PURCHASING AND SUPPLY MANAGEMENT (PSM) COMPETENCIES: CURRENT AND FUTURE REQUIREMENTS

Please see final version:
Bals, L., Schulze, H., Kelly, S., & Stek, K. (Forthcoming): Purchasing and supply management (PSM) competencies: Current and future requirements, Journal of Purchasing & Supply Management.

ABSTRACT

Purchasing & Supply Management (PSM) competencies are the individual-level foundations of organisational PSM performance. In light of recent developments in the workplace and the external environment, the question of what PSM competencies are needed now, as well as in the future, becomes one of increasing importance. Analysing qualitative data from 46 interviews from 16 companies, this paper identifies what current and future competencies are required by PSM professionals, categorizes PSM competencies according to the framework established by Tassabehji and Moorhouse (2008) and establishes how these competency requirements have changed over the last ten years. The most important current competencies required by PSM professionals are negotiation, communication and relationship management (e.g. 'Interpersonal communication'), strategy and analytics (e.g. 'Strategic thinking'), as well as professional knowledge requirements (e.g. 'Basic knowledge on PSM role & processes'). When looking at future requirements, competencies in the areas of sustainability and digitisation were identified as becoming increasingly important. Overall, 17 competencies in addition to those shown in Tassabehji and Moorhouse (2008) were identified. The most prominent new competency areas are related to digitisation (e.g. 'eProcurement Technology', 'Automation'), innovation (e.g. 'Innovative sourcing') and sustainability. The interviewees also identified 11 new competencies within the interpersonal skills cluster, most of them at the intersection between competencies and traits (e.g. 'Deal with Ambiguity', 'Curiosity', 'Passion').

Keywords: Purchasing and Supply Management; procurement; current and future competencies; skills; interviews

1. INTRODUCTION

Purchasing and Supply Management (PSM) plays a pivotal role in increasing overall organisational competitiveness. Between 60 and 80 percent of total costs (Monczka, Handfield, Giunipero, Patterson, & Waters, 2010; Van Weele, 2009) are external to the organisation, i.e. being paid to suppliers, and so PSM's role in spanning organisational boundaries and managing these external networks has become increasingly important (Van Weele & Van Raaij, 2014). In this paper, we refer to the PSM discipline as being focused on the upstream supply network.

While there exists a robust trajectory of research on the skills, competencies and knowledge required in PSM (e.g. Cousins, Giunipero, Handfield, & Eltantawy, 2006; Faes,

Knight, & Matthyssens, 2001; Giunipero, Dawley, & Anthony, 1999; Giunipero, Denslow, & Eltantawy, 2005; Giunipero & Pearcy, 2000; Kern, Moser, Sundaresan, & Hartmann, 2011; Knight, Tu, & Preston, 2014), there are recent developments that require taking stock of current and future competency requirements. Developments such as: sourcing innovation (Luzzini, Amann, Caniato, Essig, & Ronchi, 2015; Schiele, 2010, 2012), handling potential supplier disruptions (Wieland, Handfield, & Durach, 2016), ensuring sustainability in the supplier network (Montabon, Pagell, & Wu, 2016; Schneider & Wallenburg, 2012; Wilding, Wagner, Miemczyk, Johnsen, & Macquet, 2012) and the implications of technology-based workplace changes due to increased digitisation are challenging previous assumptions about what competencies the modern PSM professional will require. For example, with increasing levels of automation, are students being prepared for a future career in PSM by merely learning the textbook basics of purchase order processing or should their education include project-oriented learning on how to design processes and have them executed digitally with an advanced understanding of the role of Information Technology?

In light of these developments and the need for generating further insights for research and practice, this study addresses the following research questions:

RQ1 – What current and future competencies are required by PSM professionals?

RQ 2 – How have these PSM competencies changed over the last ten years?

2. CONCEPTUAL BACKGROUND

2.1 Terms and definitions: Competencies, skills and knowledge

It is beyond the scope of this paper to reconcile the conceptual ambiguity around the terminology of skills, competencies, knowledge and the interrelationships between them (e.g. Delamare-Le Deist & Winterton, 2005). This conceptual ambiguity and lack of consensus has been noted in other related supply chain management (SCM) studies (e.g. Derwik and

Hellström (2017). Therefore, building on similar studies in PSM, SCM and the wider Human Resource Management (HRM) fields (e.g. Bollinger & Smith, 2001; Boyatzis, 2008; Giunipero, Handfield, & Eltantawy, 2006; Mirabile, 1997) and to ensure consistency, we adopt the terms 'competency' (singular) and 'competencies' (plural) through the work, but note that this encompasses the broad spread of PSM job requirements and also includes knowledge and skills.

To obtain the widest possible view of competencies and enhance our understanding of what PSM professionals need to be able to do their jobs, we follow the holistic view advocated by Tassabehji and Moorhouse (2008), Derwik and Hellström (2017) and key works from the HRM literature (e.g. Delamare-Le Deist & Winterton, 2005), who propose broader typologies of competencies. These identify different competency clusters, but include conceptual (cognitive, knowledge and understanding) and occupational (technical and functional knowledge, psychomotor and applied skills) aspects. This reflects earlier work, e.g. Hayes (1979), who describe competencies as encompassing knowledge, motives, traits and skills. This holistic approach is also consistent with the United Nation Industry Development Organisation (UNIDO, 2017) and the European Commission frameworks (see e.g. the customs competency framework: European Commission, 2014) and also reflects how competencies have been defined in a number of similar papers in other, but related, areas such as SCM (e.g. Briscoe, Dainty, & Millett, 2001; Derwik & Hellström, 2017; Flöthmann, Hoberg, & Gammelgaard, 2018; Flöthmann, Hoberg, & Wieland, 2018; Gammelgaard & Larson, 2001; Giunipero et al., 2005; Giunipero et al., 2006; Kotzab, Teller, Bourlakis, & Wünsche, 2018; Mangan & Christopher, 2005; Prajogo & Sohal, 2013). In our study, we focus on the work of Tassabehji and Moorhouse (2008), and complement it with competency clusters based on Delamare-Le Deist and Winterton (2005) to allow us to develop our understanding of current and future PSM competencies in a structured and consistent manner.

This holistic approach provides valuable inputs for industry/practice to perform their own competency mapping exercises. In particular, our work conforms to some of the characteristics of the approach advocated by Campion et al. (2011, p. 226), in which: *"Competency models refer to collections of knowledge, skills, abilities, and other characteristics (KSAOs) that are needed for effective performance in the jobs in question"*. Specifically, we have adopted a more deductive approach (e.g. starting with the outcomes and backing into the tasks and KSAOs), in that we have asked participants what they need to do their jobs effectively, both currently and in future. Based on the input of the participants, we have then provided an overview of current and future PSM competencies that includes the utilisation of practice-specific language. However, as we have coded at a more general level, our work is not overly adapted to any specific organisational context and therefore allows practitioners to adopt aspects of our results in their own competency mapping activities and in the alignment of their HRM systems. Our approach also reflects some of the steps of focused competency mapping papers such as Yuvaraj (2011), as we have identified specific organisations and the individuals within them, conducted semi-structured interviews, collected and analysed relevant data and then classified pertinent competencies.

2.2 PSM Competencies- Literature Review

In order to address RQ1: "What current and future competencies are required by PSM professionals" and identify what PSM professionals need to effectively and efficiently do their jobs, we conducted a systematic literature search in www.scholar.google.com and www.scopus.com. This literature review also revealed how different studies over the last decade interrelate (Shaw, 1995). The key search terms used were: 'buyer', 'purchase', 'purchaser', 'purchasing', 'procurement', 'skill', 'skills', 'competence', 'competency' and

'competencies' and led to the combinations shown in Table 1: buyer OR purchas* OR procurement AND competenc* OR skill*.

Buyer	Competenc* *(e.g. competence, competency, competencies)*
Purchas* *(e.g. purchase, purchaser, purchasing)*	Skill* *(e.g. skill, skills)*
Procurement	

OR

AND

Table 1: Keywords and search terms

All 1,007 articles identified in the initial search were evaluated and any duplicates were discarded, as were those which looked at organisational (i.e. non-individual) competencies in the described fields and those that focused on the consumer-related skills of purchasing budget management. Similarly, those that briefly mentioned the term 'skill' or 'competency' in relation to the PSM profession, but did not focus on them, were also discarded. This search and review generated an extensive list of competencies found in 30 articles that were published in the PSM field from 1987 to 2017, as shown in Table 2.

