

Discussion

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Gunjima :

During the morning and part of the afternoon, we heard reports from the panelists. For the next two hours, until 5:30, we will have all participants here for an open discussion. Within that, I would like us to deepen our understanding of PSS theories. Before we start the discussion, I would like Prof. Yoshida, whom you just heard introduced, to talk about research directions in Japan. Prof. Yoshida is an assistant professor at Wakayama University and active at the Global Environment Forum Kansai, which had started the research of PSS models ahead of us. We will start by hearing his talk, interests and viewpoint of PSS

research at Global Environment Forum Kansai, after which panelists can ask and field questions and then we'll move into the open discussion. So, Prof. Yoshida, if you would please.

Yoshida:

Thank you, Mr. Chairman. Ladies and gentlemen, I am Noboru Yoshida of Wakayama University. As you just heard, I make proposals concerning environmental problems such as this as well as policy proposals based on research, at Global Environment Forum Kansai, which is a cooperative effort between industry and academics

that brings together experts from governments, private businesses and academia of the Kansai. Within that, there is a subcommittee on technology for a recycle-oriented society that is looking into PSS. Prof. Makimura of Kyoto Women's University and several members of the Kansai Forum who are here in attendance today have been researching PSS since two years ago.

In the reports heard earlier today, there was mention of B-to-B and B-to-C approaches. At Global Environment Forum Kansai, a challenging topic we face it how to focus on B-to-B and then work in B-to-C. The Forum has staged symposiums several times because it is necessary to promote green purchasing in order to change the basic way consumers think about consumption. Consumers hold the key to green purchasing, therefore one of the hopes of PSS is that it will provide the driving force for changing how consumers think. Another thing is that the business chances that will come from looking squarely at consumer needs from the perspective of the consumer will lead to business models that will help activate the Kansai area.

At present, we are continuing research that we have been doing for some time on what kinds of PSS models have potential in Japan, including the examples we heard presentations on from Matsushita Electric Industry, Duskin and Sagawa Express. Preparations are currently underway to compile findings into a book. In that regards, this workshop has been a great opportunity to learn and put our thoughts together. I would like to thank everyone for that.

I think that, during the presentations we heard today especially in the morning, everyone focused their attention on the factors and what sort of schemes are necessary for promoting PSS. We are interested in this and, as was said in the beginning, various IT will be

very important as the drivers. Especially in the case of Japan, when thinking up PSS strategies for the future, social trends will cause future scenarios to change greatly. We are very interested in how the elements, information and keywords like an aging society, security and sustainable development will determine our society, Japan's future or the future of other nations, and future scenarios, and whether they will act as a tailwind for PSS or bear some kind of negative effect.

There was another topic at the core of today's discussions: the underlying support of PSS. How do we build the social capital and social schemes that will support PSS? I will talk today not about the hardware but about regulation and deregulation and about organization. It was pointed out by Dr. Mont that, unless this underlying yellow area is included, unless we look at it with system concepts, it won't work. I find that very valuable advice.

While doing research at Global Environment Forum Kansai, I visited the USA to see examples of car sharing. I learned a lot. If I were to describe myself, I'd say that I'm a late-comer and the type of person that learns by asking questions. Though this may be getting into the next section, I've got questions about each of the presentations we heard earlier because of our interest in drivers and social capital. After I finish talking, I'd like to ask those questions during the discussion.

In the first presentation given by Dr. Stoughton, I'd like to ask how IT can really function as a tailwind for PSS. In Mr. Wong's presentation on "PSS Applications in the Consumer Goods Industry: Lessons Learned in the UK", he mentioned countermeasures to rebounding. I am interested in knowing if a single PSS system would be ineffective in canceling out the rebound effect. And, I am interested in the positions and roles of government that Dr. Mont touched upon in her

presentation on "Trends in PSS in the European Union". Even in Japan, the government is playing a big part in green purchasing and other initiatives in order to lead market formation. Then, there were the PSS examples from the business sector. I think we are at the point that we need to evaluate the specific business models such as Matsushita's and whether they are good for society or not, including the degree of customer satisfaction

Lastly, there was Mr. Bleischwitz's presentation on governance, which is a very complicated topic. In Japan, there are cases where laws on articles and buildings actually prevent PSS from working because of ownership rights. Some effective tools were also introduced in the presentations, so I want to ask which tools would be effective towards further promoting PSS.

I got a little ahead of myself, but this has been a great opportunity to learn and I want to thank everyone for that.

Gunjima:

Now to continue, I would like to move into the open discussion in which we tie in the questions from Prof. Yoshida and several other questions from everyone else.

As was pointed by Prof. Yoshida and it was even asked from the floor, a recent problem we are interested in is PSS seen from the perspective of environmental demands. Nevertheless, when thinking about PSS unto itself, Japan, which is directly faced with a dwindling population, cannot avoid a shrinking economy, an economy with a shrinking population. This will conceivably bring about changes in the balance of market labor pools and production strength, and the significance of investment. I think PSS will be looked at closely as a managerial approach to a shrinking economy and the situation will eventually act as a tailwind for PSS. As Prof. Yoshida

pointed out, PSS cannot become business just because of environmental factors; there are various aspects to look at. In that sense, there was the explanation of Dr. Stoughton; PSS models may gradually emerge in the globalization of materials procurement because of the escalating cost competitiveness of globalization, whereas it used to fall within business affiliations or supply chains used until now. And, there are the problems of environmental load, greening and the question Prof. Yoshida raised a short while ago as to whether or not IT can act as a true tailwind or not. Then, there is the care service that Duskin is providing amidst Japan's aging process; services like this will gradually be in demand from welfare perspectives. Given the situation, I would like us to begin talking about what the driving forces of PSS are and what actors act inversely as a tailwind for PSS as we heard earlier, which is what Prof. Yoshida was asking. I want us to talk about not just how PSS reduces environmental load but what driving forces will increase these types of business models, and how PSS will grow or not grow in its relationship to current social changes and economic changes. Mr. Wong is researching all aspects of that, so I'd like Mr. Wong to touch off things.

