



Developing Innovative and Attractive CVET programmes
in industrial shoe production

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Train-the-Trainer Manual Supply Chain Management

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Content

1	Introduction.....	3
1.1	Aims of the DIA-CVET Project	3
1.2	Manuals to Guide Tutors and Trainers	3
1.3	Refer your training to the business process of industrial shoe production	3
2	Supply Chain Management	5
2.1	Introduction	5
2.2	Supply Chain Management focus	7
2.3	Supply Chain Management and Business Strategy.....	8
2.4	The role of supply chain management software	9
2.5	Benefits of Supply Chain Management.....	9
2.6	An example from a footwear company	10
3	Conclusion	11
4	List of Figures	12

1 Introduction

1.1 Aims of the DIA-CVET Project

The aims of the Erasmus+ project «Developing Innovative and Attractive CVET programmes in industrial shoe production» are

- to develop, pilot and implement comprehensive courses for the Spheres of Activity (SoA) of foremen in industrial shoe production on European level; available in English (EN) as well as in DE, RO and PT,
- and to develop a sector qualification framework level 5 and 6 and to reference existing or newly drafted national qualifications from Germany, Portugal and Romania.

1.2 Manuals to Guide Tutors and Trainers

The purpose of the manuals is to prepare designated trainers for their role and to provide content and support. Due to the nature of the SoA of foremen, they do not include specific forms of training; but we suggest a blended approach. Successful Continuous Vocational Education and Training (CVET) programmes combine theoretical lessons with application of the acquired Knowledge, Skills and Competences (KSC) in real work environments. The tasks of a trainer are to

- impart SoA-specific KSC,
- demonstrate operations which the learners are expected to learn to perform,
- introduce the learners to each new task and supervise them during their first approaches,
- organise and supervise blended activities (i. e. projects),
- guide them towards an independent performance of the tasks of the respective SoA.

The manuals are not meant to replace a textbook. They are meant to provide support to the trainers to plan and execute their teaching. The trainers are invited to gather more information from other sources.

1.3 Refer your training to the business process of industrial shoe production

Industrial production is a complex process, where the Sphere of Activity, described in this manual, is embedded in the business process. Before you start the training on a specific SoA, please make sure that the learners are familiar with the other SoA of industrial foremen in shoe production.

For example, the learners should be introduced to the types of products the company manufactures and their intended use, the different customer segments, the distribution channels etc. They should be aware of the product creation and manufacturing processes, i.e. product design, pattern making, purchasing department, production planning, and all production departments to warehouse and logistics.

The production process (not part of DIA-CVET, for insights see: <http://icsas-project.eu/>) is in the core of the business process; the SoA of DIA-CVET play a preparatory, supporting or accompanying role (see Fig. 1).

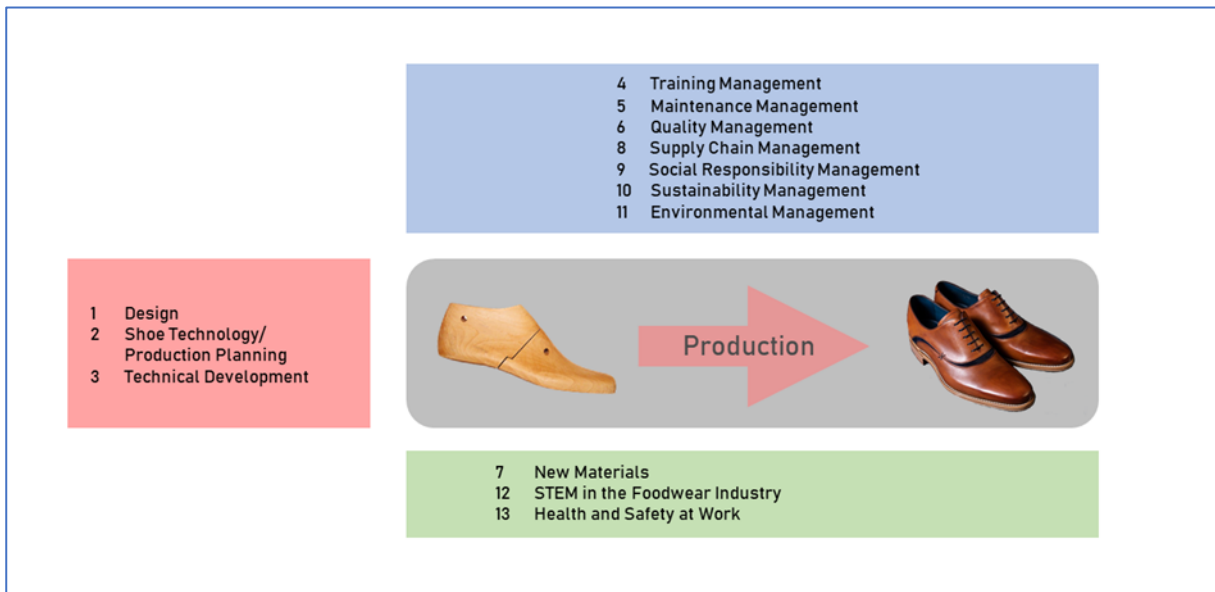


Fig. 1 Spheres of Activity of DIA-CVET and their relation to the production process.

