



**A preliminary investigation into senior management skills:
The context of Third-Party Logistics Providers (3PL)**

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5 Party Logistics Providers (3PL)
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8 **Abstract**
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10 **Purpose** - The Third-Party Logistics Provider (3PL) has faced significant change since
11 containerisation with the broadening scope of supply chains and technological developments. With
12 these changes, the required supply chain skills discussions have covered mostly graduate skills or
13 employees' skills with a limited discussion to what extent and whether senior management skills
14 were changing. Hence, 3PLs senior management skill requirements will be compiled based on
15 existing studies and assessed whether these are still relevant and if so to what extent for today's
16 3PL senior managers.
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20 **Design/Methodology/Approach** - A questionnaire has been devised based on 3PL senior
21 management skills identified in the academic literature and send out to senior managers via
22 professional social networks of 3PLs. Based on the previous literature the senior managers selected
23 had to fulfil the selection criteria of a minimum 5 years' managerial experience in a 3PL, and a
24 minimum of 10 years' experience in general, which limited our sample size to twenty-seven senior
25 managers in the 3PL sector.
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29 **Findings** – The findings indicated that fifteen senior management skill sets distributed across
30 functional, managerial, behavioural and relationship skills. The study indicated that the 3PLs
31 senior managers highlighted an increasing dependence and importance upon relational and
32 behavioural skills, particularly when compared with the more traditional functional skills.
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35 **Research implications** – The study has explored the senior management skills in 3PLs in the UK,
36 albeit the respondents possessing diverse backgrounds. Therefore, it would be beneficial to test
37 whether these findings are exemplary across wider 3PL sector, not only in the UK but also across
38 Europe to see how corporate agenda for executive supply chain skills could be devised.
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41 **Practical Implications**- Corporate supply chain training and development staff can develop
42 specific programs based on the 3PL senior management skill sets especially on relational and
43 behavioural skills, which are needed for future managers as well as up-skill senior managers' skills
44 which are deemed to be most important in the current 3PL market.
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47 **Originality/value** –This paper contributes to the supply chain skills discussion and reports subject
48 relevant challenges for today's senior management in 3PL industry. The findings have generated
49 preliminary discussions to whether senior management skills are changing with the broadening
50 scope of supply chains.
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53 **Keywords**- 3PL, Supply Chain Skills, Senior Management Skills
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3 **Paper Type-** Research Paper
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8 **1. Introduction**

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10 With the rise of 3PLs aligned with strong international trade growth, Internet of Things (IoT),
11 expanding reach of multinational supply chains (Bak and Jordan, 2016), containerisation and the
12 globalisation of manufacturing systems the 3PL field has changed radically requiring new sets of
13 skills (Mangan & Christopher 2005; Sanka et al . 2019). This trend is expected considering that
14 “logistics costs sometimes account for up to 30% of the price of the finished product” (Abbasi et
15 al. 2021, p. 1) with “[g]lobal Third-Party Logistics (3PL) market was valued at around USD 1
16 trillion in 2020, and ... expected to reach more than USD 1.75 trillion by 2026 (Mordor
17 Intelligence, 2020)”. Considering that these changes and trends are multi-faceted especially with
18 the growth of 3PL market a shortage of skilled logistics professionals was expected (Sinha et al.,
19 2016; Sanka et al. 2019). Nevertheless, filling these skill gaps becomes a challenge for most third-
20 party logistics (3PL) providers (Sanka et al. 2019). Especially, the composition of senior
21 management roles within the logistics sector is set to increase significantly for more managers and
22 senior officials within the UK Logistics industry alone (UKCES, 2014). Hence, identifying the
23 senior management skill sets in the 3PL industry requires close attention. Skills in logistics and
24 supply chain management are a key element achieving superior performance and competitiveness
25 (Derwik & Hellstrom, 2017; Marchet et al 2017, Sanka et al. 2019). Sanka et al. (2019) and Bals
26 et al. (2019) argued that whilst there has been a great deal of research into supply chain skills,
27 however there has been limited research into 3PL as well as 3PL supply chain managers’. The
28 research on 3PL senior management skills been significant changes ranging from a shift towards
29 relation-based strategies (Shub & Stonebraker, 2009) which may be influenced by a particular
30 firm’s competitive situation (Ward & Duray 2000), and for example with a senior manager
31 currently experiencing difficulties with a customer may rank relationship management and
32 problem resolution disproportionately. Hence, defining the senior management skills is a difficult
33 one, as the role of the senior manager is not static in a changing business environment; it depends
34 upon organisations’ focus and its changing role.
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Research has highlighted the expanded scope of modern supply chain management however is yet to identify gaps in skills among senior managers responsible for managing more complex supply chains and solutions (Jordan and Bak, 2016). In addition the gap between middle and senior management became increasingly blurred and multifaceted. However, in general, a senior manager has been defined someone as someone who has significant responsibility for a business unit, function, geographical area, or division (IES 1997). Similarly, Van Hoek et al (2002) highlighted the ‘people dimension’ as critical to achieving supply chain objectives. Identifying skill gaps at senior level across the researched areas will therefore highlight senior management skill sets in need of improvement. Literature within freight and supply chain management skills dedicated to senior management positions is fragmented and rigid (Ballou, 2007), with various articles exploring senior-level management skills, (Westbrook, 2015; Elkington & Breen, 2015; NSDC 2009; Khandwella, 2004; Carmeli, 2003; Hayes et al, 2000; Analoui, 1995) however do not specify the industry and environment for which those skills are most suited. Other researchers focus on skills required for 3PL although do not specify mostly at what level, or some others focus predominantly on entry-mid level, neglecting required skills at senior level (Gibson & Cook 2001; 2003, Dubey & Gunasekaran 2015; Johnson & Pyke 2000; Kopczak & Fransoo 2000; Carter et al 2006; Knemeyer & Murphy 2004). **Marchet et al (2017) surveyed senior 3PL managers to assess how they create value rather than specifically at skill gaps or focused on rather soft skills or hard skills and its division based on graduate entry levels (Bak et al. 2018; Jordan and Bak, 2016; Dubey and Gunesakaran, 2015). Whereas Dubey et al (2017) investigated 3PLs managers role in India on how they can impact of supply chain skills stating that managers “who invest in library, acquiring e-resources, offer financial support and create trust among employees are enablers of building supply chain skill”.** Hence there is a limited research on the senior management level skills to specific industry setting such as the 3PLs. Similarly, Jordan and Bak (2016) as well as Bak and Boloucher-Passet (2013) highlighted the impact on particular industry needs upon the skills relevance. To conclude, researchers have been limited to attain a holistic picture of desired skill gaps at senior level, especially within 3PL and freight forwarding companies’ context (NSDC 2009). Razzaque & Sirat (2001) argue that research on supply chain skills has been scant (Thai et al 2011).

