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INDIVIDUAL RESEARCH PAPER

A Study of Technology Transfer in a Multinational Cooperative Joint Venture

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ABSTRACT

This paper is a critical review of the article, A Study of Technology Transfer in a Multinational Cooperative Joint Venture, which was published in the IEEE Transactions on Engineering Management, Vol. 43, No. 1, February 1996.

It is organized as following:

Introduction

Concepts: Discussion of the main concepts put forth by the reviewed article.

Methodology: Discussion of methodology used by the article's authors to support their concepts.

Conclusions of the paper: A brief discussion of the main concepts brought forth by the reviewed paper.

References and Other Research

What has been discussed in the paper comparing to the other research publications in the field.

Contribution: Discussion of the contribution of reviewed paper to the field.

Critical Assessment

An assessment of the paper; what is missing, what are the strengths/weaknesses of paper in terms of concepts, and results.

Future Study Areas

Discussion on future studies related with the subject.

Conclusion

INTRODUCTION

Growth which is a sign of healthy organization is the essence of businesses. In order to grow companies need to gain access to new markets and new supply sources, capitalize on technology, use assets better, and become more profitable. Not all the companies have all the resources that needed within themselves, therefore when their objective is growth in international markets, international joint ventures or strategic alliances are very common approach [2], [7], [10].

Joint ventures are formed for variety of reasons, which include entering new markets, reducing manufacturing costs, and developing and diffusing new technologies rapidly [2]. Mostly companies choose such a strategy to improve their productivity and profitability by learning, and transferring technology from their partners. Thus, this collaborative agreement makes information and technology transfers easier across the loosen boundaries [10].

International joint ventures involve two or more organizations from different nations that cooperate to form a new organization separate from, but owned by, the parent companies [7]. In the new organization operational responsibilities, financial risks and rewards are shared while preserving it separate identity/autonomy [11].

CONCEPTS

Today, the increasing globalization of business as a result of competitive and fast growing markets has brought more attention to the concept of international technology transfer which is the process of applying knowledge across graphical or national boundaries [8]. The authors of the paper examine international technology transfer as a process and address how this transfer is affected by the cultural and organizational differences. In their research, they analyze what kind of technology transfers had taken place and the success levels of these technologies over a three-year period in an international joint venture established by three large multinational chemical corporations located in the United States, Germany and Japan.

First, the authors address the need for international joint ventures. This need is the result of globalization and companies' willingness to expand their business and the benefits of collaborative agreement. According to the authors the reason that the multinational companies establish joint ventures or formal alliances is to accomplish learning channels and increase their

technological competitiveness within specific product or business areas. However, the paper focuses more on what technologies are being transferred, the success level of these transfers and the effects of cultural differences.

Second issue, discussed by the paper is the complexity of joint ventures due to the cultural differences. According to the paper the technology transfer is a very complex issue, because of the difficulty of implementation and operationalization. The authors also points that the success level of the transfer depends on the built-up experiences and expertise of critical personnel.

Three bridging mechanisms, procedural, human and organizational bridges, are also addressed and effectiveness of these mechanisms analyzed in the paper.

METHODOLOGY

The following is the list of methodologies that they have used in their research and summary of their findings.

Literature Search: The authors provide a considerable amount of references in the introduction part. Their literature search gives readers a good understanding of the need of technology transfer, background, current literature and technology transfer characteristics.

Data Collection Interviews: According to the authors finding, the companies that have been studied in the paper need to improve their business capabilities in certain areas. Germans need to improve their manufacturing capabilities. Japanese, on the other side need to satisfy their European customers with low-priced products. Americans are more attracted to explore new markets as well as improve their own production capability and performance. Overall, the main objective was to bring the technological knowledge together in order to be competitive by learning from each other and adapting the best practices.

After the joint venture was formally established the authors started to interview in order to analyze the transfer of technologies over a three-year period among the three companies. They interviewed 24 individuals from the American company, 23 from the German company and 27 from the Japanese company, who were playing the key roles in the technology transfer process. The authors decided on English as the interview language and conducted the interviews at three different country locations.

The interview questions were structured to discover what type of technologies were transferred, the initial event that took place at the introductory stage of the transfer and the

success level of this transfer. They referred more than one person for almost all of the technologies to get more precise data. In order to determine the success levels, they grouped technology transfers in to three broad categories: unsuccessful, pending and successful.

Data Analysis: The authors interviewed totally 74 individuals within the three partner firms and determined that 208 separate technology transfer took place over three years. There is not much information on how the actual statistical analysis have been conducted. Only general percentage figures are mentioned.

CONCLUSIONS OF THE PAPER

As mentioned earlier the authors identified 208 technology transfers that took place in three years. After analyzing the respondents descriptions the authors classified these transfers in to four categories: General information, specific information, procedure and practices, and hardware. The results showed that the specific information is the most common category that has been transferred between the joint venture's partners.