Wong:

In terms of the driving forces for PSS within the European situation, one of the key driving forces is legislation. This may not be as clear as the example in the U.S. from Dr. Stoughton's talk area. In Europe, directives as passed at the EU level, with detailed implementation left to the individual member states. However, there can be no doubt that these issues are a very powerful driving force. Beyond that, we are also looking at the economics and specific business case for PSS, and looking at particular market niches in which

PSS best fits. This is also very important. We are also looking very much at IT and the aging society. Both of these things I believe are also important as broader factors.

Stoughton:

In my talk about PSS prospects in the US, I did not discuss demographic issues as an important economic factor for PSS. And that is because while the U.S. population is getting older, it is not as sudden or as dramatic as what is happening in Japan.

The effects of an aging population on PSS prospects is an interesting question. Clearly, an older population creates demands for certain kinds of services, especially "at-home services" related to health care, delivery and that kind of thing.

To my knowledge, though, I have not seen anything published in the English literature discussing the impacts of demographic transition on consumer services. If any of my fellow panelists have, I would be interested to hear. But I think Japan may be the first economy that will really experience and illustrate these effects.

Mont:

I was thinking about drivers a little bit more for business to consumer market. In Lund, we are talking about distributed economies, meaning local economies, versus globalization. We see a lot of examples in the PSS field, we are looking at the possibilities to develop local systems and this is especially driven by concern of consumers in, for example, food sector. How long your food travels, does it come from New Zealand, Australia, all the way to Scandinavia, or is locally produced food means that it is fresh and many people do not have to worry about transportation cost and environmental impact. It is also clearly linked to sort of health effects and perception

of people about food whether it has been ripe on the road or actually on the field. Many people are much more eager to pay a little bit extra to support local farmers than to support middle or long distance transportation.

Another driver being discussed at European level is the volatile work market. The job market is quite flexible. So, people are moving a lot and this leads to that many people start questioning the level of possessions they have. They need to drag their possessions all the way to different countries, depending on where the jobs are. For many people, this flexible working pattern becomes a trigger to reevaluate their ownership criteria. In Sweden it is a long-term discussion on aging population and on services that are provided to elderly. In Sweden we have a different problem - the high taxation of services. So, for many people to buy services is very expensive. We need to provide services, but we need certain changes in taxation system to promote services and local economies. It also becomes a question or rather a driver: would aging population increase the upper limit of working age. This also leads to a question: can many people consider this option of working late in their life, if it is a part time work. A lot of services that are provided at community level to elderly are part time work and flexible working hours. This is also one of the drivers for this service-oriented solution.

Gunjima:

Thank you. It was pointed out that, even though there is B-to-B PSS, B-to-C PSS is more difficult, but B-to-C PSS seems to be expanding. One case is home care services for an aging society, as Dr. Stoughton pointed out. Does Duskin have anything to add to that?

Yoshimura:

There are still aspects we have yet to

understand such as how society's aging will affect our service and whether that will act as a tailwind for servisizing. But, we want to develop business within that, make it a pillar business and prove useful to society at the same time. There are still some sticky points in how this will relate to the environment, but it is definitely a prospective direction.

Gunjima:

I believe so, too. Another thing is the high taxation of a welfare nation as was explained by Dr. Mont. Since these kinds of welfare services are shouldered with public money, on the local level, they are shouldered by - shall we say - a market economy or social economy. Dr. Mont also pointed out that flexibility in the labor market is important towards PSS models. Also, food is a problem in globalization. In Japan as well, food security and safety are very important issues. We also heard it said that fields that enhance sustainability on the local level are gradually expanding. From these talks, I got the impression that the environment is not the sole driving force behind PSS; rather, one direction we are seeing is that economic changes or demographic changes, as Dr. Stoughton pointed out, may gradually make PSS possible. Prof. Yoshida, if you have any questions or anything else to add in this respect, please do.

Yoshida:

Thank you. The explanations were quite clear. As was said earlier, the way elderly people live will change as the overall population gets older. More specifically, as one comes to need nursing care, he/she leaves his/her home to enter a semi-public facility such as a group home. How things are used within that and how people think about owing things while living a service-oriented life will more than likely change as we go forward. In that

sense, I think society's aging will become a positive driver.

Given this opportunity, I would also like to learn more about the growing use of information and IT that Dr. Stoughton spoke of. I myself deeply recognize the role that information plays as an alternative to labor, time, energy and resources, so I believe IT will also act as a positive driver. As you probably know, the IT industry in Japan even has their hands on managing baseball teams. The IT industry has grown recently by providing products to consumers at very low prices not just via e-commerce and internet communications but by serving as an intermediary between industry and consumers or, in other words, by eliminating the retailing and distribution that created visual relations with consumers. The chairman spoke of globalization, but I'd like to inquire as to another aspect of IT, that being whether or not IT can harmonize with PSS and the information be used to efficiently enhance local value. Can it harmonize well?

