Digital Transformation Readiness

Procurement Performance Excellence Report 2020

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Introduction

What is the current state of best practice in procurement? And what should organizations do to move to the next level? JAGGAER, in partnership with leading global innovation consultancy IPG, invited Chief Procurement Officers and other leaders within the discipline to participate in the 2020 Procurement Performance Excellence (PPE) Survey. Global in scope, the survey offered participants a unique opportunity to discover how their own organizations measure up against current best practices. It now offers them, through this report and individually, practical guidance on areas where they could improve, across seven focus areas.

We hope participants and non-participants alike will now take the opportunity to assess their level of maturity in procurement through benchmarking. Internal benchmarking to assess, for example, their current level of maturity in specific areas of procurement management and technological innovation against current best practices globally, in their region or in their vertical sector, and to stimulate discussions on how best to move forward.

It is clear that among the best-in-class procurement organizations, things have developed rapidly over the past five years, with the application of transformative technologies such as artificial intelligence. In some organizations the process of radical change has been further accelerated with the Covid-19 crisis, which has forced companies in many sectors to work even more closely and interactively with suppliers. They are looking to take new initiatives in digital transformation because traditional methods no longer suffice.[1]

On the other hand, many other organizations have put development projects, including the digital transformation of procurement, on hold as they look to retain cash while they ride out the storm. Where do you stand, and how do you plan to move forward? We hope our report stimulates thought and would be delighted to hear about your progress.

– Michael Roesch
– Carsten Vollrath

[1] A note on terminology: *Digitization* is the conversion of analog to digital, whereas *digitalization* is the use of digital technologies and digitized data to impact how work gets done, enabling organizations to eliminate manual processes. *Digital transformation* is more difficult to define, as it differs for each company.

Management Summary

It has been four years since we last conducted a Procurement Performance Excellence survey report. The 2020 survey results indicate that since then, some progress has been made on the digital transformation journey, but this progress has not been as rapid, and certainly not as systematic, as we had hoped. The majority of organizations are only on the first stage of the journey and a sizeable minority have barely started. A much smaller minority are among the real leaders, e.g., the 9% that have implemented supply chain mapping or the 2% who are already using predictive analytics.

Overall, the mixed results – strong in some areas, weak in others, but with the bulk of effort still focused on operational tasks – indicates the absence of a *holistic* approach to digital transformation. The report findings reveal no significant differences in performance based on size of organization, although our day-to-day business with customers suggests that it is organizations in the middle that are struggling to keep up. Large enterprises are in a better position to finance and execute the transformation, while small companies often have the flexibility to adapt; recent startups have been able to implement digital solutions from the get-go.

The main positive is that procurement is viewed more strategically than four years ago. Heads of procurement have moved up the hierarchy. This is a necessary but insufficient condition for further progress: it gives procurement the visibility and proximity to the leaders of the stakeholder functions needed to push for change, for investment, and for project sponsorship. 2020 was, of course, an exceptional year, consequently some of the results have been influenced by the "Covid-19 effect". One clear impact is that, while they have taken a strategic approach to procurement technology, these may have had to take a backseat while companies digitalize those functions that enable them to weather the storm, e.g., by facilitating remote working and paper-free document exchange.

The survey looks at seven areas of procurement performance in detail: first, company and procurement data; procurement strategy and objectives; procurement process; organization and qualification and supplier management. These allow some comparisons to be drawn with the 2016 results. There then follows a deep dive into technology management, including recently developed technologies as well as more established solutions such as supply chain management and P2P. Finally, we asked participants to think about the advanced solutions that will make their appearance, or reach greater maturity, over the next few years.

Highlights of the findings include:

- In relation to the new normal of digital procurement standards the identified average performance can be interpreted as “underdeveloped”
- Based on the survey responses, IPG rates just over a third of the survey panel (34.5%) as achieving Standard Performance, and 11.8% as Professional Standard. Two percent are ranked as Top Performers. The remainder (51.7%) are ranked as Underdeveloped
- Procurement remains heavily weighted towards operational as opposed to strategic functions. Participants in the survey employ on average 125 operational procurement FTEs to 37 strategic procurement FTEs
- The average price rate reduction was 0.2%. Less than 7% of participants are achieving annual cost reductions of 5% or more and nearly half the panel are seeing year-on-year price increases
- Concentration on key suppliers was diluted slightly compared with 2016, probably as a result of Covid-19, but is still high
- The average number of suppliers managed by a strategic procurement professional has increased considerably – from 6 in 2016 to 16 in 2020. This would seem to be a blip caused by Covid-19 because it is unsustainable for any length of time
- Overall, procurement strategy maturity has improved over the past four years; nevertheless the ”end-to-end process view” and future procurement areas are still significantly neglected
- Although continuous benchmarking and multi-year contracts are largely established, the low degree of transparent open calculations indicate potential for additional savings

- The survey surfaced participants' engagement on "special projects", which we interpret as a Covid-19 impact on procurement, because overall the strategic time profile lacks focus
- Procurement's cooperation with certain functions and departments, notably Quality Control, R&D, Production and Marketing still needs to be significantly improved
- Procurement suffers from a lack of digital competence and cross-functional collaboration: these must be addressed as a matter of urgency
- Procurement is gaining in influence, with an increasing number of heads of procurements now at board level
- Supplier selection and evaluation is highly standardized and well-defined by most companies, but there is limited collaboration intensity with key suppliers. Supplier integration and supplier portfolio management also require attention and investment
- 55% of participants have digitized key processes. 43% have developed big data applications and/or implemented data lakes, a prerequisite for the next leap forward
- 68% have implemented SRM but many are struggling with full execution and rollout
- 43% have not implemented eSourcing and a majority have yet to run an eAuction event
- 85% of respondents have digitized contract lifecycle management, but a large proportion of these have only taken the first step(s)
- Two-thirds have digitized order management. Most do digital document exchange with suppliers but nearly half are using classical EDI as opposed to more advanced options
- 70% have implemented or partially implemented procure-to-pay (P2P) technology
- Two-thirds of organizations do spend analysis. There is some way to go to implement business intelligence beyond rudimentary KPI dashboards

Background, Objectives & Methodology of the Study

Between July and October 2020 IPG and JAGGAER invited Chief Procurement Officers, Directors of Procurement and other senior executive-level decision makers to participate in the *2020 Procurement Performance Excellence Survey*.

The objective was to enable participating organizations, within a very short timeframe, to assess their level of maturity in procurement through internal and external benchmarking. Internal benchmarking can stimulate a process of discussions to assess the current status quo and to reach agreement on future strategic direction and next steps. External benchmarking allows organizations to assess, for example, their current level of maturity in specific areas of technological innovation against current best practices globally, in their region or in their vertical sector.

IPG having carried out a similar exercise in 2016, we were able to track progress in many areas.

When we launched the survey, we were already well into the Covid-19 pandemic, and we were fully aware that this would influence the results. We believed that the crisis would accelerate the process of radical change and force organizations in many sectors to work even more closely and interactively with suppliers. This assumption has been confirmed, although change has largely been tactical. Whether Covid-19 will have a sustainable impact on strategic procurement remains to be seen.

We were satisfied to receive a highly representative cross-section of the procurement community, with a significant number of large and medium-sized enterprises taking part, but also a considerable number of smaller and dynamic companies, some of them relatively recent startups. A very broad range of vertical sectors are also represented in the panel.

