

Future procurement competencies, technologies and roles for 2030– A Delphi study

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Abstract

In this research we take a pragmatic forward looking approach on the changing requirements for PSM and seek to determine what are the development priorities in terms of procurement (1) competencies, (2) technologies and (3) roles by 2030. We facilitated an industry initiated a Delphi study during the summer and early autumn of 2021 in Finland, in which we engaged 33 subject matter experts (procurement managers and CPOs) in a three-step World café event on a virtual collaboration platform. With several interesting observations in each of the three dimension, we identify five major cross-cutting themes that will characterize the future of procurement by 2030. The themes are as follows: (1) the leveraging of data and knowledge, (2) achieving the next level in terms of risk management, (3) taking a user-driven approach to digitalization, (4) enabling sustainability with resources and technology, and (5) securing ability to innovate and change with adequate resources.

1. Introduction

Observing the past contributions to understanding the changing and future requirements for skills and competencies in the purchasing and supply management (PSM) domain, we are likely to experience déjà vu moments. For example, approximately one and half decade ago, Giunipero et al. (2006, 822) suggested that “changes in supply management are driven by a changing business environment; increased globalization, technological advances, internet-based systems, and increased demands by upper management.” While we may debate the direction of some of the trends, e.g. globalization, we are inexorably dealing with technological development (now under the label of digitalization; Lorentz et al., 2021), and increasing detail and dynamic complexity of societies, business environments and supply chains (Bozarth et al., 2009). In the PSM context, such complexity may be driven for example by the demand for “broader value contribution”, increased share of spend under management (more items and stakeholders), and multitier supply networks, the footprint of which implies variety in geographies and institutions. The way organizations deal with this increasing complexity of the task environment is by matching it with additional internal complexity by expanding structures and processes (Schneider et al., 2017), and thus reducing the complexity differential with the environment (cf. Ashby’s law of requisite variety). The rather simple implication of this remedy is that PSM as a function must also respond to the changing task environment by expanding the variety in its structures and processes and therefore rethink its personnel/organizational competencies, applied technologies and job roles.

In this research we take a pragmatic forward looking approach on the changing requirements for PSM and seek to determine what are the development priorities in terms of procurement competencies, technologies and roles by 2030 (RQ1).

In the following, we frame our research problem as a capability development issue and establish a foundation for our empirical research by reviewing the state of the art in terms of future of

procurement from the perspective of competencies, technologies and job roles. We then elaborate on our method, a two-phase Delphi-process including a World café event and a follow-up survey. The results are then analysed, first within competencies, technologies and job roles, and then across these domains, producing food for thought in terms of thinking about future scenarios for procurement development and evolution (Knight et al., 2020). Discussion and conclusion brings the paper to a close.

2. State-of-the-art: future of procurement

We frame the problem of understanding future state of procurement as a capability development issue. The procurement organization is made of a bundle of resources and, crucially, capabilities (Amit and Schoemaker, 1993), and these imply that the procurement “organization has the capacity to perform a particular activity in a reliable and at least minimally satisfactory manner” (Helfat and Winter, 2011). What activities and therefore capabilities does the procurement function need in the operating environment of the future? To make the answer to this question more nuanced, we may break capabilities down to their generic building blocks, or microfoundations, which have been suggested to fall into three broad categories: individuals, processes and organisational structures (Felin et al., 2012). For practical purposes, we operationalize these dimension of the microfoundations framework as individual and organizational *competencies* (incl. skills and operational routines; cf. Peng et al., 2008), *technologies* for enabling processes, and organizational *roles*. We will use this framework to discuss the literature that may bear relevance in terms of understanding the future of procurement.

