ONZIÈME RENCONTRE INTERNATIONALE DU GERPISA
ELEVENTH GERPISA INTERNATIONAL COLLOQUIUM

Les acteurs de l'entreprise à la recherche de nouveaux compromis ?
Construire le schéma d'analyse du GERPISA

Company Actors on the Look Out for New Compromises
Developing GERPISA's New Analytical Schema

11-13 Juin 2003 (Ministère de la Recherche, Paris, France)

INTERNATIONALISATION OF RESEARCH AND DEVELOPMENT, CREATION OF LOCAL COMPETENCIES IN THE PRODUCT DEVELOPMENT, AND THE RECENT PERFORMANCE OF THE MAIN ASSEMBLERS OF THE BRAZILIAN CAR INDUSTRY

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As it was correctly brought up in the final report of CoCKEAS (Lung, 2002), the car industry is facing again a new period of major structural changes, right in the beginning of the present century. Aiming to face this scenery of a fast transformation, defined by technological, economical, and institutional new challenges, the companies of car industry are once more defied to restructuring its knowledge basis and the respective capacity of mobilising and combining a variety of competencies (Winter, 1987).

Regarding the new technologies of car industry – with the exception, of course, of the alternative forms of propulsion (electrical, hybrid, and fuel cell engines) the electronic and the information technologies (IT) are irrefutably the central variables (McAlinden, *et al*., 2000; Chanaron, 2001; PNV: *Seventh Report*, 2001). As it is happening in several other industries, the car assemblers are expanding rapidly the utilisation of electronic systems and components. In fact, almost all the functions of the more advanced vehicles are already controlled and/or operable by the electronic on board (Fine *et al*., 1996; US Industry & Trade Outlook, 2000). The current tendency, it seems, is a crescent spread of this electronic controls towards the vehicles less sophisticated too (McAlinden *et al*., 2000).

There is no doubt that the competition in the car sector has been intensified (Chanaron, 2001; Calabrese, 2001) and that the assemblers, and the main suppliers of components – particularly the suppliers of whole models and systems – have progressively changed some of their strategies. They have, for example, expanded the nature and the scope of their co-operation among themselves, and also with others components of the productive chain, particularly the so called first tiers suppliers. On the other side, they have invested a growing proportion of their profits on innovation and design (Chanaron, 1998) Likewise, they have expanded – particularly in the case of the car assemblers – the extension of their co-operation agreements among themselves, as well as towards others companies. These agreements have been multiplied in certain areas as engines, gearbox, platforms, and even power trains, but rarely involve the whole vehicle, activities of R&D,

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and design (Calabrese, 2001). This restrict integration of activities of the production development regarding the crescent number of co-operation agreements among car assemblers, seems to indicate a broader limitation of the globalisation process of R&D of this industrial sector (OCDE, 2001; Calabrese, 2001).

Despite the fact that the technological innovation is understood as an essential element, the car industry should be defined – regarding its technological activities – by the applied research. Considering a crescent number of technological competencies– electronic, IT, new forms of propulsion, and new materials– the prevalent specialisation in the auto industry is still the mechanical one[2], and its main source of renewal is based traditionally in the development departments of products and processes. The innovation in this sector is still mainly the result of the processes of the product development, and are predominantly of a incremental character (Calabrese, 2001; Coriat and Weinstein, 2001).

Previous analysis of the product strategies and R&D of the main car assemblers installed in Brazil, seem to indicate the existence of a strong association among the respective strategies of products introduced locally by the assembler's regional branches, and its internal competencies in the processes of the product development (Quadros *et al*., 2000; Consoni and Quadros, 2001 and 2002; Carvalho 2002). Considering this, it seems appropriated to enlarging this debate, trying to investigate the link between the recent performance by the mentioned assemblers in the Brazilian car market, considering not only the strategies of products adopted by them, but also, and mainly, theirs respective competencies in terms of the product development.

The premise of the present study proposed here is that the recent success in the Brazilian car market is associated not only to the strategies of the product adopted by the assemblers, but also, and probably mainly, by their respective capacity of introducing models with a strong adaptation to the local characteristics and preferences. The mentioned capacities are the result of the competencies of the branches (developed and strengthened in a long time) in terms of the product development (Consoni and Quadros, 2002; Carvalho, 2003).

Aiming to contribute to the effort of development of the GERPISA analytical schema – according to the proposition terms at *Call for papers to the 11th GERPISA Colloquium* – I am suggesting to present a study on the relations of the internationalisation of R&D, creation of local competencies in the product development, and the recent performance of the main car assemblers installed in Brazil. The selection of the five car assemblers – precisely GM, Ford, Volkswagen, Fiat and Toyota – was a result of a criterion which considered simultaneously the importance of the companies in the Brazilian market and also its international relevance.

The analysis and the comparison of the strategies of the five car assemblers mentioned here, will be considering both the international level and the regional one (Mercosur), as the national dimension (Freyssenet *et al*., 1998; Fujimoto, 1999; Lung, *et al.,* 1999); Humphrey *et al*., 2000; Quadros *et al*., 2000; Jürgens, 2000; Salerno *et al*., 2002; Boyer and Freyssenet, 2002).

[2]Despite the crescent quantity of electronic components which have been installed in cars in the recent years, they are basically a complex and systemic mechanical product. At the same time, the cars have the so called *integral architecture*, that means "a more complex relationship of parts and functions that requires each of the parts to be optimally designed to achieve its overall performance" (Fujimoto e Takeishi, 2001:3). Such characteristics are an obstacle to conceive a car integrally in modular terms, with standardise interfaces, which allows to connect the respective modules to the vehicles in just one operation as plug and play (Chanaron, 2001)

The study proposed here is a follow-up of my PhD thesis that will be presented to the University of Campinas (UNICAMP) next March. In the beginning of the researches on the international level, I had the opportunity to study during 10 months at IDS in the University of Sussex, England, under the very fruitful supervision of the Dr. John Humphrey.