The Panel: Company and Procurement Performance Profile

Composition of the Panel by Size and Sector

We received 290 replies to the survey. The panel represents a very broad cross section of vertical industries. Chemicals and Pharmaceuticals, and Mechanical and Plant Engineering, were the largest sectors represented, each with 10%, followed by Banking and Insurance, with 9% of the panel. Healthcare and Construction were also well represented, with 7% each. Overall, there is a slight bias towards business-to-business organizations, with business-to-consumer sectors such as Retail, Consumer Goods and Food & Beverage nevertheless present, each with 3% of the share.

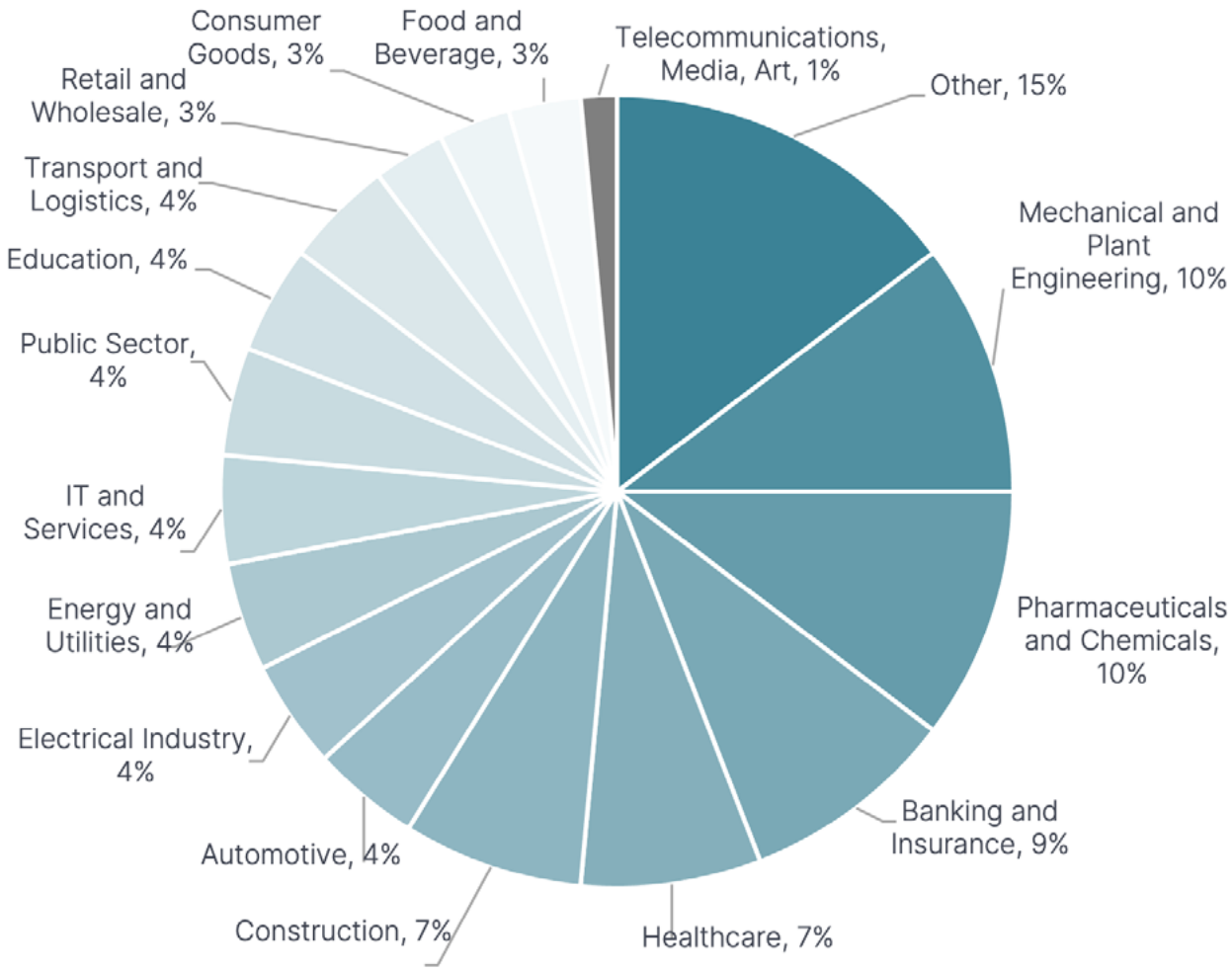


Figure 1: Panel composition by industry sector.

In terms of size of organization, medium and medium-large-sized companies predominate; 58% of respondents working for companies of between 500 and 10,000 employees. Nonetheless, large enterprises are also well represented, with 22% of respondents working for companies employing upwards of 10,000 people, and 7% above 50,000. In terms of annual turnover, the medium and medium-large sized companies also predominate, with 68% falling within the range €101 million to €5 billion. 16% have annual revenues upwards of €5 billion, including 2% above €50 billion. Small and medium sized organizations (up to €100 million annual turnover) make up the remaining 16%.

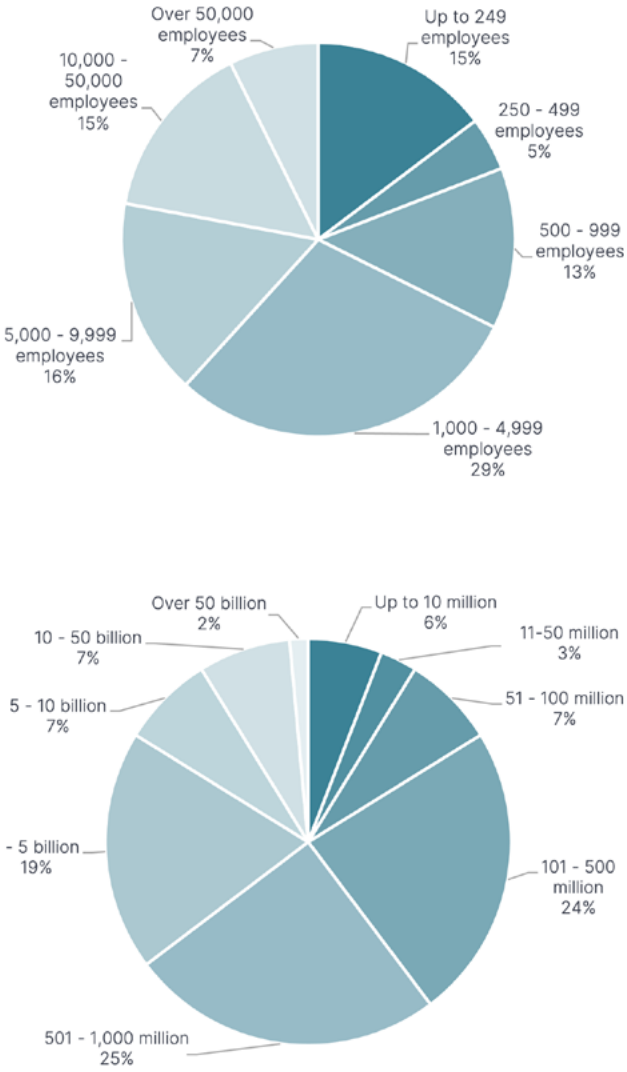


Figure 2: Panel composition by number of employees and annual turnover.

