PERFECT
Purchasing Education and Research for European Competence Transfer

# Project PERFECT Intellectual Output 2 White Paper

# Current and Future Purchasing & Supply Management Competences: Insights from Practice


January 2017

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# Content

Information on Figure on Title Page: Word cloud from NVivo 11 for the 80 most frequent words on current and future competences in the interviews.

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# List of Tables and Figures

# Glossary and Key Definitions

**CPO** - Chief Procurement Officer

**Higher Education (HE)** – in the context of this white paper, HE is used to denote education at universities or similar educational establishments, especially to degree level

**Intellectual Output (IO)** – the six main parts/work packages/activities of the overall PERFECT Project resulting in defined outputs depending on the nature of the IO

**Massive Open Online Course (MOOC)** - A massive open online course is a model for delivering learning content online to any person who wants to take a course, with no limit on attendance.

**MNC** – Multinational Corporation

**Micro Enterprise** – As defined by the European Union, a micro enterprise has less than 10 staff headcount, a turnover smaller or equal 2 million Euros or a balance sheet total of smaller or equal 2 million Euros

**PERFECT** – Purchasing Education and Research for European Competence Transfer, name of the project

**Problem and Practice based learning (PPBL)** - a student-focused approach to learning in which students learn about a subject through the experience of solving problems, which are firmly rooted in practice and industry based scenarios and contexts.

**PSM** – Purchasing and Supply Management, which comprises the management of external inputs – materials, services, capabilities and knowledge – that are required for building, running and maintaining the focal firm's processes, while simultaneously managing the external and internal stakeholder network with an extended upstream supply network understanding.

**RQ** - Research Question

**Social Enterprise -** A social business is a company dedicated to solving a social problem in a financially self-sustainable way.

**SME** – small and medium-sized enterprise

**Undergraduate (UG) degree -** a bachelor's degree (B.Sc., B.A., etc), a degree requiring about three or four years of university-level full-time study beyond secondary/high school

**VMO** – Vendor Management Office

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# 1. Executive Summary

**Note:** For readers very short of time, the main highlights of the report can best be grasped by reading sections 2.2 and 4 (section 4.1 contains Table 23 with a summary of the main findings of section 3 and its implications).

## Approach & Methodology

- The project PERFECT (Purchasing Education and Research for European Competence Transfer) was set up in 2015 and is funded by the European Union from 2015-2018 to become the first worldwide region to establish an empirically validated pan-European PSM higher education curriculum. The aim is to establish an international studying program at universities for higher education in Purchasing and Supply Management (PSM).
- This paper deals with the second Intellectual Output (IO2) of project "PERFECT". The aim of this part of the project was to conduct case study interviews with PSM practitioners to identify the competences, knowledge and skills that are required to cope with current requirements and future trends.
- The IO2 whitepaper presents the results of the analysis of 5 research questions:
    - RQ1 – What current competences/knowledge are necessary for PSM practitioners?
    - RQ2 – What future competences/knowledge will be necessary for PSM practitioners?
    - RQ3 – What is the gap between RQs 1 and 2?
    - RQ4 – How do these competences/ knowledge vary by role?
    - RQ5 – Which of these competences/ knowledge are tacit/explicit?
- Data collection: 46 interviews were conducted with representatives from 16 companies, standing for various industries in the European Union, and differing in their size and business model. A semi-structured interview guide was used for the interviews. The interviews were audio recorded, transcribed, coded and evaluated.
- Research quality (credibility/internal validity, transferability and generalizability/external validity, dependability/reliability and confirmability/objectivity) was assured along the research process (more information in section 2.3.1).
- The evaluation reflects the overall purpose of this research toward a higher education curriculum, as it discusses current and future competences, establishes the breadth of different competences, differentiates between types of competences and makes comparisons between the competences that are associated with specific case demographics.

## Results

- Current Top 10 Key PSM Competences:

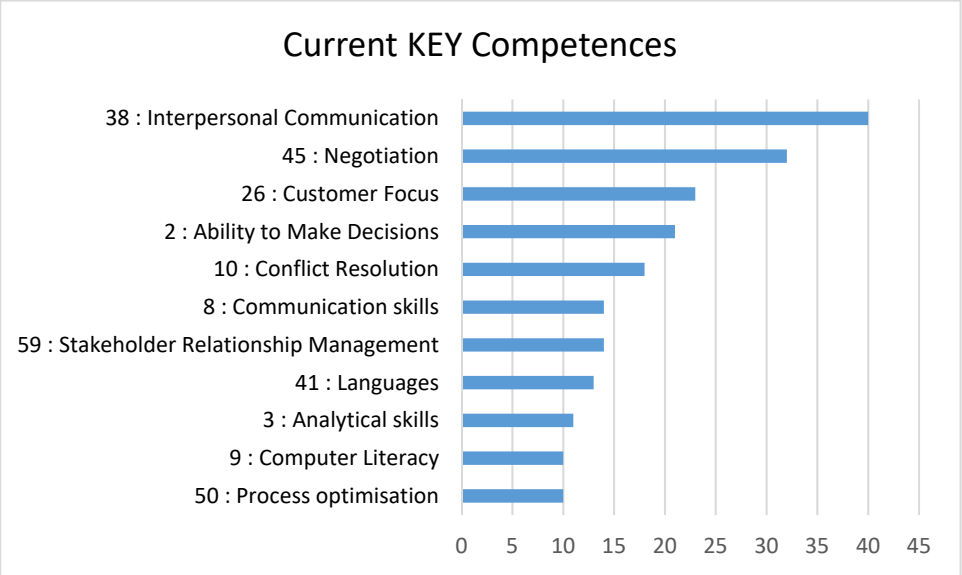


Figure 1: Top 10 Current Key Competences by Number of Codings[1].

- Employees in PSM should possess both operational and basic knowledge for PSM as well as competences related to communication or relationship-oriented. This reflects a view of PSM as being the link, or the agent, between internal customers and their requirements toward the external supply network, with the responsibility to source what the company needs in the best possible manner, while maintaining and developing useful relationships. Of particular relevance to an academic and educational audience, is that a PSM curriculum or training needs to reflect all skill areas, which seem to be interconnected.
- Both tacit and explicit competences are important and a mixed approach is needed. This work establishes that tacit knowledge is practical, action-oriented knowledge, that can be considered as 'know-how' based on practice. Explicit knowledge can be considered as 'know-what' that is described in formal language, print or electronic media (Smith, 2001: 314). This shows that those involved in the education and recruitment of both new and existing PSM staff need to be mindful that these tacit competences need to be factored into education and hiring decisions, too. Further,

[1] The numbers in front of the competences are the individual numbers that NVivo has assigned to each them as they are ordered hierarchically and alphabetically in the software, e.g. the first parent node is "Current Competences", that is why it has received number 1, "Ability to Make Decisions" is the first alphabetically ordered child note below that, therefore it received number 2. These numbers stay the same for all Figures and Tables featuring current competences in this white paper. The numbering changes for the future competences.

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considering personnel development in PSM, these competence areas need to be taught using different training methods and formats (classroom or web-based learning of PSM basics; but, for example, social learning of interpersonal communication skills via team-based or mentoring approaches).

- Other main findings on overall current competences (Table 6)
  - "Holistic Supply Chain Thinking", "Basic Knowledge on PSM Role & Processes" and "Cross-Functional Abilities & Knowledge" are consistently emphasized as explicit competences across all ranges of work experience.
  - "Sustainability", "Negotiation", "Stakeholder Relationship Management", "Business Acumen", "Interpersonal Communication", and "Strategic Thinking" are consistently emphasized as tacit competences across all ranges of work experience.
  - Key account managers attach much more importance to "Product Knowledge" and "Holistic Supply Chain Thinking" than PSM professionals do.
  - From the start-up involved, "Knowledge Sharing" and "Networking" were emphasized, rather unique across the sample.

- Future Top 10 Key Competences:

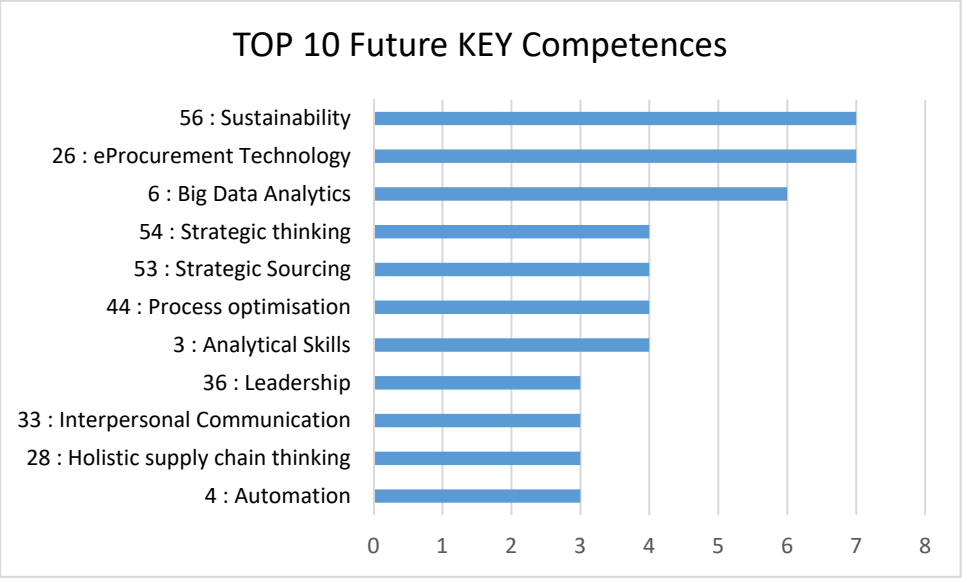


Figure 2: Top 10 Future Key Competences by Number of Codings.

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- "Sustainability" and "Digitisation" were confirmed by the numbers of codings and the prioritization of the interviewees as the main future impact areas for PSM. As these currently read more as knowledge areas rather than specific competences, a breakdown of knowledge and competences for "Sustainability" and "Digitisation" is needed to prepare students adequately for such future developments. This is also valid for corporate training.
- Digitisation/Automation will particularly impact PSM operational tasks: Sub functions, especially taking care of the Purchase-to-Pay process are going to disappear, therefore companies are advised to qualify personnel accordingly to facilitate their transfer to other jobs with different requirements. Regarding the Source-to-Contract process, for the future the critical question is how technology will change and thus enable different ways of working.
- In general, interviewees confirmed that skill requirements will change, underlining the different relevance that a PSM organisation might have in future. The scale of the future PSM function in this context was very widespread – from the prediction of PSM not existing at all as a separate function to PSM having a key role in the overall organization coping with future challenges.
- "Communication skills" and "Negotiation" were also emphasized as important future competences, therefore the profile that students need to be prepared for gets larger and includes not only tacit knowledge (e.g. communication skills), but also those of a more explicit nature [e.g. Basic Knowledge on PSM Role & Processes), especially in the context of digitisation.

- Other main findings on overall future competences (Table 9)
  - "Passion", "Integrity" and "Negotiation" are highly emphasised by the start-up.
- Main points regarding the subsequent PERFECT project phases:
  - The "long list" of (current and future) competences be used by IO3 to further investigate relative importance by means of a pan-European survey.
  - IO4 looks to develop an empirically supported PSM HE curriculum. One particularly useful insight from IO2 for IO4 (and also IO6), is to make use of practice and problem based learning (PPBL) to ensure that the students develop skills and competences that will be relevant to them in industry and also to develop more tacit skills such as communication.

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- Main Points in Additional Features on Training & Future Trends:
    - Most of the interviewees indicated a shifting priority from competences that are traditionally connected to PSM, like “Negotiation”, to knowledge and skills around automation and data management (“eProcurement Technology”, “Automation” “Big Data Analytics”, “Computer Literacy”) as well as to “Sustainability”. Nevertheless, current training programs still seem to focus on the more traditional knowledge areas (e.g. “Negotiation”). Training formats that covered “Big Data Analysis” or “Automation” seem to be rather rare.
    - Interpersonal communication skills were clearly identified as a key competence for successfully working in a PSM organisation – today and in future. Despite that, trainings on interpersonal communication were rarely mentioned to be part of the PSM program (other than in negotiation trainings).
    - When looking at other studies, digitisation with “eProcurement Technology” and further “Automation” of processes as well as “Big data analytics” and “Analytical thinking” and “Strategical thinking” are comparably regarded as important trends and developments becoming prevailing in the near future. In general, current studies also show that in the future a broader scope of necessary skills is required.
    - What stands out is that “Sustainability” is hardly mentioned in other studies, whereas in the here presented results “Sustainability” particularly stands out.
    - “Holistic supply chain thinking” is an aspect that is assumed implicitly in many other studies, but is much more explicitly expressed by the participants of the company interviews. Further skills that are expressed more in the PERFECT IO2 analysis than in other sources are communication related competences and “Negotiation”.
    - What other recent studies on average emphasize more than the cases studied here are finance and controlling competences, innovation, adaptability, flexibility and continuous learning. Nevertheless, though they did not make it to “key” competences, it should be kept in mind that they were also mentioned, e.g. as “Financial Acumen”, “Learning Agility” and “Openness”, but just not most often.

The core team that developed this white paper consisted of Prof. Dr. Lydia Bals (IO2 Lead) and Heike Schulze, both from the University of Applied Sciences Mainz, Dr. Stephen Kelly from the University of Staffordshire and Laura Berger from the Technical University Dortmund. Questions can be emailed to lydia.bals@hs-mainz.de.

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# 2. Introduction

This paper deals with the second Intellectual Output (IO2) of project "PERFECT" (Purchasing Education and Research for European Competence Transfer). The aim of this part of the project was to conduct case study interviews with Purchasing and Supply Management (PSM) practitioners to identify the competences, knowledge and skills that are required to cope with current requirements and future trends.

The approach, the findings and the conclusions that can be derived out of the data analysis are outlined in this paper. After an introduction to the PERFECT project, an insight into the methodology and how research quality was assured is provided. This is followed by a series of findings and discussions divided into current and future competences and then further broken down into how these competences can be compared by a number of different and pertinent characteristics, such as, explicit and tacit competences, differences between business models, industries, PSM organisations and their suppliers, job roles and the overall work and cross functional experience of the PSM interviewees. Each of these sections contains a set of data driven findings and then a discussion focusing on the key elements. The paper concludes with a consideration of the impact of the findings on the next intellectual outputs of the project, as well as the impact on practice and academia, incorporating future requirements for curriculum development and training methods.

## 2.1 Background PERFECT Project

The project PERFECT (Purchasing Education and Research for European Competence Transfer) was set up in 2015 and is funded by the European Union from 2015-2018 to become the first worldwide region to establish an empirically validated pan-European PSM higher education curriculum.

The value of the project is manifold and builds on current and future challenges in practice and academia. The PSM function in any organisation is a key contributor to firm performance (Drake 2012), as more than half of the total turnover of a modern industrial firm in Europe is directly transferred to suppliers (e.g. Van Weele 2010). Moreover, the bulk of supplies is now no longer of domestic origin, but of a European and international nature. As this network economy with a low depth of production and high reliance on international suppliers is a recent phenomenon that has emerged in the last two decades, firms are still struggling to find effective and efficient ways to cope with these circumstances (e.g. Van Weele & Van Raaij, 2014). This highlights the need and request for employees possessing the necessary skills and competences in this field.

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Although buying organisations are increasingly dependent on their international suppliers, many of them lack the capabilities to deal with these situations. A basic root cause of this struggle is a lack of access to personnel with knowledge and PSM skills. Despite this importance, unlike other disciplines such as marketing or finance, PSM does not have any standardized PSM higher education curriculum, yet. This issue is seen at national, European and regional/international (e.g. North America) levels. This makes it necessary for companies to hire university graduates with other specializations and often spend years bringing them up to a skill level that graduates in other disciplines already possess.

For students, a significant challenge lies in finding appropriate university courses and matching them to their course portfolio during international exchanges. For the higher education institutions involved, the varying course contents and depth in exchange programs hinder a stringent teaching of basic modules first, and then building on them further for PSM. To change this offers a significant opportunity to the European Union: If a standardized PSM curriculum in higher education would be implemented, the currently unused human potential could be made available to European companies more quickly and with lower training costs, and student mobility in international programs could be increased significantly.

The question addressed by this project is how a competence building program, i.e. a pan-European purchasing and supply management curriculum, could be structured. To seize this opportunity, the overall objective of project PERFECT (Purchasing Education and Research for European Competence Transfer) is: To develop an empirically validated European curriculum for PSM education. The aim is to establish an international studying program at universities for higher education in PSM. This would be implemented by the participating universities, but simultaneously it would be disseminated through the relevant associations and thereby available to any higher education institution in Europe.

The PERFECT project includes the following milestones:

- The project started with an in-depth **theoretical analysis** of PSM reviewing different sources, such as
    - Academic & practitioner literature dealing with PSM skills
    - European PSM Educational landscape
    - PSM Job adverts
    - Studies on trends and future requirements for PSM
- In addition to the theoretical analysis the project conducted **Case Study interviews** with industry PSM best practice to identify required skills and competences to cope with current requirements and future trends.

- The insights gained will be validated and developed further by a **survey** with European firms in order to identify those skills and competences distinguishing successful companies and effective and efficient PSM, which link to performance outcomes and future requirements. Moreover, this provides a comprehensive and systematic analysis of skills and competences needed to be covered in the curriculum.
- Based on this first ever comprehensive competence assessment project, PERFECT is going to design a pan-European **PSM curriculum**. Furthermore, in order to promote fast and broad dissemination, PERFECT is going to develop a **self-assessment tool** for PSM skill evaluation and prepare an Introductory **Massive Online Open Course (MOOC)** for basic PSM skills, which can be used by students and organisations to gauge the levels of the PSM skills.

The work is divided into six scientific project activities and additional project activity for the management of the consortium, communication and dissemination and exploitation of results. Figure 3 identifies and shows the linkages between the work packages that reflect the milestones, called Intellectual Outputs (IO).

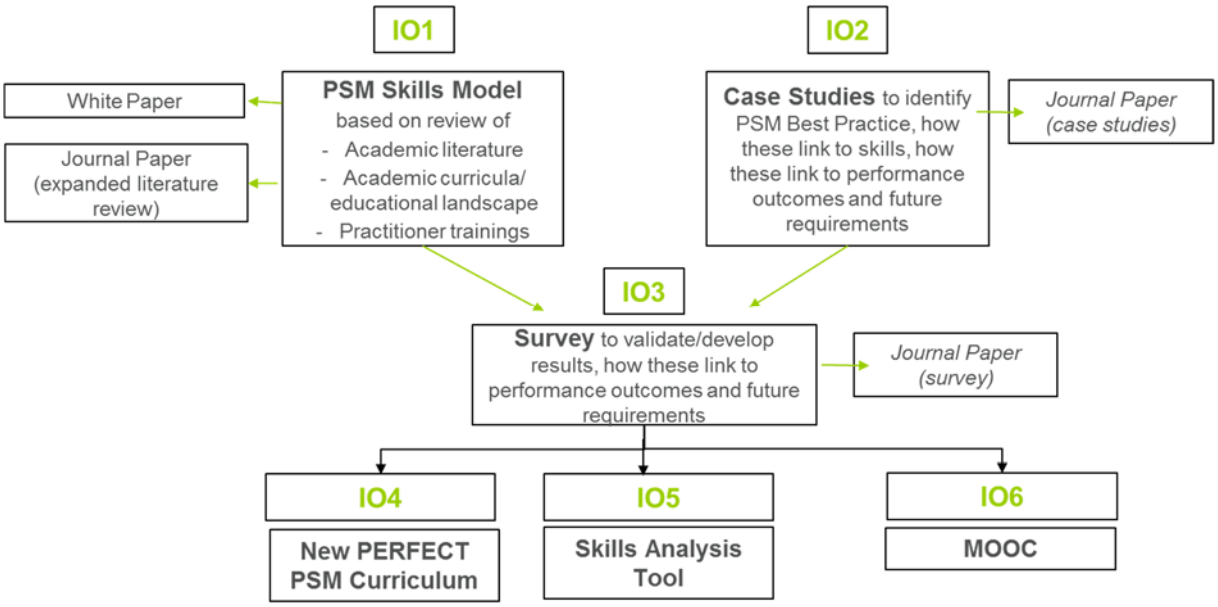


Figure 3: PERFECT IO Links (own illustration).

In order to achieve the objectives and milestones, a consortium has been formed, which brings together leading universities, European project management competence and practical exposure (e.g. associations and by industry partner workshops) with a very strong background and international network in PSM. The pan-European approach perfectly facilitates that students in future will be enabled to pursue their curricula Europe-wide, giving them the early international exposure ideal for

later careers in the PSM field. The overall project packages and respective institutional leads can be seen in Figure 4 below.

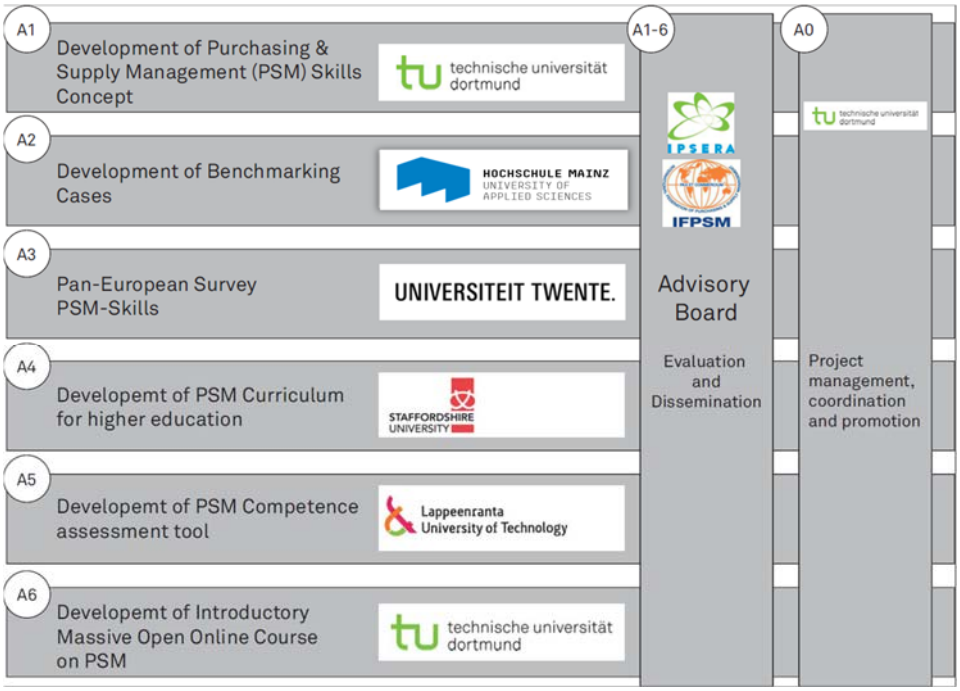


Figure 4: PERFECT Packages and Institutional Leads (own illustration).

