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

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Developing GERPISA's New Analytical Schema

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VISIONS ON (AUTO)MOBILITY: ARE THEY REALLY IMPORTANT?

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CONCEPTS FRAMEWORK

In the beginning of 2001, Yannick Lung wrote in *La Lettre du Gerpisa* that "the automobile has gone through a great deal of change (in design and production methods) since 1968 [3] – even though the product itself, above and beyond alterations in design, has basically kept the same appearance; still runs according to the same principles of motorisation; and continues to be assembled in factories that are organised by chain lines".[4] In fact, the technical dimension of this industry is almost the major factor of imagination refrain. Designers, ICT specialists and production engineers are most of the times the ones that push forward the innovative aspects of the car industry.

Because automobile industry is developing its own manufacturing structures over new marketing relations, rapid responses to the economic demand and international alliances based on complementarities of markets, products and competencies, the construction of scenarios is normally welcomed by the industrialists. This can give them some tools for decision making that enables the anticipation of market trends on some decades. And for the future, this capability of anticipation and foresight will be understood as a competitive management tool.

In fact, many suppositions on the trends of the automobile industry are based on visions related with technical features of the production systems, the models or work organization, as well as market trends (as in terms of providers and sub-contracting relations, as the emergence of e-business or modular systems organisation). But all of these visions are based on common or

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[3] He was mentioning the visions included in the Kubrick's film *2001 A Space Odyssey*.

[4] Lung, Yannick: "Happy New Year, 2001!", *La Lettre du GERPISA*, nº 148, January 2001, p. 1.

traditional aspects of car usage and urban structures. Of course, one can rely on the fact that these aspects will not change in its structural aspects for the next, let‘s say, 30 years.

If this ”generational law” (the time-gap for a radical family product or industry change) is accepted, the anticipation is still needed as a management tool to start a re-composition or re-structuring process that will be rooted in such change process. And this process will include necessarily policy making at the level of urban and regional planning, or development of financial institutions, and of social and demographic structures. Unnecessary is the need to underline the importance of political and economical sciences to acknowledge the emergence of new social actors and its integration in the governance frameworks.

In this sense, the foresight exercises with this type of time horizon need the in-put of most of social sciences. And they can be more decisive than the mere technical specializations. They will work after the main paths were built up, or were recognized the fundamental trends and hindering factors.

Nevertheless, a vision on the development of technical features related with the automobile industry must include these aspects, and must be isolated from them. The integration of some of the issues of debate on mobility and transport interfacing are strategic to understand the emergence of such paths.

These issues are related not only with the automobile sector, but well integrated in the discussions that are crossing the aeronautics industry, the railways sector and the new information and communication technology developments. The main reason is the fact that becomes crucial the transport interfacing or multimodularity, once this concept pushes the need for new architectonic problems, as well as new urban solutions, in order to take advantage of the different transportation networks. Another reason is related with the growth of financial integration of those different sectors above mentioned (aeronautics, railway, road transport, logistics, communication systems, construction, and of course, automobile industry). Thus, the co-ordination of development strategies in each of these sectors is crucial for those interests.

As mentioned recently in *La Lettre du GERPISA*, another goal for the research in the next years will be to apprehend interactions between firms’ organisational dynamics and socio-economic models of development. This seems truly the central vector of all foresight construction related with automobile and mobility structures.

Also one can verify the content of several of the foresight exercises all over Europe, US or Japan in which concerns the automobile sector. If we take the example from the German exercise that recently started under the FUTUR framework (with the construction and evaluation of ”lead visions” towards 2020, in order to build up research programmes), one of the main thematic cluster that emerged was ”Mobility: individually attractive and socially sustainable”. And three were the sub-topics considered as well important:

- Individual versus public mobility
- The tele-office in rucksack: mobility without motion?
- The Germans ”dearest child” – the new role of the car

As one can clearly understand the *mobility* issue is quite central when social and economical visions for the next 20 years are built up, and it includes the emerging concept of

sustainability and the car functionality can be discussed. This seems the essential problem to be dealt by industry in forecoming years.

Also the IMVP programme at MIT is dealing with this issue within the topic (or, *track*, as is mentioned) on ”Visions of a sustainable future” which include three themes on the global reach, the enabling and disruptive technologies and the organizational learning and knowledge management. These themes will be analysed in relation the following items:

- Green drive trains
- New materials, recycling and environmental management
- Mobility solutions

NEW ISSUES ON MOBILITY

Mobility as been one of the central social needs. And we can mention the individual needs for mobility, as well as transportation of goods and services. This creates traffic systems that are related with the division of labour principles, i.e. the distribution of specialized activities, location of production sites, location of design units, as well as management and financial ones, organization of commercial activities, pendular mouvements, etc. As demonstrated in several studies, JIT techniques, as well as e-commerce are major factors for the increase of traffic.