2.1 Future procurement competencies

Capabilities, from an organizational perspective, refer to routines that enable it to utilize resources (Rungtusanatham et al., 2003) thus the capability perspective provides one important level of consideration and frame of reference for the future development of procurement competencies. Capability view includes people, technology, tools, processes, and practices (Miller and Morris, 1999). Capability development takes place through a process that includes an organization’s view of current and future operations and the business environment (Teece et al., 1997) As this require the ability or capacity to interact effectively with its environment and effectiveness in carrying out goals (White, 1959). When this brought to the context of purchasing and supply management, the task of procurement organizations is to find out what kind of competencies can be used to adapt to the change in the business environment (Giunipero et al., 2006). The development of procurement expertise has been seen as important in organizations, especially when the significant impact of procurement on the profitability of companies is understood. In particularly strategic procurement has shown an important impact on the performance of organizations and its level increases as procurement knowledge and competence increases (Carr and Smeltzer 1997).

Giunipero et al. (2006) have identified key competencies in strategic purchasing. According to him, the competencies and skills that promote strategic purchasing are related to five skills: communication, technical skills, strategic planning, team building and economic skills. Technical competencies can include products, processes, supplier management, materials management, risk management, and related tools such as portfolios, pricing, costs, value chain analysis, and logistics. In addition to these, recent studies have identified a number of different purchasing -related competencies (Bals et al. 2019) some of which meet the newer requirement of the purchasing function for example in terms of sustainability and digitalization. The Covid-19 pandemic has recently had a significant impact on supply chains and procurement in many industries, and has brought needs to develop disaster preparedness, recovery and risk management in particular. This is presumably again bringing new needs from the perspective of purchasing competences, especially in risk management.

Although different purchasing and supply management competencies and their importance have been identified in the previous literature, it was necessary in this study to determine whether the importance of these competencies is still seen as significant in today's business environment and how different competencies will be seen in the future

2.2 Future procurement technologies

Research has been suggesting visions for the technology use in procurement for quite some time. We consider some of the more recent contributions that have moved on from the e-procurement domain into considering digitalization of procurement. Although many of the issues related to uptake and implementation are essentially the same, the technologies are novel. Use of these emerging technologies in solving procurement challenges has been suggested to play a key role on procurement capability development in the future. A useful framework for the review is provided by Lorentz et al. (2021), as they suggest a structure to the phenomenon of procurement digitalization. Whereas applications for internal communication support have to a significant degree become a reality, there remains room for more process automation (e.g. with robotic process automation, RPA) and process structuring technology (e.g. e-procurement suites and P2P systems) uptake. Furthermore, there is much unrealized potential for example in integrating external and internal data for analytics and in designing decision support systems enabled by artificial intelligence, for example.

In this vein, the potential of *automation*, by the means of for example RPA, has been considered in the literature. Indeed, Viale and Zouari (2020) suggest that RPA impacts procurement in operational, organisational and relational terms. According to Flechsig et al. (2021), procurement functions find new application areas for RPA with increasing experience. Successful applications may be found in automating transactional and operative tasks, for example within the procure-to-pay process, but also in more strategic domains such as sourcing and supply relationship management. Flechsig et al. (2021) suggest that RPA benefits may come in the form of for example employee reliefs, cost savings, improved operational efficiency and quality. Procurement function and its digitalization, for example by the means of RPA, and consequent ability to focus on more strategic tasks, is suggested to be a vital part of future organizational competitiveness.

Further, several authors consider the opportunities to enable and enhance procurement by the means of *analytics*. For example, Sanders (2016, 26) suggests big data analytics being “an imperative for business leaders across every industry sector, and gives examples of application areas in procurement, such as regarding supplier segmentation, replenishment strategies, supplier negotiations, and tail-spend analysis for opportunities. In the work of Handfield et al. (2019) on data and cognitive analytics as emerging procurement technology, future analytic platforms for procurement are identified, as well as managerial perceptions regarding benefits from procurement analytics investment in general. They identify procurement analytics areas, namely data governance and management, spend management, contract management and supplier life cycle management, as well as supply market intelligence and risk, and elaborate on the benefits of these analytics areas. Real-time data and analytics in the short term and predictive analytics in the long-term are suggested to dominate the procurement digitalization landscape. Hallikas et al. (2021, 629) confirm the beneficial effects of data analytics by showing that “digital procurement capabilities mediate the positive relationship between external data analytics capabilities and supply chain performance”.

