Global Prosperity: A US –Japan Innovation Summit (Summary Draft)

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1. Welcome Remarks

After welcome remarks by Aichi Expo US Pavilion Ambassador Lisa Gable, Dr. Hiroyuki Yoshikawa, President of the National Institute of Advanced Industrial Science and Technology, and Mr. Raymond Gilmartin, Chairman Emeritus of the Council on Competitiveness presented messages at the opening of the summit.

As he reviewed historical events, Dr. Yoshikawa stated that science and technology should play an important role in achieving sustained growth. Dr. Yoshikawa emphasized the need for a concept of social contracts between scientists and technicians and society as well as a system for implementing such contracts. Furthermore, to initiate innovation, he indicated that bridging basic and applied science and technology were important and presented a model that was achieving success at the National Institute of Advanced Industrial Science and Technology.

Mr. Gilmartin stated that while innovation was important as a source of improving productivity in the United States, win-win strategies were necessary. The key to innovation, according to Mr. Gilmartin, depended on how the powerful countries of Japan and the United States assumed leadership in presenting a vision.

2. Keynote Addresses

Representing the United States and Japan respectively, Dr. Irving Wladawsky-Berger, IBM Vice President of Technical Strategies and Innovation, and Tadashi Okamura, Chairman of the Toshiba Corporation, presented the keynote addresses.

Dr. Berger talked about three important factors promoting innovation indicated by NII: (1) talent (human aspect), (2) investment (economic/financial aspect) and (3) infrastructure (physical/political structure such as intellectual property policy). According to his analysis, digital revolution, business process revolution and social revolution were

underway, that flexibility was increasing due to an adoption of open standards in software, and that investment was being undertaken in specialization and specialized areas (open collaborative efforts). Dr. Berger added that innovation was a central issue in national policy.

Mr. Okamura delivered his keynote address on the topic *Creating Innovation for the Future*. According to Mr. Okamura, during the 20th century, there was a clear need to meet quantitative demands – to step up speed, volume, and distance – and these needs were tacitly shared by business and academia and were consequently fulfilled through a linear model of technological innovation. However, during the 21st century, according to Mr. Okamura, social needs were shifting from quantity to quality, from the tangible to intangible, and scientific discoveries and technical renovation were no longer resulting directly in innovation. Mr. Okamura expressed the view that in such an age, both business and academia must share a vision for a system innovation for the 21st century and that such a system would result in innovation by structuring and systematizing as knowledge scientific discoveries required for future innovation.

In this environment, Mr. Okamura said that companies will have to change and that in addition to the increasing importance of value creation through intangible assets, the scale of innovation through globalization and IT will surpass the scale of single corporations, making the creation of innovation through corporate collaboration with businesses of different types and categories essential. Mr. Okamura also gave a profile of a company in the 21st century where changes were required for companies to be able to fulfill diverse qualitative needs.

To realize innovation in the 21st century, Mr. Okamura suggested that it was necessary for the academic world to actively promote the interaction of outstanding researchers with the business world and for government to promote the establishment of a “knowledge-integrated research and development organization” and various systems for the promotion of interaction between business and academia.

3. Panel 1: Imagining an Innovative Future

Moderator: Michael Elliot, Managing Editor, TIME-International

Representatives of NFS and NEDO, research and development funding bodies of Japan and the United States, were first asked to give their views. Director of the National Science Foundation, Dr. Arden L. Bement, Jr. indicated a role of NSF as expanding frontier, saying that the National Science Foundation (NSF) should supply their fund to the area exceeding the scientific and technological possibilities. New concept may bring new solution for health care and disasters. Students at universities will become innovators in the future so that investment to universities is also important. Speaking about various efforts in technical development undertaken by the New Energy and Industrial Technology Development Organization (NEDO), Executive Director Yoshihiko Sasaki noted as areas that he found of particular interest: (1) semiconductors

and optic communications, (2) home information electronics, (3) robotics (MEMS chips), (4) nanocarbon tubes, and (5) solar cells and organic EL in the area of energy.

