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Organising for Innovation: Evidence from a Study among German Manufacturers

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Innovation Management is becoming a corporate priority to sustain growth rates for technology-intensive manufacturers. However, apart from introducing a formal innovation process, many firms find it difficult to create the proper organisational settings to support their innovation activities. In our study of 86 German manufacturers, we elaborate on selected organisational issues, such as the allocation of innovation responsibility, the design of organisational interfaces etc. to fully understand how these companies organise for innovation today. This paper will present the major findings of the study as well as some concluding remarks on the optimisation of the organisational design of future innovation processes.

1. Introduction & Motivation

Innovation or new product development (NPD) activities are critical to the survival of manufacturing firms. Especially during the past decade, increasing market pressure forced the majority of companies to reinforce their innovation efforts. The quest for factors that determine the probability of innovation success has become a popular research direction and has lead to a significant number of publications. While these studies vary in terms of quality, breadth and scope (Conn, 2005), they tend to propose a limited set of factors that contribute to innovation success.

From a practitioner's perspective, there has been a constant interest in those results that provide managerially actionable factors. Some prominent frameworks have gained more public recognition than others, such as the 7-S-framework (Peters/Waterman, 1982) or the EFQM framework for innovation (EFQM, 2005). However, from a research perspective, only few insights and concepts have been adopted in practice. Among the success factors that are widely accepted, it is especially the idea of a process-orientation that has had the largest impact on today's innovation practices. The presence of a formal NPD process or stage-and-gate system can be found in a majority of manufacturing companies of a certain size.

On the other hand, the authors contend that even though organisational aspects have been identified as one of the key areas needing attention, the underlying organisational structure and organisational measures to support innovation and NPD have been neglected. Research results show, for instance, that cross-functional teamwork (Gupta et al., 1992), cross-functional responsibility and interfaces between departments (Adler et al., 1992) are of critical importance. Other authors point out that sufficient horizontal communication leads to positive results; as well as that appointed leaders or "product champions" contribute to innovation success (Walsh 1990). Still, there is little evidence of how widespread these organisational measures are and how they can be combined with the innovation processes.

2. Problem Statement, Research Objectives & Research Methodology

To shed more light on the good practices of (successful) organisation patterns in innovation and NPD, we present the results of a survey among large and medium-sized manufacturers in Germany. The survey addresses three main research questions:

1. What are the dominant and successful patterns of embedding a formal innovation entity (e.g. an innovation department, dedicated project teams, etc.) and which responsibilities are assigned to this entity?
2. What are the most widespread organisational measures to support innovation processes such as the idea phase and the concept phase (e.g. cross-functional teams)
3. What are the main organisational measures to deal with the interfaces along the innovation process (e.g. information-sharing mechanisms, physical co-location of team members)

The sample of surveyed firms was chosen according to the following selection criteria:

1. Industry: Manufacturing companies.
2. Region: The survey was limited to German firms.
3. Company size: Organisations with a minimum of 100 employees

3. Research Results

To understand successful patterns of organising for innovation, it is necessary to understand the factors that distinguish a successful organisation from a less successful one. One of the key concepts of organisation science is the congruence model of organisational behaviour (Nadler/Tushman, 1997). This model, in essence, contends that the components of any organisation exist together in various states of balance and consistency. Each organisation displays a high or low degree of overall congruence. The greater the degree of congruence, or "fit", the more effective and competitive the organisation is. To determine the fit of an organisation, we need to consider a) the input that feeds an organisational system (e.g. resources, environment), b) the targeted output (e.g. the offering of products and services) as well as c) the transformation process that converts resources into offerings. These organisation principles are applicable for examining a company as a whole, but also for selected parts of an organisation.

3.1 Mapping the Organisational Terrain

To make valid statements about the ways in which companies shape their NPD efforts, it is necessary to take into account some of the environmental factors of our sample:

Company size, industry and position in value chain

We surveyed only companies with a minimum number of 100 employees to ensure the existence of a certain infrastructure dedicated to new product development. Most of the respondents (55%) are medium sized businesses with 100 - 500 employees, whereas the rest of the sample is divided between firms that feature a workforce of up to 3000 and more than 3000 people (Fig. 1). The majority of firms operate in the machining and plant engineering industry (60%), followed by firms in the electrical engineering (12%), automotive (9%) and consumer goods industry (9%). Roughly two thirds of the companies refer to themselves as Original Equipment Manufacturers (OEM) in their industries. The others operate in earlier stages of the value chain as so-called Tier-1 or Tier-2 companies (Fig. 1).