Marcus Wong said before that partnerships with high-level managers are extremely important towards socializing PSS. Can IT, which creates value chain and maintains relations with consumers, maintain the value chain and coexist with it in the future?

My question may not be all that clear, but it's a problem I am troubled by. I asked it with the intent of getting a confirmation.

Wong:

I think IT is critical. Looking to my particular case studies, there are very few where IT was not a factor, even in such cases as car-sharing. The information which is provided to the people who are members of car-sharing or even the ride-sharing scheme tends to be Internet-based. If we look at things like CMS, it is based very much on having a comprehensive database which tends to be electronically-

based and that has to be arranged using IT. So, I believe IT is very much a critical factor involved in the facilitation process. I am not sure whether I would describe it as a driver. It is, to my mind, more something which needs to be in place, to be managed correctly for a PSS solution often to be successful.

Stoughton:

I mentioned IT as a PSS driver in the U.S. economy, simply because it creates a market for certain types of PSS. And by that I mean that as long as information technology continues to change very quickly, it creates a market for services to manage IT for companies.

What Marcus was discussing is rather different and I agree with him. But in most of the business to business PSSs that I am familiar with, the value proposition to the customer is that the PSS provider can perform some logistics function better than the customers can do for themselves.

For example, in the case of chemical services, the provider can manage the ordering, the inventory, the distribution and the disposal of chemicals better than the customer. In the case of the successful car-sharing schemes that I know, what seems to make them successful is, (1) the fact they have cars at convenient locations, but (2) and just as important is effective application of IT. Effective IT means that when the customer makes a reservation, it is guaranteed. The IT system remotely unlocks the car, verifies the location of the car, and debits their account automatically.

So, it is the IT investment that makes these logistic-based PSSs possible.

Mont:

I would also like to add that we should think about IT as not a final end but as a means of enabling solutions. We have looked

at some IT solutions such as application service provision, in which companies or consumers do not have to own complex computer with the hard drive and all its hardware. One just needs to have a so-called thin-client or even an old computer which basically links you to server. So, on your monitor you see the same picture as in traditional computing, but the communication is only the clicks on the keyboard. In a way, it is outsourcing IT resources to provider. It works quite well in Swedish companies. In order to investigate attitudes of households to such models, we conducted a survey of households. People were very concerned about outsourcing their private letters or whatever database systems they had. One would think that businesses would be much more concerned about security and business secrecy, but in fact it is private people who are very careful with what they are outsourcing. So, I think there is still a big potential in business to consumer area. But, there are certain barriers, which need to be overcome in IT field as well.

Gunjima:

Thank you. As Dr. Mont just said, IT is only a means. As Mr. Wong pointed out, IT is a means of communication in the supply chain. As Dr. Stoughton pointed out, it is a logistics issue. And, Dr. Mont introduced IT for outsourcing. So, there are various intertwining issues. It's by doing those things that IT has a cost reducing effect in the supply chain. Another point is that IT takes various shapes and forms such as to cut costs and raise productivity, skip intermediary communications and so forth. On the other hand, IT is reducing environmental load via TV conferencing and other applications. IT is not PSS but seems no more than a means that brings all sorts of positive and negative factors. I think we need to research those points

a little more. This problem was put forth by Prof. Yoshida, I believe. Thank you, Prof. Yoshida. Are there any "this is what I think" comments about today's IT from the floor?

Floor:

IT all of sudden eliminates the restrictions of time and place, so I see it as a big chance for PSS. In existing business, there has only been product selection, shipping and supply with the restrictions of time and place. The way business is done is determined by the rules they are bound by. It would be advantageous to business if there were no restrictions, so this may be an alternative approach to reducing environmental load. Regardless whether restrictions are lifted by IT, IT is being introduced on the pretext of old restrictions. We should be able to avoid the mistakes and losses if we look from a PSS perspective. Thinking with a PSS perspective presents particularly big opportunities when it comes to introducing IT.

Gunjima:

Thank you. We need to restructure our socio-economic systems. The economic structures of the 20th century disposal society are changing. Not just environmental restrictions but also economic and social restrictions, including demographic restrictions, have emerged. In Japan as well, restructuring in the form of economic and social changes are taking place. I'd like to hear what sort of outlook Mr. Bleischwitz has on PSS in light of those changes and trends. Would you give us your opinion on how restructuring, not as a driving force but within its relationship to social foundations, can give PSS greater social significance?

Bleischwitz:

First I think that it generally fits together.