This brief review of the technology-focused procurement research suggests a future in which further efforts in the areas of automation and process management on one hand, and data analytics and decision support on the other, may play a key role developing procurement capability. Uptake and

implementation of these particular technologies may have the most promising enabling effect regarding the reinvention of procurement, as well as contributions to supply chain effectiveness and broader value generation (cf. Seyedghorban et al., 2020).

2.3 Future procurement roles

Research on the procurement roles is more nascent than in the other two above mentioned areas. Although, in general, the literature reveals the developments from a transactional to a strategic role over the past decades (Stek and Schiele, 2021), it is still unmaturing in terms of how this change is reflected in the procurement roles. Many of the research (see Stek 2021 for the literature review) has focused on universal set of skills to purchasing practitioners and hasn't focused on the different roles. Some expectations are the study by Knight et al. (2014), where they identify strategic, tactical and routine purchasing skills profiles were and study by Schulze et al. (2019) that elaborated on skills specifically for corporate social responsibility (CSR) and sustainable PSM.

As job roles, Mulder et al. (2005) distinguished four different purchasing roles: the Purchasing Manager, Senior Buyer, Buyer and Assistant Buyer. Schiele in his turn (2019) defined seven different roles in purchasing: (1) operative procurement, (2) purchaser for direct materials, (3) purchaser for indirect materials, (4) public procurement, (5) purchasing engineer, (6) chief purchasing officer (CPO) and (7) 'other roles' (Schiele 2019).

3. Method

In order to address these research questions, we facilitated an industry initiated a Delphi study during the summer and early autumn of 2021 in Finland. The goal of this Delphi study was to get input on procurement competencies, tools and roles from subject matter experts in a systematic way, that would allow a broad and rich contribution from practitioners (Rowe et al., 1991). The effectiveness of the Delphi method in the appraisal and assessment of future has been demonstrated, and it has been applied successfully also in the field of supply chain management (Seuring et al., 2008, Gossler et al., 2019) and procurement (Wehler et al., 2021, Schulze and Bals 2020).

In the first phase of the research process, we engaged 33 subject matter experts (procurement managers and CPOs) in a three-step World café event on a virtual collaboration platform. The World Café enabled researchers to access all participants' knowledge but avoids overemphasizing individual opinions, thereby creating more realistic outcomes (Schiele et al., 2022).

The experts presented several lines of businesses, as presented in Table 1. A total of 31 people participated in the event, representing procurement management and experts from various Finnish companies. The participants were divided to three breakout rooms. Each room discussed one of the three topics, and two moderators, one presenting the research team and one industry, hosted the debates in the groups. Virtual collaboration platform was used to support the discussion. After a predefined period of time (20–30 min), the participants are asked to change the rooms. At the beginning of each round, the moderator summarized the previous discussion points. This process is repeated until each participant has contributed to all three discussion topic. Next, the results of each room were presented to all participants. In the end, a voting procedure was used to capture the priorities of participants.

Table 1 World Café participants

| Sector | n |
|--------|---|
|--------|---|

| | |
|-------------------|---|
| Chemical industry | 5 |
| ICT | 5 |
| Pharma | 3 |
| Machine building | 3 |
| Retail | 3 |
| Real estate | 3 |
| Food | 2 |
| Logistics | 2 |
| Public sector | 2 |
| Other | 3 |

Three researchers present in this first phase data collection event then iteratively refined the results of the group work into lists of competencies (27), technology applications (17) and job roles (16).

In the second phase, a survey was conducted in which the respondents evaluated each of the 60 items on a 5-point scale in terms of (1) their effect on the competitiveness of procurement in 2030, and (2) the change in usage or development by 2030. 25 complete responses were received allowing us to rank and prioritize the items in terms both impact and the needed change.