The IO2 core team consisted of Prof. Dr. Lydia Bals (IO2 Lead) and Heike Schulze, both from the University of Applied Sciences Mainz, Dr. Stephen Kelly from the University of Staffordshire and Laura Berger from the Technical University Dortmund. Questions regarding the IO2 whitepaper can be emailed to lydia.bals@hs-mainz.de.

## 2.2 Facts and Figures

The results that are presented in section 3 of this paper are based on the input of all the interviewees that participated in the case study research. This is an overview of the most relevant facts and figures regarding the cases. Please refer to section 2.3 for details regarding case demographics, coding methodology and other areas.

| **Interviews:** | |
|---|---|
| Timespan for the interviews | June - October 2016 |
| Number of interviews conducted: | 46 |
| Number of companies involved:<br>Thereof suppliers to one of the focal companies: | 16<br>4 |
| Industries: | Automotive, chemicals, consulting, construction, food, pharma, technology/ electronics, social services |
| Characteristics: | Social & commercial business models, start-ups & companies with a long tradition, small, medium size and multinational companies |
| Role of the interviewees: | Management level in PSM, operational level in PSM, Training or HR representatives in PSM, key account managers at the supplier side |
| Countries were interviewees were located: | Germany, Netherlands, Denmark, Sweden, Switzerland, Poland, Great Britain, Italy |
| Duration of the interviews: | 60 - 90 minutes |
| Language spoken: | English |
| Number of interviewers: | 3 researchers, one or two per interview |
| Interview situation: | Skype (42 interviews), Face-to-face (4 interviews) |
| Documentation | Audio recording and written transcripts |
| **Data analysis** | |
| Timespan for data analysis | November 2016 – January 2017 |
| Data source | 46 interview transcripts |
| Coding Software | NVivo 11 |
| Number of coders | 4 researchers |
| Data Confidentiality – Anonymized evaluation | Participants' confidentiality agreements are documented by 46 individually signed consent forms; company names in the evaluation report have been disguised with names such as AUTO1, CHEM1 etc. |

Table 1: High Level Interview Characteristics.

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## 2.3 Methodology of IO2

The following section contains a summarised methodology of how the IO2 research was designed and how the data was obtained and analysed. Further details on the in-depth methodology are available upon request from the PERFECT project team.

### 2.3.1 Research Design

As discussed earlier, the overall research objective of project PERFECT is to develop an empirically based PSM higher education curriculum that reflects the current needs of PSM practitioners and to prepare them to deal with future challenges. In the development of the research design, the research questions were fundamentally exploratory in nature, as there had been limited coverage in the extant literature and therefore, a qualitative data collection approach was deemed most suitable. In analysing the approaches for case study research on the topic at hand, the research team followed the decision tree of Ketokivi and Choi (2014) and concluded that the Knowledge-based View (KBV) (e.g. Grant, 1996) would provide a suitable theoretical foundation for this research. Other theories initially considered were the Resource-based View (e.g. Barney, 1991; Wernerfelt, 1984) and Human Capital Theory (e.g. Ostermann, 1987).

Due to the exploratory nature of the research, the overriding goal was to deploy KBV in the context of PSM rather than testing any hypothesis based on it. Figure 5 provides an overview of the basic model behind the subsequent interview guide design (for an interview guide excerpt, please see Appendix A), differentiating between the different areas of “competences/knowledge”, “process execution, application, behaviour” and “PSM performance”.

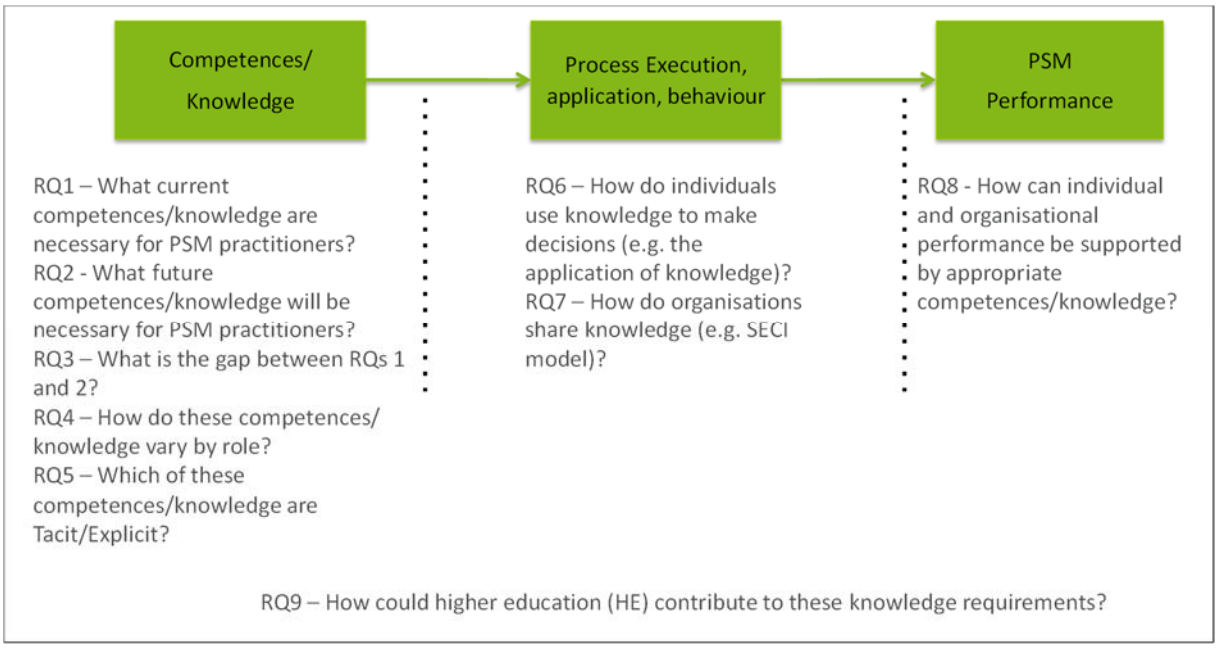


Figure 5: Overview of Research Questions for Coding.

This IO2 whitepaper presents the results of the analysis of research questions 1 to 5, which are as follows:

RQ1 – What current competences/ knowledge are necessary for PSM practitioners?

RQ2 – What future competences/ knowledge will be necessary for PSM practitioners?

RQ3 – What is the gap between RQs 1 and 2?

RQ4 - How do these competences/ knowledge vary by role?

RQ5 – Which of these competences/ knowledge are Tacit/ Explicit?

These five research questions were prioritized to fit with the timescales for Intellectual Output 3 (IO3) and the other research questions are relevant for later Intellection Outputs, e.g. RQ9 is of particular interest to IO4. Further analysis will follow in the coming weeks and months and these results will be channelled into the upcoming IOs and these insights will be made available via subsequent project whitepapers.

Research quality (credibility/internal validity, transferability and generalizability/external validity, dependability/reliability and confirmability/objectivity) was assured by the use of a number of specific techniques based on the work of Lincoln & Guba, 1985; Riege, 2009; Sinkovics et al., 2006; Yin, 2014; Salzberger et al., 1999; Welch et al., 2002. For each major project phase, preparation, implementation, follow-up and dissemination, the respective measures to be taken were defined upfront during March/April 2016, and then continuously reviewed and refined over the course of the data collection. The details of how each particular research quality requirement was addressed, is contained in Appendix B.

### 2.3.2 Sampling, Data Collection, and Analysis

Collecting qualitative data through the use of structured interviews, based on the research model (Figure 5), ensured that a full and deep understanding of the phenomenon could be obtained. A sampling strategy for the case companies was deployed that covered the following organizational characteristics and allowed for the widest possible perspective of different organizational requirements. A range of industries were included in the study; both lower and higher external value added characteristics, two major consultancies, to hear their views on PSM's current and future knowledge requirements across their clients, geographical spread (to not overemphasize one particular national culture), and conventional (i.e. commercial) business models as well of social businesses (to challenge current PSM conventions).

Further details of the case company sample demographics are briefly outlined in Table 2. All companies had some international scope in their operations.

| Case | Sector/Industry | Business Model | No. of Employees | Turnover in €* | Firm Size |
|---|---|---|---|---|---|
| AUTO1 | Automotive | Traditional | > 300 000[1] | >70 billion[1] | Very Large |
| AUTO2 | Automotive | Traditional | 80 000 - 99 999 | >10 Billion[1] | Very Large |
| CHEM1 | Chemicals | Traditional | 10 000 - 49 999[1] | > 5 billion[1] | Large |
| CHEM2 | Chemicals | Traditional | 10 000 - 49 999[1] | >10 billion[1] | Very Large |
| CONSU1 | Consulting | Traditional | > 300 000[1] | >20 billion[1] | Very Large |
| CONSU2 | Consulting | Traditional | 1 000 - 9 999[2] | >1.0 billion[2] | Large |
| TECH1 | Technology, Electronics | Social Business | < 999 | n.a. | n.a. |
| TECH2 | Technology, Electronics | Traditional | < 999 [4] | >10 million [4] | Small |
| CONST1 | Construction | Traditional | 10 000 - 49 999[3] | >1 billion[3] | Large |
| FOOD1 | Food | Traditional | 80 000 - 99 999 | >20 billion[5] | Very Large |
| PHARM1 | Pharma | Traditional | 50 000 - 79 999[1] | >10 billion[1] | Very Large |
| SOCSER1 | Social Services | Social Business | < 999 [4] | >2 million [4] | Micro |

Table 2: Case Company Demographics.

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; 5Data based on Forbes.

Within each case company, the basic target sample of interviewees included the Chief Procurement Officer (CPO) or a senior level PSM representative, a PSM employee responsible for strategic sourcing, and a PSM training/HR representative (only when this role was available in the company). In addition, most companies provided access to a wider interviewee base, which followed our intention to cover the whole procure-to-pay process (such a process description was used in discussions with potential interviewees). The process chart used to facilitate the discussion separated the source-to-contract

(S2C) from spend and demand analysis to negotiation and contract implementation, and purchase-to-pay (P2P) processes from requisition to final payment, as well as some overarching topics shown as separate topics, such as performance management or sustainability/compliance. Some of the smaller companies put forward a single interviewee, who, because of the role they had, covered all PSM areas. In several cases it was possible to also obtain an interviewee at a supplier of the case company, to obtain the buyer-supplier dyad perspective on required knowledge for a successful business relationship.

Tables 3 and 4 show the basic interviewee demographics. In total, 46 people were interviewed, thereof 14 female (30,4 %) and 32 male (69,6 %). 4 were HR representatives (8,7 %), 6 held an operative role (13 %) and 36 (78,3 %) held a managerial role. At the focal firms 41 people were interviewed and 5 at suppliers. The mean work experience at the focal firms was 17 years, at the suppliers 22. Regarding the number of interviewees, some companies are represented with up to 12, some with just 1 interviewee. Thus, in interpretation of results showing absolute number of codings across all interviews, it should be noted that around half of all interviewees (22 of 46) come from Automotive and Food industries.

| **Interviewees' Demographic Data Focal Companies** | | | | |
|---|---|---|---|---|
| | **∑** | **Percentage of Sample** | | |
| Gender | | Male | Female | |
| | 41 | 28 | 13 | |
| Title | | HR-Representative | Operative | Management |
| | 41 | 4 | 5 | 32 |
| Cross-functional experience | | Yes | No | Unassigned |
| | 41 | 20 | 13 | 9 |
| Business Model | | Traditional | Social Business | |
| | 12 | 10 | 2 | |
| | | Mean | Standard Deviation | |
| Total Working Experience | | 17 | 8,51 | |
| Company Turnover (in billion €) | | 16,1 | 21,0 | |

Table 3: Interviewees' Demographic Data for Focal Company Participants.

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| Interviewees' Demographic Data Suppliers | | | | |
|---|---|---|---|---|
| | ∑ | Percentage of Sample | | |
| Gender | | Male | Female | |
| | 5 | 4 | 1 | |
| Title | | HR-Representative | Operative | Management |
| | 5 | 0 | 1 | 4 |
| Cross-functional experience | | Yes | No | Unassigned |
| | 5 | 1 | 3 | 1 |
| Business Model | | Traditional | Social Business | |
| | 4 | 4 | 0 | |
| | | Mean | Standard Deviation | |
| Total Working Experience | | 22 | 8,79 | |
| Supplier Turnover (in billion €) | | 4,0 | 5,1 | |

Table 4: Interviewees' Demographic Data for Supplier Participants.

As can be seen from the Tables, this yielded a total of 10 focal case companies (incorporating both buyers and suppliers as one dyad; counting suppliers additionally, this amounts to 14 companies included in total) and 46 interviews. The data collection took place from June to October 2016. Originally, data collection was planned from June to August 2016, but due to the very positive response from the contacted firms, this was extended until October to allow more case companies to be covered in the study.

The first three interviews were conducted at CONST1 in June, as a pre-test for the interview guide. Rather than modifications to the questions in the guide itself, this pre-test resulted mostly in insights into how to convey context and background to the interviewees. As a result, all interviewees that followed received a small briefing on the different interview sections, so they could prepare in advance. The full interview guide was not shared or shown during the interviews, to allow for flexibility in the order and emphasis of each individual interview.

Interview guides were prepared for three different interviewee groups: Companies, Suppliers and Consultants. Apart from the questions themselves, the interviewer briefing in these documents also differed (e.g. for the supplier interview guide the wording was rephrased to how the sales counterpart would perceive the buyer-supplier relationship and buyer competences; for the consultancy interview guide it was emphasized that the interviewee should think about his/her clients' PSM departments and their buyers', not about his/her employees, i.e. consultants', competences). Within the Company guide, it was moreover differentiated as specific questions were only asked of one particular interviewee job role, e.g. CPO, Operative or HR/Training representative, in order to not overburden interviewees with duplicated aspects, such as facts & figures or training concepts. This also ensured that the interviews were kept within the planned 60-90 minutes range that had been communicated to the participants during the scheduling process.

The Company interview guide (i.e. the most comprehensive one) had five parts and two additional questions at the end. Table 5 gives an overview of these questions, as well as how the interview guide parts were introduced to the interviewees (these were the respective texts the respective interviewers had at hand in the interview guide).

| **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. Organizational structure & performance | *"Now we would like to get some information about the PSM organization 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 organization 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 emphasize? | *"Is there anything you would like to add or emphasize? […]*<br>*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? […]*<br>*Thank you very much for your valuable input and your time!"* |

Table 5: Company Interview Guide Main Parts and Introductory Texts.

All interviews were recorded and transcribed and the data analysis was done by four researchers, jointly performing the coding in the NVivo 11 qualitative data analysis software. Before the wider coding for research questions 1 and 2 commenced (research question 3 treats the comparison of the results between these), the researchers jointly coded the same interview to familiarize themselves with the approach and also to compare individual differences. Initially, the coding team used an a priori coding tree based on the outputs of IO1. But then, during the review of the experiences of the coders, it was agreed that in order not to be overly fixated on certain categories of competences, an open

coding approach would be used. Such coding is also called in vivo, or indigenous coding (Bazeley and Jackson, 2013). This also meant that the coding tree was not overly restrictive at the start of the process.

In order to ensure and increase the inter-coder reliability in NVivo 11 (i.e. how similar the coding between coders was), through the joint review of one commonly coded transcript (as mentioned above), the coding team also established regular discussion meetings and a common document as a "log" in which an agreed consensus on how to approach certain nodes was summarized. This approach ensured consistency of how individual nodes were applied in the coding process, for example through showing that an individual had coded 'willingness to work' under 'passion'. Addressing the coding in this manner helped to ensure a transparent and traceable qualitative data analysis approach (e.g. Bazeley, 2013). As a result of this joint review and discussions of the initial interview coding, coding pairs were formed for all further coding activities. Therefore, each interview was coded by two coders to ensure a broad coverage of coding nodes and further enhance the reliability of the coding process. The "coding log" was then updated by each coder continuously and passed on to the next coder, thus facilitating inter-coder consistency.

Turning to what was actually coded, Figure 6 shows a hierarchy chart exported directly from NVivo, which shows that current competences was the most frequently coded topic, followed by future competences, key competences and power quotes (i.e. quotes that do convey a point in a particularly straightforward and/or compelling way). While it gives an overview of what has been coded, it should not be interpreted to provide a picture of relative importance. Early on in the coding, the coding team agreed they would not necessarily code *every* instance of a competence multiple times in an interview, if it had been coded already for an interviewee. This was decided 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 in this case *the breadth* of competences was the focus of this research.

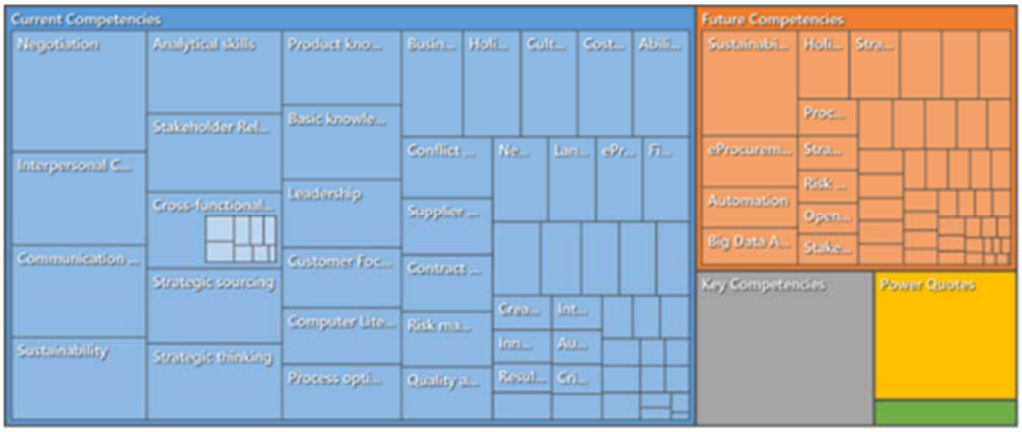

Figure 6: NVivo Hierarchy Chart for Coding in IO2 for Whitepaper, Status January 2016.

In the context of the hierarchy chart, it should be noted that 7 of the competences were actively shown/mentioned by the interviewers as part of a specific question about ranking the most important competency (as shown below in Figure 7).

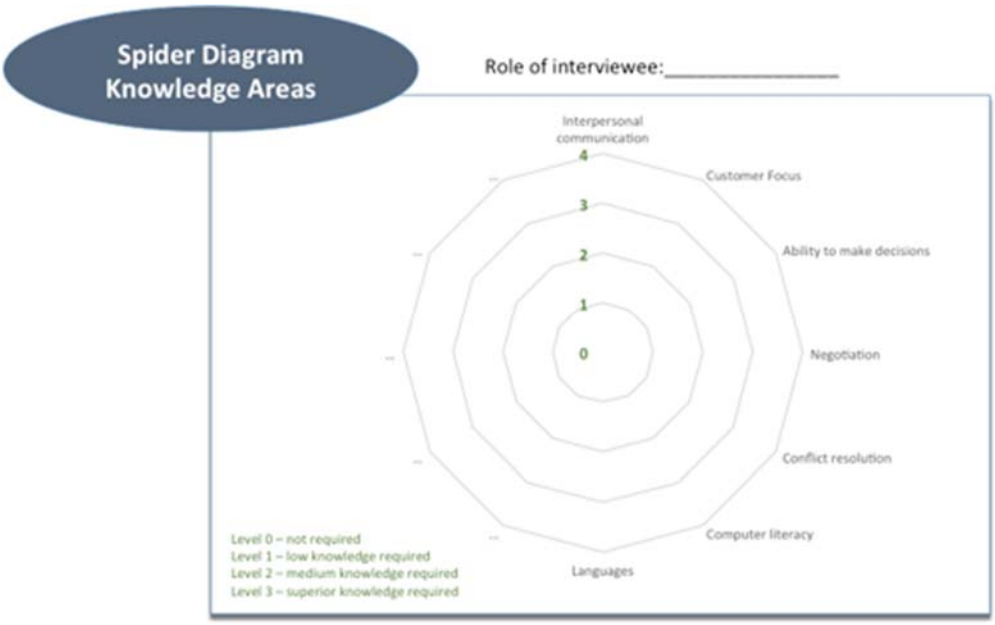


Figure 7: Spider Diagram for Discussion of Competence Priorities.
Adapted From Giunipero & Pearcy, 2000.

The Spider Diagram (Figure 7) was sent to the interviewees in advance and, as was explained to the interviewees, formed the basis of a specific question on ranking the importance of specific competences. Our intention here was not to say that these are the 7 most important competences, although they do stem from a previous study by Giunipero and Pearcy (2000), which found them to be critical for PSM professionals and this is why the left side of the chart was empty to allow interviewees to bring up their own suggestions here. Nevertheless, the high frequency of competences such as “Negotiation” or “Interpersonal Communication” visible in the hierarchy chart could be partly due to that prompting. Therefore, some care needs to be exercised in interpreting the results and it should be noted that our intention is not to generate statistically measurable numbers of instances (i.e via survey data), but rather to provide indications of emphasis across the interviewees that can be drawn together into trends. The focus of this research is on the breadth of competences covered, the differences between competence types and variations between certain case demographics such job role, work experience and type of company. Establishing the relative importance of different competences is, of course, a worthwhile endeavour and one that the PERFECT project will be dealing with in the work that follows in IO3, which is a large-scale survey of PSM practitioners.

# 3. Results

The structure of the results section reflects the overall intention of this research, which is to discuss current and future competences, establish the breadth of different competences, to differentiate between types of competences and to make comparisons between the competences that are associated with specific case demographics. Section 3.1 deals with current competences for PSM practitioners and tries to establish an overall ranking of importance. The sub-sections that follow then make use of the differences in case demographics, by identifying and discussing differences between business models (Section 3.1.2), between industries (Section 3.1.3), between suppliers and PSM organizations (Section 3.1.4) and between interviewees who have cross-functional experience and those that do not (Section 3.1.5). Section 3.2 follows the same overall structure as section 3.1, but looks at the future competences identified in the interviews. Section 3.3 then looks at establishing whether current and future competences are tacit or explicit in nature. Each individual sub-section contains a set of findings generated from the interview data and then a brief discussion of the key points, to provide insights for practitioners and academics alike. Finally, section 3.4 provides a comparison and clustering for all competences.

## 3.1 Current Competences for PSM

### 3.1.1 Overall Findings & Discussion

To identify which competences PSM practitioners identify as being currently necessary for them to demonstrate in order to meet their organisational objectives, the researchers asked dedicated questions in the section “Current knowledge requirements” of the interview guide. These questions asked participants to discuss the goals they had in their jobs and which they were rewarded for, the competences that helped them to be successful in their job, and circumstances that prevented them to be more successful.

