Skills and competencies employers require from supply chain graduates

A job advertisements content analysis
Abstract

Background: The skills and competencies of the professionals in the supply chain sector have been highlighted since the 1960s as an area of academic interest. In modern days there are reports and articles highlighting a “skills-gap” between employers’ requirements and business graduates. In the meanwhile youth unemployment is a contemporary, acknowledged European problem and therefore there shouldn’t be a gap between supply and demand of young talents. Therefore it raises questions as to why employers report lack of young talents and at the same time youth unemployment is on the rise.

Purpose: The present thesis will answer part of the abovementioned questions. More specifically it will measure the part of employers’ expectations. For that reason it will investigate in a transparent and systematic way, the requirements that employers state they expect from business graduates within the supply chain function through published job advertisements.

Method: Empirical data consist of 60 publically available job advertisements aiming at supply chain graduates. The collected empirical data were analysed by the means of quantitative content analysis and then cluster analysis.

Results and conclusion: The contemporary supply chain graduate is expected to demonstrate an all-around personality. The most frequently requested skills were teamwork, problem-solving ability, effective communication, English, and having a responsible, mature and professional attitude.

Suggestions for future research: A longitudinal study in a broader linguistic context would raise awareness on emerging skills and track changes over time.

Keywords

supply chain, graduates, skills, competencies, employers, job advertisements, quantitative, content analysis, cluster analysis,
Thanks

I consider the present thesis not an individual’s piece of work but rather the result of support coming from a group of people.

It would certainly be impossible to happen without the constant support of my dear family and Elektra Kotzampopoulou.

All the professors in the master programme of business process and supply chain management have opened doors to knowledge, I previously ignored. Therefore I am thankful to every single one of them. Exceptionally I must thank my tutor Peter Berling and my examiner Helena Forslund for their patience, advice, and guidance.

Växjö, September 2014

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1 Introduction

This chapter provides a background description of the research area by explaining how supply chain management is linked to the social world, addressing a contemporary social problem. The chapter outlines a motivation for the importance of writing the thesis, a problem discussion, research questions, purpose and disposition of the thesis.

1.1 Background

“Educational accomplishments denoted by academic degrees or by certificates are not accomplishments at all if in the process of acquiring learning the holders of the degrees or certificates have not gained awareness of their responsibilities to the public as well to their organisations they serve” (Scheleen, 1961, p. 8)

The statement above is from the very first editorial of Transportation Journal in 1961, a statement that very didactically highlights the strong link between logistics education and society. A bidirectional relationship, as the author later suggests, for it is also the society’s purpose to develop transportation statesmen, a word that implies something more than plain coordinators, and that is people who are expected to demonstrate skilful management of public affairs and possess adequate knowledge in economics, marketing, accounting, and finance in order to understand fully the panoramic view of the enterprise (Scheleen, 1961).

In the same scientific direction, and in continuation to transportation management, supply chain management (SCM) viewed as a business philosophy is part of the social sciences. As such, it is expected in postgraduate (masters) programmes to provide knowledge and skills demanded by industries operating within a broader social context (Bourlakis, et al., 2013).

The supply and demand mismatches in vocational training is a chronic concern of the contemporary society, yet the ability of the educational system to keep searching for the right direction is what really counts over time (Moura Castro & Cabral de Andrade, 1990).

Articles regarding the significance of educational issues in SCM have been published for over fifty years. Another article from the early 1960’s discusses the educational needs of the traffic managers (a prevailing term at the time) and underlines the importance of educated and multi-skilled logisticians. Furthermore the issue of
graduates entering the transportation’s sector is being briefly analysed along with the need for continuously up-to-date courses from the educational institutes (Henderson, Jr, 1963). Up to this date, academia is showing a continuous interest to improve our understanding on the proper education for a supply chain manager and the competencies that he/she should possess, through the frequent publication of articles concerning the issue (Murphy & Poist, 2006; Thai, 2012).

Murphy & Poist have extensively studied the set of skills and competencies for supply chain managers and logistics from various viewpoints (1991a, 1991b, 1998, 2006, 2007) using the BLM (Business, Logistics, Management) framework developed by Poist in 1984. A framework, consisting of approximately 70 skills, used also by other authors (Thai, 2012; Thai, et al., 2011), with three standard axis of skills, Business, Logistics and Management.

The skills of supply chain management professionals have also been addressed from an educational mismatch perspective (Mangan, et al., 2001; Bourlakis, et al., 2013). A research viewpoint that tends to emphasize more on the supply and demand mismatches in business graduates education, between master programmes and jobs advertisements with the use of content analysis (Bourlakis, et al., 2013) or interviews (Mangan, et al., 2001) rather than testing through surveys the relative importance of each BLM skill in different contexts.

From a management control point of view, the importance of knowledge and skills in SCM is very well illustrated in the Balanced Scorecard, where the human resources section, including the employee skill measures, forms the base of an organization’s performance (Kaplan & Norton, 1996). With more recent studies to indicate that even purely supply chain scorecards could benefit from incorporating measures from human resources about training and retention (Lohman, et al., 2004) the vital role of SCM skills in the contemporary organization becomes more apparent.

1.2 Problem Discussion

In a broader context, a recent Eurostat report shows that youth unemployment in the old continent is at decade high and the trend does not look promising to decline (Eurostat, 2014). The European heads of state are acknowledging the challenging situation and are showing a concerned attitude for the confrontation of the phenomenon. In July 2013, after a summit in Berlin to discuss the issue, the German chancellor Angela Merkel
stated that it is “perhaps the most pressing problem facing Europe at the present time” (Der Spiegel b, 2013), while later on that year’s November in Paris, François Hollande said “at stake is the future of an entire generation” (Der Spiegel a, 2013). Two summits dedicated to youth unemployment were held during 2013 by the European Union and a third one is planned to take place in Rome on February 2014.

![Figure 1: Youth unemployment and employers’ expectations, source: The Economist](image)

One of the explanatory theories supports the argument that despite more people looking for work, employers cannot find the skills they need in several European countries with Sweden being among them (McKinsey&Company, 2013). On 18th January 2014, an Economist’s article referring to the McKinsey report, discusses and relates the abovementioned phenomenon to the fast-changing jobs market and the employers’ expectations on graduates’ qualifications. One of the conclusions, in the article, is that there is a “mismatch between what educations systems provide and what employers need”.

Another recent article from the Economist on February 8th (Schumpeter, 2014), is strongly criticizing business schools worldwide for not providing enough good managers providing two reasons. The author claims that business schools have been captured, first of all, by the academic guild and secondly by herd mentality. Academic stars having too little incentive to focus in teaching and produce usable research, instead they produce oceans of papers with little genuine insight published in obscure periodicals that no manager would ever dream of reading. Those are only some of the accusations the author brings forward, putting a huge question mark on the role of contemporary business teaching and research society.

Nowadays business graduates, in general, are encouraged more than ever to look for international experiences which are highly regarded by employers, and as stated in a
relevant article: “The kids who will be successful today are those that take themselves out of their comfort zone and develop a global mind-set” (Kadlec, 2014). Beyond studying abroad, employment in a foreign country is thought to build a young person’s contacts, context, and international cultural awareness (Kadlec, 2014). Accordingly graduates from supply chain programmes would benefit and mature professionally proving themselves outside the “comfort-zone”. Yet the question remains whether they are equipped with the necessary skills.

Other studies support the opposite theory, that employers are not willing spent time in training their employees and that the skills gap therefore an artificial justification of such attitude. In any case the problem remains.

Past research studies regarding the skills and competencies of entry-level and senior supply chain managers did result in some prevailing frameworks, yet they have been carried out in contexts that do not contribute in analysing the present European and global situation in relation to supply chain management graduates. More specifically, to the best of the author’s knowledge, there has been no thorough and systematic study investigating exclusively employers’ demands from supply chain graduates and therefore a timely and original study would provide valuable insight.

1.3 Purpose statement

Prior to answering the main research question ambition of the present thesis is to proceed with a systematic and robust method that will be replicable, and transparent to scrutinize frameworks used to research skill and competency requirements for logistics and supply chain management. It is only after that step that we can be sure we have employed the most applicable solution for the current research project.

The aim of this thesis is to investigate what employers actually state they want in job advertisements. The requirements employers express are a major means by which they indicate, in a more or less effective way, what they want from potential employees. The thesis investigates a sub-set of the supply chain job market by analysing ads for positions suitable for early career graduates. The nature of this topic dictates a comparative analysis of supply chain and logistics job advertisements in addition to a literature review that will provide the theoretical background for critical reflection on contemporary data and analysis.
1.4 Basic Terminology and delimitations

Before continuing, basic terms need to be defined. Gammelgaard & Larson (2001) classify educational requirements of logisticians and supply chain managers into skills and competencies. Skills cover general, context-independent knowledge; general tools and rules taught in most logistics classes, which are vital for the practitioner. Competencies refer to experience-based and context-dependent knowledge. To reach a competence level in the logistics discipline, practitioners acquire context-dependent knowledge through organizational experience. Referred to as recent graduates here, we define supply chain graduates those with up to three years of work experience from university level supply chain programs, either of Bachelor or Master level. Job advertisements will be searched published only in English.

1.5 Research questions

Educators and potential graduates need to understand what skills and competencies employers actually require at any point in time and this study addresses the following questions:

**RQ1:** What does the current body of knowledge (literature) suggest for the skills and competencies of supply chain graduates?

**RQ2:** Which skills and competencies and employers list in current ads for supply chain graduates in globally?

**RQ3:** To what extend findings from current study support or contradict conclusions from past research?

The contribution of the present study lies primarily in fact that it addresses skills and competencies demanded in the global workplace for supply chain graduates and will supply relevant feedback information to an audience of three: educators, students and employers. As there will be similarities and common ground with other studies, the exclusive focus on jobs appropriate for recent supply chain graduates will shed light on the mix of skills and competencies which are currently in demand, allowing a more in depth analysis.
2 Methodology

In this chapter we will introduce the initial decisions necessary in conducting research. Discuss the methodological tools that will be considered and showing the range of choices for the given study. Accordingly we will discuss the proper random sampling techniques, with issues of access to sampling frames, message archive documentation and the management of the medium.

2.1 Methodological Review

Four main sources will be employed for the present methodological review:

1. A selected set of journal articles that employ content analysis as a research method and job advertisements as a research dataset.
2. An acclaimed guidebook on content analysis.
3. A recent literature review book on research methods in supply chain management.
4. A book on business research methods

Each chosen source serves a unique and specific role in this methodology chapter. In this way we look upon similar methodological examples, study a specialized guidebook on the selected methodology, and position the present study relative to the body of supply chain management and business research.

![Methodological review diagram]

Figure 2 A hierarchical view of the methodological ingredients, own-created

The first source, the set of articles, was selected through Web of Science Core collection. More specifically we carefully chose articles that would include in their TOPIC the terms content AND analysis AND job AND advertisements AND (logistics OR "supply chain"). The rationale behind this was to find some examples of similar or identical research works in a supply chain management or logistics context, to provide a
benchmark and a point of reference in analysing job advertisements. This yielded 3 methodological examples/articles:


2. Kovács, G., Tatham, P. & Larson, P. D., 2012. What skills are needed to be a humanitarian logistician?. *Journal of Business Logistics*


The second source, (Krippendorff, 2004), provides the history and core principles of content analysis. It examines conceptual and methodological aspects and traces several research paths through content analysis protocols. Wolf (2008) selects content analysis as one of her core methods to research supply chain management literature between 1990 and 2006. Therefore not only is it an example of an extended study that uses content analysis in a supply chain context but it also reviews a representative body of recent supply chain research.