Today’s supply chain and logistics senior managers need to be able to communicate across borders to integrate as well as increase the coordination of supply chain management (Prajogo & Sohal

2013). A number of studies have been carried out to assess the skill requirements among managers within logistics and SCM (Murphy & Poist 1991; Murphy & Poist 1991, 2007; Gibson and Cook, 2003; Thai & Tran 2011; Thai 2012). These studies underlined that the range of skills which managers possess within their industries and functions are vast and increasing. Elzarka & El-Nakib (2014) focusing on entry-mid level skill requirements, whereas most recent study into senior and executive level skills within logistics was done Murphy & Poist (2007) a decade ago. Although, Bernon & Menas' (2013) study on executive level education to fill skills gaps within supply chain management they did not classify the level of relevance of these skills. Their findings state that "the need for skills is greater than it's ever been", whilst acknowledging that there is still little research on the characteristics of strategic programs to overcome this necessity (Bernon & Mena 2013, p.445). Research has found human resource development significantly affects supply chain performance (Maku et al., 2005; McAfee et al., 2002; Sweeney, 2013; Rajesh et al. 2011). Therefore, identifying the right mix of skills required at senior management for 3PLs is more likely to have a direct impact on a firm's competitiveness (Marchet et al 2017). However, previously these skills have been only attributed to successful supply chain implementation (Mangan & Christopher 2005; Dischinger et al 2006), rather relevance to senior management skills (Bak et al, 2019). Hence, the study will explore the following research questions.

1. Which skills have been established in the academic literature relevant to senior management 3PLs
2. To what extent are the identified skills set relevant for today's senior managers?

Therefore, the following section begins with the senior management skills definition and classification focusing particularly on 3PLs, followed by the supply chain skill categories and its relevance to senior managers based on four categories: functional, managerial, relational, and behavioural. The next section discusses how this research was undertaken in the research methodology section, which led to the findings and conclusion and implications to future research.

Senior Management Skills in 3PL providers

The council of supply chain management professionals (2013) defined 3PL as "[a] firm [that] provides multiple logistics services for use by customers which include services integrated or bundled together by the provider". For the purpose of this study, 3PL and freight forwarding terms

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3 are used interchangeable as both types of firms bundle together services (Marchet et al, 2017),
4 under the roof of 3PL services and products. Hence, among the services 3PLs provide including
5 transportation, warehousing, cross-docking, inventory management, packaging (Marchet et al
6 2017; Selviaridis & Norman 2015), as well as consultancy and/or contract work to design and
7 implement new strategies (Wallenburg 2009). The use of 3PL companies is mainly due to fixed
8 labour cost savings, specialisation on core competencies, less expensive assets e.g. trucks (Bardi
9 & Tracey 1991; Gibson & Cook 2001). Therefore, identifying the right mix of skills required at
10 senior management for 3PLs is more likely to have a direct impact on a firm's competitiveness
11 (Marchet et al 2017). However, previously these skills have been only attributed to successful
12 supply chain implementation (Mangan & Christopher 2005; Dischinger et al 2006), rather
13 relevance to senior management skills (Bak et al, 2019).
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23 Therefore, an adapted framework examining the supply chain skills associated with senior
24 managers is needed. There are a number of new factors, which have led to the evolution of skill
25 sets for senior managers. For example, deregulation and computerisation have created new skill
26 niches, which require skills development, particularly at senior level (Vinh & Gi-Te 2015).
27 Changes to the 3LP industry and market environment demands new skills for senior managers
28 (Johnson & Leenders 2009). LSP's and freight forwarders are now expected to become a one-stop-
29 shop for all logistics, international, and domestic freight solutions (NSDC, 2009). Senior managers
30 will therefore require different skills as freight forwarders or agents as a value-added and
31 consultant (Robertson 2016).
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39 The 3PLs have more supplier-buyer relationships to manage, this in turn increases the requirement
40 of 3PLs to operate in a more interdependent environment, changing the type of relationship they
41 engage with partners (Blanco & Caplice 2013). Logistics and freight services is becoming
42 characterised by technology in the future as they seek more higher service, with less cost, and
43 increased sustainability (Sathaye et al 2006). Firms must have senior managers who possess skills
44 that make them appropriate to selecting appropriate information technology solutions, as
45 globalisation and advances in information technology have increased the complexity of
46 international supply chains, leading to an increased sophistication of outsourced logistics service
47 providers (Pooley & Dunn 1994; Razzaque & Sirat 2001). Advances in technology can have a
48 significant impact on freight forwarding and logistics operations, increasing performance and
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3 efficiency across all modes of transport and in warehousing (Thai et al 2011). Therefore, senior
4 supply chain and logistics roles will be characterised by more cross-functional job profiles which
5 may lead to a vacuum of senior management logistics expertise if key skills are not developed (IES
6 1997; Colombo 2016). This increases the pace at which new skills at senior level need to be
7 identified and developed to manage these more complex networks and relationships (Blanco &
8 Caplice 2013).