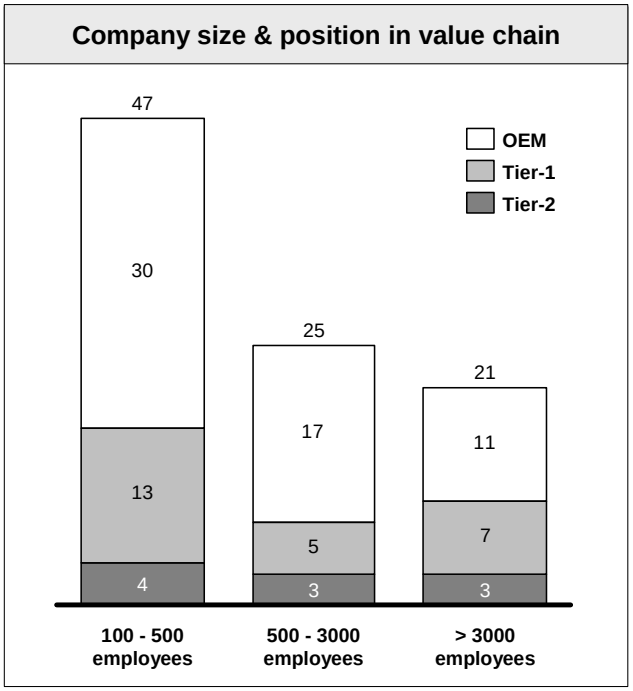

Figure 1. Company size, industry and position in the value (n = 86)

Organisational Structure

The organisational structure can be described as the total sum of ways how the overall work of the organisation is differentiated and integrated into subunits and how these subunits are coordinated for task completion (Pearce/Robinson, 2000). Organisations are structured into subunits according to different criteria. Criteria for structuring the organisation can be: activities (e.g. functions, processes, skills), outputs (e.g. product, project) or customers (market segment, geography). We found in our study that the most common way to organise among smaller firms is to split the organisation into functions, such as R&D, sales and production. Bigger organisations (>3000 employees), however, exhibit a more diverse array of primary organisational forms (Fig. 2). Since they have to deal with a greater organisational complexity, about half of them combine different organisation principles.

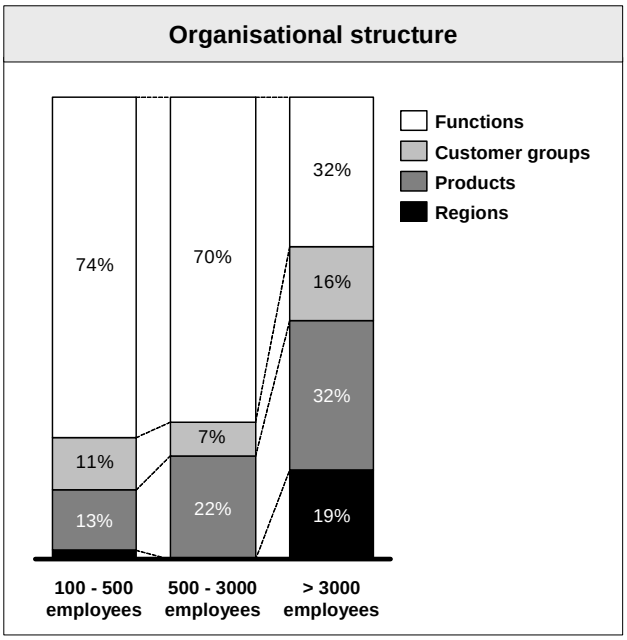

Figure 2. Primary organisational structure within sample (n=86).