Thus, the need for increased mobility is in someway in the inverse proportion of disadvantages of transportation and traffic loads. Once the major need for mobility, the increase of negative effects on environment and psychological conditions can be easily understood. The examples can be taken from the increase of noise and air pollution, the land prices, or the transformation of landscapes with roads and highways crossing mountains, valleys, plains, whatever. Also the more traffic will exist, the slower it will go. This produces clear impact on time usage and psychological constraints.

If the principle ”roads generate traffic” is widely accepted, the dependence from the individual automobile will reduce the choice of alternative paths. So what could be an improvement of life-style with individual mobility, will soon be transformed into an obstacle to social conviviality. Not only because of specific individual freedom reduction, but also because probable increase of costs of urban or metropolitan traffic congestion and environmental damages.

The sustainability is so an increased concept that only recently is taken into account, either from policy makers, or from researchers and scientists. And these aspects will be studied not only by engineers and environmentalists, but also by social scientists. New problems of social relations, of urban structures, behaviours, social needs and acceptance levels will be taken into consideration.

It is worth to underline that in the Delphi 98 exercise in Germany, on the subject area of ”Mobility and transport”, the most knowledgeable statement was related with these dimensions, once 23,5% of the respondents thought that ”telecommunications systems will be put into widespread use to achieve an intelligent distribution of traffic and transport among the various traffic routes and transport systems, to use the existing transport infrastructure more effectively

and more efficiently, to assist in the elimination of bottlenecks and peak periods and to encourage or permit the use of flexible means of transport"[5]

In this same foresight exercise was verified that the main innovations in the field of mobility will lie, according to 55% of the panel experts, in solving ecological problems. This was then considered as one of the most important problem

In this sense, the organization of traffic systems will use these research results in order to know clearly the framework conditions of such systems, and new organizational concepts involved. Most of times, also new technical concepts will emerge to organize such traffic systems and traffic carriers with the aid of ICT.

LA LETTRE DISCUSSIONS

Some of the issues related to product innovation and socio-economic models of development that can imply new auto-mobility systems can be understood through the pages of GERPISA documents in the last years. We will mention some, and take from it some conclusions.

Based on the issues of global co-operation of major car manufacturers, Robert Boyer and Michel Freyssenet mentioned in 1999 that the "innovation-product" strategy also requires a "firm managing compromise" which is acceptable by all and which allows the firm to be "flexible"[6] This aspect introduce that dimension of "internal" negociation process as condition for innovation and flexibility, specially when companies are playing in a global stage.

Indeed, as continue the authors, this management compromise must guarantee financial independence in order to take the indispensable risks related with the innovative process. This can be considered as a low "dead-end" limit to tolerate inevitable failures. It must also garantee conceptual imagination in order to anticipate in time and respond adequately to new market expectations. This management compromise enables organizational reactivity in order to rapidly satisfy demand in the case of success before competitors copy the models which are selling well. These global playing companies need also the ability to reconvert workshops rapidly and at the least cost in case of failure thanks to personnel involvement and competence.

Few time after, an article from Freyssenet on globalisation processes stressed some challenges and that the structure of demand of the various types of automobile will be probably the most important challenge for the industry. The types of cars are largely dependent on revenue distribution modes implemented in different areas. That is why they can still be so different in areas like North America, Europe, Japan, India or South America. Today, these modes vary from those which are still hierarchised and centralized to those which are balkanized and decentralized, not to mention inegalitarian and bipolarized modes or those allowing for the periodic emergence of new population categories.

"What is each area's leeway when deciding which revenue distribution mode to adopt?", still asks Freyssenet[7] Thus, it is interesting to know if the same firm or automobile group satisfy all corresponding demand in the event that not a single type of demand dominate. This can be a

[5] Cf. Cuhls, Kerstin; Blind, Knud; Grupp, Hariolf: *Innovations for our Future: Delphi'98 New Foresight on Science and Technology*, Heidelberg, 2002, Physica-Verlag, p. 129.

[6] Boyer, Robert; Freyssenet, Michel: "Renault-Nissan, What´s the point?", *La Lettre du GERPISA*, nº 131, April 1999, p. 15

[7] Freyssenet, Michel: "Globalization and Strategic Invention", *La Lettre du GERPISA*, nº 134, July 1999, p.

critical topic when one is analyzing the demand for more sustainable products, in a context that traditional CO_2-emission products still dominates the market. So, could the same company or group simultaneously offer a classically hierarchised and commonly shared range of products? One can take the example of conceptually innovative vehicles for new population categories, stylized niche automobiles for those social categories defending their specificities, luxury automobiles for the growing group of those more well-off, vehicles to get around the city in, and vehicles for emerging countries which are trying to move from two-wheels to four-wheels. And can all these types of vehicles be conceived and designed with the integration of new and inventing engines which pollute little, like hybrid vehicles or even with fuel cells?

