THE LOGISTICS FUNCTION IN THE FASHION SECTOR.

AN ANALITICAL APPROACH

Jesús García-Arca (jgarca@uvigo.es)
Ana Mejías-Sacaluga (mejias@uvigo.es)
José Carlos Prado-Prado (jcprado@uvigo.es)

Organization Engineering Group (GIO)
University of Vigo (Spain)
Departamento de Organización de Empresas y Marketing / ETSII de Vigo
c/ Maxwell, 36310 Vigo (Spain)
Tel: + 34 986 81 22 20 Fax: + 34 986 81 23 85

POMS 18th Annual Conference
Dallas, Texas, USA
May 4 to May 7, 2007

ABSTRACT

The paper presents the main results of a project undertaken by authors and with a two-fold objective: on the one hand, to determine the extent to which the logistics function is developed in companies of the fashion sector and, on the other, the design of an improvement plan in the field of logistics to increase competitiveness. To do so, in-depth analysis of the logistics function and the supply chains in 9 Spanish companies of the fashion sector (all of them significant companies in the European markets and in some cases worldwide) is carried out, taking into account both structural and organizational aspects, all this in keeping with the complexity and uncertainty of the fashion sector’s supply chain (characterized by a product with a short life cycle, high volatility, low predictability and a high level of impulse purchase).

Keywords: Logistics, Supply Chain, Fashion Sector
1. INTRODUCTION

Nowadays, the market in which companies develop their activity is characterized by an increasing demand, calling for a wider range of products, with good quality, a low profit margin and a high level of service (Bolwijn and Kumpe, 1998). In this context, logistics and SCM (Supply Chain Management) have become a key, strategic function in companies in achieving competitive advantages since a correct management of the same contributes to cutting down on costs and increasing the level of service.

Christopher (1992) defines the supply chain as "... a network of organizations that are interconnected, through upstream and downstream links, in the different business processes and activities that produce value in the shape of products and services to clients.” This approach by Christopher coincides with that later pointed out by Mentzer et al., (2001) and Stock and Lambert (2001).

Excluding certain nuances that can lead to debate on the equivalence or otherwise of the supply chain and logistics in the purely conceptual field (Larson and Halldorsson, 2004), a broader view reveals a similar approach to that of logistics in supply chain management, this being the approach taken in this paper. So as far as the authors are concerned, logistics is the “coordinated management of flows of materials and information, from the supply stage to distribution, covering production and “out of use” product management (“reverse logistics”) at each stage of the trade process”. Along these lines, the concept of “supply chain” responds to the need in all organizations to provide an efficient response to market demands in order to carry out actions aimed at an improved coordination of flows with the other companies involved in the logistics process, particularly the suppliers and customers. Thus, integrated, coordinated approaches become important between the various “links” in the supply chain, such as
JIT (Just-in-time, as popularized by the Toyota car manufacturer, focusing on eradicating “waste”; Ohno, 1988; Monden, 1997), QR (Quick Response, launched in the American textile sector to improve the level of service given to customers, in 1984), “Lean Management” or “Lean Manufacturing” (Womack and Jones, 1996), “Agile Management” (Iaccoca Institute, 1991; management of uncertainty in demand by adopting flexible organizational structures and processes) or ECR (Efficient Consumer Response), which set out to provide strategies for improving efficiency in processes and improving quality, service and costs offered to the market. In this context, a term has even been coined in an attempt to have a bearing on the need to adopt “waste” eradication strategies (Lean Management) at the same time as swift adaptation to changes in the market (“Agile Management”) known as “Leagile management” (Bruce et al., 2004; Van Hoek, 2000; Mason-Jones et al., 2000; Naylor et al., 1999).

So from the “agile” viewpoint (Christopher, 2000; Vázquez-Bustelo and Avella, 2005), companies should apply coordination and cooperation strategies with suppliers and customers, concurrent engineering in developing new products, the use of advanced technologies in the design, planning and control of the supply chain and appropriate management of know-how (via continuous improvement, team work, a standardized work procedure and a flexible organizational structure).