### 2.2 Research paradigm

The term paradigm refers the school of thought that each study belongs, the cluster of beliefs that influences the study and the basic approach and attitude of how the researcher views reality (Bryman & Bell, 2007). In his book *The Structure of Scientific Revolutions*, Thomas Kuhn (1962, p.10) first uses the term to describe “some accepted examples of actual scientific practice – examples which include law, theory application and instrumentation together – provide models from which spring particular coherent traditions of scientific research.

Recently Wolf (2008) seeking to recognize the major philosophical underpinnings of SCM research, analyzed 282 journal articles from 1990 to 2006, and identified the dominant research paradigms. The vast majority of the articles (81%) followed a positivist and post positivist tradition, whereas critical theory approaches accounted for 18%, and two articles (1%) investigated SCM through a participatory lens. No articles were found to belong in the constructivist tradition (Wolf, 2008). Thus she confirms...
earlier studies in logistics and SCM which suggest that the domain is steeped in the positivist paradigm and past research is heavily normative (theoretical models and literature reviews) and quantitative (modelling and surveys) (Kotzab, et al., 2005).

**Positivism** in epistemological terms (what is regarded as acceptable knowledge) advocates the application of the methods of the natural sciences to the study of social reality and beyond (Bryman & Bell, 2007), the investigator and the analyzed object are perceived to be independent entities, and thus the researcher is neither influencing nor influenced from the object (Wolf, 2008), in a detached and neutral relationship with the setting (Kotzab, et al., 2005). Research must be conducted in a way that is value free (objective) and biases prevented as far as possible from influencing outcomes (Bryman & Bell, 2007; Wolf, 2008). From an ontological perspective (the nature of social entities) positivists assume that reality is apprehend-able through its immutable laws and mechanisms (Wolf, 2008).

The call for more explicit statements of the research approach in logistics research (Spens & Kovacs, 2006) finds the present study intending to follow to a large extend the philosophical stream of positivism as the basic attitude will be to test a certain theory, approaching the issue with objectivism. As such, the research paradigms of Sodhi, et al., (2008), Bourlakis, et al., (2013) and Kovács, et al., (2012), who have researched the subject in US and UK and humanitarian contexts respectively, will be analysed to derive relevant research techniques in combination with Krippendorff’s (2004) guidebook . What is initially common in all three studies is the use of content analysis as a tool for collecting and analysing data through jobs advertisements requiring SCM/logistics skills.

### 2.3 The nature of SCM research and content analysis

The relationship between theory and practice in business and management research is viewed by Bryman & Bell (2007) citing the work of Gummesson (2000), to be represented by academic researchers and management consultants as groups of knowledge workers who place a different emphasis on theory and practice, but with closely related roles fundamentally. According to Bryman & Bell (2007) content analysis is an approach to the analysis of documents and texts, that seeks to quantify content in terms of predetermined categories and in a systematic and replicable way. Another similar definition by Weber (1990, p.9) is: “Content analysis is a research method that uses a set of procedures to make valid
inferences from text. These inferences are about the sender(s) of the message, the message itself, or the audience of the message”. As a technique it relies on a predefined coding scheme for textual data that can then be analysed with statistical techniques and so it is perceived to be at the intersection of qualitative and quantitative traditions, fit for balanced approaches in research (Wolf, 2008; Kotzab, et al., 2005), therefore not delimiting the scope of the researcher’s inquiry and his/her ability to contribute to the body of knowledge (Kotzab, et al., 2005).

Bryman & Bell (2007) discussing content analysis as business research method identify the advantages and the disadvantages of it. Among its advantages one will identify the increased transparency as a research method, as the coding scheme can be clearly described and follow-up studies are therefore feasible. The relative ease by which it allows longitudinal studies, as the researcher can track changes in frequency over time e.g. in job advertisements. It’s also an unobtrusive method, not entailing participants, therefore a non-reactive method. Meaning that, the documents studied are not written in the knowledge that a content analysis may one day be carried out on them. Therefore it overcomes the problem which individuals tend to deny socially undesirable manners and only admit socially desirable ones.

Characterized as the fastest-growing technique in quantitative research (Neuendorf, 2001, p.1) content analysis is not widely used by operations management researchers; yet, “in other business disciplines [it] has been firmly established as a methodological tool” (Montabon, et al., 2007, p. 1002). However during the last decade it has been employed as a research technique for generating, collecting and analysing data on a range of SCM topics:

- scientific developments, the nature and quality of research (Wolf, 2008; Spens & Kovács, 2006; Pedrosa, et al., 2012)
- value-based supply chain management (Brandenburg , 2013)
- sustainability (Seuring, et al., 2005)
- customer service (Naoui , 2013)
- skills (Sodhi, et al., 2008; Bourlakis, et al., 2013; Kovács, et al., 2012).

As with other scientific paradigms, the techniques used in content analysis are expected to be reliable, results to be replicable, and researchers in different points in times should get the same results, when applying the same technique to the same phenomena (Krippendorff, 2013). In general, content analysis material tends to be more illustrative and didactic rather that dogmatic, for there is no simple right way to do it, but
investigators must judge what methods are most appropriate (Weber, 1990). That of course does not cancel the existence of reliability, validity, which makes particular demands on content analysis (Krippendorff, 2013). Content analysis employed by researchers as a mean to study the knowledge and skill mismatch in USA (Sodhi, et al., 2008) and UK (Bourlakis, et al., 2013) indicate that earlier research paradigms do exist in this relatively unexplored area. The two aforementioned studies that will influence and guide the collection of empirical evidence in our present study have both examined the “space” between academia and practice in SCM, using similar research methods and techniques. They both made use of jobs advertisements as a mean that will indicate and provide knowledge for contemporary demand, and on the other hand, the content of MBA courses to explore the supply side. Another commonality of the two aforementioned studies is that they do not discuss questions related to reliability and validity, thus the quality of studies in content analytical approaches to SCM research can still be increased.

2.4 Cluster analysis

In his work on content analysis, Krippendorff (2004) suggests some analytical and representational techniques so that inferences from text can be easily understood, patterns can be discovered and relationships that an unaided observer would overlook can be identified. Among the suggested multivariate techniques is factor analysis, multidimensional scaling and cluster analysis. Yet, unlike the rest, cluster analysis is particularly popular in content analysis because it is based on intuitively meaningful similarities among units of analysis through a wide variety of available clustering algorithms. (Krippendorff, 2004). Therefore cluster analysis, the choice of this study, as a follow-up analytical technique on content analysis is among the natural analytical choices in the relevant literature.

As a term, cluster analysis is used to describe a group of statistical procedures designed to discover classification within complex data. (Gore, 2000). The primary goal of cluster analysis is to partition a set of objects into two or more groups based on the similarity of the objects. The issue of sample size in cluster analysis does not relate to any statistical inference power (i.e. statistical power). Instead the sample size must be large enough to provide sufficient representation of small groups within the population and represent the underlying structure. (Hair, et al., 2010, p. 519)
Considering the relation of cluster analysis to other multivariate procedures, one could find it closely related to discriminant analysis due to the fact that they both concerned with the characteristics of groups of objects. Yet the most important difference between the two techniques is that discriminant analysis is used to identify a subset of variables that can classify a new observation to predetermined groups, whereas cluster analysis begins with undifferentiated groups and attempts to create clusters of objects based on the similarity among a set of variables (Gore, 2000). In addition, it can be employed as a data exploration tool as well as for hypothesis testing and confirmation purposes, yet the most frequent use, as in the present study, is in the development of a typology or classification system where one does not already exist (Gore, 2000).

Gore (2000) also provides more advice when it comes to using cluster analysis, such as:

1. Use theory to guide research questions and to identify populations and variables of interest
2. Use theory to guide the choice of a measure of association and clustering algorithm
3. Conduct analysis using more than one method to increase confidence in findings
4. Cross-validation is the best way of demonstrating internal validity of a cluster solution
5. Cluster study should be considered a first step whenever the investigator is interested in how clusters relate to other phenomenon
6. Provide a thorough description of the procedure in a written report

2.5 Message units and sampling

Prior to deciding the message units it is an imperative demand to state the fundamental assumption of the present research project, which primarily is the statement that the content of job ads is a valid representation of the labour demands of employers, an assumption that has been employed previously in identical studies (Kennan, et al., 2009). Job ads analysis is widely used and publicly available job listings is claimed to be a fairly representative list of what is available regarding the knowledge, skills and competencies in demand (Kennan, et al., 2009; Molinero & Xie, 2007).
In order to achieve our research objectives, we will follow the research paradigm of Molinero & Xie, (2007) which is based on content analysis of textual data from job advertisements and using multivariate data analysis. In our case the sources will be:

1. Supply Chain-logistics graduate programme job ads from all over the globe

Job ads for the demand-side analysis will be collected online from the websites [www.graduateland.com](http://www.graduateland.com) and [www.linkedin.com](http://www.linkedin.com). We will initially screen all jobs available at the time of data collection (2\textsuperscript{nd} and 3\textsuperscript{rd} quarter of 2014) that will be under the categories of supply chain and logistics management and remove ads for non-degree holders.

For each ad we will introduce categorical variables for Requirements for professional qualification. While Bourlakis, et al. (2013) choose to focus only in the UK, we will choose to look for supply chain and logistics job ads from all over the world following the rationale of globalisation that encourages business graduates to look for international experiences.

The data will be analyzed in terms of occurrence of relevant words and phrases, a technique which has been used in many skill requirements studies (Sodhi, et al., 2008; Bourlakis, et al., 2013). The words and phrases in text will be deduced to certain categories according to the “dictionary”. A “dictionary” is a constructed set of content categories on the basis of a single concept (Weber, 1990), which in our case is SCM skills. This strategy provides us with numerous categories into which most words in the texts can be classified, and is a necessary, preparatory step (Weber, 1990). Such a “dictionary” has been created in previous similar studies e.g. Sodhi, et al., (2008), used also by Bourlakis, et al., (2013). Their “dictionary” lists 13,080 words and phrases up to six words long, placed in categories and sub-categories. For example the phrase “demand management” belongs in the sub-category Forecasting which belongs in the category Inventory and forecasting. Then the frequency of appearance of a set of skill (and related keywords and phrases) will indicate the relative demand for these skills (Bourlakis, et al., 2013). Yet, in an email discussion with the above authors, the advice was to create a new ad-hoc dictionary that would fit the purpose of the study, and so it was done.

In content analysis a unit is an identifiable message or message component which:

a) Serves as the basis for identifying the population and drawing a sample

b) On which variables are measured

c) Serves as the basis for reporting analyses.
Units can be words, characters, themes, time periods, interactions, or any other result of “breaking up a communication into bits” (Neuendorf, 2001, p.71). In the present study each job ad will be the research unit. Sampling as a process of selecting a subset of units for study from a larger population will have to be defined for the job ads source. As such the websites www.gratuateland.com and www.linkedin.com will be used to search for SCM graduate programmes and graduate positions globally.

