THE IMPORTANCE OF GOOD MANAGEMENT IN THE CERAMIC SECTOR SUPPLY CHAIN

Jorge Motjé, Managing Director of Miebach Logística

Miebach Logística, Spain
"Logistics as a competitive factor"

1. PROBLEMS IN THE SECTOR AND THE COMPLEXITY OF LOGISTICS

The presentation on "the importance of good management in the ceramic sector supply chain" seeks to draw attention to the fact that logistics and correct logistical management are important competitive factors.

The ceramic sector is characterised by the following **key business factors:**

- Quality and design of the products
- Yield from the raw materials
- Speed and accuracy of deliveries and satisfactory customer service
- Stock rotation
- Reducing variations in production
- Competitiveness in costs

Based with these premises, the supply chain of the companies in the sector must deal with a complex situation that can be summarised as:

- A large number of **clients**, in a sector that is spread out and dispersed around the world.
- A long list of **products** that facilitates differentiation by design and brand, but at the same time leads to great complexity given the number of items that need to be managed. The specifics of manufacturing cause additional complexity with shade and calibre.
  - Updating the catalogue to coincide with Trade Fairs
  - Variations in colour in the collections
  - More than 6,800 references in stock, that work on almost 2,000 bases
- The added complication of **displays and sample pieces**
  - The launch of display units associated with new products / new distributors
  - Unequal behaviour in sales of items in the display (80/20)
  - Complicated logistics for preparing and dispatching samples
- A **manufacturing** process characterised by the complexity of manufacturing such a large number of items profitably:
  - Limited flexibility for small series
  - Long delivery times for trims or for subcontracted products (2-3 months)
  - Minimum orders for trims
  - Variability in shade / calibre

- The number of references and the complexity involved in manufacturing them make **stock management** enormously complicated
  - Machine changeover times (particularly press dies and matrices) and colour adjustments cause inefficiency as they represent a large amount of non-productive time and lead to the production of larger batches than are necessary (1 shift minimum, 1,200 m^2)
  - The variations in the product manufactured make it very difficult to manage stocks by Model / Shade / Quality / Calibre
- Atomized **competency** and growing globalization and rapid absorption of new technologies and designs
- Low concentration of **suppliers** with a tendency to vertical integration in the sector
- In the event of having a **network of own shops**, the added complication of:
  - The need for fast service (3-5 days)
  - Access to consulting stock availability
  - Need to maintain homogeneity of shade/calibre
- Specific logistics for **clients in Spain**
  - A tendency to increase picking due to a decrease in the average size of orders
  - Chaotic management of product collection (reservations that freeze materials)
- And other specific logistics for **export clients**
  - Concentration of dispatches at the end of the week
  - Sea freight dispatch for long distances in containers according to the availability of equipment and vessel capacity.