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14 According to Myers et al (2004) up to 90% of logistics and supply chain tasks is carried out
15 unsupervised. This can create significant problems for senior managers as critical information is
16 filtered before reaching them (Westbrook 2015). Myers et al (2004) argue senior managers need
17 to possess collaborative interpersonal skills, self-management skills and cross-functional
18 experience to manage logistics organisations in future. Earlier studies such as the IES study (1997)
19 explored the changing roles of senior managers and argued environmental factors such as
20 internationalisation, information technology, and externalisation were changing business needs of
21 senior managers and their skills.

29 **2. Supply chain skill categories and its relevance to 3PL senior managers**

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31 To reflect the changes in skill requirements at senior level, a two-dimensional approach assessing
32 levels of analysis and elements of competence within literature may create more conclusive results
33 and room for further discussion (Derwik & Hellstrom 2017). **According to Derwik & Hellstrom
34 (2017), the four elements of skill are considered suitable to cover a number of skills reflecting the
35 time pressures on senior managers in particular to respond to the survey but also include some
36 more relevant skill sets to 3PL. These skills classification includes four categories: functional,
37 managerial, relational, and behavioural (ibid).**

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45 *(1) Functional Skills.* The functional skill can be described as being the technical expertise
46 required to perform a function or task. Functional skills deal with skills directly related to
47 freight forwarding, logistics, 3PL, and SCM (Derwik & Hellstrom 2017). Transport and
48 logistics was ranked in the top 5 skills in Murphy & Poist studies (1991 and 2007) and is
49 common in other skills research (Sodhi et al 2008; Johnson & Pyke 2000; Gravier & Farris,
50 2008; Jordan and Bak, 2016). These skills focus on operational and strategic levels but also
51 product development related to supply chain and logistics services. Historically, functional
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3 and managerial skills are those, which have been researched most frequently and cover all
4 skills that fall within the SCM and logistics competence (Derwik & Hellstrom 2017).
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6 Logistics and transport management as a skill deals with returns management and the
7 returns flow process, which in turn is closely related to inventory management.
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11 (2) *Managerial Skills*. Whereas managerial skills include skills related to general
12 management, commonly found and required at senior level. According to Derwik &
13 Hellstrom (2017), managerial skills are at the heart of SCM. Murphy & Poist (1991; 2006;
14 2007) study found that managerial skills are the most important component for logistics
15 professionals, increasing the need for these skills to be included within the study. Business
16 management literature deals with issues like seeing ‘the big picture’, in addition to more
17 predictable management tasks like planning and organisation (Gammelgaard & Larson
18 2001; Derwik & Hellstrom 2017). According to Derwik & Hellstrom (2017), business
19 management literature deals with execution skills, such as decision-making, and also
20 people-management and the ability to motivate others, which was one of two skills ranked
21 in the top 5 skills in both Murphy & Poist (1991; 2007) studies.
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31 (3) *Relational Skills*. Considering the relational skills deal with cultivating and developing
32 relationships with all partners in delivering a supply chain solution; sub-contractors,
33 carriers, airlines, port authorities, customs, regulatory bodies, governments, customers,
34 employees, and colleagues, which are all encompassed within customer and supplier
35 relationship management. According to Sauber et al (2008), customer relationship
36 management (CRM) includes; order management, demand management, customer service,
37 data mining, order fulfilment, B2B marketing, B2C marketing and supply chain contracts.
38 Lambert et al (1998) defined CRM and supplier relationship management (SRM) as key
39 sub-processes of SCM therefore included in this study. Giunipero et al (2006) argue that
40 SRM is important to interpret changes in the supplier market and in developing suppliers,
41 therefore critical to 3PL and freight forwarding businesses. Customer and supplier
42 relationships can take various forms from collaborative to adversarial and depend on firms’
43 strategic objectives (Hoyt & Huq 2000).
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54 (4) *Behavioural skills*. Lastly, the behavioural skills include features tied to the individual
55 such as; creativity, adaptability and flexibility (Derwik & Hellstorm 2017; Murphy & Poist
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2007; Jordan & Bak 2016). Like transport and logistics, business ethics are ranked in the top 5 most important skills in both the Murphy & Poist studies (1991; 2007). Business ethics includes integrity, empathy, and self-awareness, self-motivation, entrepreneurship, psychological intelligence, and honesty and integrity (Van-Hoek et al 2002). At the organisational level, an individual's ability to respond to more complex multicultural issues in a creative manner, demonstrating adaptability which is important in a fast-paced, globalised environment (Christopher 2012). Storey et al (2005) argue that some products with more responsive supply chains are focused on flexibility rather than cost. Therefore, identifying the importance of flexibility as a skill for senior managers in 3PL's and freight forwarders will demonstrate the change in market conditions since the 2005 study. Jordan & Bak (2016) found that both educators and students find initiative is a required skill for logistics and SCM however this was at graduate level. The study will assess the importance of initiative at senior level. Creativity was a new skill in Murphy & Poist (2007) study, not included in the 1991 study so is important to see its importance against other core logistics and supply chain skills in 2017.