In the third phase, the results were validated in virtual workshop with 37 subject matter experts. We first presented the results to the participants and then divided the participant to three breakout rooms to be able to further elaborate the findings.

4. Analysis and results

In this section, we first consider results within the framework dimensions separately, namely competencies, technologies and roles. We then consider cross-cutting themes across these dimensions, suggesting broader efforts towards procurement capability development. In the dimension specific analyses, we use an approach in which the average value of each survey item, calculated across respondents' assessments with the 1-to-5 scale, is compared with the total average of the item averages. Positive difference in item average and the total average suggests an item that has a relatively higher effect on competitiveness or change in usage, whereas negative difference suggests relatively lower effect on competitiveness or change in usage. This allows us to construct a grid with four quadrants, in which the *lower-left* corner holds items with both relatively lower effect and change in usage, and are characterized as *mature low(unrecognized)-potentials*. The *upper-left* corner holds items with relatively lower effect but with higher change in usage, and are characterized as *necessary enablers*. Further, the *lower-right* corner holds items with relatively higher effect but with lower change in usage, and are characterized as *uncertain high-potentials*. Finally, *upper-right* corner holds items with both relatively higher effect and change in usage, and are characterized as *development priorities*.

4.1 Future procurement competencies

The 27 competencies identified by the means of the three-step World café event are depicted in Figure 1. These items may be arranged into five themes, based on Tassabehji and Moorehouse (2008):

(1) **Technical/individual competencies:** Financial competence (e.g. TCO, working capital, measurement) Measurement of procurement value (impact on sales and cost), Scenario thinking and tools, Procurement digitalisation competence, Data analytics competence, Leveraging AI, Automation and RPA competence, Knowledge-based decision making, Self-management

(2) **Interpersonal competencies:** Management of people, Multicultural competence, Negotiation competence, Competence for influencing

(3) **Internal enterprise competencies:** Challenging of current practices, Internal collaboration and partnerships, Understanding stakeholders and the business, Innovation and R&D competence (open innovation, collaboration with R&D), Service design competence, Promotion of procurement agenda for stakeholders and top management, Understanding of customer needs and requirements, Virtual management, Change management

(4) **External enterprise competencies:** Circular economy competence, Risk management competence, Responsible procurement competence, Building collaborative partnerships with suppliers