2.6 Ethical considerations

As part of a business research project it is required to take under consideration a set of ethical principles suggested by relevant literature. According to Bryman & Bell (2007) such principles are revolved around four main areas:

- Harm to participants
- Lack of informed consent
- Invasion of privacy
- Deception

Harm to participants refers to actual or potential physical harm; participants’ development or self-esteem; stress; harm to career prospects or future employment and is regarded as unacceptable. Suggested ways to prevent are maintaining confidentiality of records and anonymity of accounts.

Lack of informed consent refers to whether observed participants actually want to participate in a research project, and be informed about the research process.

Due to the nature of the present study, analyzing public web content, there was low potential breach of the above mentioned ethical principles. The anonymity of the companies participating in the job ad population was considered, and therefore the companies whose job advertisements were analysed, are not mentioned. Lack of informed consent in job advertisement analysis is indeed an issue and participating companies can be informed that their public content will be analyzed. The current study does not take under consideration the abovementioned principle, due to the small-scale nature of the project.
2.7 Reliability and validity

Cronbach's alpha, is widely used for an entirely different purpose and is unsuitable for evaluating reliability in content analysis (Krippendorff, 2004, p. 222). Therefore this study will employ Krippendorff’s alpha, a coefficient designed to assess reliability in content analysis.

In its most general form, Krippendorff’s alpha is defined by:

$$\alpha = 1 - \frac{D_o}{D_e}$$

Where $D_o$ is a measure of the observed disagreement and $D_e$ is a measure of the disagreement that can be expected when chance prevails. $\alpha = 1$ indicates perfect reliability, $\alpha = 0$, indicates the absence of reliability and negative values with maximum being $\alpha = -1$ shows systematic disagreement (Krippendorff, 2004). Krippendorf’s (2004) suggestions are to:

- rely only on variables with reliabilities above $\alpha = .800$
- consider variables with reliabilities between $\alpha = .667$ and $\alpha = .800$ only for drawing tentative conclusions

The present study has the conceivably simplest reliability data which are generated by two observers who assign one of two available values (0/1) to each of a common set of units of analysis. We will use a macro in SPSS (Hayes & Krippendorf, 2007). Validity provides convincing reasons for taking the results of scientific research seriously (Krippendorff, 2004). In content analysis, validity implies that inferences drawn from text fulfil speak as truthfully as possible to as many as possible, and distinguishes validity in three categories:

- **face validity**: being obviously true, sensible, plausible
- **social validity**: addressing important social issues, contributing to public debates
- **empirical validity**, the degree to which available evidence and established theory supports intermediate stages of research process and its results

*Face validity* is “obvious” and “common truth”. Does it make sense? Does it make sense, indeed to measure an issue by the relative frequency with which the issue is mentioned in certain type of media (Krippendorff, 2004)? In the present study face validity is reflected on the question: does it make sense to measure the skills that are being mentioned in job advertisements as a reflection of the employers’ requirements?
The answer to that lies primarily and exclusively on the fact that there is a plethora of available past and identical studies that measure the frequency that certain words appear in job advertisements as reflection of the required job skills.

*Social validity* is that quality of research findings that leads up to accept them on account of their contribution to the public discussion of social concerns (Krippendorff, 2004). In our current study is reflected on its contribution to the public debate of whether supply chain graduates should be more focused on being managers or logisticians.

*Empirical validity* is the degree to which available evidence and established theory support various stages of research process, the degree to which specific inferences withstand the challenges of additional data, of the findings of other research efforts, of evidence

### 3 Theory

*The theoretical chapter presents theories relevant to the research questions, used to analyze the empirical data. The chapter begins by describing how academic articles around skills and competencies in supply chain management were selected and continues with a review of the selected theory*

#### 3.1 Introduction

Rigorous research can only be conducted in relation to existing knowledge so that we don’t “reinvent the wheel”; therefore a literature review is an essential part of the research process to ensure that. The activity of reviewing the relevant literature satisfies two specific functions. As a starting point, it helps to generate new ideas and also summarizes existing research through the identification of patterns and themes. Secondly, it justifies the notion of *contribution* to research, since it is enfolded against existing theories. (Seuring, et al., 2005, p.92)

“A research literature review is a systematic, explicit and reproducible design for identifying, evaluating, and interpreting the existing body of recorded documents” (Fink, 2010, p.3). It is focusing on high-quality original research to ensure that the results of the review will be under the researcher’s supervision and accurate (Fink, 2010). Contrasting to subjective examinations of recorded information, such a review, after examining the sources, describes and justifies what is done, so that someone else can reproduce it and determine objectively whether to accept the results of it. Subjective
reviews tend to choose sources without justifying why they are selected, giving equal credit to good or poor studies. Results are often based on partial examination of the available literature and findings may be inaccurate or even false. (Fink, 2010, p.16)

3.2 Aim, Delimitations and Basic Terminology

The aim of this literature review is to outline the existing knowledge on what are the appropriate skills and competencies of a supply chain and logistics practitioner. We researched in Web of Science™ Core Collection only for journal articles, excluding proceedings papers, which include in their title the words:

1. “supply” AND “chain” AND “skills”
2. “supply” AND “chain” AND “competencies”
3. “logistics” AND “skills”
4. “logistics” AND “competencies”

resulting in 18 unique articles in Grade Four, Three and Two journals, according to the ABS Journal guide 2010. The results were further refined by excluding articles that their abstract did not indicate relevancy with the research, limited down to 9.

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<td>Supply Chain Management - an International Journal</td>
<td>Priorities and determinants for supply chain management skills development in manufacturing firms</td>
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<td>3</td>
<td>Supply Chain Management - an International Journal</td>
<td>Developing competencies of supply chain professionals in Australia: collaboration between businesses, universities and industry associations</td>
<td>2013</td>
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<td>International Journal of Production Economics</td>
<td>The effect of individual, network, and collaborative competencies on the supply chain management system</td>
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<tr>
<td>5</td>
<td>International Journal of Logistics-Research and Applications</td>
<td>Competency requirements for professionals in logistics and supply chain management</td>
<td>2012</td>
</tr>
<tr>
<td>6</td>
<td>Supply Chain Management - an International Journal</td>
<td>Mastery of operational competencies in the context of supply chain management</td>
<td>2009</td>
</tr>
<tr>
<td>7</td>
<td>Supply Chain Management-an International Journal</td>
<td>Skill requirements for logistics license in Taiwan</td>
<td>2006</td>
</tr>
<tr>
<td>8</td>
<td>Industrial Marketing Management</td>
<td>Purchasing/supply chain management flexibility: Moving to an entrepreneurial skill set</td>
<td>2005</td>
</tr>
<tr>
<td>9</td>
<td>Journal of World Business</td>
<td>Effect of export financing resources and supply-chain skills on export competitive advantages: Implications for superior export performance</td>
<td>2001</td>
</tr>
</tbody>
</table>

As a next step and to ensure that the research is not failing to cite influential papers, the set of eleven articles was analysed to identify certain citation patterns with CitNetExplorer. More specifically we were interested in the cited references of each of the nine articles, to identify secondary sources that would be mentioned more than twice
(≥3). The rationale is that in a small set of articles, a work that is cited in more than two indicates an influential paper.

The total cited publications in the initial 9-article set were 420, yet 23 of them were mentioned in at least two of the initial 9-article set, showed more analytically in the table below:

<table>
<thead>
<tr>
<th>No. of journal articles</th>
<th>Cited times</th>
<th>Level of potential influence</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>4</td>
<td>High</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>Medium</td>
</tr>
<tr>
<td>17</td>
<td>2</td>
<td>Low</td>
</tr>
</tbody>
</table>

As stated above primary focus will be in the first two categories work of High and Medium potential influence.

<table>
<thead>
<tr>
<th>No.</th>
<th>Journal</th>
<th>Article/book title</th>
<th>Year</th>
<th>Cited</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Journal of Business Logistics</td>
<td>Logistics skills and competencies for supply chain management</td>
<td>2001</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Supply Chain Management - an International Journal</td>
<td>Skill requirements of senior-level logisticians: a longitudinal assessment</td>
<td>2007</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Non applicable</td>
<td>Psychometric Theory - book</td>
<td>1978</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Non applicable</td>
<td>Multivariate Data Analysis - book</td>
<td>1998</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>International Journal of Physical Distribution &amp; Logistics Management</td>
<td>Skill requirements: perception of the senior Asian logisticians</td>
<td>2001</td>
<td>3</td>
</tr>
</tbody>
</table>

Indeed several highly relevant works were revealed to have been missed from the initial search. Works no. 1, 2, 5, and 6 will be used in the following literature review whereas the rest were excluded as not relevant to the present study. Works no. 3 and 4 simply indicate the influence of psychometric theory and the use of multivariate analysis in the research field. Works cited four times, with high level of potential influence where 100% relevant to the present study whereas 50% of the studies with medium level of potential influence, were found to be useful.

The following discussion is limited to 13 peer-reviewed journal articles, published in English from 1998 to 2013. The primary use of such a review is to describe how much is known about the body of research and to support the need for and significance of new research.
3.3 Literature description

The distribution of the publication in the researched period (1998-2013) is displayed in Figure 4. Even though the number of studied papers is rather small (N=13) the distribution illustrates a low and sporadic interest on the subject. Gammelgaard & Larson (2001) used surveys and case studies as complementary methods and so the paper was measured as half-case study and half-survey.
3.4 Results synthesis

This compact body of knowledge, will allow us to have a brief introduction to recent theories around the skills and competencies of supply chain professionals and logisticians. The skills and competencies that a supply chain graduate or professional should possess is an ongoing discussion that has been multiply addressed from various researchers in the past (Murphy & Poist, 2007).
Razzaque and Sirat (2001) investigating the perception of senior Asian logisticians, find that what is more important to that geographical context and hierarchical level, is to be a multi-skilled generalist rather than a technically-oriented specialist. They (Razzaque & Sirat, 2001) make the use of the influential BLM (business logistics management) research framework developed by Poist in 1984, which classifies the skills a logictician professional should possess into three categories. Business knowledge and skills are defined as related to business directly (e.g. marketing, accounting) and indirectly (psychology, public relations) (Razzaque & Sirat, 2001). Logistics knowledge and skills refers to functional knowledge such as transportation, warehousing, or forecasting whereas management knowledge and skills describe personal attributes such as supervision, time management, enthusiasm, self-confidence and even personal grooming habits (Razzaque & Sirat, 2001).

A factor analysis helped the authors to reduce the skills and competencies to fewer structures. As such, the factor with the highest mean value was managerial ability and includes the abilities to adapt to change, organize, listen, manage time, supervise and do managerial control (Razzaque & Sirat, 2001). Secondly strategic ability consists of the ability to plan, delegate responsibility, view firm as a system and self-confidence. While the two highest ranked factors belong to the managerial category, the third one, storage/warehousing, is of a logistics nature and includes inventory control, warehousing, materials handling, and packaging. The fourth most important factor for senior Asian logisticians was personal qualities, which according to their factor analysis includes the sub-skills of: personal integrity, self motivation, enthusiasm, personal grooming habits, and personal dress habits. The fifth factor in their study is from the business category, called operations skill consisting of the skills: transport and logistics, procurement, production, and marketing (Razzaque & Sirat, 2001).