2 Supply Chain Management

2.1 Introduction

Supply Chain Management (SCM) is the management of the flow of goods and services and includes all processes that transform raw materials into final products. It involves the active streamlining of a business's supply-side activities to maximize customer value and gain a competitive advantage in the marketplace.

SCM represents an effort by suppliers to develop and implement supply chains that are as efficient and economical as possible.

The components of Supply Chain Management are:

- Planning;
- Purchasing;
- Operations;
- Distribution;
- Return.

Planning

The first step for companies is to plan:

Companies must first decide on their operations strategy.

What choices do companies have?

- Manufacturing a product component domestically
- Manufacturing a component in a foreign market by setting up international production facilities
- Buying a component from a foreign supplier
- Buying a component from a domestic supplier

Next, companies must know exactly how their products will be produced:

Goods can be:

- Made to stock (produced and stored, awaiting customer orders);
- Make to order (constructed in response to a customer order);
- Configure to order (partially manufactured and completed after a firm customer order is received); or
- Engineer to order (manufactured a product to unique specifications provided by a customer).

Sometimes, goods can be produced by a combination of these methods. Companies must also decide whether they will outsource manufacturing. This operations planning is essential because these decisions influence the supply chain. Planning also involves mapping out the network of manufacturing facilities and warehouses, determining the levels of production and specifying transportation flows between sites. It also involves assessing how to improve the global supply

chain and its management processes. When planning, companies should ensure that their supply chain management strategies align to business strategies, that communication plans for the entire supply chain are decided and that methods of measuring performance and gathering data are established before planning begins.

Coordination of communications between the rest of the supply chain to produce effective and time results often means exploring new software or other technological tools. Those in charge of integration are responsible for making sure that things are happening on time and to budget, without sacrificing quality.

Purchasing

The second step is to purchase.

This aspect of supply chain management involves organizing the procurement of raw materials and components.

Procurement is the acquisition of goods and services at the best possible price, in the right quantity and at the right time.

The purchasing department sources the materials, products, or other goods needed to generate the company's products. Purchasing creates relationships with suppliers and identifies the qualities and quantities of necessary items. It's very important for those in purchasing to keep an eye on the budget for things to be cost-effective for the company, as well as adhering to high-quality standards.

This step makes sure a company has everything it needs to manufacture products, including materials, supplies, tools and equipment.

Operations

Next step is to make.

This stage is concerned with scheduling of production activities, testing of products, packing and release. Companies must also manage rules for performance, data that must be stored, facilities and regulatory compliance.

The daily operations are the support of the work manufacturers do. Managers monitor the work being performed and make sure everything remains on track.

Distribution

Next step is to deliver.

The delivery stage encompasses all the steps from processing customer enquiries to selecting distribution strategies and transportation options. Companies must also manage warehousing and inventory or pay for a service provider to manage these tasks for them. The delivery stage includes any trial period or warranty period, customers or retail sites must be invoiced, and payments received, and companies must manage import and export requirements for the finished product.

The logistics of communications among retailers, clients, or wholesalers is the responsibility of the distribution team in the supply chain of command. These groups must keep an eye on shipments, and to know not only what is needed in-house to produce products but to ensure that the products get to the end-customer on time and in good shape.

Return

The last step is return.

Return is associated with managing all returns of defective products, including:

- Identifying the product condition,
- Authorizing returns,
- Scheduling product shipments,
- Replacing defective products
- Providing refunds.

Returns also include “end-of-life” products.

Companies must establish rules for the following:

- Product returns
- Monitoring performance and costs
- Managing inventory of returned product

2.2 Supply Chain Management focus

The Supply Chain Management can be focused on:

Materials and Components:

Companies must choose suppliers to provide the goods and services needed to create their product. After suppliers are under contract, supply chain managers use a variety of processes to monitor and manage supplier relationships. Key processes include ordering, receiving, managing inventory, and authorizing supplier payments.

Productivity and Efficiency in Manufacturing:

Supply chain managers coordinate the activities required to accept raw materials, manufacture the product, test for quality, package for shipping, and schedule for delivery. Most enterprises measure quality, production output, and worker productivity to ensure the enterprise creates products that meet quality standards.

Delivery and Logistics:

Delivery and logistics involve coordinating customer orders, scheduling delivery, dispatching loads, invoicing customers, and receiving payments. It relies on a fleet of vehicles to ship product to customers. Many organizations outsource large parts of the delivery process to specialist organizations, particularly if the product requires special handling or is to be delivered to a consumer's home.

Return System for Defective or Used Products:

The supplier needs a responsive and flexible network to take back defective, excess, or unwanted products. If the produce is defective it needs to be reworked or scrapped. If the product is simply unwanted or excess, it needs to be returned to the warehouse for sale.

2.3 Supply Chain Management and Business Strategy

A Supply Chain Management that answers efficiently to the business strategy must:

- be associated to a demand-driven planning model
- be agile and flexible
- have as basis the optimization in the design of the product and in the production management
- be aligned with business goals.