The survey also asked participants to indicate their annual procurement spend (see Figure 3). Here, the mid-range organizations were even more prominent, with 34% spending between €101 and €500 million per annum and a total of 67% in the range €51 million to €1 billion. 17% reported spending of between €1 and €50 billion per annum. At the other end of the scale, 16% spend up to €50 million per annum.

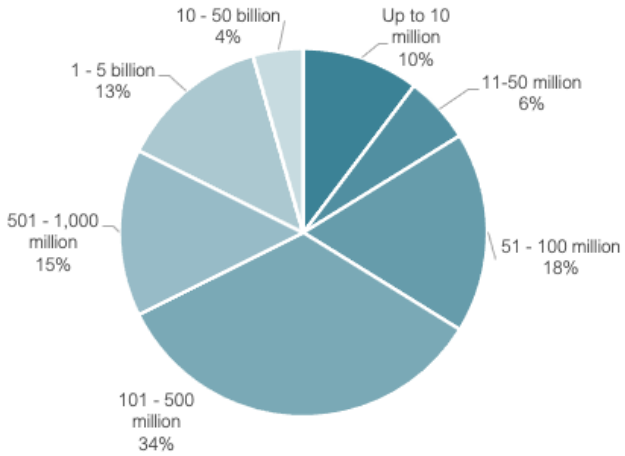


Figure 3: Panel composition by volume of procurement spend in 2019.

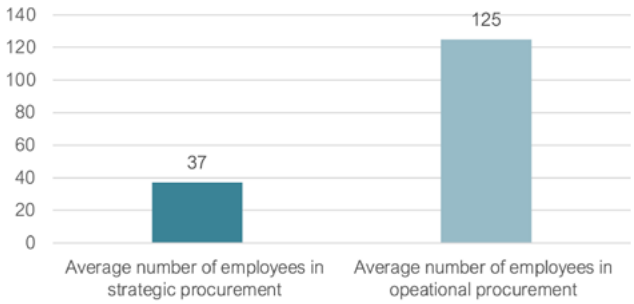


Figure 4: Panel composition by average number of employees in strategic and operational procurement.

We were also interested to know how many employees were working in the procurement function, but we asked respondents to break this down to strategic and operational procurement. On average, organizations employed 37 in strategic procurement and 125 in operational, a ratio of 1:3.37. Consequently, the human resources in procurement are overwhelmingly still deployed in roles that are – of course – important but are focused on manual, routine and repetitive tasks that do not add huge value to the organization, such as order processing, and which could be replaced by modern technologies such as machine learning and robotic process automation. Investment in these technologies to automate and digitally transform processes would enable procurement teams to shift their orientation more towards strategic, value-adding activities.

Note that although IPG itself has its own definitions of what constitutes “operational” and “strategic” procurement, based on some highly objective criteria around specific activities performed, in the survey itself it was up to the participants themselves to make the judgment call on which full time employees they would put under each category. Thus, from their own perspective, the current split is very heavily weighted towards the operational.

Procurement Performance in Detail

Purchase Price Rate

We asked participants: "What was the average purchase price rate (price reduction or price increase) across all procurement categories in the last three years in percent (average per annum, inflation adjusted)? Please provide an estimate if the precise data is not available. Indicate price reductions with negative figures (e.g. -1.7%) and price increases with positive figures (e.g. 0.6%)."

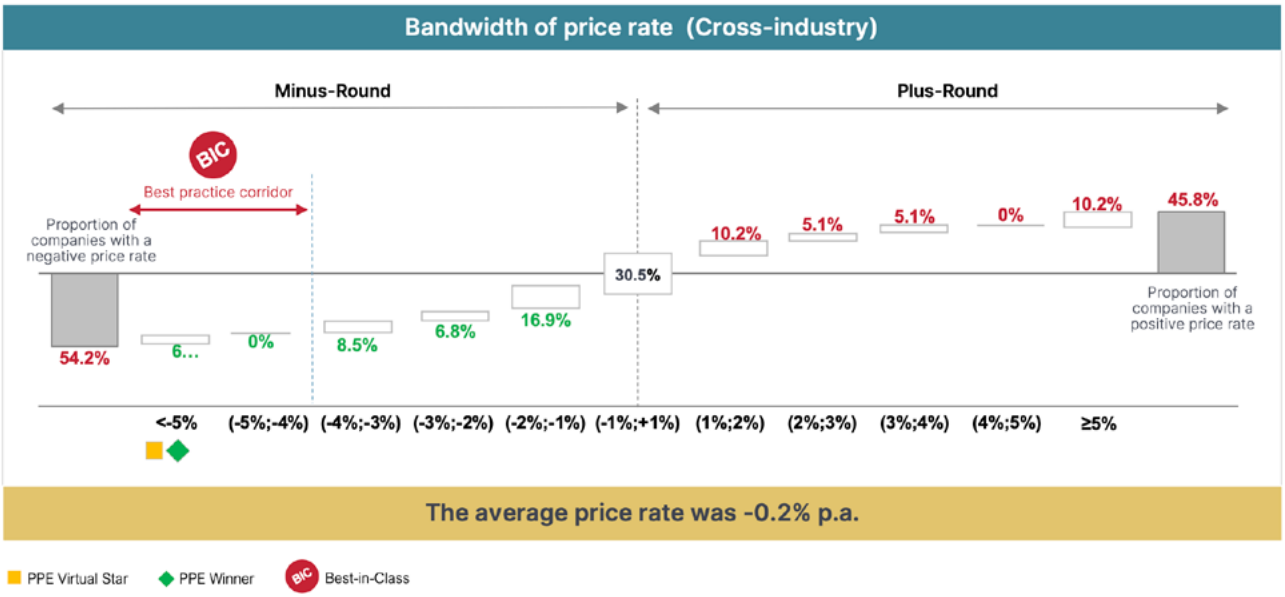


Figure 5: What was the average purchase price rate (price reduction or price increase) across all procurement categories in the last three years in percent (average per annum, inflation adjusted)?

Over the past three years 54.2% of the procurement organizations responding to the survey achieved an average annual decrease in spend (negative price rate) while 45.8% saw an increase (positive price rate). The average fall in spend across all participants (cross-industry) was 0.2% per annum. Best practice is an average annual spend reduction of above four percent, achieved by 6.8%. These figures do not compare favorably with what we found in 2016, when 29.4% of respondents came within this best practice corridor and the average fall in spend across all participants was 1.4%.

There are a couple of possible interpretations that can be placed on this relative decline in performance. One is that the supply chain disruption of Covid-19 meant that the emphasis switched to securing supply rather than negotiating better prices.

However, it may be that prices were already driven down as far as they could be using traditional negotiating methods and the small number of companies in the best practice corridor are those that have moved to the next level. I.e., there appears to be less scope for savings through hard bargaining alone. Our experience tells us that nowadays it takes more than negotiating favorable or long-term deals with suppliers. What matters is to build on this with cross-functional collaboration, technical and qualitative discipline in procurement, and discipline in all functions from production to marketing. In short, intense cooperation across the organization. Only in this way will a company's procurement team encourage innovative ideas to use resources more effectively, gain the necessary insight to identify savings and build trust in the buying departments to execute on the findings.

Concentration on Key Suppliers

We asked participants to provide data on key supplier concentration, where the indicator is given by "number of key suppliers" divided by "number of active suppliers".

