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CERTIFYING SUPPLY CHAIN PROFESSIONALS IN GREECE

CRITICAL OCCUPATIONS, KNOWLEDGE AREAS AND SKILLS

A Hellenic Industry Research

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MAY 2015

KTH ROYAL INSTITUTE OF TECHNOLOGY
INDUSTRIAL ENGINEERING AND MANAGEMENT

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Abstract

Recent research studies that have been published in Greece, have demonstrated the lack of expertise in supply chain management professionals. This fact is enhanced by the deficiency in designating the most critical occupations in the sector. Most of the studies that have been conducted are focusing on senior and strategic management executives, while not determining the needs of the lower level executives. However, the problem is remarkably intense in lower levels of the organisational structure, especially in supervisory and operational placements, in 'blue collar staff'. People who are employed in these positions, have usually acquired just a basic education, and the execution of their job duties is mostly based on their experience and in some cases, on internal training processes that might be implemented in the enterprise. Therefore, the existence of a certification based on the current needs of the Hellenic industry, could provide professionals the essential level of knowledge and skills according to the requirements of the enterprises. Hence, the enhancement of the qualities of the current professionals, the acquisition of the essential skills for people who now wish to enter professionally into the supply chain sector, the mitigation of the time needed for the enterprises to educate their executives as well as several other benefits, could be facilitated. This Thesis project, besides corroborating the aforementioned need of certifying middle management executives, supervisors, and operators, explored the *Critical Occupations* that the Hellenic industry considers significant to be certified in the supply chain, and investigated the *Knowledge Areas and the Skills* that are deemed important *for each Occupation.* These critical Occupations as well as the Knowledge and Skills were researched by surveying some of the largest enterprises, international and Hellenic brands, operating in Greece. The international experience about the certification of supply chain professionals was also cited. Ultimately, the author formulated a brief suggestion about the elaboration and the structure of the certification in the Hellenic supply chain.

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1 INTRODUCTION

1.1 BACKGROUND

Are certifications value-enhancing for professionals?

The certification is more and more considered as a significant component of the professional identity, and a critical factor for the individuals to boost their career. Especially in today's world that the professional environment is more demanding and challenging than ever, certification is considered as a core feature of professional identity in order to accomplish the high level of requirements that are set. It is inextricably connected with the expression of someone's expertise, the professional enhancement, and in general with their professional value. Therefore, it is highly appreciated by the employers/the industry who seek professionals with expertise, as well as by the individuals themselves who endeavour to stand out (Farris II and Pohlen, 2004).

According to Lester et al (2011), professional certifications are motivating individuals to keep updated in terms of their professional knowledge and practice, as well as to acquire independent information about their competences since the examinations for the certifications are usually held by independent organisations. For the employers, professional certifications prove that the individuals are meeting at least some minimum requirements, namely they assure them that the professionals possess at least some standards of knowledge and competences required for the job. Despite the fact that it is difficult to define which specific benefits are obtained by the acquisition of the certification, still the value of the professional certification is highly perceived. The aforementioned statements were confirmed in empirical research for the HR certification (Lester et al, 2011).

In a multitude of disciplines there are organisations, associations or institutes that provide certification programs and certifications. Some distinguished and internationally acknowledged certifications are for instance those of PMI in Project Management discipline, APICS in supply chain management and so forth.

Educating the professionals of the supply chain

As far as logistics and supply chain management is concerned, it should be considered as a continuously developing profession with increasing demand and simultaneously with an augmenting need for certified professionals. Meanwhile, the level of education, information and competences that supply chain management requires are greater than ever (Pohlen, 2011).

The leading organisations that operate in the supply chain sector have already figured out the contribution of their people to the development of the field; the distinguished companies recognise people as great driving forces and enablers to lead the innovation in their supply chains. In more detail, the success of such enterprises in the future will depend on the acquisition and the development of the essential skills and abilities of their professionals. However, several issues arise to this direction; the globalisation, the increasing environmental concerns and other modern challenges and critical factors differentiate the knowledge areas and skills that people involved in the supply chain should acquire in comparison with the logisticians of the past. Logisticians should possess both general management skills as well as specific supply chain knowledge (Thai, 2012). Besides that, the whole sector has changed; logistics have been evolving to supply chain management, and this transformation has to some extent altered, namely extended the skills that the professionals should possess.

Certifying professionals in the supply chain in a global level

Most of the developed countries have long ago invested to the education of the professionals that are employed in logistics and more recently in supply chain. In the United States for instance, ASTL, the American Society of Transportation and Logistics, has commenced a certification program already since 1948. The professional certification had long ago been deemed as core feature in order to promote the education and the development of the professional logisticians (Pohlen, 2011). APICS, the American Production and Inventory Control Society or the Association for Operations Management as officially changed in 2005, initiated a certification program for Production and Inventory Control in 1973 in order to establish credibility to the members of APICS and enhance their professionals status. APICS introduced the certification in supply chain management in 2005 in order to ''meet the challenging in the field of supply chain management'' (Lummus, 2006). In Canada, there four active associations in the field of supply chain management do operate and the three of them provide certifications for professionals (Larson, 2008). The certifications are usually levelled according to the university degree or/and the experience of the applicants and are divided into learning modules around the different knowledge areas of the supply chain.

In Europe, the European Logistics Association provides the ELA certification aligned to the European Qualification Framework Standards. The certification is now offered in 30 European countries in coordination with national organisations and it is structured around three levels of competence: operational/supervisory level, senior management and strategic management level. Moreover, in UK there are also lots of associations and institutes as IOSCM, CIPS, CILTUK that certify individuals in SCM. Most of the certificates are based on the European qualification levels. The CIPS also suggests some typical job profiles intended for each certification that they provide. In Germany and Sweden, the most acknowledged associations in logistics, BVL and Silf respectively, provide the ELA certification. In some cases, European associations have developed international partnerships with distinguished associations of the sector, such as Plan in Sweden which provides the possibility to acquire one of the APICS certifications. A review of the most acknowledged certifications worldwide is presented in Chapter 6-Secondary Data.

Certifying professionals in the supply chain in Greece

Lots of studies that have recently been published highlight ***the lack of specialised professionals in the sector of the supply chain in Greece*.** This shortage of highly educated and specialised workforce into the supply chain is a natural consequence of a vigorous absence of educational programmes in undergraduate or postgraduate level until the last few years. Recently, the Greek state has commenced an effort to introduce some undergraduate and postgraduate programmes into the public educational system, and such an initiative is also undertaken by private universities that have established educational programmes about the supply chain. Vocational Training is offered in a limited level by Vocational Training Centres the so-called 'KEK'. However, Greece has to make a long run in order to provide an integrated education in the field of supply chain. It should not been disregarded that the quota of educational programmes in supply chain is one of the lowest ones in the European Union (The World Bank, 2013). Seminars and conferences are organised by different associations and institutes that operate into the field of logistics and supply chain, but there has not been observed a significant contribution to the development of the field.

Besides the lack of expertise by the professionals in the field, there is also another critical component to consider*: **the Occupations of the supply chain sector are not precisely determined*.** EOPPEP, which is the National Organisation for the certification of Qualifications & Vocational Guidance, and thus responsible for the designation of the Occupations, has determined just nine professions related to the supply chain. However, ***only one profession can be certified*** at the moment**. *Hence, there is an increasing demand to promote certification of professionals in the supply chain***. The practice of certifications is extensively applied in a global level and has contributed to robust development of the whole sector. Beyond that, ***the Occupations in the Supply Chain should be clearly defined***. (''Master Plan for the Hellenic Logistics'', 2014)

A study published by the World Bank in 2013 states that ***the development of well-trained personnel*** in order to upgrade the level of the logistics' services is critical and thus, ***certification*** could offer major contribution towards this direction. It could also ***enhance the training of the personnel and the quality of logistics in the operations' level.*** According to the same study, ''***Greece could develop professional certifications and re-evaluations; and applied training*** in all supply-chain business processes (loading, handling, transportation, safety and environmental issues) ***for workers, supervisors, and drivers''*** .Emphasis should also be given in the fact that there is '' *a substantial need for* ***upgrading the skill level of blue collar staff*** *in the logistics industry, both in transport and warehousing jobs''.* (The World Bank, 2013)

Besides EOPPEP, which certifies one profession in the supply chain, there is a certification provided by HPI, the Hellenic Purchasing Institute, the so-called Certification in Supply Management-which is a limited part of the whole supply chain. Moreover, ILME (Institute of Logistics and Management) has just initiated an effort to accredit professionals with the ELA certification (European Logistics Association), and the first certificates are expected to be attributed at the end of 2015. However, ***none of these certificates has considered the need to certify Occupations in the supply chain*** and ***none of these certificates is oriented to the lower organisational level***, aiming for the operators and workers, who are in daily basis performing critical tasks.

The dynamics of Logistics sector in Greece

The supply chain sector is estimated to contribute to the 10% of the Gross Domestic Product, and significant possibilities for the sector to develop arise since the dynamics of the country is not totally considered. This fact is enhanced by the geographical location of Greece, in terms of being the closest place between Europe and the Suez canal. A further development of logistics has been foreseen, which will significantly contribute to the Hellenic Economy. The Master Plan for the Hellenic Logistics aims to achieve the realisation of the International Airport of Athens E. Venizelos and the Piraeus Port into ***international transportation hubs*** (Master Plan for the Hellenic Logistics, 2014). Moreover, several researches have demonstrated that the majority of the job placements that will be generated until the year 2020 in Greece, will is some way refer to the logistics industry (General Secretariat of Research and Technology, 2014). All these forthcoming activities set a new business era for logistics in Greece; the international business operations that are expected to take place ***require professionals specialised and hence, certified in the field of the supply chain*.** The deficiencies in qualified personnel pose a high risk for the sustainability of the Hellenic enterprises in order to cope with such high complexity operational challenges. Thus, there is a plurality of reasons to promote the certification of supply chain professionals.

1.2 RESEARCH FOCUS AND QUESTIONS

The aim of this research is to explore and further confirm the aforementioned need for certification of supply chain professionals in the Hellenic industry and to propose the critical components of the certification structure. In response of the preliminary research that has already been elaborated and stated in the research articles above, this Thesis will focus on the designation of the critical Occupations in the supply chain as well as on the identification of the essential skills required for each Occupation. Therefore, the **research questions** that the Thesis aims to investigate are:

- How significant is the need of certifying professionals in the supply chain for the Hellenic enterprises?
- How the certification in the supply chain specified for the Hellenic industry could be formulated?
  In order to answer the second research question, the following sub-questions need to be explored:
  - What *Occupations* in the supply chain the certification could designate according to the needs of the enterprises?
  - Which are the most critical *Knowledge Areas and Skills for each Occupation* that the certification should designate?

1.3 SIGNIFICANCE OF THE STUDY

The aim of this section is to present valuable argumentation about the significance of the research, state how it will differentiate from relevant studies and what value might can complement to the knowledge that is already disposable from the previous research into the relevant field.

First, the study will endeavour to explore the significance of certifying professionals in the supply chain in Greece, especially those ones in the lower organisational placements, such as supervisors and operators. Despite the fact that lot of research in the field of logistics and supply chain has been elaborated, not much argumentation has been available regarding middle and lower management level executives (corresponds to research article 'Greek Logistics;…' published by the World Bank in 2013). Second, the Thesis aims to respond to numerous research articles about certifying logisticians in Greece and in more detail, an endeavour to identify the Occupations in the supply chain that the enterprises/ the industry consider important to be certified, as well as their Knowledge Areas and Skills, will be undertaken (corresponds to research article 'Master Plan for Hellenic Logistics' published by MITN&MD in 2014). After extensive research in a huge database of scientific articles about supply chain and logistics, it has been apparent that the knowledge, skills and competences that the logisticians as whole should possess gain the whole part of the research. However, there is too minor space in research regarding the occupations of the supply chain and the correlated skills. Many questions arise around this topic; should for instance workers acquire the same knowledge and skills as managers? If yes, should they do acquire them in the same level? These questions are also intended to be addressed through our research. Moreover, it will provide an up-to-date research of the requirements of the Hellenic industry for the supply chain professionals.

1.4 LIMITATIONS

This Thesis does not intend to describe the design or implementation of any training program in order to acquire the certification. It will not provide any kind of information about the procedure that the

professionals should follow to acquire the knowledge and competences identified. Moreover, it is not in the purpose of this study to determine and analyse the certification scheme that could be developed, namely the owner institutions, organisations or bodies that will be involved in the certification process, and will not tangle with any kind of legal requirements. It will focus on the investigation of the occupations that are mostly in demand and their critical knowledge areas and skills required to be certified.

2 RESEARCH THEORETICAL FRAMEWORK

Since this Master Thesis is conducted in cooperation with a business organisation, besides serving its own purposes, it aims to provide valuable data to a variety of stakeholders and facilitate the organisation to take appropriate decisions. Therefore, it could be characterised as *Business Research study*. According to Zikmund et al (2009), Business Research entails the utilisation of a scientific method to investigate business phenomena, identify business opportunities and problems, monitor organisational performance and suggest appropriate actions. It aims to facilitate the decision-making. In order to achieve its goals, the data gathered should be accurate and objective, as well as unbiased.

In our case, A*pplied Business Research* will be conducted, since it aims to facilitate the identification of new business opportunities and affect the decision-making of the company about a specific topic; in more detail, it aims to explore the needs of the Hellenic enterprises for certified professionals and provide valuable information about the elaboration of the certification, mainly by designating the critical Occupations and their skills.

In general, Business research could be distinguished as follows:

- *Exploratory*, conducted to ''clarify ambiguous situations or discover potential opportunities''. It is usually utilised as a first step to provide a general understanding of the problem and guide the following research.
- *Descriptive,* that describes features of people, objects, environments, organisations and in order to do so, it addresses questions as who, when, where, why, how. Descriptive research is usually applied after the exploratory research, after having gained an adequate comprehension of the field, and drives the research towards specific issues.
- *Causal*, which seeks to acknowledge cause and effect relationships (Zikmund et al, 2009).

Zikmund et al (2009), considers the subsequent stages about the research process:

1. Problem discovery and definition
2. Planning the research design
3. Sampling
4. Data gathering
5. Data processing and analysis
6. Drawing conclusions and preparing the report.

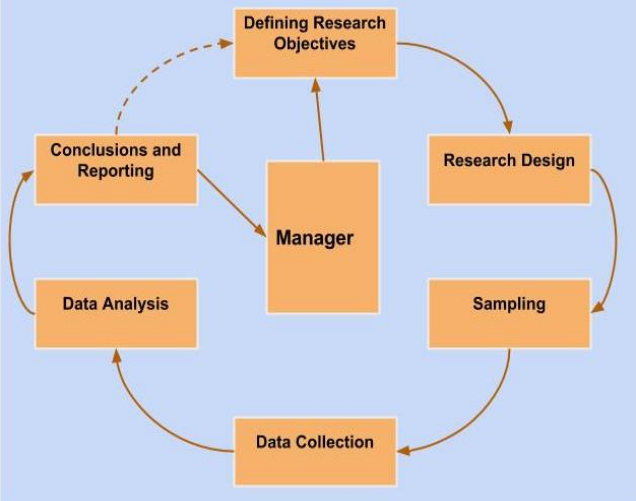

Figure 1: Stages of the Research Process (Source: Zikmund et al ,2009)

The flow concept as described in the figure above is adopted because conclusions and reporting of one study can designate the problem and the hypothesis of another study; it could be demonstrated as an iterative process (see the dash connection in figure 1). Moreover, Management is crucial and this fact is also apparent in the figure above. The earlier stages are usually completed before the later ones and influence them (forward linkage). For example, if our survey addresses to people with low educational level, our vocabulary should be simpler. On the other hand, the opposite is also possible (backward linkage). For instance, if it is known that an email survey will be elaborated, the sampling should include those people that their email addresses are available (backward linkage). Figure 2 presents in more detail the whole procedure to apply business research.