Although some of the supply chain skills have kept its importance in terms of technical skills, such as the inventory management skills which includes a range of activities such as supply planning to demand planning; warehouse management and the order fulfilment process (Johnson & Pyke 2000; Sodhi et al 2008; Murphy & Poist 2007; Ellinger et al 2002; Derwik & Hellstrom 2017). However this skill begun to include and embed other skills such as the development of inventory management skills and solutions is heavily reliant upon the simultaneous development of IT systems (Caro & Gallien 2010). Davis & Golicic (2010), Bak et al. (2019), Dubey et al. (2017) and Ngai et al (2011) note that IT functionality including IT infrastructure and system connectivity and if done well can provide better information, transparency, flexibility and modularity. IT systems connectivity includes IT infrastructure through systems such as SAP or new integrated systems including but not limited to blockchain and cloud technologies, functionality, integration ERP systems and deployment. The changing nature of the skills is not a new concept, for example Giunipero et al (2006) studied changes to supply chain skills given the changing role of logistics and SCM; similarly Jordan and Bak (2016) highlighted the changing nature of the skills requiring the acquisition of new skills. Dubey et al. (2017), Giunipero et al (2006) and Jordan and Bak (2016) agree that the skills have moved towards the strategic activities like supply chain integration

and understanding the wider scope of supply chain. Hence, which required an understanding of cross functional awareness (Derwik & Hellstrom; 2017). Firms also have to share managerial information at the organisational level which can lead to the implementation of complex, transparent information systems which share knowledge, risk, and decision making among supply chain partners (Ha et al 2011). This requires also the senior managers communication abilities, which includes an element of teamwork throughout the supply chain and relationship. The ability to motivate others is one of two managerial skills ranked in the top five for both Murphy & Poist studies (1991; 2007). Ferrer et al (2011) discusses how business management as a skill is how to manage and share risks and cost between parties on an inter-organisational level. Communication is a top skill is found across literature on relational skills (Gammelgaard & Larson 2001; Shou & Wang 2015). According to Derwik & Hellstrom (2017), relationship capital is built upon trust and a concern for the welfare of all parties as well as their own. Teamwork is also frequently mentioned in literature on supply chain skills (Gammelgaard & Larson 2001; Murphy & Poist 1991; 2007; Mangan & Christopher 2005; Wang et al. 2020). The ability to create a “win-win” scenario for supply chain partners and customers is also an integral part of relationship management (Meier 1995).

Table 1. SCM skills for 3PL Senior Managers

Skill Categories	Senior Management Skills	Authors
Functional Skills	Transport & Logistics (TRL)	Derwik & Hellstrom (2017); Dubey et al. (2017); Gammelgaard & Larson (2001); Murphy & Poist (1991; 2007); Lorentz et al (2013); Gravier & Farris (2008); Sodhi et al (2008); Johnson & Pyke, (2000)
	Inventory Management (INV)	Derwik & Hellstrom (2017); Murphy & Poist (1991; 2007); Lorentz et al (2013)
	IT systems connectivity (ITC)	Giunipero et al 2006; Derwik & Hellstrom 2017; Levenson 2012; Derwik & Hellstrom 2017; Bernon & Mena 2013)
Managerial Skills	Decision making ability (DMA)	Derwik & Hellstrom (2017); Dubey et al. (2017); Jordan & Bak (2016); Gammelgaard & Larson 2001; Murphy & Poist (1991; 2007); Thai et al (2011)
	Ability to motivate others (AMO) Business Management (BUS)	Christopher (2012); Bak et al. (2019); Jordan & Bak (2016); Dubey et al. (2017); Murphy & Poist (1991; 2007); Derwik & Hellstrom, (2017; Lorentz et al (2013)
Relationship Skills	Customer relationship management (CRM)	Dubey et al. (2017); Lambert et al (2008); Sauber et al (2008); Ballou (2007)
	Teamwork (TMW)	Derwik & Hellstrom 2017; Jordan & Bak (2016); Gammelgaard & Larson 2001
	Supplier relationship management (SRM)	Dubey et al. (2017); Lambert et al 2008; Johnson & Pyke 2000; Sodhi et al 2008; Giunipero et al 2006; Ballou 2007; Murphy & Poist 2007)
Behavioral Skills	Communication (COM)	(Murphy & Poist 1991; 2007; Derwik & Hellstrom (2017); Gammelgaard & Larson, 2001)
	Business ethics (BET)	Murphy & Poist 1991; 2007; Gammelgaard & Larson 2001; Derwik & Hellstrom 2017; Jordan & Bak 2016
	Flexibility (FLX)	Jordan & Bak (2016); Storey et al 2005; Lorenz et al 2013; Derwik & Hellstrom 2017)
	Adaptability (ADP)	Jordan & Bak (2016); Murphy & Poist 1991; 2007