Most of the interview participants were not used to articulating and discussing the nature of competences that they made use of in their jobs. Therefore, a spider diagram (see Figure 7 in section 2.3.2), showing some key PSM skills taken out of the study of Giunipero and Pearcy (2000), was used to inspire the interviewees and help them define respective competences. This specific question asked the interviewees to define the top 3 ‘most important’ competences they need for their current job. Either the pre-filled competences like “Negotiation” or “Interpersonal Communication” were discussed, or new ones have been added, such as “Stakeholder Management” or “Business Acumen”.

> **"You can learn how to: negotiate, write a contract, and all these things, managing a supplier. But if you do not have the right mind-set for that it is definitely a flaw. Mind-set is around leading without authority, listening skills, curiosity, because a lot of people assume a lot of things than rather understanding what it is what the other person needs and wants."**
> **(Interviewee FOOD1)**

In addition, competences that were discussed by the interviewees in other sections of the interview were also coded accordingly and added to the breadth of different competences that were deemed necessary for PSM practitioners.

Interviewees in a leadership position were asked to answer the questions about competence requirements in two settings: Firstly, regarding the competences being relevant for their own job role and therefore focussing on leadership and management tasks, and then secondly, relating to the competences of buyers working in their team or organisation in an operational role. In this context, they very often referred to a category manager position. For interviewees representing the procure-to-pay process, the roles were either managerial or administrative, for example in terms of ordering or payment processes.

The key account managers at the supplier side gave a picture of required competences for their counterparts in PSM who they dealt with at an operational level. The key question "Which skills, competences, knowledge, characteristics as demonstrated by the buying organization especially lead to a more successful business relationship?" was also discussed with the help of the spider diagram and the pre-designated skill areas.

Finally, the interviewers followed the same procedure when talking to consultants with expertise in the PSM context, but with a different perspective. The key question: "Based on your experience as a consultant: Which competences are the most important to perform in the major steps of the PSM process?"

These key competences, which were either explicitly identified via the Top 3 in the Spider Diagram or indicated in the interviews with attributes like "very important", "biggest challenge" or "we have to make sure we follow these requirements otherwise we will be out of business in the long-term" were coded as key competences.

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***Findings***

In total, 65 current competences and knowledge areas have been identified after coding of all interviews (see Table 6) and these have been ranked by the number of codings in the various interviews. The numbers in front of the competences are the individual numbers that NVivo has assigned to each them as they are ordered hierarchically and alphabetically in the software, e.g. the first parent node is "Current Competences", that is why it has received number 1, "Ability to Make Decisions" is the first alphabetically ordered child note below that, therefore it received number 2. These numbers stay the same for all Figures and Tables featuring *current* competences in this white paper. The numbering changes for the future competences.

In terms of number of times coded, "Negotiation" is the most prevalent competence resulting from the analysis (coded 148 times[2]), followed by "Communication Skills" (coded 125 times[1]).

**"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)**

**"Because you can be the best purchasing guy, if you can´t present facts and figures in a way that convinces everybody else, it doesn´t matter in the end because the perception is key in these cases. That is sometimes where I see a bit of frustration. (Interviewee, AUTO2 )**

[1]Interviews were coded by two coders; this figure does not represent number of instances

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| 1 : Current Competencies | Top ten in red |
|---|---|
| 45 : Negotiation | 148 |
| 8 : Communication skills | 125 |
| 38 : Interpersonal Communication | 116 |
| 64 : Sustainability | 113 |
| 3 : Analytical skills | 112 |
| 61 : Strategic thinking | 112 |
| 60 : Strategic sourcing | 110 |
| 59 : Stakeholder Relationship Management | 109 |
| 5 : Basic knowledge on PSM role & processes | 104 |
| 15 : Cross-functional abilities&knowledge | 104 |
| 51 : Product knowledge | 92 |
| 42 : Leadership | 87 |
| 6 : Business Acumen | 75 |
| 26 : Customer Focus | 71 |
| 12 : Cost savings | 70 |
| 50 : Process optimisation | 70 |
| 32 : Holistic Supply Chain Thinking | 69 |
| 9 : Computer Literacy | 66 |
| 24 : Cultural awareness | 63 |
| 54 : Quality assurance | 59 |
| 63 : Supplier management | 58 |
| 2 : Ability to Make Decisions | 54 |
| 11 : Contract Management | 54 |
| 56 : Risk management | 52 |
| 10 : Conflict Resolution | 50 |
| 46 : Networking | 47 |
| 31 : Financial acumen | 44 |
| 30 : eProcurement Technology | 43 |
| 7 : Change Management | 40 |
| 41 : Languages | 38 |
| 65 : Teamwork_working in teams | 34 |
| 43 : Learning agility | 32 |
| 47 : Openness, Open-minded | 32 |
| 13 : Creativity | 24 |
| 34 : Innovation sourcing | 23 |
| 4 : Automation | 22 |
| 52 : Project Management | 22 |
| 39 : Knowledge sharing | 21 |
| 55 : Results focus_driving for results | 21 |
| 36 : Integrity | 19 |
| 14 : Critical thinking | 17 |
| 16 : Engineering | 14 |
| 33 : Humbleness | 14 |
| 58 : Self-reflection | 13 |
| 18 : Logistics | 12 |
| 48 : Passion | 12 |
| 44 : Mobility | 11 |
| 25 : Curiosity | 10 |
| 49 : Prioritization | 10 |
| 20 : Marketing | 9 |
| 22 : R&D | 9 |
| 27 : Deal with ambiguity | 8 |
| 19 : Manufacturing | 7 |
| 21 : Quality (QHSE) | 7 |
| 28 : Effective questioning techniques | 7 |
| 35 : Innovative sourcing approaches | 7 |
| 62 : Structured way of working | 7 |
| 17 : Finance | 6 |
| 57 : Self confidence | 6 |
| 40 : KPI Reporting Design | 5 |
| 66 : Tools and Systems Implementation | 5 |
| 53 : PSM Best Practice Intelligence_Scouting | 4 |
| 23 : Supply Chain | 2 |
| 29 : Employer Branding | 2 |
| 37 : Intellectual Property | 2 |

Table 6: 65 Current Competences for PSM, Grouped by Number of Codings.

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Overall, besides "Negotiation", the top of the list mainly reflects competences either related to communication and relationship ("Communication Skills", "Interpersonal Communication", "Stakeholder Relationship Management"), or related to the cluster of strategic and analytical competences ("Strategic Thinking", "Analytical Thinking", "Strategic Sourcing").

**"Interpersonal communication can make it or break it." (Interviewee, CHEM1)**

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

In addition, professional knowledge requirements also were mentioned very often: "Basic Knowledge on PSM Role & Processes", "Product Knowledge", "Cross-Functional Knowledge" are on position 9, 10 and 11 in the list.

**"People do not really have a view of what procurement is and are often surprised what belongs to the role and how interesting procurement can be (Interviewee, CHEM2)**

**"The fundamental procurement knowledge is then about contracting, different tendering approaches, market research (Interviewee, CONSU1)**

"Sustainability" rather being a stand-alone knowledge area was coded 113 times[3] and made it on position 4 in the list. Inter-relations with other competences are discussed in section 4 of this document.

In order to provide some inter-reliability assurances, the Top 10 current competences that were coded as Key have also been extracted and shown below. In the introduction of this section it was indicated that all the interviewees were asked to name their top 3 current key competences. Figure 8 shows the consolidated list of the Top 10 current key competences by number of codings.

[3] Interviews were coded by two coders; this figure does not represent number of instances

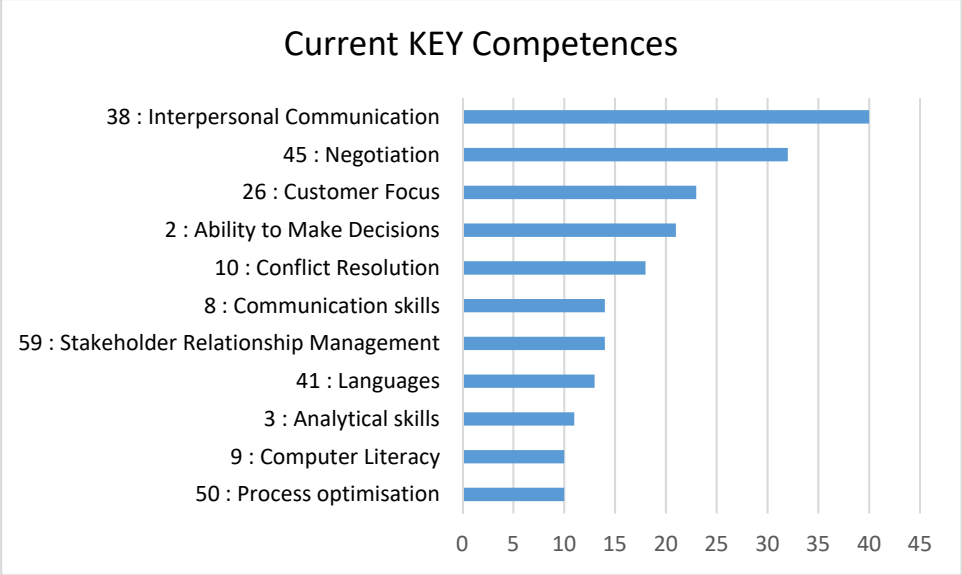


Figure 8: Top 10 Current Key Competences by Number of Codings.

Consistent with the listing of the 65 competences, “Negotiation” and “Interpersonal Communication” are also on the top of the list of key competences. “Interpersonal Communication” emphasizes the relationship aspect, whereas “Communication Skills” focus on methods and tools like presentation skills. Nevertheless, they both can be grouped into the cluster of communication, together with “Stakeholder Relationship Management” and even “Conflict Resolution”.

“Negotiation” as well as “Interpersonal Communication” were provided in the pre-filled spider diagram. On the one hand, the importance that was given to those two competences in our study confirms that, at least in this regard, the results of the study of Giunipero and Pearcy (2000) are still valid. However, the presentation of the pre-filled spider diagram to the interviewees might also have influenced the answers and must be regarded as a potential limitation of the study.

Strategic or analytical competences are just as well at top of the 65 list and the key competence list, represented there by “analytical skills” and “process optimisation”.

Interestingly, “Customer Focus” made it to position 3 in the current key competence list.

The “Ability to Make Decisions” is one of the top 10 current competences and mentioned as being an important skill for people working in various procurement roles:

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**"In a small company you can't afford that all, you can't also have a young guy who doesn't dare make a decision. Typically these guys don't progress after a while the company gets rid of them because; even if you are young it is better you do a decision. Even if you fail with the decision it's better because you learn. Really, ability to make a decision and to communicate the decision you make to the company very important. I prefer somebody who does the wrong decision, they make a decision and to make it happen, so not actually the decision but make it happen. Even if they fail, it's the wrong one at least they learn and next time they can do it better. So it is the first time somebody fails I just support very important. So ability to make a decision is and to see the decision implemented." (Interviewee, Tech2)**

***Discussion***

Two competence areas were emphasized most in the interviews: Firstly, operational or basic skills for PSM like "Negotiation", "Strategic Sourcing" or "Basic Knowledge on PSM Roles & Processes", and secondly, skills related to communication or relationship-oriented like "Interpersonal Communication", "Communication Skills" or "Stakeholder Relationship Management". The following points of interest and insight have been generated from this analysis:

- A mix of competence areas is required to be successful as a buyer or manager in PSM
- In a number of instances, a link between these competence areas was stressed (like "Good negotiation requires solid communication skills")
- This reflects a view of PSM as being the link, or the agent, between internal customers and their requirements (e.g. product requirements, financial requirements), with the responsibility to source what the company needs in the best possible manner, and in doing this to maintain useful relationships
- Of particular relevance to an academic and educational audience, is that a PSM Curriculum or training needs to reflect both of these skill areas
- Further, these competence areas need to be taught using different training methods (classroom or web-based learning of PSM basics; social learning of interpersonal communication skills)

  It is interesting to note that there are some differences in the top 10 overall versus Key competences. For example, "sustainability", "strategic thinking", "strategic sourcing" as well as cross functional abilities and knowledge" are all under the current top-10 but none is mentioned as current key. Their relative importance warrants future research.

### 3.1.2 Current Competences by Business Model

The next section looks at differences between the current competences valued by organisations adopting different business models. Most of the companies which participated in the case study followed a traditional, commercial business model (n=14), but the researchers additionally selected companies that adhered to a social business model (n=2) to ensure that as wide a spread of settings as possible was taken. Even when taking into consideration the imbalance in the number of companies representing the two categories, the following observations can be made referring to the differences and commonalities between social businesses and traditional companies. The analyses refer to the number of codings for certain competences (see Table 6) and its spread across the business model category.

***Findings***

Both types of companies put emphasis on “Negotiation”, “Analytical Skills”, “Strategic Sourcing” and “Sustainability”.

Interestingly, the number of codings for basic PSM knowledge areas are much higher for the interviews with the social businesses. The researchers coded ”Basic PSM knowledge”, “Contract Management”, “Product Knowledge”, “Quality Assurance” and “Risk Management” much more often than other competence areas. Also, “Holistic Supply Chain Thinking” did get a higher number of codings.

For the traditional businesses, there were more codings in “Communication Skills”, “Interpersonal Communication”, “Stakeholder Relationship Management” and “Strategic Thinking”.

***Discussion***

The following main observations can be highlighted:

- Social businesses prioritized basic, operational and technical PSM knowledge areas (“Basic PSM Knowledge”, “Contract Management”, “Product Knowledge”, “Quality Assurance”, “Risk Management”) even higher than traditional businesses did.
- A possible explanation is that people working in social businesses lack basic PSM skills more than traditional businesses; communication and interpersonal skills are more self-evident/ common to them.

### 3.1.3 Current Competences by Industries (and Companies)

This section looks at how current competences are emphasized across different industry sectors and to establish if there are any key similarities and differences.

***Findings***

Turning toward industry[4] commonalities and differences for current competences, the following key observations can be made (please see Table 7 for an overview). Firstly, when analysing by industry, one of the most frequently coded competences of the previous analysis makes a reappearance – "Negotiation", which is within the top 10 current competences covered in the interviews across all industries. Secondly, 6/8 industries have "Analytical Skills" and "Strategic Thinking", and 5/8 have "Sustainability", "Stakeholder Relationship Management", "Interpersonal Communication" and "Communications Skills" in their top 10. Thirdly, still half of the industries share the emphasis on "Cross-Functional Abilities and Knowledge" (but 0 mentions for Pharmaceutical).

When turning to the most striking differences:

- "Change Management" is only a top 10 competence in Construction,
- "Computer Literacy" and "Conflict Resolution" are only in the top 10 for Automotive and Pharmaceutical,
- "Cultural Awareness" only for Automotive and Electronics,
- "Holistic Supply Chain Thinking" only for Electronics and Food,
- "Process Optimisation" only at Construction and Pharmaceutical,
- "Knowledge Sharing" only at Electronics,
- "Languages" only at Construction, "Supplier Management" at Social Services,
- "Product Knowledge" only at Automotive, Chemical and Electronics, with actually no mentions at all at Construction, and Social Services,
- "Risk Management" was only emphasized at Electronics, Pharmaceutical and Social Services, but mentioned by all.

"Strategic Thinking" is emphasized by 8/12 firms, but is not emphasized by CHEM1, CONSU1, SOCSER, TECH1 and TECH2 (but no mentions at TECH1). "Stakeholder Relationship Management" skills are still emphasized by 9/12 companies (but no mentions at TECH1). "Interpersonal Communication" is

[4] In this analysis the suppliers are part of the respective dyads, i.e. their mentions are counted under the focal firm industry interviewed (applies to AUTO1, CHEM1, CONST, FOOD1).

emphasized in 7/12 companies (but no mentions in CONSU1). “Sustainability” is only emphasized by 6/12 companies in the case company view (with no mentions at Construction, and neither at TECH2). “Communication Skills” are only emphasized in 5/12 firms (with 0 mentions at TECH1). “Cross-Functional Abilities and Knowledge” were actually only emphasized by 4/12 firms (specifically by AUTO1, CONSU2 FOOD1, and SOCSER).

Looking at the most striking differences between companies, there are some smaller sub groups that highly emphasized “Ability to Make Decisions” (CONST1, PHARM1, TECH2), “Cultural Awareness” (AUTO1, PHARM1, TECH2), “e-Procurement Technology” (AUTO2, CONSU2), “Risk Management” (PHARM1, SOCSER1, TECH1), “Knowledge Sharing” and “Networking” (only emphasized by the start-up TECH2). Although discussed further above to be covered by the overall industry, within the industry Electronics, “Risk Management” was only emphasized by TECH1 (with 0 mentions by TECH2).

Turning toward case company[5] commonalities and differences for current competences, as a more detailed view below “industry”, the following key observations can be made: When this view is taken, “Negotiation”, which was mentioned across all industries, is only emphasized in 10/12 companies (not in the top 10 at CONSU1 and TECH2). Also, “Analytical Skills” is emphasized by 9/12 companies, and when an industry view is taken, it shows that these are actually not emphasized at AUTO2, CHEM1.

**Discussion**

Considering the most striking differences from the industry-comparison, it is noteworthy that food and electronics are the two industries that particularly emphasized the “Holistic Supply Chain Thinking”. When considering why that might be the case, their intricate supply chain networks may be a possible explanation. Apart from involving a lot of suppliers and sub-suppliers, food is also especially subject to other influencing factors (e.g. weather, global commodity price fluctuations, emerging substitutes etc.). Moreover, in both of these industries, products quickly devalue, in electronics due to technological obsolescence and in food due to perishability (and potentially changing trends such as gluten-free etc.).

- “Holistic Supply Chain Thinking” could be brought into the curriculum by taking very complex industry examples to develop the ability to identify the network stakeholders and develop a scenario planning capability

[5] In this analysis the suppliers are part of the respective dyads, i.e. their mentions are counted under the focal firm interviewed (applies to AUTO1, CHEM1, CONST, FOOD1).

**Table 7** – Current competences emphasized across industries (part of their respective top 10 most emphasized competences)

| Current Competences | Automotive | Chemical | Construction | Consulting | Electronics | Food | Pharmaceutical | Social Services |
|---|---|---|---|---|---|---|---|---|
| Negotiation | | | | | | | | |
| Analytical Skills | | | | | | | | |
| Strategic Thinking | | | | | | | | |
| Sustainability | | | | | | | | |
| Stakeholder RM | | | | | | | | |
| Interpersonal Com. | | | | | | | | |
| Com. Skills | | | | | | | | |
| Cross-functional A/K | | | | | | | Not mentioned | |

Table 7: Current Competences Emphasized Across Industries.

Legend: Colour Code: dark blue = is a top 10 mentioned competence for that industry, light blue = mentioned, but not among Top 10, "Not mentioned" = 0 mentions within that industry.

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"Product Knowledge" was only emphasized at Automotive, Chemical and Electronics, with actually no mentions at Construction and Social Services. The latter two probably can be explained by the fact that they are service-dominated, whereas the aforementioned all have strong physical components to their offerings.

- For the curriculum, the goal is to prepare students for a broad employer base, so it should feature both product and service exposure. Regarding "Product Knowledge" the project team can consider how to make this something covering both physical and service goods, especially considering that with increasing digitisation physical components of a product might be substituted by a service (e.g. download instead of transport already common today). Students might be encouraged to think in "features" rather than components, learning creative techniques how to engage in fruitful discussions with new product development.

Although "Strategic Thinking" was emphasized by 8/12 firms, it was not emphasized by CHEM1, CONSU1, SOCSER, TECH1 and TECH2 (with no mentions at TECH1). Whether that is because the latter saw it rather as a "given" or whether it was not that important for them is difficult to reconstruct retrospectively.

- For the curriculum, "Strategic Thinking" is an important competence to keep in mind and holds potential to be jointly developed together with other competences, such as the aforementioned "Holistic Supply Chain Thinking".

From the Start-Up involved, "Knowledge Sharing" and "Networking" were emphasized, rather unique across the sample. This might be interpreted as competences helping to get most out of a limited own resource based, by being able to connect resources as efficiently and effectively as possible internally (by "Sharing Knowledge") and accessing external parties' knowledge and know-how ("Networking").

- For the curriculum, this is a particularly relevant input, as due to the company size distribution in European countries, many students in Europe are likely to be employed by SMEs after their studies, rather than in high-resource global MNCs. How to be resourceful by creating a network might be a taught subject in class, but also how to give them exposure to develop a network (e.g. by mandatory internships, a mentorship program, program alumni community etc.) are thoughts to be further considered. This could be elaborated both on an organizational level (basics of knowledge management in an organization/department), as well as at a personal level through the basics of how to build up and maintain a personal network, including the role of social media.

### 3.1.4 Current Competences by PSM Organisations and Suppliers

As discussed above in the case demographics section, a novel feature of this research is that it incorporates the supplier perspective on what competences are needed by PSM professionals in their various job roles and, as such, 4 companies were involved in the interviews supplying each of them one of the focal companies. This section, therefore, looks at the differences between competences identified by PSM organisations and those from suppliers. As suppliers play such a key role in the success of modern organisations, it is important to capture what they consider to be important as this may be linked to increases in supplier satisfaction and more successful buyer-supplier relationships. In one of those supplier companies the researchers talked to two people, therefore in summary 5 key account managers or sales managers were interviewed (n =5).

***Findings***

When comparing the current competences, key account managers at the supplier side agree with their counterparts in PSM departments about the importance of "Interpersonal Communication" (coded 24 times[2]) and "Communication Skills" (coded 16 times[2]), as well as "Negotiation" (coded 13 times[2]), "Sustainability" (coded 11 times[2]) and "Analytical Skills" (coded 10 times[2]).

Notable differences can be seen in "Product Knowledge" (coded 18 times[2]) and "Holistic Supply Chain Thinking" (coded 11 times[2]). Both are part of the ten most often coded competences for suppliers, but not for the PSM representatives in the companies. "Holistic Supply Chain Thinking" is also closer to the middle of the listing by codings of current competences by companies.

***Discussion***

From this analysis the following key observations can be made:

"Interpersonal Communication, "Communication Skills", "Negotiation", "Sustainability" and "Analytical Skills" were equally important for both, key account managers and PSM professionals.

- This provides support from the counterparts point of view that these competences are particularly relevant.

Key account managers attach much more importance to "Product Knowledge" and "Holistic Supply Chain Thinking" than PSM professionals do. This might express the suppliers' wish or hope that buyers who know the products they buy and who understand the supply chain of these products are much

more competent business partners and argue more reasonably in negotiations for the sake of a good buyer – supplier relationship.

- There is an impact on the development of a PSM curriculum and also company training in that PSM students and PSM personnel need to be provided with a broader view on business processes and product development. Although it has to be taken into consideration that in some companies it is part of the negotiation strategy that buyers should not have a very deep understanding of the suppliers' products and needs, but rather focus on cost targets of their company only. In this context, some of the key account managers also mentioned the importance of long-term relationships with PSM personnel, and they criticized when buyers were replaced very often.