After this, they analyzed what form and in what percentage of technology was transferred by each partner. Generally the form of technology and its percentage depends on the firms' intention for entering the joint venture. For example, since German firm needed to improve its overall manufacturing capacity and productivity, it followed a strategy of adopting the technology whenever there is a chance for their purpose. As a result of this strategy, the German firm was the most active one among three partners. On the other hand the American and Japanese firms were more selective and cost conscious than the German firm.

The paper points out that all three of the firms had different perception of each others' cultures before they had established the joint venture. However, results also proved that stereotypes and biases are not always correct.

The research also shows the distribution of initial events for technology transfer, and concludes that face to face technical discussions are the most effective events. The research results also underlines that the success level of the transfer depends on the companies transfer strategies and the category of technology itself (general information, specific information...).

REFERENCES AND OTHER RESEARCH

The majority of books and papers generally focuses on the information and technology transfer across different cultures and deal extensively with cultural differences. Most of them talks about the difficulties of transferring technology due to differences in national cultures, social norms, laws, and economies, and the roles of compatible cultures and shared values on technology transfer [1], [2], [7], [9], [10], [12].

Asahi and Levinson point out that culture, at whatever level can either promote or hinder technology transfer and organizational learning efforts [10]. As Chinta and Keller support this concept by discussing that communication and personnel networks, and cultural compatibility between firms are important issues which can be barrier or bond while transferring technology [12].

According to the authors' of reviewed paper the technology transfer depends on the partner firms' own business strategies and their intention to associate with other firms. Kedia and Bhagat also support this concept. According to them companies' strategies play a significant role in determining the efficacy of such transfers [1].

As stated in this paper and in several other papers, a great deal of emphasis has been placed on economic factors that affect transfer of technology and their success rate [1], [7]. Kedia and Bhagat argue that economic analysis fail to explain the reason for failures of those technological transactions that should, indeed, succeed and the successes of those that ought to fail. Therefore they claimed claim that to understand the effectiveness of technology transfer across the nations, a conceptual frame work is needed which enhances the role of cultural differences across nations. Then, they analyzed the effect of cultural differences on technology transfer with Hofstede's national cultures map [1].

Kedia and Bhagat also support that effectiveness of transfer depends to a large extent on the type or characteristics of the technology involved. But their discussion is different than the reviewed paper. They argue that compared to product-embodied technologies, process-embodied and person-embodied technologies are considerably more difficult transfer across nations because cultural and strategic management factors play larger roles in such transfers and diffusion [1].

Most of the papers indicate that a good understanding of cultures which are involved is the most important element in technology transfer process [7]. One should learn as much as possible about the target country. When engaged in a joint venture, one should try to capitalize on the fact that each culture tends to emphasize certain strengths. The enterprise will function

smoothly if one takes advantage of what each group has to offer [5]. Yet, an analysis of the partner's culture before structuring the alliance appears to be extremely uncommon [9].

Even, at micro level personal interactions play an important role in the success of joint ventures. In their book "International Business and Technical Innovation", Roman and Puett indicate that the people interactions are one of the most effective means for transferring technology[4]. This necessitates a well educated and trained group of people for joint venture projects.

Time is another very important factor in technology transfer [10].Building trust and respect takes time [2].Technology can be transferred most effectively when involved partners maintain their relationships with each other for along period of time [6].

The authors in the paper argue that, very few of the research studies have examined the technology transfer as a process. However, Keller and Chinta states that technology transfer is best understood as a process and the context in which international technology transfers occurs is better understood examining the barriers, or impediments, to technology transfer, and the bond, or bridges that enhance it [12].

CONTRIBUTION

It is hard to come up with a single contribution of this paper to the literature not because it is a well written paper but because the issues discussed in the paper have already been studied by many other researchers as mentioned in the literature research section. What makes this paper unique is that it studies a specific case of technology transfer through joint venture by USA, Germany and Japan. Even in that sense, using only a single company from each country makes it difficult to generalize the results that come out of this study.

The study is more like a case analysis. It is well structured and it gives a good guidance for future studies. Though, as mentioned earlier, it is difficult to generalize the outputs of this study.

The focus of the paper is to uncover the effects of cultural differences in technology transfer among manufacturing lines of the same product class but belonging to different companies in different countries.

CRITICAL ASSESSMENTS

There are three major issues:

- Technology transfer and joint ventures
- Type of Joint ventures
- Effects of culture on successful technology transfers.

Technology transfer and joint ventures:

The authors clearly define the need for international joint ventures in the introduction part. They provide a good information of international joint ventures' characteristics and bridging mechanisms This part is well supported in the document. The paper puts forth a good description of the joint ventures, methodologies used in establishing them and how whole process is handled.

