Standard logistics competencies:
are they enough to operate in maritime?
An explorative study

Franca Cantoni
Paolo Gaetano Bisogni

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Paolo Gaetano Bisogni

Franca Cantoni, Dipartimento di Scienze Economiche e Sociali, Università Cattolica del Sacro Cuore, Piacenza.

Paolo Gaetano Bisogni, European Logistics Association.

⊠   franca.cantoni@unicatt.it

⊠   paolo.bisogni@elalog.org

Abstract

Maritime Supply Chains have some peculiar features when compared to the most widely known manufacturing ones. Market conditions, the use of vessels and the typical handling units, all contribute to requesting peculiar skills that cannot always be transferred from other sectors. In addition, the scenario is changing because of operators concentrations, digitalization, the growing size of vessels, the concerns for sustainability and resilience. In the light of these changes, it is obvious that the competencies required by the maritime logistics industry should be reviewed, rethought and re-designed for both managerial and operational positions to meet the new scenario. Aim of this paper is to start analysing logistics maritime competencies by listing and comparing them with the existing global standard of competencies for logistics. The methodology used by the authors is based on the comparison between one of the world most recognised and accepted standards of competence for logistics professionals, the ELA Qualification Framework, and the needs expressed during dedicated meetings by the Executives working for one of the top tier Companies in the maritime shipping industry.

Keywords: supply chain design; logistics competences; maritime logistics

Introduction

Recent and authoritative analysis of trends, strategies and challenges *(Handfield et al., 2017; Mendes et al., 2016)* show that priorities for SC professionals are concentrated on two unavoidable goals: accomplishment of customer requirements (often identified with reliable/on-schedule delivery) and logistics costs reduction *(Partida, 2017)*. It is therefore possible to recognize an external focus (customers) and an internal focus, the efficiency of business processes, a mainstay of logistics management *(Sabet et al., 2017; Bozarth & Handfield, 2016; Kernsten et al., 2017; Galbraith, 2015)*.

The digital transformation - currently underway - pushes towards the identification of a new balance between the internal and external needs (*Burson, 2017; Michel, 2017*). Hence the need to find a sustainable trade-off between the two perspectives (*company-centric* and *customer-centric*) that emerge as conflicting but need to be managed as not opposing. This results by offering the customer a positive and ever more personalized purchasing experience and leveraging at the same time on typical logistics parameters, like product availability and short delivery time *(Zhu et al., 2017; Krajewski et al., 2016)*. This strategy implemented on a global scale by the major players has led to the current situation in which consumers are highly-informed and expect - even by minor players of the market - very high logistics service levels in terms of both product availability and short delivery times. In other words, standards imposed by the majors need to be guaranteed also by the minors if they want to survive on a very competitive arena.

Traditional linear supply chains suffer from latency and visibility gaps between each stage of the process and become less and less adequate *(Lee et al, 2016)*.

In this scenario of overall change it is obvious that the skills required by the logistics industry, in our case maritime, should be reviewed, rethought and re-designed. The impact of this scenario in terms of skills and competences required to manage logistic flows is evident: a broader and more sophisticated skillset is needed in order to meet the consumer's expectations and at the same time ensure efficiency to the

system *(Hoberg, 2014; Lambert et al., 2008; McKinnon et al, 2017; Niine & Koppel, 2014, 2015).*

The paper is structured in 5 sections. Par. 1 presents the aim of the research. The subsequent Par. 2 is entirely devoted to the explanation of the standards currently recognized, that is to the description of the competence models for logistics and SCM professionals. In Par. 3 a case study is "used as representative and functional" to describe the main activities carried out by one of the top global players in the shipping and logistics sectors. It is from the activities carried out and listed that the Authors will check whether the standard skills to operate in logistics are sufficient or need to be adapted to the specificities emerged by the case. In Par. 4 the ELA QF are aligned to maritime needs and Par. 5 dedicated to the preliminary discussion of the findings.