On the same year, Gammelgaard & Larson (2001) develop their own extensive research framework with 45 skills and by arguing that logisticians are called to develop new skills, they proceed to their skills and competencies research. Investigating mid-level managers they employ a factor analysis to collapse the 45 skill areas into a smaller set. The three factors constructed are:

1. Interpersonal/managerial basic skills
2. Quantitative/technological skills
3. SCM core skills
**Interpersonal/managerial basic skills** include: ambition, critical thinking, decision-making, ethical awareness, listening, motivation, organizing, presentation skills, prioritizing, problem solving, self-directed learning, self-discipline, speaking, oral communication, time management, training, writing/written communication.

**Quantitative/technological skills** include: database ability, IT systems development, computer programming, quantitative methods, software knowledge, spreadsheet abilities, statistical analysis, knowledge of latest technology, knowledge of newest techniques.

**SCM core skills** include: ability to see the "BIG picture", change management, confidence, conflict management, cross-cultural awareness, foreign language, knowledge of the industry, leadership, negotiation, organizational culture awareness, project management, selling, supply chain awareness, and teamwork.

Interestingly, six skills failed to load on any of the above three factors: ability to perform under pressure, creativity, facilitation (of meetings), flexibility, multi-cultural awareness, and scheduling (Gammelgaard & Larson, 2001). Further on the authors identify the top five ranked skills: teamwork, problem solving, supply chain awareness, ability to see the “BIG picture”, and listening, which belong either to Interpersonal/managerial or SCM core skills. Once again prioritizing the managerial aspect of supply chain’s role against the technical/specialty one.

Murphy & Poist (2007), in a longitudinal study of senior-level logisticians with their BLM framework, find that Management skills are still more important than the Logistics and thirdly Business skills, which reinforce and update their findings from a 1991 (Murphy & Poist) study. They argue as well that their findings suggest that 2007 logisticians have a more supply chain orientation than in 1991. The five highest ranked management skills are motivate others, personal integrity, decision making ability, ability to persuade, oral communication (Murphy & Poist, 2007).

In an Australian context, investigating mainly mid-level managers Prajogo & Sohal (2013) identify communication and teamwork as the most important competencies for successful supply chain integration. They describe communication and teamwork as the ability to work effectively with individuals and groups/teams – cross-culturally, intra and inter organisationally, to manage relationships in diverse contexts and communicate effectively through different media and styles (Prajogo & Sohal, 2013, p.
Other skills that were included in their framework were: technology skills, initiative and enterprise skills, and compliance and legal knowledge. Yet, Prajogo & Sohal (2013) conclude that a supply chain professional should possess a diverse set of competencies and skills, of both technical and inter-personal nature, important for the successful integration of different business processes along the supply chain.

Lorentz, et al., (2013) design their research around manufacturing firms and their respective SCM skill development priorities. What they find is that skills that enable the connection of customers and suppliers to the company’s processes are relatively a more important development priority. As such their top five consists of:

1. Demand forecasting and supply planning
2. Sourcing and supplier management
3. Customer and distribution channel management
4. Production planning and control
5. Information systems for logistics and production planning

Thai (2012), investigating supply chain professionals define them as well trained, skilled that mainly performs managerial or administrative work, whose main capital is knowledge. He/She is developing a career and does not have an occasional relationship with the domain, but may be of entry level or experienced. His study confirms previous studies in a Singaporean context that logistics managers are managers first and logisticians later.
The overview table below presents the top skills in each of the study in the selected literature, own-created

<table>
<thead>
<tr>
<th>Article titles / author</th>
<th>Five highest ranked skills and competencies</th>
</tr>
</thead>
</table>
| Skill requirements: perception of the senior Asian logisticians, Razzaque & Sirat (2001) | 1. Managerial ability  
2. Strategic ability  
3. Storage and warehousing  
4. Personal qualities  
5. Operational skills |
| Logistics skills and competencies for supply chain management, Gammelgaard & Larson (2001) | 1. Teamwork  
2. Problem solving  
3. Supply chain awareness  
4. Ability to see the “BIG Picture”  
5. Listening |
| Skill requirements of senior-level logisticians: practitioner perspectives, Murphy & Poist (1998) | 1. Personal integrity  
2. Ability to motivate  
3. Ability to organise  
4. Ability to plan  
5. Customer Service |
| Skill requirements of senior-level logisticians: a longitudinal assessment, Murphy & Poist (2007) | 1. Motivate others  
2. Personal integrity  
3. Decision making ability  
4. Ability to persuade  
5. Oral communication |
| Supply Chain professionals: a study of competencies, use of technologies, and future challenges, Prajogo & Sohal (2012) And Developing competencies of supply chain professionals in Australia: collaboration between businesses, universities and industry associations, Sohal (2013) | 1. Ability to work effectively with individuals and groups/teams – cross-culturally, intra and inter organisationally  
2. Ability to manage relationships in diverse contexts – cross-culturally, intra and inter organisationally  
3. Ability to manage risks in supply chain and their associated issues  
4. Ability to make use of numerical techniques for decision making (e.g. forecasting and scheduling)  
5. Project Management skills and ability to lead major projects |
| Priorities and determinants for supply chain management skills development in manufacturing firms, Lorentz, et al. (2013) | 1. Demand forecasting and supply planning  
2. Sourcing and supplier management  
3. Customer and distribution channel management  
4. Production planning and control  
5. Information systems for logistics and production planning |
| Competency requirements for professionals in logistics and supply chain management, Thai (2012) | 1. Personal Integrity  
2. Managing client relationships  
3. Problem-solving ability  
4. Cost control  
5. Ability to plan |
2. Influence and persuasion  
3. Internal motivation  
4. Creativity  
5. Risk management |
4 Empirical Data

In this chapter the results from the collected job advertisements are presented. A descriptive section shows how the data was collected and transformed from text to quantitative binary data.

The data set consists of all the relevant job advertisements published in www.graduateland.com between 12th February 2014 and 12th April 2014, and additional ads from www.linkedin.com during June, July and August 2014. Even though previous studies (Sodhi, et al., 2008) have used www.monster.com a pilot search revealed mainly re-published ads from human resource agencies, which include limited information, and therefore was not used further on. The strategy for approaching the data collection was to collect ads that are the product of a clear human resource strategic plan on behalf of the employers. Job ads that revealed the criteria for inclusion in graduateland and linkedin in the data set were:

1. Job type: Graduate programmes
2. Job position: Supply Chain & logistics

In the first wave of job advertisement collecting, information was collected from 40 advertisements in www.graduateland.com, but some appeared more than once and therefore duplications were excluded from the data set. This reduced the total number to 23. An additional search for supply chain graduate programmes and positions was employed to increase the small population through www.linkedin.com, which resulted in 40 additional ads. Therefore the final total population of ads was increased to 63 and resulted in a satisfying population for further analysis which were all checked binomially (0/1) on 36 skills and competencies identified from relevant literature.

A job advertisement consists of a variety of information, and one may argue that information on the skills and competencies required may be sporadically placed in a job advertisement. But we had to choose a way in which analysis can be conducted in a systematic way, as much as possible. Therefore the information to be coded was selected only from the section with the following titles: Who we are looking for, Requirements, prerequisites, Knowledge and experience required, Qualifications, What we need, Skills and Experience, What does it take?, We expect you to have, What do I need to qualify for this job?, Your profile, Your background and skills, Competence needed.
Every job advertisement, beyond the scattered secondary information on skills and competencies required, did include a distinct section which identified clearly the candidate’s qualifications. This section varied in its title, as seen above; nevertheless it provided the exclusive source of information per advertisement.

Advice from previous researchers was taken under consideration. In short, previous researchers did provide the dictionary by which words and phrases from supply chain job advertisements were linked into skills but in an email conversation Dr. Son, Byung-Gak, Senior Lecturer in Supply Chain Management at Cass Business School, advised “If you want to go ahead with sw (software) content analysis, you might need to build your own dictionary based on the ads you have. Otherwise you’d miss out some.” Therefore the provided dictionary served the consulting role of an expert.

The first step was to quantify the skills found in the job advertisements. Each advertisement’s qualifications’ section was imported in MAXQDA® (Figure 7), a software programme for systematizing, organizing, and analyzing qualitative data. It is used by universities all over the world (MAXQDAa, 2014), and has been employed in numerous academic publications (MAXQDAb, 2014). Data entry in MAXQDA® allowed an easier extraction of raw quantitative data for further analysis in SPSS®. The reliability of coding was a further area of concern, thus inter-coder reliability was tested on one advertisement. Another post graduate student was employed as a second coder. He randomly picked an advertisement and independently re-coded it based on the “Coding-manual” document (Appendix B) that was provided after a short-training
session. Accordingly data was entered in SPSS and Krippendorff’s alpha was calculated. A Krippendorff’s alpha = 0.8731 indicated a satisfying inter-coder validity.

<table>
<thead>
<tr>
<th>Krippendorff's Alpha Reliability Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpha</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>0.8731</td>
</tr>
</tbody>
</table>

Judges used in these computations:
Nikolaos Xiaoran

Figure 8, Output for Krippendorff’s alpha (Hayes & Krippendorff, 2007) from SPSS, own created

The difficulty of coding skills and competencies varied. Skills such as teamwork, problem solving ability, flexibility, high average grade, two or more languages, and leadership were rather easy to identify, yet others such as “Responsible, mature and professional” needed more time to be identified. As in previous studies (Molinero & Xie, 2007) data was coded in zero/one variables providing binary/binomial/dichotomous data. The table below provides an equivalent to the “dictionary” used in similar content analysis studies. Any phrase from the “phrases/words” column indicated the requirement for a skill in the “Skills” column; phrases found more than one was marked only once.