The most basic version of a supply chain includes a company, its suppliers and the customers of that company. An example would be: raw material producer, manufacturer, distributor, retailer and retail customer. (2019, TechTarget.All)



Fig. 2: An example of a supply chain management (2019, TechTarget.All)

2.4 The role of supply chain management software

Technology is critical in managing today's supply chains, and ERP offer modules that focus on key functions within SCM. A few important areas to note include the following:

- supply chain planning software for activities such as demand management;
- supply chain execution software for activities such as day-to-day manufacturing operations;
- supply chain visibility software for tasks such as spotting and anticipating risks and proactively managing them;
- inventory management software for tasks such as tracking and optimizing inventory levels;
- logistics management software and transportation management systems for activities such as managing the transport of goods, especially across global supply chains;
- and warehouse management systems for activities related to warehouse operations.

The increasingly global nature of today's supply chains and the rise of e-commerce, with its focus on nearly instant small deliveries straight to consumers, are posing challenges, particularly in the area of logistics and demand planning. A number of strategies - such as lean manufacturing - and newer approaches -- such as demand-driven material requirements planning -- may prove helpful.

Technology - especially big data, predictive analytics, IoT technology, supply chain analytics, robotics and autonomous vehicles -- is also being used to help solve modern challenges, including in the areas of supply chain risk and disruption and supply chain sustainability. (2019, TechTarget.All)

2.5 Benefits of Supply Chain Management

The main benefits of the Supply Chain Management are:

- higher efficiency in responding to fluctuations in the market, products (with shorter product life cycles) and the economy
- cost reduction thanks to:
 - an improved inventory
 - better space management
 - better customer response (reduction of complaints and returns)
 - better relationship with suppliers and customers
- improved communication (better coordination and collaboration with stakeholders)
- reduction of delays
- improvement of results/profits.

Of all the benefits, communication is the most distinguishing factor. The technology currently available, if well selected and used, does not even imply that the actors share the same space.

2.6 An example from a footwear company

The responsible for the Supply Chain Management has as objective the acquisition of materials and components to supply the various production sections, through production orders, weekly planning, and stock consultation, which premises the selection and assessment of suppliers.

The main users of the SCM outputs are the following departments:

- Sample production
- Production
- All productive sectors

Internally SCM interacts and receive information from:

- Production planning
- Development
- Technical sheets
- Sample production
- Production
- Quality/Laboratory

The external interfaces are with:

- Suppliers
- Clients
- Subcontractors

In this example, from a footwear company, the main tasks to be accomplished to achieve the SCM objectives are:

- According to production planning (delivery dates and expected dates of production start-up), it analyzes the material requirements for the production orders and after checking the of materials in stock, defines the purchase orders and their deadlines to selected suppliers
- Provides permanent follow-up of the planned deliveries of each supplier in order to ensure timely availability of materials
- Communicates to the planning responsible the expected delays that may interfere with the planning for the production
- It distributes, guides and controls the execution of the work of the sector's employees, ensuring the supply of all productive sections including subcontractors, and compliance with quality, environment, safety and health standards, taking into account production planning and proposing alternative measures in function of the detected deviations
- Supervises the receipt and control of materials, intervening where necessary, and coordinating the communication with those responsible for production, and in particular that of the Cutting, for validation of materials, especially leather, by conducting production tests.
- Ensures the identification of the materials, their arrangement according to the predefined criteria and the recording of all movements, carrying out periodic inventories for stock control
- Collaborates in the company's response to customer complaints related to material compliance and in taking corrective actions
- Collaborates in the preparation and follow-up of external audits and client audits.

Adopting good practice for control of material and supplies is half of the solution for operational success. It will balance company's operations and standardize internal processes, enabling to optimize customer service and reduce costs, bringing significant improvements in the warehouse and consequently increase in level of service provided to customers and make better use of physical spaces.

There are several tools to monitor and control stock of materials and supplies.

The selection of the tool depends on:

- Number of stock items the company has
- Value of items in stock
- Business area of the company
- Level of reliability that the company wants
- Time the company intends to spend treating stock

We can consider the following ways to control stock:

- Manual registration - is the most traditional form and is now completely outdated. All registrations are made on a paper register.
- Registration in a spreadsheet - the registration is done by an operator in a spreadsheet, which only allows for the placement of filters and queries about what exists.
- Stock management software - stock management module where all records are made. As a rule it is not integrated with all areas of the company.
- Enterprise Resource Planning - in this case stocks are controlled in an integrated manner with all areas of the company.

3 Conclusion

In Supply Chain Management there will be always threats of disruptions as it is a result of a complex web of interdependencies, what justifies that companies must have a well-developed strategy. In this strategy will be always, at the center, a collaborative relationship with suppliers and other partners.

The ultimate goal is to get product to customers where and how they want it. To get costumers satisfied. Fulfilling this objective involves a lot of work, knowledge and skills, but most of all, each player must work together across supplier networks - especially in dealing with the unexpected. The latest tools and technology can then help gain a competitive edge.

4 List of Figures

Fig. 1 Spheres of Activity of DIA-CVET and their relation to the production process.	4
Fig. 2: An example of a supply chain management (2019, TechTarget.All).....	8