2. Logistics and Maritime logistics: aim of the research

Compared to the traditional notion of logistics - as pertaining to auxiliary functions within the enterprise - a much more open and complex concept is rising in theory and practice *(Sabet, 2017; Krajewski et al., 2016)*. Indeed, modern logistics is understood both:

- as a system/network that manages physical, informational and financial flows linking a plurality of enterprises participating in a single supply chain *(Burson, 2017)*;
- as a "*process of strategically managing the procurement, movement and storage of materials, parts and finished inventory (and the related information flows) through the organization and its marketing channels in such a way that current and future profitability are maximized through the cost effective fulfillment of orders*" *(Christopher, 2005; pag. 4)*.

So conceived, it plays a significant role in coordination between different nodes and functions: in this respect, the ability to integrate logistics with other business functions *(Bozarth & Handfield , 2016)* is one of the qualities that a good logistics manager must possess *(Lambert et al., 2008)* in addition to knowing how to interact with

different companies operating in the same supply chain (suppliers, customers, logistics operators, etc.).

In brief, the changing role and structure of logistics, the growing awareness of the customer, and the digitalization in progress [5] necessarily imply changes in demands in terms of professionalism.

Inevitably, the change in the SC architecture poses the need for qualified competences and skills. Aim of this paper is to analyse the gaps between an existing global standard of competences for logistics (the ELA Qualification Framework) and the skills required by the maritime logistics industry.

To summarize, as competitive advantage is unquestionably connected to the skills, knowledge and abilities of the professionals operating within the company (in all functions, but in this case essentially in logistics and SCM) this research aims to map the professional/technical skills/competences professional figures/job operating in maritime logistics and SCM must possess with the final goal to understand if there is a match or mismatch between existing and needed competences.

3. Description of the competence models for logistics and SCM professionals

The study verified the presence of standards of competence recognized by logistics professionals in the market. This reconnaissance highlighted the presence of the following competence models for logistics and SCM professionals:

- The European Logistics Association (ELA). The ELA Qualification Framework (ELAQF) is structured in three levels, limiting its scope to levels 4, 6 and 7 of the more general European Qualifications Framework (EQF) developed by the European Commission [9]. The ELA identifies the Operational/Supervisory Management level (EQF level 4), the Senior Management level (EQF level 6) and the Strategic Management or Master's level (EQF level 7). Both levels 4 and 6 are structured into three competence areas: Supply Chain Design, Supply Chain Planning and Supply Chain

Execution, the latter of which is further divided into Transport Management, Warehousing, Sourcing and Customer Service. An important trait of the ELAQF is that the standards are regularly updated by a panel of logistics and SCM managers and experts.

- The American Production and Inventory Control Society (APICS). This identifies two classes of competence: basic and professional. Professional competences are divided into three knowledge areas (operations management, distribution and logistics) and basic skills are structured around personal traits and attitudes. While competences such as problem solving, continuous learning and integrity are clearly relevant and it is important that managers develop them, they are not directly recognizable in university undergraduate curricula. Because of this, only the professional competences of the APICS model can be considered.

- The International Society of Logistics (SOLE). This organization approaches professional qualifications by placing considerable emphasis on technologies and promoting the merging of managerial and engineering approaches to logistics. The SOLE professional qualification system is articulated in five levels: Demonstrated Logistician (DL), Demonstrated Senior Logistician (DSL), Demonstrated Master Logistician (DML), Certified Master Logistician (CML) and Certified Professional Logistician (CPL). Step-by-step career progression implies performance evaluation, compliance with well-defined educational requirements, as well as mastering an additional set of functional and enabling skills. Professional experience, diplomas and educational prerequisites to access qualification levels are flexible and interrelated. According to the SOLE qualification scheme, those who hold a Master's degree can directly access the CML level. It is interesting to note that SOLE advises a model of typical university courses considered appropriate for the education of logistics professionals. This model is built on

four pillars: systems management; system design; purchasing and maintenance; distribution and customer service.

- The Chartered Institute of Logistics and Transport (CILT): CILT offers three levels of qualification [7]: International Certificate in Logistics and Transport (level 3 in the EQF), International Diploma in Logistics and Transport (level 5 in the EQF) and International Advanced Diploma in Logistics and Transport (level 6 in the EQF, a level usually requiring a university degree). These three qualifications are issued following the attendance of a training programme delivered by CILT and consisting of different modules (12–20, according to the level), accounting for a substantial course workload of 240–360 hours spread over a period of 12–18 months. According to CILT, "the Certificate operates at Level 3 (A level/post-18 school/college leaver standard), while the Diploma is aimed at those already working in the industry/sector at a middle management level and who wish to develop a strategic view of logistics and transport operations. The Advanced Diploma operates at level 6 of the EQF and its focus is on strategic logistics and transportation management".

