Difficulties of Global R&D Projects and Role of Bridge Managers

Nawarerk Chalarak*, Naoshi Uchihira, Yasuo Sasaki

Japan Advanced Institute of Science and Technology, 1-1 Asahidai, Nomi, Ishikawa, 923-1292, JAPAN. E-mail: nawarerkc@jaist.ac.jp, uchihira@jaist.ac.jp, sasaki@jaist.ac.jp

Srigowtham Arunagiri

Indian Institute of Science, C V Raman Ave, Devasandra Layout, Bengaluru, Karnataka 560012, INDIA. E-mail: a.srigowtham@gmail.com * Corresponding author

Abstract: In a highly competitive business environment, firms establish R&D sites abroad with objectives of getting access to a larger market and global knowledge resource. However, it is challenging to get the most out of global R&D projects, where people from different cultures, organizations, countries, time zones, and languages are working together. In offshore IT projects, Bridge System Engineers (BSEs) enhance the relationship between client and suppliers. Such kind of facilitator role in global R&D project has been discussing as "R&D Bridge Manager" (BM). This research aims to investigate the difficulties of BM and to establish a deeper understanding of BM role in global R&D projects. We found that quality control is one of those difficulties, which is caused by an ambiguous research target and the different output is expected by headquarters and R&D teams. Establishing project milestones throughout the projects and using more visualization for communication could help BMs overcome the difficulties.

Keywords: Global R&D project; R&D bridge manager; Bridge system engineer; Project management; Cross-cultural collaboration.

Introduction

In a highly competitive business environment, firms are finding ways to utilize knowledge in order to introduce new products or services to the customers. The trend of open innovation (Chesbrough, 2003) accelerates the utilization of both internal and external knowledge and resources. Both domestic and international R&D activities are playing important roles in the era of globalization (Coe and Helpman, 1995). There are two main objectives of establishing R&D site abroad. The first one is for knowledge exploration and the second one is for knowledge exploitation (Kuemmerle, 1997). The firms could have great benefit from acquiring knowledge from outside their home country and utilizing knowledge into the global market. Therefore, the international R&D

is important for the firms to maintain and increase the level of competitiveness. Previous studies have discussed from the organizational perspective about the process and criteria to set up new R&D sites abroad, the type of R&D site, the team structure, and the communication patterns (Chiesa, 1996; Kuemmerle, 1997; Boutellier et al., 1998; Reger, 1999; Gassmann and von Zedtwitz, 1999). On the other hand, it is beneficial to investigate global R&D management from the perspective of individual who facilitates the projects.

Huong et al. (2014) investigated the role of Bridge System Engineer (BSE) from knowledge management perspective and explained as follows. In the case of offshore software development project, the role of BSE is to enhance the relationship between clients and developers. BSEs overcome communication gap by using language skill, and overcome cultural gap by their cultural understanding and encourage the offshore teams to adapt themselves to the customers.

For global R&D project, the role of R&D Bridge Manager (BM) is to facilitate collaboration between headquarters and R&D subsidiaries (Uchihira et al., 2017). However, the characteristic of offshore software development project and global R&D project is different. The former has specific requirements, limited project period, and well-defined development process. On the other hand, the later has an unclear specification, long-term project, and high uncertainty with special tasks. Thus, BMs are facing different challenges. A few researches have investigated BM role, therefore, a deeper understanding of BM role is indispensable to enhance global R&D management.

Literature Review and Research Questions

This study focuses on previous literature related to cross-cultural management to align with the context of global R&D project, knowledge transfer between headquarters and R&D subsidiary facilitate by BM, and role of BSE and BM in a global project.

Cross-cultural management

The dramatic change in economics, politics, and technology influence the way business is managed. The managers have to deal with many challenges. One of the most important and difficult topics for the global business management is the cultural environment. Culture is important in all aspects of international business. As Hofstede (1980) defined as "the collective programming of the mind" as anthropologists emphasis on culture as something that is shared by many but proposed to access it through surveying a large number of individuals.