Creativity/Initiative (CRI)

Murphy & Poist (1991; 2007); Jordan & Bak (2016); Chu et al. (2018)

3. Methodology

The aim of the study is to explore the senior management skills for 3PLs and its relevance to senior managers within 3PL. Therefore, a questionnaire based on the literature addressing the senior managers skills (Table 1) based on the previous literature on 3PL Senior Management skills has been devised. Wagner & Kemmerling (2010) noted that the logistics research has depended on quantitative methods, as it allowed the researcher to collect data with as many logistics stakeholders at possible in a short space of time at minimum cost.

Sample Selection

The questionnaire was distributed to 3PL to management teams and senior roles within the UK. Respondents were selected randomly enabling generalisations only from the sample of 3PL and freight forwarding senior managers, rather than the wider population. To enable this, the UK based LinkedIn groups have been addressed involving 3PLs network and Chartered Senior Managers network such as Chartered Management Institute and Chartered Institute of Purchasing and Supply.

The questionnaire instrument was developed based on a comparison of the skills listed by previously conducted by supply chain researchers in Table 1. The survey was pilot tested within the higher education institution to test for clarity of questions and concepts used. Additions, modifications and alterations were undertaken based on the feedback and the questionnaire developed (Appendix 1). A high non-response rate threatens the statistical techniques that can be used on small samples but also then the validity of those techniques when applied to smaller samples as results and trends can be more difficult to draw out and build around. However, acknowledgement must also be made to the fact senior managers are difficult to reach and some cases rather busy to take part in the study, due to the daily operations (Jordan and Bak, 2016). Hence the low rate of respondents replies with %3 can indicate the specific choice of 3PL senior managers, another study conducted Jordan and Bak, (2016) across all industries and levels in terms of assessing supply chain skills (ranging from graduates to senior management) generated 20% of response rate only. Hence the current studies albeit statistically significant should be viewed as

preliminary results and perhaps replicated not only to senior managers but to all 3PL employees on their views upon senior management skills, otherwise the limitation will rest with the low response rate from limited number of senior managers available.

4. Findings and Analysis

The results indicated the presence of a variety of senior management roles in the 3PLs such as the minimum experience in the senior management profile consisted of min. 5 years' experience in 3PLs and freight forwarding companies and highest level of experience was of 35 years. The mean years spend in the 3PL and freight forwarding industry was of 19 years, with a standard deviation of 6.887. When asked how many years they held a senior management role, the mean resultant was 16 years on average with a standard deviation of 8.661 with senior managers mostly originally coming from in Asia with 51.9%; followed by Europe with 39.6; Africa with 11.1; and America 7.4%. Located in Asia with 48%, Europe 26%, Africa 11%, America 11% and Middle East 4%.

The survey instrument was tested for reliability (Table 4). When analysing the elements, codes were assigned to the following constructs in Table 4. The most measures were acceptable at a minimum for Cronbach's coefficient alpha of 0.60 (Hair et al., 2011), implying that they were internally consistent. However, a few measures were below 0.60. According to Churchill (1979), if the study is exploratory in nature, the Cronbach's coefficient alpha levels between 0.50 and 0.60 are acceptable.

Table 4: Factors and their scale items

Code		Cronbachs alpha
INV	Inventory Management	.881
TRL	Transport and Logistics	.784
ITC	IT systems connectivity	.517
CRF	Cross functional skills	.771
DMA	Decision making ability	.616
AMO	Ability to motivate others	.414
BUS	Business Management	.770
CRM	Customer relationship management	.806
TMW	Teamwork	.836
SRM	Supplier relationship management	.782
COM	Communication	.642
BET	Business ethics	.354
FLX	Flexibility	.554
ADP	Adaptability	.810
CRI	Creativity/Initiative	.549

For this study the Cronbach’s coefficient alpha was for two factors below 0.50 which were business ethics and ability to motivate others, due to the consistency level these two elements have been exempted from the analysis. Hence the findings reflect upon the following skills on Table 5.

Table 5. Senior Management skills adjusted

Functional Skills	Managerial Skills	Relationship Skills	Behavioral Skills
<ul style="list-style-type: none"> • Transport & Logistics • Inventory Management • Cross Functional Skills • IT systems connectivity 	<ul style="list-style-type: none"> • Decision making ability • Ability to motivate others • Business Management 	<ul style="list-style-type: none"> • Customer relationship management • Teamwork • Supplier relationship management • Communication. 	<ul style="list-style-type: none"> • Business Ethics • Flexibility • Adaptability • Creativity/Initiative

After having assessed and adapted the twelve senior management skills, the following section introduces the individual constructs and their respective descriptive statistics with the use of SPSS was conducted, in order to enable a broader understanding of the constructs used. Therefore, the next section introduces the findings of the twelve skills observed within this study, and their relevance to current senior management skills for 3PL and freight forwarders.

The functional skills importance has still kept its importance since Murphy & Poist (2007) indicated that functional skills transport & logistics, inventory management are important key functional skills. The results from this study suggested that functional skills are still important however, between the functional skills this has now changed. Table 6 represents the overall mean for the senior management skills and its relevance to the senior management in today’s 3PLs and FFI, the means and standard deviations for the skills relevance and importance indicates all skills are seen relevant for the senior managers, as shown in the table 6 there are no significant differences across the senior managers’ views.