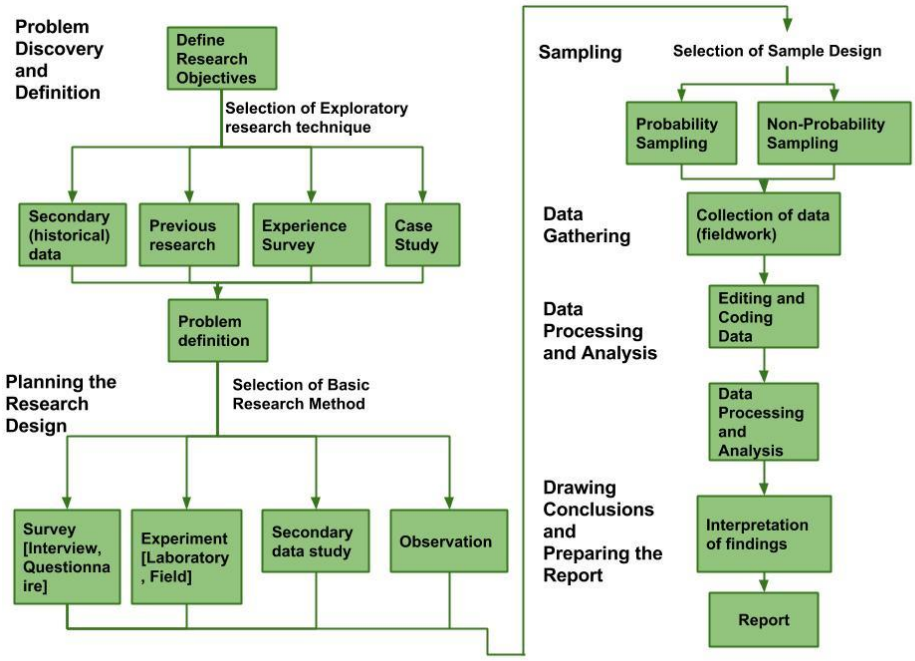

Figure 2: Flowchart of the Business Research Process (Source: Zikmund et al ,2009)

2.1 PROBLEM DISCOVERY AND DEFINITION

This step has partly been carried out by the organisation in collaboration with which this project is realised, by conducting surveys and retrieving valuable secondary data, and it is further enhanced by findings of the author (Exploratory Research). Therefore, a general statement of the problem has been defined; it has already been found that there is a great necessity to establish a certification in the supply chain oriented to specific Occupations. However, it is not yet known how significant it is, which occupations are needed to be certified and what knowledge areas and skills are critical for these Occupations. All these components are the core targets of our research. The Exploratory Research is further reported in the Literature Review chapter *(secondary/historical data, previous research)* and the research objectives are clearly defined and stated in the Introduction chapter (background and research questions).

2.2 RESEARCH METHODOLOGY AND DESIGN

Dawson (2012) defines methodology as the ''philosophy or the general principle that will guide your research''. Research Design is ''a master plan that specifies the methods and procedures for collecting and analysing the needed information''. It should be considered as the framework that will guide our actions to research. The Research design should entail the research objectives, the source of information, the design technique such as surveys or others, the sample and other critical components of the research. (Zikmund et al, 2009)

Selection of the Basic Research Method

Zikmund et al (2009) argue that regarding *descriptive research*, four core techniques could be determined: *Surveys, Experiments, Secondary Data* and *Observation.*

As mentioned above, an exploratory research has partly been elaborated by the cooperating organisation, enhanced by findings of this study, and stated in the Literature Review chapter. Therefore, our research will be mainly Descriptive.

Descriptive Research aims for a more objective and precise approach, therefore *Quantitative methods* are more proper for our study. Some limited open questions to incorporate the opinion of critical respondents could be included, however Q*uantitative methods,* such as survey questionnaires with closed questions, structured interviews and published research papers with data sets will be the principal components of the research methodology (Cottrell, 2014).

The research questions will be answered by conducting *Face-to-Face Interviews* with distinguished executives of the supply chain employed in Greek industry as well as conducting a *Survey Questionnaire*.

As far as the second research question is concerned, it should be stated that since an integrated search about certifying logistics professionals in Greece has already been realised, it is predetermined that our interest focuses on the identification of **the critical Occupations, especially in the lower scale of the supply chain organisation structure**. However, the international background is essential for guidance in lots of aspects, such make comparison, acquire valuable components of other certifications and ultimately suggest how the certification could be elaborated *(secondary data study).*

Survey

Survey is regarded as the prevalent mean for collecting primary data by communicating with a representative sample of respondents. Most surveys are conducted in response to descriptive research, thus they are considering quantitative methods. However, some components of the surveys can be qualitative, as mentioned above. (Zikmund et al, 2009)

Validity and Reliability

Validity in research indicates that the research should explore what exactly claims to explore. This fact means that all the extraneous factors that could affect the results of the research should be significantly limited or even eliminated and our research and should not enable lots of interpretations.

Reliability in research implies that the research should be conducted in such way that if it was to be performed under the same conditions by someone else, it would produce the same results. In practice, it refers to the availability of resources and participants, the methods selected and the control of the conditions. (Cottrell, 2014)

For instance, the questionnaire should be designed in such manner that participants can acquire a clear understanding of the questions, the way that they should be answered, the options of responses, the rating scales. Beyond that, they should not be forced to specific answers and they should have accurate and sufficient choices of responses available (Cottrell, 2014).

Ethical considerations

Zikmund et al (2009) refers to Business ethics as ''the application of morals to behaviour related to the business environment or context''. Some parameters that should be taken into consideration are:

- *Informed consent of the participant*
- *The obligation of the participant to be truthful*
- *Confidentiality* in return of the truthfulness of the participant
- *The participant's right to privacy*

Cottrell (2014) considers similar parameters when designing the research:

- *Anonymity and confidentiality*. Some parameters that should be considered are the electronic storage of data, accurate naming on the documentation, acquiring permission of participants for including details relevant to them and other aspects.
- *Legal Requirements*, such as data security, health and safety regulations or others legal requirements relevant to the research topic.
- *No Harm*. No one should be psychologically, physically or in any other way harmed by the research.
- *Fully Understanding*. The author should inform every participant about the details of the study, the framework, the procedure and the exact role of their participation (same as informed consent in Zikmund et al 2009).
- *Intellectual Property*. All the sources retrieved in the study should be designated and the researchers should ensure that they have the right to include the material in their research. (Cottrell, 2014)

2.3 SAMPLING

Zikmund et al (2009) state that sampling ''involves any procedure that draws conclusions based on measurements of a portion of the population''. Sample is a smaller set of a population and the significance of a representative sample is that it should produce almost the same result that would be generated if the whole population was examined. However, selecting a representative sample is not easy and there is always the possibility of error. Cottrell (2014) argues that a sample in order to representative, should ensure that deliberate and unpredictable bias is avoided.

The most critical issues when sampling are: *who is to be sampled, the size of the sample* and *the selection of the sample type and units* (random sampling, purposive or cluster sampling etc). (Zikmund et al, 2009)

Random Sampling and Non-Sampling (Systematic) Errors

The first type of errors are caused by disregarding the accuracy of the sample size and, the larger the size is the lower probability of error occurs. Non-Sampling or Systematic errors are due to the nature of the study design and the accuracy of the implementation, and they are not related to probability. (Zikmund et al, 2009)

Probability and Non-Probability sampling

In Probability Sampling, every member of the population has a specified probability to be selected. For instance, random sampling as a subcategory of probability sampling considers equal probability for all the members of the population. The types of probability sampling are:

- Simple Random Sampling
- Systematic Sampling, for example, every 20th member of the population is opted,
- Stratified Sampling; selecting some strata based on existing evidence and then in each stratum random sampling occurs-here is the difference with Quota Sampling that is stated below. Stratified Sampling is more efficient compared to a random sample
- Proportional Stratified (divided into strata and then each member of the stratum is a proportion to the population size of the stratum) and Disproportional Sampling
- Cluster Sampling, which is an efficient in terms of economy way of sampling and the prevalent unit is not an individual member of the population, but a whole cluster with elements of it.
- Multistage Area Sampling, a combination of two or more steps of the above mentioned techniques.

In Non-Probability Sampling, the likelihood of every member of the population is not known. The option of the members is arbitrary and might rely on convenience (Convenience Sampling), judgement (Judgement Sampling), quota (Quota Sampling) or Snowball Sampling:

- Convenience Sampling refers to obtaining data from people or units that are easily available,
- Judgement Sampling is elaborated by an expert-an experienced person in the relevant field that need to be explored and is based on his/her judgement,
- Quota Sampling aims to represent every subgroup of a population in a specified percentage that the investigation desires. Although it seems similar to the Stratified Sampling described above, it is different in terms that it requires a specific quota to be achieved by the interviewer.
- Snowball Sampling. It involves the utilisation of probability methods to attract an initial number of respondents and then based on information from these respondents, the selection of the additional ones is achieved. (Zikmund et al, 2009)

2.4 DATA GATHERING

Interviews

Conducting Interviews is a valuable method of gaining qualitative data and can provide useful results since immediate follow-up on questions is possible as well as a closer relationship with the interviewee. Interviews can be combined with other methods and provide a more integrated coverage of a research topic. Moreover, the interviewer can formulate the agenda of the interview in the way that he/she desires, can make sure that the interviewee has comprehended the question and can repeat the question in a different way or add more if they don't receive the required material. A skilled interviewer can also obtain information difficult to be gained in other ways. However, some constraints always do exist; first, they are time-consuming and none many of them can be easily conducted (for instance it might be difficult to find willing and appropriate people to interview). Besides that, they reflect their personal opinions, therefore general conclusions cannot be produced and the way that they are interpreted is also subjective. (Cottrell, 2014)

Types of Interviews

A. Highly Structured Interviews, Unstructured Interviews or Mixed Approaches/Semi-Structured Interviews
B. Personal/Face-to-face Interviews, Phone Interviews, Webcam Interviews
   For acquiring a better understanding of the topic, advantages and disadvantages, types of Interviews the reader can address to Cottrell (2014) (p.157) or Zikmund et al (2009) (p. 204).

Questionnaires

Questionnaires are an exceptional tool for gaining both qualitative and quantitative data. The way that they are formulated defines the type of data that would be obtained. Questionnaire main advantages are:

- It is an economical and time-saving way to collect data, since you do not need to contact every respondent personally.
- It is a flexible tool, in terms of length, kind of questions, kind of topics and so forth
- It is convenient for the respondents
- It can cover a large sample of a population, even the whole population itself as well as large geographical areas
- It can be sent to remote areas
- There is no personal influence (physical influence) of the researcher with the respondent. Still, influence can do exist by the way that it is structured.

However, they can be time-consuming when being conducted, and might result to fallacies if not properly structured. Therefore, a skilled and experienced researcher/designer is preferable. Moreover, not everyone is capable of completing a questionnaire, as it usually requires at least a basic level of education and knowledge. (Walliman, 2011)

Questionnaires can be delivered in various ways, such as by post, through the Internet or in personal. Personal delivery ensures a high respondent rate, but entails lots of constraints such as location, time and so forth. Postal deliveries facilitate the contact with a large sample and/or there is a multiplicity of location. Email questionnaires enclose the same advantages, as well as that they are the most economical and the least time-consuming method. However, their response rate is usually low. (Walliman, 2011)

Questionnaire format consists of open-ended response questions, and/or fixed-alternative questions/close-ended questions. The first category demands a high percentage of competence by the interviewee, it is costly in terms of editing, coding and analysing the data obtained by the survey, and entails potential bias by the interviewer. It should be considered as a beneficial approach for exploratory search. The fixed-alternative questions are not so demanding in terms of resources and competences and can be analysed easily. Still, disadvantages do exist in this type of format, such as the possibility to force respondents to a specific answer, or the fact that the opinion of a respondent is not embedded. In most of the questionnaires, both types of questions are included; exploratory research can be facilitated with open questions and carried out before a descriptive research (Zikmund et al, 2009). According to Cottrell (2014), there is also a possibility that the participants might misinterpret the rating scale, the questions. A general tendency of the respondents to answer what they believe the researchers are seeking has also been observed (Cottrell, 2014).

2.5 DATA PROCESSING AND ANALYSIS

Editing and Coding

Editing contains all the essential controls of the data gathered for omissions, legibility and consistency in classification. Coding entails the framework for interpreting, categorising, recording and transferring the data to the relevant storage media. The rules utilised for this process are called codes. (Zikmund et al, 2009)

Data Analysis

The process used for understanding and interpreting the data gathered is called data analysis. A simple form of data analysis might entail the determination of consistent patterns and a summary of the results of the investigation. Descriptive statistical analysis methodologies such as frequency distributions or more complex ones such as multiple regression could be analytical techniques and their option lies upon the research design, the nature of the data gathered, the information management requirements and so on. (Zikmund et al, 2009)

3 LITERATURE REVIEW

In the first part of the Literature review-Part A-some definitions are stated in order to facilitate the understanding of the following chapters, mainly addressed for chapter 6 (Secondary Data) and chapter 9 (Recommendations). Then, in Part B, the Exploratory Research is presented, demonstrating all the critical information acting as the foundation and enabler to narrow down our research. All the data retrieved in this part-Part B- prepared the ground for the definition of the problem and guided the author to this direction.

3.1 PART A: DEFINITIONS

Logistics and Supply Chain Management

In order to facilitate the reading of this report by people who are not specialists in the field of logistics and supply chain the following two definitions were retrieved by ‘’Logistics and supply chain Management’’ written by Cristopher Martin (2011):

Logistics concerns the strategic management of the procurement, movement and storage of materials, inventory and the relevant information flows in order to maximise the profitability (current-future) of the organisation through accomplishing the orders in cost-effective way.

Supply Chain Management (SCM) focuses on the management of upstream and downstream relationships with suppliers and customers in order to serve the customer with the highest value at the lowest cost of the supply chain as a whole.

ISCED, EQF and NQF

International Standard Classification of Education (ISCED)

It is the International Standard for Classification of Education (ISCED) and was firstly introduced by UNESCO in the early 1970's as a response to the need of existence of one common instrument for developing and presenting comparable indication and statistics about education in individual countries or in an international level. A new updated version was presented in 1997 and is known as ISCED 1997. It entails definitions, standard concepts and classifications and it covers all learning opportunities for children, youth, adults, and people with special educational needs. It is structured around two basic dimensions: the levels and the fields of education. The analytical table with the levels of education is enclosed in the Appendix 1.

European Qualifications Framework (EQF)

The European Qualifications Framework was developed to enhance the comparability of the qualification systems within Europe and provide a common framework for understanding and expressing them. It consists of eight common European levels which include knowledge, skills and competences related to each one of the eight levels. Hence, the National Qualifications Systems (NQF's) in Europe can be correlated with the EQF levels. It can be a useful tool for graduates, learners as well as employers for understanding and comparing qualifications accredited by the different educating national systems. The table which presents the 8 levels as described above is attached in the Appendix 2. (European Commission website, Learning Opportunities and Qualifications in Europe, 2015)

National Qualifications Framework in Greece (NQF)

The development of the Hellenic Qualifications Framework (NQF) in correspondence with European Qualifications Framework (EQF) is elaborated by the body called EOPPEP.

3.2 PART B: EXPLORATORY RESEARCH

In the previous chapter, four methods for exploratory research were mentioned: secondary data (historical data), previous researches, experience surveys and case studies. The author has chosen two methods amongst them as the most appropriate ones to elaborate the Exploratory Research in this Thesis project: *Secondary Data (Historical Data)* and *Previous Research*.

The two research articles stated below, the ''Master Plan for the Hellenic Logistics'' and the ''Supply Chain Sector- Diagnostic Mechanism of Business Needs in Occupations and Skills'' as well as the description of the certification bodies for supply chain in Greece compose the foundation of our Exploratory Research. Through the information cited below, several critical Occupations in the supply chain were identified based on recent research studies as well as on the indication of responsible

bodies, such as EOPPEP in Greece. Moreover, a designation of several of the correlated skills for particular Occupations was also possible.