Cultural expertise

Although the researchers studying about the expertise typically do not analyze the more general form of behavior beyond the specific skills, they have an analogy of "the basic skills required for living in a culture", to explain the context (Ericsson, Krampe and Tesch-Römer, 1993). The children recognize the meaning of the words and separate them from the set of letters without meaning (Ericsson, 2005). People have many options for doing activities with values. However, the way people understand those options, and

social constructs that have an effect on the reward for selecting societally preferable options, unavoidably structured into a person's cultural expertise.

Multicultural Team

Previous researches on multicultural team emphasize that a single conclusion from a single study cannot provide the integrated understanding of the global virtual team. It is challenging to establish integrated findings report. Moreover, the cultural diversity may have an association with a pattern of identification, communication, conflict, and performance (Knippenberg and Schippers, 2007). Sagiv and Elron (2001) found that the norm that emerges in newly created teams are associated with a particular composition of individual-level values that team members bring with them to the team. The value from national culture level may have a similar effect on the team norms. Therefore, the future research should not focus on the number of nationalities in a team, but pay attention to qualitative as well as the quantitative difference in cultural composition of the teams.

Work culture could be formulated in different level ranging from individual, team, department, organization, or even nation. In addition, work culture could be formulated by global organization members, who share a common understanding, when they are working in a global environment (Erez and Gati, 2004). The global work culture and its definition share understanding of visible rules, regulations, behavior, deeper values and ethics of the global work context (Erez and Gati, 2004; Shokef and Erez, 2006). There are various organization cultures but still lacking the global work culture. Therefore, Smith et al. (2008) use deductive approach to derive global work values from characteristics of the global work environment. The values show what is good or bad, right or wrong, should be rewarded or should be punished. Moreover, the global work culture represents the values that facilitate adaptation to the global work context. The difference of location and culture between headquarters and subsidiaries weaken their relationship and their identification. To overcome this challenge, the value of organizational social responsibility adopt by the local communities and the environment they operate (Gradberg and Fombrun, 2006). There are several values found in the organizational culture, however, the competitive aspect of outcome orientation, organizational social responsibility, openness to cultural diversity, and trust have emerged directly from the global work environment characteristic.

Knowledge transfer

Knowledge becomes an important resource for the organizations (Grant, 1996). The corporate asset has changed from tangible assets to intangible assets such as information and knowledge (Dunning, 2000). This kind of intellectual capital is not easy to manage. The organizations have to deal with it more wisely to make the most effective use. In many cases, knowledge management plays an important role and it is included in organization management discipline (Nonaka and Takeuchi, 1995). In order to create and maintain knowledge in the organization, the knowledge transfer techniques are applied. There are studies proposing knowledge transfer models and tools (Hislop, 2005; Uchihira et al., 2012; Uchihira, 2014).

Information stickiness

The information and problem-solving capability are two important factors to solve problems. Information itself is not easy to acquire and use, especially, when applying it to the location different from its origin. "Sticky" was coined by von Hippel (1994) and this term has an influence on the innovation-related problem-solving.

The definition of "Sticky Information" is that the information used in technical problem solving is costly to acquire, transfer, and use in a new location (von Hippel, 1994). The stickiness of information is the incremental expenditure required to transfer that unit of information to a specific locus and usable by the information seekers. There are three reasons why information is sticky. First, the nature of the information. Second, The amount of information. Lastly, the attributes of seekers and providers. The nature of the information deals with the difference between tacit and explicit information. Polanyi (1958) explained that the human skills and expertise are often tacit, which can be perceived by observation. It can be transferred by showing examples by masters to novices.

Barrier of knowledge transfer

Szulanski (1996) analyzed the internal stickiness of knowledge transfer within the organization. This research showed the major barriers to internal knowledge transfer which is caused by knowledge-related factors such as the absorptive capacity of the recipient, causal ambiguity, and the relationship between sources and recipients of knowledge.