Once mapped the standards of competence, it has been necessary to define which one to adopt. As the scope of our research spans Europe, it has been considered as to be more appropriate to focus the research on the two models frequently chosen by Italian logisticians: APICS and ELAQF. Of these, only ELA has mapped its competence levels according to the EQF. Because of this feature, in Italy the ELAQF has a decided advantage when considering national and regional qualification frameworks as possible elements for comparison with university curricula (or even inputs, as teaching programmes of Higher Technical Education Schools [ITS]).

Because of this, it was decided to adopt the ELAQF as a reference standard. We excluded CILT diplomas and the SOLE system as they are virtually non-existent in the Italian business practice.

The paper illustrates a case study which will help to understand which activities are carried out by a shipping company. By using this case that describes the activities carried out by one of the top global players in the shipping and logistics sectors Authors will derive the competencies that may be needed to operate in maritime logistics.

4. Container liner shipping: the MSC case

Liner shipping is the activity of transporting goods by means of high-capacity, ocean-going ships that travel regular routes between specified ports on fixed schedules. Liner vessels, mostly containerships and roll-on/roll-off ships, carry about 60 percent of the goods by value moved internationally by sea each year. Container liner shipping is one of the most efficient mode of transporting goods. ULCS, short for Ultra Large Container Ships, have a nominal container capacity of over 10,000 TEUs (Twenty foot Equivalent Units) and over In one year, a single Ultra Large containership could carry over 200,000 container loads of cargo.

From a commercial point of view, prices of transport services are negotiated well in advance (Haralambides, 2004; Jansson and Shneerson, 1987). These services are in principle open to everyone with some cargo to ship, and in this sense, it resembles a public passenger transport service. The provision of such a service, often requiring global coverage, requires extensive infrastructure and therefore investments in terms of terminals and/or cargo handling facilities, ships, equipment, and agencies.

MSC Mediterranean Shipping Company S.A. is one of the top global players in the shipping and logistics sectors. MSC is the world's second-largest shipping line in terms of container vessel capacity. As of May 2019, MSC was operating 510 vessels with an intake capacity of 3,378,000 twenty-foot equivalent units (TEUs). The MSC fleet is the one which deploys the largest number of ULCS (90) and at the same time has the largest ULCS on order (11x 23,350 TEU). In comparison, Maersk Line, who is responsible for introducing and

developing the ULCS concept with the launch of the 15,500 TEU Emma Maersk in August 2006, todays comes second with 86 existing vessels. Through its controlled company TIL (Terminal Investment Limited), MSC manages 54 terminals handling over 29 million moves (45 million TEUs) per year, being present in 7 of the world's 25 busiest ports by volume: Antwerp, Singapore, Long Beach, Ningbo, Newark, Bremerhaven and Rotterdam.

MSC's ranking and organizational features contribute at making the Company one of the best representative of its industry; Therefore we decided to organize a number of meetings with top MSC executives of the Logistics functional area and to interview them to collect information about the Company's needs in terms of skills and competences. In order to avoid bias, no detailed information was provided about the ELA Qualification Framework during the meetings. The authors analysed and cleansed the raw feedback collected and compared the output against the content of the ELAQF.

Main operational activities performed by MSC staff include, first of all, the management of Inward and outward freight. The inward and outward freight department takes care of everything that concerns the shipment of containers. The organization of work is by lines or routes, and the objective of the "liner" is to manage the full cost by line or route. Managing the outward freight, entails drawing up the necessary cargo documents (e.g. the manifests, the bills of lading), and making the transport capacity available to the Agencies through the bookings. As for the inward freight it is necessary to collect all of the bills of lading and other required documents and handling the cargo.
Further logistics activities performed by MSC include:
- Chartering, or renting ships in order to flexibly increase shipping capacity of extra tonnage during periods of increasing amounts of cargo, or to allow decommissioning of older, owned ships from the line, or for chartering of ships on the tramping market in times of insufficient cargo offer,thereby reducing the capital required to invest in the purchasing of additional physical assets (the ships).

