Ruby City MATSUE Project: Regional Industrial Promotion through Open Source and Industry-Government-University Cooperation with Open Source Communities

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Abstract. East Asia nations have made some progress with this technology, and started to introduce OSS for e-government systems during the early part of this century. Many countries granted it a central role in their policies. The reasons for this include adoption of software based on standard specification, liberation from vender lock-in, or opposition to the market control of proprietary software. However, the primary reason is to reduce adoption costs for e-government systems. While this policy work is useful, there is a great deal more that needs to be done. The OSS adoption policy in each nation of East Asia must be accompanied by technological progress in domestic IT service industries or US multinationals will expand at the cost of local businesses. If this continues unchecked it will create a new form of lock-in for East Asian nations. Some Asian nations are trying to promote their domestic IT service industries, putting their OSS adoption policy to practical use, and this workshop will provide case studies of that work. It will also provide a forum for discussing current challenges and opportunities around both policy and practical implementation issues across Asia.

1   Introduction

In Japan, in spite of "Worldwide Economic Crisis", investment and economic growth in metropolitan areas is still lasting. However, the result of "trickle down" has not reached to local economy as well as small and medium-sized enterprises. Or the economic discrepancy is rather expanding. So, the industrial promotion policy and the market expansion that uses each original regional resource are necessary in each region. Government agencies, such as METI (Ministry of Economy, Trade and Industry) or SMEA (Small and Medium Enterprise Agency), founding "Small and medium-sized enterprise regional resource use program", have converted the focus of administration from metropolitan area to regions. It contains sales promotion to the world market, and aim to acquire foreign currency, having the side of assistance measures to consider "Market" strongly. In the "Small and Medium-sized Enterprise Regional Resource Use Promotion Method" enacted by SMEA, the regional resource

is defined as regional industrial resources summarized to following 3 points. (1) Agriculture, forestry and fisheries or mining and manufacturing goods to which equivalent extent is recognized as special product in region, (2) Technology that is related to production of mining and manufacturing goods that become special products, and (3) The one recognized as tourist resources in region. Thus, in the recognition of the government, the regional resource has been limited to physical (visible) products or sightseeing places.

On the other hand, Shimane Prefecture Matsue City – typical local country city in Japan with a population of less than 200,000 people, takes rather opposing position to the Japanese Government Policy. Matsue City started a totally new local project which regards non physical (invisible) product as its own regional resource. In 2006, Matsue City started "Ruby City MATSUE Project", considering open source programming language "Ruby" as a regional resource of the city.

Ruby is the Object-oriented Script Language released by Mr. Yukihiro Matsumoto, called "Matz" in open source communities, and was opened to the public in 1993. Matz lives in Matsue City in Japan and has been developing Ruby with many open source developers all over the world through the Internet. The number of core committers of Ruby is about seventy in 2011, and the two-third of them are Japanese. So Ruby is one of very few open source projects that Japanese engineers are mainly engaged in developing. At first, though Ruby commanded attention through geeks, it had not been spread in business uses. But, in 2005, David Heinemeier Hansson – a programmer in Denmark, released Ruby on Rails, web application framework constructed by Ruby. Hence, Ruby came to attract attention and to be used also in enterprise areas. According to TIOBE Programming Community Index, which announces the ranking based on the retrieval by keyword of the search engine, the share of Java is 18.5% in the investigation of in 2010, and PHP is confronted to 7.8%, and Ruby is at level of 1.9% (ranking 10th place) .But the number of Ruby's engineers has been increasing remarkably. It is forecast that the engineer who will use Ruby by 2013 reaches four million people according to the investigation of United States research company Gartner.

There are a number of regional development policies and plans that use ICT (Information-Communication Technology), especially in the region with a nationwide market by the Internet shopping and Web, in order to reactivate regional communities. It is very understandable in the sense that the needed investment is relatively smaller than conventional manufacturing industries. However, the Matsue City's promotion plan that makes a programming language – invisible and so to speak a "Statelessness" regional resource, doesn't exist anywhere else but in Matsue in Japan.

At first, this "conceptually new" policy was considered rather "rash" not only by Government Agency but also by open source communities in Japan, but Matsue City had grounded a view from the beginning. As for the development of new software and the system by OSS, and the development of OSS itself, people gather and participate independently all over the world by using Internet, and source codes can be freely used and prompt correspondence become possible. Moreover, the

places where people discuss and decide united standards and standardizations are open. This process, one hand, means "Statelessness", on the other hand, it can expand business chances of the addition of the function to OSS, and the construction of the system, etc. even if it is a local small and medium-sized enterprise. The software development method by such open source software can release the relationship, called "vendor lock-in" which is consist of through trust and consignment typically in Japanese information industry. And it will make chances that small and medium-sized information service enterprises in regions catch orders directly from large enterprises and expand their markets.