Master Plan for the Hellenic Logistics

One of the major actions that should be undertaken in the sector of logistics and supply chain *is the* ***development of specialised workforce***. Second***, the designation of the most significant professions in the sector is critical*****.** At the moment, the professionals employed in the field operate in multiple sections of the supply chain, but with no adequate and oriented education, and thus the high operational complexities of the sector cannot be properly managed. **A *better educational system in combination with the essential vocational-practical training*** can shape professionals with the competences required. According to same report published by the Hellenic Ministry of Infrastructure, Transport and Networks and the Ministry of Development, the Occupations that are involved within the field of the supply chain are not clearly defined. EOPPPEP, the National Organisation for the certification of Qualifications & Vocational Guidance, has designated just nine professions that are related to the supply chain and has developed the job description of these profiles, but just for one of these professions certification is provided. While considering the multiplicity of Occupations and activities that are elaborated in most of the Greek enterprises today, it can be apparent **that *a larger spectrum of Occupations should be deemed*****.** The National Committee responsible for the supply chain that was founded in 2013 states that the need to *promote* ***the Certification of Professionals in the supply chain*** has intensely emerged the last few years; it is a core practice applied abroad and has significantly contributed to the development of the field. Thus, the need *to* ***Certify Occupations in supply chain should be also deemed as critical in Greece.*** Hence, there should be developed a coordinated effort that will entail:

- Formulation and development of a certification scheme
- The accreditation of associations related to the certification of the professional qualifications
- Certification of qualifications and application of the National Register of Certified Professionals

The Master Plan for the Hellenic Logistics considers that the aforementioned actions will encourage the development of new generation of professionals that will acquire the essential specialisation and simultaneously will assure the quality in services and hence the development of the sector. EOPPEP is the responsible association to realise these actions in cooperation with the Ministry of Infrastructure, Transport and Networks.

The Master Plan also refers to the connection of the logistics sector and businesses with ***the lifelong learning***; a coordinated effort to enhance the skills and competences of the professionals employed in the supply chain, provision of expertise to students in order to facilitate their assimilation from the professional sector, as well as ***expansion of the certification and continuous training to logisticians***. Moreover, the establishment of University Departments that will provide graduate ad postgraduate programmes in Supply Chain Management is also considered significant. (''Master Plan for the Hellenic Logistics'', 2014)

Supply Chain Sector – Diagnostic Mechanism of Business Needs in Occupations and Skills by SEV

SEV is the Hellenic Federation of Enterprises aiming to modernise and develop the Greek enterprise so that it can successfully accomplish its mission within a global and turbulent environment. SEV

represents the majority of the Hellenic Enterprises in most sectors and develops multiple actions to support its members. (SEV website, 2015)

The Hellenic Federation of Enterprises (SEV) has developed a mechanism to diagnose the needs of the Hellenic enterprises in terms of skills and competences as well as professions within the different sectors of the economy. One of these sectors is the supply chain sector. This mechanism estimates the essential knowledge, skills and abilities for the critical professions of the forthcoming years and formulates proposals for the development of the working capital of the sector.

Report: 'Supply Chain Sector – Diagnostic Mechanism of Business Needs in Occupations and Skills'
In a research paper published by SEV in 2013, it is stated that the supply chain sector is characterised in a global level by the augmentation of its services and at the same time the turnover reduction caused by the reduction of the modular payments. According to this paper, the Hellenic enterprises are characterised by low level of extroversion and the need to increase the level of customer service. However, opportunities for development have also emerged, such as

- The increase of the percentage of the services provided by the leading enterprises and the extension of the vertical integration in order to provide integrated solutions.
- The fact that the customers have been aware of the possibilities that supply chain management can achieve in terms of cost reduction.
- The development of the sector promoted by the release of the transportation sector.
- The promotion of Greece as an international transportation hub.

The recognition of the need in human capital within the supply chain sector, concerning the spectrum of the professionals that will be introduced to the supply chain sector until 2020 and the requirements in terms of knowledge, skills and abilities, lies upon the estimation of critical factors that will affect the evolution of the supply chain sector and as a result, the modifications in the employment within this sector. As far as the prevalent scenario of the estimated evolution of the sector is deemed, apart from the factors that are related to the development of the national and global economy as well as the change of the consumption patterns which are estimated to remain constant, all the other identified factors are expected to increase rapidly; these factors are the infrastructure, the impact of globalisation, the development of new technologies, the legislation framework and the environment awareness. In response to this scenario, *20 Basic Occupations* that are related to the supply chain were selected in terms of future needs of the enterprises as well as regarding the foreseeing alteration of their requirements in skills, knowledge and abilities (Table 1).

20 Basic Occupations in the supply chain indicated by SEV	
• Supply Chain Manager	• Warehouse Coordinator
• Logistics Manager	• Distribution Manager
• Warehouse Manger	• Export Manager
• Purchasing / Procurement Manager	• Demand Planner
• Customer Service Manager	• Transportation Planner
• SCM / Logistics Planner	• Distribution Planner
• SCM / Logistics Analyst	• Customs Officer
• Logistics Engineer	• Network Development Manager
• Transportation Manager	• Quality, Health & Safety Manager
• Logistics Coordinator	• Business Development Manager

Table 1: 20 Basic Occupations in the Logistics Sector as indicated by SEV in 2013 (Source: SEV, 2013).

Then, the 12 most critical ones were determined and formulated in detail. These **12 critical Occupations** as well as the required knowledge areas, skills and abilities for each occupational profile are in summary presented in Table 2 below. (SEV, 2013)

Critical Occupation	Required Knowledge, Abilities - Skills
Supply Chain Manager	Knowledge of specialized programs. Knowledge of economics and finance. Negotiation skills. Knowledge of safety issues. Technical knowledge. Project management skills. Knowledge of foreign languages both oral and written. Communication skills. Management skills and knowledge. Knowledge about human resources management. Perception skills. Presentation skills.
Transportation Manager	Knowledge of telematics and routing. Knowledge about mechanical issues. Extensive knowledge about transportation regulations. Extensive knowledge of safety issues. Knowledge of foreign languages both oral and written. Communication skills. Analytical skills.
Logistics Manager	Knowledge of specialized programs. Knowledge of economics and finance. Knowledge about regulations. Knowledge of safety issues. Knowledge about human resources management. Management skills and knowledge. Analytical skills. Presentation skills.
Logistics Coordinator	Knowledge of supply chain management. Technical knowledge. Knowledge about regulations. Knowledge of foreign languages both oral and written. Teamwork. Perception skills. Information management.
Distribution Manager	Knowledge of telematics and routing. Extensive knowledge about transportation regulations. Extensive knowledge of safety issues. Communication skills. Analytical skills. Negotiation skills.
Export Manager	Knowledge about sales methods. Knowledge of economics and finance. Knowledge about regulations. Knowledge about human resources management. Knowledge about transportation network. Management skills. Communication skills.
Warehouse Manager	Knowledge about human resources management. Ability to use equipment. Technical knowledge. Knowledge of foreign languages both oral and written. Management skills. Knowledge about inventory management. Communication skills. Analytical skills.
Logistics Engineer	Technical knowledge. Knowledge about statistical analysis and mathematics. Knowledge of economics and finance. Knowledge about transportation network. Knowledge about Management systems. Presentation skills. Analytical skills.
Demand Planner	Knowledge about demand management. Knowledge of economics and production. Technical knowledge. Knowledge of foreign languages both oral and written. Communication skills. Teamwork. Perception skills.
Purchasing / Procurement Manager	Knowledge about Supply Chain Management. Technical knowledge. Knowledge about customer service. Knowledge about production. Negotiation skills. Knowledge of economics. Management skills and knowledge. Knowledge about transportation regulations. Communication skills.
Warehouse Coordinator	Knowledge about inventory control. Technical knowledge. Ability to use specialized tools. Knowledge of safety issues. Ability to coordinate processes. Teamwork.

Customer Service Manager	Knowledge about customer service and helpdesk. Negotiation skills. Knowledge of economics. Technical knowledge. Management skills. Perception skills. Teamwork. Ability to use management and solution methods.

Table 2: 12 Critical Occupations and Required Abilities – Skills as indicated by SEV in 2013. (Source: The logistics Sector in Greece; HIT, 2014)

Certification bodies in Greece

A. The National Organisation for the Certification of Qualifications and Vocational Guidance (EOPPEP)

EOPPPEP is the National Organisation for the certification of Qualifications and Vocational Guidance. It creates and applies the National Accreditation and Certification system for non-formal education in Greece. Within this framework, EOPPEP is responsible for the certification of qualifications, vocational training and adult education as well as other services related to vocational counselling and guidance. In more detail,

- It accredits the providers of non-formal education such free studies workshops(EES), private vocational training institutes (IIEK), vocational training centres (KEK) and special centres for vulnerable groups
- It develops and accredits Occupational Profiles in response to the need of the industry
- It accredits Curricula regarding their standards and specifications
- It develops the National Qualification Framework (NQF) based on EQF
- It develops the National system for the Certification of Qualifications
- It offers Vocational Guidance and Counselling

As far as the Occupational profiles are regarded, a detailed job description, as well as all the requirements in terms of knowledge, skills, abilities, and the potential educational paths to acquire the aforementioned qualifications, have been developed. In the supply chain sector, EOPPEP has designated 9 Occupations related to the supply chain and it has established their Occupational profiles. These job profiles are:

Occupations in SCM as indicated by EOPPEP
1. Freight Forwarder
2. Warehouse Worker
3. Logistics Assistant
4. Distributor of products with company owned trucks
5. Courier
6. Stevedore
7. Ports' Lifting-Truck Operator
8. Customs broker
9. Beverage and wine distributor

Figure 3: Occupations in SCM as indicated by EOPPEP (Source: EOPPEP website, 2015)

The knowledge areas, skills and abilities of these nine occupational profiles are available at EOPPEP's website. (EOPPEP website, 2015)

Regarding certifications, there is yet no certification centre oriented to the logistics industry and there are no accredited institutions to provide certifications. EOPPEP, amongst the other activities mentioned above, creates a generic certification scheme and proposes indicative criteria for the examination of the required knowledge, skills and abilities in each occupational profile (for instance written examination, oral, multiple choice questions, interview and so forth) based on different standards determined by itself.

B. Hellenic Purchasing Institute (HPI)

The Hellenic Purchasing Institute (HPI) was founded in 1978 and is a non-profit association of Purchasing and Supply Management professionals in Greece. HPI is a partner of IFPSM (International Federation of Purchasing & Supply Management). HPI provides the IFPSM Certificate of Competence in Purchasing and Supply Management, organises workshops and events, and make publications and research into the related field of purchasing and supply.

The *Certificate in Supply Management* consists of 19 sessions of 8 learning hours for one of them and lasts 9 months (2 semesters). During their studies, the professionals are responsible to elaborate a supply process improvement project for their enterprise in a session of their choice. The professionals that are eligible are those that hold at least a university degree into Business Administration or related discipline and have acquired at least 3 years of working experience in the field of purchasing/supply/procurement. Adequate knowledge of English and computer skills are also essential. (HPI website, 2015)

C. The Institute of Logistics and Management (ILME)

The (ILME) is a non-profit organisation that aims to enhance the competitiveness of Logistics and to promote logistics management in Trade, Industry and Public Administration sectors. ILME is also a strategic partner of ELA, the most recognised logistics organisation in Europe, and its official representative in Greece. ILME is a full member of ELA with intense participation in international conferences, logistics cities' visits, assessment of ELA Awards as well as in the planning, organisation and implementation of the Certification system of logisticians (ECBL) that ELA provides (ILME website, 2015).

It should be stated that the provision of the ELA certification through ILME has just been initiated and the first examinations for the certification process are expected to be realised by the end of 2015. Moreover, the education of the professionals that will participate to the examination is not a responsibility of ILME or ELA and the participants are responsible to qualify themselves for the certification procedure.

D. The Supply Chain Institute of Southeastern & Central Europe (SCISCE)

The Supply Chain Institute was founded in 2007 in Athens, ''aiming at creating a common platform of logistics know-how and cooperation for supply chain professionals of the region''. It has already acquired a great experience in the supply chain sector through the elaboration of congresses, conferences, workshops, as well as benchmarking, training and networking services. It also conducts scientific surveys in respect to the logistics costs, publishes technical guides, provides information about the regulatory framework and coordinates the assessment and option of human resources in the relevant field. The aforementioned activities have been followed by more than 6000 executives of Hellenic enterprises. It should be also highlighted that 75 in a total of 100 largest enterprises operating

in Greece are core members of the Institute. The Supply Chain Institute coordinated this Thesis Project by guiding the survey, sharing its expertise and providing data from previous surveys that have been carried out. Moreover, many executives devoted lot of their time to cooperate and guide the Author.

4 RESEARCH DESIGN AND REALISATION

In the research method chapter, four basic methods for Descriptive Research were stated: *Survey* (Interviews and Questionnaires), *Experiment* (laboratory, field), *Observation* and *Secondary Data Study.* The experiments and observations considered as not sufficient to address the research questions of this Thesis. Therefore, the **Survey (Interviews, Questionnaire)** as the basic research method and **Secondary Data Study** were elaborated.

4.1 RESEARCH METHODOLOGY

Validity and Reliability

The option of surveying as the basic research method and specifically the choice of questionnaire and semi-structured interviews leads to results that could be interpreted in one specified way and minimises the 'white spaces', namely reduces the potential of more than one valid interpretations. Moreover, the level of the research reliability should be considered high, since the conditions of the research could be the same for other people who would elaborate the research the same period, at the same place and cooperate with the Supply chain Institute. Most of the resources that were utilised could be acquired by everyone, for instance searching in Google Scholar while others required studentship at KTH, such as the search in KTH Primo.

Ethical considerations

The following parameters were carefully considered when designing the research:

- *Anonymity and confidentiality*. The email questionnaire when sent to respondents, clearly stated that the responses will remain confidential and that the data will be utilised only for the purposes of the current research. Moreover, the results of the study will be available to all the participants after the accomplishment of the study. One of the interviews was recorded with the agreement of the interviewee, after him being assured that the material will be utilised only by the interviewer for the purpose of this research and will not be published.
- *Legal Requirements*. This study is in compliance with any kind of legal requirements.
- *No Harm*. No one will be psychologically, physically or in any kind of way harmed by this study.
- *Fully Understanding*. The author informed every participant in the study about the details of the study, the framework, the procedure and the exact role of their participation. Therefore, every participant was aware of their role and willing to participate in the study.
- *Intellectual Property*. All the sources retrieved in this study are cited in the text flow and then analytically listed in the References Chapter at the end of this Report. Moreover, the author endeavoured to ensure that the utilised material could be legally retrieved and do not violate anyone intellectual property. However, if you feel that you have justified complaints about any kind of material used in this study, please do not hesitate to contact the author.

4.2 SAMPLING

The questionnaire was sent to 293 respondents, mostly employed in senior placements in the supply chain, such as supply chain directors, supply chain and logistics managers, customer service managers,

commercial directors, based on contacts of the Supply Chain Institute (convenience sampling). The interviewees were chosen amongst the same contacts. Meanwhile, their willingness to participate was firstly ensured. Initially, more interviews had been planned, but the availability of the interviewees as well as the constraints set by the time frame of this Thesis, ultimately limited the interviews to two.

4.3 DATA GATHERING

Interviews

Interviews to address two different purposes were conducted:

At an initial stage the author compiled a long list of 202 skills retrieved from different sources: the skills indicated by EOPPEP, by SEV as well as the ones found in the subsequent research articles ‘‘Competency requirements for professionals in logistics and supply chain management’’ by Thai (2012), "Accreditation program design: a survey of supply chain professionals’’ by Larson (2008) and, "Skill requirements for logistics license in Taiwan" by Chun et. Al (2006), were included. These skills were reviewed by the Interviewees and ultimately limited to 65 skills. The Interviewees were: Mr. Stamatios Andrianopoulos, the founder of Planning SA and one of the most experienced executive consultants in the supply chain in Greece, who has participated in international projects and is a scientific partner of the National Technical University of Athens in Mechanical Engineering. Moreover, MSc Mr. Kostas Labrou-experienced executive and consultant in the supply chain who has elaborated IT Manager and Supply Chain Manager placements in large enterprises in Greece-, and Mrs. Marilena Arghyrou-the Managing Director of the Supply Chain Institute of Southeastern and Central Europe with great experience around the supply chain- were interviewed. The ultimate limitation of the skills to 65 was based on several criteria after considering the Interviewees’ perspectives. The most significant criteria were the specification of the skills to address the needs of the Hellenic enterprises as well as a potential generalisation for some skills which had been divided into very specific subgroups (for instance descriptive statistics and statistics were unified and titled as statistics). Another criterion was the decision not to include personal skills and characteristics that is impossible for someone to acquire by a certification procedure (around 50 personal skills were included in the initial long list). For instance, it might be important for the enterprises that a courier is a reliable person, since their daily activities include collection of money, yet it is almost impossible to train someone to be reliable and to some extent certify his/her reliability.