2007-2017	1997-2007	1987-1997
Baily, Farmer, Crocker, Jessop, and Jones (2008) Eltantawy, Giunipero, and Fox (2009) Kern et al. (2011) Knight et al. (2014) Tassabehji and Moorhouse (2008) Tatham, Wu, Kovács, and Butcher (2017) Zawawi et al. (2014)	Burt, Dobler, and Starling (2003) Carr and Smeltzer (2000) Cousins, Giunipero, et al. (2006) Cousins and Spekman (2003) Faes et al. (2001) Giunipero (2000) Giunipero et al. (2005) Giunipero and Handfield (2004) Giunipero and Pearcy (2000) McKeefry (1998) Mulder, Wesselink, and Bruijstens (2005) Muller (2001) Trent and Monczka (2003)	Anderson and Katz (1998) Carter and Narasimhan (1996) Cavinato (1987) Cruz and Murphy (1996) Dowd and Liedtka (1994) Keough (1993) Killen and Kamauff (1995) Kolchin and Giunipero (1993) Murphy (1995) Pagell, Das, Curkovic, and Easton (1996)

Table 2: PSM competencies literature 1987-2017

Tassabehji and Moorhouse (2008) has been chosen as the basis for the comparative analysis in this study, as it is the most elaborately categorised model and is in line with other research in the area, for example Tatham et al. (2017) and Killen and Kamauff (1995).

Tassabehji and Moorhouse (2008) uses in-depth interviews with Chief Procurement Officers (CPOs) and the following PSM competency/skills studies: Kolchin and Giunipero (1993), Giunipero and Pearcy (2000), Carr and Smeltzer (2000), Giunipero et al. (2005), Cousins, Lawson, and Squire (2006), Giunipero et al. (2006) and Large and Giménez (2006). A strong, underlying element in Tassabehji and Moorhouse (2008) are the longitudinal study reports from Purchasing Education Training (1993) and Purchasing Education Training-2 (2000) (i.e.: Giunipero, 2000; Kolchin & Giunipero, 1993), both initiated by the Centre of Advanced Purchasing Studies (CAPS).

Tassabehji and Moorhouse (2008) differentiate between *Technical skills*, *Interpersonal skills*, *Internal and External enterprise skills* and *Strategic business skills* (as shown in Appendix A) and categorise procurement skills as 1) procurement specific skills and 2) generic management skills. This distinction is also seen in the works of Killen and Kamauff (1995), Shou and Wang (2015) and Tatham et al. (2017).[1] Tassabehji and Moorhouse (2008) state that PSM reaches strategic maturity when PSM professionals possess both 'basic' procurement specific competencies and 'advanced' generic management skills, as long as they have top management support for the PSM function. The specific categorisations in the different papers seem to depend on the different methodologies and the research focuses of the studies. However, in general, there is a distinction between PSM-related, general management and inter- and intrapersonal competencies. In Appendix B Tassabehji and Moorhouse's (2008) original table has been extended to encompass other relevant research. During the past decade, Tassabehji and Moorhouse (2008) has been cited in 42 peer-reviewed journal articles (based on www.scopus.com, October 2018). Appendix C shows the five main topics that these articles refer to.

[1] The paper of Shou and Wang (2015) collected requirements from 900 online SCM job ads in Canada, China, India, Malaysia, and Singapore, UK, USA and 'other' countries. The work of Tatham et al. (2017) is a literature review and Killen and Kamauff (1995) is a handbook titled 'Managing Purchasing: Making the Supply Team Work'.

As the number of scholars that study PSM competencies seems to be limited, there may be a risk of self-referencing in the PSM literature because of a small group of authors who are citing each other and/or who are co-authoring journal papers. To further explore this, the search terms 'purchasing', 'supply' and 'skills' were entered in www.scopus.com (October 2018) and the search scope limited to 'business, management & accounting' journals (2008-2018), and those authors not mentioned in Table 2 were excluded. This process identified in 19 articles, of which 7 are (co-) authored by scholars mentioned in Appendix C. The remaining 12 articles were analysed on the basis of their titles and abstracts to establish if the core subject of the paper is PSM competencies. This resulted in seven papers which do not cite Tassabehji and Moorhouse (2008) and these are displayed in Appendix D (in combination with the related citations). Since our research is based upon Tassabehji and Moorhouse (2008), we note that this self-referencing is a potential limitation of our study, however the empirical nature of our work ensured that additional competencies would be identified and categorised.

In addition to the academic literature, there are two recent practitioner publications by consultancy firms KPMG and Deloitte that identify characteristics of PSM professionals, particularly intrapersonal traits in combination with cross-functional competencies. In their outlook on the future of PSM for the consultancy firm KPMG, Von der Gracht, Giunipero, and Schueller (2016, p. 6) introduce 'dynaxibility', which is a composition of 'dynamic', 'complex' and 'ability' as "the ability to competently manage dynamic and complex (dynaxic) developments – in other words, to manage our near and distant future". Deloitte (2013, p. 14), in their 2020 outlook for the PSM field, state that: "(…) one of the most important roles of procurement leadership is to embrace diverse skills, capabilities and background for the appropriate positions." Moreover, cross-functional skills are needed to "engage and interact with constituents across legal, IT, HR, marketing, engineering/design, customer service/support, supply chain, manufacturing, etc.". Also, Deloitte (2013, p. 14) identify a

commonality between the skills needed in finance departments in 2013 and those in PSM in 2020*:* "Analytical skills and a data-driven orientation will be the ante but will not stand alone in assembling the right team members. Overall, how organisations conceive of talent will transcend just identifying 'A-players' at all ranks and levels".

3. METHODOLOGY

3.1 Research Design

As discussed in the introduction, this research provides an updated perspective on current and future PSM competencies, by building on and then extending the work of Tassabehji and Moorhouse (2008). In the development of the research design, a qualitative data collection approach, with the aim of theory elaboration was deemed most suitable to facilitate the emergence of competencies beyond a predefined list, based on previous research.

The assurance of research quality criteria, such as: 1) credibility/internal validity, 2) transferability and generalizability/external validity, 3) dependability/reliability and 4) confirmability/objectivity was addressed by the use of a number of techniques (based on Lincoln & Guba, 1985; Riege, 2009; Salzberger & Sinkovics, 2006; Salzberger, Sinkovics, & Schlegelmilch, 1999; Welch, Marschan-Piekkari, Penttinen, & Tahvanainen, 2002; Yin, 2013). The details of how each particular research quality requirement was addressed in every single project phase is contained in Appendix E. For each major project phase, i.e. preparation, implementation, follow-up and dissemination, the specific measures to be applied were defined during March/April 2016, and then continuously reviewed and refined over the course of the data collection. The preparation phase included the development of the methodology, the development of the interview guide and company selection. For example, project implementation included participant communication, conducting interviews and generating relevant documentation. The semi-structured interview guide helped to enhance reliability in

the data collection phase (Maxwell, 1997; Yin, 2003). Finally, coding by four researchers and consistent peer discussion and evaluation of the results ensured credibility and objectivity in the interview analysis phase. Figure 1 systematically draws together the development steps for our updated PSM competencies set.

First, we have taken the range of various competencies identified from the primary data from this research and linked them to the categories of the Tassabehji and Moorhouse (2008) model. Second, the research identifies 17 additional new competency areas that reflect the current needs and requirements of PSM professionals and complements the Tassabehji and Moorhouse (2008) research.

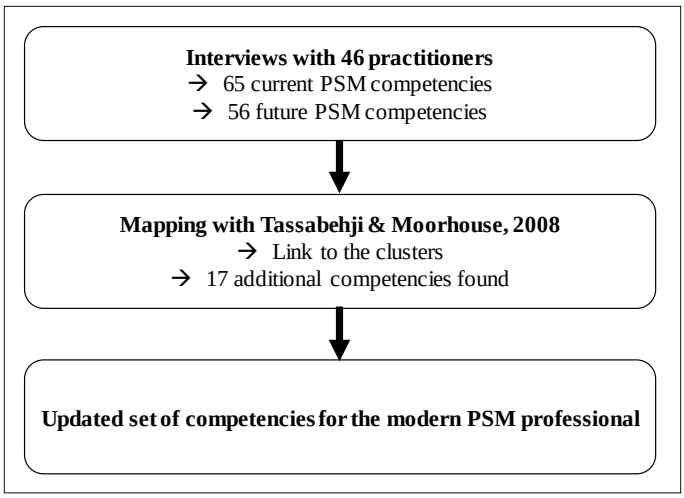

Figure 1: Development of a set of competencies for the modern PSM professional

Finally, a third step allowed us to identify any changes to PSM competencies over the last decade and derive an updated set of competencies for PSM professionals that reflects both current and future requirements.