Next, Mr. Yasuo Nishiguchi, Chairman and CEO of Kyocera, and Dr. Hiroyuki Watanabe, Senior Technical Executive of Toyota Motor Corporation, presented reports on the actual innovation site in their companies. Using the example of the development of solar cells, Mr. Nishiguchi commented on the importance of managerial philosophies in the initiation of innovation.

Citing the example of the development of the Prius, Dr. Watanabe also indicated the importance of management decisions in innovation. According to Dr. Watanabe, Toyota's top management (Chairman Hiroshi Okuda) made a decision in 1995 that the Prius had to be completed to coincide with the 1997 Kyoto Conference and that if this decision had not been made, the Prius would not have come into being. He added that while leadership is essential for realizing innovation, orders from the top alone were not enough and that the things engineers thought would be important in the future should be stored under their desks.

Innovative processes in the company system

Dr. Hiroshi Komiyama, President of Tokyo University, gave his comments from a different social perspective from the actual process of innovation in the corporate sector. Dr. Komiyama stated that in innovation the foundation and structure of society change and that it could not be achieved through scientific and technology alone but that (1) financial and (2) social issues were also involved. To promote innovation, Dr. Komiyama suggested that collaboration among the Cabinet Office's Council for Science and Technology Policy, the Council on Economic and Fiscal Policy and the Council on Deregulation was necessary. Dr. Bement said that educating people, government regulations, and raising awareness through education were needed and that in the United States the NSF was taking budgetary measures for this.

Commentator Dr. Stephan Joel Trachtenburg, President of George Washington University, remarked that innovation was accompanied by resistance and that it was a problem in universities.

According to Dr. Trachtenberg, universities are modeled on a system and architecture dating back to the Middle Ages, so the university's own vision of innovation is shackled by regulations and controls and therefore innovation under normal circumstances is not possible. According to Dr. Trachtenberg, external influence from the industrial and corporate worlds is vital and universities must take advantage of this influence to bring about change.

The role of universities

Speaking from his own experience, Dr. Bob Bishop, CEO of Silicon Graphics, commented that universities should be thought of as places where knowledge and wisdom are born, that with the arrival of new tools, such as high-performance computers, computer combinatorial simulations are becoming possible and that, as a result, the generation of innovation is coming into being as a process.

Touching upon a difference between Japanese and American universities, Mr. Nishiguchi commented that universities and the corporate world in the United States shared very good relationships and that there was a rich source of skilled human resources “who held the American dream”. He said that in Japan there should be more collaboration between industry and the academic world.

In response to this, Dr. Komiyama asserted that it was already not possible for the Western model to be introduced into Japan. He stated that Japan had its own particular issues which only Japan could resolve and that it had to find its own method of resolution. Dr. Komiyama stated that it was necessary to see Japan as a developed country with issues which had to be dealt with by creating its own system of innovation. From his position as a person from the government sector, Mr. Sasaki proposed that it was necessary to have highly motivated university researchers and that the key to executing successful technical strategies was in policy makers being able to interact with such motivated university researchers.

The need for interfacing

Dr. Bement clarified the role of the NSF is being an “enzymatic role”. He indicated that while every country has its own order of priority, interfacing is important in bringing about a true transformation that will produce innovation. He continued by saying that between life science and organic science, a new field, organizational engineering, was coming into existence as an area of knowledge which did not exist previously.

After clearly defining innovation as something that was implemented, not a theory, Dr. Richard Adams, Senior Vice President of Battelle, stated the importance of the interfacing between science and the market. As he sees it, interfacing itself is innovation and produces high value-added goods. Whereas in the past education focused on a narrow area, today fusion is important. Dr. Adams believes that Japan has an advantage in the fusion of technology. He also believes that a system of innovation changes continuously and that the required elements are: (1) leadership (not “how” but “what” as described by Dr. Watanabe), (2) diverse teams (it is essential that they work well together) and (3) an organization that can be conscious of itself. To explain his point, Dr. Adams gave an example of innovation in medical equipment.