At a more advanced level of the survey and after the formulation of the survey questionnaire, 2 more interviews were conducted. The aim of these interviews was to incorporate data that might be disregarded by the design of the questionnaire and add further value to the survey. These interviews are embedded in Results and Data Analysis chapter.

Questionnaire

A. CONTEXT. The following parameters were critical for the decision making when designing the questionnaire in terms of context:

The questionnaire design was based on the results of the Exploratory Research. Therefore, it focused on determining the significance of *certifying middle management level executives*, *supervisors, operators and workers*, since there is a lot of evidence about the knowledge areas and skills required for the upper management placements in the supply chain (research question 1).

In order to determine the most critical Occupations (research question 2, sub question 1), the following components were taken into consideration:

- The 9 Occupations that EOPPEP has indicated
- The 12 most critical Occupations of the supply chain until 2020 designated by the study of SEV in 2013
- A typical supply chain organisation chart specified for the Greek Industry, based on the experience of the Supply Chain Institute (19 Occupations) (Figure 4).

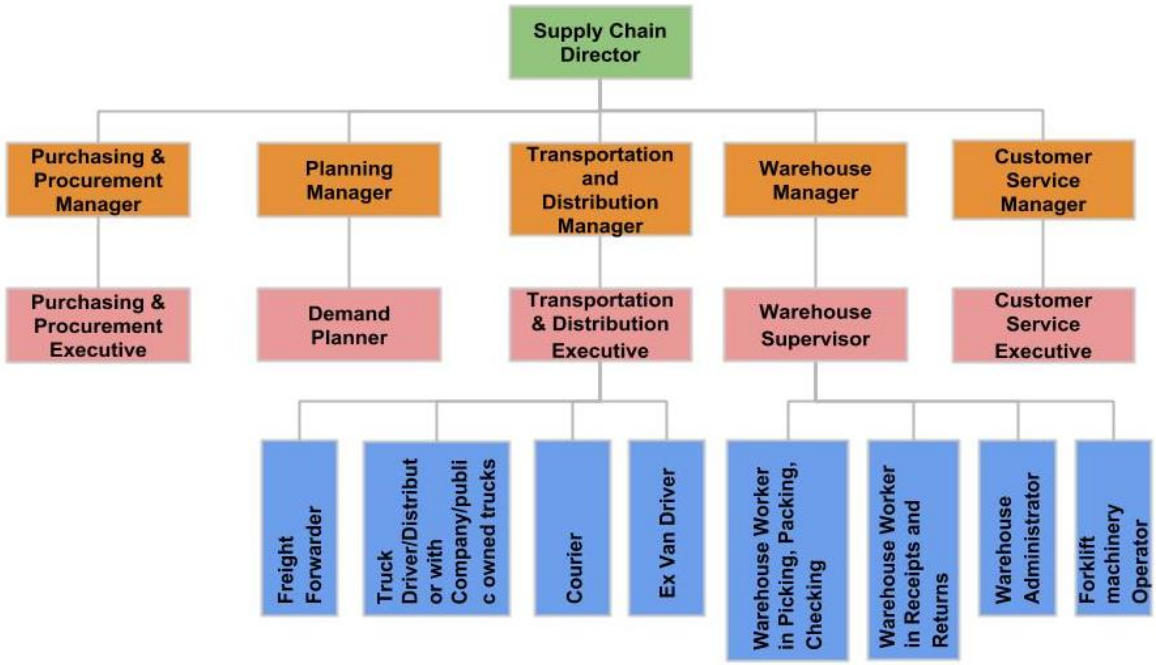

Figure 4: Typical Supply Chain Organization Chart in Greece

Some of the Occupations mentioned above were common in the aforementioned studies, others were similar and might had been named differently, and several were deemed as too specialised and to some extent, not so urgent to be entailed in a study at this preliminary level of certifying Occupations in SCM in Greece. The Occupations were reviewed by the organisation that coordinated this Thesis project, the Supply Chain Institute, and also discussed during the first stage Interviews and reviewed again. Ultimately, 16 Occupations were determined as critical and included in the questionnaire.

Another purpose of the research was to determine the most critical Knowledge Areas and Skills for each Occupation (research question 2, sub question 2). Since some Knowledge Areas and Skills are generic and thus applicable to all the selected occupational profiles, it was decided that a table compiled by these 19 generic skills for all the 16 Occupations could be established. Furthermore, in order to determine the Special Knowledge Areas and Skills, the 16 Occupations were clustered in 4 groups according to their similarity in job description (operating similar working activities) or in terms of requirements for knowledge and skills. The groups were formulated as follows:
Group A: Purchasing and Procurement Executive, Demand Planner, Freight Forwarder
Group B: Warehouse Manager, Warehouse Supervisor, Warehouse worker in Receipts and Returns, Warehouse worker in Picking-Packing-Checking, Forklift Machinery Operator
Group C: Transportation and Distribution Manager, Transportation and Distribution Executive,

Truck Driver with company/public owned trucks, Ex van Driver
Group D: Customer Service Manager, Customer Service Executive, Warehouse Administrator
The questionnaire is attached in the Appendix 5.

B. FORMAT. The format of the questionnaire was composite, but the main body was determined to consist of close-ended response questions with a standard rating (see the rating scale below). Moreover, the potential to complement Occupations as well as Special Knowledge Areas or Skills that might had not been considered by the author was also provided.

C. RATING SCALE. The rating scale was chosen from 5 to 0 or from 5 to 1 for other questions, explained as follows: 5: Critical - 4: Very Significant - 3: Significant - 2: Slightly significant – 1: Not so significant – 0: Totally Insignificant. The scale was opted while considering similar studies in the field of SCM as the ones found in the 3 research articles mentioned above.

D. MEANS OF DELIVERY. It was decided that electronic mail would be the most appropriate means of delivering the questionnaire considering mainly the strong constraints in time and cost.

E. TIME. The survey was conducted from the 8th until the 20th May of 2015.

4.4 DATA PROCESSING AND ANALYSIS

The survey was conducted from the 8th until the 20th May of 2015. Still, the constraint of writing this report limited the results acquired until the 15th of May 2015. Therefore, 15 questionnaires were responded in this time frame and the answers of those ones were evaluated, edited and analysed to produce the results for this Thesis project.

Editing and Coding

Editing in this research meant the control of all the questionnaires for omissions. In the majority of the cases, the questionnaires were fully completed, however in 5 cases there were some omissions in numbers in the tables of PART B and therefore, the author decided not to include these questionnaires for the Data Analysis in Part B. Hence, the results in the part B of the questionnaire are extracted by the opinions of 10 respondents. The coding of the questions followed the order of the questionnaire and was applied to facilitate the analysis.

Data Analysis

All the data were analysed in Microsoft Excel 2013 and produced the results that are stated in detail in the following chapter.

5 RESULTS AND DATA ANALYSIS

5.1 QUESTIONNAIRES

The questionnaires, were responded by senior supply chain professionals such as supply chain and logistics managers, commercial directors and customer service managers, employed in several of the most distinguished enterprises operating in Greece in terms of supply chain operations, number of employees in the supply chain and size of turnover, with some of them also operating in an international level. The companies participated in the survey questionnaire were Barilla SA, Elbisco SA, Minerva SA, Alumil SA, Kri-Kri SA, Infoquest SA, Kafkas SA, Y-Logimed SA, RB, Roche Diagnostics (Hellas) SA, Oktabit SA, Kallimanis SA ,Synergy SA and LG Electronics SA. These companies cover a multiple spectrum of operations in the supply chain, therefore they master different activities of the supply chain and their opinions are valuable since they incorporate this large spectrum of operations and requirements respectively. Furthermore, the participants have acquired an average of 15 years of

experience in the supply chain. Lastly, more than half of the companies participated in the survey have obtained a turnover amongst 50 to 100 million of euros.

As far as the first question is concerned, the respondents were asked to grade from 5 to 1, the significance of certifying professionals in middle management, supervisory and operations level placements in the supply chain. The 61% of the participants considered the certification as very significant (graded as 4), a 31 percent as significant (graded as 3), while only 8% deemed this fact as slightly significant. There were no participants that could not foresee the significance of the certification (figure 5).

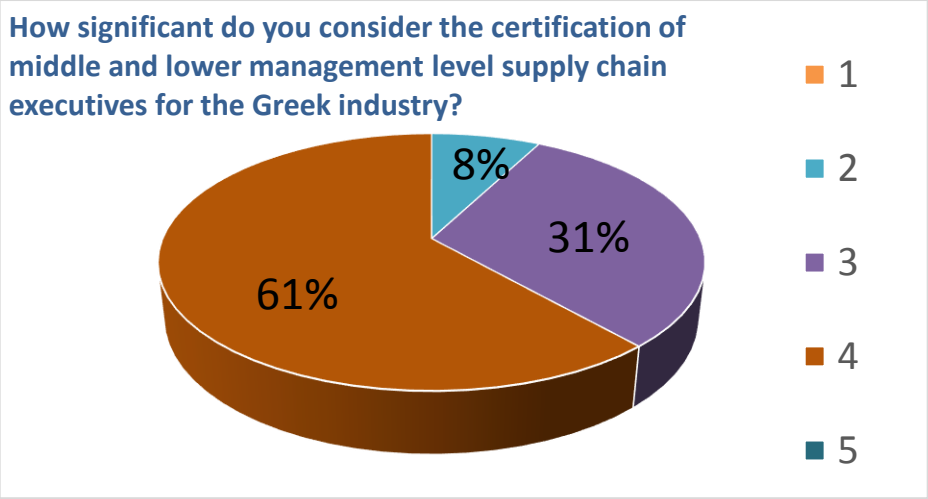

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Figure 5: Significance of the certification

Regarding the second topic, the participants were asked to consider the benefits that the certification of the personnel could attribute to the enterprises. They were asked to grade the significance of several benefits such as the increase in productivity and quality of work, the reinforcement of safety within the work environment, the minimization or risk while managing human resources, the avoidance of continuous rotation of the personnel, the enhancement of implementation of innovation, the reinforcement of company's brand and the participation in public and private bids. Their responses are presented below:

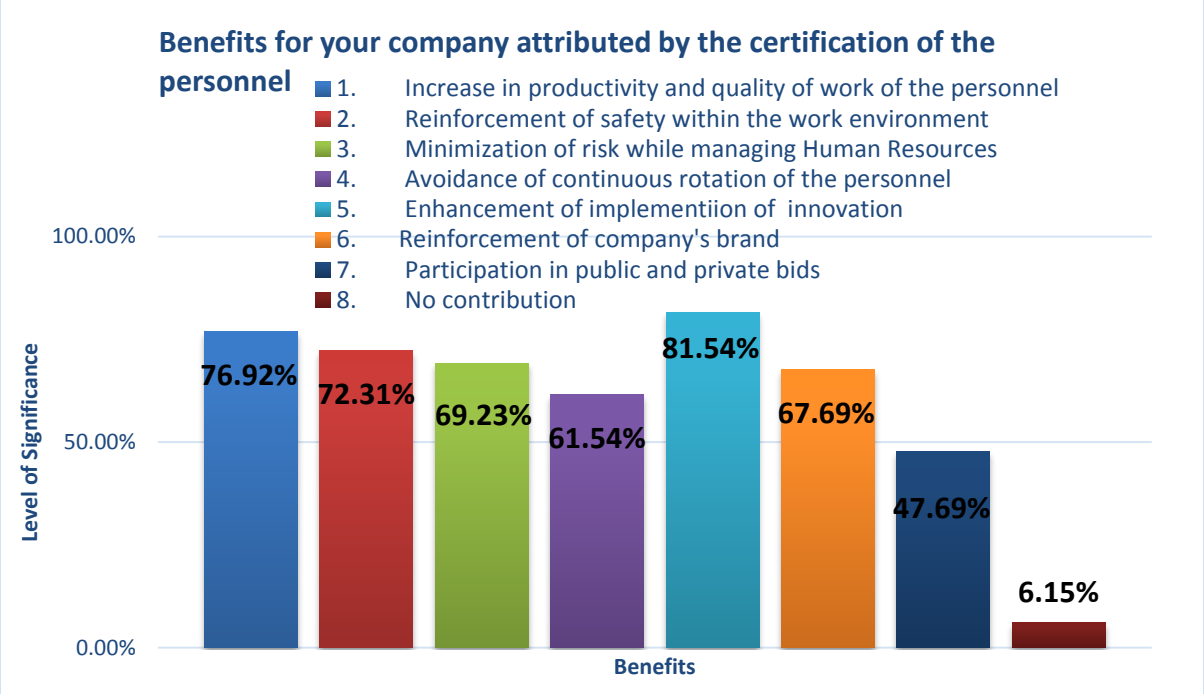

Figure 6: Benefits for the enterprise attributed by the certification of its personnel

The enhancement of implementation of innovation was considered as the most significant enabler of the certification at 81.54%. The increase in productivity and quality of work were leveled as 76.72% important and the reinforcement of safety within the work environment was also deemed very important gathering a 72.31% of significance for the participants (Figure 6).

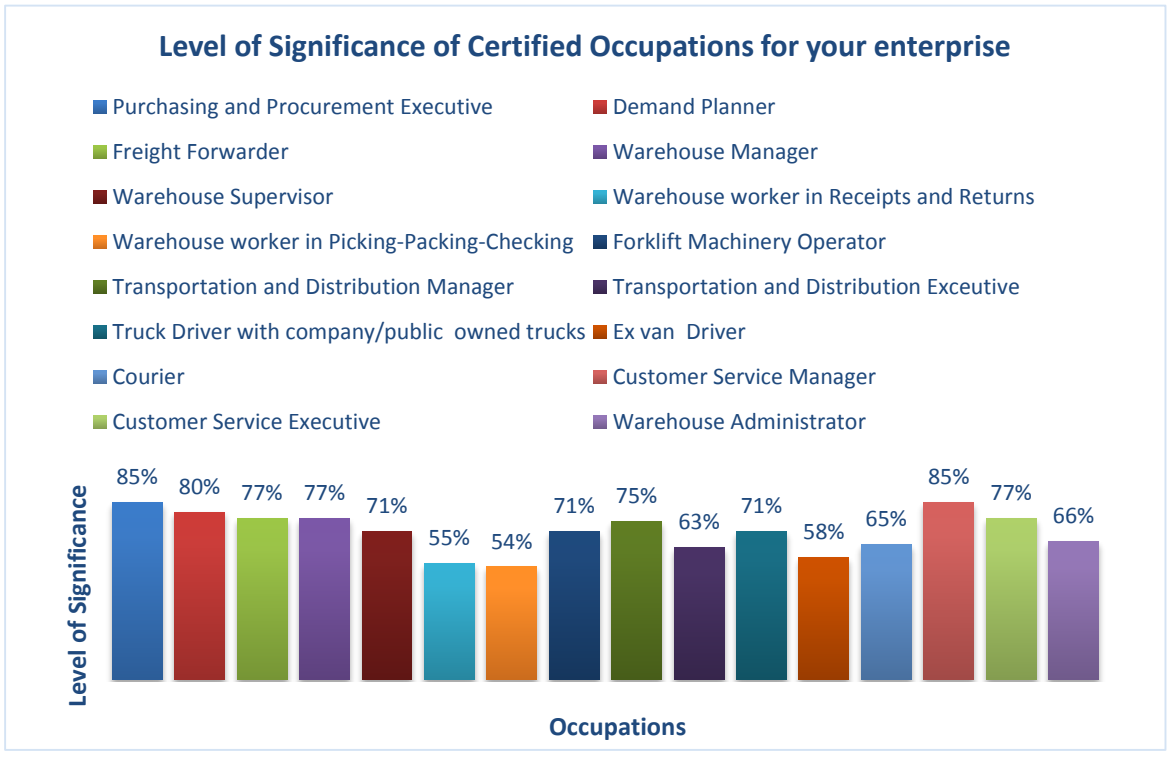

Figure 7: Significance of the Certified Occupations presented above for the enterprise

Then, 16 Occupations were chosen based on surveys and suggestions of EOPPEP, SEV as well as the experience of the Supply Chain Institute of Southeastern and Central Europe. The respondents were asked to evaluate the significance of the certification of several occupational profiles for their enterprise. All the Occupational profiles were deemed at least significant to be certified (at least 54% of the significance scale). The most critical profiles were the Purchasing and Procurement Executive (85%), the Customer Service Manager (85%), the Demand Planner (80%), the Freight Forwarder (77%), the Warehouse Manager (77%), the Customer Service Executive (77%), the Transportation and Distribution Manager (75%), the Warehouse Supervisor (71%), the forklift machinery operator (71%) and the truck driver (71%). All the results are depicted above in Figure 7.