3.2 Empirical Research: Company Selection, Data Collection, and Analysis

Collecting qualitative data through the use of semi-structured interviews ensured that a deep understanding of the phenomenon could be obtained. A robust selection strategy for the companies was used, encompassing a range of organisational characteristics: Industries with

lower and higher external value added; two major consultancies to obtain their views on PSM's competency requirements across their client base, geographical spread (to not overemphasise one particular national culture), and conventional (i.e. commercial) business models alongside social businesses (to challenge current PSM conventions). Although not aiming for statistical representativeness, the breadth of organisational types did facilitate the widest possible perspective of different requirements. This led to a final selection of 12 buying companies, described in Table 3, all of which had some international scope in their operations.

Within each of these companies, the interviewee target sample included the Chief Procurement Officer (CPO) or a senior level PSM representative, a PSM employee responsible for strategic sourcing, as well as a PSM training/HR representative. These different hierarchical and functional roles were included to ensure a more holistic view of the research topic, and to cover the full procure-to-pay process (Figure 2).

Some of the smaller companies nominated a single interviewee, who, because of the role he/she had and the nature of the organisation, was able to cover all PSM areas. In four organisations, we were also given access to interview a supplier, providing another perspective on the competencies required to facilitate a successful business relationship. In total, this resulted in 16 companies (12 buying companies and 4 suppliers) and 46 separate interviews (Table 3). Our coverage of those involved in the operational aspects of the PSM process (shown in Figure 2 and referred to as 'operational roles'), as well as those assisting in the recruitment process (e.g. HR), complements and extends Tassabehji and Moorhouse (2008), whose study focused on managerial roles only. The core interviewee demographics are shown in Tables 4 and 5.

Case	Sector/Industry	Interviewees	External value added	Business Model	No. of Employees	Turnover in €*
AUTO1	Automotive	10	High	Traditional	> 300 000[1]	>70 billion[1]
AUTO1 Supplier	Automotive	2	High	Traditional	10 000 - 49 999[1]	> 1 billion
AUTO2	Automotive	1	High	Traditional	80 000 - 99 999	>10 billion[1]
CHEM1	Chemicals	2	Low	Traditional	10 000 - 49 999[1]	> 5 billion[1]
CHEM1 Supplier	Training & Consulting	1	Low	Traditional	< 999	n.a.
CHEM2	Chemicals	6	Low	Traditional	10 000 - 49 999[1]	>10 billion[1]
CONSU1	Consulting	2	Low	Traditional	> 300 000[1]	>20 billion[1]
CONSU2	Consulting	1	Low	Traditional	1 000 - 9 999[2]	>1 billion[2]
TECH1	Technology, Electronics	1	High	Social Business	< 999	n.a.
TECH2	Technology, Electronics	1	High	Traditional	< 999 [4]	>10 million [4]
CONST1	Construction	3	High	Traditional	10 000 - 49 999[3]	>1 billion[3]
CONST1 Supplier	Construction	1	Low	Traditional	1 000 - 9 999[2]	n.a.
FOOD1	Food	9	High	Traditional	80 000 - 99 999	>20 billion[5]
FOOD1 Supplier	Food	1	High	Traditional	1 000 - 9 999[2]	
PHARM1	Pharma	3	Low	Traditional	50 000 - 79 999[1]	>10 billion[1]
SOCSER1	Social Services	2	Low	Social Business	< 999 [4]	>2 million [4]

Legend: *Exchange rates 31.12.15; [1]based on companies' annual reports 2015; [2]Data from 2014 based on company homepage; [3]Data from 2015 based on company homepage; [4]Data based on expert interview; [5]Data based on Forbes.

Table 3: Company Demographics

Interviewees' Demographic Data Focal Companies				
Gender	Σ 41	Male 28	Female 13	
Title	41	HR-Representative 4	Operational 5	Management 32
Cross-functional experience	41	Yes 20	No 13	Unassigned 9
Business Model	41	Traditional 38	Social Business 3	
		Mean	Standard Deviation	
Total Working Experience (in years) Company Turnover (in billion €)		17 16.1	8.51 21	

Table 4: Interviewees' Demographic Data for Focal Buying Company Participants

Interviewees' Demographic Data Suppliers				
Gender	Σ 5	Male 4	Female 1	
Title	5	HR-Representative 0	Operational 1	Management 4
Cross-functional experience	5	Yes 1	No 3	Unassigned 1
Business Model	5	Traditional 5	Social Business 0	
		Mean	Standard Deviation	
Total Working Experience (in years) Company Turnover (in billion €)		22 4	8.79 5.1	

Table 5: Interviewees' Demographic Data for Supplier Participants

Tailored interview guides were prepared for each of the three interviewee groups: Companies, Suppliers and Consultants and an overview of the main headings is shown in Appendix F. An overall PSM process overview, showing the strategic (Source-to-Contract) and operational (Purchase-to-Pay) processes (Monczka, Handfield, Giunipero, & Patterson, 2016; Van Weele & Van Raaij, 2014), plus typical competence centre responsibilities (e.g. data and systems), was used to ask the interviewees about the competencies needed to perform activities within these processes effectively and efficiently, both currently and in the future. The process overview (see Figure 2) was sent to all interviewees in advance. Our initial idea to focus the discussions on our understanding of the activities that relate to specific job titles was discarded, as companies have considerable variety in job titles and there was a risk that there would be a misunderstanding in scope between the interviewers and the interviewees.

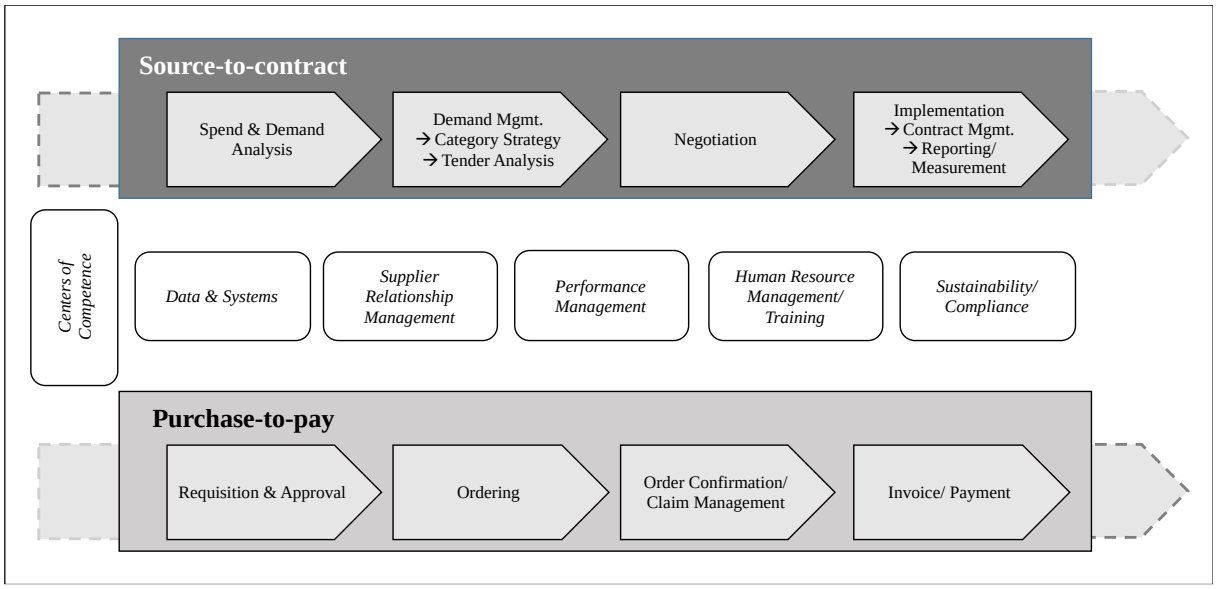

Figure 2: Purchasing and Supply Management processes, adapted from van Weele, 2014; Monczka et al., 2016

Instead, based on the PSM process overview, the interviewees were asked to describe the most important competencies they need to perform their individual job. To support the discussion, we used a spider diagram, which was sent to the participants before the interview and was partly pre-filled with seven competencies from a study by Giunipero and Pearcy (2000), but with space to allow the interviewees to add other competencies as necessary. The interviewer initially asked interviewees to rank the seven competencies based on their importance, and then broadened the discussion by encouraging them to add their own thoughts and suggestions. Our intention here was not to say that these are the seven most important competencies, but to foster a discussion around importance of competencies and complement this list during the interviews.

A pre-test was performed in June 2016 at one of the organizations (CONST1), where the first three interviews were conducted, to obtain interviewee feedback on the questions and interview process. This feedback mainly focused on explaining the context and the background of the interview, but not on the questions themselves and therefore a short briefing document

was developed. The interviews started in June and were completed by October 2016, and they were all recorded and transcribed.