Making the point that fundamental research was important in promoting innovation, Dr. Watanabe presented the example of the development of the electric cell for the Prius. To increase the efficiency of the Prius, it was necessary to consider what was taking place inside the electric cell and this meant going back to the basic research. Both in-depth knowledge and product evolution were needed and, in this respect, innovation interfacing was essential. According to Dr. Watanabe, it is important for researchers to understand what people in society want; also of importance is achieving appropriate mixture of a coordinating (grinding to fit) technology and an openness in relation to the company’s independent principles.

Touching upon basic research and its application, Dr. Bishop indicated that for basic research to reap results, it takes 100 years and that research and development have been carefully undertaken according to those processes. He also said that we must look carefully around us to see how many basic “discoveries” are right before our eyes at present.

Dr. Charles Chambers, President of Lawrence Institute of Technology commented from the floor that both innovation and the invisible hand (market) were present in making this a reality. He then asked whether there was a mechanism for these discoveries to actually reach the market. In response to this, Dr. Bement said that fundamental research was the foundation and that, at this moment, it was impossible to “do an autopsy to find out which chicken will lay a golden egg”, but it is worthwhile to pursue such innovation process.

Cultivation of human resources as the basis for innovation

A comment from the floor noted that innovation basically came down to a question of people and queried what was happening in terms of educational systems. In response to this, Dr. Trachtenberg said that universities had become nearsighted and that it was necessary to provide rewards which could be allocated to recipients who could use them as they saw fit. He said that the gap between poor and rich was growing and that schools and education alone were not enough. Expressing his dissatisfaction over the state of education, he said that there was a lot of talk, but no action.

Dr. Bishop said that the United States was a country that accepted chaos and risk. Japan, on the other hand, was conservative, he said, and integrating the two might produce interesting results. He also noted that VC did not exist in Japan. In response to this, Mr. Nishiguchi first remarked that Japan was not at all averse to taking risks and indicated that how engineers perceive development in general was important in cultivating engineers with ability in innovation.

Dr. Bement remarked that there had been a failure in the United States to instill in children an interest in science and mathematics and that he believed simulation would be an important tool in the future for motivating students.

There was a comment from the floor to the effect notable differences between Japan and the United States were openness and graduate school education. Indicating that it was important for university professors and lecturers to interface with graduate students, the person commenting said that while in the United States very capable human resources were nurtured in this way, research in Japan was perceived solely as a process for becoming a professor or lecturer. Dr. Komiyama commented that this was a very important point and that Japan should learn from the United States in this regard. For a university, he said, human resources were more important than intellectual resources. Dr. Watanabe joined in saying that from his experience with the Lexus development team he came to have high regard for the American system of cultivating human resources.

Using the abilities of people of advanced age

One person from the floor commented that retirement in itself causes the skills and abilities of senior persons to become obsolete. Taking up this comment, Dr. Bishop put forward the idea of receiving the advice of such people via the internet or virtual campuses. He also noted that in Japan, there is valuable art and culture (paper making, pottery etc.) and that there was a need to preserve the knowledge of its senior citizens as national treasures.

Changes bring about both threats and opportunities

Dr. Adams commented that one difference between Japan and the United States was that in Japan radical innovations were carried out by large corporations, while in the United States they were initiated by start-up companies. Remarking that changes brought about both risks and opportunities, Dr. Adams noted there were many issues for companies to consider but that it was time for testing their ability to respond to these.

4. Luncheon Keynote Addresses

Mr. Raymond Gilmartin, Chairman Emeritus, US Council on Competitiveness

The following are the essential conditions proposed as an innovation framework for an innovation economy: (1) educational system, (2) official endorsement of basic research, (3) efficient regulations, (4) protection of intellectual property, (5) economic incentives and (6) access to global markets. The United States has become the most advanced country in the field of bioscience by fulfilling these conditions. A report from the Council on Competitiveness substantiates this claim. If the creation of an innovation environment is supported in Japan, there is no limit to how much it can expand and it will be beneficial for everyone.

In 2002, the Council on Competitiveness under Michael Porter published the *Cluster of Innovation*. However, the National Innovation Initiative this time is something that will advance the whole of the global economy. It will be important to share the viewpoint with Japan which has a possibility to enhance her presence in the field of life science.