Furthermore, in order to facilitate improving flexibility and uncertainty, Lowson (2002) put forward the “Postponement” strategy (involving delaying execution of logistics activities as long as possible until the exact attributes of the demand are identified). Precursors of these strategies are found in the proposals by Bowersox and Closs (1996), Morehouse and Bowersox (1995).
Alongside this, the academic and professional field has assisted in developing various proposals to characterize the supply chain in which companies are involved. Such proposals include conceptual models SCOR (Supply Chain Operations Reference Model) or the AMT (Asset Management Tool). The first of these was developed in 1996, by the Supply-Chain Council (SCC) to provide a framework drawing together trade processes, Key Performance Indicators (KPIs), best practices and technologies in a structure to support collaboration between agents in the supply chain and to improve their management. The second of these proposals was developed as a strategic support tool for the decision that makes supply chain management possible in an “extended company” set up, at IB Personal Systems Group (PSG) (Lin, 2000). In this model, basically two parameters are taken into account: cutting down and managing uncertainty and improving flexibility, with particular emphasis, for instance, on collaborative manufacturing (McClellan, 2003) and in developing information systems (Simchi-Levi et al., 2003).

Recently there have been many studies on the supply chain. Sachan and Datta (2005) conducted an analysis of 442 articles, recently published by various academic magazines on issues related to logistics management or supply chain management; this study demonstrated that in the scientific literature there has been both an increase in research based on case studies and a tendency towards applied research aimed at creating management models for subsequent validation in the business world, conclusions which basically coincide with those of the evolutionary study of supply chains conducted by Meixell and Gargeya (2005) from a review of 100 scientific articles. In this way, the research by Sachan and Datta reveals the lack of interdisciplinary studies between different companies within the supply chain, aspects which have suggested some aspects found in this paper.
In this context, the “agility” concept is especially applicable to sectors such as the fashion retail sector (Fernie and Sparks, 1998) characterized by the short life cycle of the product, high volatility, low predictability and a high rate of compulsive buying with no consumer loyalty to a particular brand. Thus, although there are articles on the importance of applying “agile” strategies in the textile sector (Bhamra et al., 1998; Chandra and Kumar, 2000; Bruce et al., 2004) or even in other sectors (Vazquez-Bustelo and Abella, 2005), they fail to make an in-depth analysis of the models and organization that make its implementation easy or difficult, this being the aim here.

2. METHODOLOGY

In the conceptual context presented in the previous section, the research project carried out by the authors sets out to determine the flexibility of the supply chains in specific companies in the fashion sector. More specifically, the case study methodology has been applied to analyze nine representative companies in the fashion sector in Spain. Recent studies have shown the importance of research based on case studies as a methodological tool for empirical analysis in Operations Management (Barnes, 2001).

Many important advances in the concepts and theories of operations management, from lean manufacturing to manufacturing strategy, have been developed by means of case studies, and many works have called for further empirical research based on this methodology (i.e., Meredith and Samson, 2001; Stuart et al., 2002). Case study methodology is usually applied in the initial stages of development of a new theory, although it can also be used to support, extend or broaden theories or to generate queries on the same (Yin, 1989).
The information compilation system used was based on personal interviews (with a structured questionnaire) with each of the nine companies selected, in conjunction with analysis of secondary information of companies and the world textile sector. This study is part of a broader multi-sector work carried out by the authors, funded by the Regional Government of Galicia’s Department of Innovation and Industry (Northwest Spain).

To achieve these objectives, questionnaire was developed structured into 11 sections with over 60 questions concerning, both qualitatively and quantitatively, the characterization of the market and of the marketing channel, description of the supply chain, the management and technological systems used in the supply chain, best practices and tendencies.

Furthermore, the authors took a direct part in some “continuous improvement” and logistics projects in two of the companies, in line with the “action research” approach. This approach is framed within the so called intervention processes, boosting collaboration between the entrepreneurial and the academic world, underlining the role played in these interventions by the researchers themselves (facilitator or agent of change). Several authors have backed the action research approach in the field of production/logistics, as referred to in the works by Warmington (1983), Meredith (1993), Platts (1993), Maull et al. (1995), Prado, (2000) and Coughlan and Coghlan (2002).

The companies selected have some homogenous characteristics that make them particularly interesting for this kind of analysis: they are companies that promote the brand name and design in their clothing, they are well known companies on the Spanish and Portuguese market (three of them rank among the leading 25 companies in Spanish fashion) and the formulae used to market their products include preferably the use of
one brand outlets. So the number of exclusive outlets among the nine companies analyzed is of 417 in Spain and 248 abroad. The annual turnover in the companies analysed ranges from 7 million euros in the smallest to more than 150 million euros in the largest.