Table 1 Dictionary used for the conversion of words to skills, indicative sample for the top 10 skills, own-created

<table>
<thead>
<tr>
<th>Skills</th>
<th>Phrases/ Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teamwork</td>
<td>• team player&lt;br&gt; • ability to work in a team&lt;br&gt; • ability to build and maintain strong relationships in a cross-functional environment&lt;br&gt; • work well as part of a team&lt;br&gt; • thrive on delivering excellent performance to your team&lt;br&gt; • work in teams&lt;br&gt; • team working spirit&lt;br&gt; • ability to work well with others as a team</td>
</tr>
</tbody>
</table>
| Problem solving ability | • pragmatic  
• analytical skills  
• problem-solving  
• affinity with numbers  
• strong analytical approach |
| Flexible | • flexible  
• flexible and mobile  
• high learning agility  
• flexibility  
• ability to adapt to change |
| High average grade | • with a grade average of 70%  
• good scholastic record  
• GPA 80% or better  
• excellent track record and good academic background  
• above average university degree  
• bachelor with great results  
• graduated with a minimum 2:2 degree  
• minimum 2:1 degree  
• strong academic track record  
• minimum achieved grade of 2:2 |
| Two or more languages | • good command in both English & Mandarin  
• fluency in English (additional/local languages a plus)  
• English language is a must, German or French would be an advantage  
• Bi-lingual in Dutch (native speaker) and English. French is also an advantage  
• fluency in English (spoken and written) and good German knowledge  
• command of one of the Nordic languages and English  
• excellent command of English, additional languages advantageous  
• English and at least one Nordic language  
• English spoken & written for contact with suppliers + french |
| Understanding logistics terminology | • major in Logistics or related is preferred  
• a bachelors or advanced qualification in supply chain, or a supply related field  
• bachelor’s degree in Logistics, Supply Chain  
• business degree in Logistics, Supply Chain or similar  
• bachelor within economic, maritime, logistic or commercial areas  
• Procurement, Supply Chain or Business related degree  
• experience about supply chain  
• master's degree in supply chain management  
• degree qualified in a relevant discipline, e.g. Logistics, Supply Chain Management, Procurement, Operations and Supply Chain Management |
| Responsible, mature and professional | • Strong sense of responsibility  
• Mature, professional personality  
• attention to detail with discipline to follow through on assigned tasks  
• willingness and capability to take handle difficult situations, with a strong sense of responsibility  
• structured and methodical approach to work and follow things through  
• independent and responsible  
• readiness to take on responsibilities and work independently  
• detail oriented  
• high degree of ownership |
| Leadership | • leadership  
• leaders in their profession  
• potentially want to become the future leader of our business |
| Enthusiasm | • ambitious individual with a passion and drive to excel  
• high degree of initiative, energy  
• willing to learn and continue to challenge oneself  
• high level of energy  
• have the drive to learn and succeed |
• eager to learn and roll up your sleeves
• challenge your talent in order to become one of our future high potentials

General business administration

• Post graduate qualification in business
• Degree should be Business, Marketing, Management, Commerce
• Master’s Degree within Economics or a relevant field of study is preferred
• Business related degree
• In a business subject

Ability to plan and organise

• strong capabilities to prioritise, optimise and perform under limited resources and tight deadlines
• project management skills
• Ability to think and plan in a proactive manner
• Organized and reactive
• proactive

List of skills and competencies

1. Ability to plan and organise
2. Adapting to organisational change
3. Ambitious
4. Analysing statistical data
5. Creativity - Outside the box thinker
6. Customer service
7. Effective verbal communication
8. Effective written communication
9. English
10. Enthusiasm
11. Expertise in interpersonal relations
12. Flexible
13. General business administration
14. High average grade
15. Identifying opportunities and threats
16. Impact of globalisation
17. Information system management
18. Knowledge of operations
19. Leadership
20. Local citizenship
21. Long-term commitment
22. Perform under pressure
23. Personal integrity
24. Problem-solving ability
25. Product demand forecasting
26. Production planning
27. Public Relations
28. Purchasing
29. Responsible, mature and professional
30. Self-motivation
31. Strategic management
32. Teamwork
33. Two or more languages
34. Understanding logistics terminology
35. Use of logistics specialised softwares
36. Work experience (max 3 years)
5 Analysis

This chapter provides the analysis of the empirical data. After being quantified, a descriptive part of the data is presented. A paretto chart, a dendrogram and a bar-chart are the main visualization tools used.

The data collected were kept in the form of a table of variables by job advertisements and cases by skills and competencies and it will be analysed by means of multivariate analysis tools, in particular hierarchical cluster analysis. The objective of the analysis is to see the way in which skills and competencies are related and explore if they tend to appear in combinations. A “tree diagram” or dendrogram indicates the sequence in which points are merged. Each time a merger takes place a branch is created indicating how far apart the points merged were. When the branches are short, the points have much in common. When the branches are long, the points have little in common. What is meant by “large” is a matter of judgement (Molinero & Xie, 2007). The dendrogram can be seen in Figure 7. We used Ward’s agglomeration approach which attempts to maximize similarity between clusters while maximizing dissimilarity between clusters, and tends to produce reasonable results (Molinero & Xie, 2007).

![Dendrogram](image)

Figure 9 Choropleth map of the job ads collected, viewed by countries, own created

Additional information regarding the initial location of each job was also collected. Using SPSS®, a choropleth map visualizes the countries and the count of the collected ads. Most jobs for supply chain graduates are located in Europe and secondarily China
and United States.

Figure 10 Bar-count of the job ads collected, viewed by country, own created

Job ads in countries that are not visible due to their geographical size is Denmark (9 ads), Singapore (3 ads) and Taiwan (1 ad). It does provide an overall view of the regions that provide opportunities for international supply chain graduates, in an English-based context. The search for job ads was conducted using English key words; therefore an improved research project could possibly be conducted in several languages.

Figure 11 Bar-chart with all the skills and competencies observed and cumulative ratio, own created
The skills that have been observed in the level of 80% of the total observations from left to right stop at the skill *Self-motivation*, including it. Interestingly two requirements that are identified in this thesis are flexibility and being a responsible, mature and professional person. Employer’s ads, besides previously known skills, require from graduates to be flexible, both in terms of mobility and as a general personal characteristic and professional, in terms of acting independently, being confident, . In terms of educational background, both engineering degrees and business/management degrees were requested, which again indicates the dyadic nature of the supply chain domain.

*Figure 12 Dendrogram from SPSS cluster analysis showing two distinct clusters, own created*
The dendrogram reveals two main clusters, yet the two of them are closely related. The first cluster (green) consists of the skills: 7, 8, 11, 29, 1, 24, 9, 36, 12, 16, 13, 33, 10, 30, 14, 19, 34 and 32. The second cluster (yellow) includes skills: 25, 26, 18, 21, 2, 28, 20, 15, 31, 3, 27, 23, 5, 6, 35, 22, 4, 17. Now “cluster analysis, along with factor analysis, is much an art as a science” (Hair, et al., 2010, p.518) and in order to make a meaningful interpretation of the clusters we also looked at the descriptive statistics. We observed (Figure 14) that the “green” cluster colour includes skills and competencies towards the high frequency skills, whereas the “yellow” cluster tends to include skills and competencies with medium and low ranged frequency skills.

The clusters are as follows:

Table 2 Skill clusters, own created

<table>
<thead>
<tr>
<th>green cluster</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teamwork, Understanding_logistics_terminology,</td>
</tr>
<tr>
<td>Problemsolving_ability, Two_or_more_languages,</td>
</tr>
<tr>
<td>Ability_to_plan_and_organise, Flexible,</td>
</tr>
<tr>
<td>Responsible_mature_professional, Leadership, English,</td>
</tr>
<tr>
<td>Impact_of_globalisation, Expertise_in_interpersonal_relations</td>
</tr>
<tr>
<td>High_average_grade, Self-motivation,</td>
</tr>
<tr>
<td>Work_experience_(max_3_years), Effective_verbal_communication,</td>
</tr>
<tr>
<td>Effective_written_communication,</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>yellow cluster</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perform_under_pressure, Identifying_opportunities_and_threats,</td>
</tr>
<tr>
<td>Local_citizenship, Strategic_management,</td>
</tr>
<tr>
<td>Use_of_logistics_specialised_softwares,</td>
</tr>
<tr>
<td>adapting_to_organisational_change, Analysing_statistical_data,</td>
</tr>
<tr>
<td>Customer_service, Knowledge_of_operations, Long-term_commitment, Personal_integrity, Product_demand_forecasting,</td>
</tr>
<tr>
<td>Production_planning, Purchasing, Information_system_management,</td>
</tr>
</tbody>
</table>
On those grounds, it may be argued that a meaningful interpretation of the green cluster is to be seen as a representation of the core, very important skills and competencies employers require from supply chain graduates (Figure13). A candidate that demonstrates teamwork abilities, understands logistics terminology, has analytical and problem solving abilities, speaks two or more languages, can plan, organize and prioritize his tasks, is flexible and mobile, and shows independence and professionalism is the golden candidate.

Furthermore he/she will show high potential performance, as reflected in his/her high average academic grade, leadership skills, has international experience or has worked with other cultures, is a self-motivated and quick learner, is an expert in interpersonal relations, negotiator, as described in an ad “he can influence without formal authority”, and has some relevant work experience.

Specialized logistics and supply chain competencies were found to be sporadically requested, such as knowledge of ERP systems, production planning, or product demand forecasting.
The additional cluster analysis, in an attempt to classify job ads, did reveal two clear clusters yet it made limited meaningful classifications associated to what the employers need from supply chain graduates. As past studies have revealed clustered skills for operations research candidates (Molinero & Xie, 2007), such results were not revealed in the present study. In the way that Gammelgaard & Larson (2001) refer to skills and competencies, results indicate that employers’ requirements are more based on graduates’ skills and less on competencies. In similar studies conclusions have been reached through surveys yet looking through the above 63 job advertisements, teamwork has also been identified as the top skill in Gammelgaard & Larson (2001) followed by problem solving ability, which is also the main outcome of the present study.

To sum up, a clear direction of the job requirements towards managerial and personal attributes for supply chain graduates rather than logistics is also apparent, supporting the “statesman” view of transportation managers from the 1960’s. Yet the present study
supports profiles the contemporary supply chain graduate and supports findings from past research in two ways:

- Possessing managerial skills are a good starting point for a career in supply chain management
- “All-round player” is a term that briefly describes the employers’ expectations from supply chain graduates

Figure 15 The present study, through the study of job ads, supports results and updates knowledge from past studies in the field of SCM skills

6 Conclusions

This chapter provides the main results and conclusions. Lastly, practical contributions, limitations and future research suggestions are presented.

The present study looked into job advertisements for supply chain graduates as a source of information on required skills that employers demand. It made use of two specific scientific tools, taught in the present MSc programme, to analyse the collected data: content analysis and cluster analysis. Both of which were part of quantitative research methods. In general, the study confirms and updates findings from past researches but approached from a different methodological angle as way to triangulate past results. Thus the findings from Murphy & Poist (2006), that entry-level logistics personnel, such as graduates are expected to be “well-rounded” with a strong emphasis on personal characteristics are viewed to be confirmed. What is quite apparent is the cross-functional, networking and problem-solving attitude of the modern supply chain
graduate. He/she has to be ready to “roll up his sleeves” within a team, and is not an isolated, shiny, cutting diamond or a bright lone star. Even though he is expected to demonstrate leadership potential he will have to act in a constellation of players. The employing cliché “hire for attitude and train for skills” also appears to be valid. What are requested in most job advertisements for graduates are not specific technical skills and competencies but behavioural, attitude and indicators of potential performance (high average grade).

The findings of this thesis have potential implications for various stakeholders including student/graduates, employers and educators. For students and graduates, the results provide a view of how employers will look on them, what attributes they will be expected to demonstrate other than a good academic record and an educational background in supply chain or logistics management. Expectations on team work, problem solving abilities and flexibility are aspects that are perceived as very important in the job market; along with being someone others can rely on, being mature and professional with leadership potentials, as viewed in the core cluster.

For employers it provides a benchmark comparison of what the broader job market requires from supply chain graduates. Employers that expect their new supply chain employees to possess significant technical competencies should reconsider their human resource strategy, as the overall picture of the market shows that the prevailing approach is to “hire for attitude and train for skills.”