Transfer of best practice is considered one of the most important issues in management. The performance of different units within the firm indicates that knowledge utilization needs to be improved. The "practice transfer" inside the firm has a concrete and fairly unambiguous meaning to practitioners. "Practice" means the organization's routine use of knowledge, which has tacit component, embedded in individual skills, and collaborate the social argument. "Transfer" is used to show the movement of knowledge in an organization. Thus, the "transfer of best practice" is a dynamic exchange of knowledge between the source and recipient units in the organization.

The transfer process could be explained as follows. Firstly, the organization has a need and the knowledge to meet that need. The discovery of the need may trigger a search for potential solutions and lead to a discovery of the superior knowledge. After the need and the potential solutions are identified, then the feasibility of the transfer is explored. Second, the decision needs to be made to start transferring the knowledge. The transferred practice is adapted to meet the recipient need. This process is diminished when the recipient starts using the transferred knowledge. Third, after recipient starts using the transferred knowledge, the recipient will concern about identifying and resolving unexpected problems, which could block the ability to exceed post-transfer performance expectations. The recipient will improve utilization of knowledge until the satisfactory level is met. Fourth, after recipient satisfies the result of using transferred knowledge, it will become a routine of the recipient.

Bridge System Engineer

The offshore project is a kind of project, which customers and suppliers are located in different countries. Huong et al. (2014) has studies BSE role in knowledge transfer process and discussed as follow. BSE is a coordinator who mediates and enhances the relationship between clients and developer teams in software development projects. In offshore outsourcing projects, the cultural difference is one of the factors that slow down knowledge transfer process. BSEs utilize their experience and knowledge to provide advice for service providers as well as using communication skill to support information flow between two sides. This role creates values, improves collaboration, bridges knowledge gap and cultural gap through four working phases.

- Planning with client and offshore project
- Breaking down requirements, design plan and transfer
- Problem solving, review, fix, final quality assurance and deliver the product
- After delivery: externalizing and sharing experience

R&D Bridge Manager

There are roles involve in global R&D projects such as project manager, researcher, and administrator. The firms utilize global knowledge resources to strengthen company's core resources (Uchihira et al., 2017). BMs facilitate global R&D project with the objective to enhance collaboration between headquarters and R&D teams in foreign countries. BM plays an important role in offshore R&D project, especially, in Japanese firms that have R&D subsidiaries in several locations other than Japan. Arunagiri et al. (2016) explore BM role in university-industry collaboration and focusing on the knowledge transfer perspective. In a global context, there are differences in cultures, languages and time zones, thus, difficulties arise throughout the R&D process. BMs utilize their skills and knowledge in this diverse environment to solve difficulties.

From the issues mentioned above, organization management is not the only concern in global R&D projects, but also the knowledge transfer as well. This could bring attention to the intensive knowledge transfer and effective collaboration as the key elements for the better performance of global R&D project. Some studies discussed R&D collaboration by having support from innovation champion and BM. Hemmert et al. (2014) identified the activities of innovation champion to develop trust, which is important for research collaboration between university and industry. BM is a role in global R&D project, who facilitates collaboration between institutes. Arunagiri et al. (2016) discussed BM role for knowledge transfer in university-industry collaboration. However, in today's business, globalization encourages R&D projects to include effective knowledge transfer among project members in different countries. The role of facilitator such as BM becomes more important in this context.

Research questions

This research explores the role of BM in global R&D project particularly it aims at understanding the BM difficulty in facilitating global R&D projects. In addition, this research tries to identify causes and effects of difficulties in the R&D project management. The research questions are as follows.

- What are the difficulties that BMs face in facilitating global R&D projects and how are they caused?
- How do BMs work in global R&D projects?

Research Methodology

The semi-structured interview was used to collect data from experienced managers. We conduct the interview with seven managers. They have at least three years of experience in the global R&D project management. All of them are working in Japanese information technology (IT) companies, IT industry. The companies have headquarters in Japan and R&D subsidiaries in several countries such as Japan, India, US, China, France, and Germany.