### 3.1.5 Current Competences by Cross-functional Experience

This next section differentiates current competences by cross-functional work experience, i.e. that the interviewees have spent part of their career working in other (functional) departments, such as Finance, Marketing and Engineering etc.

***Findings***

The following commonalities and differences for current competences can be observed (please see Table 8 for an overview).

| | A : Person:Cross-functional experience = Yes | B : Person:Cross-functional experience = No |
|---|---|---|
| **1 : Current Competences** | 809 | 633 |
| 3 : Analytical skills | 47 | 41 |
| 5 : Basic knowledge on PSM role & processes | 39 | 44 |
| 6 : Business Acumen | 21 | 37 |
| 8 : Communication skills | 59 | 34 |
| 15 : Cross-functional abilities&knowledge | 31 | 40 |
| 38 : Interpersonal Communication | 47 | 39 |
| 42 : Leadership | 31 | 37 |
| 45 : Negotiation | 58 | 49 |
| 50 : Process optimisation | 40 | 19 |
| 51 : Product knowledge | 39 | 24 |
| 59 : Stakeholder Relationship Management | 45 | 41 |
| 60 : Strategic sourcing | 42 | 35 |
| 61 : Strategic thinking | 39 | 49 |
| 64 : Sustainability | 35 | 49 |

Table 8: Current Competences Emphasized by Interviewees With Cross-functional Versus Without Cross-functional Experience[6].

(With Cross-functional Experience n = 20, Without n = 13, Rest was Unassigned n = 13.)

Legend: Red shade means is part of Top 10 most-often mentioned competences in that list.

As can be seen from Table 8, there is similar emphasis for many of the current competences between the two groups (e.g. for “Analytical Skills”, “Basic Knowledge on PSM Role & Processes” and “Interpersonal Communication”). However, there are a number of competences interviewees with cross-functional experience emphasized more than their counterparts without such experience. These were “Communication Skills”, “Process Optimization”, “Product Knowledge” and “Strategic Sourcing”.

[6] Any experience outside PSM was counted as cross-functional, regardless which (e.g. IT, Sales etc) or how many other functions (e.g. just one or multiple).

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Conversely, interviewees without cross-functional experience more emphasized “Business Acumen”, “Cross-Functional Abilities and Knowledge”, “Leadership” and “Sustainability”.[7]

***Discussion***

Looking back at the results of the effects of cross-functional experience on whether competences were emphasized or not, the ones emphasized by interviewees with such experience were “Communication Skills”, “Process Optimization”, “Product Knowledge” and “Strategic Sourcing”. It could be interpreted that their cross-functional background exposes them to how these competences facilitate their PSM roles. With such a perspective, competences such as “Communication Skills”, “Product Knowledge” and “Strategic Sourcing” seem particularly relevant, as they may be more familiar with cross-functional communication, may have worked in a function closer to the products (e.g. R&D, sales or production) and in “Strategic Sourcing” usually have to engage with other functions (e.g. during specification). It is worth highlighting that those without cross-functional experience still highlighted “Cross-functional abilities and knowledge” explicitly.

- As “Cross-Functional Abilities & Knowledge” in any case have appeared as an emphasized competence throughout the IO2 analysis, bring this topic into the PSM curriculum is particularly pertinent. How to train it in class (e.g. by role plays in-class and/or computer-aided business simulations) will be further analysed in future Intellectual Outputs of the PERFECT project.

## 3.2 Results on Future Competences for PSM

The research now moves onto analysing future competences that the interviewees identified and the structure of this section follows the structure of section 3.1, which deals with current competences. Section 3.2.1 looks at establishing whether these competences are tacit or explicit in nature. The sections that follow then make use of the differences in case demographics, by looking to identify and discuss differences between business models (Section 3.2.2), between industries (Section 3.2.3), between suppliers and PSM organizations (Section 3.2.4), between whether interviewees have cross-functional experience (Section 3.2.5).

[7] Cross-checking these with the total years of experience, indeed the interviewees with least work experience (3-5 years) to also emphasized all of these as their top ones, except for “Leadership” (which is driven by the interviewees from the Consulting industry). So there seems to be a correlation between total years of work experience and whether interviewees have cross-functional experience, which might just be their age.


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The section “Future skill requirements” in the semi-structured interview guide covered questions to evaluate future trends in PSM. After discussing trends and upcoming changes (“What are the current trends in PSM in general?”), the researchers asked how these might influence the current job of the interviewee and which knowledge and competences will be required in future (“What do you think will change specifically in your job in the future due to these trends?”). Although most of the interviewees mentioned “Digitisation”, and confirmed “Sustainability” when asked about it, in order to ensure a discussion was forthcoming in these areas, each interviewer was instructed to ask about these aspects and discuss with the interviewees, whether these trends are important drivers for change in PSM.

When interviewing the key account managers of suppliers, the researchers asked about the upcoming challenges and changes they foresee for the PSM function at their customer. Being the interface to the customer, the key account managers, in most cases, focused on the buyer-supplier relationship and how it might change in future (“What do you think will change in your job in the future?”). In addition, the PSM consultants provided a general assumption on the future developments for PSM, including the implications for competences and knowledge areas that will be relevant. It should be noted that many future competences were mentioned in comparison or addition to the current ones; e.g. basic skills like “Negotiation” were said to be still important in future, but there were nonetheless some additional, specifically future competences that were identified. The most important ones, indicated in the interviews with attributes like “very important”, “biggest challenge” or “we have to make sure we follow these requirements otherwise we will be out of business in the long-term” were coded as key competences.

Some of the interviewees used the skills discussed at an earlier stage in the interview with the help of the spider diagram to reflect on the changed competence requirements in the future.

### 3.2.1 Overall Findings & Discussion

***Findings***

Overall, 56 future competences were identified out of all the interviews (see Table 6) and these have been ranked in Table 9 by the number of instances that they were coded in the various interviews. Again, it has to be noted that this gives an indication of what competences have been covered and emphasized by the interviewees, but should not be over-interpreted as a full ranking of relative importance. The numbers in front of the competences are the individual numbers that NVivo has assigned to each them as they are ordered hierarchically and alphabetically in the software, e.g. the first parent node is “Future Competences”, that is why it has received number 1, “Ability to Make Decisions” is the first alphabetically ordered child note below that, therefore it received number 2. These numbers stay the same for all Figures and Tables featuring *future* competences in this white paper. The numbering was different for the current competences.

| | Total |
|---|---|
| **1 : Future Competences** | +Top 10 in red |
| 56 : Sustainability | 125 |
| 26 : eProcurement Technology | 55 |
| 4 : Automation | 53 |
| 28 : Holistic supply chain thinking | 41 |
| 6 : Big Data Analytics | 36 |
| 54 : Strategic thinking | 36 |
| 10 : Computer Literacy | 34 |
| 3 : Analytical Skills | 31 |
| 53 : Strategic Sourcing | 28 |
| 44 : Process optimisation | 27 |
| 55 : Supplier Management | 25 |
| 41 : Openness | 22 |
| 50 : Risk management | 22 |
| 9 : Communication Skills | 21 |
| 52 : Stakeholder Relationship Management | 21 |
| 22 : Cultural awareness | 18 |
| 45 : Product Knowledge | 17 |
| 30 : Innovation sourcing | 16 |
| 8 : Change Management | 15 |
| 14 : Creativity | 14 |
| 48 : Remote_Virtual Working | 13 |
| 7 : Business acumen | 12 |
| 37 : Learning agility | 12 |
| 33 : Interpersonal Communication | 11 |
| 46 : Project management | 11 |
| 16 : Cross-functional skills | 10 |
| 24 : Customer Focus | 10 |
| 31 : Innovative sourcing approaches | 10 |
| 36 : Leadership | 10 |
| 39 : Negotiation | 10 |
| 40 : Networking | 9 |
| 42 : Passion | 8 |
| 2 : Ability to Make Decisions | 7 |
| 5 : Basic knowledge on PSM role & processes | 7 |
| 15 : Critical thinking | 7 |
| 57 : Teamwork_working in teams | 7 |
| 12 : Contract Management | 6 |
| 32 : Integrity | 6 |
| 38 : Mobility | 6 |
| 29 : Humbleness | 5 |
| 35 : Languages | 5 |
| 49 : Resilience | 5 |
| 13 : Cost savings | 4 |
| 34 : Knowledge sharing | 4 |
| 27 : Financial acumen | 3 |
| 11 : Conflict Resolution | 2 |
| 18 : Finance | 2 |
| 20 : R&D | 2 |
| 23 : Curiosity | 2 |
| 43 : Prioritization | 2 |
| 47 : Quality Assurance | 2 |
| 51 : Self reliance | 2 |
| 17 : Engineering | 1 |
| 19 : Production | 1 |
| 21 : Sales | 1 |
| 25 : Deal with ambiguity | 1 |

Table 9: 56 Future Competences for PSM, Grouped by Number of Codings.

"Sustainability" was mentioned most often (coded 125 times[2]), followed by "eProcurement Technology" (coded 55 times[2]) and "Automation (coded 53 times[2]). We explicitly asked in the interview if "Digitisation" and "Sustainability" are relevant future trends. This was therefore confirmed by a high number of interviewees.

Besides "Sustainability", competences at the top of the list mainly reflect the area of digitisation: "eProcurement Technology", "Automation", "Big Data Analytics", "Computer Literacy", "Analytical Skills".

**"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 be able to filter, prioritize and decide which are the right and useful information." (Interviewee, CHEM2)**

**"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 tones 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)**

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When looking at the TOP 10 future competences (see Figure 9) that were highlighted by the interviewees, the two most important future areas were confirmed: “Sustainability” and “Digitisation”.

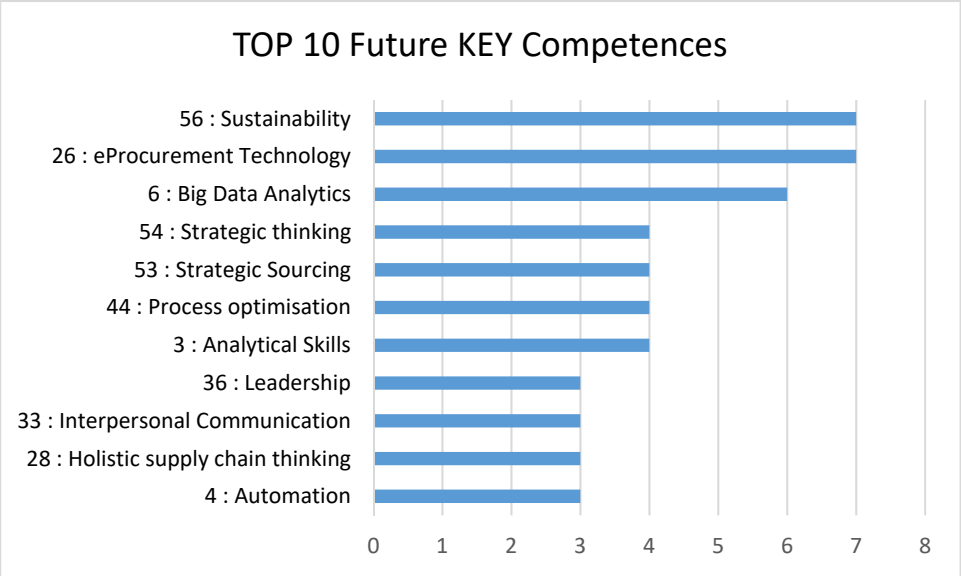


Figure 9: Top 10 Future Key Competences by Number of Codings.

“Sustainability” was mentioned in a broad context, including resource scarcity, supplier relationship management and long-term strategic thinking:

**“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 behavior 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)**

**“There are more and more people on the planet and weather conditions that go adverse, materials which going to become scarcer to source in the future possibly. So the market is changing. So skills you need it for that one to move effectively forward, or the trend in this area is we really need to be able to anticipate in the future and situations more and be able to put the right strategies in place once we anticipate the situation. (Interviewee, FOOD1)**

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Both lists of future competences, ranked by number of codings as well as by Top 10 prioritization, not only focus on digitisation and sustainability, but at the same time also emphasize strategic skills like "Strategic Thinking" (coded 36 times[2]; prio 4 on top 10 list), "Holistic Supply Chain Thinking" (coded 41 times[2] prio 10), "Strategic Sourcing". In addition, the top 10 overview highlights the continuing importance of communication skills, listing "Interpersonal Communication" as priority 9.

In general, interviewees confirmed that skill requirements will change, showing the different relevance that a PSM organisation might have in future. The scale of the PSM function in this context was widespread; from the prediction of PSM not existing at all as a separate function to PSM having a key role in the overall organization coping with future challenges. Interviewees especially with jobs in the area of indirect, non-production procurement confirmed the more pessimistic outlook (for the PSM function), whereas PSM colleagues dealing with manufacturing products indicated a more integrated role of PSM in the future.

Nearly all interviewees agreed that automation will particularly influence and replace administrative tasks, but there were also differing statements:

**"Do I believe it is really going to make a difference? No! To be honest, yes digitisation helps making a certain number of things easier in communication costs and things like that. But honestly is it going to revolutionise the business world, I don't think so! Contrary to logic and reading I honestly don't think so." (Interviewee, FOOD1)**

**"We are trying to make the procurement process as much as possible Amazon-like for the user and us. "(Interviewee, CHEM2)**

***Discussion***

"Sustainability" and "Digitisation" were indeed mentioned as the main future impact areas for procurement. For "Digitisation", some knowledge areas and competences were specified (mainly analytics), but uncertainty on the character and impact of "Digitisation" on PSM and required competences was expressed in the interviews. For "Sustainability", precise knowledge areas and competences were not specified in the interviews. This leads to the following observations:

- A breakdown of knowledge and skills for digitisation is needed to prepare students adequately for this future development. Which competences constitute "Automation" or "Big Data analytics" in the PSM context?
- A breakdown of knowledge and skills for sustainability is needed to prepare students adequately for this future development. Which competences constitute "Sustainability" in PSM? The correlation with competences that also were given a high priority in future PSM, like "Holistic Supply Chain Thinking" or "Strategic Thinking", might give an indication on the skills model further defining "Sustainability".
- When competences are further defined for those two areas, appropriate teaching methods need to be developed.
- This is also valid for corporate training – how to train PSM personnel or maybe even re-educate people that need to change their jobs as a result of increasing automation?

"Communication Skills" and "Negotiation" were also emphasized as important future competences, therefore the profile that students need to be prepared for gets larger and includes not only tacit knowledge, but also those of a more explicit nature, especially when talking about digitisation. Also, although increasing emphasis of digitisation and sustainability imply transformative changes of PSM organisations, it is noteworthy that competences such as "Change Management" and "Project management" were not equally emphasized, although they might be critical to actually make that transition. This will be taken up further in the curriculum development.

### 3.2.2 Future Competences by Business Model

The next section looks at differences between the future competences valued by organisations adopting different business models.

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***Findings***

Looking at the differences between traditional (commercial) and social businesses, commonalities can be found in the rating of "Sustainability" as a future knowledge requirement for PSM. When comparing the number of ties coded, "Sustainability" is top of the list of future competences for both business models.

Notable differences can be identified regarding competences in correlation to digitisation. Whereas "Analytical Skills" are on the list of the 10 most often coded competences for both business models, zero codings for social businesses were made for "Automation", "Computer Literacy" and "Big Data Analytics". Interestingly, "eProcurement Technology" was coded equally for both.

As outlined in section 3.1.4 of this paper, the imbalance in the number of companies representing the two categories (Traditional businesses N = 14, social businesses N=2) has to be taken into account when drawing conclusions from this data.

***Discussion***

The following key observations arise from the findings:

"Sustainability" was highly prioritized by social businesses as well as by traditional businesses. However, "Automation", "Computer Literacy" or "Big Data Analytics", being very important for traditional businesses, did not find the same recognition when talking to PSM professionals from social businesses.

- Firstly, skills in the context of digitisation like "Automation" might not be that important for social businesses with a certain product or service, e.g. in the social welfare sector. Secondly, and possibly the more valid interpretation is that social businesses are generally smaller, younger companies that have probably already anticipated digitisation aspects from their inception/founding. Therefore, they did not feel the need to explicitly define this as a future challenge. Competences related to digitisation might be more challenging for established, bigger companies. This might be an area of future research, having a more detailed look using a broader empirical data base. It could also be investigated if there is such a link to start-ups.

### 3.2.3 Future Competences by Industries (and Companies)

This section looks at how current competences are emphasized across different industry sectors and to establish if there are any key similarities and differences.

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***Findings***

Turning toward industry commonalities and differences for future competences, the following key observations can be made (please see Table 10 for an overview). In contrast to current competences there was no single competence that came up in the top 10 for all industries. The most common emphasis, by 7/8 industries (except Construction for both of these, with 1 and 0 mentions respectively) is placed on "eProcurement Technology" and "Sustainability". However 5/8 industries emphasized "Supplier Management", "Process Optimisation" (but 0 mentions at Consulting), "Computer Literacy" (but 0 mentions at Pharmaceutical and Shared Services) and "Automation" (but 0 mentions at Social Services).

As notable differences, the sporadic emphasis (as part of top 10 competences) of the following industries stands out:

- "Creativity" made it into the top 10 competences mentioned for Construction and Social Services industries,
- "Customer Focus" was only emphasized in the Consulting industry,
- "Innovation Sourcing" only in the Food industry,
- "Innovative Sourcing" approaches and "Leadership" only in the Consulting industry,
- Cross-functional skills and some specific cross-functional partners only in the Construction industry,
- "Cultural Awareness" only in the Automotive industry,
- "Passion", "Integrity" and "Negotiation" only at the Electronics industry,
- "Learning Agility" only at the Pharmaceutical industry.

Turning toward case company[8] commonalities and differences for future competences, as a more detailed view below "industry", the following key observations can be made. First, "eProcurement Technology" was actually emphasized by 10/12 companies (except by TECH1 and Construction) and "Sustainability" actually was emphasized by 9/12 companies (except AUTO2, Construction, TECH2, all of these three notably with 0 mentions, and not emphasized as top 10 by CONSU2). Second, "Supplier Management" was emphasized by 6/12 (with 0 mentions at CHEM1, CONSU1, CONSU2 and TECH2), "Process Optimization" by 6/12 (in fact, within Consulting only emphasized by CONSU1) and

[8] In this analysis the suppliers are part of the dyads, i.e. their mentions are counted under the focal firm interviewed.

"Automation" by 7/12 (in fact with 0 mentions by AUTO2, and TECH1). "Computer Literacy" is emphasized by 7/12 (in comparison to the industry view by both AUTO1 and AUTO2, but only TECH2, not TECH1; the latter actually has 0 mentions). Third, "Supplier Management" is still emphasized by 6/12 companies, as is "Process Optimization" (but 0 mentions at AUTO2, CONSU2, TECH1 and TECH2). "Sustainability" is emphasized by 8/12 companies (except AUTO2, Construction, CONSU2, and TECH2).

- The most prominent differences/additions to the industry view are that the "Customer Focus" emphasis in the consulting industry is actually in the top 10 emphasized competences by both CONSU1 and CONSU2, "Innovative Sourcing Approaches" was driven by CONSU1 (not CONSU2) and "Leadership" by CONSU2 (not CONSU1). The "Cultural Awareness" emphasis mentioned for automotive stems exclusively from AUTO1 (0 mentions for AUTO2). "Passion", "Integrity" and "Negotiation" are all driven by TECH2 (not TECH1).

***Discussion***

The cross-industry comparison confirms a number of competences that have been emphasized multiple times in the preceding analysis, such as "e-Procurement Technology" and "Sustainability" (see Table X2 on the next page). Looking at the most striking differences to ensure that no relevant competences are missed in the overall rankings, the sporadic emphasis of "Creativity" (construction and social services), "Customer Focus", "Innovation Sourcing" and "Leadership" (all emphasized by consulting), "Cross-Functional Abilities & Knowledge" (construction), "Cultural Awareness" (Automotive), "Passion" and "Integrity" (both only Electronics), "Learning Agility" (Pharma) stood out.

The emphasis on "Creativity" and "Cross-Functional Abilities & Knowledge" seems to particularly relate to those industries that are more service-dominated (construction and social services), where how to create value across different functions seems to be emphasized.

- ➢ With this in mind, and as discussed previously, the physical versus service product basics and cross-functional approaches are re-emphasized also for the future.

**Table 10** – Future competences emphasized across industries (part of their respective top 10 most emphasized competences)

| Future Competences | Automotive | Chemical | Construction | Consulting | Electronics | Food | Pharmaceutical | Social Services |
|---|---|---|---|---|---|---|---|---|
| eProcurement Tech. | | | | | | | | |
| Sustainability | | | Not mentioned | | | | | |
| Supplier Mgmt. | | | | Not mentioned | | | | |
| Process Opt. | | | | | Not mentioned | | | |
| Computer Literacy | | | | | | | Not mentioned | Not mentioned |
| Automation | | | | | | | | Not mentioned |

Table 10: Future Competences Emphasized Across Industries.

Legend: Colour Code: dark blue = is a top 10 mentioned competence for that industry, light blue = mentioned, but not among Top 10, "Not mentioned" = 0 mentions within that industry.

Interestingly, the consulting interviewees, who were asked to comment on what they would regard as the most important competences for PSM at their clients from their point of view, as they see across many industries simultaneously and over time, were the only industry to emphasize the "Customer Focus", "Innovation Sourcing" and "Leadership". It might be interpreted that both of the first two of these have a PSM department external orientation, i.e. "Customer Focus" requires to actually think rather towards both internal and external customers.

- This reemphasized the PERFECT project's assumption that PSM has the role of a boundary-spanner not only internally (cross-functionally) but also externally. A consideration that can be combined with a variety of the aforementioned competences (e.g. "Holistic Supply Chain Thinking").

"Leadership" may be something that is assumed to exist internally, but as consultants usually rely on strong/good leadership in their client organization to be able to successfully drive projects forward. Due to the nature of their business, they may see both "good" and "bad" cases more frequently over time as they move from project to project/client to client, than somebody based in one organization for a longer time, so they might be more cognizant that a "Leadership" competence should be emphasized for PSM.

- This is an interesting consideration for a curriculum on two levels. Linked with the competence "Stakeholder Relationship Management", it might be an area to teach in terms of how to ensure the required leadership (by your superiors/management) to back initiatives/projects. On the other hand, it also appeals to the individual level, i.e. how to develop (at least first) leadership competence during a curriculum. Toward the latter the use of teamwork and/or applied projects should be further considered.

"Cultural Awareness" in the automotive industry could be seen due to the international supply network structure of that industry.