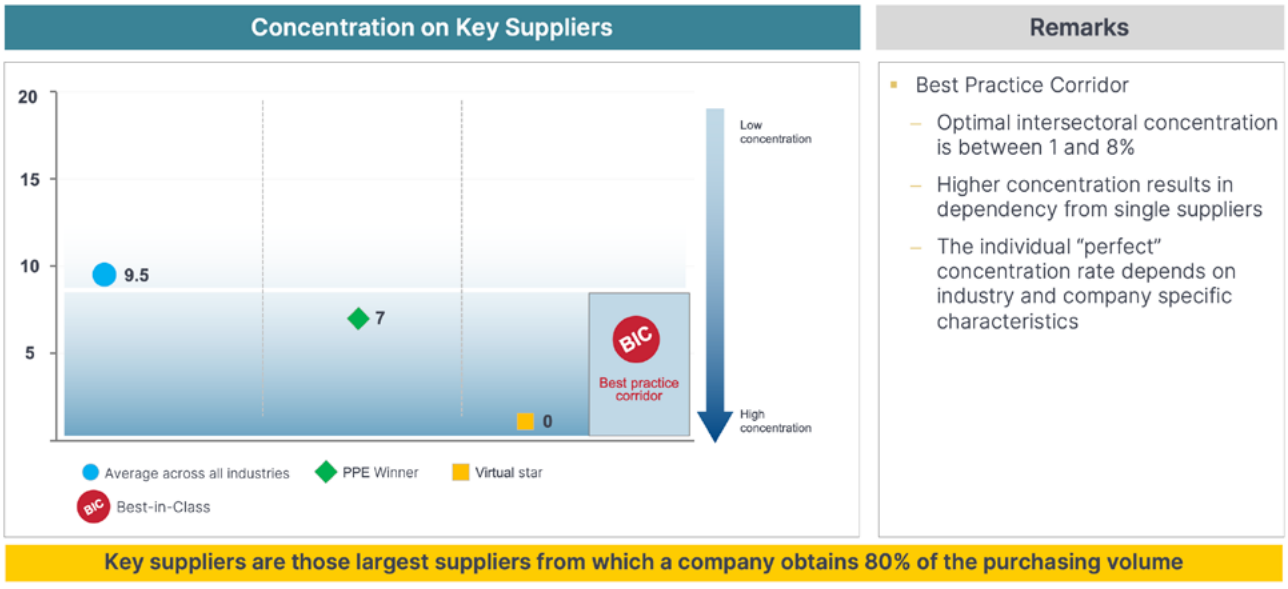


Figure 6: Please provide the following supplier data on key suppliers concentration. The indicator "concentration on key suppliers" is given by "number of key suppliers" divided by "number of active suppliers".

What is the proportion of key suppliers within the entire supplier universe? Key suppliers here are defined as those who account for 80% of total spend. The smaller the number of those suppliers, the higher the concentration. For example, if a company places 80% of its spend volume with 1% of its suppliers, that is an extremely high concentration; a company that places 80% of its spend volume with 20% of its suppliers has a relatively low concentration on key suppliers. Our best practice corridor here is under 8%, the reason being that it is normally only possible – though there may be wide variations by industry – to devote the necessary time and intensity of engagement to a relatively small number of partners.

Our survey revealed that, on average, key supplier concentration among our panelists' organizations was 9.5%. This is a relatively high concentration close to the "best practice corridor". Nevertheless, it represents a slight dilution of key supplier concentration compared with 2016, when we asked the same question, and the average was 8%. This shift may reflect the Covid-19 countertrend to diversify the supplier base, largely to mitigate risk, reduce single-supplier dependency and increase flexibility.

Key Supplier Management

What is the relationship between the number of employees working in strategic procurement and the number of key suppliers? The answer provides another interesting metric, on Key Supplier Management. For example, if an organization has 20 employees in strategic procurement, and 100 key suppliers, then the ratio is 1:5. Each strategic buyer manages five key suppliers. The smaller the value, the more intensive the relationship with strategically important key suppliers.

In our survey, the average number of key suppliers per respondent organization was given as 604, and the average number of full-time employees in strategic procurement was given as 37, producing a key supplier management rate of 603/37=16.3. This is not only alarmingly high but also a dilution of focus compared with 2016, when the equivalent figure was 6.1.

To achieve best practice, an organization must achieve the right balance to maximize the benefits from key suppliers. Our best practice corridor is three key suppliers per supplier management specialist or fewer. If the ratio is close to or above 1:10 then alarm bells should start ringing as it is virtually impossible for one individual to manage such a large number of strategic relationships with the necessary intensity. There seems little doubt that this year's result of 1:16 largely reflects the impact of Covid-19, although it is impossible to determine the exact extent.

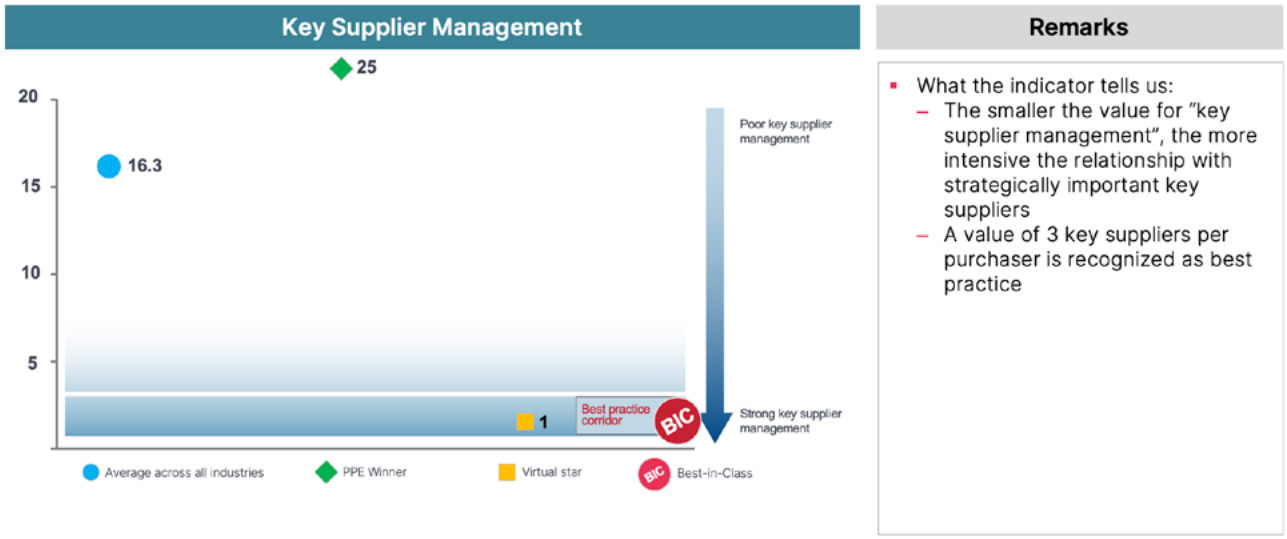


Figure 7: The indicator "key supplier management" is given by "number of key suppliers" divided by "number of employees in strategic procurement".