They tend to see towards service economy, decentralization, a more offensive competition policy in favor of small-and-medium-size enterprises and with regard to sociological side also change towards individualism. I would think all these trends are very much in line with PSSs. And the question would be whether there should be additional policies for PSS. I am not sure. I would think that within these existing policies, it might be worthwhile to look at what specific measures are being undertaken and what their likely impact would be on the PSSs. Then you would come up with more specific analysis. I could imagine that product services systems are not yet in the mind of the regulator of the central government. Therefore, just a few pieces of regulations could perhaps be added to the already existing tracks. In particular, I do believe that perhaps it needs a framework for the environmental impacts; because what I learned today is that many of the case studies just pick up their individual environmental assessment which is fine indeed. They look at CO2 and waste etc. But I guess it is also the interest of the business to have some kind of orientation of what the main environmental indicators would be. I think this would be a task where policies could be appropriate. In addition, I would also think that the tax system is quite relevant. I can indeed argue in favor of environmental tax which is under consideration here. But also I think the general idea of what should be taxed. If not labor or capital, what else? And then you automatically see that taxing services less seem to be reasonable. Given public tasks, a certain tax amount should be raised. The question is: where should it come from? Then you could look at energy, materials and water which could be taxed. With regard to decentralization, the fiscal federalism issue would come up. So, the question is why shouldn't there be

federal taxes or local taxes or prefectural taxes. This is now under discussion in some of the European states.

Gunjima:

Thank you. Mr. Bleischwitz made the point that the systematic problems of taxation and decentralization have considerable significance with regards to PSS. Prof. Yoshida spoke earlier of ownership as a factor for discouraging PSS under today's legal system. It would seem that, in order to promote PSS models, socio-economic restructuring is a big issue. Systems become banal so that innovative business by PSS doesn't fit inside the shell of existing systems. To further promote PSS, in addition to systematic structures, cultural backgrounds such as consumer behavior, will be major issues. Could we get Prof. Yoshida to say something about the importance of expanding one's sights and researching PSS models with these kinds of thoughts?

Yoshida:

I think it would be difficult to gain the social consensus to build new systems for promoting new PSS. In that regards, I would like to hear what Dr. Stoughton has to say. He introduced an NPO by the name of Chemical Strategies Partnership in his talk about CMS. How can such an organization prove itself useful towards plotting new social values on a table and demonstrate to society the new benefits of building the legal base? Would you explain a bit more about how an NPO such as CMS can play a part.

This may be a bit hasty, but when considering a labeling system for organic farm products, since these products don't use fertilizer, the system basically cannot be socially promoted within today's organizational frameworks of selling fertilizer in Japan. If you have anything to comment as to whether or

not a flexible organization such as an NPO can prove useful to PSS by encouraging social consensus, please share your thoughts.

Stoughton:

OK. I will try. I guess there are a few important things to know about the chemical management model and then also this NGO, the Chemical Strategies Partnership.

Regarding the Chemical Management Services model in general, a large part of the reason that there is a market for Chemical Management Services is the existence of environment regulation that makes the use of chemicals much more expensive than it would be otherwise. Regulations create or increase costs related to disposal, to reporting, and also to storage and special handling requirement. If those costs did not exist, the market for CMS would be much less.

And regarding how a non-profit got involved with promoting a business or industry. Before CSP existed, Chemical Management Services was reasonably well-established in the automobile sector. The question was "Did it have applicability outside the auto sector?" CSP was basically created to try to address that question through some applied research with willing companies. And the idea was that with the provision of some technical assistance, companies would be willing to be more experimental, or take on slightly more of the risk than they would otherwise.

Once the feasibility of CMS was proven in certain other sectors, CSP really turned to addressing some market barriers. These are mostly related to lack of information about CMS in the market. In other words, potential customers who did not understand the CMS concept, who did not understand how to evaluate their internal business case for CMS or how to create a request for a proposal so that they could actually initiate the chemical

services program. So, CSP's hope is that when the market is well enough established, CSP will no longer have a reason to exist.

So the CSP case is rather different than the idea of a non-profit entity forming the permanent administrator of a PSS. Whereas the example of municipalities which hire coordinators for car-sharing schemes is a "permanent administrator" model. CSP is definitely oriented around a business to business PSS that is adopted for and perpetuated for economic reasons. We became interested in CMS because the largest cost-savings under the Chemical Management Systems are also directly linked to the largest environmental gains. So, it is the situation in which the environmental and economic incentives and benefits are aligned nicely. I do not think that is always the case for other models.

Gunjima :

So, one PSS model is working not by just business doings but by collaboration with other types of organization. Though slightly different from a PSS model, Mr. Bessho presented a program that Sagawa Express has to reduce environmental load via collaboration with the WWF. I don't suppose we could hear a little more about that?

Bessho:

That was the Climate Savers Program where NGOs and businesses work together to reduce CO2. The reason why we are taking part in such a program is that, amidst the trend of interjecting third party opinions into performance reports and environmental reports, we are working with NGOs in order to gain greater transparency and trust than they have today. Our collaboration with the WWF involves having the WWF, a third party, announce the activities of Sagawa Express. There is no actual transfer of objects or anything;

it is addressed as one way to improve brand image.

Gunjima :

Thank you. The reduction of environmental load is tied to CSR in some ways. The PSS model presented by Dr. Stoughton creates a win-win situation for the involved organizations. There are many cases of collaboration with NGOs in European programs such as EcoProfit and Energy+. Mr. Bleischwitz, would you elaborate on that a bit?

Bleischwitz:

Yes, an interesting thing that we observed from the case studies is that they can be characterized as driven by private companies, because they have an interest in selling their products or related services. But they see the information gap for instance, therefore they ask for public participation, and they ask for NGOs participation for two reasons. One is reputation which has been mentioned already. And the second reason is that these NGOs have kind of an outreach. They have members and they have people reading their magazines etc. So many companies hope that at least the members of those NGOs would be among the first customers and this gives an additional impulse to emerging markets beyond those niches.