The next topic concerned a suggestion to the respondents to propose Occupations needed to be certified according to their opinion and were not designated in the questionnaire. A total of 7 proposals was acquired. The suggestions included Sales and Operations Planning manager and executive, Invoicing executive, IT in logistics, Accounting and Pricing executive, Costing executive and Supply planner. However, there were not common perspectives amongst the respondents, and therefore a more targeted survey is required at next stage of the certification process.

The next section of the questionnaire-Part B- was the most demanding one and was aiming to explore the most critical generic and special Knowledge Areas and Skills for each of the 16 Occupations mentioned above. A list of 19 General Knowledge Areas and Skills was formulated and they were clustered in 9 clusters; Economics, Legislation, Informatics, Environment, Quality, Business Administration, Communication, Education and Languages. The respondents were asked to evaluate in terms of significance these 19 skills for each one of the 16 Occupations considering the rating scale from 5 to 1. The aforementioned General Knowledge Areas and Skills are presented in Figure 8. The mean and the standard deviation values for every Knowledge Area/Skill for each Occupation were calculated. The same procedure was elaborated in order to identify the level of significance for the Special Knowledge Areas and Skills. The Special Knowledge Areas and Skills were clustered in 4 groups of Occupations according to their similarity in job descriptions, job activities or their requirements, and are also presented below in table 3.

GENERAL KNOWLEDGE AREAS AND SKILLS FOR THE 16 OCCUPATIONS
1. ACCOUNTING
2. COSTING
3. KNOWLEDGE OF LABOR LAW
4. SPECIAL LEGISLATION OF EACH OCCUPATION
5. OFFICE – WINDOWS
6. ERP
7. SUSTAINABILITY
8. QUALITY MANAGEMENT/ISO
9. HUMAN RESOURCE MANAGEMENT
10. NEGOTIATION SKILLS
11. PERFORMANCE MEASUREMENT/KPIS's
12. REPORTING
13. TIME MANAGEMENT
14. COMMUNICATON SKILLS
15. TEAM WORKING
16. POSTGRADUADE DEGREE
17. UNIVERSITY DEGREE
18. HIGHSCHOOL GRADUATE
19. ENGLISH

Figure 8: General Knowledge Areas and Skills for the 16 Occupations, indicated by the Author

SPECIAL KNOWLEDGE AREAS AND SKILLS															
1. PURCHASING AND PROCUREMENT EXECUTIVE	2. DEMAND PLANNER	3. FREIGHT FORWARDER	4. WAREHOUSE MANAGER	5. WAREHOUSE SUPERVISOR	6. WAREHOUSE WPRKER IN RECEPITS /RETURNS	7. WAREHOUSE WORKER PICKING,PAKING,CHEC	8. FORKLIFT MACHINERY OPERATOR	9. TRANSPORTATION AND DISTRIBUTION MAAGER	10. TRANSPORTANTION DISTRIBUTION	11. TRUCK DRIVER	12. EX VAN DRIVER	13. COURIER	14. CUSTOMER SERVICE MANAGER	15. CUSTOMER SERVICE EXECUTIVE	16. WAREHOUSE ADMINISTRATOR
1. TERMS-REGULATIONS OF INTERNATIONAL TRANSPORTATION (INCOTERMS) 2. TRANSPORTATION OF FREIGHTS (ROAD – SEA - AIR – RAIL) 3. GENERAL KNOWLEDGE OF CUSTOMS PROCEDURES 4. PLANNING AND MANAGEMENT OF BIDS AND CONTRACTS 5. ASSESSMENT METHODS OF SUPPLIERS 6. ABC ANALYSIS 7. FORECASTING & INVENTORY CONTROL 8. SALES 9. INFORMATION SYSTEMS FOR PLANNING - SCHEDULING – FORECASTING				1.BASIC PRINCIPLES OF ERGONOMY 2.PROPER USE OF HARDWARE (SCANNERS, PRINTERS K.A.) 3.WAREHOUSE MANAGEMENT 4.LEAN - 5S 5.INVOICE MANAGEMENT AND CONTROL 6.MAINTENANCE OF MACHINERY AND EQUIPMENT 7.PALLET MANAGEMENT 8.PACKAGING AND MATERIALS 9.WMS 10. HEALTH AND SAFETY OF WORK				1. SAFE LOADING 2. SAFE AND ECONOMICAL DRIVING 3. VEHICLE MAINTENANCE 4. POD APPLICATIONS 5. COLLECTION OF MONEY 6. REVERSE LOGISTICS 7. MANAGEMENT OF RETURNED MERCHANANDISE 8. CUSTOMER-CENTRIC BEHAVIOUR 9. BASIC PRNCIPLES OF SALES AND DELIVERIES 10. MERCHANDIZING 11. TELEMATICS 12. FLEET MANAGEMENT 13. DANGEROUS FREIGHTS MANAGEMENT (ADR) 14. MANAGEMENT OF VULNERABLE PRODUCTS IN TEMPERATURE, FREEZING EQUIPMENT			1. CUSTOMER SERVICE / HELP DESK 2. E-INVOICING 3. PRICING 4. SERVICE LEVEL AGREEMENTS 5. MANAGEMENT OF CUSTOMER COMPLAINTS 6. BASIC KNOWLEDGE OF PRODUCTS FOR SERVICING CUSTOMERS(SOLVE PROBLEMS ETC) 7. BASIC PRINCIPLES OF WAREHOUSE MANAGEMENT 8. BACK ORDERS MANAGEMENT 9. MANAGEMENT OF CREDIT BALANCES 10. MANAGEMENT OF RETURNS OF MERCHANDISE 11. SLAES & MARKETING (DISCOUNTS, PROMOTION ETC) 12. KNOWLEDGE OF CRM SYSTEMS		

Table 3: Special Knowledge Areas and Skills in Groups for the 16 Occupations, indicated by the Author.

The results of the respondents are presented below through the mean values and the standard deviation values. In order to facilitate the understanding of the tables, a spectrum of 3 colours was utilised for the mean values, considering these facts: thick green was chosen for very significant or critical knowledge areas and skills, light green deemed appropriate to depict skills that were regarded at least significant and orange-red colour was used to depict features considered slightly significant or insignificant by the participants (table 5). Thus, it can be easily apparent what knowledge areas and skills are significant or critical for each Occupation. Moreover, a spectrum of 4 colours based on white and blue was utilised to demonstrate the standard deviation values. Standard Deviation is a great tool to demonstrate deviation in respondents' opinions or to identify potential statistical errors.

	1. PURCHASING AND PROCUREMENT EXECUTIVE	2. DEMAND PLANNER	3. FREIGHT FORWARDER	4. WAREHOUSE MANAGER	5. WAREHOUSE SUPERVISOR	6. WAREHOUSE WPRKER IN RECEPITS /RETURNS	7. WAREHOUSE WORKER PICKING,PAKING,CHECKIN	8. FORKLIFT MACHINERY OPERATOR	9. TRANSPORTATION AND DISTRIBUTION MAAGER	10. TRANSPORTANTION DISTRIBUTION EXECUTIVE	11. TRUCK DRIVER	12. EX VAN DRIVER	13. COURIER	14. CUSTOMER SERVICE MANAGER	15. CUSTOMER SERVICE EXECUTIVE	16. WAREHOUSE ADMINISTRATOR
1. ACCOUNTING	2.83	1.83	3.33	3.17	2.00	1.67	1.33	1.33	3.33	2.50	2.50	2.83	2.50	3.33	2.83	3.17
2. COSTING	4.00	3.67	3.50	3.00	2.50	1.83	1.67	1.67	3.17	2.83	2.83	2.33	2.17	3.33	2.67	2.67
3. KNOWLEDGE OF LABOR LAW	2.00	1.50	2.83	4.00	3.17	1.67	1.50	2.00	3.17	2.50	2.50	2.00	2.00	2.67	2.33	2.17
4. SPECIAL LEGISLATION	2.33	1.83	3.00	3.00	2.50	1.67	1.67	2.17	3.17	2.67	3.00	3.00	2.83	2.50	2.17	2.00
5. OFFICE – WINDOWS	4.50	4.67	3.17	4.17	3.50	2.33	2.00	2.00	4.00	3.50	2.00	2.33	2.17	4.50	4.17	3.83
6. ERP	4.33	4.33	2.83	4.17	3.50	2.33	2.00	2.00	4.00	3.67	2.17	2.17	1.83	4.17	4.17	4.17
7. SUSTAINABILITY	3.67	3.50	3.17	3.50	2.50	2.00	1.83	2.00	3.00	3.00	2.50	2.33	2.33	3.00	2.83	2.67
8. QUALITY MANAGEMENT/ISO	3.17	2.17	2.50	3.50	2.33	2.00	2.17	2.00	3.17	2.33	1.83	1.83	1.67	3.17	2.33	2.17
9. HUMAN RESOURCE MANAGEMENT	2.33	2.33	2.17	4.33	4.00	1.67	1.33	1.50	3.00	2.33	1.67	1.67	1.50	3.33	2.17	2.00
10. NEGOTIATION SKILLS	5.00	3.67	3.00	3.17	2.17	1.67	1.50	1.50	3.67	2.33	1.67	2.17	1.50	3.83	2.83	2.33
11. PERFORMANCE MEASUREMENT/KPIS's	4.17	4.17	3.67	4.33	3.50	2.50	2.33	2.33	3.83	3.33	2.17	2.17	2.17	4.17	3.00	2.83
12. REPORTING	4.33	4.67	3.50	4.17	3.17	1.33	1.17	1.33	3.83	3.00	1.50	1.33	1.50	4.33	3.33	3.17
13. TIME MANAGEMENT	3.50	3.50	3.00	3.83	3.50	2.50	2.17	2.33	3.50	3.17	2.17	2.17	2.17	3.67	3.00	3.00
14. COMMUNICATON SKILLS	4.67	4.17	3.33	4.17	4.00	2.50	2.50	2.50	4.00	3.50	3.50	3.67	3.50	4.50	4.33	3.67
15. TEAM WORKING	4.17	4.00	3.67	4.33	4.33	3.83	3.83	3.83	3.83	4.00	3.00	3.17	3.17	4.33	4.17	4.00
16. POSTGRADUADE DEGREE	3.50	3.17	2.33	2.67	1.50	1.17	1.17	1.17	2.33	1.50	1.17	1.17	1.17	3.50	2.17	1.83
17. UNIVERSITY DEGREE	4.17	4.17	3.00	3.50	2.33	1.33	1.17	1.17	3.17	2.33	1.50	1.50	1.33	4.17	3.00	2.83
18. HIGHSCHOOL GRADUATE	4.67	4.67	4.50	4.67	4.50	3.50	3.17	3.17	4.50	4.00	3.50	3.50	3.50	4.67	4.50	4.50
19. ENGLISH	4.83	4.50	4.00	4.33	3.33	2.17	1.83	1.83	3.83	3.17	2.67	2.33	2.00	4.50	3.83	3.33

Table 4: Ratings of the respondents regarding General Knowledge Areas and Skills of the 16 Occupations

Mean Values
Very Significant or Critical = 4-5
At least Significant = 3-3.99
Slightly significant or Insignificant = Below 3

Table 5: Mean Values

Stand. Deviation Values
Minor Deviation = 0-0.49
Normal Deviation = 0.5-0.99
Significant Deviation =1-1.49
Critical Deviation= 1.5 and greater

Table 6: Standard Deviation Values

Drawing generic conclusions from such a composite table is not feasible and someone should examine each Occupation separately to extract the required knowledge areas and skills according to their significance. However, we could briefly state that management and supervisory placements were demanding in terms of requirements for the majority of the generic knowledge areas and skills entailed in our study (thick or light green colours). On the other hand, workers, operators and drivers require a minority of knowledge and skills, such as team working and a high school degree, as well as communications skills in some cases (Table 4).

For the following Special Knowledge Areas and Skills, the mean and standard deviation values are presented. Higher values of standard deviation show sharp differences between respondents or might demonstrate a design error, such as low level of reliability of the selected feature. Therefore, one should also look at the value of the standard deviation in order to get a more integrated point of view and extract safest conclusions (table 6).

SPECIAL KNOWLEDGE AREAS/SKILLS	1. PURCHASING AND PROCUREMENT EXECUTIVE		2. DEMAND PLANNER		3. FREIGHT FORWARDER	
	Mean	St.Dev	Mean	St.Dev	Mean	St.Dev
1. TERMS-REGULATION OF INTERNATIONAL TRANSPORTATION (INCOTERMS)	4.67	0.50	3.11	1.05	4.67	0.50
2. TRANSPORTATION OF FREIGHTS (ROAD – SEA - AIR – RAIL)	4.11	0.93	2.67	0.87	4.67	0.71
3. GENERAL KNOWLEDGE OF CUSTOMS PROCEDURES	3.89	0.93	2.78	0.67	4.33	0.71
4. PLANNING AND MANAGEMENT OF BIDS AND CONTRACTS	4.78	0.44	2.44	1.59	2.56	1.51
5. ASSESSMENT METHODS OF SUPPLIERS	5.00	0.00	2.44	1.42	3.11	1.45
6. ABC ANALYSIS	4.44	0.73	4.56	0.73	2.78	1.39
7. FORECASTING & INVENTORY CONTROL	4.11	1.36	4.89	0.33	2.00	1.41
8. SALES	3.11	0.93	3.44	0.73	2.67	1.66
9. INFORMATION SYSTEMS FOR PLANNING - SCHEDULING - FORECASTING	4.11	1.45	4.78	0.67	2.56	1.42

Table 7: Ratings of the respondents regarding Special Knowledge Areas and Skills of Group A

Concerning the Purchasing and Procurement Executive, all the skills proposed deemed as at least significant by the respondents, while as regards the Demand Planner, the transportation of freights, a general knowledge of customs procedures, bids and contracts and the assessment of suppliers were not highly weighted by the respondents. The Freight forwarder, as indicated by the participants, should acquire exceptional competence in terms/regulations of international transportation

(INCOTERMS), transportation of freights, general knowledge of custom procedures, as well as significant skills in assessing the suppliers (Table 7).

As far as the next group of Occupations (Group B) is regarded, Warehouse Managers and Supervisors should have acquired at least significant competence of all the skills proposed by the author. Workers in receipts and returns should not be so much aware of ergonomy, Lean-5S, maintenance of equipment and packaging/materials but they should hold a significant expertise in the utilisation of hardware, warehouse management, invoice management and control, pallet management and WMS,. Almost the same skills were considered for the worker in picking, packing, checking (apart from invoice management and control). Almost the same skills with the worker in picking-packing-checking were considered by the participants for the forklift machinery operator, who should of course hold an expertise in maintaining machinery and equipment. All the Occupations of this group should be capable of using hardware while obtaining a significant expertise in WMS and an excellent understanding of health and safety in the work environment (Table 8).