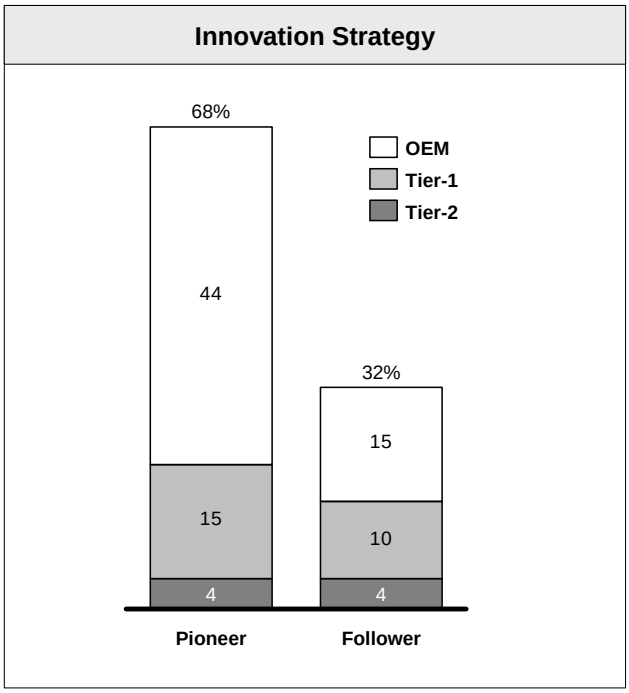

Figure 3. Dominant innovation strategies (n=86).

Choice of Innovation Strategy

One of the most important questions in innovation management is the choice of timing to launch new products or technologies and to enter new markets. Firms can either act as pioneers or as followers. While pioneers benefit from first-mover advantages (higher profitability, high initial market share), this option also bears some risks, notably relatively low sales volumes and high investments. On the other hand, there are companies that consciously decide to follow. Empirical studies have shown that both strategies can be successful (Suarez/Lanzola, 2005). In our sample, we can observe that approximately three out of four companies consider themselves to be pioneers, rather than early or late followers (Fig. 3).

It is important to note that this percentage of pioneering companies in our sample is quite high. While the rate of innovators, defined as companies that successfully introduce product and process innovations, is relatively high in the German manufacturing sector (approx. 57%) (Aschhoff et al., 2009), it is generally agreed that the majority of firms, especially SME, are not considered as innovating companies. Since all the respondents were promised to attain access to the results of our study, we can safely assume that the more innovative companies simply had a higher interest to participate.

3.2 Organisational Measures to Support the Innovation Process

During the past two decades, academics as well as practitioners agreed that there is a strong need for a standard activity plan, i.e. an innovation process, to reduce the high risks of innovation projects. In the meantime, virtually all innovative firms have implemented such a “blueprint for action” (Cooper/Kleinschmidt, 1986), enabling innovation managers to allocate sufficient time and resources to particular activities and to avoid the omission of critical steps during product creation.

Despite this consensus, firms have also realised that not all innovation problems are solved by the introduction of a solid innovation process alone. The real innovation process is far more complex than depicted in linear models. Choices are made continuously between alternative development options, feedback loops are important and other factors (e.g. social factors) play an important role, too.

So while there is an agreement on the usefulness of following a pre-defined sequence of activities, this

process needs be aligned within the entire organisation. In the following paragraphs, we highlight the measures that companies take to integrate the innovation process into existing structures. In particular, we emphasise the relation of the innovation department to other organisational entities as well as on the allocation of responsibilities along the innovation process.

Integration of Innovation Activities

Innovation efforts involve, by nature, non-routine activities that require the inclusion of a variety of different functions (product development, marketing etc.). Philips (2006) argues that, despite all innovation efforts, firms find it hard to pinpoint the responsibility for innovation: "Since ideas can come from anywhere, and can reflect anything, it's hard to categorize and assign responsibilities for good ideas." In reality, good ideas for new products tend to be evaluated by R&D, marketing and product management. Good ideas to improve processes are usually evaluated by the heads of several functional groups. But while innovation should be pervasive across the organisation, any company will hesitate to add another layer of management.

In principle, firms can assign innovation responsibilities either to an existing unit (e.g. R&D, product management), to temporary groups that run innovation projects or they can establish permanent functions or departments (e.g. "innovation officer", "innovation department"). We found in our sample, that almost half of the respondents (41% - 48%) (Fig. 4), have established an independent innovation unit. The bigger the company is, the higher the probability that one will find a designated innovation officer, whereas among smaller companies, temporary project groups are a common means to deploy innovation activities.