- Bunkering, or procuring the necessary fuel for the fleet. Bunkering consists of drawing up the contracts with the oil companies and purchasing fuel at the most advantageous conditions
- Cargo handling and stevedoring includes the reception of the containers at the terminals, their handling and stowage on board

Stowage Planning is the act of allocating space to containers on board of a container ship in the order of the discharge ports. Tools needed for stowage planning include:
- The scheduled list of ports that the ship will be calling at, in the order of rotation
- A summary of the number of containers – size/type/weight of containers per port that are planned to be loaded on the ship
- A summary of the number of hazardous, reefer and OOG containers per port that are planned to be loaded on the ship
- List and summary of containers that are on board after discharge of the containers at your port.

Criteria for stowage planning resemble Storage and Retrieval Rules (SRR) in Warehousing: the list of containers that are to be loaded on board are segregated by destination. Space is allocated to each of the containers firstly in the order of destination – the farthest destination at the bottom and the next port of call right on top, secondly in the order of weight – the heaviest boxes at the bottom and lightest at the top.

MSC owns and runs a global network of 480 Agencies located in 155 Countries. MSC Maritime Agencies play a twofold role, a commercial one, selling the transport capacity allocated by MSC, and second, a "servant" role in organizing and delivering support activities in ports where MSC ships are transiting.

In details, **commercial and customs activities** consist in:
- Offering transport capacity to Customers, both corporate and Freight Forwarders, according to the allocation set by MSC

- Collecting freights
- Drawing up the documents for the customs and harbour services

While **operational activities consist** in:
- Ensuring a berth for the ships calling at the port
- Arranging for the pilot and the tugs if necessary
- Arranging for the necessary ship fresh water and food
- Arranging for the necessary healthcare assistance for the crew
- Arranging for storage bunkers at the port if these are needed
- Arranging for necessary repairs
- Conveying instructions to and from the ship owner
- Organizing the transport and the handling of the containers to the port terminal
- Organizing the necessary contacts with the stevedores
- Contacting shippers and the receivers of the goods

This case helps us to list the main activities carried out by a container shipping company. Given the typical characteristics of the maritime sector we will compare them with the standard ELA QF for logistics with the goal to understand if they are sufficient, must be reviewed, integrated or deleted.

5. ELA Standards applied to maritime

In this section, the standards ELA QF are applied to the maritime sector and some proposals are put forward: standards to be maintained unaltered (No Change – NC), to be cancelled (C) or rewritten (RW).

As said before, the ELA Qualification Framework (ELAQF) is structured in three levels: Operational/Supervisory Management level (EQF level 4), the Senior Management level (EQF level 6) and the Strategic Management or Master's level (EQF level 7). Both levels 4 and 6 are structured into three competence areas: Supply Chain

Design, Supply Chain Planning and Supply Chain Execution, the latter of which is further divided into Transport Management, Warehousing, Sourcing and Customer Service. In the sections we will investigate the three different levels.

The comparison of individual standards against maritime logistics competencies was done line item by line item following the structure of the ELAQF. When evidence collected during the meetings with the management of MSC shown that competences listed in the ELAQF match with the ones required by companies in the industry being analysed, that competence was marked with a "No Change – NC" flag. When evidence collected during the interview suggested that a competence listed in the ELAQF is not required in the skillset of managers working in the maritime shipping sector, that item was marked with a "Cancel – C" flag. Lastly, when evidence suggested that a competence already listed in the ELAQF requires amendments that materially change the competence listed, that item was marked with a "Re Write – RW" flag. The content of the competence to be added or rewritten was suggested in the corresponding cell of the table.

4.1 EQF Level 4

Tab. 1 - Business Principles

Cod.	Competence (Ela std)	NC
4.1.01.01	Understands the elements of a Profit and Loss (P&L) statement and balance sheet	x
4.1.01.02	Understands the meaning of financial terminology	x
4.1.01.03	Calculates the costs of inventory holding	x
4.1.01.04	Monitors supplier and customer payment terms	x
4.1.01.05	Understands the importance of benchmarking in performance management	x
4.1.01.06	Understands the link between shareholder value and supply chain improvements	x
4.1.01.07	Describes the use of 4Ps in a marketing plan	x
ADDED 4.1.01.08	Is able to edit a bill of lading properly	