(5) **Strategic business competencies:** New business development with suppliers

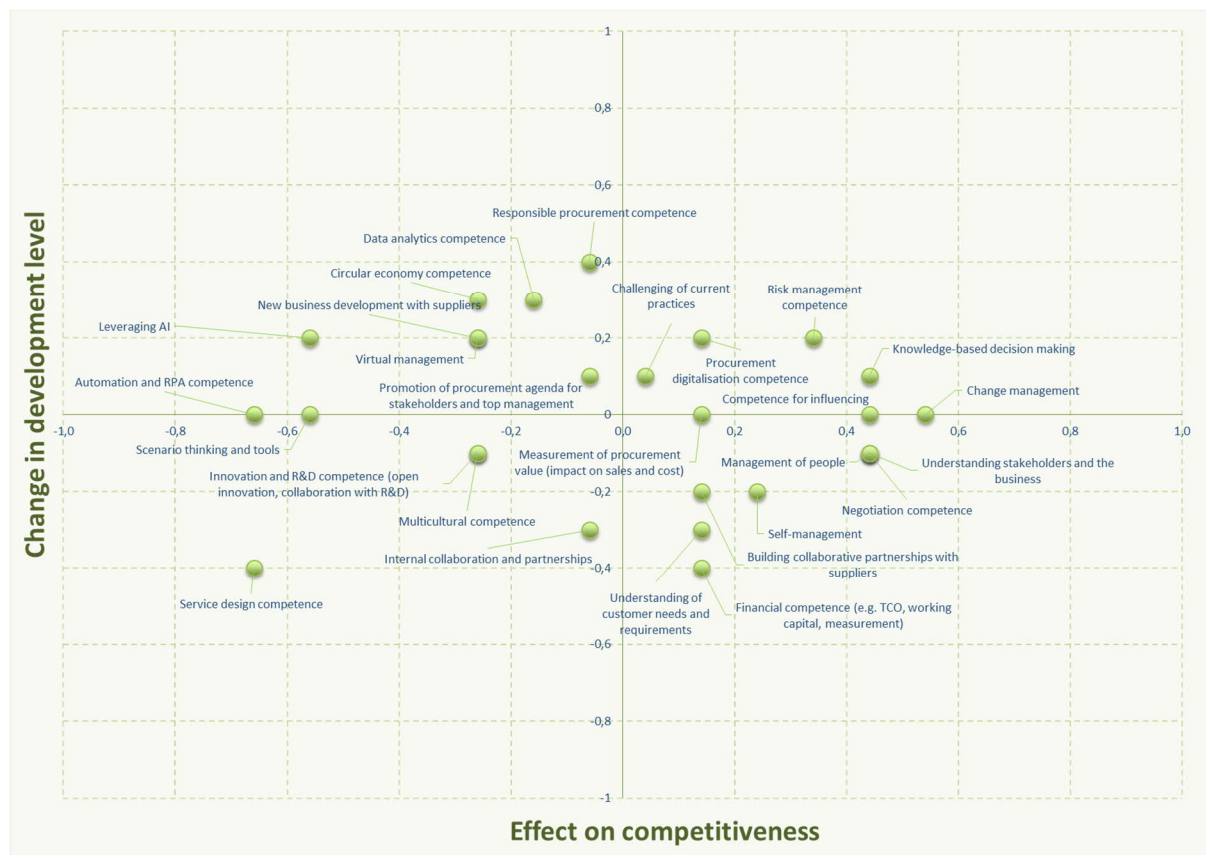


Figure 1 27 future procurement competencies

The 27 identified competencies represent a wide range of procurement competencies, including newer but also more traditional competencies that have been widely identified as key competencies in procurement. The following competencies that appear in the matrices of the upper-right quadrant will be prioritized in developing procurement during the current decade: knowledge-based decision making, risk management, change management, influencing and digitalization.

On the other hand, if we look at which competencies are in the lower-right corner of the assessment, i.e. those that are seen as competitive but whose development potential is no longer seen as great, then there are many more traditionally recognized supply management competencies like negotiation skills, supplier cooperation, customer requirements and the financial competencies and tools related to procurement.

The upper-left quadrant (necessary enablers) includes expertise in areas such as responsible procurement, the circular economy, data analytics, artificial intelligence and RPA (Robotic Process Automation) technologies, the development of which is seen as important but whose impact as individual areas is still seen as relatively small or medium.

4.2 Future procurement technologies

The 17 technology applications identified by the means of the three-step World café event are depicted in Figure 2. These items may be arranged into three themes:

(1) **Technologies for supply base management:** Virtual platforms for supplier collaboration, Digital tools for supplier auditing, Efficient digital tools for supplier discovery, Digital contracts and automatic contract monitoring, Digital applications for end-to-end supply chain tracing

(2) **Technologies for internal operational efficiency:** User-friendly applications and systems in procurement, Automatic ordering and replenishment, Virtual platforms for internal collaboration, Inter-organisational systems for transaction management, Bots for aiding buying by internal customers, Negotiation bots for automatic tendering and contracting

(3) **Technologies for procurement analytics:** External and internal data utilising and decision aiding tools for supply risk management, Integration and exploitation of external supplier data in analytics, Analytics applications for carbon footprint monitoring and compensation, Decision-aiding supply market analytics, Efficient combination, analytics and visualisation of dispersed internal data in customised form for different user groups, Real-time spend analytics and aided development priority recognition