The initial coding protocol planned to use a pre-defined coding tree based on existing literature, but a subsequent review suggested that an in vivo, or indigenous coding approach (Bazeley & Jackson, 2013) was more suitable in ensuring that we were not overly fixated on certain categories of competencies. To ensure consistency and reliability of the open coding process, the research team had regular discussion meetings and created a common reference document that captured an agreed consensus on how to code in a standardised and consistent manner. To ensure and increase the inter-coder reliability in NVivo 11, all the researchers initially coded the same interview to get accustomed to the approach. A detailed review meeting to discuss this transcript allowed the group to become aware of any individual differences, further enhancing the consistency of the coding process and ensuring a transparent and traceable qualitative data analysis approach (e.g. Bazeley, 2013). All further interviews were coded by two researchers to ensure broad node coverage and to further enhance the reliability of the coding process. Each coder continuously updated the common reference document and passed it on to the next coder.

The coding team also agreed that they would not necessarily code every instance of a competency multiple times in an interview if it had been already been coded. However, if the text yielded an additional insight on what was behind a certain competency, it would be added to further develop our understanding. This process was followed because the qualitative research approach only has limited power to make very precise inferences from frequencies to importance. Instead, the complexity of the phenomenon and the breadth of competencies were the focus of this research.

4. FINDINGS AND DISCUSSION

4.1 Current and Future Competencies identified by practitioners

The first research question investigates the *current* competencies that are required by PSM professionals, with the second question considering the same question in relation to *future* competencies.

To identify which competencies PSM professionals consider as being currently necessary to meet their organisational objectives, the researchers asked participants to discuss their work goals, which they were rewarded for, the competencies that helped them to be successful in their jobs and circumstances that prevented them being more successful. PSM professionals identified a total of 65 competencies, which they felt were *currently* necessary for them to meet their personal and organisational objectives. These were ranked by the number of instances that they were coded in the various interviews and the top-10 of the 65 *current* competencies are shown in Table 6 in the left column.

'Negotiation' was coded with the highest number of instances. When grouping competencies into those that share similar characteristics, then the remaining competencies related to communication and relationship ('Communication skills', 'Interpersonal communication', 'Stakeholder relationship management'), strategic and analytical aspects ('Strategic thinking', 'Analytical thinking', 'Strategic sourcing'), or to professional knowledge requirements ('Basic knowledge on PSM role & processes', 'Cross-functional knowledge'). This shows that there is a mix of competencies that are required to be successful in a PSM role and there are also interrelationships between some of these competencies, as shown in interviewee statements such as:

"… interpersonal, which I think comes into negotiation as well. Negotiation is quite specific, but it's that building of a relationship." (Interviewee, SOCSER1);

"Naturally, you mentioned negotiations, this is not negotiable for me, so they have to be able to negotiate on an external level with suppliers on a price and contract, but also on an internal level; how are they positioning and selling themselves and their ideas." (Interviewee,

FOOD1).

The section on *future competency* requirements in the semi-structured interview guide contained questions evaluating future trends in PSM, with a clear focus on the developments and challenges that the interviewees were already starting to see in their work environments. After discussing trends and upcoming changes ('What are the current trends in PSM in general?'), the researchers asked how these might influence the current activities of the interviewee and which competencies will be required in future ('What do you think will change specifically in your job in the future due to these trends?'). The interviewees emphasised new competencies that will change or are additional to the current profile and so any different future priorities, should not be interpreted as a replacement of current competency requirements, but be seen as a shift towards competencies required for coping with new challenges in PSM.

PSM professionals identified a total of 56 competencies, which they felt would be necessary for them to meet their objectives in the *future*. These were ranked by the number of instances that they were coded in the various interviews and the top-10 of the 56 *future* competencies are shown in the right column of table 6. These competencies reflect areas of growing interest and concern for both PSM professionals and across the wider organisational context. There are a number of competencies that relate to the broader digitisation agenda (e.g. 'eProcurement Technology', 'Automation', 'Big Data Analytics' and 'Computer Literacy') and the high ranking of 'Sustainability' emphasises its increasing importance in the modern industrial context. The following statements demonstrate what these competencies mean to PSM.

"This is giving a kind of requirement of their way of working and solving process. Because the massive data that you are getting today is so big. Given that you do completely understand the equipment that you are buying for your organisation, might be helpful in some part. But how do you merge this tons of information into something meaningful and make the right decision. This is important and not everybody is capable of doing that and that is where we all have to learn and develop." (Interviewee, PHARM1)

"From a sustainability point of view, of course where products come from and transparency around that it's really the trend we see now. Not only for a company like ours, but any

company; the need to integrate that into purchasing behaviour and not only from a compliance perspective, but also from a driving value and partnership perspective that is really the trend to come or already there." (Interviewee, TECH1)

In case digitisation and sustainability were not mentioned proactively, we prepared the interview guide to ask specifically whether the interviewees considered these to be relevant future trends. Digitisation was discussed proactively in all interviews, but not all participants mentioned sustainability before being specifically asked about it. All of the interviewees considered the two competencies, or at least one of the two, as being relevant future trends. Competencies in these areas were rated with a high priority, complementing those that are traditionally connected to PSM, such as 'Negotiation'. However, interviewees expressed uncertainty on exactly what specific competencies would need to be developed in PSM professionals and students to meet these requirements. Although the correlation with competencies that were also given a high priority in future PSM, such as 'Holistic Supply Chain Thinking' or 'Strategic Thinking', might give an indication as to how these can be further broken down into manageable areas, it is recognised that further investigation is needed.

Four competencies were shared across both *current* and *future* views (as shown in grey in Table 6; in alphabetical order); 'Analytical Skills', 'Strategic Sourcing', 'Strategic Thinking' and 'Sustainability'.

Current Competencies	Future Competencies
Analytical skills	Analytical Skills
Basic knowledge on PSM role & processes	Automation
Communication skills	Big Data Analytics
Cross-functional abilities & knowledge	Computer Literacy
Interpersonal Communication	eProcurement Technology
Negotiation	Holistic supply chain thinking
Stakeholder Relationship Management	Process optimisation
Strategic sourcing	Strategic Sourcing
Strategic thinking	Strategic thinking
Sustainability	Sustainability

Table 6: Top ten *current* and *future* competencies for PSM, in alphabetical order; grey colour indicates commonality between current and future competencies.

4.2. Comparison of the findings to the Tassabehji & Moorhouse framework

To answer the second research question "How have PSM competencies changed over the last ten years?", the findings from the interviews are compared with the Tassabeheji and Moorhouse (2008) framework.

4.2.1 Clustering Process and Aggregated Results

Many of the nodes were the same as, or very similar to, those identified in Tassabehji and Moorhouse (2008), and were therefore easy to allocate. However, those remaining were clustered by the research team based on a careful review and agreed decision-making process. The team discussed whether competencies related to category management would also fit within the *External Enterprise skills* cluster or that of *Strategic Business skills*, but kept the format as it is, adding the competencies related to category management to the *Technical Skills* cluster. We also identified a close relationship between *Internal Enterprise skills* and *External Enterprise skills* and so the two categories were grouped together. A key contribution of our work is therefore an updating of the PSM competencies and clusters identified by Tassabehji and Moorhouse (2008), to reflect both current and future challenges and requirements. Our study confirms that the competencies are still valid, but the clustering of the coded competencies revealed 17 competency areas that have not been identified in previous research. The most prominent new competency areas are related to digitisation (e.g. 'Automation'),

innovation (e.g. 'Innovative sourcing') and 'Sustainability'. Practitioners also identified 11 new competencies to the interpersonal skills cluster, most of them in the intersection between competencies and traits (e.g. 'Passion').

Table 7 combines all current and future competencies that were coded in the interviews. In the *Technical skills* cluster, 'Innovation Sourcing' and 'Innovative Sourcing Approaches' complement the list of *Advanced Procurement Process skills (APP),* which is defined as a sub-cluster by Tassabehji & Moorhouse (2008), as shown in Appendix A. Additionally, 'Automation' and 'Big Data Analytics' are added to the technical cluster, and can be considered as technical knowledge that is required to cope with future challenges, particularly as 'Big Data Analysis' was coded as one of the most important future competency requirements. Practitioners also mentioned 'Self-Confidence', 'Self-Reliance' and 'Self-Reflection' as being important *Interpersonal skills* for PSM professionals, together with the ability to 'Deal with Ambiguity' and 'Integrity'. It is questionable why Tassabehji and Moorhouse (2008) left out 'integrity' when analysing Giunipero and Pearcy (2000), as 'Integrity' and 'Honesty' are items that are referred to by Killen and Kamauff (1995), who refer to 'Integrity'; and Mulder et al. (2005) and Giunipero and Handfield (2004) who use the term 'Ethics'. Data relating to 'Curiosity', 'Openness' and 'Passion', although considered as personal traits rather than skills or competencies, were also coded and added to the *Interpersonal skills* cluster. For the cluster *Internal/external enterprise skills,* no additional competencies were identified in our interviews. In the context of *Strategic business skills,* 'Critical Thinking' 'Holistic Supply Chain Thinking' and 'Sustainability' complement the list of Tassabehji and Moorhouse (2008), with the latter two competencies being in the list of the top ten future key competencies resulting out of the interviews. Table 8 shows supporting quotations for the newly added competencies.