Dr. Masuo Aizawa, President, Tokyo Institute of Technology

Japan's development of human resources has been formed by a domestically closed system. Japan's postgraduate education tends to concentrate within laboratories without reaching out to other areas. The verdict of the Central Council for Education indicates that Japan's postgraduate education requires fundamental changes. There is a need to secure international superiority particularly in higher education. This means putting more effort into pulling up its ranking.

The disciplines of science and technology in Japan were segmented in efforts to achieve deeper study. To provide solutions to social problems, the formation of trans-disciplines is required as well as a holistic investigation from consolidated perspectives. We are

contemplating the development of “brain power” by overhauling postgraduate programs completely.

Japan must consider ways of aggressively utilizing diversity. There is a need to collaborate with universities all over the world. Collaboration with business has been progressing for the last few years and the time has come for proposing a platform for both business and university in promoting innovation. There is a need for integrating of business and university efforts in solving difficult problems. Businesses will not be able to create innovation unless they initiate participation from the integration process. The idea is to unify knowledge creation and transformation to innovation. A case example of cooperation between Tokyo Institute of Technology and Mitsubishi Corporation was also presented.

Promoting the development of human resources more vigorously is a challenge which must be addressed in the future.

5. Panel 2: Creating Regional Innovation Clusters

Moderator: Mr. Koichi Nishioka, Columnist & Editorial Writer, Nihon Keizai Shimbun (NIKKEI)

Current Status of Cluster Construction and Attendant Issues in Japan and United States

Dr. Hiroo Imura, Chairman of the Foundation for Biomedical Research and Innovation, reported on Japan’s current status, indicating that half of Japan’s knowledge clusters are bio-clusters and outstanding issues include: (1) development of human resources, (2) lack of a global perspective, (3) weak VC, (4) deregulation problems and the problem of conflict of interest

Mr. Rodney Nichols, Advisor of Richard Lounsbery Foundation, listed the following as themes in cluster construction: (1) stimulation, (2) national policy, and (3) best practice. Furthermore, he emphasized that provision of authority for the use and utilization of resources, a reduction in regulations, the permission to experiment freely, and sufficient rewards for success were important in stimulating innovation.

Mr. George Hara, Managing Chairman of DEFTA Partners, reported on the current situation of VC by pointing out that VC that will accept risks declining in the United States as well. Speaking from his experience in VC in the Silicon Valley, he cited the following as important conditions for initiating venture businesses: (1) finding the money involved, (2) separation of management and business promotion, (3) rewards as stimulation and motivation, (4) rapid merchandising capability, and (5) area’s openness towards immigrants.

Furthermore, as adequate conditions, he indicated the importance of culture and climate.

A cluster is something that occurs naturally rather than through a top-down approach

Dr. Kenan Sahin, President of TIAX LLC, presented the viewpoint of a person managing a technical development company which acquired the technical development division of Arthur D. Little, and as a person who is at the center of technical development. He pointed out that the reason for the increased interest in innovation is probably due to Moore's Law. He also indicated the current challenge by saying that the technical development model which in the past used large internal research divisions in companies in the 1960s and 70s, and also use SMEs for innovation transformation in the 80s, has collapsed. At the same time, he noted that the number of innovations from universities increased during 2000 to 2004. However, he said that at the moment there is no more capacity to absorb this innovation and we do not know how to address MBAs, because of a rift in mutual understanding between MBA people and researchers. In terms of clusters, he also expressed a sceptical opinion of top-down clusters and then went on to show a framework which will become the basis of innovation in the 21st century. In the future, he said that key elements would be (1) new universities (knowledge factories), (2) industry (3)government and (4) empowered individuals, and showed that virtually clustering these elements would become the framework for the 21st century.

Mr. Tamotsu Ueno, President of Tosei Electrobeam discussed industrial clusters which began in 1998 in the Tama area. Focusing on his experience of starting up industrial clusters, he stressed the importance of the existence of industries with leadership and drive.

We have all the right ingredients but our cooking leaves something to be desired.