- For the curriculum development, this emphasizes how "Cultural Awareness" should be raised, e.g. by covering basics of cross-cultural management somewhere in the curriculum (if not covered at the institution, yet). Also, practically, this could be fostered by mixing teams of international students, having mandatory international internships, and, for example, integrating (brief) reflective sessions into the lectures (e.g. as part of overall teambuilding and project management considerations) for cross-functional/cross-cultural sourcing endeavours.

Looking at the company level, it is particularly interesting to take up that "Passion", "Integrity" and "Negotiation" are all driven by TECH2 (not TECH1), the start-up. Again, in a resource-scarce business, ways to leverage what is available seems to be in focus.

- For the curriculum, this shows the need to emphasize such competences, particularly for the ability to gain a foothold in smaller companies, although this may still be relevant to larger organizational settings. Rather they are emphasized by a firm that has to strongly rely on a smaller number of people, maybe enabling it to pinpoint specific competences that are deemed critical in a more pronounced way than in a large firm with a very broad employee base. "Passion" and "Integrity" need to be analysed further in terms of how "trainable" they are (whereas "Negotiation" is part of many current curricula). Nevertheless, as part of teamwork, role-plays or simulations, such traits could be explicitly part of project/assignment instructions and evaluations and also be part of (brief) reflective sessions.

### 3.2.4 Future Competences by PSM Organisations and Suppliers

This section aims to compare and contrast the competences that PSM organisations and their suppliers identify.

***Findings***

Supplier representatives' future competence ranking coincides with the one from companies for the areas of "Sustainability" (highest number of codings for both groups), and for "eProcurement Technology" (second highest number of codings for both groups).

The ranking differs for "Cultural Awareness" and "Passion" – for key account managers, these are within the 10 most often coded future competences, whereas for interviewees from PSM, there were not that relevant, as of the number of codings.

***Discussion***

As regarding future competences there are not so many obvious findings to be concluded, but rather to state that both sides of the buyer-supplier dyad seem to be aware of "eProcurement Technology" as an important future competence.

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### 3.2.5 Future Competences by Cross-functional Experience

This next section differentiates future competences mentioned by whether interviewees have cross-functional work experience, i.e. the interviewees time spent working in other departments such as Finance, Marketing and Engineering etc., or not.

***Findings***

Turning toward interviewee cross-functional experience, the following commonalities and differences for future competences can be observed (please see Table 11 for an overview).

| | A : Person:Cross-functional experience = Yes | B : Person:Cross-functional experience = No |
|---|---|---|
| **1 : Future Competences** | 258 | 236 |
| 3 : Analytical Skills | 10 | 15 |
| 4 : Automation | 20 | 18 |
| 6 : Big Data Analytics | 14 | 14 |
| 10 : Computer Literacy | 15 | 11 |
| 26 : eProcurement Technology | 25 | 18 |
| 28 : Holistic supply chain thinking | 8 | 24 |
| 41 : Openness | 10 | 7 |
| 44 : Process optimisation | 11 | 9 |
| 50 : Risk management | 9 | 10 |
| 52 : Stakeholder Relationship Management | 9 | 12 |
| 53 : Strategic Sourcing | 19 | 3 |
| 54 : Strategic thinking | 8 | 15 |
| 55 : Supplier Management | 14 | 4 |
| 56 : Sustainability | 44 | 45 |

Table 11: Future Competences Emphasized by Interviewees With Cross-functional Versus Without Cross-functional Experience[9].

(With Cross-functional Experience n = 20, Without n = 13, Rest was Unassigned n = 13.)

Legend: Red shade means is part of Top 10 most-often mentioned competences in that list.

As can be seen from Table 11, there is commonality of emphasis for many of the future competences between those two groups (e.g. for “Analytical Skills”, “Automation”, “Big Data Analytics”). However, there are a number of competences interviewees with cross-functional experience emphasized more heavily than their counterparts without such experience. These are “Openness”, “Process Optimization”, “Strategic Sourcing” and “Supplier Management”. Conversely, interviewees without cross-functional experience more emphasized “Holistic Supply Chain Thinking”, “Risk Management”, “Stakeholder Relationship Management” and “Strategic Thinking”.[10]

[9] Any experience outside PSM was counted as cross-functional, regardless which (e.g. IT, Sales etc.) or in how many other functions (e.g. just one or multiple).

[10] Cross-checking these with the total years of experience, indeed the interviewees with least work experience (3-5 years) to also emphasized all of these as their top ones , except for “Risk Management”. So there seems to be a correlation between total years of work experience and whether interviewees have cross-functional experience, which might just be their age.

***Discussion***

The stronger emphasis of "Openness", "Process Optimization", "Strategic Sourcing" and "Supplier Management" of interviewees with cross-functional experience as future competences, may be interpreted in a similar way as that for the current competences: That their cross-functional background lets them see how these competences (would in future) facilitate their PSM roles. With such a perspective, particularly "Openness" and "Process Optimization" stand out as potentially connected to upcoming changes due to technological advances, as end-to-end process optimization will require cross-functional efforts. To be open to new solutions, technologies, but also other functions' points of view/requirements would then be how "Openness" could be interpreted.

- Promoting "Openness" could be fostered by covering a broader range of potential options of how to approach a certain problem in a course and/or actually change the scenario during the course by unforeseen events (such as a main stakeholder in another function leaving the firm, or a new IT manager proposing a new automation software, just when the student team has figured out the manual process) in order to increase tolerance for dynamic changes. "Process Optimization" could either be combined with this approach, but also could be grouped with learning about certain techniques related to it when covering the basic PSM processes (e.g. introducing process flow analysis, Ishikawa/Fishbone Diagrams, Pareto Analysis etc.).

"Strategic Sourcing" and "Supplier Management" represent rather traditional PSM competences, but their emphasis by the group who has cross-functional experience shows that these cross-functional endeavours. In that context, it is worth stating that those without cross-functional experience still highlighted "Holistic Supply Chain Thinking" and "Stakeholder Relationship Management" explicitly.

- When introducing these topics they could directly be set into an intra-company and inter-company stakeholder network context. For example, to students hearing about it for the first time "Supplier Management" may sound like a clear PSM activity, to be done by PSM only. But how to analyse the (often multiple) interfaces of a company to suppliers (e.g. by Quality departments, Marketing & Sales and/or R&D) and how to achieve "one face to the supplier" could actually be a starting point for analysing and teaching the subject, rather than potentially more of a final comment of how things can deviate from the textbooks in practice.

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## 3.3 Tacit and Explicit Competences

The following section takes the list of current and future competences from the preceding section and differentiates them as either being explicit or tacit in nature. Before the findings are discussed, a brief explanation of what is meant by explicit and tacit knowledge is given. The distinction between explicit and tacit is then deployed in conjunction with a number of different aspects of the case demographics to provide further, more focused, insights. Firstly, section 3.3.1 looks at the differentiation between tacit and explicit in relation to current competences and is followed by section 3.3.2 which does the same in relation to future competences. Sections 3.3.3 and 3.3.4 differentiate explicit and tacit respectively in relation to job role and sections 3.3.5 and 3.3.6 make the tacit and explicit distinction by total years' experience.

The distinction between tacit and explicit knowledge was first made by Polanyi (1966) and was based on the idea that we can know more that we can tell. This was further developed by Nonaka and Konno (1998) in their socialization, externalization, combination and internalization (SECI) model. However, the distinction between tacit knowledge and explicit knowledge is not entirely clear (Takala, 2008) and therefore, in order to provide a structure to the distinguishing between the knowledge types, the set of characteristics used by Smith (2001) has been used. This work establishes that tacit knowledge is practical, action-oriented knowledge, can be considered as 'know-how' based on practice, acquired by personal experience, is seldom expressed openly, often resembles intuition (Smith, 2001: 314). Whereas, explicit knowledge, or academic knowledge can be considered as 'know-what' that is described in formal language, print or electronic media and is often based on established work processes, use people-to-documents approach (Smith, 2001: 314).

This analysis uses a set of characteristics exemplifying the different knowledge types, as shown in Table 12 below, which have been taken from Smith (2001).

| Characteristic | Explicit | Tacit |
|---|---|---|
| **Work process** | organized tasks, routine, orchestrated, assumes a predictable environment, linear, reuse codified knowledge, create knowledge objects | spontaneous, improvised, web-like, responds to a changing, unpredictable environment, channels individual expertise, creates knowledge |
| **Learn** | on the job, trial-and-error, self-directed in areas of greatest expertise, meet work goals and objectives set by organisation | supervisor or team leader facilitates and reinforces openness and trust to increase sharing or knowledge of business judgement |
| **Teach** | trainer designed using syllabus, uses formats selected by organization, based on goals and needs of organization, may be outsourced | one-to-one, mentor, internships, coach, on-the-job training, apprenticeships, competency based, brainstorm, people to people |
| **Type of thinking** | logical, based on facts, use proven methods, primarily convergent thinking | creative, flexible, unchartered, leads to divergent thinking, develops insights |
| **Share knowledge** | extract knowledge from person, code, store and reuse as needed for customers, e-mail, electronic discussions, forums | altruistic sharing, networking, face-to-face contact, videoconferencing, chatting, storytelling, personalize knowledge |
| **Motivation** | often based on need to perform to meet specific goals | inspire through leadership, vision and frequent personal contact with employees |
| **Reward** | tied to business goals, competitive within workplace, compete for scarce rewards, may not be rewarded for information sharing | incorporate intrinsic or non-monetary motivators and rewards for sharing information directly, recognize creativity and innovation |
| **Relationships** | may be top-down from supervisor to subordinate or team leader to team members | open, friendly, unstructured, based on open, spontaneous sharing of knowledge |
| **Technology** | related to job, based on availability and cost, invest heavily in IT to develop professional library with hierarchy of databases using existing knowledge | tool to select personalized information, facilitate conversations, exchange tacit knowledge, invest moderately in the framework of IT, enable people to find one another |
| **Evaluation** | based on tangible work accomplishments, not necessarily on creativity and knowledge sharing | based on demonstrated performance, ongoing, spontaneous evaluation |

Table 12: Characteristics of Tacit and Explicit Knowledge (Smith, 2001).

It should be noted that a number of the knowledge areas could contain both tacit and explicit characteristics, so the distinction in these cases was made on where the balance lay. For example, one

could learn the process of negotiation, such as the steps to take, and this would be done in a more explicit manner. However, the more intuitive nature of the bargaining aspect and the feel for a walk away position is far more tacit. In such an example, the importance of the latter aspects, mean that this knowledge area was designated as tacit.

### 3.3.1 Overall Explicit and Tacit Current Competences

The first part of the analysis looks at whether the current competences identified from all interviews were either tacit or explicit in nature and makes use of the characteristics provided by Smith (2001) as a guide to making this distinction.

***Findings***

The 10 competences, which were referred to the most times in the interviews (number of instances), are shown in Table 13 below. These are then further broken down into whether they are tacit or explicit in nature.

| Current Competence | Number of instances | Tacit or Explicit |
|---|---|---|
| Negotiation | 148 | T |
| Communication Skills | 125 | T |
| Interpersonal Communication | 116 | T |
| Sustainability[11] | 113 | T |
| Analytical Skills | 112 | E |
| Strategic Thinking | 112 | T |
| Strategic Sourcing | 110 | E |
| Stakeholder Relationship Management | 109 | T |
| Basic Knowledge on PSM Role & Processes | 104 | E |
| Cross-Functional Abilities & Knowledge | 104 | E |

Table 13: Top 10 Current Competences – Tacit vs. Explicit.

As shown, of the top 10 current competences, 6 were deemed tacit and 4 were explicit and this demonstrates the importance that those competences play in ensuring that PSM professionals and therefore the overall function can meet their objectives. Further, although 6 out of the 10 Top 10

[11] For some of those the decision to allocate them to either side was very gradual. E.g. sustainability certainly contains a number of explicit aspects, such as KPIs, concrete measures to address it etc., but on the other hand has a strong connection to attitudes and values, which are more tacit. Likewise intensively, the coding team discussed "Holistic Supply Chain Thinking" to lean towards explicit in comparison to "Strategic Thinking", because the interviewees particularly emphasized understanding the actual product components and visualizing/mapping the related supply chain and influencing factors, which made it more something that can be broken down in concrete steps, as well as analytical approaches and even software tools.

competences were tacit, they form the top 4 ("Negotiation", "Communication Skills", "Interpersonal Communication" and "Sustainability").

***Discussion***

Differentiating between explicit and tacit PSM areas, generates a number of pertinent insights that are useful for practitioners and academics alike:

- Firstly, both tacit and explicit areas are important and a mixed approach is needed in a number of different areas.
- This shows that those involved in the education and recruitment of both new and existing PSM staff need to be mindful that these tacit competences need to be factored into decision making in these areas of activity. Although explicit competences can be imparted through formalised education methods, tacit areas often need different methods, such as mentoring and practice-based learning to be developed. Therefore, such competences should not be left out of training programmes as doing so will miss key areas of necessary competence development if they do so. When considering the design of any PSM relevant curriculum, an over-reliance on traditional methods of teaching (such as lectures) may mean that tacit areas are overlooked and not imparted to students in the most effective manner.
- Tacit knowledge is more difficult to share than explicit knowledge, as it is less codifiable, being more difficult to articulate. Therefore, knowledge sharing between individuals and within a function needs to reflect the high importance of tacit PSM competences. This means that aspects of socialisation (as per Nonaka & Takeuchi, 1996) such as mentoring and buddying need to be integrated into work practices to ensure that tacit knowledge can be articulated and shared in the most effective manner. Further, although Standard Operating Procedures (SOPs) and manuals serve a useful purpose, they do not allow for a full sharing of tacit knowledge and therefore these cannot be seen as the end point of training, but are rather a start point.

### 3.3.2 Overall Explicit and Tacit Future Competences

The second part of the analysis is similar to that shown in the previous sections, which looked at current competences, but now looks at whether the future competences identified from all interviews were either tacit or explicit in nature.

***Findings***

The 10 competences, which were referred to the most times in the interviews, are shown in Table 14 below. These are then further broken down into whether they are tacit or explicit.

| Future Competence | Number of instances | Tacit or Explicit |
|---|---|---|
| 56 : Sustainability | 125 | T |
| 26 : eProcurement Technology | 55 | E |
| 4 : Automation | 53 | E |
| 28 : Holistic Supply Chain Thinking | 41 | E |
| 6 : Big Data Analytics | 36 | E |
| 54 : Strategic Thinking | 36 | T |
| 10 : Computer Literacy | 34 | E |
| 3 : Analytical Skills | 31 | E |
| 53 : Strategic Sourcing | 28 | E |
| 44 : Process optimisation | 27 | E |

Table 14: Top 10 Future Competences – Tacit vs. Explicit.

As shown, of the top 10 current competences, 2 were deemed tacit and 8 were explicit, although the top competence listed was tacit in nature ("Sustainability"). This is a different balance than that found when current competences (as per section 2.2) was analysed and tacit competences were deemed of overall more importance.

***Discussion***

The following key observations can be made:

- The shift in emphasis between explicit and tacit aspects, can perhaps be explained by how much easier it is to articulate knowledge of an explicit dimension and therefore those that are yet to materialise may fall into this category.
- This notwithstanding, as the majority of these future competences are explicit in nature, there is an opportunity for explicit based training (both in-house and in education settings) to be

developed and delivered now to ensure that PSM practitioners are best equipped to develop these competences that are envisioned to play an important role in the future.

### 3.3.3 Explicit Current Competences by Role

The next section makes use of the tacit and explicit split as detailed above and looks at how individuals with different organisational roles perceive the importance of different EXPLICIT competences to be. Individuals were allocated to one of three different roles; managerial, operative and HR/Training.

***Findings***

The instances of the various competences were then ranked according to these different job roles and is shown in Table 15 below (those in blue denote commonality across the three roles). The figures show the top 13 competences, as this accounts for tied instances.

| Management | Operative | HR/Training Representative |
|---|---|---|
| Contract Management | Strategic Sourcing | Cross-Functional Abilities & Knowledge |
| Analytical Skills | Supplier Management | Strategic Sourcing |
| Basic Knowledge on PSM Role & Processes | Cross-Functional Abilities & Knowledge | Holistic Supply Chain Thinking |
| Strategic Sourcing | Basic Knowledge on PSM Role & Processes | Quality Assurance |
| Product Knowledge | Holistic Supply Chain Thinking | Basic Knowledge on PSM Role & Processes |
| Cross-Functional Abilities & Knowledge | Quality Assurance | Product Knowledge |
| Cost Savings | Contract Management | Analytical Skills |
| Process Optimisation | Analytical Skills | Supplier Management |
| Computer Literacy | Product Knowledge | Financial Acumen |
| Holistic Supply Chain Thinking | eProcurement Technology | Contract Management |
| Risk Management | Financial Acumen | Cost Savings |
| eProcurement Technology | Project Management | Process Optimisation |
| Quality Assurance | Computer Literacy | Computer Literacy |

Table 15: Top 13 Current Explicit Competences – by Job Role.

There is a considerable degree of similarity demonstrated across the different job roles, as all contained the same 9 in the top 13, which were; “Contract Management”, “Basic Knowledge on PSM Role & Processes”, “Product Knowledge”, “Strategic Sourcing”, “Computer Literacy”, “Cross-Functional Abilities & Knowledge”, “Analytical Skills”, “Holistic Supply Chain Thinking”, “Quality Assurance”.

Of high importance to the Operative role was “Supplier Management” (ranked 2nd) and although this was ranked 9th by the HR/Training Representative role, it did not appear in the top 13 Management based competences (ranked 16th). “Cost Savings” was ranked highly (6th) by the Management role, although this was ranked 11th by the HR/Training Representative role did not appear in the top 13 Management based competences as it was unranked (0 instances). Similarly, “Risk Management” (ranked 11th) was of high importance to the Management role, but this was not reflected in the Operative or HR/Training Representative roles. The remaining 4 competences identified in relation to the HR/Training Representative role (“Supplier Management”, “Financial Acumen”, “Cost Savings” and “Process Optimisation”) were reflected in either the Management or Operative roles apart from the HR/Training representative did not contain eProcurement, but both the Management and Operative roles did.

***Discussion***

Differentiating by individuals with different organisational roles perceive the importance of different EXPLICIT current competences generates some relevant insights as follows:

- Although there was a close match between the HR/Training Representative and specific PSM roles, the HR/Training Representative did not identify the “eProcurement” competency as being of importance, yet the others did. Any in house training programmes need to ensure that this is adequately represented and that it does not get missed out. The increasing focus on digitisation in most aspects of modern organisational practices means that PSM as a function needs to highlight the importance of eProcurement in the wider organisational context or it risks the area not being seen as a priority.
- As “Supplier Management” was not listed in the Management role, but was specifically in the Operative. This is not necessarily surprising, as it is more of day-to-day task of purchasers to focus on direct dealings with the suppliers of the organisation. However, it is suggested that those in a Management role, whilst, of course, focusing on “Leadership” etc., that the key aspect of “Supplier Management” is not overlooked. Continued dealings with suppliers would ensure that those in Management roles maintain a close link to the supply market and current and future challenges that may arise.

### 3.3.4 Tacit Current Competences by Role

The next section is similar to the one above, but now looks at how individuals with different organisational roles perceive the importance of different TACIT current competences to be. Individuals were allocated to one of three different roles; managerial, operative and HR/Training. The instances of the various competences were then ranked according to these different job roles and is shown in the Figure below (those in blue denote commonality across the three roles).

***Findings***

Table 16 shows the top 14 competences, as this accounts for tied instances.

| Management | Operative | HR/Training Representative |
|---|---|---|
| 17 : Negotiation | 12 : Interpersonal Communication | 28 : Sustainability |
| 31 : Communication Skills | 17 : Negotiation | 25 : Business Acumen |
| 24 : Stakeholder Relationship Management | 14 : Languages | 26 : Strategic Thinking |
| 12 : Interpersonal Communication | 28 : Sustainability | 17 : Negotiation |
| 26 : Strategic Thinking | 1 : Conflict Resolution | 24 : Stakeholder Relationship Management |
| 15 : Leadership | 7 : Customer Focus | 12 : Interpersonal Communication |
| 28 : Sustainability | 26 : Strategic Thinking | 7 : Customer Focus |
| 5 : Cultural Awareness | 4 : Ability to Make Decisions | 18 : Networking |
| 7 : Customer Focus | 19 : Openness, Open-minded | 31 : Communication Skills |
| 25 : Business Acumen | 24 : Stakeholder Relationship Management | 15 : Leadership |
| 4 : Ability to Make Decisions | 16 : Learning Agility | 6 : Curiosity |
| 1 : Conflict Resolution | 21 : Prioritization | 16 : Learning Agility |
| 18 : Networking | 29 : Teamwork_working in teams | 19 : Openness, Open-minded |
| 30 : Change Management | 31 : Communication Skills | 2 : Creativity |

Table 16: Top 14 Current Tacit Competences – by Job Role.

Although there is less commonality than with the Explicit competences (as shown in the preceding section), there is nonetheless still a considerable degree of similarity demonstrated across the different job roles, as all contained the same 7 in the top 14 as follows: “Customer Focus”, “Interpersonal Communication”, “Strategic Thinking”, “Negotiation”, “Stakeholder Relationship Management”, “Sustainability”, “Communication Skills”.

“Communication Skills” was ranked highly (2nd) by Management, but was ranked lower by Operative (14th). “Leadership” and “Business Acumen” was considered important by Management (ranked 6th, 10th respectively) and also by the HR/Training Representative role (ranked 10th, 2nd respectively), but

was not contained on the Operative list of top competences. Conversely, “Languages” was ranked 2nd on the Operative list, but did not appear in either the Management or HR/Training Representative lists.

***Discussion***

This analysis shows a similar trend to that identified in the discussion above for explicit areas:

- There is a mismatch between “Languages” contained in the Operative, but not in the Management or HR/Training Representative lists. This suggests that those in the Management role may be more experienced and therefore have had chance to develop their “Languages” skills more fully and due to their more senior level may be dealing with inter-organisational counterparts who have similar levels of “Languages” skills. This may not be the case for those in Operative roles, who are more likely to be less experienced and more likely to be dealing with the operational level of suppliers and may see “Languages” as a more immediate challenge. This highlights the need for the integration of schemes such as the ERASMUS Mobility Programme into HE curricula and also that organisations consider the use of internships or exchange programmes with PSM parts of their organisation in different countries or possibly supplier exchange programmes.

### 3.3.5 Explicit Competences by Total Years of Experience

This section looks at differences in years of TOTAL work experience in the following categories and shows which EXPLICIT CURRENT and FUTURE competences those individuals deemed were important.