Tab. 2 - Core Management Skills

Cod.	Competence (Ela std)	NC
4.1.02.01	Plans own and team professional development	x

4.1.02.02	Understands the principles of change management	x
4.1.02.03	Participates in cross functional teams	x
4.1.02.04	Has good oral and written communication skills	x
4.1.02.05	Demonstrates decision making ability	x
4.1.02.06	Chairs meetings	x
4.1.02.07	Manages a team	x

Tab. 3 - Process Management

Cod.	Competence (Ela std)	NC	RW
4.2.03.01	Understands the trade-offs within the supply chain	x	
4.2.03.02	Describes a value chain		Describe the maritime supply chain
4.2.03.03	Understands the effect of demand variability on the supply chain	x	
4.2.03.04	Understands the basic concept of lean	x	
4.2.03.05	Understands how to calculate total supply chain costs	x	
4.2.03.06	Understands the use of a Quality Management Systems (QMS)	x	
4.2.03.07	Uses business test scenario's	x	
4.2.03.08	Understands the different types of data used in organisations	x	
4.2.03.09	Understands process reference models	x	

Tab. 4 - Change and Project Management

Cod.	Competence (Ela std)	NC
4.2.04.01	Mantains project documentation	x
4.2.04.02	Understand PM tools	x

Tab. 5 - Demand, production and distribution requirements planning

Cod.	Competence (Ela std)	NC	C	RW
4.3.05.01	Calculates total supply chain/logistics lead time	x		
4.3.05.02	Uses inventory replenishment models		x	
4.3.05.03	Establishes and maintains Bill of Materials (BOM) and Bill of Labour (BOL)		x	
4.3.05.04	Calculates stocks turns or weeks cover and reports it		x	
4.3.05.05	Understands stock ageing report		x	
4.3.05.06	Allocates available products to orders			Allocates available slots to cargos
4.3.05.07	Uses ABC analysis to differentiate inventory management	x		
4.3.05.08	Uses forecasting methods to create a demand forecast		x	

4.3.05.09	Understand the concept of Available to Promise (ATP)			Utilizes stowage planning techniques
4.3.05.10	Understands different planning techniques	x		
4.3.05.11	Understands different inventory management optimisation tactics			Understand ship routing techniques
4.3.05.12	Understands the functionality of planning systems	x		

Tab. 6 - Warehousing

Cod.	Competence (Ela std)	NC	C	RW
4.4.06.01	Understands the key challenges in warehouse management	x		
4.4.06.02	Has a detailed understanding of the warehousing processes	x		
4.4.06.03	Understands different order picking strategies		x	
4.4.06.04	Understands different order picking methods		x	
4.4.06.05	Deploys appropriate warehouse handling equipment			Deploys appropriate material handling equipment
4.4.06.06	Understands how to design a warehouse layout			Understands how to design a dock yard layout
4.4.06.07	Organises stock taking		x	
4.4.06.08	Optimises packing of goods prior to dispatch		x	
4.4.06.09	Understands the implications of storing hazardous goods	x		
4.4.06.10	Understands the role of logistics service providers			Understands the role of logistics service providers, terminal operators, freight forwarders and maritime agencies
4.4.06.11	Implements warehouse safety procedures			Implements IMO (International Maritime Organization) safety procedures
4.4.06.12	Understands the functionalities of Warehouse Management Systems (WMS)			Understands the functionalities of IT technologies applied to the maritime industries

Tab. 7 - Transportation

Cod.	Competence (Ela std)	NC	C
4.4.07.01	Describes the shipment process)	x	
4.4.07.02	Manages transport routing and scheduling	x	
4.4.07.03	Describes the transport procurement process	x	
4.4.07.04	Manages day to day shipment operations	x	
4.4.07.05	Understands key elements of transport cost	x	
4.4.07.06	Understands the European transport policies,legislation and procedures		x
4.4.07.07	Understands the implications of shipping hazardous goods	x	
4.4.07.08	Understands the functionalities of Transport Management Systems (TMS)	x	