Table 6.Senior Management Skills

Component	Overall Mean (OM)	Standard Deviation (SD)	Extraction	Total	% of Variance
INV	4.37	1.964	.861	2.998	74.951
TRL	5.70	1.409	.784	2.519	62.968
CRF	5.93	1.238	.809	2.614	65.341
ITC	5.92	1.382	.884	2.314	57.862
DMA	6.67	.555	.817	2.457	61.432
BUS	6.15	1.231	.931	2.429	60.725
CRM	6.26	1.196	.599	2.676	66.891
TMW	6.37	1.079	.845	2.989	74.371
SRM	5.63	1.471	.940	2.473	61.831
COM	6.63	.565	.776	2.500	62.492
FLX	5.67	1.271	.713	2.518	62.940

ADP	5.93	1.107	.910	2.913	72.813
CRI	6.26	.923	.771	2.405	60.131

The above table indicates that the senior managers agree that the lowest importance is placed upon the functional skills including transport and logistics (5.70), inventory management (4.37), information technology systems (5.92) and cross functional skills (5.93) for the senior managers with an overall mean of 4.7. In the below section a more detailed skills assessment for senior managers in the field of transport and logistics including freight forwarders and the training needs will be discussed based on the skill sets.

In conformance with the previous studies three constructs are found having eigenvalues greater than 1.0 and small factors suppressed at 0.50. The scales' average variance extracted ranging from 60% to 91%. The factor loadings ranged from .637 to .943 ($p < .01$). Table 8 below reports the complete CFA results. The initial analysis for reliability indicated that all measures were acceptable at a minimum for Cronbach's coefficient alpha of 0.60 and in case of explorative measures 0.50 (Hair et al., 2011), implying that they were internally consistent.

Skills Categories	Individual Skills	Item	Std. factor loading	Average Variance Extracted
Functional Skills	Transport & Logistics (TRL)	TRL1	.799	76.42
		TRL2	.834	
		TRL3	.660	
	Inventory Management (INV)	INV1	.907	73.24
		INV2	.920	
		INV3	.726	
	IT systems connectivity (ITC)	ITC1	.883	77.15
		ITC2	.846	
		ITC3	.586	
Managerial Skills	Decision making ability (DMA)	DMA1	.862	81.31
		DMA2	.728	
		DMA3	.851	
	Business Management (BUS)	BUS1	.870	68.40
		BUS2	.943	
		BUS3	.637	
Relationship Skills	Customer relationship management (CRM)	CRM1	.838	79.18
		CRM2	.920	
		CRM3	.909	
	Teamwork (TMW)	TMW1	.957	89.70
		TMW2	.966	
		TMW3	.918	
	Supplier relationship management (SRM)	SRM1	.940	71.01
		SRM2	.925	
		SRM3	.626	
	Communication (COM)	COM1	.921	75.30
		COM2	.923	
		COM3	.748	
Behavioural Skills	Flexibility (FLX)	FLX1	.836	82.81

	FLX2	.946	
	FLX3	.943	
Adaptability (ADP)	ADP1	.927	91.32
	ADP2	.938	
	ADP3	.875	
Creativity/Initiative (CRI)	CRI1	.877	80.11
	CRI2	.897	
	CRI3	.911	

Table 8. CFA, AVE Results

Based on the findings within the functional skills IT systems connectivity is one of the highest ranked for skills which should be developed in future, which suggests IT connectivity between shippers and transport carriers will become a greater selling point for those who can implement advanced systems to create added value. **The findings support this view, as IT systems connectivity is the highest ranked skill in importance for 3PL companies. Similarly, Derwik & Hellstrom (2017) and Zimmerman et al. (2020) found that integrated systems connectivity and the system-based skills to be an inter-organisational skill. This supports the view that systems understanding that enables connectivity across supply chain has become important with the growing scale and scope of supply chains (Jordan and Bak, 2016), despite different views between businesses exist at intra-organisational level, to increase transparency and communication is becoming more of a core required skill within 3PL and freight forwarding industry.** Lastly, the findings show that alongside more intra-organisational interaction the cross-functional skill seem to be highly ranked skill and highest in short supply chain. The role of 3PL senior managers is clearly becoming more cross functional given the score on importance and also the need for the skill to be developed for future senior managers. Given that cross-functional skill is one of the more emerging skills in 3PL and freight forwarding, this is an impressive score and is not included in previous studies and should be explored further. This can lead also practitioners and academics to develop training and educational programs which improve cross-functional thinking and dialogue.