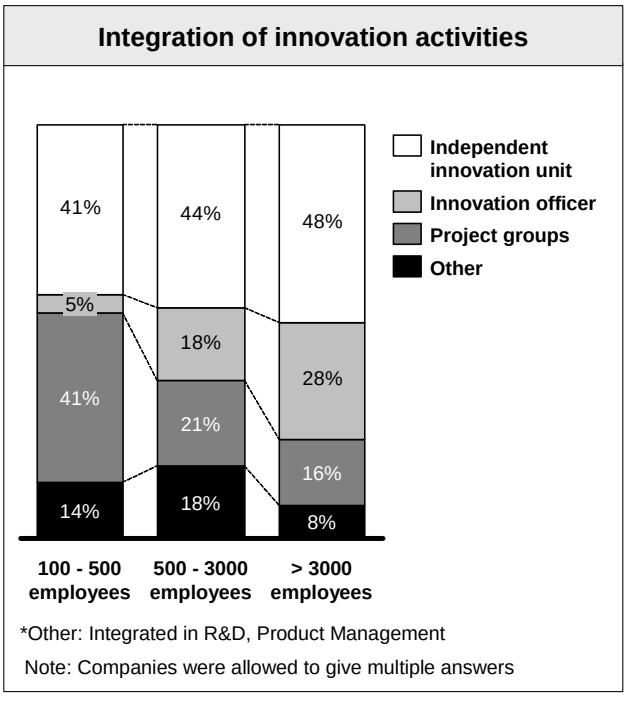

Figure 4. Integration of Innovation Activities in the Organisation (n=86)

Break-down of Innovation Responsibilities

The sheer existence of an innovation department or an innovation officer is not sufficient to characterise the way innovation activities are organised. To determine the exact range of responsibilities, we provided a set of typical tasks that innovation managers perform. Theses tasks, for instance, include the coordination of innovation activities, reporting and participation in project teams.

Interestingly enough, we found that innovation managers exercise only a limited set of responsibilities (Fig. 5). Their main duty is related to the coordination of innovation activities (71%), to reporting (58%) and to the documentation (41%) of the project progress. Few innovation managers have more active roles, in the sense that they go beyond the coordination and involve the composition of teams, the participation in teams or even the lead of innovation teams.

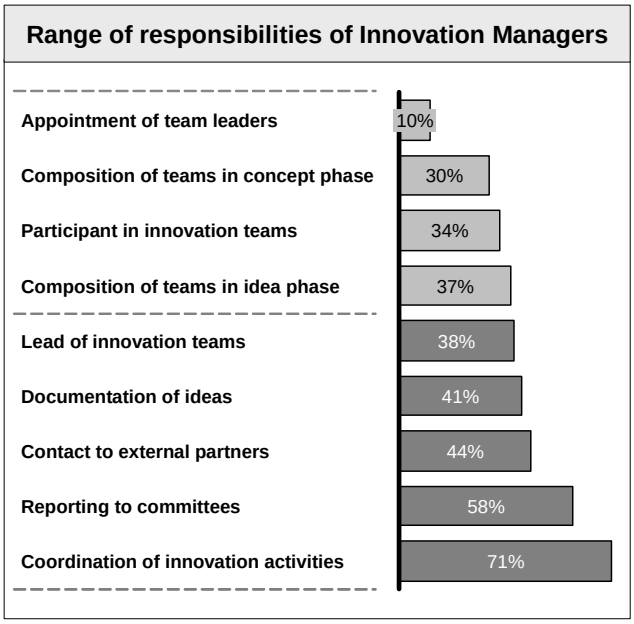

Figure 5. Range of Responsibilities of Innovation Managers (n=86)

The limited responsibility of the innovation manager is also exemplified through our investigation of the interfaces between the early innovation phases (idea and concept phase) and the development phase. While in the majority of smaller firms there is no change of project responsibility between the early innovation phases and the product development, large firms clearly differentiate between these phases (Fig. 6).