***Findings***

Table 17 provides an overview of the five groups, with work experience ranging from least in group 1 (3 to 5 years of total work experience) to most in group 5 (more than 35 years). "Analytical Skills" appears as the top ranked competency on both group 2 and group 3, and as 6th ranked competency in the group 4, but is not among the most emphasized for the first or fifth groups. "Product Knowledge" appears in all groups, apart from the second and is ranked highly by all the other groups (1st in group 1, 6th in group 3, 2nd in group 4 and 2nd in group 5).[12]

***Discussion***

The analysis of total years of experience for explicit competences highlights the following:

- The lack of "Analytical Skills" in group 1 suggests that this is an area that needs to be focused on in HE curricula and also through in-house training programmes, as it is deemed highly important in all the other categories (apart from group 5).
- The consistency of "Holistic Supply Chain Thinking", "Basic Knowledge on PSM Role & Processes" and "Cross-Functional Abilities & Knowledge" across all of the cgroups, means that these need to be firmly embedded in HE curricula to ensure that these areas are reflected in the courses that are being offered and that these areas are maintained throughout an individual's career.
- Similarly, these areas can be reflected in early stage in-house training of organisations

[12] Cross-checked with the later analysis of whether interviewees possess cross-functional experience or not, "Analytical Skills" where emphasized by both.

Table 17 below ranks these competences against the different years of TOTAL work experience:

| Group 1 (3 to 5 years) | Group 2 (6 to 10 years) | Group 3 (11 to 20 years) | Group 4 (21 to 35 years) | Group 5 (over 35 years) |
|---|---|---|---|---|
| Product Knowledge | Analytical Skills | Analytical Skills | Strategic Sourcing | Contract Management |
| Cross-Functional Abilities & Knowledge | Strategic Sourcing | Basic Knowledge on PSM Role & Processes | Product Knowledge | Product Knowledge |
| Holistic Supply Chain Thinking | Basic knowledge on PSM Role & Processes | Strategic Sourcing | Basic Knowledge on PSM Role & Processes | Risk Management |
| Holistic Supply Chain Thinking | Holistic Supply Chain Thinking | Cross-Functional Abilities & Knowledge | Cross-Functional Abilities & Knowledge | Holistic Supply Chain Thinking |
| Basic Knowledge on PSM Role & Processes | Process Optimisation | Cost Savings | Process Optimisation | Automation |
| Quality Assurance | Cross-Functional Abilities & Knowledge | Product Knowledge | Analytical Skills | Cross-Functional Abilities & Knowledge |
| Supplier Management | Cost Savings | Computer Literacy | Cost Savings | Holistic Supply Chain Thinking |
| Quality (QHSE) | Computer Literacy | eProcurement Technology | Contract Management | Innovation Sourcing |
| eProcurement Technology | Supplier Management | Holistic Supply Chain Thinking | Holistic Supply Chain Thinking | Basic Knowledge on PSM Role & Processes |
| Automation | Financial Acumen | Process Optimisation | Computer Literacy | Financial Acumen |
| Process Optimisation | | Quality Assurance | | Supplier Management |
| Product Knowledge | | | | Project Management |
| | | | | Innovative Sourcing Approaches |
| | | | | Financial Acumen |
| | | | | Finance |

Table 17: Top Current & Future Explicit Competences – by Years of Total Work Experience.

Those in blue denote commonality across the ranges of experience

### 3.3.6 Tacit Competences by Total Years of Experience

This section looks at differences in years of TOTAL work experience in the following categories and shows which TACIT CURRENT and FUTURE competences those individuals deemed were important.

***Findings***

Table 18 below ranks these competences against the different groups with more and less years of TOTAL work experience.

There are 6 tacit competences that are shared across the different years of work experience as follows and this shows a higher level of similarity than for the analysis above dealing with explicit competences and total years worked. These competences are “Business Acumen”, “Strategic Thinking”, “Negotiation”, “Sustainability”, “Interpersonal Communication”, “Stakeholder Relationship Management”.

| Group 1 (3 to 5 years) | Group 2 (6 to 10 years) | Group 3 (11 to 20 years) | Group 4 (21 to 35 years) | Group 5 (over 35 years) |
|---|---|---|---|---|
| Negotiation | Sustainability | Stakeholder Relationship Mgmt. | Sustainability | Negotiation |
| Sustainability | Stakeholder Relationship Mgmt. | Strategic Thinking | Communication Skills | Interpersonal Communication |
| Conflict Resolution | Strategic Thinking | Negotiation | Negotiation | Strategic thinking |
| Interpersonal Communication | Negotiation | Communication Skills | Interpersonal Communication | Ability to Make Decisions |
| Languages | Leadership | Sustainability | Customer Focus | Customer Focus |
| Strategic Thinking | Interpersonal Communication | Interpersonal Communication | Cultural Awareness | Stakeholder Relationship Mgmt. |
| Integrity | Communication Skills | Leadership | Strategic Thinking | Sustainability |
| Prioritization | Customer Focus | | Languages | Communication Skills |
| Stakeholder Relationship Mgmt. | Ability to Make Decisions | Business Acumen | Openness, Open-minded | Cultural Awareness |
| Business Acumen | Business Acumen | Cultural Awareness | Teamwork_working in teams | Business Acumen |
| Teamwork_working in teams | Change Management | Networking | Change Management | Change Management |
| Cultural Awareness | Conflict Resolution | Learning Agility | Business Acumen | Learning Agility |
| | Languages | Customer Focus | Leadership | Leadership |
| | Creativity | Change Management | Stakeholder Relationship Mgmt. | Teamwork_working in teams |

Table 18: Top Current & Future Tacit Competences – by Years of Total Work Experience

Those in blue denote commonality across the ranges of experience

There are, however, some key differences. The competences of “Integrity” and “Prioritization” and “Cultural Awareness” only appears in group 1 and is not highly ranked in any of the other year groups. “Conflict resolution” is not important for the lower years’ work experience of groups 1 and 2, but is ranked in the other higher year categories. “Communication” was a key competency for all year groups apart from the first and the competences of “Integrity” and “Prioritization” and “Cultural Awareness” only appears in group 1.

***Discussion***

Again, there are a number of main observations to be made:

- In a similar way to the Explicit discussion above, those areas that demonstrate consistency across the different year categories, such as “Sustainability”, “Negotiation”, “Stakeholder Relationship Management”, “Business Acumen”, “Interpersonal Communication”, and “Strategic Thinking” , should form the basis of ongoing training programmes and development plans for PSM employees.
- Similarly, as these are core areas that are going to be required across a PSM career, the earliest possible start on these can be achieved through integration into the HE PSM curriculum.
- “Conflict Resolution” becoming more of a focus later in a PSM career, suggests that this is integrated into Masters level HE curricula and advanced level in-house training programmes.
- “Communication” is seen as a key area in the analysis above and also in section 3.1 (2nd ranked in Current Competences), but this is not reflected in the early stage of the PSM career and this could be an area that warrants a particular focus on its development in all education settings.

## 3.4 Comparison and Clustering of Current and Future Competences

### 3.4.1 Comparison of Competences – Current and Future

As indicated in section 3.2, the interviewees rated the future competences compared to the current ones. They especially emphasized new competences that will change or add to the current skill profile. Therefore, the different future priorities compared to the current ones should not be interpreted as a replacement of current competence requirements, but as a shift towards the support of new challenges in PSM. The key observations when comparing the current to future competences emphasized in the interviews are the following:

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- Strategic competences ("Strategic Thinking", "Strategic Sourcing") and communication skills are rated with high priority for both current and future PSM requirements.
- There is a shifting priority from competences that are traditionally connected to PSM, like "Negotiation", to knowledge and skills around automation and data management ("eProcurement Technology", "Automation" "Big Data Analytics", "Computer Literacy") as well as to "Sustainability". When comparing the Top 10 lists, "Negotiation" is the top 1 current competence, whereas "Sustainability" is the top 1 future competence. "Negotiation" is not part of the Top 10 future competences emphasized.
- "Holistic Supply Chain Thinking" moved up from position 17 in current to position 4 in future.
- The competences that were only mentioned for the future were 1) "Big Data Analytics", 2) "Cross-Functional Abilities & Knowledge – Sales", 3) "Remote_Virtual Working", 4) "Resilience" and 5) "Self Reliance".

### 3.4.2 Clustering of Competences

For an additional analysis, the coded competences were grouped thematically. The cluster categories are based on the skills required of world-class purchasers derived by Giunipero & Pearcy, 2000, which are Strategic, Process Management, Team, Decision-Making, Behavioural, Negotiation and Quantitative Skills.

Table 19 shows the mapping of the competences to these clusters by agreed decision of the project's IO2 core team. The grey ones are only current competences and the blue ones occurred only related to the future. An analysis was done combining the competence clusters with the industries of the case companies in order to detect similarities and noticeable differences.

| Strategic Skills | Process Management Skills | Team Skills | Decision-making Skills |
|---|---|---|---|
| Cost savings | Automation | Change Management | Ability to Make Decisions |
| Critical thinking | Basic knowledge on PSM role & processes | Effective questioning techniques | Deal with ambiguity |
| Financial acumen | Conflict Resolution | Employer Branding | Prioritization |
| Business Acumen | Cross-functional abilities & knowledge | Integrity | Results focus_driving for results |
| Innovation sourcing | • Engineering | Knowledge sharing | |
| Innovative sourcing approaches | • Finance | Leadership | |
| Product knowledge | • Logistics | Networking | |
| PSM Best Practice Intelligence_Scouting | • Manufacturing | Remote_Virtual Working | |
| Quality assurance | • Marketing | Stakeholder Relationship Management | |
| Risk management | • Quality (QHSE) | Teamwork_working in teams | |
| Strategic sourcing | • R&D | | |
| Strategic thinking | • Supply Chain | | |
| Supplier management | • Sales | | |
| Sustainability | Process optimisation | | |
| Holistic Supply Chain Thinking | Project Management | | |
| | Customer Focus | | |

| Behavioral Skills | Negotiation Skills | Quantitative Skills |
|---|---|---|
| Communication skills | Contract Management | Analytical skills |
| Creativity | Intellectual Property | Big Data Analytics |
| Cultural awareness | Negotiation | eProcurement Technology |
| Curiosity | | KPI Reporting Design |
| Humbleness | | Tools and Systems Implementation |
| Interpersonal Communication | | Computer Literacy |
| Languages | | |
| Learning agility | | |
| Mobility | | |
| Openness, Open-minded | | |
| Passion | | |
| Resilience | | |
| Self confidence | | |
| Self-reflection | | |
| Self reliance | | |
| Structured way of working | | |

Table 19: Competence Clusters (Grey: Only Current, Blue: Only Future).

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***Findings***

Overall, strategic, behavioural and process management skill are the top three clusters (as shown in Table 20), but there are some differences in the respective industries. The clusters Decision-making and Negotiation skills are the least mentioned ones.

| | Total |
|---|---|
| 1 : GiuniperoPearcyVII_BehaviouralSkills | 544 |
| 2 : GiuniperoPearcyVII_DecisionMakingSkills | |
| 3 : GiuniperoPearcyVII_NegotiationSkills | |
| 4 : GiuniperoPearcyVII_Process Management Skills | 517 |
| 5 : GiuniperoPearcyVII_QuantitativeSkills | |
| 6 : GiuniperoPearcyVII_TeamSkills | |
| 7 : GiuniperoPearcyVII_StrategicSkills | 930 |

Table 20: Competences Analysed by Clusters.

The Strategic skills cluster is by far the most frequently coded cluster in total and in all industries. Only in the Construction industry, where strategic, behavioural and process management skills are close together, it is not the sole number one category. Besides Construction, these three clusters are the top three in Automotive and Chemical as well. In Electronics, Food and Pharmaceutical industry, the cluster Team Skills is included in the top three instead of Process Management Skills.

Table 21 shows the discrepancies in Consulting as well as Social Services compared with the summarized figures. In Consulting, Process Management and Team Skills are number two and three after Strategic Skills, and in Social Services, Quantitative Skills are ranked higher than in other industries, whereas team skills are at the bottom of the ranking.

| | D : Consulting | H : Social Services |
|---|---|---|
| 1 : GiuniperoPearcyVII_BehaviouralSkills | 36 | 11 |
| 2 : GiuniperoPearcyVII_DecisionMakingSkills | 6 | 2 |
| 3 : GiuniperoPearcyVII_NegotiationSkills | 21 | 8 |
| 4 : GiuniperoPearcyVII_Process Management Skills | 78 | 21 |
| 5 : GiuniperoPearcyVII_QuantitativeSkills | 41 | 11 |
| 6 : GiuniperoPearcyVII_TeamSkills | 43 | 4 |
| 7 : GiuniperoPearcyVII_StrategicSkills | 113 | 34 |

Table 21: Competence Clusters in Consulting and Social Services.

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***Discussion***

Key observations:

- Strategic Skills is the top one cluster, mostly followed by behavioural and – depending on the industry – Process Management or Team Skills.
- In Consulting, Team Skills are ranked high instead of Behavioural Skills.
- In Social Services, Quantitative Skills are emphasized; Team Skills are not.

It is discovered that most competence clusters are of similar importance for most industry sectors. Especially Strategic Skills, Behavioural Skills and Process Management Skills are emphasized by the company representatives. This shows that long-term thinking is important as well as thinking in processes, improving them and possessing certain soft skills.

Team Skills are ranked high in summary, but surprisingly not in Social Services. A reason could be that such skills are taken for granted in these kinds of businesses. On the contrary, in Consulting Team Skills are expressed explicitly, as in consulting business it is essential to work efficiently in teams with direct colleagues and with partners from the customers' side.

Quantitative Skills seem to be more important for Social Services than for other businesses. It might be possible that they are less experienced in aspects like analytics and, therefore, see a gap between their abilities and the modern requirements, which leads to paying increased attention to Quantitative Skills.

# 4 Conclusions & Final Discussion: PSM Competences

This section synthesises all the findings and discussions from the analysis of current and future competences across the different demographic elements. Specific areas that practitioners and educators can prioritise, as well as case specific statements, are combined to develop a perspective on state-of-the-art PSM competences, as well as recommendations for the implementation of education and training in the PSM field.

## 4.1 Summarizing the Main Findings from the Analyses

The findings and discussions contained in this paper are wide ranging and cover a number of different areas of interest for practitioners and academics alike. In order to synthesise these diverse areas, the Table X1 summarises these along with a set of practical recommendations for training/education. As some observations rather hinted at further research needs than concrete implications, these were put into another Table X2 to summarize avenues for future research related to these specific analyses.

Without repeating all that is stated above, one central finding is that employees in PSM should possess both operational and basic skills for PSM like “Negotiation”, “Strategic Sourcing” or “Basic Knowledge on PSM Roles & Processes”, and also skills related to communication or relationship-oriented like “Interpersonal Communication”, “Communication Skills” or “Stakeholder Relationship Management”. This actually reflects the picture of PSM being the link or the agent between internal customers and their requirements (e.g. product requirements, financial requirements), with the responsibility as a function to source what the company needs in the most effective and efficient manner, alongside maintaining valuable relationships. Being the interface between internal and external stakeholders reinforces the needs for PSM practitioners to act as network agents. In this context, the high rankings of “Interpersonal Communication”, “Conflict Resolution”, “Communication Skills” can be explained. This actually underlines the PSM definition followed by project PERFECT: PSM comprises the management of external inputs – materials, services, capabilities and knowledge – that are required for building, running and maintaining the focal firm’s processes, while simultaneously managing the external and internal stakeholder network with an extended upstream supply network understanding. This is visualized in Figure 10 below.

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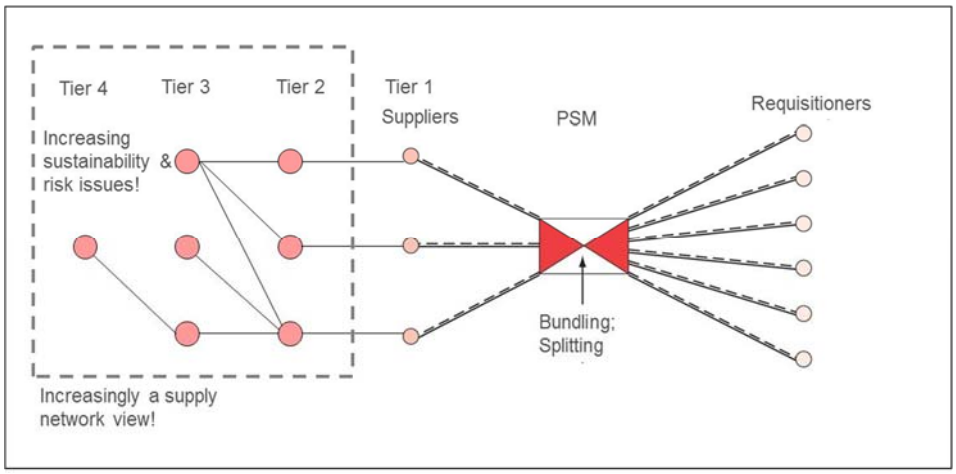


Figure 10: PSM's Context.

Adapted From: Kummer, Grün, & Jammernegg, 2013.

The framework shown in Table 22 directly takes up the structure shown in Figure 10 and can be used to further organize and cluster the competences brought into focus by the case studies. An initial analysis is provided in Table 23 and a more detailed view will be taken by IO4, when the PSM curriculum will be developed.

| Supply Chain Overarching | | |
|---|---|---|
| "Holistic Supply Chain Thinking"; "Sustainability"; "Stakeholder Relationship Management"; "Strategic Thinking"; "Interpersonal Communication", "Communication Skills"; "Conflict Resolution"; "eProcurement"; "Languages"; "Analytical Skills"; "Product Knowledge"; "Networking"; "Knowledge Sharing"; "Process Optimisation"; "Automation"; "Creativity"; "Customer Focus"; "Leadership"; "Cultural Awareness"; "Passion"; "Integrity"; "Openness" | | |
| **External Network** | **PSM Basics** | **Internal Network** |
| "Supplier Management" | "Basic Knowledge on PSM Role & Processes"; "Negotiation"; "Business Acumen"; "Strategic Sourcing"; "Innovation Sourcing" | "Cross-Functional Abilities & Knowledge" |
| | | |

Table 22: Highlighting the Competences Mentioned in the Main Findings.

(Blue=Highlighted (only) by Particular sub Analyses, e.g. by Industry.)

As pointed out in the implications, the need to educate and train such competences in an integrated, combined way holds particular potential. Also, beyond the mainstream competences emphasized across the different analyses (e.g. "Negotiation"), the differentiated analyses were able to carve out some additional competences to inspire the future PSM curricula, such as "Integrity" and "Passion", particularly highlighted by the start-up in the sample. Moreover, the smaller companies emphasized "Networking" and "Knowledge Sharing", something that particularly for working in SMEs might be valuable competences for prospective employees.

The explicit versus tacit competences analyses underlined the need to cover both. When going further with the curriculum development, this demonstrates the importance of finding an appropriate balance between ways of conveying explicit knowledge (e.g. via course books, either traditional or online) and/or tacit knowledge (e.g. via role-plays, teamwork, reflection sessions/mentoring/coaching etc.).

Considering how and where to educate such competences, the "Languages" topic underlined the opportunity to convey a future curriculum in an international, ideally pan-European way: Ideally having the students move between countries via the ERASMUS program and ideally even integrating (international) internships into the curriculum by design.

Another highlighted competence via the more detailed analyses was "Product Knowledge", which was particularly emphasized by both the automotive industry and, interestingly, by the supplier interviewees (i.e. the key account managers). Again, it has to be reiterated that this is an interesting aspect for both manufacturing as well as service companies alike. "Product Knowledge" was especially mentioned in relationship with "Holistic Supply Chain Thinking" and "Customer Focus". The quote

**"It's a big challenge understanding how you write your strategies. So which is hugely complex and you say it in this source to contract and category strategy that still be a really small portion I think that is hugely underestimated in this overview because, strategy management or knowing what it is that you buy, knowing how the market works, knowing what your stakeholder wants, making that connection and looking to the future, that is I would say for an effective procurement manager is essential." (Interviewee, FOOD1)**

shown below illustrates that interconnectedness of these competences.

And the following illustrate the emphasis of "Product Knowledge" in that context.

**"We need people who know a lot and have a fundamental knowledge of various topics. Talk to the people who is on the one side the requester who has a special need and understands the requester. And also to talk to the markets and the suppliers and understand what they are offering. Therefore I need a basic knowledge in the stuff they are buying." (Interviewee, CHEM2)**

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**"And what every buyer really has to do with a snap is how the cost structure of a component is? That is basics, if you study economic engineering or business administration or economics. What is really there in the different regions? How important is added value? What is added value depending on? So the cost structure if you are waken up during the night you should just wake up and tell the cost structure of your supplier base. So this is nothing new but we have to revitalize it." (Interviewee, AUTO1)**

The following quote highlights how it is about the right mix of competences.