Mr. Robert Friedman, International Managing Editor of FORTUNE Magazine remarked philosophically on the current state of innovations by saying that we have all the right ingredients but we do not yet have the right recipe. Although, at the negative side, the number of patent disputes arising from claims to rights has increased as a result of the Bayh-Dole Act, Mr. Friedman says that how we "cook" these ingredients is more important. On the other hand, Mr. Nichols felt that we do not need to look at the Bayh-Dole Act so dismally as Mr. Friedman does, saying that it is all up to the chef.

Role of governments

Quoting from research conducted by the OECD, Mr. Nobuo Tanaka, OECD Director for Science, Technology, and Industry, pointed out the characteristics of Europe by citing country's different economic performances due to performance of labor market and innovation /clusters in Europe. Openness is effective in the United States, he noted, while Japan was the worst among the OECD countries under all of the following indices: co-patenting, openness and mobility. He recommended that the government speed up processes in the same way a business would.

Mr. Hara pointed out that Japan, Europe and the United States have different backgrounds. Conceding that many things were happening within the system in the United States, he said that it was important to find appropriate solutions to such matters when considering the course Japan should take. It is important to create the core of basic

industries for the next generation as well as create a system of investment for perfecting technology, he said. Mr. Nichols also clearly stated that a top-down approach was counterproductive.

Mr. Lincoln Bloomfield Jr., Former Assistant Under Secretary, Department of State, making a comment from the floor, described the role of the government is an enabler. Although it may be said that government is becoming a barrier, he added, concern of other companies possessing so-called crown-jewelry industry and empowered individuals possessing advanced technology can become a threat to security, necessitating regulation through some kind of guidelines.

Mr. Nichols, in response to this, pointed out the importance of the existence of an advisory committee in relation to institutional problems. He asserted that because no appropriate advice was being given, winners and losers were created as a consequence. Furthermore, Dr. Sahin pointed out the problem of ceiling and the role of government as a seeds aerator described that seeds will follow the investment by the government and lead to creating entrepreneurs. However, conflict of interests arising from such investment should be eliminated by the government.

6. Panel 3: Innovation Through Collaboration

Moderator: Clay Chandler, Asia Editor/Senior Writer, FORTUNE Magazine

Development of a global innovation system

Dr. Peter B. Corr, Senior Vice President of Science and Technology at US Pfizer, introduced global research and development methods at the world's largest pharmaceutical company. According to Dr. Corr, the top priority in handling R&D bases located globally is deciding on what will be done at which particular base and the management is decided last. He says that it is important to provide R&D bases with stimulation and that his company invests in places where rewards are given for innovation. Presenting examples of how the center of innovation in the area of medicine is shifting from Germany to the United States, he explained that R&D investment is undergoing redistribution due to the competitive edge of the innovation environment in each region in the world.

President and CEO of Olympus Corporation, Mr. Tsuyoshi Kikukawa said that at Olympus a central research lab had been established two years ago and that there had been a shift in the concept of research, with Olympus going from a linear to a chain model (with equal partners, co-creation, an alliance system and duplicity) and that Olympus undertakes development from basic technical research after determining what people in the 21st century will see as value. In overseas alliances, he made reference to the Waseda-Olympus Bioscience Research Pte and, as reasons for undertaking such investment, cited the cooperation of the government in bioscience policing and the merits of the concentration of intelligence in terms of being able to obtain outstanding researchers.

In response to the question as to why GM was operating in China, Mr. Rudy Schlais, former GM Asia Pacific President and current GM Group Vice President, replied that a

major factor was, unlike the situation of NUMMI, there was a population of 1.3 billion people in China and that the market was expanding. When entering the market in China, he said that GM: (1) unlike other manufacturers, gave quality assurance of its processes and logistics system, (2) placed importance on cooperation, (3) brought in parts assembly operations, (4) introduced a joint venture for technical development and included Chinese management, and (5) viewed investment as long-term investment and had its partner clearly articulate what it viewed as being important in the partnership.

Dr. Victor Fung, Group Chairman of Li & Fung Group, has developed a new business model which enabled his company to make inroads into 40 countries and handle products for consumers. Under this model, everything from the thread to the cloth and the sewing operations of textiles as well as which company at which location in the world does which processes is decided for up to 10,000 orders. According to Dr. Fung, everything has to be done as if it were under the roof of one factory (IT development, organization of orders and the existence of logistics are required.)