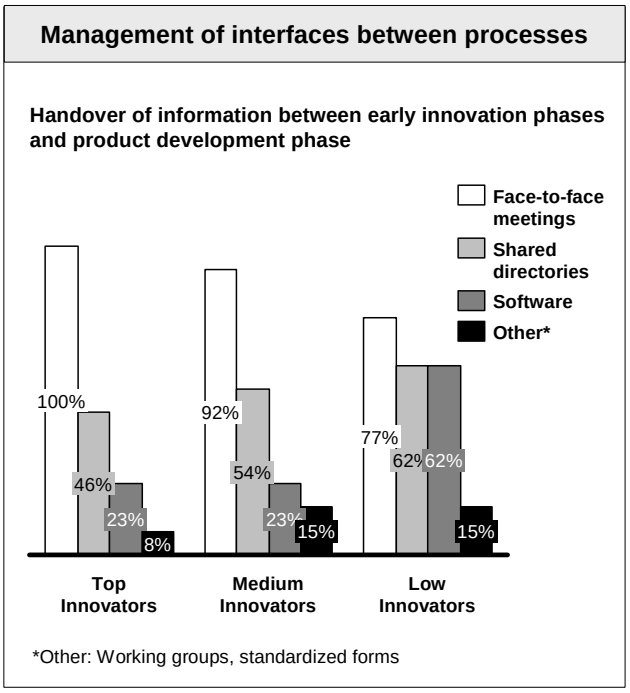

Figure 6. Design of interfaces between innovation processes.

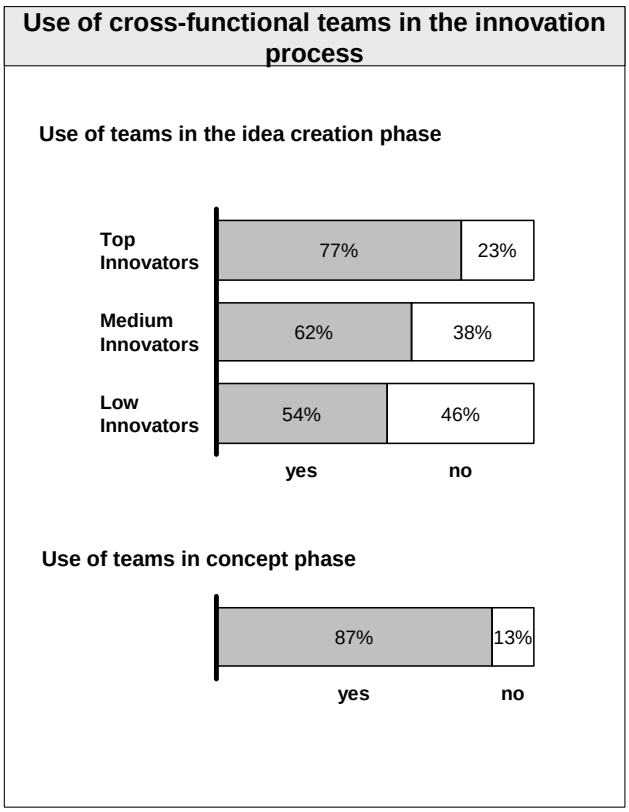

Figure 7. Use of cross-functional teams in the innovation process.

The cut between these phases doesn't affect the success of the overall project as long as there is no significant loss of information between project stages. To investigate the change of responsibilities between project stages in more depth, we differentiated the respondents in top, medium and low innovators, according to some efficiency and effectiveness metrics that were part of the information collection. The analysis of this data revealed that all top performers install face-to-face meetings to achieve a seamless transition from one phase to another. Those companies with a lower innovation performance put more emphasis on the use of shared directories and other software-supported information transfer methods and tools.

The Role of Cross-functional Teams

To make sure that innovation efforts encompass the whole organisation, companies increasingly utilise cross-functional teams (Gupta et al., 1992). While there is evidence about difficulties in communication and possible conflicts in cross-functional teams, the advantages seem to outweigh the disadvantages. Cross-functional teams allow performing development tasks in parallel. Moreover, the diversity of ideas and different viewpoints lead to a higher quality of decision-making along the innovation process.