Also, a further nexus of union among the companies selected is that their operational headquarters are located in the same geographical area, Galicia (Northwest Spain). In Galicia is located one of the world leader companies of the fashion sector: Inditex (company owner of Zara brand).

For reasons of confidentiality required by the companies involved, analysis of company cases is presented jointly on an anonymous basis which, as far as the authors are concerned, does not detract from the validity, usefulness and conclusions in the paper.

3. CONCEPTUAL BUSINESS MODELS IN THE SPANISH FASHION SECTOR

By way of a summary of the above, it is noted that nowadays, the majority of fashion companies set out to adopt an “agile” strategy in the design of their supply chain, in order to adapt themselves to the variability and volatility of customers’ orders, often developing new products with a reduced stocks policy. In order to achieve these aspects in practice (quick service and low stock levels), it is essential to have an adequate coordinated management model for the flows of information and materials, in each and every one of the stages of the supply chain.

All companies analyzed adopt the “season” model (autumn-winter; spring-summer) in their business concept (albeit with a degree of flexibility), what it generates increased stock levels due to the uncertainty and variability in the fashion market. All this increases the percentage of products to be sold off, sold in promotions or simply left to
become obsolete season after season. The previous consideration affects both the
definition of the supply chain and its very organizational structure. In this regard,
conceptual differences have been found when managing such a supply chain, to make it
adapt swiftly to market demands. Thus, in this context, the authors establish five
conceptual businesses: “replacement model”, “seasonal model”, “seasonal model with
replacement”, “seasonal model with renewal” and “frequent renewal”. Each of these
models is detailed below.

The Replacement model

The “replacement” model in companies is characterized by manufacturing and
marketing “classic” products that are sold in all seasons (where it is not necessary to
make any important redesigning), which are strongly subject to competition from Asian
products (especially in the lower range). In this management model, emphasis lies on
productive turnover (to lower costs) and it is usually associated with high stock levels,
both of raw materials (to achieve better prices per volume), although without involving
the risk of obsolescence (in view of the fact that they are “classic” products).

In the companies analyzed, none is purely associated with this model, although for some
products in the range, one of the companies can be partially identified with this model.
The way in which they are marketed combines a single brand with a multi-brand outlet.

The seasonal model

The seasonal model in companies is characterized by the design, manufacture and
marketing of different (or almost different) products every season (autumn-winter,
spring-summer), in line with market trends. In this model, most of the sales to the
marketing points occur beforehand, at the start of each season, manufacturing quasi “on
order” (first, a clothes collection is drawn up and is offered to the sales channel with which orders for clothing are to be established. Then they are manufactured wholesale to be distributed according to need, there being the risk of being imitated by competitors.

This type of management also puts the emphasis on productive turnover (at lower costs), but involving an important mission in the design departments. In view of the supply periods involved and it being impossible to adjust supply times to production times, it is normal to work with a high level of raw material stocks (fabrics, threads, yarn,…) as well as high finished product stocks in certain periods of the year (prior to distribution in each season). Also, manufacturing remnants of garments and returns coming back from the market generate the risk of holding obsolete goods.

Three of the companies analyzed come under this model. These companies market their products via multi-brand outlets, single-brand outlets or they are direct suppliers of well-known brands.

The seasonal model with replacement

The seasonal model with replacement in companies is characterized by the design, manufacture and marketing of different (or almost different) products for each season (autumn-winter, spring-summer) in line with market trends, as in the case of the previous model. But in this model, however, although a fair part of the sales to marketing points occurs before the start of each season, there is an important percentage of sales (and, by extension, of the production and distribution) occurring throughout the season (replacing, on a lower scale, depending on the market sales), with the risk of imitation by competitors.
In this management model, there is still emphasis on production turnover and design capacities, although aspects such as flexibility in the areas of production and distribution start to become important. Furthermore, the problem with the supply periods is still accentuated, so that this model works with a high level of raw material stocks and finished products in certain times in the year (prior to distribution for each season). Also, manufacturing remnants of clothing and returns coming back from the market generate the risk of obsolete products (although in a lesser level than in pure “seasonal” model”).