The decision-making ability is the highest ranked skill in its importance in the 3PL & freight forwarding industries across the entire study, suggesting senior management decisions have a more important role to play specifically in these industries, rather than SCM as a whole as in the Murphy & Poist (1991; 2007) studies. The senior managers indicate that this will remain its strength and continue to be developed for future senior managers, as 3PL and freight forwarding teams are multi-cultural and positioned across different locations this study finds this will continue to be the

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3 case. Although, the literature includes a degree of joint decision-making (Ha et al, 2011), but these
4 results find this to be the least important of the managerial skills assessed across all questions.
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7 The communication skills have achieved the highest score in the senior managers which was
8 similar to the study Murphy & Poist (2007). However, despite achieving a high score in 1991 and
9 2007 in Murphy & Poist study, the senior managers indicated that this was the lowest ranked
10 managerial skills. Amongst relational skills, customer relationship management was a skill
11 suggested the market has become more saturated with providers and therefore customer
12 relationship management is growing in importance. Of relational skills, this is also the skill
13 identified as most in short supply, and second highest in the entire study, just behind cross-
14 functional. Supplier relationship management, teamwork scores highly in its importance,
15 coinciding with the importance of cross-functional skills and is also ranked highly a skill which
16 should be developed for future senior managers. On the other hand, the creativity, adaptability
17 and flexibility skill scores were highly rated in importance and as a skill to be developed for future
18 senior managers, which is surprising as it was scored as the one of the lowest skills in Murphy &
19 Poist (2007) study. This suggests that as supply chains are becoming more complex (Jordan and
20 Bak, 2016), encouraging a view that these skills amongst senior managers are becoming a key
21 differentiator between 3PL firms and their success.
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33 34 **5. Discussion**

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36 The study also identifies the senior manager skills in 3PL industry, updating previous studies
37 (Murphy & Poist 1991; 2007; Gammelgaard & Larson 2001; Jordan and Bak, 2016; Derwik &
38 Hellstrom 2017; Dubey et al. 2017) on 3PL senior management supply chain skills. The significant
39 impact of environmental and global changes (Jordan and Bak, 2016) has led to changes in graduate
40 skills and training requirement, however the existing studies did include rather limited discussion
41 at senior manager skills and how these have been impacted. For example, the Murphy & Poist
42 (2007) study indicated that managerial skills included the business ethics, however our study
43 indicates that there has been differences in respondents view, this may be due to the fact that ethics
44 guidelines have been treated as a part of the daily operations i.e. Modern slavery Act (2015), rather
45 than considered as a standalone skill at senior management level, The findings show that current
46 and future senior managers highlighted the importance of a range of skills in order to be successful
47 as shown in table 6, including decision making, communication, teamwork, creativity and
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3 initiative which had been seen formerly as a trait rather than a skill, however seems to have an
4 overarching impact on the managers daily operations (Matsuo, 2014). The relationship skills with
5 the broadening scope of the supply chain the results suggest that skill should be included in any
6 senior manager development training and investigate the impact upon 3PL supply chain managers.
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10 11 *5.1 Theoretical implications*

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13 This research illustrates that for senior-level the managerial skills are seen as the most important
14 skill alongside the relational skills, which are also ranked as the skills most in short supply.
15 Therefore, 3PL industry can focus on developing both managerial and relational skill training to
16 develop future successful senior managers. These results resemble Murphy & Poist (2007) to a
17 certain degree with the managerial skills but also provide an insight into future directions of skill
18 importance to enable firms to take appropriate action. This study also highlights the increasing
19 importance of relational and behavioural skills, particularly when compared with the more
20 traditional functional skills which deemed to be more prevalent at senior manager level in previous
21 studies.
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30 31 *5.2 Managerial implications*

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33 The changing global environment for supply chain and logistics has a considerable impact upon a
34 firm's ability to deliver world class supply chain and logistics solutions, this become also evident
35 during Covid-19 although the questionnaire was conducted before Covid-19. Firms' will
36 inevitably have to train existing senior managers and recruit new skills in order to manage the
37 complexity and relational changes in modern global SCM. Results indicated that managerial and
38 relational skills are important for 3PL and freight forwarding senior managers. This can be an area
39 for firms to improve their hiring and training practices to accommodate in required senior
40 management skills which could be done through developing suitable trainings and personal
41 development plans for senior managers that could incorporate the desired skill sets identified in
42 this study.
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50 51 *5.3 Conclusion, limitations and future work*

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53 This paper contributes significantly to 3PL senior management skills literature. Considering the
54 scope of impact of senior managers in 3PLs and global operations , the research suggests that
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flexibility and adaptability has become very important to 3PLs senior managers. Although the limitations are indicating preliminary results the indicators highlight the impact upon individual senior managers as such. This study included a limited number of senior managers, however advice from senior managers remained that a more qualitative focus group discussion may be relevant in assessing particular the role of adaptability, flexibility and creativity in senior management skills in future studies. Especially in the uncertain environment, successful operations may hinge on being able to introduce creative solutions or being able to adapt to the changing operational conditions. As this is only a preliminary study conducted at senior management level, the findings needs to be taken at case basis and further studies need to include perhaps all supply chain members not only senior managers and understand their perspectives on important 3PL senior management supply chain skills are, and whether these are different than the fifteen skills identified in line with senior manager skills.