Technical Skills	**Interpersonal Skills**	**Internal/ External Enterprise**	**Strategic Business Skills**
Matching competencies – competencies identified by Tassabehji and Moorhouse (2008) and found in the interviews			
Basic knowledge on PSM role & processes	Analytical skills	Change Management	Business Acumen
Computer Literacy	Conflict Resolution	Communication skills	Financial acumen
Contract Management	Creativity	Cross-functional abilities & knowledge	PSM Best Practice Intelligence Scouting
Cost savings	Decision making	Engineering	Risk management
eProcurement Technology	Effective questioning techniques	Finance	Strategic thinking
Intellectual Property	Integrity	Logistics	
KPI Reporting Design	Interpersonal Communication	Manufacturing/ Production	
Languages	Knowledge sharing	Marketing	
Negotiation	Leadership	Quality (QHSE)	
Process optimization	Learning agility	R&D	
Product knowledge	Prioritization	Supply Chain	
Project Management	RemoteVirtual Working	Sales	
Quality assurance	Results focus driving for results	Cultural awareness	
Strategic sourcing	Structured way of working	Customer Focus	
Tools and Systems Implementation	Teamwork-working in teams	Networking	
		Stakeholder Relationship Management	
		Supplier management	
Additional competencies – competencies NOT identified by Tassabehji and Moorhouse (2008) and found in the interviews			
Automation	Curiosity		Critical thinking
Big Data Analytics	Deal with ambiguity		Holistic Supply Chain Thinking
Innovation sourcing	Humility		Sustainability
Innovative sourcing approaches	Mobility		
	Openness, Open-minded		
	Passion		
	Resilience		
	Self-confidence		
	Self-reflection		
	Self-reliance		

Table 7: **competencies matching with Tassabehji & Moorhouse (2008) and additional competencies gathered in interviews**

Competency Cluster (based on Tassabehji and Moorhouse, 2008)	**Additional competencies resulting out of the study** (see Table 8)	**Quotes from interviews with practitioners**
Technical skills	Big Data Analytics, Automation	*"In the past it was difficult to get information about the market. Now the question is how to make use of this overflow of information. Really being able to filter, prioritise and decide which are the right and useful information."* (Interviewee, CHEM2)
	Innovation Sourcing	*"If the procurement function is set up correctly, the strategic procurement guys really have the time to focus on market developments, can bring insights into the business and can get a really solid understanding of what is going on and which innovation we can get in."* (Interviewee, CONSU1)
	Innovative Sourcing Approaches	*"I try to come up with new ideas. I mean new processes, how we approach the market, new tools that we implemented which increased the efficiency of the team very much or release them from operational work to focus on strategic work."* (Interviewee, CHEM2)
Interpersonal skills	Curiosity	*"Being able to work in different cultures and different environments I think is important."* (Interviewee, FOOD1)
	Deal with Ambiguity	*"(Being able to) implement a project together with the supplier that drives value and there along the way you start to understand more about the actual realities on the grounds and where you can improve."* (Interviewee, TECH1)
		"Scenario based thinking and making your own views and mind up of all of the opinions you hear on multiple scenarios and the trigger point as to what you have to do here." (Interviewee, CHEM2)
		"Being able to adapt your style, whether it is in communication or how you contact with people personally." (Interviewee, FOOD1)
		"That you are able and feel comfortable to make decisions if you only know 60 percent of what could be known." (Interviewee, CONST1)
	Humility	*"Also, when you have people employing at companies like […] who are big branding and they are very proud of having that title or something like that. It's very important that they are also still very humble."* (Interviewee, FOOD1)
		"Mobility means that you are able to do your job when you are not sitting in your office." (Interviewee, CHEM1)
	Mobility	*"[…] have worked in different geographies or in different segments"* (Interviewee, FOOD1)
		"Flexibility in the thinking and also in writing and in speaking with new persons (…) like suppliers or internal functions." (Interviewee, AUTO1)
	Openness, Open-minded	*"(be able to) drive people to go more for their ideas."* (Interviewee, PHARM1)
		"This traceability is something and that is why it is so important that when a purchaser comes that they have a winner mentality but on a team level, which means we can win this on the team because, together with suppliers, together with internal people and so on; you can you
	Passion	

	Resilience Self- Confidence Self-Reflection Self-Reliance	*can succeed to build something like that, you cannot win by doing it on your own."* (Interviewee, FOOD1 Supplier) *"You sit alone in a plane all through the week you speak with suppliers. You must discuss with 5 or 10 different companies. Can you handle it?"* (Interviewee, AUTO1) *"… (the ability to) execute and run and drive, a certain ambition and hunger".* (Interviewee, CONSU2) *"I think it is really, really important to ask yourself some questions about your work, but first you have to see the result of your work after 2, 3 or 4 months."* (Interviewee, CHEM2) *"(…) our people have to be able to work in agile teams so the higher share of responsibility (…) means that the team sets targets by themselves and tracks also the target achievement."* (Interviewee, AUTO1)
Strategic business skills	Critical Thinking Holistic Supply Chain Thinking Sustainability	*"Being able to ask the right questions and set the right hypotheses I think is quite important."* (Interviewee, CHEM2) *"(… the ability) to pick up quickly an understanding of the whole supply chain related to the good or the service that (buyers) are actually dealing with. And it's not just the first level supplier but the second, third, and fourth, and fifth level supplier and that we teach them the skills to understand how to sort of think through and map and come to some ideas around the whole supply chain and how that supply chain can be influenced to be of value to our company be it in a cost perspective be it in an innovation perspective be it in an environmental or sustainability perspective so they see the whole supply chain and understand what really happens."*(Interviewee, CONSU1) *"(…) buying chemicals it probably makes sense to understand the full picture of this product, of the whole value chain, the whole supply chain, the whole the supply chain part, which are also services that you buy with the product."*(Interviewee, CHEM1 Supplier) *"Also doing supplier assessments and audits and is something that needs to be made aware to the buyers."* (Interviewee, CHEM2) *"It's more about how you include sustainability in your sourcing strategy".* (Interviewee, FOOD1) *"Having some basic knowledge and understanding of (sustainability) is important. It would be great if people have the chance to think for themselves what does that mean for themselves and for their future life and role."* (Interviewee, FOOD1)

Table 8: Additional competencies to the competency clusters of Tassabehji and Moorhouse (2008)

4.2.2 Differences by Sample Demographics

A more detailed analysis by industry reveals that the ranking in terms of the competency clusters (Table 7) is valid for the automotive, chemical, construction and pharmaceutical sectors. However, the consultancy companies emphasised *Technical skills* over the other three competency clusters, whereas representatives of the electronics industry, although still prioritizing *Technical skills*, were more equally balanced across the four competency clusters. Interestingly, *Strategic business skills* was identified as second on the priority list for the food sector and social services. Regarding differences in the individual competencies by industry, "Creativity" was in the top ten future competencies for construction and social services industries. Additionally, several future competencies were only mentioned by a single or small number of industries, with the key ones being: "Creativity" (construction and social services), "Cross-Functional Abilities & Knowledge" (construction), "Cultural Awareness" (automotive), "Passion" and "Integrity" (both only electronics), "Learning Agility" (pharma). The emphasis on "Creativity" and "Cross-Functional Abilities & Knowledge" seem to relate particularly to those industries that are more service-dominated (construction and social services), in which cross-functional value creation seemed a particular focus.

When the consultants were asked what they would regard as the most important competencies for PSM at their clients (as they work across many industries simultaneously and over time in their consulting engagements), they were the only industry area to emphasise "Customer Focus", "Innovation Sourcing" and "Leadership". It might be interpreted that the first two of these demonstrate that PSM professionals need to engage with both internal and external customers and therefore emphasises PSM's boundary-spanning role. Although "Leadership" may be seen as being primarily internal in focus, consultants often rely on strong leadership at their clients' organisations in order to successfully drive projects forward. Due to

the nature of their work, consultants may see both "good" and "bad" cases more frequently over time, as they move from project to project/client to client.