(1) Discovering worthwhile products and (2) a collaboration system are characteristics. The company ensures that orders placed with a supplier should be 30% to 70% of total sales of each supplier.

Mr. S. Gopalakrishnan, COO of Infosys Technologies based in India, is developing the company's information business globally. According to Mr. Gopalakrishnan, the development of information communications technology has made it possible to divide business processes, and because of this, business process outsourcing is emerging as a business area. Mr. Gopalakrishnan sees the ability to transmit knowledge and management ability as the core competency of Infosys Technologies.

President of Waseda University, Dr. Katsuhiko Shirai said that cultivating human resources is a basic condition of innovation and that universities today are being asked to think about the kind of people they are trying to train. According to Dr. Shirai, if we are to educate persons who will be leaders in the 21st century, it is widely accepted common sense that education should be open and, in that regard, it is vital to have exchanges of persons among universities all over the world. The issues are (1) communication and (2) motivation of both individuals and society in relation to science. He commented that in the past Japan's exclusiveness contributed to innovation but that this way of doing things ceased to be the accepted standard when openness became the accepted norm.

Importance of establishing the environment for collaboration: innovation in global processes

Dr. Fung said that creating a "win-win" solution using his company's model was important and that in areas where cooperation in the industry was difficult, it was necessary to formulate rules for competition.

As commentator, Professor Emeritus of Harvard University Dr. Dale Jorgenson asserted that it was important to create an environment of collaboration. Using the example of the IT industry, his analysis indicated that (1) the organizational change of going from a vertical to horizontal structure and (2) constant dramatic changes in accordance with

Moore's Law have had an effect on the form of industry. He also noted that while Japan and U.S. were a developed country in terms of IT, trade policies were playing a very important part. Furthermore, making the introductory remark that globalization is progressing in the opposite direction of 20 years ago, Dr Jorgenson stated that in the future business development would require international collaboration, as seen with the development of the Apple I-Pod, and that innovation was a global process.

Dr. Fung indicated that the atomizing of the global supply chain was taking place and that small and medium-sized businesses were included in this process, making business conditions fair. As a result, the vitality displayed by small to medium-sized businesses marked a conspicuous change from the past. One area of risk noted by Dr. Fung as a problem, however, was the existence of non-tariff barriers and growing number of the bilateral trade agreements.

Dr. Constantin Papadakis, President of Drexel University made the comment that 75% of American high school graduate entered the university and with online learning many people in China and India would also be able to go to university without increasing number of universities. He stressed that with the existence of global networks among universities, these networks should be efficiently utilized. But, there exist such barriers as intellectual right and anti-trust law against global collaboration. If we could coordinate globally such barriers, more meaningful collaboration would be accomplished.

The best global arrangement and investment?

Dr. Corr believes that since R&D exists externally, alliances should be actively pursued. Since Japan is unique, he said, it is operating on one model. However, the United States is becoming the most difficult place for conducting R&D with universities. This is because material transfer agreements are needed. Therefore, it is gradually becoming impossible to undertake R&D there.

Mr. Kikukawa said that Olympus is operating on the principle that products where quality safety in medical equipment is required are manufactured in Japan and consumer products are manufactured in China. However, he said that the quality of products manufactured in China was high. Mr. Kikukawa attributed this to the very good eyes of staff in China and their ability to fabricate products according to manuals. On the other hand, he said that Japanese had the tendency to attempt improvement in clumsy ways and this resulted in further problems.

7. Closing Remarks

Relating his impressions of discussions at the summit, Dr. Shuzaburo Takeda, Executive Director of the Business-University Forum of Japan, said that it was clear that the concept regarding innovation had changed and that it was the issue causing the most concern in each country at the moment. Afterwards, the Honorable Alan P. Larson, former US Under Secretary of State for Economic Business and Agricultural Affairs, and Mr. Shigeo Tani, Deputy-Director for Industrial Science and Technology Policy, METI,

gave their views on the significance of the summit and expressed their feelings of gratitude at its successful conclusion.

Compiled by Harukazu Nishio, Director of the Business-University Forum of Japan