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21 Appendix1: Questionnaire

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23 1. Your Job Title
24 2. Nationality:
25 3. Current location:
26 4. Senior management experience (in years): 0-50 years
27 5. Years' experience in the 3PL / freight forwarding industry: 0-50 years
- 28 **Inventory management**
29 6. As a senior manager do you believe this skill is important for your role? (Likert Scale 0-7)
30 7. How important is this skill for senior management roles in the 3PL and freight forwarding industry? (Likert Scale
31 0-7)
32 8. Is this skill in short supply? (Likert Scale 0-7)
33 9. Do you believe this skill needs to be developed for future senior managers? (Likert Scale 0-7)
- 34 **Transport & logistics**
35 10. As a senior manager is this skill important for your role? (Likert Scale 0-7)
36 11. How important is this skill for senior management roles in the 3PL and freight forwarding industry? (Likert Scale
37 0-7)
38 12. Is this skill in short supply? (Likert Scale 0-7)
39 13. Do you believe this skill needs to be developed for future senior managers? (Likert Scale 0-7)
- 40 **IT systems connectivity**
41 14. As a senior manager do you believe this skill is important for your role? (Likert Scale 0-7)
42 15. How important is this skill for senior management roles in the 3PL and freight forwarding industry? (Likert Scale
43 0-7)
44 16. Is this skill in short supply? (Likert Scale 0-7)
45 17. Do you believe this skill needs to be developed for future senior managers? (Likert Scale 0-7)
- 46 **Cross-functional**
47 18. As a senior manager do you believe this skill is important for your role? (Likert Scale 0-7)
48 19. How important is this skill for senior management roles in the 3PL and freight forwarding industry? (Likert Scale
49 0-7)
50 20. Is this skill in short supply? (Likert Scale 0-7)
51 21. Do you believe this skill needs to be developed for future senior managers? (Likert Scale 0-7)
- 52 **Decision making ability**
53 22. As a senior manager do you believe this skill is important for your role? (Likert Scale 0-7)
54 23. How important is this skill for senior management roles in the 3PL and freight forwarding industry? (Likert Scale
55 0-7)
56 24. Is this skill in short supply? (Likert Scale 0-7)
57 25. Do you believe this skill needs to be developed for future senior managers? (Likert Scale 0-7)
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Ability to motivate others

26. As a senior manager do you believe this skill is important for your role? (Likert Scale 0-7)
27. How important is this skill for senior management roles in the 3PL and freight forwarding industry? (Likert Scale 0-7)
28. Is this skill in short supply? (Likert Scale 0-7)
29. Do you believe this skill needs to be developed for future senior managers? (Likert Scale 0-7)

Business management

30. As a senior manager do you believe this skill is important for your role? (Likert Scale 0-7)
31. How important is this skill for senior management roles in the 3PL and freight forwarding industry? (Likert Scale 0-7)
32. Is this skill in short supply? (Likert Scale 0-7)
33. Do you believe this skill needs to be developed for future senior managers? (Likert Scale 0-7)

Customer relationship management

34. As a senior manager do you believe this skill is important for your role? (Likert Scale 0-7)
35. How important is this skill for senior management roles in the 3PL and freight forwarding industry? (Likert Scale 0-7)
36. Is this skill in short supply? (Likert Scale 0-7)
37. Do you believe this skill needs to be developed for future senior managers? (Likert Scale 0-7)

Teamwork

38. As a senior manager do you believe this skill is important for your role? (Likert Scale 0-7)
39. How important is this skill for senior management roles in the 3PL and freight forwarding industry? (Likert Scale 0-7)
40. Is this skill in short supply? (Likert Scale 0-7)
41. Do you believe this skill needs to be developed for future senior managers? (Likert Scale 0-7)

Supplier relationship management

42. As a senior manager do you believe this skill is important for your role? (Likert Scale 0-7)
43. How important is this skill for senior management roles in the 3PL and freight forwarding industry? (Likert Scale 0-7)
44. Is this skill in short supply? (Likert Scale 0-7)
45. Do you believe this skill needs to be developed for future senior managers? (Likert Scale 0-7)

Communication - written & oral

46. As a senior manager do you believe this skill is important for your role? (Likert Scale 0-7)
47. How important is this skill for senior management roles in the 3PL and freight forwarding industry? (Likert Scale 0-7)
48. Is this skill in short supply? (Likert Scale 0-7)
49. Do you believe this skill needs to be developed for future senior managers? (Likert Scale 0-7)

Business ethics

50. As a senior manager do you believe this skill is important for your role? (Likert Scale 0-7)
51. How important is this skill for senior management roles in the 3PL and freight forwarding industry? (Likert Scale 0-7)
52. Is this skill in short supply? (Likert Scale 0-7)
53. Do you believe this skill needs to be developed for future senior managers? (Likert Scale 0-7)

Flexibility

54. As a senior manager do you believe this skill is important for your role? (Likert Scale 0-7)
55. How important is this skill for senior management roles in the 3PL and freight forwarding industry? (Likert Scale 0-7)
56. Is this skill in short supply? (Likert Scale 0-7)
57. Do you believe this skill needs to be developed for future senior managers? (Likert Scale 0-7)

Adaptability

58. As a senior manager do you believe this skill is important for your role? (Likert Scale 0-7)
59. How important is this skill for senior management roles in the 3PL and freight forwarding industry? (Likert Scale 0-7)
60. Is this skill in short supply? (Likert Scale 0-7)
61. Do you believe this skill needs to be developed for future senior managers? (Likert Scale 0-7)

Creativity/initiative

62. As a senior manager do you believe this skill is important for your role? (Likert Scale 0-7)

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3 63. How important is this skill for senior management roles in the 3PL and freight forwarding industry? (Likert Scale
4 0-7)

5 64. Is this skill in short supply? (Likert Scale 0-7)

6 65. Do you believe this skill needs to be developed for future senior managers? (Likert Scale 0-7)

7 **Additional Comments**

8 66. Are there any skills not covered in this survey you believe to be important? If so, please list here for future research.
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