Four of the Galician companies analyzed (one partially using the replacement model) come under this model. The way of marketing used by the companies under this model is preferably through single brand outlets. The companies controlling part of this channel (own outlets or franchise ones) usually store on their distribution platforms in order to replace sales, as goods are sold (taking advantage of previously manufactured stock already at the central warehouse, or by manufacturing on a small scale, depending on the availability of raw materials).

The seasonal model with renewal

The seasonal model with renewal in companies is characterized by the design, manufacture and marketing of different (or almost different) products each season (autumn-winter, spring-summer), in line with market trends, as in the previous model. But in this model, although a fair part of the sales to the marketing points still occurs before the start of each season, there is an important percentage of sales (and by extension, of production and distribution) carried out throughout the season (replaced on a small scale, depending on market scales).
When replacing, however, there is no manufacturing or marketing of the same product, but rather some changes are normally made in the design to differentiate them from previously existing ones, thus being able to compete better with competitors’ imitations. In this management model, the emphasis still lies on production turnover and design capacities, alongside flexibility in the area of production and distribution.

This model accentuates the problem with supply periods, so that it works with a high level of raw material stocks and medium or low levels of finished products, at certain times of the year (before distribution for each season, although to a lesser extent than in the case above). Also, manufacturing remnants of clothing and returns coming back from the market generate the risk of obsolete goods (although in a lesser level than in pure “seasonal” model”). Out of the companies analyzed, only one comes under this model, which manufactures its products through single brand outlets.

**The regular renewal model**

Finally, the regular renewal model: characterized by the design, manufacturing and marketing of different products in each season (autumn-winter, spring-summer) and, throughout the season, in line with market trends. Special emphasis is made in this model on flexibility throughout the supply chain, not only in the areas of production and distribution, but rather in the supply area. In this manner, levels of raw material stocks and finished product are kept low, thus reducing the effects of imitations and obsolete products.

Not only are sales in the outlets continually being replaced, but also, the supply of products for the same are renewed on a regular basis. This model is the one most directly designed to give a “swift” response to market demand and the one that can act
as an example to other companies, both in the textile sector and even in other sectors seeking to adopt this “agile” approach.

Some of the most representative companies in the sector, such as the Spanish Inditex (headed by its emblematic Zara firm) follow this model, involving three key factors: control of the marketing channel (with its own subcontracted chains, agile design of new products and control of all flows of materials and information in the supply chain). Unfortunately, none of the companies analyzed has exactly adopted this model, although they certainly are attempting to approach it.

4. THE SUPPLY CHAIN IN THE SPANISH FOOD SECTOR

As commented earlier, adopting “agile” supply chains is one of the key elements for an efficient management of the fashion market. In this context, the most important companies in the sector have made a strategic commitment both to the brand and to its appropriate placement as well as controlling the marketing channel and the supply chain as a whole.

Such strategies have allowed leading companies to deal with pressure from competition coming from low cost Asian (especially Chinese) products, with the best weapons. This pressure from Asian competitors has increased even further with the withdrawal of quotas on imports from member countries of the World Trade Organization (WTO) since 1st January 2005.

In this regard, it is in the coordinated control of the supply chain where companies are now winning or losing the tough race against competitors. This statement is justified both by the increased complexity in managing the supply chain in companies to be able to give an agile response to market demand (a complexity that can be synthesized in the
need to make the entire chain “visible”, starting with the outlets) and by the need to “line up” in these chains with other clusters of companies, such as suppliers, logistics operators and textile workshops.

These problems are dealt with from the very concept of design, since not all fashion companies are evolving from the “seasonal” concept to the concept of “ongoing replacement” of products (new or otherwise), in line with the local needs in each market, as noted under the previous heading.

Regular adoption of the seasonal model, or variants on the same, associated with a slow design process (not associated with a regular renewal) by the companies interviewed, leads to a problem of adaptability to demand which, along with the potential problems of “visibility” through a marketing channel not exclusively its own (own single brand outlets or on a franchise basis) generate high stocks and the risk of the products becoming obsolete.

In this context, companies have banked on agility in the distribution field by developing logistics platforms that are intensive in terms of handling technologies, in order to improve efficiency in preparing orders for outlets.

Conversely, although companies have gradually made their supply chain flexible, particularly in the production field (by outsourcing some dressmaking activities to external textile workshops), this flexibility has not been conveyed to the supplies area where there are still big production batches and long supply periods involved.