SPECIAL KNOWLEDGE AREAS/SKILLS	4. WAREHOUSE MANAGER		5. WAREHOUSE SUPERVISOR		6. WAREHOUSE WPRKER IN RECEPITS AND RETURNS		7. WAREHOUSE WORKER IN PICKING - PACKING - CHECKING		8. FORKLIFT MACHINERY OPERATOR	
	Mean	St.Dev	Mean	St.Dev	Mean	St.Dev	Mean	St.Dev	Mean	St.Dev
1. BASIC PRINCIPLES OF ERGONOMY	3.88	0.99	3.50	1.31	2.63	1.19	2.38	1.06	2.38	1.06
2. PROPER USE OF HARDWARE (SCANNERS, PRINTERS κ.ά.)	3.63	1.30	4.13	0.83	3.63	1.30	3.50	1.31	3.63	1.06
3. WAREHOUSE MANAGEMENT	4.88	0.35	4.63	0.74	3.13	1.46	3.00	1.51	3.13	1.36
4. LEAN - 5S	4.75	0.46	3.88	1.36	2.50	1.41	2.38	1.41	2.38	1.41
5. INVOICE MANAGEMENT AND CONTROL	4.38	0.74	4.50	0.76	3.75	1.58	2.75	1.28	2.50	0.93
6. MAINTENANCE OF MACHINERY AND EQUIPMENT	3.38	1.41	4.00	0.76	2.50	0.76	2.63	0.92	3.75	0.89
7. PALLET MANAGEMENT	3.50	1.51	4.38	0.52	4.00	1.51	4.00	1.51	4.50	0.93
8. PACKAGING AND MATERIALS	3.50	1.07	3.50	1.07	3.00	1.41	3.13	1.55	3.13	1.36
9. WMS	4.63	0.74	4.88	0.35	3.63	1.19	3.63	1.19	3.75	1.04
10. HEALTH AND SAFETY OF WORK	5.00	0.00	5.00	0.00	4.38	1.19	4.38	1.19	4.38	1.19

Table 8: Ratings of the respondents regarding Special Knowledge Areas and Skills of Group B

The next group, Group C, included a category of Occupations in Transportation and Distribution, from the management/supervisory level to the drivers and couriers. Most of the skills proposed by the

author were considered at least significant for all these Occupations. The minimum requirements were set for the courier, who should not acquire significant competence in returned merchandise, principles of sales, merchandising and fleet management, but they should possess all the other skills. All the professionals should acquire excellent competences in safe loading, safe and economical driving, POD applications, customer-centric behaviour, dangerous freights management (ADR) and management of vulnerable products. It might seem weird that management placements should master for instance, safe and economical driving since they do not need to drive a truck as managers. However, it would be infeasible to convince your colleagues to drive safely and economically if you, as a manager do not acknowledge what it is, why it is valuable and how it should be achieved (Table 9).

SPECIAL KNOWLEDGE AREAS/SKILLS	9. TRANSPORTATION AND DISTRIBUTION MANAGER		10. TRANSPORTATION AND DISTRIBUTION EXECUTIVE		11. TRUCK DRIVER WITH COMPNAY OR PUBLIC OWNED TRUCKS		12. EX VAN DRIVER		13. COURIER	
	Mean	St.Dev	Mean	St.Dev	Mean	St.Dev	Mean	St.Dev	Mean	St.Dev
1. SAFE LOADING	4.60	0.52	3.60	0.97	4.70	0.48	4.70	0.48	4.70	0.48
2. SAFE AND ECONOMICAL DRIVING	4.11	0.60	3.56	0.88	4.70	0.48	4.70	0.48	4.70	0.48
3. VEHICLE MAINTENANCE	4.00	0.82	2.78	0.83	4.60	0.84	4.50	0.85	4.50	0.85
4. POD APPLICATIONS	4.00	1.33	3.80	1.23	3.50	1.08	4.10	0.74	4.00	0.67
5. COLLECTION OF MONEY	3.90	0.88	3.30	0.95	3.90	0.88	4.30	0.48	4.30	0.48
6. REVERSE LOGISTICS	4.10	0.88	3.80	0.92	3.10	1.29	3.10	1.29	3.00	1.33
7. MANAGEMENT OF RETURNED MERCHANANDISE	4.20	0.63	3.78	0.67	3.00	1.00	3.00	1.00	2.89	1.05
8. CUSTOMER-CENTRIC BEHAVIOUR	4.60	0.70	4.10	0.88	4.60	0.70	4.60	0.70	4.60	0.70
9. BASIC PRNCIPLES OF SALES AND DELIVERIES	3.60	0.70	2.80	0.92	2.80	1.03	3.40	0.97	2.80	0.92
10. MERCHANDIZING	2.50	0.97	2.30	0.82	2.50	0.85	3.22	0.83	2.33	1.00
11. TELEMATICS	4.30	0.48	4.20	0.63	3.30	1.25	3.30	1.16	3.30	1.16
12. FLEET MANAGEMENT	4.60	0.52	4.50	0.53	3.00	1.15	2.60	0.84	2.50	0.85
13. DANGEROUS FREIGHTS MANAGEMENT (ADR)	4.60	0.52	4.60	0.52	4.00	0.82	3.60	1.07	3.60	1.07
14. MANAGEMENT OF VULNERABLE PRODUCTS IN TEMPERATURE, FREEZING EQUIPMENT	4.60	0.52	4.60	0.52	4.30	0.67	4.10	0.99	4.10	0.99

Table 9: Ratings of the respondents regarding Special Knowledge Areas and Skills of Group C

With respect to the last group, Group D, for operating in customer service department or administering warehouse procedures, the vast majority of the knowledge areas and skills suggested by the author deemed as significant or critical by the respondents. Principles of warehouse management were not significantly considered for the customer service manager and executive, and sales and marketing and CRM were also not seen as significant for the warehouse administrator by the respondents (Table 10).

SPECIAL KNOWLEDGE AREAS/SKILLS	14. CUSTOMER SERVICE MANAGER		15. CUSTOMER SERVICE EXECUTIVE		16. WAREHOUSE ADMINISTRATOR	
	Mean	St.Dev	Mean	St.Dev	Mean	St.Dev
1. CUSTOMER SERVICE / HELP DESK	4.45	0.32	4.27	0.48	3.64	0.67
2. e-INVOICING	3.45	0.79	3.45	0.63	3.27	0.52
3. PRICING	3.45	0.92	3.36	0.82	3.55	0.88
4. SERVICE LEVEL AGREEMENTS	4.27	0.48	3.55	0.88	3.27	0.84
5. MANAGEMENT OF CUSTOMER COMPLAINTS	4.36	0.42	4.36	0.42	3.00	0.67
6. BASIC KNOWLEDGE OF PRODUCTS FOR SERVICING CUSTOMERS(SOLVE PROBLEMS etc)	4.27	0.67	3.91	0.95	3.00	1.25
7. BASIC PRINCIPLES OF WAREHOUSE MANAGEMENT	2.64	0.88	2.55	0.79	3.45	0.92
8. BACK ORDERS MANAGEMENT	3.55	0.57	3.27	0.84	3.27	0.84
9. MANAGEMENT OF CREDIT BALANCES	3.45	0.79	3.27	0.70	3.27	0.84
10. MANAGEMNT OF RETURNS OF MERCHANDISE	3.45	0.63	3.09	0.70	3.36	0.48
11. SLAES & MARKETING (DISCOUNTS, PROMOTION etc)	3.36	0.67	2.82	1.10	2.18	0.84
12. KNOWLEDGE OF CRM SYSTEMS	4.18	0.52	3.64	1.05	2.64	0.99

Table 10: Ratings of the respondents regarding Special Knowledge Areas and Skills of Group D

In all four tables of Special Knowledge Areas and Skills, just around 4% of the standard deviation values were greater than 1.50. This fact reflects in general a high level of agreement between respondents and an accurate choice of the selected special competences by the author. Hence, the results indicate a high level of reliability of the research.

5.2 INTERVIEWS

Two semi-structured interviews were conducted in order to collect data that could not potentially been embedded through the completion of the email questionnaires and to further add value to our research. The Interviewees were Mr Stelios Katsamakis, Logistics and Commercial Director of Beinoglou SA, one of the largest 3PL companies operating in Greece with great international networking and Mr George Antipas, Logistics Network Manager of Unilever Logistics SA, an international firm and one of the largest enterprises in Greece and the largest supplier of retailers in Greece.

INTERVIEWS' SYNOPSIS		
QUESTIONS	INTERVIEWEE 1	INTERVIEWEE 2
1. [Question 1 in Questionnaire:] How significant do you consider the certification for supply chain professionals in middle management, supervisors and operators' level for the Greek industry?	At least significant. Grade 3 and might 4 (scale 5-0)	The same answer with Interv. 1. At least 3 and in some cases 4.
2. [Question 2 in Questionnaire:] How do you consider the significance of the following benefits for your company attributed by the certification of the personnel employed within the supply chain (at your company)?	Increase in productivity and quality of work, managing human resources, brand reinforcement, Innovation. I don't foresee any special significance for safety, participation in bids, rotation of personnel.	All of them important apart from rotation of personnel and participation in bids.
3. Are any benefits that you consider significant and were not included in the questionnaire?	Not anything that were not stated above. 'In others words, I would say the facilitation of the recruiting process.'	Highlighted the facilitation of recruitment process when aiming to hire new personnel. Understanding job role, common platform for communication.
4. [Question 3 in Questionnaire:] How significant do you consider the certification of the 16 Occupations for your enterprise?	Most of the Occupations are significant to be certified, but prioritise middle managers and executives. Not significance for the company for ex van drivers, couriers.	Most of the Occupations at least significant. Not significant for his company regarding couriers.
5. [Question 4 in Quest.] Are there any other Occupations within the Supply Chain in middle management, supervisory or operators level that you consider significant to be certified and were not found in the list above (either within your company or in general)?	Customs clearers, Managers and executives specialised in exports, imports	Master Data Executives
6. Does your company provide any kind of internal training for the personnel and especially for the Occupations mentioned above?	Yes. For truck drivers for instance, safe loading and so on.	Yes. Business administration, health and safety in work environment, customer service are some of the core topics of the training.
7. How do you consider the general and special skill determined in the questionnaire?	Difficult to assess now	Most of them seem significant, but difficult to evaluate them during the interview. However, a discussion about the skills of workers was done.

Table 11: Results of the Interviews

In both interviews, the structure of the questionnaire was followed and all the questions that were included in the first part were responded by the Interviewees. During the first interview, the interviewee considered the high significance (graded at least 3 in a total of 5 in the 5-1 scale) of the certification of middle management executives, supervisors and operators. Moreover, he stated that the enhancement in the productivity and quality of work, the reinforcement of the enterprise brand and the implementation of innovation would be the most significant benefits attributed by the

certification of the personnel in his enterprise. However, he did not considered so significant benefits in terms of safety within the work environment and as regards the participation in bids. On the other, he highlighted that a certification could facilitate the process of recruiting personnel. The interviewee stated that internal training processes for the personnel are already being implemented within the company, such as for truck drivers, but if new people were to be hired, the certification would be an excellent criterion to be chosen for an interview. It was also highlighted that almost all the Occupations that were entailed in the questionnaire were important to be certified, prioritising middle management executives and supervisors (not ex van drivers, couriers). The next topic of the questionnaire was asking the opinion of the respondent about occupations that might had been disregarded. The interviewee stated that since the company has intense daily activities concerning international transportation and freight forwarding, export and import managers and executives, and customs clearers could be entailed in the certification process (Table 11).

The second interview was conducted with Mr George Antipas, Logistics Network Manager of Unilever Hellas SA. Unilever Hellas is the Hellenic partner of Unilever, an international leading company and the largest supplier for retailers in Greece. The operations of the company extend to a multiplicity of activities covering the whole spectrum of the supply chain, such as logistics (warehousing, transportation and distribution), planning, manufacturing, purchasing and procurement, and customer service. Some of the operations are centralised, while others are oriented to the Greek market (procurement and customer service). During the interview, the structure of the questionnaire guided the interviewer (author) who asked for explanations and details when needed. The interviewee cited that the certification of middle managers, supervisors and operators is significant and in some cases, very significant. While discussing about the benefits of the certification, he mentioned that the existence of the certification could facilitate the process of recruiting new personnel, since it shows that the candidate has at least acquired a foundation of the skills required for the job, and thus a common platform for understanding and communication with the superiors could easily be achieved. The interviewee also stated that people who work as workers in the company should be at least high school graduates and then, they should acquire a basic understanding of the basic concepts of their job. If this acquisition has already been realised through trainings sessions required to obtain a certification, this fact could save resources from the company. The interviewee mentioned that internal training processes for low level executives are also been applied, concerning business administration, customer service, health and safety and other core issues of their professional role. As regards the certification of the 16 occupations proposed by the author, he stated that most of them would be significant for the enterprise, apart from courier. Regarding any suggestions about occupations that might have not been included in the questionnaire, he mentioned the occupation of master data executive. Master data include product codes, descriptions, weights, dimensions, and several manufacturing specifications and the certification of master data executives could be valuable for the operations of the company (Table 11).

6 SECONDARY DATA

International Experience in Certification of SCM professionals

In United States and Canada, most of the certifications provided are internationally recognised since the Associations or Institutes located there are global leaders in the field of logistics and supply chain management with long history in the sector and global networking. Some of the certifications cover

the whole supply chain while others are more specified in logistics or other supply chain topics. They are usually structured in modules or courses and either require separate exams for each course or one unique examination is intended for a total of courses. The certifications are usually organised according to the level of experience of the professional; for the entry level certifications either a bachelor degree or a minimum relevant working experience is required. At an initial stage, a basic knowledge around core supply chain management concepts is offered and in more advanced levels, more specialised and technical knowledge is determined. Several of the certifications, such as those offered in Canada, entail also business skills, such as negotiation, communication, leadership, social responsibility and so forth. The most advanced designations address to experienced executives and usually demand the acquisition of the entry level certifications as prerequisites. For instance, a professional who desires to acquire the SCPro level 2 designation of CSCMP, is not eligible unless he has already held the SCPro level 1 certificate as well as having acquired a bachelor degree and/or several years of experience (Table 12).

COUNTRY	ASSOCIATIONS, INSTITUTES, BODIES IN THE SUPPLY CHAIN	CERTIFICATION			
		NAME	FEATURES		
			LEVELS	TOPICS OR OTHER CORE FEATURES	REQUIREMENTS
UNITED STATES	APICS, American Production and Inventory Control Society or the Association for Operations Management	CPIM	Focuses on manufacturing,5 exams for 5 Modules	Demand management, procurement management, supplier planning, material requirements planning, capacity planning, sales and operations planning, master scheduling, performance measurements, supplier relationships, quality control and continuous improvement	
		CSCP	Takes a broader view of the supply chain, 1 exams for all 3 modules: Supply Chain Management Fundamentals, Supply Chain Strategy, Design, and Compliance, Implementation and Operations		Either a Bachelor's degree or international equivalent OR CPIM, CIRM, SCOR-P, C.P.M or CPSM designations
	ASTL, American Society of Transportation and Logistics	GLA Global Logistics Associate	Workplace Skills, Supply Chain Management, Logistics and Transportation, Warehouse Operations,SCM Information Technology, Safety Compliance		undergraduate degree or at least 3 years of professional working experience
		PLS Professional Designation in Logistics and Supply Chain Management	Competitive strategy, customer value and service, logistics costs and performance, responsiveness, lead-time management, collaboration across multiple enterprises, globalization, risk management, integration of supply chain processes, and transforming the logistics organization		No special requirements
		CTL Certified in Transportation and Logistics	Transportation Economics Management, Logistics Management, International Transport and Logistics are the compulsory subjects, and General Management Principles and Techniques, Lean Logistics, Logistics and Supply Chain Strategy, Logistics Finance, Supply Chain Management, Creative Component are the elective ones		Undergraduate degree or at least 3 years of professional working experience.
		DLP Distinguished Logistics Professional	Distinguished professionals in the field (with at least 20 years of experience in the industry		

	CSCMP, Council of Supply Chain Management Professionals	SCPro	Level 1	Supply Chain Concepts, Demand Planning, Procurement and Supply Management, Manufacturing and Service Operations, Transportation, Inventory Management, Warehousing, Order fulfilment and Customer Service	Bachelor's degree or 4 years of relevant work experience
			Level 2	Risk Assessment and Management, Supply Chain Strategy, Supply Chain Finance, Supply Chain Network Design, External Process Integration, Internal Process Integration, Sustainability	Level 1 designation as well as a bachelor's degree and 3 years of relevant work experience or 7 years of relevant work experience
			Level 3	Intends to certify people with exceptional competences in the field and the whole procedure is very demanding	Level One and Level Two designations as well as either a bachelor's degree and five years of relevant experience or nine years of relevant experience