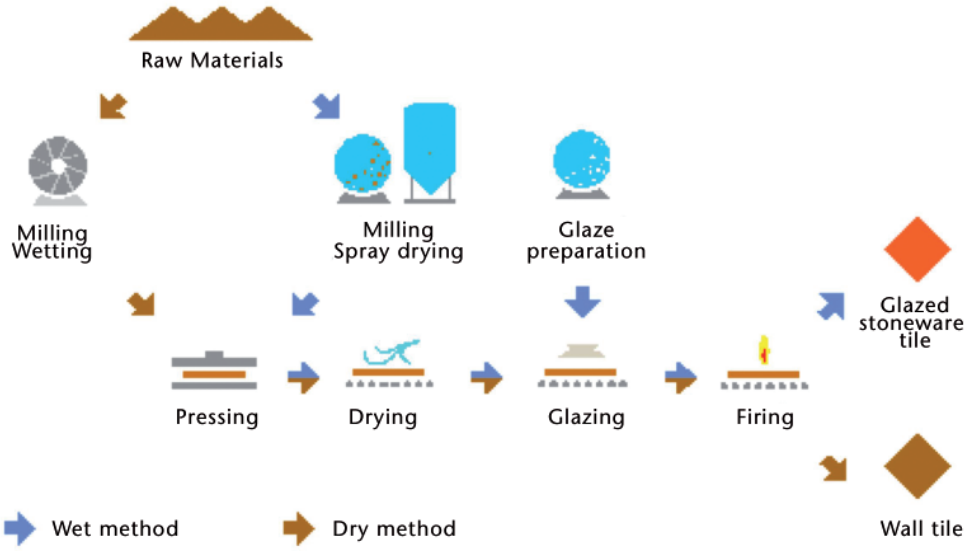


Figure 1. Source: Instituto de Tecnología Cerámica (ITC).

In summary, the logistics of ceramics shares part of the complexity of the textile fashion sector with regard to:

- Decorative trends (colours, glazes, finishes, formats, etc.)
- Very varied markets
- Logistics of samples, trade fairs, displays

2. OPPORTUNITIES FOR IMPROVING SUPPLY CHAIN MANAGEMENT

2.1. RATIONALISING THE PRODUCT CATALOGUE

One of the main problems of the sector is the enormous variety of products and the implications of the production and production planning processes (numerous manufacturing batches), stock management and storage and preparation of orders.

- Which are the important products?
- Are the costs of logistics assigned correctly to each product?
- Contribution margins with logistics costs assigned to products based on logistics and not accounting criteria.
- The impact of managing a large number of items
- Systematic launches of new products and on-going review of the product catalogue
- Recommendations in the ceramic sector

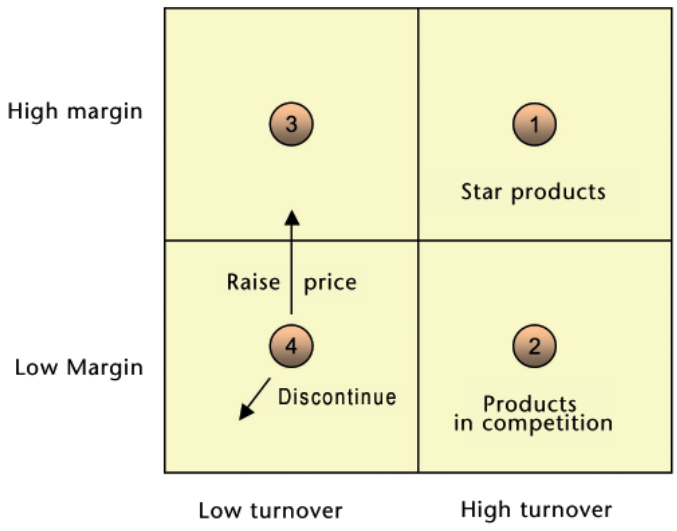
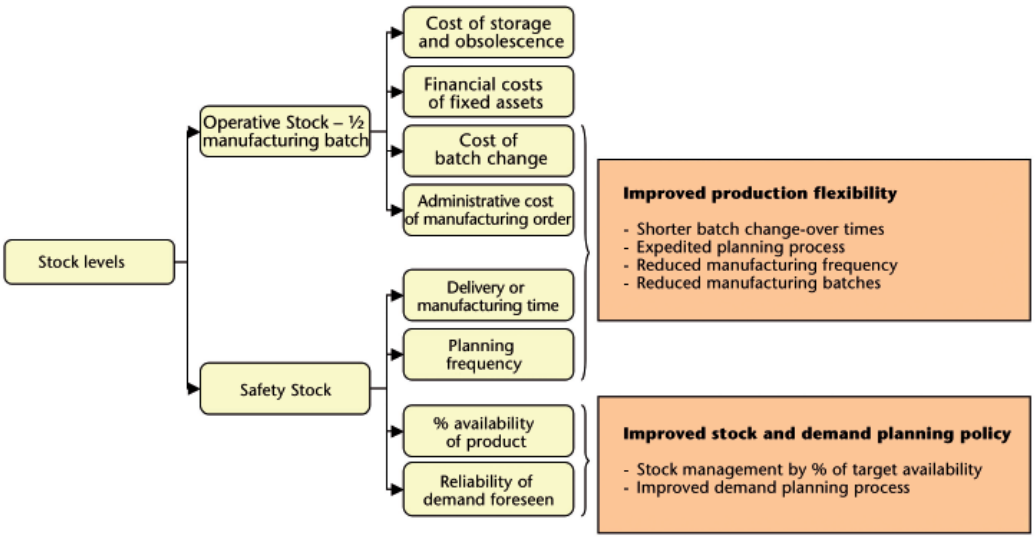