**"The DNA of the people has to change, of course the fundament needs to be there, we need the right skilful people, the right technical procurement skills, but the skills around being collaborative, innovative, being able to empower people and really drive people to go more for their ideas is becoming more and more crucial." (Interviewee, PHARM1)**

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| Key finding | Section | Recommendation for implementation |
|---|---|---|
| **CURRENT COMPETENCES** | | |
| A mix of competence areas is required to be successful as a buyer or manager in PSM | 3.1.1 | Education/Training should include both operational or basic skills for PSM like “Negotiation”, “Strategic Sourcing” or “Basic Knowledge on PSM Roles & Processes”, and secondly, skills related to communication or relationship-oriented like “Interpersonal Communication”, “Communication Skills” or “Stakeholder Relationship Management”. |
| In a number of instances, a link between these competence areas was stressed (like “Good negotiation requires solid communication skills”) | 3.1.1 | How to combine education/training for a variety of competences simultaneously should be considered. Further, these competence areas need to be taught using different training methods (classroom or web-based learning of PSM basics; social learning of interpersonal communication skills) |
| Firstly, both tacit and explicit areas are important and a mixed approach is needed in a number of different areas. | 3.3.1 | This shows that those involved in the education and recruitment of both new and existing PSM staff need to be mindful that these tacit competences need to be factored into decision making in these areas of activity. Although explicit competences can be imparted through formalised education methods, tacit areas often need different methods, such as mentoring and practice-based learning to be developed. Therefore, such competences should not be left out of training programmes as doing so will miss key areas of necessary competence development if they do so. When considering the design of any PSM relevant curriculum, an over-reliance on traditional methods of teaching (such as lectures) may mean that tacit areas are overlooked and not imparted to students in the most effective manner. |
| Tacit knowledge is more difficult to share than explicit knowledge, as it is less codifiable, being more difficult to articulate. Therefore, knowledge sharing between individuals and within a function needs to reflect the high importance of tacit PSM competences | 3.3.1 | This means that aspects of socialisation (as per Nonaka & Takeuchi, 1996) such as mentoring and buddying need to be integrated into work practices to ensure that tacit knowledge can be articulated and shared in the most effective manner. Further, although Standard Operating Procedures (SOPs) and manuals serve a useful purpose, they do not allow for a full sharing of tacit knowledge and therefore these cannot be seen as the end point of training, but are rather a start point. |
| Although there was a close match between the HR/Training Representative and specific PSM roles, the HR/Training Representative did not identify the “eProcurement” competence as being of importance, yet the others did. | 3.3.3 | Any in house training programmes need to ensure that this is adequately represented and that it does not get missed out. The increasing focus on digitisation in most aspects of modern organisational practices means that PSM as a function needs to highlight the importance of eProcurement in the wider organisational context or it risks the area not being seen as a priority. |

| | | |
|---|---|---|
| "Supplier Management" was not listed in the Management role, but was specifically in the Operative. | 3.3.3 | This is not necessarily surprising, as it is more of a day-to-day task of sourcers to focus on direct dealings with the suppliers of the organisation. However, it is suggested that those in a Management role, whilst, of course, focusing on "Leadership" etc., that the key aspect of "Supplier Management" is not overlooked. Continued dealings with suppliers would ensure that those in Management roles maintain a close link to the supply market and current and future challenges that may arise. |
| There is a mismatch between "Languages" contained in the Operative, but not in the Management or HR/Training Representative lists. | 3.3.4 | This suggests that those in the Management role may be more experienced and therefore have had chance to develop their "Languages" skills more fully and due to their more senior level may be dealing with inter-organisational counterparts who have similar levels of "Languages" skills. This may not be the case for those in Operative roles, who are more likely to be less experienced and more likely to be dealing with the operational level of suppliers and may see "Languages" as a more immediate challenge. This highlights the need for the integration of schemes such as the ERASMUS Mobility Programme into HE curricula and also that organisations consider the use of internships or exchange programmes with PSM parts of their organisation in different countries or possibly supplier exchange programmes. |
| There is a lack of emphasis for "Analytical Skills" in the 3-5 years of total work experience category. | 3.3.5 | This suggests that this is an area that needs to be focused on in HE curricula and also through in-house training programmes, as it is deemed highly important in all the other categories (apart from the 35 years and over category). |
| "Holistic Supply Chain Thinking", "Basic Knowledge on PSM Role & Processes" and "Cross-Functional Abilities & Knowledge" are consistently emphasized as explicit competences across all ranges of work experience. | 3.3.5 | These need to be firmly embedded in HE curricula to ensure that these areas are reflected in the courses that are being offered. Similarly, these areas can be reflected in early stage in-house training of organisations and that also these areas are maintained throughout an individual's career. |
| "Sustainability", "Negotiation", "Stakeholder Relationship Management", "Business Acumen", "Interpersonal Communication", and "Strategic Thinking" are consistently emphasized as tacit competences across all ranges of work experience. | 3.3.6 | These should form the basis of ongoing training programmes and development plans for PSM employees. Similarly, as these are core areas that are going to be required across a PSM career, the earliest possible start on these can be achieved through integration into the HE PSM curriculum. |
| "Conflict resolution" becoming more of a focus later in a PSM career. | 3.3.6 | This suggests that this is integrated into Masters level HE curricula and advanced level in-house training programmes. |

| | | |
|---|---|---|
| "Communication" is seen as a key area (…), but this is not reflected in the early stage of the PSM career. | 3.3.6 | This could be an area that warrants a particular focus on its development in all education settings. |
| Food and Electronics are the two industries that particularly emphasized the "Holistic Supply Chain Thinking". | 3.1.3 | "Holistic Supply Chain Thinking" could be brought into the curriculum by taking very complex industry examples to train the ability to identify the network stakeholders and develop a scenario planning capability |
| "Product Knowledge" was only emphasized at Automotive, Chemical and Electronics, with actually no mentions at Construction and Social Services. | 3.1.3 | For the curriculum, the goal is to prepare students for a broad employer base, so it should feature both product and service exposure. Regarding "Product Knowledge" the project team can consider how to make this something covering both physical and service goods, especially considering that with increasing digitisation physical components of a product might be substituted by a service (e.g. download instead of transport already common today). Students might be encouraged to think in "features" rather than components, learning creative techniques how to engage in fruitful discussions with new product development. |
| Although "Strategic Thinking" was emphasized by 8/12 firms, it was not emphasized by CHEM1, CONSU1, SOCSER, TECH1 and TECH2 (even with no mentions at TECH1). | 3.1.3 | For the curriculum, "Strategic Thinking" is an important competence to keep in mind and holds potential to be jointly developed together with other competences, such as the aforementioned "Holistic Supply Chain Thinking". |
| From the start-up involved, "Knowledge Sharing" and "Networking" were emphasized, rather unique across the sample. | 3.1.3 | For the curriculum, this is a fruitful input, as due to the company size distribution in European countries, many students in Europe are likely to be employed by SMEs after their studies, rather than in high-resource global MNCs. How to be resourceful by creating a network might be subject in class, but also how to give them exposure to develop a network (e.g. by mandatory internships, a mentorship program, program alumni community etc.) are thoughts to be further considered. This could be elaborated both on an organizational level (basics of knowledge management in an organization/department) as well as personal level (basics of how to build up and maintain a personal network, e.g. also including reference to social media). |
| "Interpersonal Communication", "Communication Skills", "Negotiation", "Sustainability" and "Analytical Skills" were equally important for both, key account managers and PSM professionals. | 3.1.4 | This provides support from the counterparts point of view that these competences are particularly relevant. |

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| | | |
|---|---|---|
| Key account managers attach much more importance to “Product Knowledge” and “Holistic Supply Chain Thinking” than PSM professionals do. | 3.1.4 | Implications for PSM curriculum and also company trainings: Provide PSM students and PSM personnel with a broader view on business processes and product development. Although it has to be taken into consideration that in some companies it is part of the negotiation strategy that buyers should not have a very deep understanding of the suppliers’ products and needs, but focus on cost targets of their company only. In this context, some of the key account managers also mentioned the importance of long-term relationships with PSM personnel, and they criticized when buyers were replaced very often. |
| Competences emphasized by interviewees with cross-functional experience were “Communication Skills”, “Process Optimization”, “Product Knowledge” and “Strategic Sourcing”. | 3.1.5 | As “Cross-Functional Abilities & Knowledge” in any case have appeared as an emphasized competence throughout the IO2 analysis, to bring this topic into the curriculum is seen as very fruitful. How to train it in class (e.g. by role plays in-class and/or computer-aided business simulations) should be further analysed in coming work packages of the PERFECT project. |
| **FUTURE COMPETENCES** | | |
| “Sustainability” and “Digitisation” were indeed mentioned as the main future impact areas for procurement. | 3.2.1 | A breakdown of knowledge and skills for digitisation is needed to prepare students adequately for this future development. Which competences stand for “Automation” or “Big data analytics” in the PSM context?<br>A breakdown of knowledge and skills for sustainability is needed to prepare students adequately for this future development. Which competences stand for “Sustainability” in PSM?<br>The correlation with competences that also were given a high priority in future PSM, like “Holistic Supply Chain Thinking” or “Strategic Thinking”, might give an indication on the skills model further defining “Sustainability”.<br>When competences are defined for those two areas, appropriate teaching methods need to be developed.<br>This is also valid for corporate trainings – how to train PSM personnel or maybe even re-educate people that need to change their jobs? |
| “Communication Skills” and “Negotiation” were also emphasized as future competences. | 3.2.1 | The profile that students need to be prepared for gets a broader scope and includes a big part of tacit knowledge, but also parts of explicit skills especially when talking about digitisation. |
| More explicit than tacit competences are emphasized for the future. | 3.3.1 & 3.3.2 | Though the shift in emphasis between explicit and tacit competences may partly be explained by how much easier it is to articulate knowledge of an explicit dimension, there is |

| | | |
|---|---|---|
| | | an opportunity for explicit based training (both in-house and in education settings) to be developed and delivered. |
| The emphasis on "Creativity" and "Cross-Functional Abilities & Knowledge" seems to particularly relate to those industries that are more service-dominated (construction and social services). How to create value across different functions seems to be emphasized. | 3.2.3 | In light of that, the earlier mentioned physical versus service product basics and cross-functional approaches are re-emphasized also for the future. |
| On industry level, consulting was the only industry to emphasize "Customer Focus", "Innovation Sourcing" and "Leadership" most often. | 3.2.3 | Regarding "Customer Focus" and "Innovation Focus": This reemphasized the PERFECT project's assumption that PSM has the role of a boundary-spanner not only internally (cross-functionally) but also externally. A consideration that can be combined with several of the aforementioned competences (e.g. "Holistic Supply Chain Thinking").<br>Regarding "Leadership": This is an interesting consideration for a curriculum on two levels. Linked towards "Stakeholder Relationship Management" it might be something to teach in terms of how to ensure required leadership (by your superiors/management) to back initiatives/projects. On the other hand it also appeals to the individual level, i.e. how to develop (at least first) leadership competence during a curriculum. Toward the latter the use of teamwork and/or applied projects should be further considered. |
| "Cultural Awareness" was highlighted by the automotive industry. | 3.2.3 | For the curriculum development, this emphasizes how the "Cultural Awareness" should be raised, e.g. by covering basics of cross-cultural management somewhere in the curriculum (if not covered at the institution, yet). Also, practically, this could be fostered by mixing teams of international students, having mandatory international internships, and, for example, integrating (brief) reflective sessions into the lectures (e.g. as part of overall teambuilding and project management considerations) for cross-functional/cross-cultural sourcing endeavours. |
| "Passion", "Integrity" and "Negotiation" are all driven by TECH2 (not TECH1), the start-up. | 3.2.3 | For the curriculum, this brings up the thought to emphasize such competences, particularly for the ability to gain a foothold in smaller companies, although surely these are not relegated to just apply in such a context. Rather they are emphasized by a firm that has to strongly rely on a smaller number of people, maybe enabling it to spell out some competences that are deemed critical in a more pronounced way than in a large firm with a very broad employee base. "Passion" and "Integrity" need to be analysed a bit further in terms of how "trainable" they are (whereas "Negotiation" is part of many curricula even |

| | | |
|---|---|---|
| | | today). Nevertheless, as part of teamwork, role-plays or simulations, such traits could be explicitly part of project/assignment instructions and evaluations and also be part of (brief) reflective sessions. |
| Stronger emphasis of "Openness", "Process Optimization", "Strategic Sourcing" and "Supplier Management" of interviewees with cross-functional experience | 3.2.5 | Promoting "Openness" could be fostered by covering a rather broad range of potential options how to approach a certain problem in a course and/or actually change the scenario during the course by unforeseen events (such as a main stakeholder in another function leaving the firm, or a new IT manager proposing a new automation software, just when the student team has figured out the manual process…) in order to increase tolerance for dynamic changes. "Process Optimization" could either be combined with it, but not necessarily, as it could also be grouped with learning about certain techniques related to it when covering the basic PSM processes (e.g. introducing process flow analysis, Ishikawa/Fishbone Diagrams, Pareto Analysis etc.). |
| Those without cross-functional experience still highlighted "Holistic Supply Chain Thinking" and "Stakeholder Relationship Management" explicitly. | 3.2.5 | When introducing these topics (e.g. the ones emphasized as future competences by those without and those with cross-functional experience), they could directly be set into an intra-company and inter-company stakeholder network context. For example, to students hearing about it for the first time "Supplier Management" may sound like a clear PSM activity, to be done by PSM. But how to analyse the (often multiple) interfaces of a company to suppliers (e.g. by Quality departments, Marketing & Sales and/or R&D) and how to achieve 'one face to the supplier' could actually be covered as a starting point to start analysing and teaching the subject, rather than potentially more of a final comment of how things can deviate from the textbooks in practice. |
| The key findings of the clusters analysis of the competences show that the focus is on Strategic Skills across all industries. | 3.4.2 | Strategic Skills like for example "Strategic Thinking", "Critical Thinking", "Holistic Supply Chain Thinking" and "Sustainability" are ranked as the most important group of competences. Such competences with a long-term focus are essential in PSM. They need to be taught as a combination of explicit and tacit knowledge by learning methods focusing on strategic and holistic thinking, such as case studies and scenario analysis. |

Table 23: Main Findings and Implications.

| Observation | Section | Suggestion for future research |
|---|---|---|
| **CURRENT COMPETENCES** | | |
| Social businesses prioritized basic, operational and technical PSM knowledge areas ("Basic PSM Knowledge", "Contract Management", "Product Knowledge", "Quality Assurance", "Risk Management") even higher than traditional businesses did. | 3.1.2 | A possible explanation is that people working in social businesses lack basic PSM skills more than traditional businesses; communication and interpersonal skills are more self-evident/ common to them. This warrants further research. |
| **FUTURE COMPETENCES** | | |
| "Sustainability" was highly prioritized by social businesses as we as by traditional businesses. However, "Automation", "Computer Literacy" or "Big data analytics", being very important for traditional businesses, did not find the same recognition when talking to PSM professionals from social businesses. | 3.2.2 | The researchers discussed various reasons for this difference in the rating. At first, skills in the context of digitisation like "Automation" might not that important for social businesses with a certain product or service, e.g. in the social welfare sector. Second, and this might be the much more valid interpretation, social businesses in general very often are smaller, younger companies that probably already anticipated digitisation aspects from their inception/founding, and therefore did not explicitly define this as a future challenge. Competences related to digitisation might be more challenging for established, bigger companies. This might be an area of future research, having a closer look and a broader empirical database. It could also be investigated if there is a correspondence to start-ups. |

Table 24: Future Research Suggestions Based on Particular sub Analyses.

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## 4.2 Competences in the Light of Future Trends and Developments

"Sustainability" and "Digitisation" were confirmed by the numbers of codings and the prioritization of the interviewees as the main future impact areas for procurement. For "Digitisation", some knowledge areas and competences were specified (mainly analytics), but uncertainty on the character and impact of "Digitisation" on PSM and required competences was expressed in the interviews.

For "Sustainability", precise knowledge areas and competences were not specified in the interviews. Therefore, as digitisation, this might be an area for further investigation and research. Besides, the correlation with competences that also were given a high priority in future PSM, like "Holistic Supply Chain Thinking" or "Strategic Thinking", might give an indication on the skills model further defining "Sustainability".

With a particular focus on future developments in PSM is that roles and job profiles that cover mainly PSM operational tasks (in Source-to-contract, but especially in purchase-to-pay) are going to disappear, therefore companies are advised to qualify personnel accordingly to facilitate their transfer to other jobs with different requirements.

When considering the future development here, the question arises how this will further develop. In their recent study on various service providers, the Everest Group (2016) suggested that there are different levels of "judgement" required in various PSM processes. The more we look at the (transaction-intensive, but easy to codify) Purchase-to-Pay transactional processes, the less judgement is required, lending itself to automation. To anticipate such a trend and re-calibrate one's training curricula to develop the competences needed rather for the Source-to-Contract process seems of increasing importance.

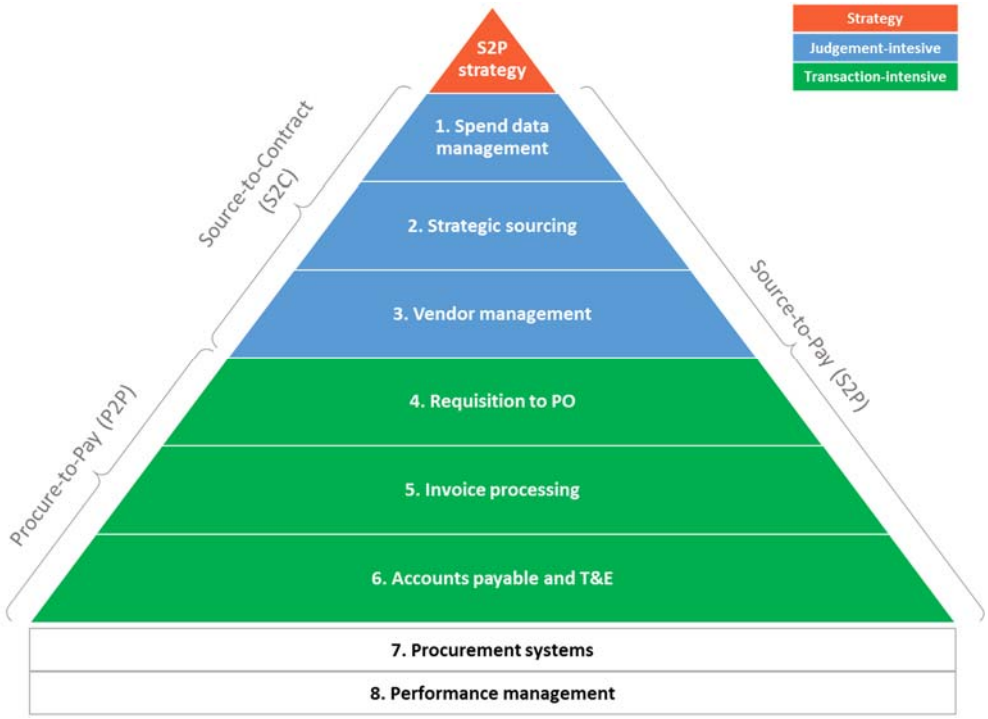


Figure 11: Differentiation of PSM Processes by (Human) Judgement Needed.
Adapted From: Everest Group, 2016.

While the activities in the green part of Figure 11 become increasingly automated, the personnel would have to shift in into the blue and orange processes in order to add (increased) value. This goes hand in hand with having to raise one's level of competences up to a different profile of competences. In one of the interviews with the responsible person for the complete transactional PSM process shared service centre this was illustrated as shown in the quote below.

**"We do not have a wide range of opportunities to develop people within operational procurement. What we try to do is to identify the people who have potential for strategic procurement, and because our target is to increase automation rate this means the number of people working for operational procurement will shrink in the future, and the number of strategic or technical purchasers will increase. At least they will not shrink. We really try to identify people with potential for strategic or tactical additions, and make the way for them so they can change to the strategic team. […] The change in my role is more about developing people and defining roles. We have roles and now we are trying to go further to find out which person could leave operational procurement when the automation rate is growing. Obviously I don't need so many people as I had when we started. " (Interviewee, CHEM2)**

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However, even within areas such as the Source-to-Contract process, for the future the critical question is how technology will change, for example, the way in which PSM employees interact with their internal and external partners. With increasing use of social media, and even virtual and augmented reality platforms, the areas with currently established ways of human interaction, e.g. stakeholder relationship management, will be affected, too. This development has already started in the field of negotiation, which has moved from being primarily and exclusively face-to-face to an increasing use of e-solutions. The below quotes illustrate that point.

**"I think the negotiation is less and less important, because we don´t negotiate that much anymore. If you do a year auction you don´t even negotiate the price with the supplier for classical negotiation, we simply put the system in place and you run the e-auction and what comes out of it is the results of it. So that is one thing that is going to be less important about negotiation. What is also going to be less import in the future is, I was just about to say interpersonal skills, but they are not, because you need a way of engaging your supplier while you are at the same time using e-tools. It is just a different challenge that is coming, it is not less important but different." (Interviewee, FOOD1)**

**"[…] introducing digitalization 4.0 […], where we are looking at improving and setting up new systems and new forms of collaboration with our suppliers. " (Interviewee, CHEM2)**

**"From my point of view the administrative tasks so for instance to do the basic analysis of the quotation or cost comparison yeah I think this can also in future be done by our servers and computers so to get quotations automatically to prepare them automatically to prepare the decision out of this and also to decide and to send the contract to our suppliers automatically without any involvement of the normal purchaser. Then purchasing can really focus on strategic purchasing and therefore I think the administrative tasks will become less important in the future." (Interviewee, AUTO1)**

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**"[…] we developed for example virtual category or supply rooms where you have the possibility to interact with suppliers, your business and your procurement departments globally very easily, exchange ideas, have discussions, store information on platforms in a very efficient way generating value which is just normal for the new people, but just horrible for some of the older people. " (Interviewee, CONSU1)**

# 5 Next Steps in the PERFECT Project

The research covered in this White Paper is based on the first five research questions of IO2 of Project PERFECT and which has addressed the breadth of competences required by PSM practitioners in both their current roles and what they envisage the future will hold. In addition, these current and future competences have been differentiated into tacit and explicit areas and further analysed according to a variety of demographic characteristics, such as job role, total years worked and cross functional experience. The team working on IO2 will be developing this area of research, using the data collected in the interviews, to look at how individuals make use of this knowledge to make decisions (RQ6), how organisations share knowledge (RQ7), how individual and organisational performance can be supported by appropriate competences/knowledge (RQ8), and how individual and organizational performance can be supported by appropriate competences/knowledge (RQ9). In addition, the structure of the project ensures that there are clear linkages between the different IOs and the results of the IO2 analysis will be used by the teams working on IO3 and IO4, which are discussed in more detail below.

## 5.1 Way Forward to Intellectual Outputs 3 and 4

As mentioned earlier in the methodology, one of the aims of IO2 was to create a "long list" of (current and future) competences that can be used by the next IO (IO3) to further investigate in terms of relative importance by means of a pan-European survey. In total 70 competences could be identified by IO2.

IO4 looks to develop an empirically supported PSM HE curriculum and will use some of the data collected in IO2 to rigorously inform the development of an Undergraduate and Postgraduate

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Programme Specification, which will include a rationale for the course, competences and skills to be developed, a structure and content of individual modules, teaching and learning approaches and assessment techniques. IO2 has provided a robust set of competences that need to be covered in any PSM curriculum, both now and in the future, which will provide the basis of what subject areas need to be covered. In addition, by differentiating between tacit and explicit skills allows for a deeper understanding of how these competences can be best taught and developed in students. By attributing competences to different job roles and work experience levels will also allow for a distinction to be made between an undergraduate and postgraduate curriculum.

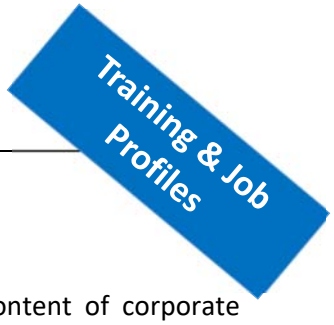
As mentioned earlier, as one particularly useful insight for IO4 (and also IO6), is to make use of practice and problem based learning (PPBL) to ensure that the students develop skills and competences that will be relevant to them in industry and also to develop more tacit skills such as communication. An example of such a PPBL approach is to establish a problem based on a specific case (or real-life) situation and then structure the ensuing teaching material around supporting the students in generating potential solutions for the situation. For example, for students hearing about “Supplier Management” for the first time, may mean that they see this as clearly a PSM activity, to be done by PSM alone. But how to analyse the (often multiple) interfaces of a company to suppliers (e.g. by Quality departments, Marketing & Sales and/or R&D) and how to achieve “one face to the supplier” could actually be covered at an early point in the teaching, rather than potentially more of a final comment of how things can deviate from the textbooks in practice.