COUNTRY	ASSOCIATIONS, INSTITUTES, BODIES IN THE SUPPLY CHAIN	CERTIFICATION			
		NAME	FEATURES		
			LEVELS	TOPICS OR OTHER CORE FEATURES	REQUIREMENTS
CANADA	SCMA, Supply Chain Management Association	SCMP	8 modules, 6 interactive workshops, In-Residence week	Supply Chain Management, Procurement and Supply Management, Logistics and Transportation, Operations and Process Management, Knowledge Management, Global Sourcing, Supply Chain Management for the Public Sector, Supply Chain Management for Services, Capital Goods and Major Projects, leadership, negotiation, communication and relationship, ethics and social responsibility, international business and multicultural skills	Degree or diploma program in a business discipline at a university, college or technical institute of Canada. Working experience is acknowledged
	CITT, Canadian Institute of Traffic and Transportation	CCLP	Five courses of supply chain logistics expertise and 2 of the elective courses	Transportation Systems, Logistics Processes, Integrated Logistics, [Elect]: Economics Influence in Logistics, Transportation Law, Logistics Decision Modelling	Graduate degree in a business discipline or by attending some special business courses and hold at least 5 years of relevant experience, in Canada or international one
	Logistic Institute of Canada	Professional Logistician (P.Log.)	Leadership program or a Process Management Program		
		Logistics Specialist (LS)	Professionals at supervisory roles	Core modules in the Essentials Series, Frontline Logistics and Integrated Logistics Networks	

Table 12: Certifications of supply chain professionals in US and Canada

In Europe, the philosophy of almost all the certifications is based on the EQF levels. A leading certification association for logisticians in Europe is ELA, the European Logistics Association, which is ''a federation of 30 national organisations, covering almost every country in Central and Western

Europe''. It has developed the ELA certification in coordination with the ELAQF standards of competence, which are aligned to the European Qualification Framework (EQF), and certify professionals who fulfil these standards. The EQF assures the accordance of the competences in all the European countries by establishing a common platform and enables professionals to have their qualifications acknowledged in many countries. The ELAQF standards derive from extensive research of the industry needs and they have been formulated in accordance with that. The ELA certification is divided into three levels based on EQF levels:

Level 4: Supervisory/Operational Management-European Junior Logistician- EJLog, for supervisors in an operational role and for first line managers

Level 6: Senior Management- European Senior Logistician- ESLog, for managers or consultants planning, coordinating and controlling different parts of the logistics network

Level 7: Strategic Management-European Master Logistician- EMLog, for senior managers, senior consultants or directors with considerable experience in logistics management

It should be stated that ELA does not provide the methodology or training that the professionals should fulfil in order to acquire the knowledge and skills required. The provision of training is usually accomplished by national partners which determine the essential procedures. (European Qualification Standards for Logistics Professionals, ELA, 2014. ELA website, 2015)

In UK, most of the associations offering multiple designations in the supply chain are structured on EQF levels and the designations are offered as certifications, awards or diplomas depending on the requirements that are set. A critical feature that should be highlighted, is the fact that one of the Institutes that offers certifications in UK, CIPS which specialises in supply and purchasing, has diagnosed the need to certify occupations, and thus each of the certifications that it provides, suggests typical job titles/occupations. A significant differentiation with the American and Canadian certifications, as well as the ELA certification, is that in UK there is also a potential for people who are not so experienced or even not experienced at all, and for people who are not university graduates, to get trained, qualified, and commence their career in the field of supply chain, in operators' or workers' placements (Table 13).

COUNTRY	ASSOCIATIONS, INSTITUTES, BODIES IN THE SUPPLY CHAIN	CERTIFICATION			
		NAME	FEATURES		
			LEVELS	TOPICS OR OTHER CORE FEATURES	REQUIREMENTS
EUROPE	ELA	ELA CERTFICATION	Structured on EQF levels		
		European Junior Logistician- EJLog	Level 4	For supervisors in an operational role and for first line managers	
		European Senior Logistician- ESLog	Level 6	For managers or consultants planning, coordinating and controlling different parts of the logistics network	
		European Master Logistician- EMLog	Level 7	For senior managers, senior consultants or directors with considerable experience in logistics management	

	IOSCM, Institute of Supply Chain Management	Certifications, diplomas and awards structured on EQF levels	The maximum level that is accredited is level 6	Supply Chain, Freight Transport, Logistics and Transport, Purchasing, Shipping and Warehousing	
	CIPS, Chartered Institute of Procurement and Supply	Suggests typical job titles/Occupations			
		Certificate in procurement and Supply Operations	Typical job titles: Administrative assistant, Purchasing assistant, Contracts administrator, Stock controller, Merchandiser		No special requirements
		Advanced Certificate in Procurement and Supply Operations	Typical job titles: Administrator, Assistant buyer, Assistant contract officer, Contract analyst, Stock/ inventory controller/planner		
		Diploma in Procurement and Supply	Typical job titles: Buyer/Procurement/purchasing executive, Procurement specialist, Contract officer, Supply chain/ inventory/Logistics analyst, Supply chain/inventory/logistics planner		
		Advanced Diploma in Procurement and Supply	Typical job titles: Buyer/Procurement/Purchasing executive, Procurement specialist, Contract officer, Supply chain/inventory/logistics analyst, Supply chain/inventory /logistics planner		
		Professional Diploma in Procurement and Supply	Typical job titles: Strategic/senior/purchasing/procurement manager Head of commercial, Supply chain manager, Head of logistics/transport, Operations manager		
	CILTUK, The Chartered Institute of Logistics and Transport	Certifications, diplomas and awards structured on EQF levels	The maximum level from EQF that is accredited is level 6		

Table 13: Certifications of supply chain professionals in Europe

7 DISCUSSION

The research demonstrates the augmented need of certifying middle management executives, supervisors, operators and workers in the supply chain in Greece. It is crucial that some of *the largest companies in Greece and international ones* were sampled. Another critical fact is that the sample of the aforementioned companies covers *a large spectrum of operations in a great extent of the supply chain* and hence, the respondents had a significant knowledge of the occupations as well as the skills investigated in the research. It was also very important that the author was *guided by the Supply Chain Institute* with great experience in the field of the supply chain in Greece, and could conduct *interviews with exceptionally experienced people*, such as Mr Stamatios Andrianopoulos, MSc Mr Kostas Labrou and Mrs Marilena Argyrou, that directed and facilitated the research. Hence, the scientific level of the study should be considered high. On the other hand, there are limitations that could be attributed to the research. A difficulty of the research was the *demanding level of the second part of the survey questionnaire*. The respondents should complete 5 tables, and the first one with the general knowledge areas and skills required to grade (from 5 to 1) a total of 19 skills for each of the 16 occupations involved (19*16=304 cells). Thus, one could say that the respondent could to some extent intuitively grade skills, and this fact directly affects the results. Hence, *a larger sample* could provide safest conclusions, especially for the identification of the critical skills that the professional should

acquire. Additionally, in order to *extract conclusions about the whole population*, more advanced statistics methods are required (Inferential statistics), which is not in scope of this research project. Besides that, the *results obtained by the interviews could not be easily quantified and combined to the results of the questionnaires;* for instance regarding the 3rd question of the questionnaire that the respondents should grade the significance of the 16 occupations and definitely for questions 5 and 6 (grade the skills), it was impossible to acquire quantitative results during the interviews due to several constraints. However, the results obtained by the interviews further confirmed, extended and added value to the results of the questionnaires, especially in respect to questions 1, 2 and 4, and therefore, they enhanced the validity of the survey.

Implications

The research has several implications; for the Supply Chain Institute of Southeastern and Central Europe who is the main stakeholder of this project, for the Hellenic enterprises and their executives, and for all the interested parties regarding the certification procedure of supply chain professionals in Greece (certification bodies as EOPPEP, universities and so on). Firstly, the results confirm the need for certifying Occupations in the supply chain, and especially those 16 comprised in the research. Second, the identification of the Knowledge Areas and Skills of the Occupations, facilitates the commencement of the certification procedure in terms of development of the essential training programme oriented to the needs of each Occupation. Moreover, it could be stated that the identification of the skills required for the Occupations could be also critical for ***the enterprises*** in order to grasp a more integrated understanding about the skills that the whole industry considers important for each professional, and enhance the competences of their personnel. In these terms, the development or enhancement of internal training programs of the enterprises could be also facilitated. It is also an impetus and a good foundation for ***the Supply Chain Institute of Southeastern and Central Europe*** to establish a certification scheme for supply chain professionals, and the findings of the research can provide a good guidance about the development of an oriented training programme for the acquisition of the essential skills (Applied Business Research, Chapter 2). Additionally, the research provides a basis *for* ***Universities and Educational Institutes*** to get a current grasp of the Hellenic market needs and orient their graduate or postgraduate programmes towards this direction. The interconnection of the universities with the industry is important since several studies that have been published demonstrate the lack of professionals with expertise in the Hellenic supply chain. The knowledge areas and skills presented in this study can guide the universities' programmes concerning the current industry needs. Hence, it can contribute to the creation of programmes that are industry-oriented and enhance the employment of young people who wish to pursue a career in the supply chain sector. Last, it is crucial to state that the certification structure proposed by the author in the last chapter could be the basis of a certification process that would involve the training of people who might are not university graduates, do not yet hold significant working experience or even are not experienced at all. According to the author, the possibility for ***young and not experienced people to get introduced into the supply chain sector*** even in lower level placements (workers, operators) through attending an integrated training procedure that would lead to certification, is remarkable; especially in an era that the unemployment rates for young people are sharply augmented.

8 CONCLUSIONS AND FUTURE RESEARCH

The exploratory research showed that the education provided mostly addresses to senior management placements and there is a lack of workforce with expertise in the supply chain. Additionally, the certification of professionals is still at preliminary level while most of the effort concerns middle and senior management executives. However, it was apparent that there is a substantial need to certify supervisors, operators and workers; the 'blue collar staff' as they are called. There was also a lot of evidence that designated the need to certify occupations in the supply chain. Hence, this Thesis endeavoured to enlighten these issues stated above.

The *first research question* that this Thesis managed to answer concerned the level of significance of certifying professionals in the supply chain for the Hellenic enterprises. The results of the survey and their analysis corroborated the augmented need that was reported in the exploratory research (data from research articles and previous researches) for certifying professionals in the supply chain. The survey conducted by the author and the Supply Chain Institute also showed that the need is especially intense for middle managers, supervisors and operators in the supply chain in Greece. This fact was further enhanced by citing valuable argumentation; several benefits for the enterprises that could be accompanied by the certification of their personnel in the supply chain were identified. Core benefits that could be attributed to the certification according to the survey were the enhancement of implementation of innovation, the increase in productivity and quality of work, the reinforcement of safety in the work environment and the minimisation of risk in managing human resources.

The *second research question* that this Thesis aimed to determine, was the elaboration of the certification for the supply chain professionals in Greece. Namely, since the need for certification is significant, how the whole process should be carried out? Two core components were designated; the identification of the most critical Occupations (sub question 1) and the Knowledge Areas and Skills (sub question 2) required for each Occupation. After extensive research on recent research articles as well as based on the experience of the Supply Chain Institute, 16 occupations were proposed and included in the questionnaire. All of them were considered as significant to be certified by the respondents. The respondents prioritised the Purchasing and Procurement Executive, the Customer Service Manager, the Demand Planner, the Freight Forwarder, the Warehouse Manager, the Customer Service Executive, the Transportation and Distribution Manager, the Warehouse Supervisor, the forklift machinery operator, and the truck driver. The respondents of the questionnaire also proposed occupations that could be added in, focusing on specific areas of the supply chain, such as sales and operations planners, supply planners, accounting, pricing and costing executives, export and import managers and executives, and IT logisticians. The interviewees also foresaw the significance of certifying customs clearers, export and import managers and executives, and master data executives. However, these occupations refer to high expertise, and might could be determined in a more advanced stage of the certification process. Then, for those 16 Occupations, General Knowledge Areas and Skills as well as more Specific and Technical skills were investigated in terms of their significance for each occupation. The results were presented in detail in the Results and Data Analysis chapter. Based on these results the author formulated a proposal about a potential structure of the certification according to the Occupations and the Knowledge Areas and Skills required, which is demonstrated in the next chapter.

9 RECOMMENDATIONS

While considering the results of the survey (questionnaires and interviews) as well as the secondary data (the international experience of certifying supply chain professionals), the author suggests a generic certification structure as demonstrated in Table 14:

LEVELS	LEVEL OF SKILLS REQUIRED BASED ON NQF, EQF	GENERAL KNOWLEDGEA AREAS, SKILLS	SPECIAL KNOWLEDGEA AREAS, SKILLS
1	Levels 1,2,3,4	Warehouse Supervisor, Warehouse worker in Receipts and Returns, Warehouse worker in Picking-Packing-Checking, Forklift Machinery Operator, Transportation and Distribution Executive, Truck Driver with company/public owned trucks Ex van Driver, Courier, Customer Service Executive, Warehouse Administrator	Group A: Demand Planner, Freight Forwarder, Group B: Warehouse worker in Receipts and Returns, Warehouse worker in Picking-Packing-Checking, Forklift Machinery Operator Group C: Truck Driver with company/public owned trucks, Ex van Driver, Courier Group D: Customer Service Executive, Warehouse Administrator
2	Levels 5,6,7	Purchasing and Procurement Executive, Demand Planner, Freight Forwarder, Warehouse Manager, Transportation and Distribution Manager, Customer Service Manager	Group A: Purchasing and Procurement Executive Group B: Warehouse Manager and Supervisor Group C: Transportation and Distribution Manager and Executive Group D: Customer Service Manager

Table 14: Certification structure as indicated by the author

A more extensive sample could demonstrate more reliable results for the Knowledge Areas and Skills required in each Occupation. Moreover, further research is needed to identify Occupations of high expertise that would be valuable to be certified in more advanced stages as well as to determine their essential knowledge and skills.

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APPENDICES

APENDIX 1

International Standard Classification of Education (ISCED)

HOW TO DETERMINE THE LEVEL OF A PROGRAMME				
PROXY CRITERIA FOR CONTENTS		**NAME OF THE LEVEL**	**CODE**	**COMPLEMENTARY**
MAIN CRITERIA	**SUBSIDIARY CRITERIA**			**DIMENSIONS**
Educational properties **School or centre-based** **Minimum age** **Upper age limit**	Staff qualification	Pre-primary education	0	None
Beginning of systematic apprenticeship of reading, writing **and mathematics**	Entry into the nationally designated primary institutions or programmes Start of compulsory education	Primary education First stage of basic education	1	None
Subject presentation **Full implementation of basic skills and foundation for lifelong learning**	Entry after some 6 years of primary education End of the cycle after 9 years since the beginning of primary education End of compulsory education Several teachers conduct classes in their field of specialization	Lower secondary education Second stage of basic education	2	Type of subsequent education or destination Programme orientation
Typical entrance qualification **Minimum entrance requirement**		(Upper) secondary education	3	Type of subsequent education or destination Programme orientation Cumulative duration since the beginning of ISCED level 3
Entrance requirement, **Content,**		Post-secondary non tertiary education	4	Type of subsequent education or destination Cumulative duration since the beginning of ISCED level 3

Age, **Duration**				Programme orientation
Minimum entrance requirement, **Type of certification obtained,** **Duration**		First stage of tertiary education (not leading directly to an advanced research qualification)	5	Type of programmes Cumulative theoretical duration at tertiary National degree and qualification structure
Research oriented content, **Submission of thesis or dissertation**	Prepare graduates for faculty and research posts	Second stage of tertiary education (leading to an advanced research qualification)	6	None

(Source: http://www.unesco.org/education/information/nfsunesco/doc/isced_1997.htm)

APPENDIX 2:

European Qualifications Framework (EQF). Descriptors defining levels in the EQF.