More recently (end of 2002) a text from Heloísa de Medina on the sustainability of automobile mentioned that "in a search for flexibility, at the production level as well as in redefining the car's concept, the automakers are looking forward to extending its market that is restricted to only 20 percent of the planet by the end of this century. For getting there, without more harmful effects to the environment, they have to improve automobiles fuel efficiency as well as to reduce their CO2 emissions and their final costs. And the continuous innovation is the key strategy to balance these goals in order to achieve economical and environmental sustainability for one more century" [8]. Of course, one must consider that some of these innovations appear, and tend to integrate all the products because of political decisions towards environment protection. If this legislation was not approved, the car manufacturers would not try to make some "financial engineering" to innovate compulsory and to compress the final costs…

Medina concludes that after the 70's, the oil crisis, the outcome of the new environmental paradigm and the Japanese boom shocked the basis of the car industry, namely, its production models, materials and its technical process. As result of that, the North American and the European car companies put a great effort on improving quality, comfort, safety, as well as reducing emissions and final disposal. The designing for global innovation was the main strategy adopted by these world companies regarding all these requirements integrating new criteria such as recycling and low emissions systems to cope with the restrict environmental regulations. Although different factors affect the diffusion of innovations concerning the technological, economic or institutional aspects involved from an industry to another, the best trajectory seems to be work in simultaneous partnership for R&D, designing, and engineering activities up to the industrial level. Working in network partners share risks and profits and also get more innovative solutions to reach the sustainability of the automobile, as Medina still concludes.

Clearly, this supposition can be a great opportunity for the automotive plants in less developed countries to get into the designing activities, which up to now concerned only the headquarters bureau employees, normally in Europe, Japan or US. That is also a means of get from all partners from regions with different levels of economical development their contribution to the sustainability of car industry and of the automobile itself.

This issue of unbalance of technology development participation on the new models of vehicle construction and design raises also some central questions that concern the labour dimension. One knows that the market uncertainty and the labour uncertainty are connected through the volume of national income and its distribution mode. If the capital-labour relation (and by extension the capitalism) take different forms, not only historically (along a time series),

[8] Medina, Heloísa: "The sustainability of the automobile for the 21st century" *La Lettre du GERPISA*, nº 162, Sept.-Oct. -2002, p. 3.

but also at the same moment, what make their inflexible unity, asks Freyssenet in a interesting article recently published? One knows that one of the answers is the particular form that would take the division of labour under the capital-labour relation, he argues[9] One knows as well that the division of labour is one from the major sources of the extension of the market. Thus here lays one of the main answers to the fact that obstacles for the development of the automobile product as we know are still so present. In fact, the system of division of labour at a global level is still an obstacle to the possibilities offered through the technological challenges for new traffic and mobility systems, or for new type of transport vehicles.

Chanaron welcomed, four years ago, the innovations that came with the new SMART as a positive way out from a certain European lack of mouvement and novelty in the car industry. The new Swatch-Daimler venture was at that time an important factor of dynamics of the automotive industry towards new profit sources (modularization production model). However, it is yet necessary that these innovations articulates with a pertinent project and be coherent with the other components of that manufacturing model. If not, the constraints that will appear can be much more heavier to the project than the advantages that it seems to have.

Of course, the JIT system is very constrictive and the partnership system that one can find at Hambach (Smartville) can be justified just in a perspective of radical cost reduction in a very standardized model. Also the Smart is very simple to be assembled, and this could a generalized product and become as a new form of urban transport. Nevertheless, Daimler s will to modify in some way the product policy of Smart seems to break down this initial pertinence. For one side, the constant increase of product variety imposed by this new market strategy it is undoubtedly to shaken up strongly the partnership system with the suppliers[10] if not destroy it.

So, beside the need for ”internal” negociations and management compromises, the existing obstacles due to the international system of division of labour, the pressure on the demand side for new sustainable products, the inflexible unity of capitalism, the new opportunities offered by the technological challenges, and the innovation constraints that can disrupt the partnership system, the automobile industry is still unable to face and solve the new problems emerging from the dominant cultural model of urban structuring, traffic system and public-individual transport vehicle usage. At this point of severe contradictions the visions on auto-mobility can offer some solutions, suggestions or recommendations, always with the danger of falling into a ”science-fiction” melting pot.