Figure 2.

2.2. IMPROVEMENTS IN THE PLANNING PROCESSES

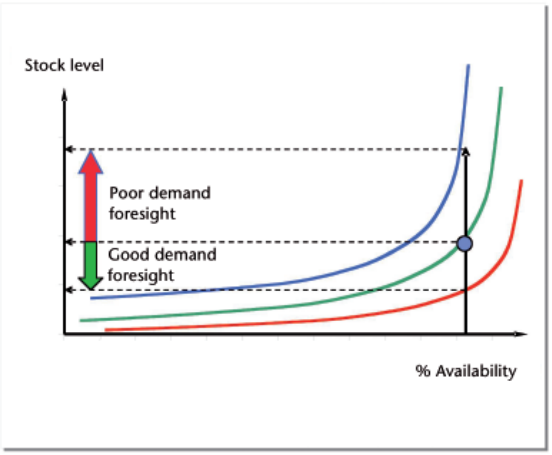
The complexity of managing the range of products and the rigidity of a manufacturing process that requires large batches to be profitable makes the planning process one of the fundamental elements in the supply chain:

- Flexible production versus improved planning processes. Where does the balance lie?
- Manufacturing against stock or against order?
- Manufacturing ordered by collections (floor tiles, wall tiles and trims)
- "Sales and Operations Planning": management of scheduled demand
- Stock policies based on target availability



The reduction in stocks is evidence of the improved efficiency of the whole supply chain, by an improved planning process and demand planning, increased flexibility of production and optimised inventory policies.

The more flexible the manufacturing processes the lower the dependence on demand planning. In any event, the benefits of improved demand planning are evident.



- Increase the Level of Service/Product Availability and/or reduce stocks, obsolete products and offers owing to excess inventory.
- Gain experience from the behaviour of earlier collections and apply it to new launches
- Adapt manufacturing to seasonality and specific commercial actions
- Distribute manufacturing in an ordered way between the different references making up a collection (floor and wall tiles, and trims).
- Expedite decision-taking related to variations in demand.
- Anticipate the behaviour of sales by opening new shops.
- Reduce the workload needed keep the information constantly updated, as well as the communication with the manufacturing systems.

Stock levels can be drastically reduced if a good system for demand planning is available