Wong:

When we look at the issue of marketing PSS solutions, consumers tend to take with a slight pinch of salt company publicity: they are slightly suspicious about their environmental claims. If these claims could be backed up by NGOs which have a good reputation such as Friend of the Earth or Greenpeace, then these claims will often have greater weight in the market place.

Bleischwitz:

There is perhaps another striking reason why such a cooperation is essential. We have in mind a fifth dimension of innovation which is called "systems innovation". So far PSS is not yet really capable of addressing systems innovation for several reasons. But, when you assume that at least some of the NGOs or the green NGOs are among the forethinkers, whatever that means, then you could think that any cooperation prepares a system change which then would take place later on. The exchange of thoughts could be essential, but this is a different level. One is the daily business level where different people are involved. And other one is more long-term-oriented strategic cooperation where, most likely, different actors from the NGO and company-side would participate, but it also is one element of cooperation between NGOs and firms.

Gunjima:

In a certain sense, one of the problems in collaborating with an NGO is the community or, in other words, the readership community. IT offers the possibilities of development within a virtual community, but the real development takes place in the local community. If anyone has anything to say about the relationship between PSS models and community businesses and social enterprises, in the sense that they enhance the sustainability of the local community, or whether or not it would be a good idea to evaluate PSSs by their relationships with small and medium size companies as Mr. Bleischwitz suggested, please speak up.

Bleischwitz:

My simple comment would be "keep it as simple as possible". Because small-and-medium-size enterprises do not have resources to hire expensive consultants or to undertake ISO procedures. Therefore, what the call is

for is a simple procedure. In many cases it needs some external expertise to carry out that kind of assessment. This is partly what researchers of publicly financed agency are good for who do not ask for high fees like McKinsey and other consultants.

Wong:

Looking at the sources of firms which have taken part in my research, most of them are large firms. However, there were one or two small firms that had implemented sustainable PSS solutions. As Dr. Bleischwitz has mentioned, they were supported very much by NGO-type, consultancy-type organizations, who helped them develop their solutions. But I believe there is a great role for small-and-medium-sized companies because they are often flexible enough, so they can move faster than larger companies to fulfill particular market niches which perhaps PSS solution is best adapted to.

Mont:

We see now the role for housing organizations or real estate companies in providing PSS solutions. They are looking for extending their service range to tenants, and are looking for additional services, which can be provided by small-and-medium-size enterprises at the community level, close to where people live, starting from bicycle repair shops and other small activities. I guess this is also one way of approaching the local community, but also providing business case for SMEs.

Stoughton:

Let me say something regarding SMEs, as customers for PSS services. In the B to B market, a lot of purchasing or buying is done by SMEs. And as with larger manufacturers and enterprises, SMEs have the potential to improve their efficiency significantly in terms

of the use of inputs and production of waste. This is certainly true in the area of chemicals and it is true in the area of resource efficiency (that is, waste production).

We have seen one difficult problem in the SME market for BtoB PSSs. This problem arises when the PSS requires to transfer of certain functions that previously we were done inside the firm to an outside provider.

You can look at the total cost to a SME of managing chemicals or the total cost of an SME performing a particular logistics function. In theory, an outside provider could do the job for less. But in most SMEs, one person is doing multiple functions. So shifting one of their functions to an outside provider may not really transfer the associated cost. For example, if one person spends 15% of their time purchasing chemicals, that person will still exist after you have a CMS program. So, you are paying the CMS provider and you are paying your own employee.

This problem makes it difficult to get a sufficient economy of scale for SMEs to purchase certain types of PSSs. The problem seems to be fundamental to certain PSS models and we are not sure what to do about it. For other types of PSSs like energy services, this problem does not seem to arise.

Gunjima:

Thank you. I'd like to move on to the next question. Prof. Yoshida, if you have a question, please ask it.

Yoshida:

I've learned about the organization and roles of NPOs today. The circumstances are a bit different in Japan, but I'd like to hear about the roles played by governments. In the talk about car-sharing before, there were some examples of government's roles in supporting basic elements of PSS such as providing

parking lots. In the case of ESCO, an energy servsizing project talked about earlier, energy efficiency is improved by sharing without requiring any capital. Despite the serious financial woes of the Japanese government, they play a specific part in ESCO by subsidizing the project. In a certain sense, the government is a core actor in forming a PSS market within the ESCO project, but some say they should leave it to the businesses. I would like to hear about any cases in Europe, if there are any, in which the government supports basic elements of the project or contributes to forming a market.

Gunjima:

Does PSS support end with the local government or does support go as far as creating PSS market to some degree? So, the question is "up to what stage does the government provide its support?"

Yoshida:

In Japan, the government leads up a wide variety of projects and has helped create markets. For example, with green purchasing, in order to create a market for using recycled paper made from 100% used paper, the government was first to promote green purchasing. Certainly, the market is created, but up to what point should the government spend energy to recycle used paper? The government continues to stimulate demand without letting the market decide. In some cases, private sector markets are messed up for reasons like this. With PSS, what kind of governmental involvement would be good? I imagine the situation is quite different according to the country. It seems to have something to do with governance, but if you have any suggestions that might be of reference to Japan, please let me know.

