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HOW HAS THE CO-ORDINATION OF KNOWLEDGE AND COMPETENCIES CHANGED AFTER THE WAVE OF STRONG ENGINEERING OUTSOURCING IN THE AUTOMOTIVE INDUSTRY? THE CASE OF ITALY

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The pace of product introduction has induced most firms in the automotive industry to dramatically change the *scope* and the *structure* of their product development process. In the wake of the so called "*Japanization*" phenomenon (Oliver and Wilkinson, 1992), much literature has focused on the business relationships between car makers and suppliers, on the success conditions for practices such as "just in time", and on the contributions that a close network of affiliated suppliers can make in the product development stage - prior to the start of production. The involvement of suppliers in automotive component design has been a "hot topic" for at least a decade. The literature has demonstrated that a close *network* of suppliers heavily involved in component design can greatly boost design performances (Liker, et al.1996, Garel, Midler, 1998).

The characteristics of the buyer-supplier relationship, therefore, become central when suppliers are involved in the vehicle design. As can be noted, the successful involvement of suppliers in the design of new products is dependent on engineering, organisational and relational issues. However, the outcome of the new productive relations set up with competent suppliers by the OEMs in the automotive sector is not clear and straightforward. Supplier involvement at a very early stage of the OEM product development process, in fact, has implied not only a mere redefinition of the design activities but also a dramatic change in the management of the OEM business processes and knowledge management. Supplier involvement in OEMs' product development has led to (1) the relocation of knowledge and tasks within the supply chain, (2) a major organisational change within the OEM and in the buyer-supplier relationship (information

flows, team staffing and building, etc.) and (3) the redefinition of the tools (relational and based on engineering practices) used to implement the relationship. All these factors are contributing to changing the nature of the buyersupplier relationships and, at the same time, the way car makers design new vehicles. In addition, in the Italian case, the response to an increasing pace of product introduction has been to outsource engineering and design activities to a very high degree. As a consequence not only the division of labour between the different parts of the auto manufacturing value chain has changed, but also the coordination of competencies required in the design, engineering and manufacturing activities.

In this paper we focus on how the *coordination of the competencies and knowledge required for these activities has changed* in recent years in the Italian auto industry. The analysis proceeds along two lines: the change of organizational structures and of organizational practices. With regard to organizational structures, the question we focus on is: 'Which roles do (i) teams, (ii) projects, (iii) stable interfirm-relationships resp. -teams, and (iv) functional divisions have in the coordination of competencies and knowledge?' As for practices, the paper scrutinizes design and engineering practices, but also human resources and remuneration practices for their roles in the coordination of competencies and knowledge.

We then assess the strategic consequences of the changes in the coordination of competencies and knowledge by employing two considerations. First, what is the impact on sustained competitive advantage? Based on Dierickx and Cool (1989) and Foss and Knudsen (2002), we argue that the competences most important for sustained competitive advantage are the ones that have the highest time-cost attached to their imitation, and where the access to the 'template' for copying can be successfully controlled (Winter and Szulanski, 2001). We use this criterion to identify those organization structures and practices that have the highest (positive or negative) impact on the possibility of sustained competitive advantage – and thus the highest strategic impact. Second, knowing from preliminary results that the car-maker needs its suppliers to reduce the complexity of its business, we assess whether the concrete ways in which this is done (organizational structures and practices) are a strategy feasible for the long term, and what its strategic implications are. In doing so, we build on a view on uncertainty, dispersedness and strategies for coordinating dispersed competences and knowledge that is informed by the works of Hayek (Becker, 2001).

The paper draws on a multiple case study for exploring the relational settings between a major European car maker and some of its first tier suppliers and answering the research questions described above. From the analysis of the multiple case study, we arrive at an assessment of the strategic impact of the current way the Italian car-maker coordinates

competencies and knowledge. As a contribution to the general research agenda, we also develop testable hypothesis on thecoordination of competencies and knowledge that can be used in further research.

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