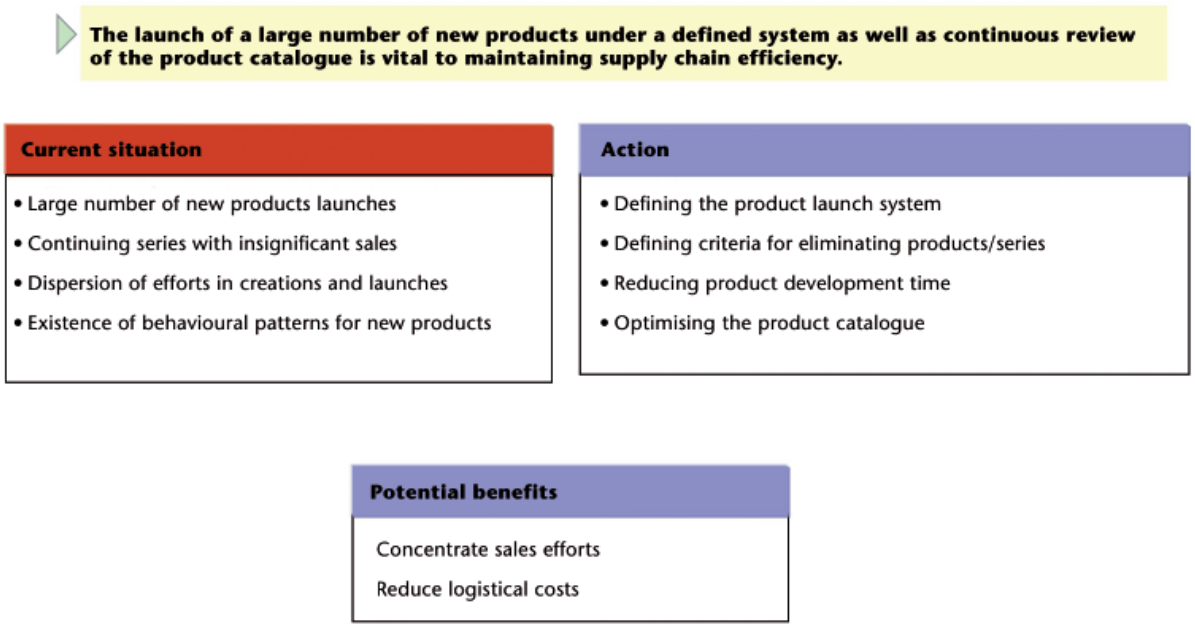


Figure 3.

2.3. DISPATCHES AND IMPROVED CUSTOMER SERVICE

Improved reliability of the availability dates for products depends to a large extent on the agility and **speed in the preparation and dispatch of the goods.**

This is why it is a good idea to improve how the dispatches are made with freight companies and give priority to the planned loads, as well as trying to concentrate the loads in a consolidation centre shared by several manufacturers.

There are also other factors that have a negative influence on the productivity of the warehouse and preparation of orders. These factors can be counteracted by automating part of the processes.

- Improved productivity and shorter loading times
- Opportunities for automating the logistics processes
- Reliability of the dates when the goods are available to the client
- Collection by the client and the Shared Logistics Centre

Improvements in productivity and **shorter load times** depend on a series of factors that currently work against:

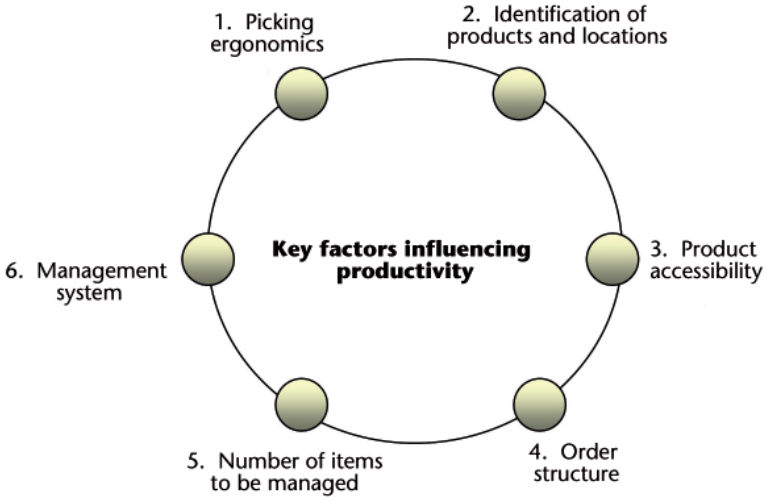


Figure 4.

- The ergonomics of picking very heavy boxes is bad
- The products and locations are not correctly identified leading to mistakes and unnecessary time spent searching
- The block storage system makes it difficult to get direct access to the product, leading to double handling
- The order structure, resulting from the demands of the market, worsens, increase the picking lines and decreasing the m^2 per order
- The number of items needing to be managed is very high, taking into account tones, calibres and qualities, samples, etc.
- There is no management system that manages and optimises the warehousing operations

The automation of the warehouse substantially reduces the amount of handling, increases productivity and decreases loading times However, it is necessary to justify the profitability of the investment.