Bleischwitz:

I can perhaps make a few remarks on it. First, I think one should really be careful with government interventions. I have seen two innovative firms delivering eco-efficient services, running into insolvency because of environmental policies. This is indeed a tragedy. One was because of misleading waste policies and other one was because of misleading subsidies to bio-fuels which then have contributed to running forestry-based insulation material producing firm into insolvency. So, one should be careful a bit. But I think the main thing about European policies is that they have become clever in that regard. Look at, for instance, the setting of an energy agency in Germany which provides information on energy-saving potentials. This is not directly funded by public taxes, but by money from privatization plus support from electric utilities. One formerly state-owned company was privatized and part of that money was used to set up such an agency. I guess such model can also be applied to other areas. Public tasks do not have to be financed completely by public money. Often, such tasks also coincide with active employment policies pursued by local governments. Local governments actively search for options where environmental relief and PSS can be pursued simultaneously. This kind of policy integration is essential because it saves money and it avoids too many conflicting targets. In terms of what could be done, I could imagine that it also would be important to look at the legal frame for small-and-medium-size enterprises were, for instance, standardized contracts or a simple liability law could be one essential reform which does not cost really money but would encourage small-and-medium-size enterprises to go into the market of services. Because then they would have the lower cost for legal advisors etcetera.

Gunjima :

I'd like to go back to the original problems of the market. I have two questions for Mr. Imai of Matsushita Electric Industry. One is from Yuji Kimura of Osaka University, who asks "what promotional factors and impediments are there to establishing a market for the "Light and Trust Service", which differs from the conventional sales system, without governmental support?" Mr. Imai, if you would please.

Imai:

I spoke earlier about the background to the Light and Trust Service. We make fluorescent light fixtures and the fluorescent bulbs themselves, but our share of the fluorescent bulb market is dropping. The fluorescent light fixtures are made by group company Matsushita Electric Works, who maintains an extremely high share of the market. With prices for fluorescent bulbs falling markedly because of internet sales and internet auctions, we lost share of the fluorescent bulb market. The conventional sales approach is no longer viable. So, we thought it might be possible to sell fluorescent bulbs at overall higher prices and regain market share by giving the fluorescent tubes some kind of added-value. We thought we might gain the understanding of customers by properly treating waste and thus the Light and Trust Service was born.

Gunjima :

When conceptualizing this business model, where was resistance the strongest, inside the company or outside?

Imai:

We first ran into resistance within the company. We started this business model as B-to-B, because some people felt more thinking was needed to deal with the effects of B-

to-C. Outside the company, since a dealer contracted by Matsushita handles the Light and Trust Service, there was a problem in that the capital configuration changed. Normally, when a fluorescent bulb is sold, money comes in right then and there, so capital is easily collected. However, in this business model, the fluorescent bulbs are rented, and payment comes back at a fixed rate. Because of that, the sales company that had previously made the sales and collected the money had to change over to managing rental and lease payments. Matsushita made up any cash flow gaps during the transition period.

Gunjima:

With this Light and Trust Service, making the bulbs longer lasting would mean less bulbs would have to be provided. If this PSS model lasts, the idea and desire to make the bulbs more durable will emerge as a strategy, won't it?

Imai:

We initially started the project to regain market share, so we haven't gone as far as to redesign the fluorescent bulbs themselves. It is necessary that our engineering teams start thinking about extending the service life of our products.

Gunjima:

Thank you. Are there any questions about Matsushita's current activities?

Yoshida:

You just said that it was necessary to start thinking about B-to-C. One of the big differences between B-to-B and B-to-C is that the market can change greatly because, in market creation, much depends on how consumers accept the service. I'd like to briefly introduce a case we are researching. Mr. Gunjima

presented a PSS model in which used refrigerator parts were salvaged and used to extend product service life a little. It's a case of "making assets more durable", but our investigations into the possibilities of this kind of business model showed that consumer acceptance of this previously nonexistent business of used parts was extremely low. However, after visiting a recycle plant and understanding how those used parts are put to use, consumer acceptance improved markedly. Nevertheless, for a business, it is a question as to whether there is a market right now or not. As consumers become more aware of the environment, a market will certainly grow, but that is where the big risks lie. I imagine you faced the same risks with Light and Trust Service. What criteria did you use to move forward? What is the judgment of the project leader or was some kind of quantitative figure necessary? With B-to-C, it must be particularly difficult. How did you evaluate a market you could not see? I'd appreciate any thoughts or comments you might have.

Imai:

Matsushita, too, is studying B-to-C applications. This is just my personal opinion, but PSS is closely related to how mature a culture is. Even at Matsushita, our product design group has many young engineers who are researching the possibilities of PSS-like products, but one's sense of values differs with every generation. Japan's population has many people today age 55 who were born just after WWII. This generation treasures their "possessions" and finds value in them. However, their children's generation is not that into ownership; it is a generation that prizes "activities" such as events and communications. So, for that kind of generation, the possibilities of B-to-C PSS should increase.

Gunjima:

What is the situation overseas? Here, we had a B-to-B PSS that took ownership of "something" as a pretext and changed it to an ownership configuration that did not insist on owning "anything", but PSS trends would likely differ according to the cultural aspects of a nation. So, what is the situation like in Europe and the USA? Even if promoting B-to-B that does not depend on ownership, what thoughts do you have about "ownership" in promoting B-to-C? Dr. Stoughton said that there wasn't much B-to-C PSS in the USA, but Dr. Mont, what is the situation like in Sweden and North Europe in general? Is there a generation gap?