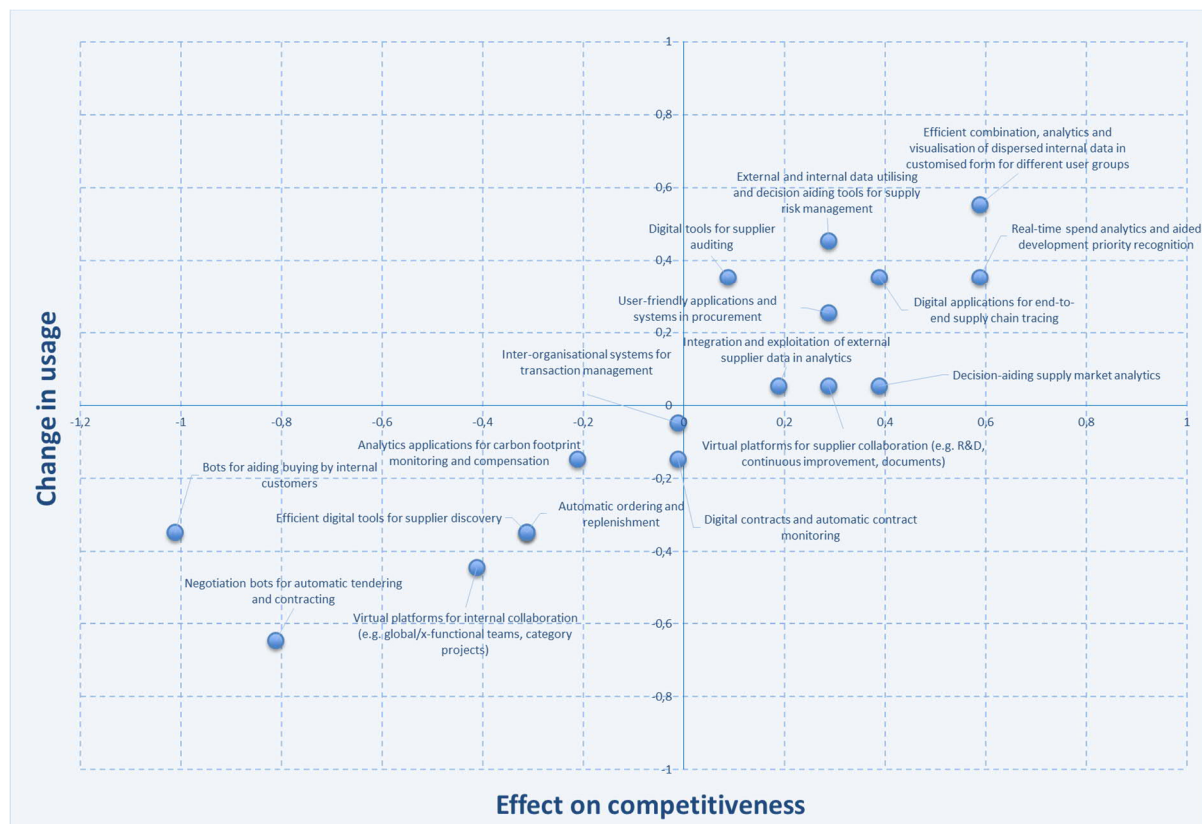


Figure 2 17 future technology applications in procurement

The 17 items fall into two quadrants only in Figure 2: the mature low(unrecognized)-potentials and development priorities. Starting from the lower-left corner, it is perhaps to see bots for automation in this quadrant, but it may well be that the potential for these during the current decade is yet unrecognized more broadly. Furthermore, one might expect analytics applications for carbon footprint and tools for efficient supplier discovery to have more effect on competitiveness in the current environment.

In contrast, the upper-right quadrant is prominently populated by technology applications for analytics (e.g. efficient combination, analytics and visualization of dispersed internal data in customized form for different user groups; real-time spend analytics and aided development priority recognition; external and internal data utilizing and decision aiding tools for supply risk management). Also technology applications for supply base management are saliently present (e.g. digital applications for end-to-end supply chain tracing, digital tools for supplier auditing). This quadrant further demonstrates a flavor of operational efficiency in the form of emphasis on user-friendliness of applications and systems in procurement.