The profitability of an automatic warehouse must be justified taking aspects such as those listed below into account:

- Reduction in direct and indirect manpower
- Improved use of land
- Fewer errors in preparation, breakage and damage to the goods
- Improved picking ergonomics (picking stations at warehouse intake)
- The possibility of receiving merchandise in three shifts without personnel

On the other hand, the factors against automation are:

- An open-air warehouse is free!
- It is necessary to oversize the equipment correctly for the points

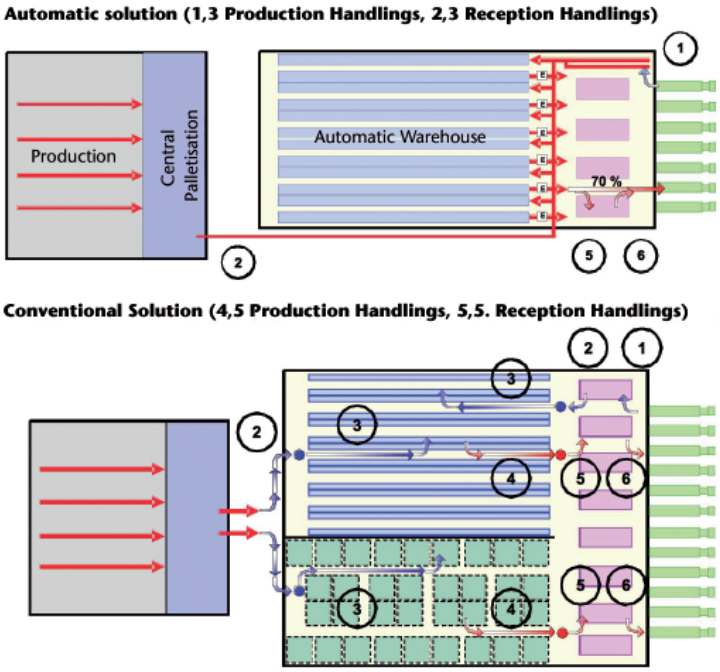


Figure 5.

The concept of picking "**merchandise to the man**" at **fixed workstations** makes optimum ergonomics possible and drastically improves picking productivity. This strategy is particularly suitable for heavy products with average to low rotation. Products with high rotation can be prepared using conventional picking and/or "layer picking"

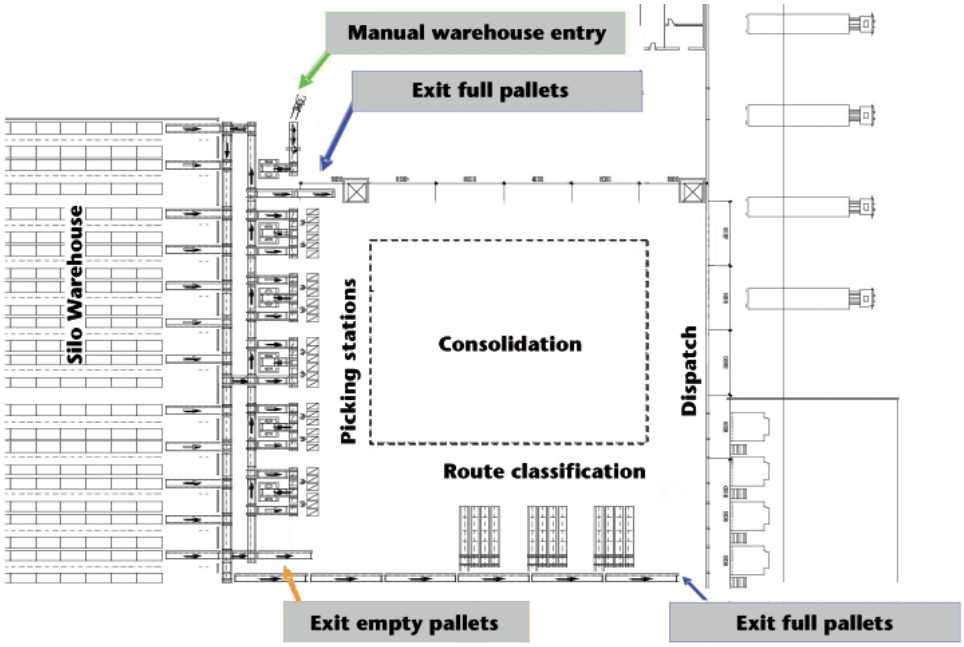


Figure 6.