For supply chain professional educators it may serve as a contemporary indicator, a “compass” on planning, designing or re-directing curricula. E.g. programmes with too much focus on individual assignments may have to re-design some aspects of their programme since team-work is so highly required from employers.

Finally, the findings of this study are subject to a number of limitations. A main limitation of this study is the relatively small sample size. Another limitation is the exclusive use of job advertisements written in English. The study is also limited to jobs suitable for recent supply chain graduates justified on the grounds that supply chain management is a large field and focusing the investigation on a part of it is likely to produce more useful results than a study attempting to analyse all levels of positions. Yet no study could hope to identify all available jobs at any point in time as jobs are advertised in a wide range of sources.
In terms of data analysis, a limited number of statistical operations can be applied to processing textual data and whether binominal classifications can be objectively extracted from textual information is an ongoing debate in content analysis. Therefore the author might be blamed for a degree of subjectivity in the attempt to generate binominal scales from the abovementioned textual data.

The above limitations are not considered to bias, yet the study would benefit from a larger population, including non-English context. Finally, while this study represents an attempt to highlight some of the skills and competencies contemporary supply graduates are called to possess, it is quite logical that it cannot be adequate in providing a holistic picture. Future research may benefit from providing a longitudinal study, examine and reveal the change over time of the employers’ expectations, and raise awareness on emerging skills. Such a monitoring will provide useful insight and enable proactive attitude from the abovementioned stakeholders.
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Appendices

Appendix A – The job advertisements

1. Who we are looking for

- Post Graduate Qualification in Business or related discipline (with a grade average of 70%) with a maximum of 3 years’ relevant work experience.
- A South African Citizen
- Ambitious individual with a passion and drive to excel.
- Have an international mind-set and excellent command of English (both spoken and written).
- A pragmatic and holistic thinker.
- Resourceful and flexible with strong capabilities to prioritise, optimise and perform under limited resources and tight deadlines.
- Strong desire to pursue a long-term career within the commercial part of the business.

2. Requirements

- University graduate or above, major in Logistics or related is preferred.
- At least 2 years related working experiences is a must.
- Mature, presentable and independent with good interpersonal skills.
- Strong sense of responsibility, self-motivated with positive working attitude, a strong team player.
- Natural leadership qualities, flexible & mobile, can work under pressure.
- Good command in both English & Mandarin.

3. Who we are looking for

Since DIGP programme is an extensive and highly competitive programme, we are looking for candidates with

- a strong educational background with some work experience;
- Bachelor degree and above with 2 years’ work experience (incl. part time, internship experience, Logistics related preferred).
- The Degree should be Business, Marketing, Management, Commerce, Engineering or something related.
- International travel, International work experience and Significant achievements will add advantage
- Shipping industry knowledge not mandatory
- Mature, professional personality with realistic goals and good communication skills
- Fluency in English (additional/local languages a plus)
- Flexible team player, networker, and collaborator
- Global mindset, social and intercultural competency

4. Pré-requisitos:

We are interested in candidates who hold a bachelors or advanced qualification in supply chain, science, engineering or a supply related field. We are open to people who have recently completed their studies and are looking for a first position, or those who have up to three years post-university professional experience and are wishing to broaden their skills. English language is a must, German or French would be an advantage. Good analytical and interpersonal skills, project management skills coupled with high learning agility, proactivity and ability to work in a team are essential.
5. Knowledge and experience required:

Education: Bachelor’s degree in Logistics, Supply Chain or Industrial Engineering. To be considered for the Trainee program, candidates must have:

- A good scholastic record
- Proficient computer skills, including Microsoft Word, Excel, Visio
- High degree of initiative, energy and ownership.
- Ability to think and plan in a proactive manner
- Attention to detail with discipline to follow through on assigned tasks.
- Ability to build and maintain strong relationships in a cross-functional environment.
- Strong analytical and problem-solving skills.
- Excellent skills in verbal and written communications.
- Ability to operate in a multi-tasking environment.

Specific experiences will be considered a plus:

- Prior Internship/Co-op experience working in a logistics or supply chain environment.
- Engineering standards (work measurement, time studies...)
- Statistical analysis tools (Minitab)
- Project management, Six Sigma and/or leadership skills.

Other Considerations:

- Open to US citizens only
- Must be willing to travel domestically and internationally
- Willingness to relocate

6. We recruit people who are visionary, can take the initiative and seek out ways to advance our business success so we’re looking for graduates with the following qualities and skills:

- Bachelor or Master Degree
- Bi-lingual in Dutch (native speaker) and English. French is also an advantage
- Have a strong interest in logistics & transport
- Customer focused
- Excellent communication, organisational and interpersonal skills
- Good analytical and problem solving skills
- Demonstrate leadership skills/potential
- Ability to build relationships and work well as part of a team
- Willingness and capability to take on difficult situations, with a strong sense of responsibility
- Flexibility and mobility to move between DHL sites within the Benelux (most of our DHL sites are located in the south of the Netherlands and in the Northern part of Belgium)
- Must have a current driving licence and access to own car
- Willing to start in operations & work in warehouse environment, prepared to work shifts

7. Qualifications

- Expecting a Bachelor’s Degree in business, engineering or medical disciplines.
- GPA 80% or better.
- Strong communication capabilities
- Willing to learn and continue to challenge oneself
- Disciplined and capable of self-management
- Team player

8. Who we are looking for

To succeed, you will thrive on delivering excellent performance to your team with tasks of complexity ranging from the highest to the lowest. You have a rational mindset, the ability to interact naturally and professionally with high level stakeholders. You possess a high level of energy and integrity, showing yourself as an agile learner. You have a structured and methodical approach to work and follow things through.

You should have 1-2 years of working experience, an excellent track record and good academic background.

A high level of IT proficiency, especially MS Excel, is required.

You must be a highly-driven individual who relishes challenges, as you will be expected to deliver excellent results in your projects, course modules spanning across three cities around the world in addition to excellent performance at work.
9. **What we need**

   - An above average university degree (diploma, Bachelor’s or Master’s degree)
   - Fluency in English (spoken and written) and good German knowledge

10. **Skills and Experience:**

   - Graduate with a Business Degree in Logistics, Supply Chain or similar prior to commencement
   - A credit average in your degree
   - A strong skill base in the Microsoft office package
   - Strong written and oral communication skills

11. **What does it take?**

    DFDS’s trainee program is designed for candidates who have a fresh bachelor or plan to complete their bachelor in 2014. The study must be within economic, maritime, logistic or commercial areas. It’s a requirement that you have finished your bachelor with great results along with a keen interest in the industry. As you will work in different locations around northern Europe and our corporate language is English, you must be fluent in English.

    As a person you have outstanding Interpersonal skills, with specific ability to work in teams. To get success as a trainee in DFDS you must be proactive, open minded, independent and responsible. You must be eager to learn and roll up your sleeves, take a chance when you see one and be ready to step out of your comfort zone and dig into a whole new world of opportunities.

12. **Are you ready for the challenge? Join us!**

    To join us we want you to be recently graduated or have up to two years of working experience and have a Master’s Degree within Economics or Engineering, a relevant field of study is preferred. You have excellent command of one of the Nordic languages and English. You have a drive for results and the ability to learn on the fly. International and FMCG experience is a big plus. At last but not least, you have a great passion for our brands and our business.

13. **What do I need to qualify for this job?**

    We expect you to have:
    - Work experience in customer service, preferably gained in an international environment,
    - At least a student of a bachelor’s degree,
    - Very good written and verbal communication in English and in German,
    - Very good working knowledge of MS Office package,
    - Knowledge of SAP and travel arrangement related applications would be an advantage,
    - Excellent communication and presentation skills,
    - Customer-oriented approach,
    - Ability to handle pressure and able in work in a fast-paced, deadline-driven environment,
    - Proactive approach to problem solving and flexibility
    - Team player attitude.

14. **What do I need to qualify for this job?**

    You will be graduating or have graduated with a minimum 2:2 in a Procurement, Supply Chain or Business related degree.
15. **Qualifications**

In order to succeed in this exciting role, we expect you to have experience about supply chain, product marketing, and product management. M.Sc. studies preferred. Working knowledge about sales & operations planning (S&OP) and affinity with numbers needed. Excellent language and communication skills in English are needed.

16. **Your profile**

You will have graduated recently with a master's degree in law, supply chain management, international business, engineering or a like and have delivered excellent results.

It is a requirement that you have a maximum of 12 months of relevant professional experience, and that you are fluent in spoken and written English.

As you will be joining a dynamic company with ambitious goals and targets, it is important that you are able to adapt yourself to an ever-changing working environment.

You are eager to challenge your talent in order to become one of our future high potentials within one of our three career paths, ie as a line manager, a project manager or a specialist.

Some of your key motivators are to be challenged daily on your personal and professional skills. Therefore, you must be able to draw on a strong analytical approach, enabling you to handle a range of complex tasks quickly. You have a strong personal drive and a highly developed learning ability.

Furthermore, you are a good communicator and focus on stakeholder management. You have a commercial mind-set and a keen interest in procurement. Finally, being a team player is vital to your personal success, and it is essential that you thrive on meeting new people.

17. **Candidate requirements**

- Fluent in English
- Organized and reactive
- Committed
- Competencies in VB macro would be a plus

18. **Your profile**

- Bachelor degree completed or in master studies
- Availability in summer 2014 (16 June to 5 September)
- Excellent command of English, additional languages advantageous
- Readiness to take on responsibilities and work independently
- Strong analytical, conceptual and communication skills

19. **Qualifications**

You will need a minimum 2:1 degree in a business subject, with excellent analytical skills, commercial acumen, creative thinking and strong leadership qualities.
### Qualifications
- Your background and skills
  - Masters Degree with strong academic track record
  - Extracurricular activities and/or work experiences outside the academic world, that display your commercial awareness, drive and leadership potential
  - Most likely some international experience
  - Fluent in English and at least one Nordic language

### What we look for
If you have the potential, the appropriate degree and the desire to progress your career within a global organisation, we want to hear from you.

Your creativity will be encouraged and we will look to you for suggestions on how we can improve the things we do.

You must possess a good technical grounding and have the desire to become expert in your field and potentially want to become the future leader of our business.

You must also demonstrate evidence of our core values.