Procurement Strategy and Objectives

The survey posed a series of questions to enable a forensic qualitative assessment of the extent of transformation and maturity towards best practice. We asked, *"To what extent do the following characteristics apply to your procurement strategy?"* and listed 12 characteristics of a best-practice organization. We asked the participants to rank their organization's current status on a four-point scale, from "Does not apply" through "Applies to some extent" and "Applies to a large extent" to "Fully applies". We then computed the panel averages, which are indicated in Figure 8. The blue lines represent the actual results, and the orange line indicates the maximum possible value. Some of these characteristics are picked out as representative of best practice criteria in "best-in-class" (BIC) organizations.

Overall, the blue line has shifted from left to right since we last undertook a similar survey in 2016, including on the points where a direct comparison is possible. Nevertheless, there are some areas that are still significantly neglected. Notably, the average rating from the characteristic *"The 'future procurement areas' for technologies, products and services that we intend to source from external partners and suppliers in the future are continuously derived from our company-wide development program and are clearly defined"* remains at the lower end of the "Applies to some extent" range, as does the characteristic, *"The 'end-to-end' procurement process in our company from demand specification to supplier identification/qualification to contract management and strategic supplier management is seamlessly established and runs harmoniously and efficiently."*

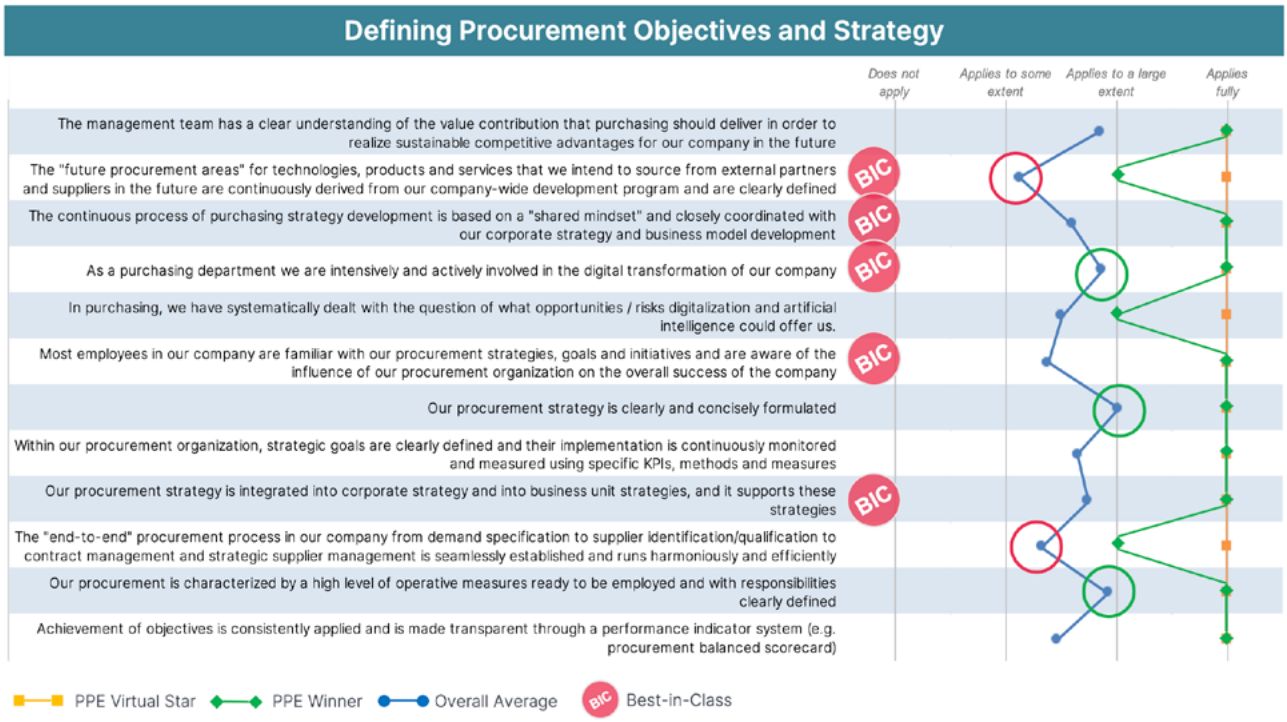


Figure 8: To what extent do the characteristics listed apply to your procurement strategy? Values are the panel average.

(This was not one of the questions in 2016.)

Taken together, the two weak points indicate that procurement still has some way to go if it is to embed itself as an equal partner in a fully cross-functional and well-coordinated enterprise-wide strategy. The end-to-end effect and the synergies that it brings are still largely absent. Moreover, procurement is not yet systematically and sustainably integrated into the wider organization's innovation cycle to acquire and implement the technology, products and services that will drive competitiveness and success in the future.

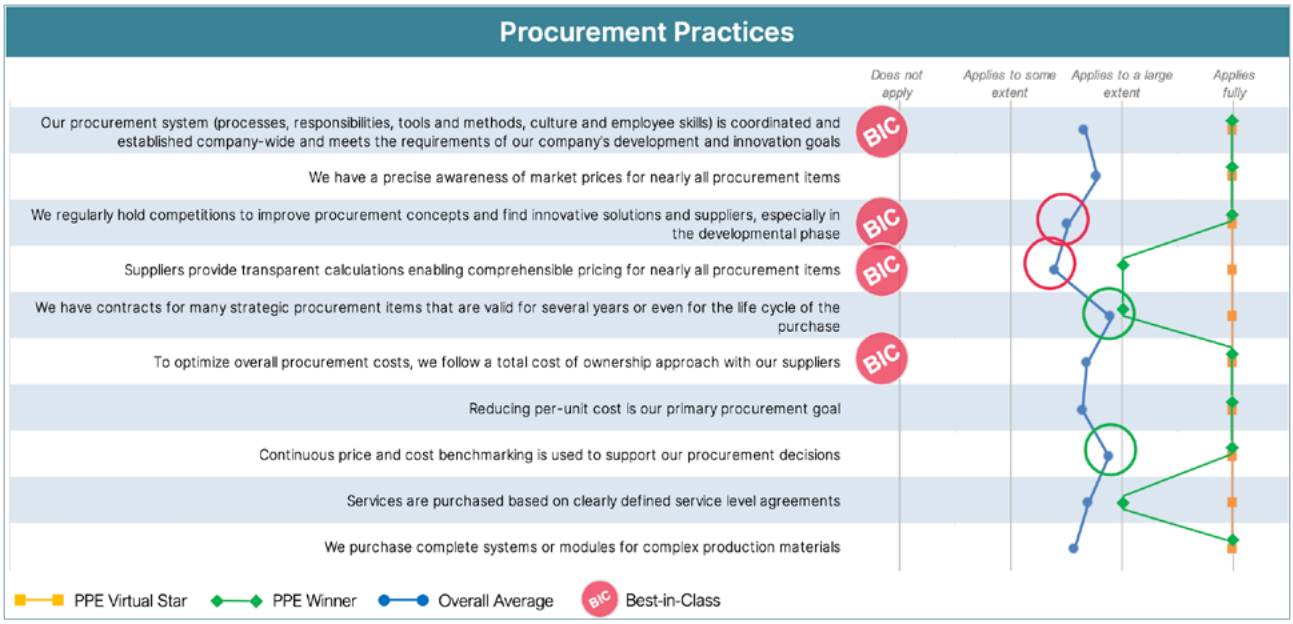


Figure 9: To what extent do the characteristics listed apply to your procurement practices? Values are the panel average.