The interviews took from 45 to 90 minutes with audio recorded. All managers were asked about their experience, problems and issues, and opinion of working in the global R&D projects. The set of questions were prepared beforehand, however, we did not keep the sequence of the questions as prepared but carried on the interview base on our conversation with the managers. This could help us to gather insight without interruption and managers can reveal their experience exhaustively.

After data collection, the interviews were transcribed, coded, and analyzed. Although the number of interviews is small, the information from all managers was analyzed using the qualitative method and able to suggest research findings. The highlight information from all managers provides a deeper understanding of difficulties of BM in global R&D projects.

Finding and Discussion

Working process of R&D bridge manager

According to the interviews, we can summarize the working process of BM into two important phases, which are the initial phase and operation phase. The first phase is initial phase. BMs gather data and information from all related parties such as management team, marketing team, development team, customers, and suppliers. BMs collect data from the meeting, discussion, and some documents. For example, BMs attend the meeting with the marketing team in order to understand the real needs of the customers. After that, BMs have to transfer information and knowledge to R&D team because, in the global context, it is difficult to synchronize the development schedule between teams from different countries as one manager mentioned below. "For example, Japan side gets the new devices and we can invite the China development people to Japan to test the application together with the real device in Japan. But in this case, the biggest problem is the schedule in Japan side and the schedule in China side. The development schedule is very difficult to get together. The conflict between each other."

The data and information are summarized by BMs before transferring to another side. BMs utilize their knowledge and skills during this process such as technical skill, language skill, and cultural expertise. After having a meeting, and transfer the information and knowledge to R&D team, BMs gather information, basic ideas and feedback from R&D team and bring back to the headquarter teams and asking for some decisions and support required by R&D team.

The second phase is an operation phase. After the decision is made to carry out the R&D project then the R&D teams start working on the research. BMs have to travel between the headquarters and R&D subsidiaries to facilitate the collaboration between them. BMs work with R&D team to create the development plan so that they can propose several options to the management or headquarter team. The different options have different good and bad points, together with the different support required from headquarters.

"Maybe they show us a document like development plan. For example, to involve this problem we have plan A, we have plan B, plan C. We want to do this this this and the risk is this this this and to develop plan A, we need some support from Japan side like this this."

During this phase, BMs have to establish several mutual agreements between headquarters and R&D subsidiary throughout the R&D process. It is difficult for BMs to convince both sides to get agreements. BMs play an important role to facilitate this situation.

"It is very difficult to convince with each other. This is a big problem. In Japan side, we think we are the order so China side must follow them because we are the order. But in China side, we can follow your order but in this case, the risk is very big. So, please take risk the possibility in Japan side."

BMs help R&D teams to develop reports for providing project updates to the headquarters. There are meetings between headquarters and R&D teams, which the BMs have to attend. In some cases, BMs have to explain additional information from R&D team by themselves because the researchers or developers hesitate to talk to the headquarter team directly.

Difficulties in global R&D project

There are several difficulties mentioned during the interview. However, the BMs emphasized four common difficulties, which we concluded as following quality control, communication, way of thinking, and understanding of requirement.

High quality is one of the most important goals of the R&D projects. According to the response from BMs, the quality control seems to be the most difficult activity in the projects. Especially in basic research, it is more difficult than applied research. In basic research, researchers keep working on the projects to introduce new knowledge for organizations. The new knowledge is expected to transform into the final products. However, mismatch of expectation between headquarters and R&D teams causes a problem because requirements are ambiguous. Therefore, the expected outcome of basic research is not quite clear.

"In the research level, it is very difficult to manage the performance because in our side we did not have the idea how to involve the problem currently. So, it is the big problem for us right now how to check, how to control the performance in the research level."

"In product level, we have a very clear specification in order. But in research level, we did not have the specification to which performance is good and which performance is the best we did not know."