"Sustainability" as a future competency was highly prioritized by both traditional (profit-focused) and social businesses. "Automation", "Computer Literacy" and "Big Data Analytics" were all very important for traditional businesses, the PSM professionals from social businesses did not see them as being of great importance. Potentially, skills in the digitisation context, such as "Automation" might not be so important for social businesses, e.g. offering a certain product or service in the social welfare sector. It is also possible that social businesses tend to be smaller, younger companies and may well have anticipated digitisation aspects from their inception/founding and therefore may not feel the need to explicitly mention this as a future challenge. In addition, the competencies related to digitisation might be more challenging for established, bigger companies, in which wide spread organisational change is more difficult to engender. We suggest that this is an area of future research, specifically looking at this area in more depth and across a broader empirical base.

Comparing the interview results from supplier and buying company representatives, both agreed about the current importance of 'Interpersonal Communication' and 'Communication Skills', as well as 'Negotiation', 'Sustainability' and 'Analytical Skills'. 'Product Knowledge' and 'Holistic Supply Chain Thinking', are part of the ten most often coded current competencies for suppliers, but not for those in buying roles. This might indicate that suppliers see that buyers who more fully understand the products they buy and the wider supply chain are deemed to be more competent business partners. This may make them more 'reasonable' in negotiations and ensure a more balanced buyer-supplier relationship. The ranking also differs for 'Cultural Awareness' and 'Passion', as these are in the ten most important future competencies for suppliers only. Supplier representatives' future competency priorities confirm those from buying interviewees in the areas of 'Sustainability' (highest

number of codings for both groups), and for 'eProcurement Technology' (second highest number of codings for both groups).

The analysis of the codings related to the total work experience of the study participants revealed other key findings. We coded competencies related to *Interpersonal skills* much less often for interviewees with only three to five years of working experience, when compared to those who were more experienced. *Interpersonal skills* for this less experienced group is the least relevant cluster, and *Technical skills* are by far mentioned the most. For interpersonal skills, "Conflict resolution" and "Communication" stand out as being less important for interviewees with only three to five years working experience, although "Conflict resolution" was also emphasised by all other groups. This finding could be an indication of how recent PSM professionals have been educated and trained for their job, although it could be that they did not get an understanding of the importance of *Interpersonal skills* during their academic education, or they lack the *Technical skills* that they need in their first PSM professional role. Therefore, this finding would need further data and investigation to develop a fuller understanding. The competencies of "Integrity", "Prioritization" and "Cultural awareness" were only focused on by the PSM professionals with least work experience.

There were also differences based on cross-functional experience, as interviewees with greater experience in this area placed a stronger emphasis on 'Openness', 'Process Optimization', 'Strategic Sourcing' and 'Supplier Management' when talking about future requirements. This may be interpreted that their cross-functional background lets them see how these competencies (would in the future) improve their effectiveness and the competencies of 'Openness' and 'Process Optimization' stand out as being connected to upcoming technological advances, with which end-to-end process optimization will require greater cross-functional efforts. This 'Openness' can be interpreted as being open to new solutions and technologies, as well as to the points of view and requirements of other functions.

Regarding differences across roles, HR/Training representatives did not identify the 'eProcurement' competency as being of current importance, yet the other roles did. This may indicate that PSM, as a function, needs to highlight the importance of eProcurement to the rest of the organisation or there is a risk that it is not seen as a priority. 'Supplier Management' was not listed as a current competency in the management role but was specifically in the operational one. This is not necessarily surprising, as it is more of the day-to-day task of operational buyers to focus on direct dealings with their suppliers

5. CONCLUSIONS

Our two research questions '1. What current competencies are required by PSM professionals?' and '2. How have these PSM competencies changed over the last ten years?', were addressed through interviews with 46 practitioners representing either a managerial, operational or Training/HR role in PSM, in 12 buying companies across a broad range of industries, located in different countries and also from four supplier organisations.

Based on a combination of a systematic literature review and rich empirical data, we found that the *current* competency profile for PSM encompasses a range of competencies, such as 'Negotiation', those that relate to communication and relationship management (e.g. 'Interpersonal communication'), strategy and analytics (e.g. 'Strategic thinking'), as well as professional knowledge requirements (e.g. 'Basic knowledge on PSM role & processes). From a *future* perspective, particularly 'Digitisation' and 'Sustainability' were identified as upcoming competency areas.

To provide a more solid platform for staff development, we identified an additional 17 competencies to those previously established in the Tassabehji and Moorhouse (2008) framework (Table 8). These additional competencies relate to digitisation (e.g. 'eProcurement Technology', 'Automation'), 'Sustainability' or to the need to adopt a more holistic perspective,

specifically around supply chain management and innovation (e.g. 'Holistic supply chain thinking', 'Innovative sourcing approaches'). We also identified a range of new competencies in the interpersonal area (e.g. 'Deal with ambiguity', 'Self-confidence', 'Curiosity'), many of which are closely connected to personal traits. These additions reflect the requirements of modern PSM and complement the findings of previous research. The combination of the newly identified competencies with others that have already been found in previous research (see Tables 8 and 9), suggests that a new, more modern competency profile for PSM practitioners is needed, that reflects a business context influenced by the latest developments in industry 4.0 and sustainability, such as the move towards a circular economy and circular supply chains (De Angelis et al., 2018).

5.1 Limitations

As with all research, there are limitations. First, taking the study by Tassabehji and Moorhouse (2008) as the basis for our comparative analysis might contribute to the self-referencing mentioned in section 2.2. On the other hand, our literature review and results promote future research that should take into account all studies and avoid the disparities shown in Appendix D.

Second, in relation to our results, it should be noted that there may be some over reporting by the interviewees based on the identification of seven of the competencies pre-defined in the spider diagram, as outlined in the methodology section. Similarly, the future competencies section of the interview guide explicitly asked for digitisation and sustainability as potential trends, which might have partly influenced the number of codings, although if companies did not see these as important, there was also no text generated that would have been coded later (interview questions were not coded, nor was just mentioning a word without the

appropriate context[2]). Nevertheless, when looking at the list of the top ten future competencies, the interviewees did not just refer to the seven pre-defined competencies but also discussed their own competency descriptions, e.g. only 'Interpersonal Communication' appeared in the top ten future competency list.

Third, as with much qualitative research, the main limitation of this research lies in the restricted number of interviewees and companies. Also, when results refer to the total number of codings across all interviews, it must be noted that around half of all interviewees (22 of 46) are from the Automotive and Food industries so care is needed in interpreting the results. Our intention however was not to generate statistically measurable numbers of instances, as obtained via survey data, but to generate insights into the breadth and relevancy of the competencies needed and to develop and update an overall competencies framework for PSM.

5.2 Implications for Research

Our primary contribution to the academic literature is through the analysis of current and future individual competencies required for PSM, identifying differences and similarities from work done ten years ago. Specifically, our study is a timely refresh of the Tassabehji and Moorhouse (2008) framework, with the addition of competencies that reflect changes in the PSM environment over the last decade, as well as taking a forward-looking view to establish what future requirements may be. As far as we are aware, our research is the first to add specific, empirically grounded, competencies to the PSM literature since Tassabehji and Moorhouse (2008). We have also taken a holistic view of the full competency requirements of individuals who work in a variety of PSM roles in different industrial sectors and complements other research that focuses on the competencies needed in special categories, such as: sustainable purchasing (Liu, Srai, & Evans, 2016; Yu, Chavez, & Feng, 2017); how to manage *"enablers*

[2] E.g. if someone would mention "Sustainability is currently not a priority, instead we focus on…" that would not have been coded as a mention of sustainability-related competencies.

of building supply chain skills" (Dubey, Gunasekaran, Childe, & Papadopoulos, 2018, p. 143); varying competency sets in the Kraljić portfolio quadrants (Knight et al., 2014); the distinct difference between explicit and tacit knowledge as mediators between supply chain knowledge management capability and supply chain performance (Schoenherr, Griffith, & Chandra, 2014); the role of strategic skills on supplier integration (Eltantawy et al., 2009); the identification of *"current trends, skills and knowledge areas for PSM professionals"* that *"PSM focus on purchasing cost reduction, the skills focus on negotiation and communication, and the knowledge on supply analysis and relationship management"* (Lau, 2010, p. 400); on specific intrapersonal/entrepreneurial abilities "*which incorporates creativity, innovation, problem-solving, risk-taking, directing resources, and taking initiative"* (Steward, Wu, & Hartley, 2010, pp. 127-128).

Future research could further investigate why the 17 newly defined competencies have gained importance and how such changing competencies are shaping the daily work of PSM departments. For example, how will an improved competency level in "big data analytics" influence the PSM process? Are there industries in which these are particularly relevant and may offer cross-training opportunities with other departments, such as marketing (e.g. in the pharmaceutical industry)? Also, investigating the link between competencies and the purchasing maturity of organisations, resulting in higher levels of firm performance, is a field for future research, for which a comparative case study approach could be an appropriate methodology.