Procurement Practices

We then asked, *"To what extent do the characteristics listed apply to your procurement practices?"* and listed ten characteristics, four of them identified as determined by "best-in-class" (BIC) criteria. Although continuous benchmarking and multi-year contracts have been largely established across procurement departments, the low degree of *"transparent calculations from suppliers, enabling comprehensible pricing for nearly all procurement items"* indicates that there is still considerable savings potential that could be realized. Money is being left on the table. Another area that we have designated as important in "best-in-class" organizations revealed itself as a relative weakness: *"We regularly hold competitions to improve procurement concepts and find innovative solutions and suppliers, especially in the developmental phase."* These are both characteristics that we would expect to see in a best-in-class procurement function.

Areas of procurement practices that revealed themselves as relatively strong were benchmarking *("Continuous price and cost benchmarking are used to support our procurement decisions")* and multi-year contracts *("We have contracts for many strategic procurement items that are valid for several years or even for the life cycle of the purchase")* although we would expect most organizations to have already established these practices – they are no longer representative of a best-in-class procurement function.

Here again, a slight improvement on the 2016 results is evident on most of the characteristics that allow direct comparison (e.g., suppliers provide transparent calculations, continuous price and cost benchmarking, TCO) indicating some progress on best practices.

Procurement Process

The survey panel was asked, *"What percentage of the time available to your whole procurement organization is spent on the following processes?"* The survey questionnaire listed 16 procurement processes (including "other") and asked respondents to reply within five time bands ranging from 0% to greater than 25%. The processes included five that could be more or less labelled "operational" and ten that could be more or less labelled "strategic". However, the most time-consuming process activity was *"Running special projects to improve / develop procurement"*.

Although this is normally considered a strategic activity, the amount of time expended in this area must surely reflect a Covid-19 impact on procurement, including a lot of operational "firefighting" or "war room" management. The time spent here shows a sharp increase on previous surveys but because of the exceptional circumstances it is difficult to ascertain if these special projects will have a sustainable effect, though it is probably reasonable to assume that Covid-19 jump-started or accelerated some initiatives that were already waiting for approvals or resources.

It is also clear from the results that *"Assessing orders"* burns an inappropriately large amount of time. This is a blunt process that can and will be increasingly automated in the coming years.

Generally speaking, more needs to be invested in technology to reduce time spent on operational activity (shifting the line further to the left). Although there has been some progress since 2016 in areas such as supply chain planning and make-or-buy analysis, more time needs to be invested in the strategic processes that add sustainable value to the enterprise. Survey results suggested the need for greater focus on the four processes *"Conducting demand assessment / supply chain planning", "Make-or-buy analyses", "Supplier management" and "Procurement market research"*.

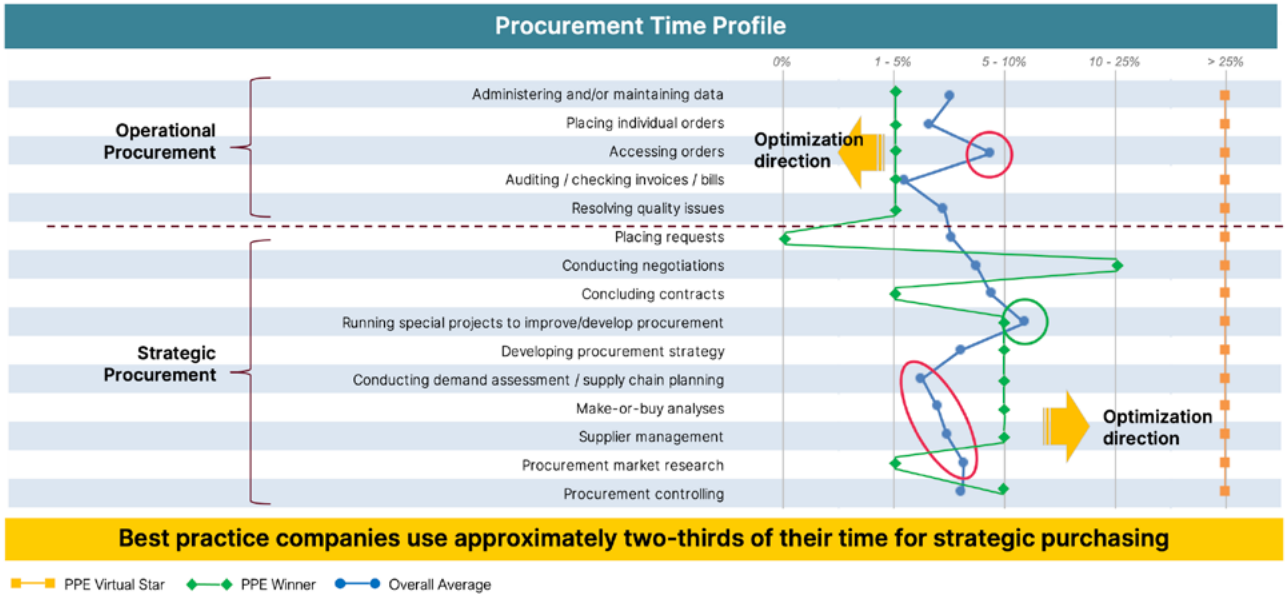


Figure 10: What percentage of the time available to your whole procurement organization is spent on the following processes? Time spent in % (∑ = 100%) (please evaluate each option).

Cooperation with Internal Customers

The survey went on to ask participants, "To what extent does your procurement department cooperate with internal customers (company units)?" and to rank their answers on a scale from "none" to "high". We can begin by noting a very wide divergence in the levels of cooperation, with Marketing and Human Resources getting a "fairly low" amount of attention from procurement. One would expect this to change over the course of time: Marketing, because companies are increasingly customer-driven, and this must surely contribute to supplier management. Some companies already see the benefit in establishing alliance programs with strategic suppliers.

And HR, because the employment market has evolved away from exclusive reliance on full-time employees to a more hybrid approach, in which organizations recruit a contingent or extended workforce (contractors, freelances etc.) and this calls upon the expertise of both HR and procurement functions.

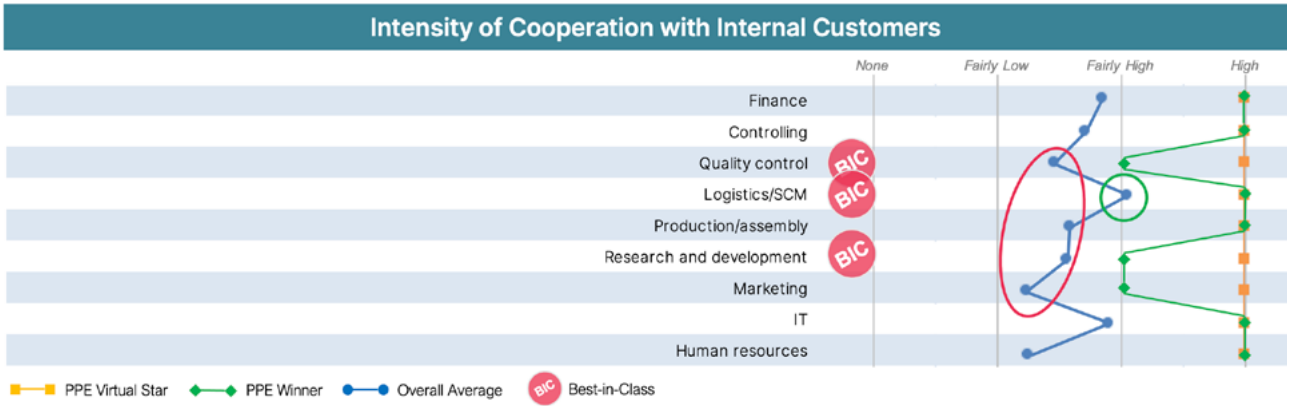


Figure 11: To what extent does your procurement department cooperate with internal customers (company units)? (Please evaluate each option.)