It is even more complicated when the expected outcome is different between headquarters and R&D teams. Headquarters expects to have an outcome for customers, with high quality and reliability. On the other hand, R&D teams deliver the outcome as quickly as possible which might be lacking in quality.

"Not only developer in Japan side, but also marketing researcher and the highlevel people will check it. And the developer will ask, it is ok or not ok. If they need to change or not."

"This is the best right now. We can do it. Please check it and if you want us to change something or improve something, tell us and discuss information, give us some support."

The difficulty in communication between project members is another challenge of BMs. Because of the characteristic of the global project, this kind of project includes people from different cultures, organizations, countries, time zone, and speaking different languages. The working culture of people from different countries creates difficulty in communication when they are working and using different approaches. Moreover, teamwork is important for the success of the project. BMs have to work in this diverse environment and find ways to establish a smooth operation.

"The Chinese people and Japanese people are the same in this case because team is very important in Asian. In East-Asian such as Korea, Japan, and Thailand, team is very important, not process. We do not need the hero in the team. We need teamwork. Teamwork is very important. We want you to show the best teamwork. So, the Indian, the thinking is like American, I think. The personal idea is very important for them. It is very difficult to change their opinion."

"I am still feel similar. I mean when I meet with different culture and also languages. I think there are various big issues. I try to repeat my questions again and again to know what they really think. That is difficult, I think. Project proposal, may be they do not ask everything out. Sometimes, they have feeling do not tell everything. Every time, we do the formal documents. This is the method to deal with that problem."

The project members use different approaches based on their way of thinking to deliver the outcome. Although we can achieve the same outcome, the process and evidence of the research approach are also very important for the research project. BMs do not validate only the outcome but also the process with evidence. It is difficult for BMs how to make the project members understand and work smoothly with the different way of thinking of their colleagues.

"Sometimes the operation is incomplete to proof the advantage as a result. Sometimes I do not believe the result. If the result is completely good in that case is good. But Indian result usually have some problems. They have to use some approaches but they do not use such approaches and they use different approach. Even the different approach is completely good, no problem. But the result is not so good. It does not have an evidence. If Japanese researchers want to change the requirement approach, they may show evidence that result quality is very good. Because Japanese researcher is honestly. Japanese researchers normally show the evidence of their quality is good, process in detail. Indian researchers think about the rough idea. They think this approach is good, they believe, so they go to this direction different from Japanese side. This is the way of thinking."

"I have this problem as well but I solve it by I change the role between Japan and Germany. What I mean is that Japanese guy always say that they design, they write down specification and I ask Japanese to stop it and German start to write the design and the specification and the Japanese just check it and then it work better."

The last difficulty is the understanding of the market. In global R&D project, R&D teams are located in different locations from the markets or the places where the result of R&D will be used. This setting creates difficulty since the beginning of the project when BMs have to explain and transfer knowledge about the market and real need of the customers from headquarters to R&D teams. Without a clear understanding of customer's needs, R&D teams cannot deliver the outcome, which satisfies the customers. To overcome this difficulty, BMs have to coordinate with customers and headquarters to gather necessary information. Before taking requirement to R&D teams, BMs use their knowledge and skills such as language skill and cultural expertise to find effective solutions to transfer that requirement.

"This is the order to China side. So to manage this order, first, we need to translate, introduce the new technology to China side. Then we must explain the need of the marketing why we must do this way and the third we must explain our aims to China side."

Difficulties	Description
Quality control	In basic research, the requirement is ambiguous, and headquarters and R&D teams are having a different expected result. Therefore, the outcome is not satisfied. BMs establish several milestones and regularly evaluate the result. This helps to prevent the unexpected outcome.
Communication	Misunderstanding usually happens in a diverse work environment because project members are having different cultures and speaking different languages. The additional documents and more visualization are used by BMs to overcome communication barrier.
Way of thinking	Because of the diverse background, researchers have their own ways of thinking. Thus, controlling research direction is a bit tricky. BMs will cooperate with headquarters to evaluate process with evidence and outcome of the research projects.
Understanding of requirement	The requirement could emerge in any country. It is challenging for BMs to bring such requirement to the R&D teams, especially, the tacit elements. BMs have to study the requirement by themselves then apply their knowledge and skills to effectively transfer requirement to the R&D teams.