Tab. 8 - Sourcing

Cod.	Competence (Ela std)	NC
4.4.08.01	Describes the procedures covering the procurement process cycle	x
4.4.08.02	Supports supply market analysis	x
4.4.08.03	Describes the different purchasing approaches	x
4.4.08.04	Understands supplier evaluation and selection process	x
4.4.08.05	Understands the negotiation process	x
4.4.08.06	Uses Key Performance Indicators (KPIs) to measure supplier performance	x
4.4.08.07	Describes the goal of a supplier certification and the process steps	x
4.4.08.08	Understands functionalities of Electronic (e)-Procurement Information Technology (IT) tools	x

Tab. 9 - Customer Service

Cod.	Competence (Ela std)	NC
4.4.09.01	Understands customer service procedures	x
4.4.09.02	Uses Key Performance Indicators (KPIs) for measuring customer service	x
4.4.09.03	Understands multi channel customer communication	x
4.4.09.04	Understands the key functionalities of Customer Relationship Management (CRM) Systems	x

4.2 EQF Level 6

Tab. 10 - Business Principles

Cod.	Competence (Ela std)	NC	C	RW
6.1.01.01	Understands the financial impact of holding inventory	x		
6.1.01.02	Understands cash to cash (C2C) cycle	x		
6.1.01.03	Is able to calculate Net Present Value (NPV)			Is able to properly process the bill of lading
6.1.01.04	Monitors actual costs versus budgeted costs	x		
6.1.01.05	Prepares a business plan	x		
6.1.01.06	Understands how a pricing strategy is defined	x		
6.1.01.07	Assesses business performance	x		
6.1.01.08	Makes outsourcing decisions	x		
6.1.01.09	Defines and implements a performance scorecard	x		
6.1.01.10	Designs an appropriate organisation structure	x		

Tab. 11 - Core Management Skills

Cod.	Competence (Ela std)	NC
6.1.02.01	Demonstrates excellent communication skills	x
6.1.02.02	Influences and coaches others to achieve superior performance	x
6.1.02.03	Demonstrates strategic thinking	x
6.1.02.04	Facilitates change	x
6.1.02.05	Understands the principles of situational leadership	x
6.1.02.06	Understands the principles of Management By Objectives (MBO) and performance evaluation	x

SC and Logistics Design Level 6

Tab. 12 - Process Management

Cod.	Competence (Ela std)	NC	C	RW
6.2.03.01	Analyses the supply chain by using value stream mapping			Analyses the supply chain by using different modeling tools
6.2.03.02	Understands what is required to implement a lean & agile supply chain		x	
6.2.03.03	Applies problem solving techniques	x		
6.2.03.04	Implements reverse logistics	x		
6.2.03.05	Understands the elements of a Cost-to-Serve model	x		
6.2.03.06	Identifies and implements supply chain Key Performance Indicators (KPIs)	x		
6.2.03.07	Applies lean techniques to identify process improvement opportunities			Identify process improvement opportunities
6.2.03.08	Uses modelling to explore the impact of options on the supply chain	x		
6.2.03.09	Performs software functionality tests	x		

Tab. 13 - Change and Project Management

Cod.	Competence (Ela std)	NC
6.2.04.01	Defines and manages the scope of a project	x
6.2.04.02	Establishes project governance structure	x
6.2.04.03	Understands the concept of project management life cycle	
6.2.04.04	Applies phase gate process to a project	x
6.2.04.05	Coaches projects managers	x
6.2.04.06	Applies a project methodology whilst managing a project	x
6.2.04.07	Manages the costs of project	x
6.2.04.08	Understands project quality management	x
6.2.04.09	Implements a continuous improvement programme	x

SC and Logistics Planning Level 6

Tab. 14 - Demand, Production and Distribution Requirements Planning

Cod.	Competence (Ela std)	NC	C	RW
6.3.05.01	Improves the demand management process		x	
6.3.05.02	Implements collaborative forecasting		x	
6.3.05.03	Understands push/pull planning		x	
6.3.05.04	Optimises planning parameters to fine tune inventory holding			
6.3.05.05	Establishes safety stock		x	
6.3.05.06	Optimise Distribution Requirements Planning (DRP)			Optimise ship routing schedules
6.3.05.07	Understands how to adapt inventory holding taking into account product cycle		x	
6.3.05.08	Identifies causes for stock obsolescence and redundancy and propose ways for minimising this		x	
6.3.05.09	Runs the demand management, supply management and the scenario analysis of the Sales and Operations Planning (S&OP) process		x	
6.3.05.10	Understands functionalities of inventory optimisation tools		x	
6.3.05.11	Implements Vendor Management Inventory (VMI) process		x	
6.3.05.12	Develops Key Performance Indicators (KPIs) relative to inventory management	x		
6.3.05.13	Selects and implements appropriate Information Technology Systems (ITS) such as Advanced Planning Systems (APS)	x		