Picking high rotation goods and single pieces can be done outside the automatic warehouse, minimising investment in lifting equipment and lengthening the operation capacity of the plant.

Picking for high rotation references can be automated via a picking by layers system or box by box.

An **automatic loading and unloading system** would minimise the extra costs involved with having different manufacturing plants and a simple dispatch warehouse.

Figure 7.

Ideally the dispatch warehouse should be attached to the production plant.

If there are several plants, in order to have a single dispatch it may be recommendable to have an automatic loading and unloading system.

- Collecting the output by transporters or automatic laser-guided vehicles (LGVs)
- Automatic loading by a shuttle lorry (three minute loading time)
- Automatic unloading from the shuttle lorry and automatic storage
- No handling between the production line and storage
- The warehouse can absorb three production shifts without personnel

Improved reliability of the availability dates for products depends to a large extent on the agility and **speed in the preparation and dispatch of the goods.** This is why it is a good idea to improve how the dispatches are made with freight companies

and give priority to the loads planned, as well as trying to concentrate the loads in a consolidation centre shared by several manufacturers.

- Transport is usually managed by the client (except in cases of firms with their own shops) Lorries are sent out according to load volume: the aim is a complete load. High percentage of foreign freight companies. Reduced number of Spanish freight companies
- The Lorries have to wait approximately 1.5 hours to load up on average, regardless of the amount to be loaded.
- There is usually just one queue of lorries to load, which does not give preference to the freight companies scheduling the time for loading with the ceramic company
- The flow of information between the ceramic companies and the freight companies is poor and they do not have modern communication systems
- Less than 4% of orders arrive via new technologies (internet, etc)
- High concentrations of loads are on Thursdays and Fridays (more than 55%)
- The average number of loading points for each lorry is 12

2.4. INTRODUCING A WAREHOUSE MANAGEMENT SYSTEM (WMS)

Many companies in the sector manage their warehouses with corporate systems that offer few possibilities for optimising the processes for storing, preparing and dispatching orders.

Introducing a Warehouse Management System (WMS) could drastically improve the operations of the logistics centre, as set out below:

Better quality service	**Because**
■ Fewer mistakes	Validates every operation via the bar code reading
■ Misplaced merchandise	Automatic assignment and validation of the location
■ Exact stock on computer	Validates each operation
■ Traceability of orders and batches	Gathers and stores data
■ Specific deliveries at reference level	Validates the product code
Improves product quality	**Because**
■ Breakages	Automatic stacking management
■ Stock rotation	Application of FIFO
Better efficiency	**Because**
■ Assignment of resources	Controls worker profiles
■ Worker performance	Optimises routes and reduces dead times
■ Making the most of space	Smart warehouse strategies
■ Search times	Knows the stock by location at all times
■ Overtime	Task planning and optimisation of resources
■ Inventory-taking time	Makes zero stock inventory and continuous validations of products and locations

Figure 8.

3. CONCLUSIONS

- Improving the efficiency of the warehouse could be achieved by means of:
  - Introducing a Warehouse Management System with radio frequency
  - Automating processes (it is necessary to ensure profitability)
  - Reengineering the processes and improving the layout

- The standard of service can be improved by:

  - Improvement in planning for demand
  - Rationalising the range of products in favour of profitable items and discontinuing the least relevant items. Systemising the introduction of new products
  - Making production more flexible, the planning processes more agile and reducing the times needed to change batch and production batches.
  - Increasing communication with clients and transporters to plan and guarantee better delivery times