As in the past, logistics/supply chain management still dominates time and attention devoted to internal cooperation. It was alone among company functions in breaching through from "fairly high" to "high"; nevertheless, even here, cooperation falls short of the optimum. The next internal customers that procurement should be looking to cooperate with very closely are Quality Control and Research & Development. In both of these, QC in particular, the level of cooperation is still disappointingly low. There is a slight improvement on 2016 in Quality Control and Production/Assembly but otherwise little change. In fact, cooperation with the Marketing function appears to have diminished.

Overall, there is ample scope for procurement to play a more active role not just as a participant but also even as an orchestrator of cross-departmental initiatives and projects. This is not simply a functional question, it is one of cultural change and qualitative evolution to give procurement the visibility and prominence in decision-making that would more accurately reflect its role, as enterprises focus more intensively on their core strengths and rely on key suppliers to meet their extended needs. Of course, it is not always an easy transition to make for someone schooled in dealing with one supplier at a time, but this is the direction of travel.

Procurement Organization and Qualification

Human Resources in Procurement

The survey then inquired, *"To what extent do these criteria apply to human resources in procurement?"*, listing eleven of them. The responses were somewhat disappointing. They suggested that the development of digital competences in procurement has been significantly neglected – yet these are precisely the competences that will be needed now and in future. Secondly, skill development on cross-functional collaboration needs further emphasis if procurement is to be rightly positioned as a "networked value-added manager". A cultural shift is required here to enable procurement professionals to see the wider context of their role and work cross-functionally; procurement professionals must receive adequate education and training to develop in this direction. These are all aspects of a "best-in-class" procurement organization.

Another aspect where we would like and expect to see further movement regards procurement taking a lead in promoting sustainability on cross-functional teams.

Digital competence in procurement is significantly neglected. Skill development on cross-functional collaboration needs greater emphasis to position procurement as the “networked value-added manager”.

Deeper analysis on this topic based on the research findings has indicated little variation according to the size of company. Bigger is not necessarily better in this respect and there are some great examples of best practices in smaller companies, especially those that are relatively recent startups, perhaps with a high percentage of digital natives who also embrace contemporary cross-functional team culture. Insofar as we have identified a variation through our work with clients, it tends to be the medium-sized companies that are slower to move, because they lack both the flexibility (and in some cases the modern outlook) of the very small companies, but they also lack the staff development resources of the very large companies.

Compared with 2016, we can detect a marginal improvement in the proactive management of supplier and revenue/ yield management. There has been some but little progress on environmental and sustainability issues.

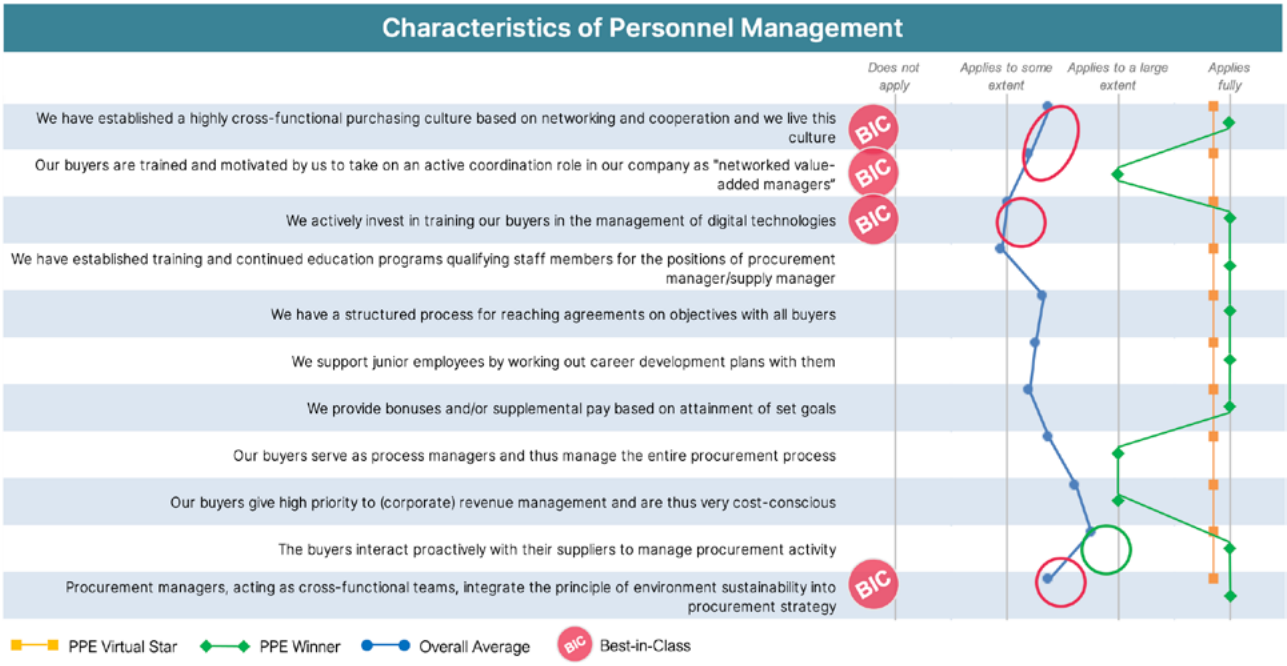


Figure 12: To what extent do these criteria apply to human resources in procurement? (Please evaluate each of the criteria.)

Head of Procurement within the Company Hierarchy

Procurement is gaining influence through an enhanced status of its leadership in organizational structures. We asked, "On which hierarchical level is the position 'Head of Procurement' located in your organization?" In two-thirds of the participating organizations, the leader of the procurement function is at the top or second level of the hierarchy. The largest number (45%) are positioned on the second level, that is to say, division management. But a sizeable proportion (21%) are represented at board level. A further 28% are at the third level, that is to say, department management, and just 6% at the fourth level.

Compared with previous surveys this does indeed show a systematic progression "from the backroom to the boardroom". In 2016 12% of heads of procurement were still at the fourth level of management. This number has been halved, while the percentage at the top (board) level has leapt by half, from 14% to 21%. Procurement is seen as increasingly important to corporate success in more and more companies. However, there is still some distance to travel. By far, the majority are still at the second or third level, down only fractionally from 2016.