Mont:

I am thinking now: what is our goal? Is the goal to undermine ownership or is it to really reduce lifecycle environmental impact? If our goal is the second, then we should not probably restrict ourselves by leasing or sharing ideas if they contradict cultural context or history of the country. Then we should probably avoid leasing and sharing, but instead, develop systems, which would make take-back process easier and introduce supporting remanufacturing and recycling facilities. So, whatever works depending on context is fine. Also regarding ownership, cars became member of families basically in many countries and yet we see increasing number of members in car-sharing organizations. So, on the one hand, we have the symbol of ownership and status in many countries and on the other hand, there are people who go into membership of car-sharing organizations. So first of all we should be flexible enough to have systems, which work for different context, but, then also in each country there are different consumers as well. Some are prepared to working in flexible and mobile market. They

do not need all the goods, which other people really think they need to own. So these are the two different approaches. I think if the ultimate goal is to reduce lifecycle environmental impacts, then we have options and companies should develop different solutions for different customers. Customers should be given information about what options there are. Suppose I come to a shop to buy a drill, which I use once a year. I should be told by the sales personnel that "what do you need this drill for?", "how many holes do you want to drill?", "are you professional or not?" Based on that information they may suggest not to buy a drill, but to rent one or to buy a handyman service all together. If you are semi-professional, they can talk about different options, different product levels, because products are also different in the level of their sophistication. Sometimes people pay a lot for quality, but they use the product very seldom, it is also a sort of waste of money and materials which goes into high level products. I guess the diversity of alternative as well as access to the information, knowing what options are there, is very important for private consumers. It is not only to buy the "product", but it may be to buy "service", and go into leasing or sharing system in place.

Stoughton:

And more than that, I think there are situations where it is actually not desirable to have PSSs that have the effect of increasing the durability of certain kinds of goods. I do not want a refrigerator to last 20 years. I want a refrigerator to last five years, with energy efficiency standards for new refrigerators increasing each of those five years. For "durable products," where the largest portions of impacts are in use, the persistence of much older products in the population of products in use is actually a big environmental problem.

Mont:

I totally agree. That is a very important point. Some research about refrigerators shows that we buy more efficient refrigerators, but they grow in total volume. So, basically the consumption of energy from refrigerators is growing. In Sweden we have community-based washing centers provided by producers of washing machines through third-party service organizations. The service organizations support and maintain the washing centers and we see washing machines replaced every three years since they wear out fast due to high frequency of use by many households and since more efficient models are coming to the market.

Wong:

I think that it is fair to say that when we are comparing the B-to-B and the B-to-C market, the B-to-B market is typically more rational. Decisions are made for more functional reasons whereas the B-to-C market is often more irrational, where decisions are made on emotional reasons. However, there is a danger that what we are discussing here all the time is looking at the consumer as a very rational sort of being. Perhaps we are discussing issues like ownership: whether ownership is a good thing or a bad thing in terms of how much it's going to cost, when perhaps we should be looking at the consumer psychology behind their behavior. For example, there is very little rational reason for owning a large off-road car which runs 10-15 miles per gallon and the owner is driving that car in the city. Perhaps what we could be looking at is to accept that the consumer is going to be emotional and irrational about a lot of these decisions but still change the way they think towards greater sustainability. And for example, in a study which was carried out in terms of car-sharing, it showed that a lot of people

who are involved in the car-sharing scheme, because they are now more environmentally aware of their situation, are more likely to make environmental choices over other aspects of their life. They are also more likely to take part in other sharing, other social and neighborhood schemes. This is perhaps an example of accepting that the consumer will be irrational but, by using a sustainable PSS to introduce them to issues of general sustainability, we may address the underlying issue of modifying customer behavior.

Bleischwitz:

I have a brief academic remark because it coincides with what has been analyzed in research as difference between private goods and collective or public goods. Now we know that there are goods in-between like club goods. What you mentioned here seems to indicate that consumers are not only interested in their private ownership but also in membership in club, such as car-sharing initiatives. These clubs can be provided as a service from firms meaning that their customers then are members of a club, the Matsushita Customer Club, if you wish.

Mont:

I would like to defend private consumers on a point that they are totally irrational and only emotional. I guess we count the money we spend on whatever we buy. First it is also important to remember that each company or organization has a professional buyer who spends hours on making the purchasing choices. Some studies show that private consumers have three to five seconds for making purchasing choices when they come to shop. So, having this time in mind, consumers probably make very rational choices. Secondly, it all depends on what type of information consumers have as well as how much

time they have to handle it. Electrolux is now introducing an interesting way of selling products because they are developing environmentally sound white goods which are bit more expensive than other brands. They have been thinking how to persuade consumers to buy more expensive, but also more environmentally sound products. They come up with an idea of showing to consumers lifecycle costs together with environmental label. In this way they show that in case of a refrigerator the energy that consumer pays throughout product life is a considerable cost. The company shows that although the initial investment for product is larger than for other brands, in the lifecycle of the product, consumers save money. So, in that way they are giving information to consumer, helping them being rational about their money and selling environmentally sound technology at the same time.