Essentially you must possess the following:
- A minimum achieved grade of 2:2 within the relevant subjects detailed below
- Degree qualified in a relevant discipline, e.g. Logistics, Supply Chain Management, Procurement, Operations and Supply Chain Management, Engineering Management, Mechanical, Civil or Marine Engineering or equivalent, (BEng (hons), MEng (hons), BSc (hons), or MSc).
- The permanent right to work in the UK and be able to travel without restriction

### Competence needed
- Knowledge of SAP (already used if possible)
- Knowledge in production planning & forecasting
- English spoken & written for contact with suppliers + French

### Qualifications:
* Leadership and influencing skills
* Strategic thinking and problem solving skills
* Ability to work well with others as a team
* Innovative and analytical mindset
* Ability to adapt to change
25.
- university degree (specialization could be: supply chain/logistics, business/commercial)
- English – must be fluent
- communications skills on the highest level – working with customers all over the world, different culture and approach
- team work attitude
- no problem with working under time/customer pressure
- good organizational skills
- IT skills
- knowledge of JDE ERP system would be an advantage

26. What do I need to qualify for this job?

Master degree within Supply Chain Management (could be a combination with other educations) or similar - with above-average grades (please attach transcript)
International experience of a foreign culture e.g. from a semester abroad
Fluency in English - knowledge of other languages is welcome
Relevant work experience such as an internship in an engineering company
Convincing personality and outstanding communicative, social and interpersonal skills
A strong personal drive characterized by your proactive approach to take on responsibility and achieve results
A high degree of flexibility/mobility and an interest in working in an international and constantly changing work environment
Excellent analytical and conceptual skills

27. Key Requirements:

An accredited B Comm Supply Chain/Logistics/Transport Economics
Must be Computer Literate (MS Office)
Over 65% academic average
Shows a drive to achieve ambitious performance objectives and quality standards
Willing to take every opportunity to learn and grow
South African Citizen or Permanent Residency in RSA

28. REQUIREMENTS:

We’re looking for graduates with the following qualities and skills:
Degree educated (Bachelor or Master)
Bi-lingual in English and Czech or Slovak
Have interest in logistics and transport
Customer focused
Leadership potential
Excellent communication and organizational skills
Ability to build relationships and work well as part of a team
Flexibility and mobility to move as required
Strong interest in a career opportunities in the Supply Chain industry

29.

WHO ARE WE LOOKING FOR?
We are looking for a fresh or recent graduate from Industrial Engineering & Management (I), Mechanical Engineering (M) or Technology Management (T). Your studies have been focused on Supply Chain Management and/or Business & Innovation, with good results. We are looking for someone that is ambitious and social – to meet and collaborate on essential to your success at Kla. In addition, you are structured and analytical. You can work effectively both independently and in a team. We are searching for someone who enjoys working in a fast-paced and dynamic environment and wants to develop and maintain relationships with suppliers, customers and other stakeholders. You also have an entrepreneurial attitude, drive initiatives and take responsibility for the result.
30.

Required experience and knowledge
1. Excellent written and verbal communication skills
2. Basic project management skill set
3. Bachelor’s degree (BBA or advanced degree preferred) - preferably Agricultural Economics/Animal Sciences studies or Supply Chain Management
4. Excellent teamwork skills
5. Strong analytical skills (i.e. ability to develop business cases and financial models) desired
6. Proven ability to influence cross-functional teams without formal authority
7. Bilingual in English/Spanish, preferred but not required
8. Must be able to travel globally 25-50% of the time
9. Must be willing to relocate to Grand Island, N.Y. & other locations

Minimum Qualifications (must have)
Supply Chain management
Preferred Qualifications (nice to have)
MBA in Supply Chain management

31.

Desired Skills and Experience
- Master's degree (university degree, engineering schools, business school) with a specialization in supply chain management, including an experience abroad (internship or Erasmus program)
- Fluent in English and French
- Self-starter, highly motivated and able to work independently as well as within a multi-cultural and cross-functional team
- Fast learning and self-development: curiosity to learn
- High energy levels. Action oriented. Willingness to take responsibility and initiative. Able to proactively identify and resolve problems

32.

Desired Skills and Experience

Basic Qualifications
Current undergraduate or graduate student studying supply chain or a related field

Proficiency in Microsoft Office, specifically Excel

Ability to analyze complex data

ability to multi-task and learn quickly

Ability to work independently and as part of a team

Preferred Qualifications

Strong written and verbal communication skills

This position is 40 hours/week during summer and 20 hours/week during academic year

33.

Great analytical skills
Excellent communication skill
Positive attitude
Problem solving skill
Ability to work independently
Ability to understand and meet deadlines

Strong Excel skill

Description
As part of the Operations Analytics team, the intern is responsible for data analysis and interpretation of results based on an annual survey, to determine customer satisfaction at different stages of the entire buying experience and drive improvements that will help to build and maintain a high level of customer loyalty.

In this role, the intern will be given the opportunity to learn end-to-end ACS fulfillment cycle and using both strong analytical skills, to improve internal processes.

Tasks include:
- Make judgement calls and determine if customer feedback require escalations to respective teams to drive resolution
- Participate in meetings with stakeholders to highlight customer pain points
- Investigate customer complaints/feedback and perform root cause analysis on customer feedback
- Document findings and develop an action plan
- Build documentation with regards to internal processes

Education
- Undergraduate in Business, Management, Marketing, Operations, or Engineering

Additional Requirements

Proficiency in second language (Japanese, Korean, Mandarin, etc.) will be an advantage

34.

Desired Skills and Experience

Could you play an integral part in achieving our goals?

We’re looking for passionate, driven people who can help us meet the complex challenges of the future – but also seize the opportunities we have to offer. While specific requirements vary from role to role, there are some things all our graduates have in common.

Minimum requirements

You must have:

At least 1 year of experience in supply chain management or equivalent

Proficiency in English and preferably a second language for use in the program

An international mindset and a willingness to travel

We want you to be an ambassador for the company and to play a key role in achieving our goals. To do that, you will need to embody the company values in the way you act in our business. We encourage entrepreneurial thinking and entrepreneurial thinking and seek employees who are flexible and accountable.

Working with those

Resilience is an important part of our business, so you’ll need to be a highly effective communicator with excellent interpersonal and team-working skills. Organized, pragmatic and solutions-focused, you’ll enjoy working with others to achieve results.

Drive and curiosity

You’ll be looking for evidence of solid academic achievement, not just academic results. You need to be highly motivated and have the drive and desire to learn, develop and succeed.
35. Desired Skills and Experience
Obtained a Bachelor or Master degree, preferably in supply chain or logistics
Passionate, Driven and Motivated
Strong Communication
Good Team Player

36. Skills & Experience
Strong analytical skills
Fluency English and German required. Additional business level European language is desired
Ability to multi-task, strong organizational skills
Eager to pick-up the phone to solve problems and negotiate with suppliers
Team-player with an outgoing personality

37. Required:
Bachelor student or higher in Logistics, Engineering, or Business
Excellent execution skills
Attention to details
Strong communication skills
Fluent in French or Dutch English

Preferred:
Experience within a retail environment (in FMCG)
Experience with an ERP (SAP is an asset)
Previous experience in customer service or other business area in logistics or related function

38. Desired Skills and Experience
- Degree in engineering or supply chain management. Graduation in 2014 or with maximum 1 year professional experience in supply chain required
- Excellent Dutch, French and English mandatory. Other languages are an advantage
- Willingness to start your career in an operational and organizational role
- Passion for computer applications, preferably in a logistics environment, knowledge of WMS systems and SAP is an asset
- Hard worker with flexibility to evolve in a rapidly changing, dynamic environment
- Quick learner and self-starter, demonstrated analytical & leadership skills
- Demonstrated success in and passion for a cross-functional, excellence seeking, collaborative team environment

Attitudes and aspirations:
- Hands-on, “door”, focus on improvement & efficiency
- Committed to achieve your goals, result driven by nature
- Autonomous & assertive worker
- Curious and business minded
- Open to learn and empower others
- Adherent to the Danone values

39. Desired Skills and Experience
Master or equivalent degree, ideally in Engineering/Supply Chain, with at least one significant experience in an international company (interimship, Trainee program, entry level job), in a C2B or B2C environment, preferably in a supply chain, procurement, or warehousing role
- Knowledge of key supply chain processes
- Very strong communication & excellent interpersonal skills
- Robust, science-oriented ability to analyze issues and solve them methodically
- A professional, positive and enthusiastic attitude, with the ability to be a team player
- Advanced proficiency in MS Office, especially Excel and PowerPoint
- Fluency in English

VIII
40.

Qualification / Requirements
Degree in Engineering (major in Mechanical, Industrial, or Electrical) with outstanding results
Unrestricted authorization to work in Europe
Prior intern, co-op, or research experience in engineering or manufacturing
Strong communication, analytical and problem solving skills
Fluency in English and good command of German language
Drive to start and build a career in an international environment
Flexible to move within Europe region
Work permit for Europe is a prerequisite

41.

Education
Master degree or similar within Supply Chain management, Manufacturing, or Operations management top 3% of your class

Job experience
0-2 years after completion of master degree

Language skills
Fluent in spoken and written English

Travel time during trainee program
• 6 months at home base office
• 18 months away from home base office in 3 different Global PANDORA offices

Personality
• High energy level
• Eager to learn
• Extrovert
• Doer

42.

Competences requires

Formation et connaissances
• University degree – preferably in Purchasing, Economics or Accounting
• Ability to use computer software in procurement/accounting
• Fluent in English
• Experience: 0 to 6 months related work experience

Aptitudes
• High level of integrity
• Organized and a good negotiator
• Exceptional analytical skills

43.

Experience / Knowledge
• Your personality demonstrates a good emotional intelligence
• You are characterized by your highly analytical skills, you have proven strategic thinking
• You like to gain new insight by questioning assumptions
• During your studies or past work experience you gained some relevant experience in supply chain and/or operation management
• A previous experience abroad would be of interest to us
• Your excellent English communication skills as well as your ability to present have already helped you to get your message across and convince your audience.
• Mastering another language like Chinese or German would be an asset
Minimum Requirements

- Willingness to learn and progress
- Mature, composed, professional demeanour
- High degree of competence in IT
- Articulate and confident, with strong communication skills
- Ambitious, motivated and enthusiastic
- Ability to respond quickly to client requirements
- An awareness of global, regional and local factors influencing construction costs
- Forensic approach to research and problem solving
- Flexibility to be able to take short term changes of direction in response to changing demands
- A developed technical writing skill that is clear and accurate
- Ability to effectively analyse and manipulate large amounts of construction cost information and
- construction related statistics to identify and produce relevant trends
- organisational skills - large quantities of information will be available for some high value projects. You will need to demonstrate the ability to effectively manage the collection and analysis of this data
- Understanding of the real estate / construction / management consultancy sectors (desirable requirement, but not essential)

Preferred Qualifications

- Construction and / or supply chain related or similar analytical based degree or equivalent
- Working towards Membership to the Royal Institution of Chartered Surveyors (MRICS), Chartered Institute of Purchasing and Supply (CIPS) or similar professional qualification or equivalent

Qualifications

- You have completed or are about to complete a degree in Business & Economics, Business Studies, International Management, Law, Economics, Procurement or a similar subject with an above-average grade (ideally a Master’s degree. If you have a Bachelor’s degree you should be able to show at least 18 months’ experience in the relevant field of work).
- A major in Materials Management/Logistics, Supply Chain Management or a comparable area of emphasis are preferred.
- During your studies or while on work experience you have gained some experience in the field of procurement and have a passion about automobiles.
- You have an excellent command of English and Chinese and have obtained several months of relevant, in-depth experience abroad, either during your degree course or independently. Knowledge of German would be useful.
- You enjoy working on complex issues both independently and as part of a team. In doing so, you show us that you would like to assume a role in coordination and management, are eager to assume responsibility quickly and have the ability to inspire people.
- You are involved in a personal or social capacity alongside your studies. You also attach great value to personal and professional development.
- You feel comfortable in an international working environment and can offer a high degree of mobility and flexibility.
- You believe that diversity and equal opportunity are important.

Who are we looking for?