Our study shows that the vast majority of companies indeed makes use of cross-functional teams in the concept phase (87%) (Fig. 7). However, this is not equally true for the idea phase. Again, we performed a more detailed analysis based on innovation performance. It turned out that top innovators use cross-functional teams more extensively during idea creation (77%), whereas the percentage dropped with decreasing innovation performance. Some companies commented in the questionnaire that they would like to complement their innovation teams with more representatives from other departments. In terms of diversity, the composition of the teams features predominantly members from R&D and from sales, but also from many other corporate functions (production, marketing, purchasing etc.).

The Role of Product Championing, Co-Location and Co-Creation

Eventually, we investigated some additional organisational measures that are able to contribute to innovation success. A major mechanism to support innovation is the idea of product champions (Markham, 2002). Product champions are individuals (sometimes groups) that are committed to promote the development of a certain product and that will even defend the product from attack once the process of development is under way. Often the product champion is the originator of the product idea. We found that the idea of product championing is relatively wide-spread, 60% of our respondents make use of this instrument.

Another way to support innovation activities is to provide shared facilities to the members of an innovation project ("Co-Location") (Christensen/Overdorf, 2000).

By doing so, innovation teams can communicate more easily. Furthermore, they are recognised as a homogenous unit by the rest of the organisation. This concept is applied by relatively few firms (27%).

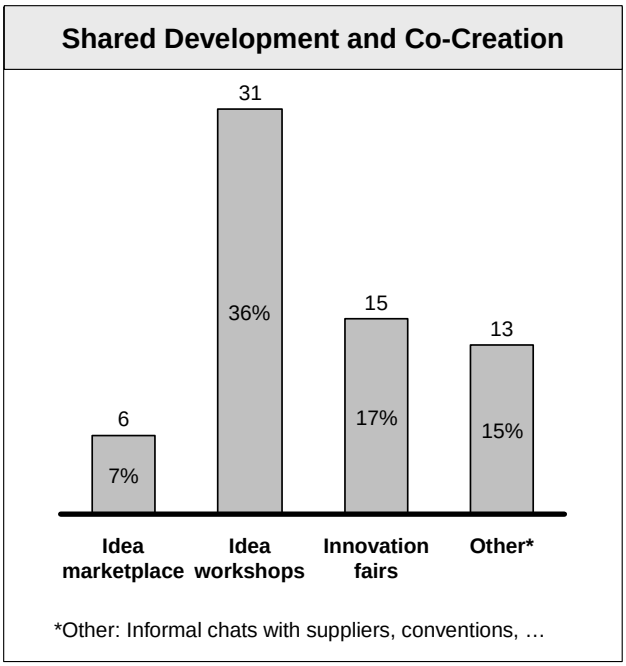

Figure 8. Use of selected innovation support mechanisms: Co-Location/-Creation (n=65)

In addition to the measures that can be taken inside the organisation, one of the main innovation imperatives that could be observed during the last years was the integration of external ideas and concepts through mechanisms such as "Co-Creation" and "Open Innovation" (Chesbrough, 2003). These mechanisms stress the fact that not all smart ideas are created and further developed within the own company. Hence firms need to find ways to access and share product ideas, and to co-develop products with other relevant stakeholders, such as customer and suppliers. We found that this concept has not been fully embraced yet. Roughly one third of the firms (36%) conduct (irregular) innovation workshops with external participants, but other similar mechanisms (innovation fairs etc.) are not very widespread, too (Fig. 8).

4. Conclusion

Within this paper, the authors elaborated on selected aspects of the organisation of innovation activities within German manufacturing companies. The answers from 86 respondents revealed a multitude of different solutions with regard to the allocation of innovation responsibilities, the design of cross-functional teams and interfaces between innovation stages as well as with regard to the diffusion and usage of selected organisational measures that support innovation (product champion, co-location and co-creation).

Despite a certain bias in our results, resulting from the high percentage of more innovative firms in our sample, we find very diverse ways of organising for innovation. Some selected organisational instruments, such as cross-functional teams and product champions, prove to be very widespread, regardless of the company size. Other concepts, however, such as co-development, have been adopted to a relatively small extent.

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