SC and Logistics Execution Level 6

Tab. 15 - Warehousing

Cod.	Competence (Ela std)	NC	C
6.4.06.01	Optimises warehouse costs	x	
6.4.06.02	Implements a health and safety programme	x	
6.4.06.03	Improves receipt of goods from suppliers		x
6.4.06.04	Selects appropriate storage systems		x
6.4.06.05	Implements a 5S programme in warehouse environment		x
6.4.06.06	Performs warehouse risk management assessments	x	

6.4.06.07	Defines and implements Key Performance Indicators (KPIs) to improve warehouse operations	x	
6.4.06.08	Understands and implements appropriate technology in warehousing	x	
6.4.06.09	Selects and implements appropriate IT systems such as a warehouse management system (WMS)	x	

Tab. 16 - Transportation

Cod.	Competence (Ela std)	NC	C	RW
6.4.07.01	Optimises transport mode selection	x		
6.4.07.02	Evaluates freight market and selects appropriate carriers	x		
6.4.07.03	Implements transport supplier agreements	x		
6.4.07.04	Optimises transport scheduling	x		
6.4.07.05	Selects logistics service providers		x	
6.4.07.06	Designs a distribution network			Designs and implements inland transport networks and agreements
6.4.07.07	Defines and implements Key Performance Indicators (KPIs) to improve transportation	x		
6.4.07.08	Selects and Implements appropriate Information Technology (IT) systems such as a transport management systems (TMS)	x		

Tab. 17 - Sourcing

Cod.	Competence (Ela std)	NC
6.4.08.01	Prepares sourcing plans	x
6.4.08.02	Establishes supplier agreements	x
6.4.08.03	Creates and manages collaborative supplier relationships	x
6.4.08.04	Optimises negotiation strategies with all involved stakeholders	x
6.4.08.05	Standardises and optimises operational purchasing processes	x
6.4.08.06	Selects and implements electronic (e)-Procurement tools	x

Tab. 18 - Customer Service

Cod.	Competence (Ela std)	NC
6.4.09.01	Implements a customer service policy	x
6.4.09.02	Establishes a customer service organisation	x
6.4.09.03	Defines and implements Key Performance Indicators (KPIs) to improve customer service	x
6.4.09.04	Selects and implements appropriate Information Technology Systems (ITS) such as Customer Relationship Management (CRM) systems	x

4.3 EQF Level 7

Tab. 19 - Business Principles

Cod.	Competence (Ela std)	NC
7.1.01.01	Understands the impact of supply chain design on company taxation	x
7.1.01.02	Identifies and manages enterprise risk	x
7.1.01.03	Evaluates the impact of government and politics on business strategy	x
7.1.01.04	Understands the implications of contract law	x
7.1.01.05	Develops appropriate Key Performance Indicators (KPIs) and Service Level Agreements (SLAs) for inclusion in contracts	x
7.1.01.06	Manages contracts life cycle with third party service providers and suppliers	x

Tab. 20 - Core Management Skills

Cod.	Competence (Ela std)	NC
7.1.02.01	Demonstrates excellent communication skills	x
7.1.02.02	Influences and coaches others to achieve superior performance	x
7.1.02.03	Demonstrates strategic thinking	x
7.1.02.04	Facilitates change	x

