

Title:NOCourse:EMGT 520Term:FallYear:1996Author(s):M. Testa

Report No: P96070

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Type:	Student Project
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Abstract: Critique of the IEEE Transactions on Engineering Management article, "Organization, Autonomy, and Success of Internationally Dispersed R&D Facilities."

## Critique of the IEEE Transactions on Engineering Management article, "Organization, Autonomy, and Success of Internationally Dispersed R&D Facilities."

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EMP-9670

EMGT 520, Fall 1996: Individual Research Paper

Submitted by Martina Testa



Critical Evaluation of "Organization, Autonomy, and Success of Internationally Dispersed R&D Facilities", by Klaus Brockhoff and Bernd Schmaul but autonomy include independence of local facilities as well, not just headquarters. This finding is significant as it helps explain correlation results with the R&D success variables.

The analyzed data confirms that an interrelationship exits between the type of organizational structure and specific success criteria. The hub-model favors timeliness of R&D and meeting of performance goals. In contrast, it appears that the network models is inferior in budgeting, timeliness and performance. The competence model is resulting in average success in budgeting and timeliness, but less than average performance ratings. While the first two statements would be predictable, given that the heads of R&D at headquarters may stem from a bias towards centralization, the last finding is very surprising. Competence models draw their existence from the need to build on local excellence and freedom to achieve high technical performance, but with outcomes less optimal than both other organizational structures.

Furthermore, as confirmation of proposition three in the paper, an interesting discovery is made: when investigating the influence of autonomy on R&D success, one may find it plausible that the optimum solution may lie neither in total autonomy, nor in total dependence from headquarters. But the results show clearly that the optimum degree of autonomy for the investigated sample of companies favors locally dependent decision making, for example by a local business unit.

## STRENGTHS AND WEAKNESSES

Methods of numerical classification and statistical analysis of information that is difficult to quantify in the first place is subject to questions of validity. The construction of the questionnaire, and the pre-categorization imprint a framework onto the subject matter under investigation, that will influence the outcome of the data. This is especially true for the success variables of efficiency and effectiveness, since the questionnaire asks for a rating compared to expectations, perceptions, but does not ask for factual proof of the statement made.

While the 44.9% response rate to the questionnaire is an achievement, the study suffers from small sample size because of the limitation to firms that are large and have significant operations located in Germany. In some cases, data is missing because of this, and in other cases, statistical validity is questionable.

The selection of only heads of R&D, located mostly at headquarters, limits the results to the perspective of the central management, with respective danger of conflict of interest. It also biases R&D success towards the performance parameter, diminishing the significance of timing and budgeting for overall R&D success. The overall factor scoring by the respondents confirms this.

The categorization of success variables is very restrictive, as factors such as customer/market introduction, innovative ability (patents) and success at technology transfer are not included. In general, the concept of measuring R&D success has a strong influence on the deductions that can be made from the data, so a more balanced scorecard would be advantageous.

The strength of the paper lies in the fact that the numerical analysis allows not only to state relationships between organizational structure, autonomy and success, but actually allows an insight into the type and direction of influence.

## OTHER RESEARCH

Older literature generally states that a centralized R&D facility is the best recipe for R&D success. While decentralization is supported by many as an aide towards more efficiency, when it comes to core competencies, and that includes R&D, many favor centralized structures.

But as corporations grow larger, international competition and globalization of technological operations force companies to disperse their R&D operations into different countries [Chiesa]. The approach that companies take towards the internationalization of R&D is seen as building on one of two distinct models. The *multidomestic model* assumes that competition in one country is independent of competition in other countries, and so gives rise to decentralized approach that locates R&D facilities at manufacturing plants, with the objective to develop products for the local market, as managed by a local subsidiary In the categories of the investigated paper, this would classify as a locally dependent facility. Companies that adopt the global model assume that a company's competition position in one country is greatly influenced by its position in another country. Consequently, R&D remains centralized, so as to achieve effective communication, rapid learning, and economies of scale.

This author [Chiesa].concludes, that as both approaches have their advantages and limitations, an optimum may be achieved by combining the best of each, namely a *coordinated network* strategy, with the objective to carry out original, unique R&D under a centrally coordinated global plan., with three organizational structures to support the actualization of the plan. They key differences between Chiesa's and the primary paper is the importance of a long-term strategic plan, the differentiation of R&D into three basic tasks, with requisite strategies. The suggested network then is really three networks, a technology development network, a product development network, and a technical support network, giving rise to different solutions in organizational design.

A function of the technology development network is the selection of new technologies that best leverage the international company's technical strength. One corporation, Hoechst Celanese, is successfully using stage-gate reviews to bring discipline to this process [Teresko].

An area that has not been investigated in Brockhoff and Schmaul's research is the importance of staffing in international R&D facilities, and a closer look at who pays for these labs [Krogh]. The choice of country, language proficiency and qualifications of the staff, and competent managers who can translate the strategic plan of the corporation into a local mission for the lab all are factors that determine the successful operation of R&D facilities abroad.

Krogh, however, misses the opportunity to go beyond the selection of the country for human resource, customer or logistics reasons. As the majority of staff in a particular country is bound to be native to that country, it is important to

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be aware of the different cultures and respectively accepted organizational structures and management styles [Gwynn, Lazar]. Management principles must compensate for the weaknesses of the local culture, and take advantage of its strengths. The choice and compatibility of the lab director with the staff, will consequently have a big impact. Themselves, the R&D heads of global corporations face the challenges of developing and establishing a company-wide technology strategy that fits the corporate structure, convincing senior management that long-term, non-linear thinking is needed [Lederman, Erickson]. To integrate the activity of laboratories in different countries requires a global mindset, superior leadership and communication skills, and the ability to thrive on diversity and cultural differences.

## FURTHER DISCUSSION

The question has to be asked if, given that locally dependent R&D facilities are the best guarantor for R&D success, just the situation one would have when operating just one large facility, if globalization of R&D can ever be advantageous. Globalized R&D can go along with much frustration for the personnel involved, an issue of personal experience.

I am working in what one may classify as a locally dependent R&D facility, attached to a local manufacturing operation. The facility has been acquired by the division five years ago, and is still grappling with finding an identity in the multinational arena. The R&D facility constitutes one locale for R&D activities to support a single "competence center case". The competence center of this division is one of several international and domestic competence centers, with projects that are approved and budgeted in a central location (France). The decision making process is far removed and opaque, and the project outcomes can not be easily evaluated by the central facility. The information flow appears one-sided, bottom-to-top, and an overall strategy, if it exits, is not well communicated.

Instigated by this research article, it would be interesting to find out more details about this multinational corporation's long-term strategy, and how it is conceived. The company is currently undergoing an organizational redesign to improve R&D effectiveness and overall competitiveness in the global mobile radio communications market.

Another area of increasing opportunity is to improve global communication between principal investigators by means of information technology (i.e. Email), and the impact on R&D effectiveness. This multinational company has the advantage of expertise in information networks, and has not yet been able to harness this power for the benefit of its own research operations worldwide. What are the particular barriers, and how can they be overcome?

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