4.3 Future procurement roles (Anna)

The 16 procurement roles identified in the three-step World café event are presented in Figure 3. These roles may be arranged into five categories:

(1) **Digitalization experts as part of procurement teams:** RPA expert as part of procurement team, Procurement digitalisation expert, Coder / developer as part of procurement team

(2) **Data and market analysts as part of procurement teams:** Data analyst as part of procurement team, Data steward as part of procurement team, Risk management analyst, Market analyst, Innovation and technology scout

(3) **Sustainability experts are part of procurement teams:** Circular economy specialist as part of procurement team, Sustainable procurement specialist

(4) **Procurement development managers:** Procurement development manager (incl. change management and innovation), Service designer as part of procurement team, Procurement process owner and developer (e.g. risk management)

(5) **Integrators:** Integrator of procurement and business, Integrator between procurement and end-customer, End-to-end -process specialist as part of procurement team

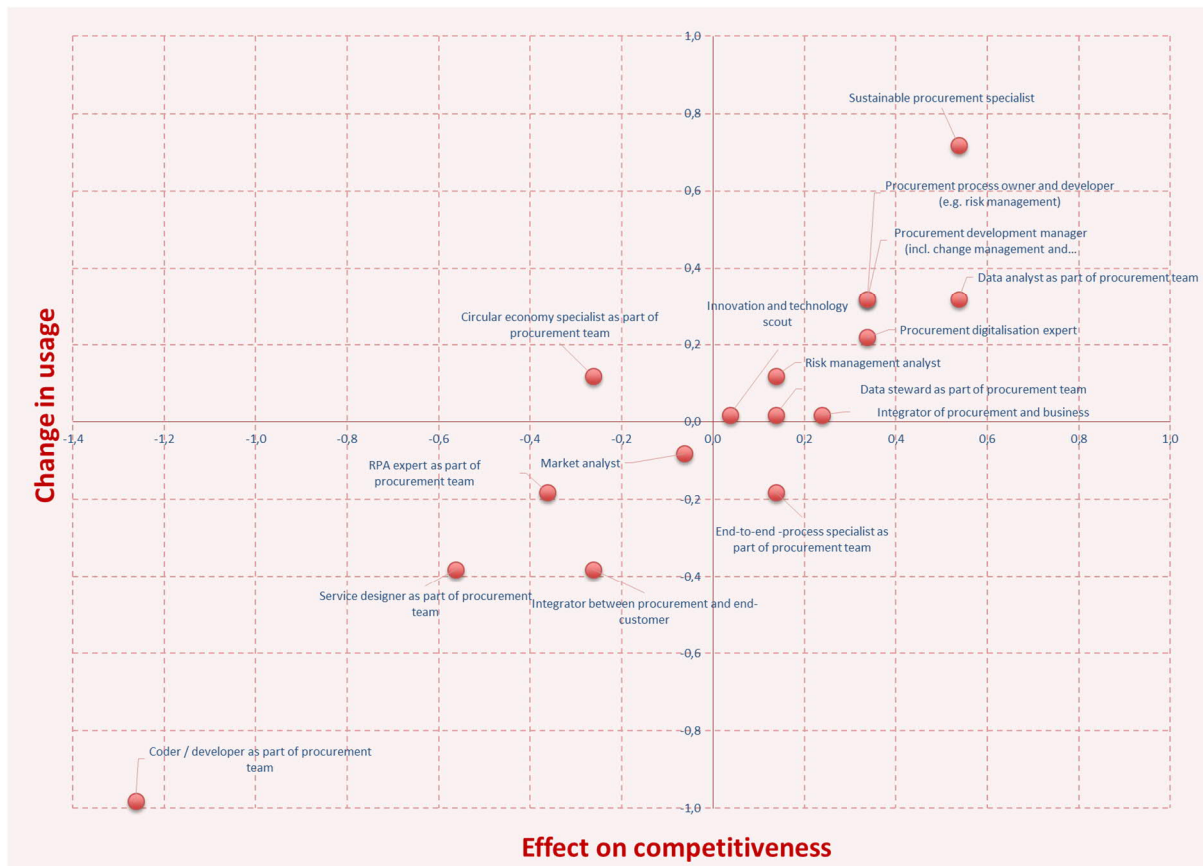


Figure 3 16 future job roles in procurement

These 16 roles fall into all four quadrants, but mainly into the mature low (unrecognized)-potentials and development priorities quadrants. Circular economy specialist as part of the procurement team falls into *necessary enablers* and end-to-end process specialist to *uncertain high-potentials*. Both coder-developer and RPA experts are in the lower left quadrant (mature low (unrecognized)-potentials), indicating that these roles might not need to be part of the procurement team but located in other parts of the organization. The upper right corner (development priorities) consists of various subject matter experts and specialists as part of the procurement team: sustainability, risk management and digitalization experts. This proposes that to advance sustainability and risk management to their full potential, these topics need to have specific roles as part of procurement organizations. Also, procurement development managers fall into this quadrant, as an answer for procurement's development needs and pressures. Accordingly, the role of innovation and technology scout in procurement is located as a development priority, proposing the importance of understanding the technology development in supply markets. However, in general, based on World Café respondents, roles seem to have a smaller role to the competitiveness than competencies..

To summarize, the following new *job roles* (top 5) will be prioritized in developing procurement during the current decade: sustainable procurement specialist, data analyst as part of procurement team, procurement process owner and developer (e.g. risk management), procurement development manager (incl. change management and innovation) and procurement digitalization expert.