Stoughton:

We also talked about the ownership ethic of the consumer being a real problem. But sometimes in the choice of goods, it is actually lack of ownership that poses a problem. For example, in the U.S., the expectation is that if you rent an apartment, it comes with all the appliances, refrigerator, air conditioner, heating. You do not own those appliances as a renter. The person making the purchasing decision and the service decision is in fact the property owner. The property owner is not inclined to decide on the bases of the lifecycle cost. They are inclined to decide on the basis of the size of capital investment required up front. So, the larger lifecycle cost for inefficient appliance is transferred in fact to the renter who often-but not always-has less disposable income than the landlord. So for product service systems where the purchaser is in a way different from the user (which is true

in many housing situations), you have a different set of problems.

Imai:

I share the exact same opinion as Dr. Stoughton with regard to replacement purchasing. As I explained earlier, the annual power consumption of a refrigerator is one-fifth that of ten years ago. If thought of in terms of lifecycle, it's a Factor 5 product because power consumption during use accounts for more than 90% of the total consumption. Now we are targeting consumers who are smart about replacement purchasing, and we are making proposals to governments. Of course, the customer owns the product, so we are just advocating. If they have already changed over to PSS, then there is a different approach. It is necessary to prepare environmental labels and catalogs further evolved from the current type 2 environment labels as Dr. Mont mentioned so as to make lifecycle energy consumption and environmental load appealing product attributes..

Gunjima:

Prof. Yoshida, have you any questions for those who presented reports today?

Yoshida:

I will have to organize everything I learned today, but there is one last thing I would like to know. Mr. Bleischwitz spoke of Sustainable Impact Assessment (SIA) as a PSS evaluation tool in his report. I myself believe it is important to assess PSS with a tool such as that. Since businesses undertake PSS as a social responsibility, SIA and accounting tools are important because they prove environmental load has been reduced. Already the Wuppertal Institute is recommending a quantitative method, but like Mr. Gunjima said, after resource productivity, there is need to make

services efficient and quantify the efficiency. First, I'd like to ask if any advanced research is being done into that. Though this is true with tools for making self-evaluations of the social impact after implementing a business model, is there any development underway on evaluation tools for improving PSS that would newly rework additional profits of ongoing business models and hidden costs that are internalized by environmental load, or that identifies new value chains that lead to profits? I would appreciate any comments you might have about those evaluation tools.

Bleischwitz:

Thanks. Regarding resource productivity, I guess the measurement can be done, because you can measure resource intensity. There are different schemes but, there is now harmonization going on how the material intensity can be measured. This is done under European Environmental Agency. It is going to become harmonized both in the EU and OECD. So, this is done more or less. Service efficiency is quite more complicated. Don't you think that the only way of measuring it is to ask questions to the consumers? Because this is not a statistical exercise but a question of market response ultimately if consumers are satisfied to buy a certain goods or not. This is perhaps an economist's view. But, I truly believe in the freedom of choice. Among those questions, there should be some questions which are all related to public issues such as sustainability of a region or the public goods such as some environmental things, not only the satisfaction of private consumers with private needs. This mixture of handling private needs and public needs makes service efficiency evaluation somewhat more complicated. But, I guess that many evaluation tools are on the road and it is up to us, the researchers to compare and improve these evaluation tools

over time together with case studies of likeminded companies.

Gunjima :

Are there any questions from the floor after hearing what has been said up to this point? Dr. Mont said that whether something is consumed or not is one option when information is made available. On that point, I would like to ask something of Mr. Yoshimura: Do you recommend renting as a club with memberships? Or, do your customers prefer selling to renting?

Yoshimura:

Customer needs vary. It is important in the business world for a business to supply what the customer needs. Within that, we look at recommending something to a customer as added-value.

Gunjima :

Thank you. We've been talking for about two hours so we have little time remaining. If there are any more questions from the floor, let us take one last question. I would like to ask Mr. Matsuo, who is an IGES researcher and does research also into the situation in Europe, to say something about his impression of today.

Matsuo:

It was a very interesting day listening to the talks from various countries. When I did my MA thesis, I wrote about car-sharing as a PSS. My impression after studying PSS is, like everyone today pointed out, "does it really reduce environmental load" and there are still a lot of unsolved issues. It is a future topic, I think, to clarify the environmental load reducing effect of PSS. Also, the rebound effect is a problem. When looking at a single specific service, efficiency has been improved and load

has been reduced, but when looking at the overall system, sometimes environmental load increased. In Japan, cars and many other products have progressed far with fuel efficiency and electrical efficiency, but Japan on the whole has increased its CO2 emissions, some say. In that regards, I am very curious as to how PSS should be carved and shaped, and I feel it is an important part of any research project. Because research is promoted with this understood as the problem, it was very meaningful today to - for example - analyze the examples presented by the participating companies.

Gunjima :

Thank you. Today, we heard reports from the morning and have just spent a considerably

long time in discussion. I would like to call for a round of applause for the presenters and Prof. Yoshida who provided his comments on everything. Thank you very much.

A guide to the research group of this project has been passed out to everyone. This research group plans to meet every other month in 2005 with today's workshop being the kick-off meeting. I would like to invite all businesses, organizations and researchers on the IGES network and anyone who is interested from the general public to join in. If anyone here today is interested or has information on PSS, please make yourself known to us. We want to promote this research group in cooperation with all stakeholders.

Thank you for such a long time today.