This latter situation makes it difficult to adopt more agile models in the supply chain, and requires a larger size or volume to be able to negotiate with the suppliers, apart from needing more coordination with the same, in a current and future situation where
the variety and renewal of products demanded by the market are not exactly helped along by the large batches of supplies. By way of a summary, the supply chain in the fashion sector analyzed can be illustrated as in Figure 1.

![Figure 1. Supply chain in the Spanish fashion sector](image)

### 5. SUPPLY CHAIN ORGANIZATION IN THE SPANISH FASHION SECTOR

Based on a broad definition of logistics as the “coordinated management of flows of materials and information”, both direct and reverse, from stockpiling raw materials and components (activities related to Purchases/Supplies), covering processing said components and raw materials in finished products (activities related to Production), to their delivery to the customer (Physical Distribution activities), companies were asked as to which departments are responsible for managing both the strategic and operational activities of Purchases/Supplies, Production, Physical Distribution and Inverse Logistics.

While it is true that there is no single way of structuring the logistics function in an organized manner, one essential requirement in all the valid alternatives is the presence
of coordinating mechanisms between the various people responsible for each of the activities covering this function.

So, one of the possible organizational alternatives that could be considered to ensure that logistics management is efficient is such a responsibility be assigned to a same department (be it called Logistics or otherwise), thus making it easier for the coordination that must characterize the logistics function in the companies in the sector adapted to the needs of supply chain management.

On this issue, it is fairly widespread among companies under this model, in view of the fact that many of them have a department specifically responsible for the coordinated management of all the logistic flows of materials and information. This department takes charge of the total management of these flows in 3 companies and, partially in 5 of them (in 3 out of the 5 companies, they jointly coordinate the production and distribution flows; the fourth company jointly coordinates the supplies and production flows; finally, in the fifth company, there is a certain coordinated functional management (supplies, production and physical distribution), although supplies and production management are separated according to the type of product).

In this context, only one of the companies interviewed presents a distributed organization for logistics activities between different departments, especially through the production department.

Also, at a strategic level, the main responsibility of designing the network of factories and warehouses is shared by these flow management departments (where they exist) and companies’ directors.
The figure of a flows coordinator is less common in companies with purely seasonal management models (in one of the companies under this model, there is no coordinating figure, and in the other two, there is coordination, although only partially).

On the other hand, in line with the comments at the start of this heading, even when there is not a department drawing together the integrated management of logistic activities, there are other valid organizational alternatives when the appropriate coordination systems are put in place between departments related to the logistic function or to other unrelated departments.

Nevertheless, despite the fact that a fair number of companies (5) have formal coordination mechanisms for the appropriate management of logistics flows (pre-established meetings with contents, attendees and a given regularity, which is aided by the extent to which the logistics management commented on above is integrated), there are still 4 companies claiming not to have these formal systems to be able to search for strategic alternatives in the supply chain (purchases, supplies, production, physical distribution and reverse logistics) to make it possible to improve the quality, service and costs standards offered to the market (only one of these last companies foresees establishing these coordination systems in the future).

Likewise, from an operational viewpoint, there is a majority of coordination mechanisms in logistics matter (in 6 of the companies) that, besides, will promote them in the future (in 3 of the latter 6 companies). However, there are still 3 companies claiming not to have these coordination mechanisms at present and none of these ones foresee doing so in the future. In any case, in these operational tasks, all the companies will improve coordination by additionally applying informal mechanisms, such as the telephone, e-mail, etc.
This state of coordination is repeated for the logistics function with other entrepreneurial functions (particularly product design, but also in commercial, financial, personnel issues …). Thus, 5 of the companies state that they have formal coordination mechanisms, both in strategic and in operational matters. Once again, all the Companies rely on this coordination with informal mechanisms.

In this context, coordination needs to be backed by an adequate system of logistic indicators (KPIs) backing the needs of ongoing improvement of the processes involved.

In this regard, based on the analysis, it is noted that the production area followed by purchases are those with a greater backing from the indicators (in aspects such as quality, cost and service). At a certain distance away are the physical distribution indicators. Indicators associated with reverse logistics management (for product recovery) are almost non-existent.

On the other hand, companies’ satisfaction with the extent of the development of these indicators is medium (3 of the companies set values from 1 to 2, on a scale of 1 to 5; 4 companies set a value of 3, and 2 companies, from 4 to 5). This is despite the fact that obtaining these indicators is moderately integrated into the companies’ information systems (in 5 out of the 9 companies). This medium satisfaction with the logistics indicators developed and their level of integration within the information system could justify the fact that almost all the companies analyzed (8) highlight the need to strengthen their development in the future.