Apart from collecting and analysing primary data for such a purpose, another useful exercise could be to analyse secondary data from grey literature such as trade journals, consultancy and think-tank reports. Due to the nature of such sources, they could be analysed for additional competencies, and then primary data collection and validation could be used to validate this extended list.

Our findings reflect the consultant reports on the expected future competencies in PSM, in which both Deloitte (2013) and (Von der Gracht et al., 2016) (i.e. KPMG) see an increasing strategic role for PSM in firms and highlight the importance of analytical skills, data-driven orientation and cross-functional abilities. Moreover, Deloitte and KPMG both agree that the PSM function has an important role in environmental and sustainability compliance and Deloitte note the need for PSM involvement with stakeholder engagement (Deloitte, 2013). KPMG and Deloitte foresee an increasing need for creative and inventive skills to facilitate innovation sourcing and refer to out-of-the-box thinking. (Deloitte, 2013, p. 13) is more focused and calls it "thinking outside of the standard procurement transformational box", which is in line with our identification of the 'Holistic supply chain thinking' competency.

The empirically based list of competencies put forward in this research provides an opportunity for future work to further develop the research stream on individual PSM competencies to cover the future role of PSM as an organisation, e.g. by further developing a PSM competency model. This might lead to a revision of the taxonomy of Tassabehji & Moorhouse (2008), adding or changing the clusters to reflect the new findings.

Also, using frameworks and competency cluster models from organisational psychology would be an innovative way of further investigating how they could be applied in the PSM context. For example, the competency typology of Delamare-Le Deist and Winterton (2005), which differentiates between cognitive, social, functional and meta-competencies, provides a comprehensive framework to build a current and future competency model for PSM professionals. Cognitive competencies are general knowledge and understanding, social competencies are focused on individual behaviour, and functional competencies cover skills and knowledge in a professional context. Meta-competencies are described as being *"concerned with facilitating the acquisition of the other substantive competences"* (Delamare-Le Deist & Winterton, 2005, p. 39). The latter might be a competency category that could be

added to the clusters of Tassabehji and Moorhouse (2008), reflecting the new findings based on our research. Such meta-oriented competencies may help to keep competencies up-to-date in an increasingly dynamic business environment. Looking at the competencies added to the interpersonal skills cluster (see Table 8), all of them would fit more closely into a meta-oriented category. For example, 'Curiosity', 'Deal with ambiguity', 'Integrity' or 'Openness' all fit within the category of facilitating the acquisition of other competencies. The discussion of the results in light of the four competency clusters by Delamare-Le Deist and Winterton (2005) also emphasises the need to think beyond functional skills, and embrace the meta-oriented competency area and this is becoming increasingly relevant for the modern PSM professional.

5.3 Implications for Practice

From a managerial perspective, the implications of these findings are to set out a list of all current and future competencies that could form part of personnel selection and any staff development processes. The findings can be used as an input into organisational competency models or mapping activities (as per Campion, 2011) and inform the alignment of relevant HR systems. The results also have implications for the educational and managerial training and knowledge management context, as a wider range of required competencies has been identified and may necessitate changes in teaching methods and content. For instance, looking at the 11 intrapersonal competencies that were added to the framework, these need to be reflected in curricula and training programs. There is evidence in peer-reviewed literature that PSM bachelor and master courses do not, with limited exceptions, cover intrapersonal learning objectives (Birou, Lutz, & Zsidisin, 2016; Waller, Gravier, & Farris, 2008; Wong, Grant, Allan, & Jasiuvian, 2014). Additionally, competencies needed in the key areas of sustainability and digitisation should be more fully integrated into higher and professional education and professional/industrial training programmes. Further, the type of competency needs to be taken

into consideration, as current training and teaching methods are not necessarily suitable for developing all types of competencies and the pedagogy needs to be adapted to reflect these requirements. Specifically, different training methods are needed when developing competencies in the technical skills cluster in comparison to those in other clusters. Fostering shared experiences highlights the potential of in-class training formats such as role plays and the potential for online courses and more interactive formats, e.g. blended learning or flipped classroom approaches. The meta-oriented competency cluster reasoning presented in this paper suggests that finding and training employees in how to develop and apply these kinds of competencies might be the key to sustain performance over time, under rapidly changing contextual factors.

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APPENDICES

Appendix A: Introduction of a new taxonomy of procurement skills, adapted from Tassabehji and Moorhouse (2008)

1	*Technical skills* (TS): Fundamental and basic administrative skills necessary for any procurement professional in the 21st century. They include product knowledge, computer literacy, total quality management and government legislation. The sub-category 'Advanced procurement process skills (APP)' includes category management, project planning and e-procurement.
2	*Interpersonal skills* (IS): Necessary for interaction with people in teams and on an individual level including written and oral communication, conflict resolution, influencing and persuasion, group dynamics, leadership, problem solving and interpersonal and cultural awareness.
3	*Internal enterprise skills* (IE): These skills relate to the overall business and how the different functions interaction.
4	*External enterprise skills* (EE): These skills relate to the supply chain/network and its stakeholders.
5	*Strategic business skills* (SB): These skills relate to broader strategic issues and how procurement can impact on overall organisational value such as planning and managing strategic partnerships and alliances, risk management and adding value to the organisation.

Appendix B: Previous literature with competency clusters, adapted from Tassabehji and Moorhouse (2008, p. 58)

Source	**Categorisation of Procurement Skills** *1. procurement specific;* *2. generic management*	**Individual skills**
Kolchin and Giunipero (1993) based on division of 18 skills	1. Technical 2. Management 2. Interpersonal / group 2. Individual	- Cost analysis, product knowledge, computer literacy, total quality management and government legislation global sourcing development - Market analysis, negotiating with partners, managing internal and external relationships, change management and planning and organisational skills, risk taking, written and oral communication, conflict resolution, influence and persuasion, group dynamics, leadership, problem solving and international and cultural awareness
Giunipero and Pearcy (2000) based on a total of 29 skills including Kolchin and Giunipero (1993) skills	1. Strategic 1. Quantitative 2. Process management 2. Team skills 2. Decision-making 2. Behavioural 2. Negotiation skills	- 'Strategic thinking', supply base research - Structuring supplier relationships, technology (planning), supplier cost targeting, risk taking/entrepreneurship, salesmanship, computational, technical, blueprint reading, specification development - Market analysis, negotiating with partners, managing internal and external relationships, change management and planning and organisational skills - Risk taking, written and oral communication, conflict resolution, influence and persuasion, group dynamics, leadership, problem solving, and international and cultural awareness
Carr and Smeltzer (2000) based on a total of 35 skills	1. Technical skills	- Drafting CAD/computer skills, maths skills, technical business writing, blueprint reading, forecasting

	2. Skills techniques	- Understanding: tool capability, manufacturing processes, MRP, materials, inventory systems - Analytical, communication, presentation, co-ordination, negotiating (cost) and issues, cost analysis, problem solving, quality management, programme management, organisational (paperwork) time management
	2. Behaviour skills	- People skills (suppliers), internal customers and functions, detail orientation, proactivity, ability to follow up, flexibility, stress management, team working, patience, multi-tasking
Other sources not cited by Tassabehji and Moorhouse (2008):		
Killen and Kamauff (1995) characteristics of a buyer	1. Product Knowledge	- Knows: major facets of product or materials; market prices; major sources; quality requirements; external customer requirements & impact of that on internal customers and suppliers.
	2. Principles of Purchasing and Management	- Knows: purchasing's role in the organisation; quality & pricing theory; to negotiate; inventory control; to time; value analysis; capital equipment buying; apply make-or-buy theory; apply SCM concepts; marketing, accounting, MIS, operations, organisational behaviour and finance.
	2. Personal Attributes	- Integrity; accuracy; research skills; careful decision-making; appropriate risk-taking; high self-esteem & taking initiative.
	2. Interpersonal skills	- Is good at team working; communicating; listening; persuasive speaking; writing & reporting; dealing with opposing views.
Killen and Kamauff (1995) characteristics of a purchasing manager	1. Technical Knowledge	- Understanding of product aspects; purchasing principles; organisation knowledge; current trends; marketing, accounting, MIS, operations, organisational behaviour and finance.
	2. Analytical Ability	- Is able to identify problem; solve problems; make fast decisions; thinking in the abstract; analysing strategic options and understanding the potential and impact.
	2. Interpersonal skills	- Is able to cooperate with department members, other departments and suppliers; making compromises; handling conflicts; handling organisational politics; maintaining a positive attitude; aligning purchasing with the organisation.
	2. Managerial Skills	- Knows to plan materials, budget, work etc.; organise work and people; to be a good leader; communicate to top management and subordinates; motivate people; monitor according the plans; set objectives; participate in new product/service development, firms growth and strategies.
Shou and Wang (2015)	2. generic soft skills	- Coordination, time-management, communication, negotiation, and problem solving
	2. generic analytical skills	- Analytical skills, data processing, forecasting skills, and evaluation ability
	2. functional soft skills	- Interpersonal skills, organise skills, stakeholder management, and decision-making.
	2. functional technical skills	- KPI management, contract management, risk management, and project management.
	1. SCM leadership characteristics (1)	- Requirements regarding: accountability, drive ability, team-work, team-building, commercial awareness, strategy management and leadership.
	1. SCM qualifications	- SCM certification, requirements regarding management of: purchasing, warehousing, logistics, targets, and SC specific requirements
	1. SCM expertise	- Requirements regarding: product launch, operations, production, warehousing, logistics, pricing, delivery, customer service, resource management, change management, and regulations knowledge.
	2. industry-specific skills	- Industry-specific requirements
	2. senior management skills	- Demand management, order management, control ability, execution ability, budget management, financial acumen, staff management, learning ability, and making recommendations.