- You’re bright. Think outside the square. Don’t mind working hard. Love solving problems. And you’re just about to finish your university degree.
- We look for people who are industrious, can challenge conventional thought, offer unique perspectives and conceive and implement practical, value-adding solutions for our clients.
- We want people who bring intelligence to everything they do, people who have the potential to develop into business or government leaders, and who will be credible in the boardrooms and at other executive levels of the world’s biggest companies and public sector institutions.
- More than anything though, we are looking for people who can see how things can work better, and have the drive to make it happen
Additionally we look for the following attributes in our graduates:

**Capacity**
- Ability to analyse data quickly and learn fast, basing judgments on fact not sentiment;
- Analysing outside existing boundaries to identify implications and learn from others;
- Creativity to propose innovative solutions and manage uncertainty within complex environments to produce workable solutions.

**Achievement**
- Drive and enthusiasm to set themselves and others challenging unambiguous targets;
- The resilience to deliver;
- Courage and self-confidence to tackle unfamiliar problems and go against the crowd when necessary.

**Relationships**
- Genuine respect and concern for people and valuing everyone regardless of culture or status;
- Demonstrating honesty and integrity in all their actions;
- Creating trust by open and direct communications;
- Persuading others by the inspiration, sensitivity and clarity of their argument;
- Arranging clear means of communication and decision making.

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**Job Description**

**Candidates should have:**

- Relevant science or business Master's degree with strong academic results
- For experienced candidates: training or experience within SAP

**Professional Skills**

Candidates should desire to work in an information systems environment, and be:

- Analytical, structured and meticulous
- Self-driven and flexible
- Solution-oriented
- Team workers
- Good communicators in Norwegian and English

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**Key Competences required**

- Enthusiasm and commitment for delivering to commitments as part of a global supply-chain team.
- Data analysis and numerical skills with the aptitude to evaluate, understand and present data.
- Attention to detail & commercial awareness.
- Proficient in continuous process improvements within the supply-chain.
- Excellent interpersonal skills - works well across all functions and groups.
- Good problem solving skills – constant focus on improvement.
- Excellent verbal and communication skills.

**Key Areas of Responsibility**

- Ensure Continuity of Supply.
- Manage the supply-chain manufacturing cycle/demand time for your commodities.
- Manage demand sensing and demand shaping solutions.
- Monitor forecast versus actual bookings and make adjustments as required.
- Provide options for part shortages & supply chain challenges.
- Ensure prompt correction to forecast as required.
- Communicate forecasting issues to appropriate groups.
- Supply-chain reporting and planning versus management.

**Qualifications**

**Qualifications and Skills**

- Sound analytical skills to resolve short-term supply chain issues and adjust to the dynamic requirements of our customer and supplier base.
- Good working knowledge of Excel.
- Strong written and verbal communication skills (English).
- Able to work autonomously.
- Ability to manage and work with management.
- Ability to identify and manage planning process improvements.
- Good business acumen skills.
- Good working knowledge of Microsoft Office.

**Education**

- Degree level or higher preferably in Business, Engineering or Operational Management.
- 2 years experience in Supply Chain is desirable but not a strict requirement
Qualifications

All candidates, of graduate level must have strong numerical, analytical and IT skills with a view to looking strategically at the logistics function, meeting the company’s ever changing needs. The role involves ensuring customer requirements and volume expectations are understood and met whilst enabling operations to plan and operate effectively. Good communication skills, both verbal and written, are essential along with the ability to work with diverse groups across the whole supply chain. Eliminating losses and delivering continual supply chain improvements is also a base expectation of the role.

50.

51.

52.

53.

54.
55.

Desired Skills and Experience

Selection criteria

Each year we select, train and develop some of the world’s brightest and most outstanding graduate trainees. New challenges and responsibilities – people who want to stand out in the corporate world.

It’s a good start to have the following:

- Master’s / Honours degree in controlling or engineering
- 0-2 years of work experience
- English is required, ability in any other languages is a plus
- Evidence of achievements in academic and/or non-academic activities
- Good business acumen
- Proactive and result-oriented
- Collaboration skills and ability to work in a team

56.

QUALIFICATIONS:

Required:
- Bachelor’s degree (completed prior to start date) in business, computer science, or related fields
- Basic knowledge of sales processes
- Strong IT literacy skills
- Reliable and able to work toward objectives and keep commitments
- Self-confident, forward looking - able to respond quickly and influence others
- Ability to solve problems quickly and effectively by critically analyzing relevant information
- Tenacious approach underlined by a drive to win
- Ability to handle unique situations confidently
- Passion for technology
- Eager, quick learner with strong team-work spirit

Excellent oral and written English communication skills

57.

Qualifications and skills

- Master’s degree in business or business related studies
- Among the top students
- Working experience (e.g. as a working student) is an advantage
- International experience (studying, working) is a plus
- Excellent analytical and logical skills
- Able to quickly grasp different problems even outside the direct field of expertise
- Ability to deliver high quality work within tight timelines
- Passionate about developing innovative solutions for our clients
- Strong teamwork skills but as well able to work independently
- Good networker
- Enthusiastic to work in an dynamic and challenging environment based on open communication and trust
- Willing to work in international teams and flexible travelling for work
- Excellent written and verbal communication skills in English (corporate language is English)

58.

QUALIFICATIONS:

Bachelor or Master Degree in Engineering, IT, Computer Science or Business Administration
Fluency in both Swedish and English
Good verbal and written communications skills
Maximum 2 years work experience after your graduation
Appendix B – The coding manual

- The 36 skills-framework provided below is the scan-guide for each advertisement.
- Skills should be identified only in that job ad section where it is most clearly stated by the section-title that the competencies and requirements for the job are about to be described. E.g. “candidate requirements”, “competence needed”, “qualifications”, “your profile”, “what we look for”, “knowledge and experience required”, “what we need”.
- A skill may be identified or indicated by only one word or a whole phrase.
- A certain skill can be identified only once in each job advertisement.
- If more languages than English are stated or required, then mark both, two or more languages and English as an identified skill. If only English is stated as a requirement, then just mark English as a required skill.

<table>
<thead>
<tr>
<th>Skills</th>
<th>Phrases/ Words</th>
</tr>
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</table>
| Teamwork | • team player  
|         | • ability to work in a team  
|         | • ability to build and maintain strong relationships in a cross-functional environment  
|         | • work well as part of a team  
<p>|         | • thrive on delivering excellent performance to your team  |</p>
<table>
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<tbody>
<tr>
<td></td>
<td>work in teams</td>
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<td></td>
<td>team working spirit</td>
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<td></td>
<td>ability to work well with others as a team</td>
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<tr>
<td>Problem solving ability</td>
<td>pragmatic</td>
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<tr>
<td></td>
<td>analytical skills</td>
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<tr>
<td></td>
<td>problem-solving</td>
</tr>
<tr>
<td></td>
<td>affinity with numbers</td>
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<tr>
<td></td>
<td>strong analytical approach</td>
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<tr>
<td>Flexible</td>
<td>flexible</td>
</tr>
<tr>
<td></td>
<td>flexible and mobile</td>
</tr>
<tr>
<td></td>
<td>high learning agility</td>
</tr>
<tr>
<td></td>
<td>flexibility</td>
</tr>
<tr>
<td></td>
<td>ability to adapt to change</td>
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<tr>
<td>High average grade</td>
<td>with a grade average of 70%</td>
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<tr>
<td></td>
<td>good scholastic record</td>
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<tr>
<td></td>
<td>GPA 80% or better</td>
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<tr>
<td></td>
<td>excellent track record and good academic background</td>
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<tr>
<td></td>
<td>above average university degree</td>
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<tr>
<td></td>
<td>bachelor with great results</td>
</tr>
<tr>
<td></td>
<td>graduated with a minimum 2:2 degree</td>
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<tr>
<td></td>
<td>minimum 2:1 degree</td>
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<tr>
<td></td>
<td>strong academic track record</td>
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<tr>
<td></td>
<td>minimum achieved grade of 2:2</td>
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<tr>
<td>Two or more languages</td>
<td>good command in both English &amp; Mandarin</td>
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<tr>
<td></td>
<td>fluency in English (additional/local languages a plus)</td>
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<tr>
<td></td>
<td>English language is a must, German or French would be an advantage</td>
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<tr>
<td></td>
<td>Bi-lingual in Dutch (native speaker) and English. French is also an advantage</td>
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<tr>
<td></td>
<td>fluency in English (spoken and written) and good German knowledge</td>
</tr>
<tr>
<td></td>
<td>command of one of the Nordic languages and English</td>
</tr>
<tr>
<td></td>
<td>excellent command of English, additional languages</td>
</tr>
</tbody>
</table>
| **Advantageous** | • English and at least one Nordic language  
|• English spoken & written for contact with suppliers + french |
| **Understanding logistics terminology** | • major in Logistics or related is preferred  
|• a bachelors or advanced qualification in supply chain, or a supply related field  
|• bachelor’s degree in Logistics, Supply Chain  
|• business degree in Logistics, Supply Chain or similar  
|• bachelor within economic, maritime, logistic or commercial areas  
|• Procurement, Supply Chain or Business related degree  
|• experience about supply chain  
|• master's degree in supply chain management  
|• degree qualified in a relevant discipline, e.g. Logistics, Supply Chain Management, Procurement, Operations and Supply Chain Management |
| **Responsible, mature and professional** | • Strong sense of responsibility  
|• Mature, professional personality  
|• attention to detail with discipline to follow through on assigned tasks  
|• willingness and capability to take handle difficult situations, with a strong sense of responsibility  
|• structured and methodical approach to work and follow things through  
|• independent and responsible  
|• readiness to take on responsibilities and work independently  
|• detail oriented  
|• high degree of ownership |
| **Leadership** | • leadership  
|• leaders in their profession  
|• potentially want to become the future leader of our business |
| **Enthusiasm** | • ambitious individual with a passion and drive to excel  
<p>|• high degree of initiative, energy |</p>
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<tr>
<td></td>
<td>• willing to learn and continue to challenge oneself</td>
</tr>
<tr>
<td></td>
<td>• high level of energy</td>
</tr>
<tr>
<td></td>
<td>• have the drive to learn and succeed</td>
</tr>
<tr>
<td></td>
<td>• eager to learn and roll up your sleeves</td>
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<tr>
<td></td>
<td>• challenge your talent in order to become one of our future high potentials</td>
</tr>
<tr>
<td>General business administration</td>
<td>• Post graduate qualification in business</td>
</tr>
<tr>
<td></td>
<td>• Degree should be Business, Marketing, Management, Commerce</td>
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<tr>
<td></td>
<td>• Master's Degree within Economics or a relevant field of study is preferred</td>
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<tr>
<td></td>
<td>• Business related degree</td>
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<td></td>
<td>• In a business subject</td>
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<tr>
<td>Ability to plan and organise</td>
<td>• strong capabilities to prioritise, optimise and perform under limited resources and tight deadlines</td>
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<td></td>
<td>• project management skills</td>
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<td></td>
<td>• Ability to think and plan in a proactive manner</td>
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<tr>
<td></td>
<td>• Organized and reactive</td>
</tr>
<tr>
<td></td>
<td>• proactive</td>
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