In this context, it is not uncommon in the companies interviewed for there to be a department specifically known as “logistics” (only in one of the companies). The term most used by companies in these departments managing these logistics flows, either
fully or partially, is that of “operations department” (in 4 out of the 5 companies with this integrated outlook on logistics issues).

As regards the hierarchical level, existing operations or logistics departments currently in these companies are positioned in the company organization chart, headed by Directors (in the 5 companies with such departments), which strengthens the importance given by these companies to this function.

On the other hand, in the other 4 companies lacking a logistics operations department, there is a production department, which takes on a predominant role in logistics management which, in all cases, hierarchically depends on Directors.

Special mention is made to the important role played in 4 of the companies interviewed of other departments, such as the commercial department, not related to the operations, logistics or production department commented on earlier, that are directly or indirectly responsible for some logistics activities management, such as the physical distribution (in one companies) or purchases and supplies (in three companies).

As far as coordination with the other agents in the supply chain is concerned, it is noted that in the relations with their strategic raw materials suppliers (fabric, threads, yarm, accessories,...), the majority of the companies interviewed opt for primary models (“basic” or “friendly” negotiations) as opposed to models involving a greater commitment, coordination or collaboration. This trend is similar to the predominant type of relationship between the companies analyzed and their non-strategic suppliers (e.g., packaging suppliers).

Nevertheless, there is certainly a more developed relationship among companies and textiles workshops since the “cooperation” type is more common, which makes it
possible to orientate an agile strategy in the companies towards the strategy applied in the workshops.

Contrary to this, the relationship between the companies analyzed and the companies in the commercial channel (outlets, single and multi-brand, or large scale customers) is preferably characterized by an advanced model (cooperation and collaboration), although there are still basic formulas of friendly negotiation still being used (especially in companies with less control over the channel as they work intensively with multi-brand outlets).

6. CONCLUSIONS

Taking into consideration the comments at the start of this paper, from a “swift” point of view, companies should, among other strategies, apply coordination and collaboration with customers and suppliers.

But however, adopting the “seasonal model” or “seasonal model with replacement”, as is the case of the majority of the companies analyzed (albeit with a degree of flexibility), generates increased levels of stocks because of the uncertainty and variability that the fashion market entails.

Furthermore, although in most companies there is a department specifically responsible for the coordinated management of all logistics flows of materials and information (widely known as “operations”), and despite the fact that some companies claim that they have formal coordination mechanisms available for the adequate management of logistics flows, almost half of these state that they lack such mechanisms to look for alternatives in the supply chain with a broader strategic approach (purchases, supplies,
production, physical distribution and reverse logistics) to allow them to improve the quality, service and costs standards offered to the market.

On the other hand, as far as coordination with the other agents in the supply chain is concerned, it should be noted that although the relations with the agents in the channel can be termed as advanced, in the relations with their suppliers, the companies interviewed mostly opt for primary models (“basic” or “friendly” negotiations) as opposed to models involving more commitment (coordination and collaboration). The predominant type of relationship among companies in the Spanish fashion sector with its suppliers means that aspects of joint logistics improvement are not strengthened in a systematic manner, nor is there too much sharing of information in the logistics field.

In view of the above, authors consider that there is still a considerable potential for improvement in companies in the fashion sector in Spain as regards extending the favourable level of integration of the supply chain available, at internal level, upstream (particularly), and downstream in order to make progress in a management model for the supply chain where it is possible to apply the “agile” approach.

In fact, adopting more flexible, agile models in the supply chain calls for a larger size or volume in the companies analyzed to be able to negotiate with suppliers apart from a greater coordination with these ones, in the current and a future environment where the variety and renewal of the products required by the market is not exactly helped by the big production batches of suppliers.

Taking all this into account, the question to answer is how to acquire this competitive characteristic if it is difficult to obtain volume because the growth level of outlets is expensive and slow (representing a financial risk for companies). From the viewpoint of
design and industrialization, it is possible to follow “modularity” policies for the product components and “postponement”, but oddly enough, an option not to be taken lightly is that of collaboration among competitors, thus making reality the old adage of “war in marketing, but collaboration in logistics”.

REFERENCES