2   Water fall of industrial structure in Japan and Ruby City Matsue Project

In the commercial report of Shimane Prefecture in 2005 their main market for IT enterprises is "Information Service Industries" themselves, amounting to 37%. It is so high a ratio compared to that of the whole of the country (28.3%) . It shows the multiple chains of commission and entrust among the same trade relations in Japanese IT industry, which is a typical water fall model of development. The local IT enterprises depend on the major IT vender enterprises in Tokyo for their receiving of orders.

     And "Administration Sector" (22%) and "Construction Industry" (9%) follow in the commercial report of Shimane. In the national report those ratios are 8.6% and 1%, respectively. These figures indicate that the IT industry is heavily dependent on the public expenditure. On the other hand, "Service Industry" (16%) and "Finance and Insurance" (1%) are extremely low compared to the whole in the country. It is shown that the orders are given by major enterprises outside Prefecture.

     The orders from "Administration Sector" and "Construction Industry" had already been decreasing in nationwide scale still. If they had depended mainly on the orders in these fields indefinitely, the sales would have clearly declined fast. Shimane Prefecture faced the need to make a choice whether waiting for the reduction of the market or starting regional industry promotion policy to break the present circumstances.

     Matsue City, capital city of Shimane Prefecture, 70% of information service industries in the prefecture, even in workers and sales gather, needed to change this trend. At first Matsue City began to learn from the case of Nagasaki Prefecture, where the governor scouted the CIO from private sector and then cut down the large projects into smaller projects so that regional SMEs can receive the orders and work with Prefectural projects. However, with regards to Matsue City, it was difficult to instruct city's administration staffs to be able to participate in the upper processes of the software development in a short term. Then, Matsue City, having their own regional resource "Ruby", intended to make open source development style in the industrial promotion plan, the city adopted another method somewhat different from

Nagasaki Prefecture. It is not the style that the administration adopts the development style of open source directly, but the style that promote regional industry through the cooperation of the industrial-government-academic (University) complex.

Ruby is the Object-oriented Script Language invented in 1993 by Mr. Yukihiro Matsumoto" called "Matz" in communities, and opened to the public. Matz lives in Matsue City and has been developing Ruby with many developers all over the world through the Internet. At first, Ruby had not been spread in business uses except some engineers. But, in 2005, David Heinemeier Hansson – a programmer in Denmark, released "Ruby on Rails", web application framework. Hence, Ruby came to attract attention and to be used also in enterprise areas. Then Matsue City took notice of the fact "Matz lives in Matsue" and started the project, which attempts to create a new regional brand for the city based around the Ruby programming language, as part of its efforts to regenerate the city and its environs.

The project aims, through the physical facility "Matsue Open Source Lab", one minute walk from the Matsue Central Station. The Lab is creating a hub for all activities relating to Open Source Software and making Matsue a centre for OSS research, development and exchanges.

3   The cooperation of the industrial-government-academic complex with open source communities

But, only by this project, the abilities of the project management in local information service industries couldn't be improved. The development power would have been only used for major IT vendors in Tokyo. To support Ruby and advance this project, the organization of open source, "Open Source Society Shimane" was also established in 2006, by companies, technicians, researchers, students, and users who specialize in open source software for them to be able to exchange knowledge and information, and to improve their technological development and project management abilities through utilizing "Matsue Open Source Lab". Through such activities Matsue City will be able to become a national centre for open source software development, duly leading to new technological innovation, increased competitiveness in the field of OSS, and above all else the development of a modern workforce well versed in the intricacies of the IT world. Ultimately, it will make Matsue City a world-renowned Mecca for Ruby and OSS.