5. Discussion and conclusions

Observation of the results across the identified three dimensions, allowed us to identify five major cross-cutting themes that will characterize the future of procurement by 2030. The themes are as

follows: (1) the leveraging of data and knowledge, (2) achieving the next level in terms of risk management, (3) taking a user-driven approach to digitalization, (4) enabling sustainability with resources and technology, and (5) securing ability to innovate and change with adequate resources. We discuss each of these themes in turn, as they serve as development priorities and provide guidance for practitioners and also challenge researchers to push further the boundaries of our field.

First, regarding the leveraging of data and knowledge in procurement, it is possible that procurement is subject to a relatively high task uncertainty due to the need to manage potentially thousands of suppliers, hundreds of items, dozens of stakeholders, and several constantly changing supply markets. Future-proof procurement must be able to navigate this complexity and make informed decisions by integrating data from different sources and developing analytics competencies.

Second, future-proof risk management may have to advance from the typical focus on risk sources (e.g. FMEA based methods) to securing supply network recoverability, while simultaneously balancing both top-down and bottom-up disruption detection (Lorentz et al., 2021). This requires dedicated analyst tools, resource intensive efforts for supply network mapping and capability assessment, and leveraging of novel digital tools.

Third, it is necessary to take a user-driven approach to digitalization, which could mean better use of easy-to-use and easy-to-integrate digitization platforms to support procurement processes and management. As the results show, experts see an increase in investment in digitalisation technologies, but the real effects will be achieved when digitalisation skills can be increased holistically.

Fourth, a need has been identified to enable sustainability with resources and technology, where the development and resourcing of technologies that support responsibility will be strengthened in the future. The potential of digitalisation in the sharing and utilization of responsibility information in supply chains between suppliers and purchasing companies is particularly emphasized here. Such information and analytics may relate to, for example, the carbon footprint and the corporate social responsibility of suppliers.

Fifth, there seems to be both internal and external pressures that lead for the needs for procurement to innovate and change. This makes it necessary to secure ability to innovate and change with adequate resources, and the procurement experts see for instance need for change management competencies

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