Supply chain and Logistics Design Level 7

Tab. 21 - Process Management

Cod.	Competence (Ela std)	NC	RW
7.2.03.01	Understands the drivers to supply chain transformation	x	
7.2.03.02	Understands leading and lagging Key Performance Indicators (KPIs)	x	
7.2.03.03	Derives an appropriate supply chain strategy from the business strategy	x	
7.2.03.04	Understands how sustainability might impact on the supply chain	x	
7.2.03.05	Understands the impact of technological innovation on supply chain design	x	
7.2.03.06	Manages lean projects to identify and reduce waste		Manages lean projects to identify and improves sustainability
7.2.03.07	Improves synchronisation along the supply chain	x	
7.2.03.08	Understands and implements lean	x	

	flow principles		

Tab. 22 - Change and Project Management

Cod.	Competence (Ela std)	NC
7.2.04.01	Acts as an expert in phase gate models in projects	x
7.2.04.02	Applies principles of change management	x
7.2.04.03	Coaches managers to manage change	x
7.2.04.04	Initiates change management programmes	x
7.2.04.05	Completes project risk assessment	x
7.2.04.06	Makes the business case for supply chain automation and systems	x

Supply chain and Logistics Planning Level 7

Tab. 23 - Demand, Production and Distribution Requirements Planning

Cod.	Competence (Ela std)	NC	C
7.3.05.01	Improve forecasting process		x
7.3.05.02	Implements Sales and Operations Planning (S&OP) process		
7.3.05.03	Implements push/pull planning systems		x
7.3.05.04	Optimises inventory within a multi echelon inventory management systems		x
7.3.05.05	Understands relationship between New Product Development (NPD) and Supply Chain Management (SCM)	x	
7.3.05.06	Assesses supply chain risks	x	
7.3.05.07	Manages the Material Review Board (MRB)		x
7.3.05.08	Implements process to achieve end-to-end supply chain visibility	x	
7.3.05.09	Deploys a multi criteria inventory categorisation model		x

Supply chain and Logistics Execution Level 7

Tab. 24 - Warehousing

Cod.	Competence (Ela std)	NC	C	RW
7.4.06.01	Determines whether to outsource warehouse operations	x		
7.4.06.02	Implements sustainable warehouse policies and practices	x		
7.4.06.03	Implements lean warehouse policies		x	Works on resilience
7.4.06.04	Implements collaborative agreements with service providers	x		

Tab. 25 - Transportation

Cod.	Competence (Ela std)	NC	RW
7.4.07.01	Seeks collaboration to improve load utilisation		Seeks collaboration
7.4.07.02	Implements freight optimisation strategies	x	
7.4.07.03	Implements sustainable transportation management programmes	x	
7.4.07.04	Links transportation costs with business strategy	x	

Tab. 26 - Sourcing

Cod.	Competence (Ela std)	NC
7.4.08.01	Establish a strategic procurement programme	x
7.4.08.02	Manages outsourcing projects	x
7.4.08.03	Manage Total Cost of Ownership (TCO) of sourced services and goods	x
7.4.08.04	Implements Supplier Relationship Management (SRM)	x
7.4.08.05	Implement a category management approach	x

Tab. 27 - Customer Service

Cod.	Competence (Ela std)	NC
7.4.09.01	Understands use of social media in customer service processes	x
7.4.09.02	Implements Voice of the Customer (VOC) programmes	x
7.4.09.03	Implements effective Service Level Agreements (SLA)	x
7.4.09.04	Implements preventive complaint handling process	x

Summarizing the work done so far, some preliminary conclusions can be drawn.

6. Preliminary results: discussion

Though maritime logistics shows typical peculiarities in terms of the size of investment required, type of assets deployed, transport modes, technical setup and planning objects, skills and competences needed by managers to operate in this industry still fit within a general framework designed to describe the skills of supply chain management professionals. Most skills remain unaffected while some addition or cancellation changes must be made.

This confirms on one hand the typical transversal nature of supply chain management as a discipline, and a the same moment, the presence of peculiar activities in specific industries.

In the full knowledge that a single case study cannot be representative of a research reality as complex as that of maritime operators, the Authors conducted this preliminary analysis which revealed interesting results

At operational level (level 4 of the European Qualification Framework and the ELAQF) the main changes will affect the Plnning area (demand, production and distribution requirements planning module in the ELAQF) and warehousing. As for SC and Logistics Planning at EQFLevel 6 lots of changes will occur in demand, production and distribution requirements planning. Level 7 undergoes very marginal changes. This last finding is not surprising, as the skillset of people at VP or C-level are often only marginally linked to technical skill of the professional area.

It should also be specified that the ELA standards currently do not directly address important issues such as resilience, sustainability and digitization whose growing importance does not allow to neglect them.

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