Tatham et al. (2017)	2. general management skills	- Supplier Relationship Management (SRM), Customer Relationship Management (CRM), Strategic Management, Marketing, Written Communication, Risk Management, Project Management, Information Technology & Financial Accounting
	2. problem solving skills	- Information Gathering, Problem Solving, Problem Identification, Problem Analysis & Information Sharing
	2. interpersonal skills	- Change Management, Leadership, Negotiation, Personnel Management, Listening, Oral Communication, Stress Management & Meeting Facilitation
	1. functional logistic skills	- Forecasting, Inventory Management, Logistic Information Systems, Transport Management, Purchasing, Warehousing, Reverse Logistics, Import/Export, Legal Specification & Port/Airport Management.

Appendix C: *Subjects cited from Tassabehji and Moorhouse (2008) by other scholars*

	Cited subject:	Cited by:
I	'PSM is (evolving to be) a strategic function'	Almeida and Sano (2018); Feisel, Hartmann, and Giunipero (2011); Hedenstierna, Hilletofth, and Hilmola (2011); Homfeldt, Rese, Brenner, Baier, and Schäfer (2017); Kern et al. (2011); Knight et al. (2014); Leger, Oueslati, and Salanié (2013); Paesbrugghe, Rangarajan, Sharma, Syam, and Jha (2017); Paesbrugghe, Sharma, Rangarajan, and Syam (2018); Pohl and Förstl (2011); Quesada, González, Mueller, and Mueller (2010); Schneider and Wallenburg (2012); Sporrong and Bröchner (2009); Tassabehji (2010); Tomino, Park, and Hong (2012); and Wagner and Kemmerling (2014)
II	'Developing individual PSM skills combined with top management support for the PSM function leads to strategic advantage'	Dubey et al. (2018); Feisel et al. (2011); Hawkins and Gravier (2014); Lau (2010); McKevitt et al. (2012); and Miocevic (2011)
	'Developing individual PSM skills leads to strategic advantage' (without 'top management support')	Hong and Kwon (2012); Sinha, Millhiser, He, Hazen, and Hazen (2016); Tchokogué, Nollet, and Robineau (2017); and Tchokogué, Paché, Nollet, and Stoleru (2017)
	'Top management support for the PSM function leads to strategic advantage' (without 'developing skills')	Kilpi, Lorentz, Solakivi, and Malmsten (2018)
III	'Developing communication skills for internal use leads to excellence'	Feisel et al. (2011); Hartley, Brodke, Wheeler, Wu, and Steward (2014); Hong and Kwon (2012); Lonsdale, Hoque, Kirkpatrick, and Sanderson (2017); Schneider and Wallenburg (2012); Steward et al. (2010)
IV	Referring to the PSM skills taxonomy	Ahsan and Rahman (2017); Dubey, Bag, Ali, and Venkatesh (2013); Feisel et al. (2011); Hohenstein, Feisel, and Hartmann (2014); Mahamadu et al. (2018); and Mansi and Pandey (2016)
V	'PSM function faces an *internal politico-cultural glass ceiling*'	Andreasen and Gammelgaard (2018); Antonson and Åkerskog (2015); Feisel et al. (2011); Hartley et al. (2014); and Zsidisin, Hartley, Bernardes, and Saunders (2015)

***Appendix D**: Relation of PSM skills articles that are not citing Tassabehji and Moorhouse (2008)*

Authors of articles that are not citing Tassabehji & Moorhouse (2008) …	***…of which are citing the references (i.e. sources) of the taxonomy of Tassabehji & Moorhouse (2008).***	***…of which are citing articles that are citing Tassabehji & Moorhouse (2008).***	***…of which are citing articles that did not cite Tassabehji and Moorhouse (2008).***
Flöthmann, Hoberg, and Gammelgaard (2018)	Giunipero and Pearcy (2000)	Hohenstein et al. (2014)	Schoenherr et al. (2014)
Lintukangas (2010)	Carr and Smeltzer (2000)		
Liu et al. (2016)			
Rottenburger, Carter, and Kaufmann (2018)	Giunipero et al. (2006)	Eltantawy et al. (2009)	
Schoenherr et al. (2014)			
Scholten and Dubois (2017)	Giunipero and Pearcy (2000)		
Yu et al. (2017)			

Appendix E: Research Quality Assurance, adapted from Lincoln and Guba (1985); Sinkovics, Penz, and Ghauri (2005);Maxwell (1997); Strauss and Corbin (1994); Welch et al. (2002).

Phase	Credibility (internal validity)	Transferability/ Generalizability (external validity)	Dependability/Reliability	Confirmability/ Objectivity
Preparation *Methodology & approach, interview guide, company selection*	• Built on established theory: competencies, skills and knowledge • Pre-test of interview guide	• Stringent decision tree for research methodology • Pre-testing definition of concept • Sampling strategy: Adequate # of interviewees within one industry sector and cross-industry	• Decision tree for research approach • Sample for different industries according to external depth of value added	• Contextualized theories: competencies, skills and knowledge • Literature review as basis • Systematic and rigorous approach
Sample & context	• Ethics: the way the participants were treated in general -> written consent before the interviews • Communication with participants -> documented how often we had to contact to convince them (field notes) • Subject selection -> theoretical sampling along the purchasing process • Researchers rapport before, during and after -> delivered approach email, summaries and results report			
Implementation *Contact participants, conduct interviews, document interviews*	• Establish chain of evidence • Peer review within research team	• Common approach of interviewers ensured	• Semi-structured interview guide • Audio Recording of interviews (all in English) • Data collection and analysis in alternating sequences -> pre-test analysis served to adapt guide	• Transcription of interviews (only English to English)
Follow-up *Analysis of interviews*	• Coding system in NVivo • Peer discussion of evaluation results	• Coding and nodes in NVivo	• Coding and nodes in NVivo following steps organising, coding, searching and modelling • Peer review with research team • Research invites replication	• Had probing counter-check (audit) by someone outside of research team

Appendix F: Interview Guide Main Parts and Introductory Texts

Interview Guide Part	**Introductory text**
1. General Data	"*At first, we need some general data about the company and the participants of this interview. We need this information to evaluate if certain knowledge is related to specific industries or roles within PSM. We will now list the data for the recording."*
2.Organisational structure & performance	"*Now we would like to get some information about the PSM organisation and performance measurement. We need this information to evaluate if certain knowledge is related to specific roles within PSM. Also, performance measures give an indicator on the knowledge that is needed to perform accordingly."*
3. Current knowledge requirements	"*The following section deals with the knowledge that you apply when performing the individual tasks of your job. This helps us to evaluate which knowledge to include in the curriculum."*
4. Learning in and for PSM	"*The following section deals with the training program and knowledge management system provided by your company for PSM. Getting information on this helps us to identify the efforts of your organisation to either train specific skills or capture specific knowledge."*
5. Future skill requirements	"*The following section deals with challenges in PSM that might also become more evident in the future. We try to evaluate knowledge that is needed to cope with these challenges in the future."*
6. Is there anything you would like to add or emphasise?	***"****Is there anything you would like to add or emphasise? (…)* *Thank you again that we were able to record the interview to facilitate the analysis. To comply with research ethics, we also need that in written format. Therefore, we sent in advance the consent form. This is just about the recording, the results are treated confidentially, as mentioned."*
7. Can we get back to you if clarification needs should arise?	*"*Can *we get back to you if clarification needs should arise? (…)* *Thank you very much for your valuable input and your time!"*