Table 1 Difficulties of BM in global R&D projects

We found that BMs have four difficulties in facilitating global R&D projects. They are quality control, communication, way of thinking, and understanding of the requirement. Those difficulties occur throughout the R&D project, especially, in basic research. The causes of difficulties are described in the previous section and Table 1. BMs work closely with headquarters and R&D subsidiaries to enhance collaboration by utilizing their knowledge and skills. In the initial phase, BMs gather all data and information from related parties, create additional documents and facilitate the exchange of information between headquarters and R&D teams. During operation phase, BMs support R&D teams to create a development plan, reports, attend meetings, and establish agreements. These activities reveal an important role of BM in global R&D projects.

Conclusion

This research explores the difficulties of BMs in global R&D projects. The difficulties and role of BM are identified. The interview revealed working process of BM, the importance of difficulties, how difficulties are caused and role of BM to solve them. This research is focusing on a particular role and analyzing from BM's perspective.

Product quality is considered as an important component, which is expected by customers. However, along with the R&D process, there are many activities, that have an effect on quality of products. BMs have a difficulty to maintain or improve product quality because in a basic research, there is an unclear target to achieve. The research has been done for creating new knowledge or introducing innovative ideas, which will be used for future products. Moreover, the way of thinking of a particular group of researchers also has an impact on the quality of the products.

Cultural difference is important difficulty in global R&D projects. Bridging between different cultures is a challenging task for BMs because BMs have to understand the diversity of culture and then find the effective ways to establish cross-cultural collaboration between headquarters and R&D subsidiaries. Cultural intelligence skill is indispensable.

Understanding of the market and requirement is important for R&D teams to set the goal of the project and to conduct the R&D activities so that the outcome could satisfy the real needs of customers. Because the needs of the customers and the research activity are in different location, researchers do not have a direct experience to perceive and understand the requirements. BMs have difficulty to deliver requirement and transfer knowledge to R&D teams so that they can precisely understand the market.

To overcome difficulties, BMs suggest solutions that they are using in the projects. Establishing quality measurement and intermediate milestones throughout the R&D process to control the product quality and prevent the unexpected outcome. The communication difficulty could be solved by using more documents and visualization. They support BMs to explain and elaborate information with deep detail. Cross-checking result by different teams and switching roles between researchers are used for controlling R&D approaches and activities. In addition, switching roles between researchers and headquarters, who knows customer's needs, helps them to share their understanding of the requirement.