While discussing the types of technologies transferred, measurements are made according to the technologies acquired but the sources of that specific technology is not mentioned.

There is no mention as the time wise length of a successful joint venture and technology transfer. It can be argued that three year might not be enough to see the actual results of a technology transfer whether it is successful or not.

Type of joint ventures:

Even though it is clear that culture is more of a problem for multinational joint ventures, it is not discussed how the culture might effect in other types of joint ventures. The paper gives an impression that the authors have first had a data set and then defined their problems. It is not well explained why the paper focuses on relative effectiveness of coordinating or bridging mechanisms in the transfer of technologies between manufacturing lines belonging the companies from different nations.

Effects of culture on successful technology transfers:

Other papers agree with the authors on the effect of cultural issues. Though authors lack the explanation of why German, American and Japanese companies have been selected for this specific study. Since the paper's primary purpose is to investigate the role of cultural differences

play in the transfer of technology, to have a better understanding they should have provided more information about the cultures of the partner firms. So that the reader would have a good perception of the differences between the cultures.

FUTURE STUDY AREAS

First and fore most the conclusion of this paper should be challenged by using a different set of companies from same countries. This will allow us to benchmark the results of this paper and give us a good idea on how to evaluate its suggestions.

Another future area of study is the definition of technologies and their complexity since the success levels mostly depend on these two variables.

The measurement set used to evaluate the success level of technology transfer can be another candidate for a possible research area.

CONCLUSION

Globalization and competition forces companies to extend their businesses internationally. In this competitive environment the ability of a firm to effectively and quickly transfer technology across national boundaries is a very critical factor. International technology transfer usually faces greater problems than in a domestic situations due to differing cultures.

This paper confirms that cultural differences across nations that are involved in the transfer of various kinds of technologies are considered one of the major factors that influence the success of transfer. Therefore, in this paper the authors examine international technology transfer as a process and address how this transfer is affected by the cultural and organizational differences.

If you are working for a company that goes through a joint venture with a company from another company, this paper gives you a good idea on how to proceed and what kind of problems you might expect. Though results are not 100% applicable to all case

The focus of the paper is to reveal the effects of cultural differences in technology transfer among the partners of joint venture. It gives a good information of the characteristics of technology transfer and joint ventures. But as mentioned earlier the study is more like a case analysis which makes difficult to generalize the output.

REFERENCES

[1] Ben L. Kedia, Rabi S. Bhagat, " Cultural Constraints on Transfer of technology Across Nations: Implications for Research in International and Comparative Management," Academy of Management Review, vol. 13, no. 4, pp. 559-571, 1988.

[2] Bruce A. Walters, Steve Peters, Gregory G. Dess, " Strategic Alliances and Joint Ventures: Making them Work," Business Horizons, vol. 37, iss 4, pp. 5-10, July/August 1994.

[3] Christian N. Madu, Rudolph A. Jacob, "Multiple Perspectives and Cognitive Mapping to Technology Transfer Decisions," Futures, vol. 23 , pp. 978-997, November 1991.

[4] Daniel D. Roman, Joseph F. Puett, Jr, " International Business and Technological Innovation," Amsterdam, Elsevier Science Publishing Co., Inc., 1983.

[5] Emily Slate, " Success Depends on an Understanding of Cultural Differences," HR Focus, vol.70, pp. 16-17, October 1993.

[6] James R. Basche, Jr., Michael G. Duerr, "International Transfer of Technology: A Worldwide Survey of Chief Executives," New york, The Confrence Board, Inc., 1975.

[7] Jean L. Johnson, John B. Cullen, Tomoaki Sakano, " Opportunistic Tendencies in IJVs with the Japanese: The Effects of Culture, Shared Decision Making, and Relationship Age," The International Executive, vol. 38, pp. 79-94, January/February 1996.

[8] John M. Ivancevich, Peter Lorenzi, Steven J. Skinner, Philip B. Crosby , "Mangement Quality and Competitiveness", Irwin, Inc., pp.188, 1994.

[9] Kenneth J. Fedor, William B. Werther, JR, " making Sense of Cultural Factors in International Alliances," Organizational Dynamics, vol.23, pp. 33-48, Spring 1995.

[10] Nanette S. Levinson, Minoru Asahi, " Cross-national Alliances and Interorganizational Learning," Organizational Dynamics, vol. 24, iss 2, pp. 50-63, Autumn 1995.

[11] P.R. Lynch, "The Practical Guide to Joint Venture and Corporate Alliances", New York, John Wiley& Sons, 1987.

[12] Robert T. Keller, Ravi R. Chinta, " International Technology Transfer: Strategies for success," Academy of Management Executive, vol. 4, pp.33-43, 1990.