In order to materialize its mission promoting ICT industries through open source initiatives, Open Source Society Shimane conducts many varieties of activities in both policy and technology fields. One of the Society's main activities is to hold "Open Source Salon" in Matsue Open Source Lab. This "Salon" is a series of study meeting or seminar in more casual forms. The theme of the salon also varies; government officials explaining their policy initiatives, university professors presenting the recent OSS or IT-related research results, and the Ruby or OSS engineers are illustrating the cutting-edge OSS technologies, know-how and

applications. As of June 2011, the salon was held 60 times since its inception. The audience counts approximately 30 to 40 every time, and then this salon becomes the "hub" for connecting people and information. The salon is conducted in the quite international atmosphere; up to now, the speakers came from New Zealand, U.S., China, Korea, Netherlands and France. They enjoy visiting Matsue, Shimane and meeting Matz and Ruby engineers (Upon their visit, the Society organizes the salon – win-win effect). In addition to the salon, the Ruby engineers conduct "Ruby study meeting" occasionally in the Lab, welcoming new engineers and valuing up their technology skills. With regard to business area, the Society conducts "Business Exchange Meeting" when receiving the visits from ICT-related enterprises outside of Shimane. This business meeting is exclusively for the members. Hence, the Society plays the hub role connecting people, information, technology, and businesses. As of June 2011, the Society consists of 32 corporate members, 11 individual members, and 28 support members.

These are, so to speak, the Superficial Result, but most important purpose is industrial promotion by creating abilities of project management in local information service industries. By improving the abilities of project management, local information industries have been increasing the chances to participate in the upper processes of the software development. For example, "Medical and Nursery Care System of Matsue City" was constructed by "Techno Project" using Ruby in 2007, "Matsue SNS -Collaboration Effect of Regional SNS Connection (Morioka, Sayou, Matsue)" was opened by "Wacom IT" using by Ruby on Rails in Feb. 2008, and "Knowledge Management System of Matsue City" by "NaCl" also using RoR in 2008. These are all local information service industries in Matsue City. Moreover, Shimane Prefecture developed "Shimane Prefecture CMS" using by RoR to construct its own Web Site, and opened the source of "Shimane Prefecture CMS" to the public in 2008. Then, other many local governments come to have interest in this CMS and prepare to adopt it for their Web site. "Shimane Prefecture CMS" is, of course, open source, but to construct and maintain Web sites, the roles of private businesses are needed, and the orders mostly come to local information service industries in Matsue City. So in 2008 they have increased their Markets 30% more compared to 2005. And attracting enterprises – 6 companies are now newly located in Matsue City with intention of collaborating with Ruby from Tokyo, Osaka, and Hiroshima.

One of the key success factors of the project of Matsue City is the development power jointly collaborated with the open source community of the nationwide. By touching upon the nationwide expertise of the open source, Matsue City and the project related people including us, recognizes crucial importance to cooperate with the open source of the whole country which connects further to the worldwide open source community. In addition, a personnel training and industrial promotion are advanced by the cooperation of the industrial-government-academic complex in the region. Through "Open Source Society Shimane", the industrial-government-

academic complex as a catalyst, and improve their abilities of project management to acquire orders and expand Markets.

And, it is Shimane University that takes the initiatives in the academic side. The Roles of Shimane University are both contribution to open source community in research areas, and development of human resources of open source in the region. Shimane University began "Research on the stabilization of the open source software and on the business model's construction" in 2008. In this research, the examination of the technique of making documentation and the stabilization of programming language is being taken into practices.

Although open source software development is advancing in arenas other than corporations and institutions, the stabilization and upgrade of such software is not guaranteed. In addition, the problem of licensing must be dealt with, as with, for example, a General Public License (GPL). This project examines techniques for producing documentation for and guaranteeing the stability of open source software, focusing on the object-oriented script language Ruby. In addition, with the cooperation of industry, government, academia, and the software development community, empirical and theoretical research will be conducted on the value of business models for this field. For the former, the match for the standardization of Ruby is advanced in cooperation with Ruby Association, LLC (Limited Liability Company), which was established to promote and support Ruby activities in July 2007. For the later, we are now investigating in the theme of "Motivation and Productivity by 'Rub match' system in the Development of Open Source Software". In this theme the standardization and modulation of the information service industry, and its relation to productivity, advanced by an international system of the division of labor, are being researched.

4   Conclusion

The software development method by such open source software have a possibility to release the relationship, called "vendor lock-in" which is consist of through trust and consignment typically in Japanese information industry. And it will make chances that small and medium-sized information service enterprises in regions catch orders directly and expand their Markets. However, a possibility is only a possibility. To move this possibility to reality, there will be some methods by Local Governments. There is a worldwide community that supports development of open source. Moreover, in the region, the industrial-government-academic complex also supports a series of open source related activities. Open source Ruby led to further regional industrial promotion by implementing research projects and personnel training in Shimane University. In the process of these approaches for these three years, Ruby City MATSUE Project has been tying to the promotion of regional industries, by making "Statelessness" programming language as a local regional resource.

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