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References

- Arunagiri, S., Chalarak, N., Uchihira, N., Sasaki, Y. and Mathew, M. (2016). Global Knowledge Transfer Framework: A University-Industry Collaboration Perspective. *Proceedings of ISPIM Innovation Summit 2016*, Kuala Lumpur, Malaysia.
- Boutellier, R., Gassmann, O., Macho, H. and Roux, M. (1998). Management of dispersed product development teams: The role of information technologies. *R&D Management*, 28(1), pp.13-25.
- Chesbrough, H. (2003). *Open Innovation: The New Imperative for Creating and Profiting from Technology*. Harvard Business Review.
- Chiesa, V. (1996). Managing the internationalization of R&D activities. *IEEE Transactions on Engineering Management*, 43(1), pp.7-23.
- Coe, D. T. and Helpman, E. (1995). International R&D Spillovers. *European Economic Review*, 39(5), pp.859-887.
- Dunning, J. (2000). Regions, globalization, and the knowledge-based economy. Oxford: Oxford University Press.
- Erez, M. and Gati, E. (2004). A Dynamic, Multi-Level Model of Culture: From the Micro Level of the Individual to the Macro Level of a Global Culture. *Applied Psychology*, 53(4), pp.583-598.
- Ericsson, K. (2005). Recent advances in expertise research: A commentary on the contributions to the special issue. *Applied Cognitive Psychology*, 19(2), pp.233-241.
- Ericsson, K., Krampe, R. and Tesch-Römer, C. (1993). The role of deliberate practice in the acquisition of expert performance. *Psychological Review*, 100(3), pp.363-406.
- Gassmann, O. and von Zedtwitz, M. (1999). New concepts and trends in international R&D organization. *Research Policy*, 28(2-3), pp.231-250.
- Grant, R. (1996). Prospering in Dynamically-Competitive Environments: Organizational Capability as Knowledge Integration. *Organization Science*, 7(4), pp.375-387.
- Hemmert, M., Bstieler, L. and Okamuro, H. (2014). Bridging the cultural divide: Trust formation in university-industry research collaborations in the US, Japan, and South Korea. *Technovation*, 34(10), pp.605-616.
- Hislop, D. (2005). *Knowledge management in organizations: A critical introduction*. Oxford: Oxford University Press.
- Huong, N. T., Umemoto, K. and Dam, H. C. (2014). The Knowledge-Bridging Process in Software Offshoring from Japan to Vietnam. *The Electronic Journal of Information Systems in Developing Countries*, 64(9), pp.1-29.
- Knippenberg, D. van and Schippers, M. C. (2007). Work group diversity. Annual Review of Psychology, 58(1), pp.515-541.
- Kuemmerle, W. (1997). Building Effective R&D Capabilities Abroad. Harvard Business Review, March/April, pp.61-70.

- Nonaka, I. and Takeuchi, H. (1995). *The knowledge-creating company: How Japanese companies create the dynamics of innovation*. New York: Oxford University Press.
- Polanyi, M. (1974). *Personal knowledge: Towards a post-critical philosophy*. Chicago: University of Chicago Press.
- Reger, G. (1999). How R&D is coordinated in Japanese and European multinationals. *R&D Management*, 29(1), pp.71-88.
- Sagiv, L. and Elron, E. (2001). Cultures within teams: The Role of Group Composition of Values in the Culture of Small Groups. In Teams within Cultures, Cultures within Teams. Paper Presented at the 61st Annual Meeting of the Academy of Management (M. Erez, Chair), Washington, DC.
- Shokef, E. and Erez, M. (2006). Global Work Culture and Global Identity, as a Platform for a Shared Understanding in Multicultural Teams. In *National Culture and Groups*, edited by Ya-Ru Chen. Oxford, UK: Elsevier.
- Smith, P. B. and Fischer, R. (2008). Acquiescence, Extreme Response Bias and Levels of Cross-cultural Analysis. In *Multilevel analysis of individuals and cultures*, edited by Van De Vijver., D.A. Van Hemert. and Y. Mahwah Poortinga. NJ: Erlbaum.
- Szulanski, G. (1996). Exploring internal stickiness: Impediments to the transfer of best practice within the firm. *Strategic Management Journal*, 17(S2), pp.27-43.
- Uchihira, N. (2014). Knowledge Transfer in Product-Based Service Design. In *Progressive Trends in Knowledge and System-Based Science for Service Innovation*, edited by Michitaka Kosaka and Kunio Shirahada. Hershey, PA: IGI Global.
- Uchihira, N., Chalarak, N. and Arunagiri, S. (2017). The Role of Bridge Manager in Global R&D Projects. Proceeding of PICMET'17: Technology Management for Interconnected World, Oregon, USA.
- Uchihira, N., Hirabayashi, Y., Sugihara, T., Hiraishi, K. and Ikawa, Y. (2012). Knowledge Transfer in R&D Project Management: Application to Business-academia Collaboration Project. Proceedings of PICMET'12: Technology Management for Emerging Technologies, Vancouver, Canada.
- von Hippel, E. (1994). "Sticky Information" and the Locus of Problem Solving: Implications for Innovation. *Management Science*, 40(4), pp.429-439.