## 5.2 Outlook on Additional Analyses

As mentioned in the introduction of this whitepaper, this report centres on the results of research questions (RQs) 1-5. Over the following weeks and months, the data will be further analysed to gain additional insights on some of the aspects highlighted here, plus the additional research questions 5-9 that were shown in Figure 5. One of such additional insights areas is to differentiate the mentioned competences further by job role, in a more granular manner. Nevertheless, it has to be mentioned that the overall intended result of project PERFECT is a curriculum that prepares students rather generally to enter a PSM position, not already centred on any particular role within PSM.

# Additional Features

## Further Insights on Training and Job Profiles




How do companies qualify PSM personnel? The management, design and content of corporate training programs gives an indication how knowledge is managed in the company, and which competences are regarded as being relevant for PSM jobs. Therefore, one section of the interview guide covered the training organisation and program that companies established for PSM. Questions in this section were answered either by specialised training or HR managers (four interviewees in total) or, if this role did not exist, either by a person that indicated that training was part of his/her responsibility, or the most senior interview partner of a company. The researchers asked about roles, job profiles and job descriptions as well as about training organisation for PSM.

This feature provides a summary on best practices and the most relevant findings in terms of corporate PSM training organisation and responsibilities, pre-defined roles and job descriptions, the content of training programs as well as formats and methods. It concludes with an outlook on future training requirements and challenges.

**Responsibility for PSM trainings**

The responsibility for PSM trainings within corporate structures ("How is PSM training embedded in your company?") certainly varies, above all depending on the size of a company, but also on the maturity of the purchasing organisation as such. Best practices in companies show the following elements:

- PSM specific training organisations/ training managers: Located within the PSM organisation, either dedicated training academy teams or individual training managers are responsible for all trainings in PSM. They are the interface to the company's human resources or training department. In most cases, the training teams or training managers report to a staff or strategic sub department within the overall PSM department.
- In many companies with a broad international scope and organisation, a centralized training manager coordinates PSM education in cooperation with local hubs.

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- The PSM specific training organisation and program contributes to a corporate curriculum that itself addresses general training needs like leadership, languages, communication.
- Internal and/ or external trainers usually conduct the trainings. More and more, companies run train-the-trainer programs to qualify internal trainers and minimize the number of external trainers required.
- Some PSM organisations cooperate with external training providers for certain trainings, either to conduct web-based trainings or quite often regarding trainings on soft skills (e.g. leadership, communication) or management tools (e.g. project management).
- Some companies completely outsourced PSM training to an external provider, using training platforms, customized to the individual needs of the company.

**Roles & Job profiles**

Nearly all companies have established job roles for PSM, reflecting the usual process steps in the source-to-contract and the Purchase-to-Pay process.

Best practice PSM training concepts are based on clearly defined roles, tasks that apply to the roles and competences that are required to successfully perform the tasks. In addition, some companies also defined PSM skill levels. A framework of courses and related learning targets builds a standardized qualification plan. Self-assessments are used to evaluate the individual training needs compared to a certain job profile. Therefore, individual training plans can be derived, using pre-defined modules for job roles, tasks and management levels.

The following PSM profiles and roles were defined in best practices:

- Spend/Market Analysts, Buyers (junior/ senior), Category/ Commodity Managers
- Line buyers or managers v. project buyers or managers
- Roles reflecting the Source-to-Contract and Purchase-to-Pay process steps

In addition, many training concepts take other role specifications into consideration:

- Managerial v. operative
- Local responsibility v. global responsibility
- Experts v. managers

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All the best practices had a strong focus on on-boarding trainings for new employees (e.g. PSM "crash courses", "PSM driver's licence"). Interestingly, some companies explicitly do not customize the on-boarding training for a dedicated job role, but implement the same training for all new employees. The aim is to provide all individuals, whether indirect or direct purchasing, strategic function or controlling function, with the same basic PSM background and therefore initiate networking within the PSM organisation.

**Training programs**

PSM organisations that offer a training program based on job profiles and key competences provide a comparable set of training courses. All companies in this study conducted negotiation trainings for buyers. Other courses cover PSM basic knowledge (e.g. PSM processes and tools for new employees, supplier management, strategic sourcing) and compliance and sustainability (code of conduct basics, law, sustainable sourcing, supplier auditing). Team and leadership skills as well as intercultural trainings were part of some PSM training plans, but in most cases are covered by a corporate training module or academy program, or sometimes outsourced to an external provider.

Best practice general training modules and topics:

- Basics: Negotiation, PSM processes, PSM tools and systems, procurement strategy (e.g. strategy setting and planning), category management (e.g. category strategy, strategic supplier management), strategic sourcing (e.g. spend and market analysis), managing supplier relationships (e.g. measuring supplier performance, establishing relationships), managing procurement (e.g. selling procurement to the business, outsourcing), contract management,
- Compliance & Sustainability: Ethics in business relationships, code of conduct training, PSM – related laws and regulations, responsible sourcing,
- Other: Purchasing quality, supplier development, project management, value contribution, innovation (generate new ideas), foundations of finance,
- Topics usually covered by courses within a company-wide training program: Leadership, intercultural trainings, languages, project management.

In addition to general PSM training courses, companies offer specific trainings depending on roles and targets. For example, there are partially different programs for direct vs. indirect procurement, technical buyers and staff functions like process development.

Some training programs are split in mandatory and optional courses.

Interestingly, PSM training concepts that were discussed in the interviews tend to focus on globally standardized roles and modules, and, although discussed, local adaptations were not mentioned to be very relevant for the training programs as such.

**Training formats**

Most companies indicated that they are moving from massive classroom trainings to forms of blended learning, combining web-based self-study tools with classroom events. Also, especially for new employees, informal 'training-on-the-job' opportunities like mentoring, so-called buddies, or meetings with top managers are part of the on-boarding program. Looking back at the description of tacit and explicit knowledge areas in section 3.3 of the IO2 white paper document, these informal methods were said to be most effective to transfer tacit knowledge to new employees.

In contrary to informal trainings transferring potentially the tacit knowledge, web-based learning solutions are used for either PSM basics or compliance related topics. Some companies rely on standardized eLearning modules provided by external providers.

The following training formats are applied in PSM training programs:

- Formal learning: Online Learning, classroom trainings, webcasts, webinars, blended learning (online & classroom combined),
- Informal learning (Coaching, networking, mentoring, job rotations),
- Workplace learning (Wikis, web resources, blogs),
- Project assignments,
- Networking events.

**Outlook: Future requirements for PSM training in organisations**

When comparing the best practice training concepts and organisations with the findings of the case study regarding required competences and knowledge in PSM, the following observations are to be made:

- Most of the interviewees indicated a shifting priority from competences that are traditionally connected to PSM, like "Negotiation", to knowledge and skills around automation and data management ("eProcurement Technology", "Automation" "Big Data Analytics", "Computer

Literacy") as well as to "Sustainability". Nevertheless, current training programs still seem to focus on the more traditional knowledge areas (e.g. "Negotiation"). Training formats that covered "Big Data Analysis" or "Automation" seem to be rather rare. Qualification for "Sustainability" mostly covers compliance aspects.

  - Digitisation: The qualification of PSM employees for digitisation requirements, like dealing with big data or automation processes could be an area of further development of the current training programs. Even when still facing some kind of uncertainty about the actual requirements and implications for PSM, PSM training managers might urgently need to evaluate these new qualification needs.
  - Sustainability: Trainings for sustainability in most cases focused on compliance (e.g. code of conduct adherence), quite often provide by mandatory web-based trainings. Facing the future impact of sustainability aspects on several PSM roles, there might be a benefit for companies to focus the qualification more on a general understanding of the basics, on stakeholder management, holistic supply chain thinking, on active sustainability risk analyses and on the ability to search for business opportunities.

- Interpersonal communication skills were clearly identified as a key competence for successfully working in a PSM organisation – today and in future. Despite that, trainings on interpersonal communication were rarely mentioned to be part of the PSM program (other than in negotiation trainings). With this competence area as one of the top in current and future, there might be potential in future to run specific courses that cover the role of PSM being a networker/interface to internal and external customers, suppliers and other stakeholders.

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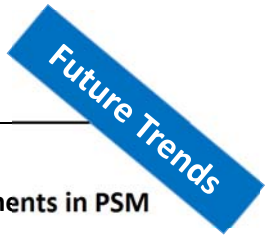


**Analysed Competences in the Light of other Studies about Trends & Future Requirements in PSM**

Business environments constantly underlie changes that organisations have to face and develop accordingly in order not to fall behind in times fast developments, where fast transformation is indispensable. Purchasing and supply management (PSM) organisations and their activities, tasks and orientation are especially affected by many current trends and developments causing new requirements. New and flexible profiles and ways of thinking will be needed in order to cope with the challenges in the long run. PSM as an enterprise function has the opportunity to increase its importance by focusing on the newly upcoming tasks and paying attention to strategic approaches.

To stay constantly informed, the PERFECT project team always pays attention to other current studies, which might contain interesting insights and give hints for the curriculum development as well. In this section, the content of several studies is summarised and then compared to the IO2 findings of competences needed in the future.

**Summary of several Studies and Surveys**

In a recent study by GEP five megatrends (Kushner, 2015), which will significantly shape the procurement function in the future, are identified. First, procurement units within organizations will have the possibility to focus on analyses and cross-functional work in order to improve decision models, because there will be an increase in outsourcing and automation of basic procurement functions. Furthermore, global sourcing will facilitate and accelerate the realisation of savings, but also complicate processes and requires cross-cultural awareness. Outsourcing will enable building key supplier relationships rather focusing on revenue generation than on cost minimization. In addition, the establishment of a Vendor Management Office (VMO), concerned with contractual and administrative tasks, can become increasingly popular. Finally, to be able to mitigate risks and manage supply contracts and relationships, it is probably advantageous to centralize the purchasing structure.

A study by A.T. Kearney from 2014 talks about 10 megatrends effecting procurement. It mentions training, transparency digitalisation, controlling, risk management and collaborative optimization as some of the key aspects for PSM's future (Scharlach et al., 2014). Ernst & Young picks out 10 change dimensions as central themes for PSM affecting stability versus disruption: Risk, sustainability, globalisation, integration, finance, innovation, collaboration, transparency, analytics and people

(Ernst & Young, 2015. In general, further studies that are not analysed here separately deal with the trends and future requirements shortly summarised in the next sentences. The references can be found in the literature list for a more detailed view.

Focusing on the staff and intrapersonal abilities, adaptability is one of the most important aspects. It is essential that professionals in a purchasing position are able to be open-minded and adaptable to whatever obstacles they encounter in their job. These challenges can result from a variety of developments, including organizational changes, technological advances, and changes in leadership, market changes, or process improvements. During times of change, a PSM professional should remain flexible and continue being an effective employee.

Closely related to this topic are new technologies and practices. While it is important to be able to react to these new improvements, it is also essential to be educated on these changes. The developments include the utilization of the internet for spot-buying, tenders, and transactions in general. Additionally, digital reporting, cloud based computing, augmented and virtual reality, 3D-printing, and mobile technologies are among the other technological advances that are currently being established. Being able to understand these new technologies and their importance as well the ability to integrate them into the companies' existing practices seems to be increasingly important. Out-of-the-box thinking and creativity are greatly valued in purchasing as they could often lead to the creation of these new technologies and practices. Thinking in alternatives, intrapreneurship and value creation are skills that a manager can use in order to help the company work more effectively and efficiently.

According to the aforementioned studies, it is also important to be able to drive innovation with suppliers. Concerning this innovation, a degree of strategic thinking is required in order to be able to integrate it with existing practices. The capability to analyse possible scenarios early on using methods such as visualization, regression analysis, predictive modelling and a deep understanding of statistics can be very useful.

More specifically, analytical thinking is especially important in the areas of risk management and cost reduction. The ability to identify, analyse, and evaluate risks is a skill that successful purchasing firms value in prospective employees. In addition, being able to consolidate and reduce spending can be a great asset to a purchasing company. With regard to this, the capability to perform spending analyses and manage currency and cost risks is very useful. Finally, the ability to maintain costing transparent is another asset purchasing firms can take advantage of in the future.

Especially related to cost and risk management is the growing importance of international relations. It is helpful to be able to understand how business is conducted on an international level. In addition,

being able to adapt to global changes such as shifts in buying regions, international growth, global competition, the utilization of outsourcing, and geopolitical developments might be more and more of importance. In order to participate in these international exchanges it is also important to possess excellent social skills. Being able to communicate effectively and to be fluent in several languages facilitates negotiations, networking and the general exchange of knowledge. As central as international relations is the ability to work collectively within the company. Firms that take advantage of cross-functional teams can collaborate both within and outside of the company. Fostering relationships between third party stakeholders and suppliers is regarded as beneficial to the firm.

The ability to understand a wide range of products, markets, and business/economic structures should therefore not be underestimated. This knowledge can come from a variety of sources, from formal training over research to just general knowledge. The capability to learn and the intrinsic motivation to continue learning are crucial skills, which complete the profile of a skilled purchasing manager according to several studies. Considering the already evaluated skills profile of trained purchasing professionals, one can differentiate between several roles within the procurement function: the financial analyst, the internal consultant, the intelligence agent, the relationship broker, the risk advisor, the legal expert and finally the supplier coach, according to a KPMG study (Khushalani, 2013). While the financial analyst is not only concerned with saving costs but more importantly with gathering knowledge about trends, capital markets and the development of financial business cases, the internal consultant collaborates with internal stakeholders in order to generate business value and implement category strategies. Intelligence agents need mainly strategic and analytical skills, relationship brokers deal with problem solving and connecting different internal and external parties. Risk advisors need a great understanding of the whole supply chain network and work closely together with legal experts. Supplier coaches are supposed to create innovation, develop strategies and optimise processes together with suppliers.

The valued skills and abilities of future purchasing organizations discovered by the studies and surveys are quite interrelated. The ability to adapt to new technologies and improvements fosters an environment in which innovation is likely to occur. Then, the ability to integrate these new practices strategically into the company can lead to more effective cost and risk management. Of course, none of this would be possible without growth and collaboration, which are generated as a result of positive international and domestic communication with several shareholders. It is the ability to constantly learn and be aware of what is happening within the company as well as around the world besides role specific competences that makes a purchasing professional suitable for the individual position.

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**Comparison with IO2 Future Competences Analysis**

Comparing the contents of the studies taken into account with the IO2 findings on future competences, there are many aspects emphasised on both sides. Digitalisation with “eProcurement Technology” and further “Automation” of processes as well as “Big data analytics” and “Analytical thinking” and “Strategical thinking” are comparably regarded as important trends and developments becoming prevailing in the near future. In general, current studies show that in the future a broader scope of necessary skills is required.

What stands out is that “Sustainability” is hardly mentioned in the researched sources, whereas in the here present interview cases “Sustainability” is the clear number one competence field in the analysis of future competences. A reason for its strong enhancement can be that it was explicitly asked for input regarding “Sustainability” and digitalisation in the final part of the interviews. Nevertheless, the difference in the prominence of “Sustainability” is striking.

“Holistic supply chain thinking” is an aspect that is assumed implicitly in most studies, but is much more explicitly expressed by the participants of the company interviews. Further skills that are expressed more in the PERFECT IO2 analysis than in other recent studies are communication related competences and “Negotiation”.

On the other hand, what the studies on average emphasize more than the cases studied here are finance and controlling competences, innovation, adaptability, flexibility and continuous learning. Nevertheless, though they did not make it to “key” competences, it should be kept in mind that they were also mentioned, e.g. as “Financial Acumen”, “Learning Agility” and “Openness”, but just not most often.

The mentioned differences emphasise the importance of always taking into account available other research and indications from practice in order to create a curriculum that covers as many required competences as possible.

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# Appendix

## Appendix A – Interview Guide Excerpt

Document structure of interview guide:

Section A: Instruction for interviewers (page 2)

Section B: Interview questions (pages 3 - 12)

Section C: Process charts & spider diagram (pages 12-13)

Excerpt from Section B; part 3 of interview questions:

**3. Current knowledge requirements**

→ *Introduction text: 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.* Just to get into the topic: In general, would you say there is certain knowledge that is specific for PSM (in comparison to other areas like Finance or HR)?

→ *Provide interviewee with process chart (see p. 12) and refer to this for the following questions*

3.2 *Question to CPO & Staff department/HR representative:* Which roles are differentiated in your organization to cover the process steps?

3.3 *Question to CPO & Staff department/HR representative:* Can you provide us with an overview of how people progress within the organization usually (e.g. career ladder)?

3.4 *Question to operative level:* How would you describe your role with regards to these process steps?

*3.5* Please describe your daily work: *For CPO: We will at first ask you the following questions with regards to your individual role. In a second step, we will then ask you to answer these questions with regards to the roles within your organization you just mentioned (strategic sourcer, purchaser)*

*3.5.1 What are 1-3 of your major goals in your role?*

*3.5.2 What do you do to achieve this goal/these goals?*

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*3.5.3 How did you know how to do that when you did this the first time?*

*3.5.4 How did the way of doing your job change after you became more experienced?*

*→ Provide interviewee with skill diagram (see p. 13) to mark the required skills and add new ones*

3.6 Which competences are the most important for you to perform your job? *[mark top 3 competences on diagram] For CPO:* Which ones are the most important for your team?

3.7 Which skills, competences, knowledge, characteristics especially help you to be successful in your job?

3.8 What is preventing you to act (more) successfully?

3.9 *Question for operative level:* What did you learn in trainings or through knowledge platforms (e.g. handbooks, process descriptions, systems functionalities, …)? [mark on diagram]

3.10 *Question for operative level:* Which knowledge did you get through learning by doing? [mark on diagram]

3.11 *Question for CPO and training responsible:* How is knowledge shared in your organization between individuals and also within the PSM department?

3.12 How is documentation used in daily work? (social network as substitute; drivers-antecedents/barriers to share tacit knowledge)

3.13 *Question for operative level:* What do you feel that you would need to learn to progress to the next organizational level or to get promoted?

3.14 *Question for operative level:* From your point of view which extra knowledge does your superior need for his/ her job compared to yours? (What is this role of superior called?)

3.15 How do you onboard or induct new employees in PSM after you selected them:

*3.15.1 Are there any specific standard documents (e.g. manuals, policies, etc.) for a formal onboarding/induction process?*

*3.15.2 What do you usually do in addition to the formal onboarding process – on a more informal level- to get people started in their new job (e.g. introduction to team, buddy/mentor system etc.)?*

3.16 Which knowledge do you have that new PSM colleagues usually do not have in the when they start work?

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3.17 Have you hired people from outside of PSM in the past? What knowledge do they bring along that was missed before?

3.18 *Question to CPO:* To which extend does the industry sector or culture influence the required knowledge for PSM jobs?

3.19 How can quality and relevance of higher education be improved, based on your experience with new employees?

3.20 *Question to training representative:* How should a competence development program be structured?

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## Appendix B – Research Quality Characteristics and Project Responses

| *Project Phase* | Credibility (internal validity) | Transferability/ Generalizability (external validity) | Dependability/Reliability | Confirmability/ Objectivity |
|---|---|---|---|---|
| **Preparation**<br><br>*Methodology & approach, interview guide, case selection*<br><br>→ Avoid construct, item and method bias | • Built on established theory: KBV<br>• Reference to findings of IO1 (literature and educational landscape review of pre-established dimensions)<br>• Pre-test of interview guide → Basis for research question and approach | • Stringent decision tree for research methodology: Theory elaboration, case study<br>• Pre-testing definition of concept → see Salzberger/Sinkovics<br>• Sampling strategy: Adequate # of cases within one industry sector and cross-industry | • Decision tree for research approach<br>• Sample for different industries according to external depth of value added | • Contextualized theories (KBV, RBV)<br>• Sound literature review of IO1 as basis<br>• Systematic and rigorous approach |
| *Sample & context* | • Ethics: the way the participants were treated in general -> have to give written consent before the interviews<br>• Communication with participants -> document how often we had to contact to convince them (field notes)<br>• Encounters with participants (Strauss/Corbin, 1994, 1998) -> how and where (e.g. face to face on their premises)<br>• Subject selection -> theoretical sampling along the purchasing process<br>• Researchers rapport before, during and after -> document our approach email, our summaries and our results report | | | |
| **Implementation**<br><br>*Contact participants, conduct interviews, document interviews*<br><br>→ Avoid method bias | • Multiple sources of evidence: Observations & documentation<br>• Establish chain of evidence (Yin, 2003)<br>• Peer review within PERFECT IO2 project team | • Common approach of 3 interviewers (training of interview situation? → see Welch et al.)<br>• Selection of Units → follows from sampling strategy above | • Semi-structured interview guide (Yin, 2003; Maxwell, 1997)<br>• Audio Recording of interviews -> all in English<br>• Value-free note taking -> goes into Nvivo as well<br>• Data collection and analysis in alternating sequences (analysis drives collection) -> pre-test analysis serves to adapt guide | • Transcription of interviews (only English to English) |

| *Project Phase* | Credibility (internal validity) | Transferability/ Generalizability (external validity) | Dependability/Reliability | Confirmability/ Objectivity |
|---|---|---|---|---|
| **Follow-up**<br><br>*Analysis of interviews*<br><br>→ Avoid stimulus bias | • Coding system in Nvivo -> a-priori based on KBV<br>• Search for negative incidents (→ "lack of" questions)<br>• Peer discussion of evaluation results | • Coding and nodes in Nvivo<br>• Establish domain to which the study's findings can be generalized (Lee, 1999) | • Coding and nodes in Nvivo following steps organizing, coding, searching and modelling (Strauss/Corbin, 1994; Yin, 2003)<br>• Peer review with PERFECT team<br>• Research invites replication | • 3 interviewers/ 4 researchers<br>• Have probing counter-check (audit) by someone outside of IO2 (challenged with P. Schneemann and Laura checked transcripts) |
| *Discussion* | • Clearly and concisely summarized<br>• Implications follow data<br>• Limitations concisely stated<br>• Contributions to the body of knowledge clearly and convincingly<br>• Alternative explanations | | | |
| **Dissemination**<br><br>*Publication of results* | • Structured documentation of results and gaps for IO3 Survey | | • Feedback in research community (e.g. IPSERA 2017) | • Availability of research results & design, framed by PERFECT project |

Table 25: IO2 Case Studies – Quality Assurance by Project Phase.

Adapted from: Lincon & Guba (1985), Riege 2009, Sinkovics et al. 2006, Yin, (2014), Salzberger et al. (1999), Welch et al. (2002).

For example, while to place the research design on the solid foundation of KBV (addressing multiple quality criteria shown in Table 25 on the right), the a-priori coding based on KBV was challenged for the coding of the first two research questions, for which finally an open coding was favoured. For that part of the research questions the focus was more on the competences themselves rather than their usage in process execution and/or performance implications in line with Figure 5; the latter are still to be covered in further analyses.