EQF LEVEL	KNOWLEDGE	SKILLS	COMPETENCE
	In the context of EQF, knowledge is described as*theoretical and/or factual*.	In the context of EQF, skills are described as *cognitive* (involving the use of logical, intuitive and creative thinking), and *practical* (involving manual dexterity and the use of methods, materials, tools and instruments)	In the context of EQF, competence is described in terms of *responsibility and autonomy*.
Level 1	Basic general knowledge	Basic skills required to carry out simple tasks	Work or study under direct supervision in a structured context
Level 2	Basic factual knowledge of a field of work or study	Basic cognitive and practical skills required to use relevant information in order to carry out tasks and to solve routine problems using simple rules and tools	Work or study under supervision with some autonomy
Level 3	Knowledge of facts, principles, processes and general concepts, in a field of work or study	A range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information	Take responsibility for completion of tasks in work or study; adapt own behaviour to circumstances in solving problems
Level 4	Factual and theoretical knowledge in broad contexts within a field of work or study	A range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study	Exercise self-management within the guidelines of work or study contexts that are usually predictable, but are subject to change; supervise the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities
Level 5[1]	Comprehensive, specialised, factual and theoretical knowledge within a field of work or study and an awareness of the	A comprehensive range of cognitive and practical skills required to develop creative solutions to abstract problems	Exercise management and supervision in contexts of work or study activities where there is unpredictable change; review and develop performance of self and others

	boundaries of that knowledge		
Level 6[2]	Advanced knowledge of a field of work or study, involving a critical understanding of theories and principles	Advanced skills, demonstrating mastery and innovation, required to solve complex and unpredictable problems in a specialised field of work or study	Manage complex technical or professional activities or projects, taking responsibility for decision-making in unpredictable work or study contexts; take responsibility for managing professional development of individuals and groups
Level 7[3]	Highly specialised knowledge, some of which is at the forefront of knowledge in a field of work or study, as the basis for original thinking and/or research Critical awareness of knowledge issues in a field and at the interface between different fields	Specialised problem-solving skills required in research and/or innovation in order to develop new knowledge and procedures and to integrate knowledge from different fields	Manage and transform work or study contexts that are complex, unpredictable and require new strategic approaches; take responsibility for contributing to professional knowledge and practice and/or for reviewing the strategic performance of teams
Level 8[4]	Knowledge at the most advanced frontier of a field of work or study and at the interface between fields	The most advanced and specialised skills and techniques, including synthesis and evaluation, required to solve critical problems in research and/or innovation and to extend and redefine existing knowledge or professional practice	Demonstrate substantial authority, innovation, autonomy, scholarly and professional integrity and sustained commitment to the development of new ideas or processes at the forefront of work or study contexts including research

(Source: https://ec.europa.eu/ploteus/content/descriptors-page)

APPENDIX 3

Critical Occupations indicated by SEV, 2013

Critical Occupation	Required Knowledge, Abilities - Skills
Supply Chain Manager	Knowledge of specialized programs. Knowledge of economics and finance. Negotiation skills. Knowledge of safety issues. Technical knowledge. Project management skills. Knowledge of foreign languages both oral and written. Communication skills. Management skills and knowledge. Knowledge about human resources management. Perception skills. Presentation skills.
Transportation Manager	Knowledge of telematics and routing. Knowledge about mechanical issues. Extensive knowledge about transportation regulations. Extensive knowledge of safety issues. Knowledge of foreign languages both oral and written. Communication skills. Analytical skills.
Logistics Manager	Knowledge of specialized programs. Knowledge of economics and finance. Knowledge about regulations. Knowledge of safety issues. Knowledge about human resources management. Management skills and knowledge. Analytical skills. Presentation skills.

Logistics Coordinator	Knowledge of supply chain management. Technical knowledge. Knowledge about regulations. Knowledge of foreign languages both oral and written. Teamwork. Perception skills. Information management.
Distribution Manager	Knowledge of telematics and routing. Extensive knowledge about transportation regulations. Extensive knowledge of safety issues. Communication skills. Analytical skills. Negotiation skills.
Export Manager	Knowledge about sales methods. Knowledge of economics and finance. Knowledge about regulations. Knowledge about human resources management. Knowledge about transportation network. Management skills. Communication skills.
Warehouse Manager	Knowledge about human resources management. Ability to use equipment. Technical knowledge. Knowledge of foreign languages both oral and written. Management skills. Knowledge about inventory management. Communication skills. Analytical skills.
Logistics Engineer	Technical knowledge. Knowledge about statistical analysis and mathematics. Knowledge of economics and finance. Knowledge about transportation network. Knowledge about Management systems. Presentation skills. Analytical skills.
Demand Planner	Knowledge about demand management. Knowledge of economics and production. Technical knowledge. Knowledge of foreign languages both oral and written. Communication skills. Teamwork. Perception skills.
Purchasing / Procurement Manager	Knowledge about Supply Chain Management. Technical knowledge. Knowledge about customer service. Knowledge about production. Negotiation skills. Knowledge of economics. Management skills and knowledge. Knowledge about transportation regulations. Communication skills.
Warehouse Coordinator	Knowledge about inventory control. Technical knowledge. Ability to use specialized tools. Knowledge of safety issues. Ability to coordinate processes. Teamwork.
Customer Service Manager	Knowledge about customer service and helpdesk. Negotiation skills. Knowledge of economics. Technical knowledge. Management skills. Perception skills. Teamwork. Ability to use management and solution methods.

(Source: SEV,2013)

APPENDIX 4

Survey Questionnaire

Identity:

Name:

Placement:

Experience in the supply chain (years):

Company:

Job activity:

Total number of employees in your company:

Total number of employees in the supply chain (within your company):

Turnover: 0-2 mil.€ ☐ 2-10 mil.€ ☐ 10-50 mil.€ ☐ 50-100 mil.€ ☐
100-150 mil.€ ☐ > 150 mil.€ ☐

PART A

1. **How significant do you consider the certification for supply chain professionals in middle and lower management level executives for the Greek industry?**

   (Place a number in the cell from 5 to 0. Please consider the following rating scale: 5: Critical - 4: Very Significant - 3: Significant - 2: Slightly significant – 1: Not so significant – 0: Not at all significant)

   ☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ 0

2. **Please evaluate the significance of the following benefits for your company attributed by the certification of the personnel employed within the supply chain (at your company)?**

   (Place a number in the cell from 5 to 0. Please consider the following rating scale: 5: Critical - 4: Very Significant - 3: Significant - 2: Slightly significant – 1: Not so significant – 0: Not at all significant)

BENEFITS	
1. Increase of the productivity and the quality of work of the personnel	
2. Reinforcement of Safety within the work environment	
3. Minimization of risk while managing Human Resources	
4. Avoidance of continuous rotation of the personnel	
5. Enhancement of implementing innovation	
6. Reinforcement of company's brand	
7. Participation in public and private bids	
8. No contribution	

3. **How significant do you consider the certification of the following Occupations for your enterprise?**
   (Place a number in the cell from 5 to 0. Please consider the following rating scale: 5: Critical - 4: Very Significant - 3: Significant - 2: Slightly significant – 1: Not so significant – 0: Not at all significant)

Επαγγέλματα		
1	Purchasing and Procurement Executive	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ 0
2	Demand Planner	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ 0
3	Freight Forwarder	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ 0
4	Warehouse Manager	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ 0
5	Warehouse Supervisor	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ 0
6	Warehouse worker in Receipts and Returns	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ 0
7	Warehouse worker in Picking-Packing-Checking	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ 0
8	Forklift Machinery Operator	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ 0
9	Transportation and Distribution Manager	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ 0
10	Transportation and Distribution Exceutive	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ 0
11	Truck Driver with company/public owned trucks	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ 0
12	Ex van Driver	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ 0
13	Courier	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ 0
14	Customer Service Manager	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ 0
15	Customer Service Executive	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ 0
16	Warehouse Administrator	☐ 5 ☐ 4 ☐ 3 ☐ 2 ☐ 1 ☐ 0

4. **Are there any other Occupations within the Supply Chain in middle management/supervisory or operators level that you consider significant to be certified and were not found in the list above (either within your company or in general)? (If YES, please state up to 5 in the list below)**
   1.
   2.
   3.
   4.
   5.

PART B

5. **How significant do you consider the following General Skills and Knowledge Areas for the following Supply Chan Professions stated below?**

Note: (Place a number in the cell from 5 to 1. Please consider the following rating scale: 5: Critical - 4: Very Significant - 3: Significant - 2: Slightly significant – 1: Not so significant)

(The note is also valid for Question 6)

		GENERAL SKILLS AND KONWLEDGE AREAS	OCCUPATIONS														
			1. PURCHASING AND PROCUREMENT EXECUTIVE	2. DEMAND PLANNER	3. FREIGHT FORWARDER	4. WAREHOUSE MANAGER	5. WAREHOUSE SUPERVISOR	6. WAREHOUSE WPRKER IN RECEPITS AND RETURNS	7. WAREHOUSE WORKER IN PICKING - PACKING - CHECKING	8. FORKLIFT MACHINERY OPERATOR	9. TRANSPORTATION AND DISTRIBUTION MANAGER	10. TRANSPORTATION AND DISTRIBUTION EXECUTIVE	11. TRUCK DRIVER WITH COMPANY OR PUBLIC OWNED TRUCKS	12. EX VAN DRIVER	13. COURIER	14. CUSTOMER SERVICE MANAGER	15. CUSTOMER SERVICE EXECUTIVE	16. WAREHOUSE ADMINISTRATOR
ECONOMCS	1	ACCOUNTING																
	2	COSTING																
LEGISLATION	3	KNOWLEDGE OF LABOR LAW																
	4	SPECIAL LEGISLATION OF EACH OCCUPATION																
INFORMATICS	5	OFFICE – WINDOWS																
	6	ERP																
ENVIRONMENT	7	SUSTAINABILITY																
QUALITY	8	QUALITY MANAGEMENT/ISO																
BUSINESS ADMINISTRATION	9	HUMAN RESOURCE MANAGEMENT																
	10	NEGOTIATION SKILLS																
	11	PERFORMANCE MEASUREMENT/KPIS's																
	12	REPORTING																
	13	TIME MANAGEMENT																
COMMUNICATION	14	COMMUNICATON SKILLS																
	15	TEAM WORKING																
EDUCATION	16	POSTGRADUADE DEGREE																
	17	UNIVERSITY DEGREE																
	18	HIGHSCHOOL																
LANGUAGES	19	ENGLISH																

6. **How significant do you consider the following Special Skills and Knowledge Areas for the following Supply Chan Professions stated below?**

	SPECIAL SKILLS AND KNOWLEDGE AREAS	1. PURCHASING AND PROCUREMENT EXECUTIVE	2. DEMAND PLANNER	3. FREIGHT FORWARDER
1	TERMS-REGULATION OF INTERNATIONAL TRANSPORTATION (INCOTERMS)			
2	TRANSPORTATION OF FREIGHTS (ROAD – SEA - AIR – RAIL)			
3	GENERAL KNOWLEDGE OF CUSTOMS PROCEDURES			
4	DESIGN AND MANAGEMNT OF BIDS AND CONTRACTS			
5	ASSESSMENT METHODS OF SUPPLIERS			
6	ABC ANALYSIS			
7	FORECASTING & INVENTORY CONTROL			
8	SALES			
9	INFORMATION SYSTEMS FOR PLANNING - SCHEDULING - FORECASTING			

Please state up to 5 additional skills and knowledge areas that you deem significant, and consider the rating scale above

	OTHER SKILLS AND ABILITIES			
1				
2				
3				
4				
5				

	SPECIAL KNOWLEDGE AREAS AND SKILLS	4. WAREHOUSE MANAGER	5. WAREHOUSE SUPERVISOR	6. WAREHOUSE WPRKER IN RECEPITS AND RETURNS	7. WAREHOUSE WORKER IN PICKING - PACKING - CHECKING	8. FORKLIFT MACHINERY OPERATOR
1	BASIC PRINCIPLES OF ERGONOMY					
2	PROPER USE OF HARDWARE (SCANNERS, PRINTERS κ.ά.)					
3	WAREHOUSE MANAGEMENT					
4	LEAN - 5S					
6	CONTROL AND MANAGEMENT OF INVOICE					
8	MAINTENANCE OF MACHINERY AND EQUIPMENT					
9	PALLET MANAGEMENT					
10	PACKAGING AND MATERIALS					
11	WMS					
12	HEALTH AND SAFETY OF WORK					

Please state up to 5 additional skills and knowledge areas that you deem significant, and consider the rating scale above

	OTHER SKILLS AND ABILITIES					
1						
2						
3						
4						
5						

SPECIAL SKILLS AND KNOWLEDGE AREAS		9. TRANSPORTATION AND DISTRIBUTION MANAGER	10. TRANSPORTATION AND DISTRIBUTION EXECUTIVE	11. TRUCK DRIVER WITH COMPNAY OR PUBLIC OWNED TRUCKS	12. EX VAN	13. COURIER
1	SAFE LOADING					
2	SAFE AND ECONOMICAL DRIVING					
3	VEHICLE MAINTENANCE					
4	POD APPLICATIONS					
5	COLLECTION OF MONEY					
6	REVERSE LOGISTICS					
7	MANAGEMENT OF RETURNED MERCHANANDISE					
8	CUSTOMER-CENTRIC BEHAVIOUR					
9	BASIC PRNCIPLES OF SALES AND DELIVERIES					
10	MERCHANDIZING					
11	TELEMATICS					
12	FLEET MANAGEMENT					
13	DANGEROUS FREIGHTS MANAGEMENT (ADR)					
14	MANAGEMENT OF VULNERABLE PRODUCTS IN TEMPERATURE, FREEZING EQUIPMENT					

Please state up to 5 additional skills and knowledge areas that you deem significant, and consider the rating scale above

	OTHER SKILLS AND ABILITIES					
1						
2						
3						
4						
5						

	SPECIAL SKILLS AND KNOWLEDGE AREAS	14. CUSTOMER SERVICE MANAGER	15. CUSTOMER SERVICE EXECUTIVE	16. WAREHOUSE ADMINISTRATOR
1	CUSTOMER SERVICE / HELP DESK			
2	e-INVOICING			
3	PRICING			
4	SERVICE LEVEL AGREEMENTS			
5	MANAGEMENT OF CUSTOMER COMPLAINTS			
6	BASIC KNOWLEDGE OF PRODUCTS FOR SERVICING CUSTOMERS(SOLVE PROBLEMS etc)			
7	BASIC PRINCIPLES OF WAREHOUSE MANAGEMENT			
8	BACK ORDERS MANAGEMENT			
9	MANAGEMENT OF CREDIT BALANCES			
10	MANAGEMNT OF RETURNS OF MERCHANDISE			
11	SLAES & MARKETING (DISCOUNTS, PROMOTION etc)			
12	KNOWLEDGE OF CRM SYSTEMS			

Please state up to 5 additional skills and knowledge areas that you deem significant, and consider the rating scale above

	OTHER SKILLS AND ABILITIES			
1				
2				
3				
4				
5				

Thank you for your participation

CERTIFYING SUPPLY CHAIN PROFESSIONALS IN GREECE

CRITICAL OCCUPATIONS, KNOWLEDGE AREAS AND SKILLS

A Hellenic Industry Research

Recent research studies that have been published in Greece, have demonstrated the lack of expertise in supply chain management professionals. This fact is enhanced by the deficiency in designating the most critical occupations in the sector. Most of the studies that have been conducted are focusing on senior and strategic management executives, while not determining the needs of the lower level executives. However, the problem is remarkably intense in lower levels of the organisational structure, especially in supervisory and operational placements, in 'blue collar staff'. People who are employed in these positions, have usually acquired just a basic education, and the execution of their job duties is mostly based on their experience and in some cases, on internal training processes that might be implemented in the enterprise. Therefore, the existence of a certification based on the current needs of the Hellenic industry, could provide professionals the essential level of knowledge and skills according to the requirements of the enterprises. Hence, the enhancement of the qualities of the current professionals, the acquisition of the essential skills for people who now wish to enter professionally into the supply chain sector, the mitigation of the time needed for the enterprises to educate their executives as well as several other benefits, could be facilitated. This Thesis project, besides corroborating the aforementioned need of certifying middle management executives, supervisors, and operators, explored the *Critical Occupations* that the Hellenic industry considers significant to be certified in the supply chain, and investigated the *Knowledge Areas and the Skills* that are deemed important *for each Occupation.* These critical Occupations as well as the Knowledge and Skills were researched by surveying some of the largest enterprises, international and Hellenic brands, operating in Greece. The international experience about the certification of supply chain professionals was also cited. Ultimately, the author formulated a brief suggestion about the elaboration and the structure of the certification in the Hellenic supply chain.

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