The limits of visions: the Matra case of Romorantin

Perhaps one of the most interesting cases related with the mentioned contradictions, is the Renault Avantime model produced by Matra at Romorantin. This model knew the death of its production line few time after it started as a new promise and challenge to the industry. The Avantime’s failure is, nevertheless, one possible destiny associated to innovation strategies.

[9] Freyssenet, Michel: ”Why the labour and the industrial relations are not any more in the core of the reflection within the GERPISA?” *La Lettre du GERPISA*, nº 165, January 2003, p. 7.

[10] Pardi, Tommaso: ”Innovation, mais a quell prix? L’usine Smart GmbH a Hambach”, *La Lettre du GERPISA*, nº 166, February 2003, p. 10.

This car product was innovative at two levels[11] either in terms of its technical design (which delayed the product launch because of the problems faced in managing certain technical choices); and its commercial positioning. The decision to go for a radically different style inferred the creation of a new automobile niche, technologically innovative, modern and radical design, and high standard vehicle. Although the European market may never has been as fragmented as is some people believe. Once again, the income distribution model at the European level did not push the emergence of an young and affluent social group, that could search this kind of product. And Renault couldn't reproduce with the Avantime everything that it had been able to achieve with its other minivan launches (from the Espace to the Scénic).

Thus, in fact, innovation in the automobile industry it is not always synonymous of industrial success. For social and economical actors that follow a strategy of "innovation and flexibility" what counts is the ability to manage failure, as well as success, as Yannick Lung underlines in his recent article.

As it is mentioned further, Matra offers an example of trend that far too often have been generalised on the basis of a few emblematic strategies. However, this example still is important for the construction of such visions because it offers a view that shows the evidence of situational diversity. Not always these stories are successful ones, and one must analyses carefully the result.

Renault has internalised production and assembly of the Espace, a model it used to subcontract to Matra (the original designer). This internalisation mentioned by Lung is justified by the consolidation of this market segment (hence the production of medium/large series) and by Renault's application of a platform strategy, wherein the new Espace shares several elements with the two other models that Renault assembles at Sandouville: the Laguna II and the Vel Satis.

As regards its low volume niche products (specifically the innovative models whose commercial success is far from a foregone conclusion), medium-sized firms continue to offer flexibility, something that induces them to subcontract this type of production (see the coupé models Heuliez will assemble for Opel, or the one that Sodia can do in Portugal for VW). Nevertheless, it remains relatively unlikely that this fabric of companies, which is particularly dense in Europe, can avoid the temptation to develop their own production and assembly activities. Instead, it is in the consolidation of design and engineering activities where they could benefit carmakers' externalization as we can see from the example of Pininfarina (P3). The future of the automobile industry is definitively not Dellism, says again Lung [12], and we can agree on that.

Challenges

As was mentioned by some conclusions from Cockeas project the automobile industry's entire value chain has undergone a profound reorganisation. The purpose has been to rationalise

[11] Lung, Yannick : "Lessons from the Matra plant's closure", *La Lettre du GERPISA*, nº 167, Mars 2003, p. 1

[12] op. cit., p. 2. On the term of "Dellism", from the name of the hardware company Dell, Freyssenet mentions (La Lettre 148) the example of this company that only manufactures an item once an order is received for it, and which makes home deliveries of computer systems comprised of elements that the clients themselves have chosen. Outsourcing, modularisation, order-triggered production, client determined product definition, Internet-based ordering and rapid delivery – these are the main ingredients of a new industrial model that will allegedly be spreading soon to all sectors of economic activity

and improve the coordination of all of its activities, from whole vehicle design to final product manufacturing to retail distribution.

Part of a move from a push to a pull logic, this change took place in an environment where greater differentiation and responsiveness became key constituents of competitiveness. But this environment included also increased economic difficulties that reflected clearly of the income distribution structure. Of course, ICT may have driven this change, but the diffusion thereof varied greatly from one area to the next and often encountered a number of structural obstacles.

The re-organisation inferred a deep-seated restructuring of the relationship between car manufacturers and their suppliers, marked by an increasing delegation of design, production and module assembly functions to first tier suppliers.

Nevertheles this was never accomplished at global level. The common platforms are required for the American and the European markets at least. But the car-makers are still not able to do so, not only because of technical problems, but mostly because of marketing strategies. The supplier networks are then established at a regional level, but do not act at a global level. If this is still difficult in these two world regions, more difficult even is to do so with the Japanese one. This implies an all sort of compromises and conformity solutions that goes by power relations among companies all over these regions and markets.

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