Hierarchical Suspension of Procurement Function

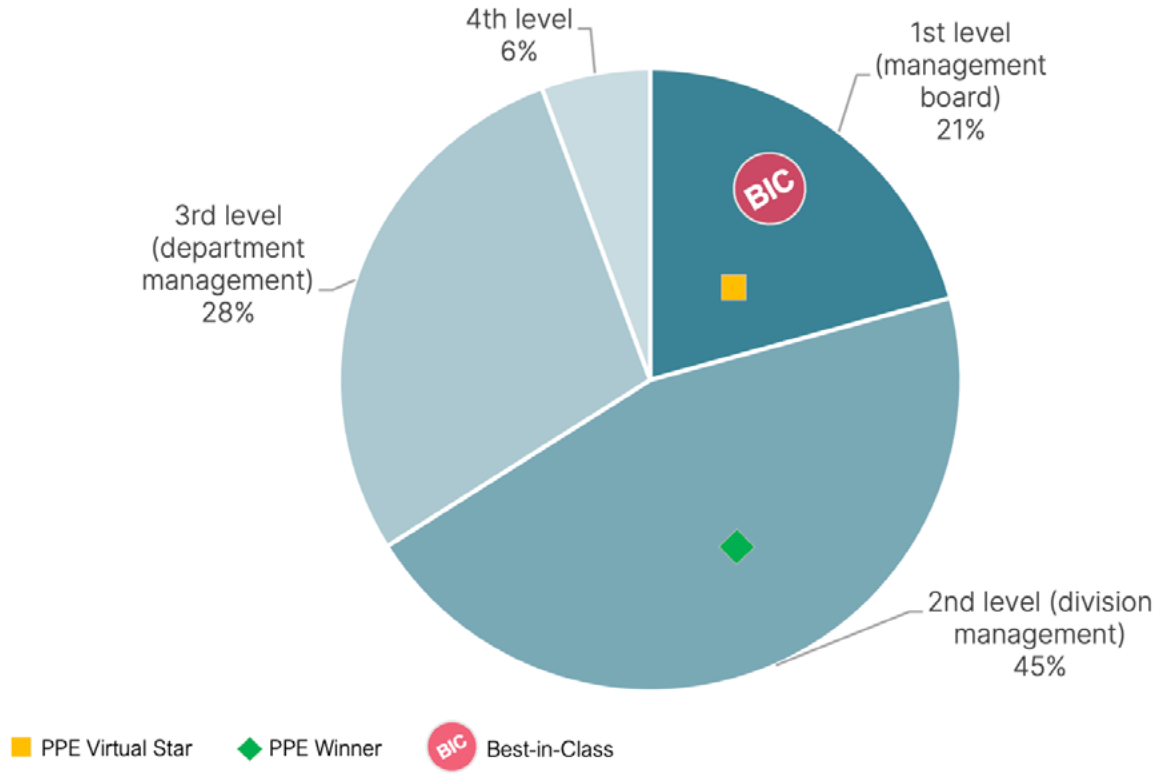


Figure 13: On which hierarchical level is the position "head of procurement" in your organization located?

Supplier Management

Supplier Management: Evaluation and Selection

We then turned to supplier management, which we subdivided from the more “operational” activities up to the more “strategic”, beginning with the classic bread-and-butter topic of supplier evaluation and selection, moving to the next stage of supplier development, then to supplier integration, which is more dependent on the deployment of robust processes and IT, and then finally supplier portfolio management, which implies a new outlook and should define the future direction of the discipline. In all four areas we took a top-down approach; naturally, there are other subordinate disciplines, such as category management.

Respondents were asked, “How well do the following characteristics apply to your current evaluation and selection of suppliers?” and invited to rate their performance against 11 characteristics on the scale “Does not apply” to “Applies fully”. The overall picture is that supplier evaluation and selection is highly standardized and well defined in the majority of organizations. They also require suppliers to provide proof of quality such as certification to the ISO 9001 standard, QS 9000 or internal quality audits. Nevertheless, we identified a couple of weak points. There is a low level of joint optimization systems and related bonus programs with suppliers, indicating limited collaboration intensity with key suppliers. On the latter, even the best-performing respondents stated that they fall short of best practice on the bonus systems.

The 2020 results show little significant change compared with 2016, although there is a slight improvement in the definition of criteria for selecting suppliers. Joint optimization programs is an area in need of attention, showing no or negative change since 2016.

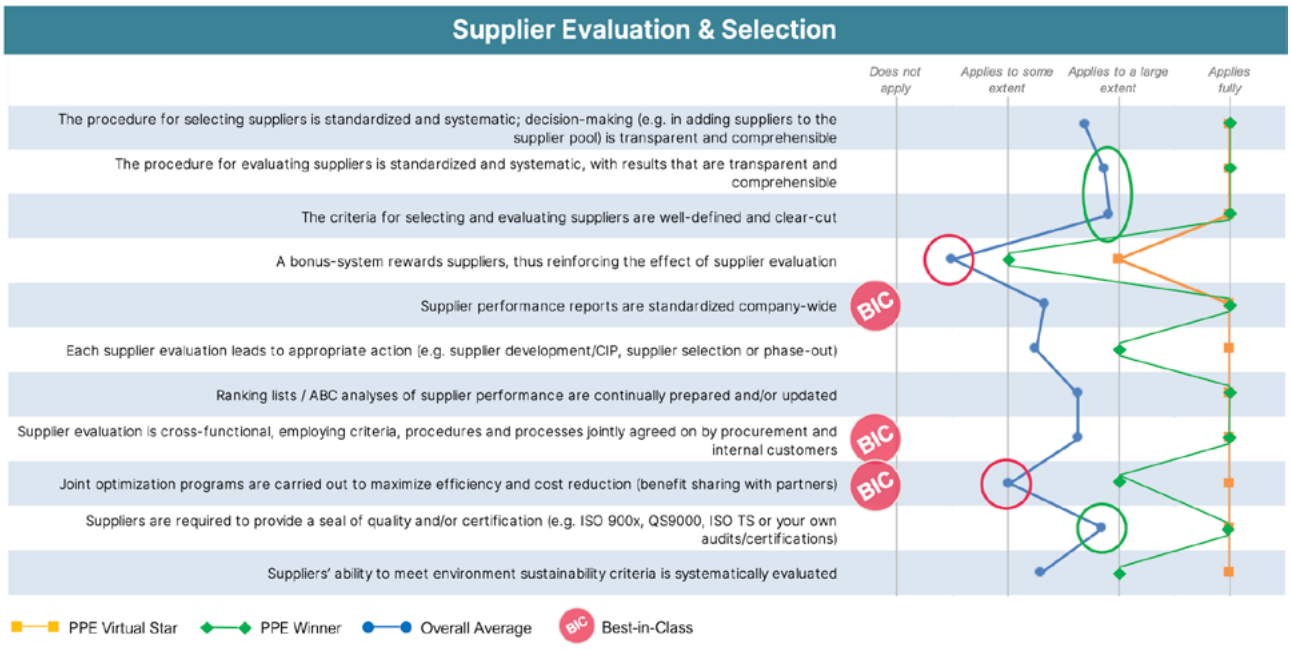


Figure 14: How well do the following characteristics apply to your current evaluation and selection of suppliers? (Please evaluate each of the characteristics.)

Supplier Management: Development

Respondents were asked to rate their performance in supplier development against seven criteria, on the scale "Does not apply" to "Applies fully". Overall, the survey identified a lack of focus on strategic supplier management and development, indicating that significant optimization potential is not being leveraged as much as it could be. Specifically, there is an opportunity for procurement to provide more support to suppliers in their efforts to increase efficiency and to provide feedback for corrective actions by continuously monitoring progress. Most tellingly, organizations are under-performing when it comes to providing key suppliers with medium-term development plans that outline clear objectives. The sharing of financial rewards arising from savings, and support for suppliers in implementing lean management and production, are areas of strength, and we regard these as criteria for adjudging and organization "best-in-class".

Taken as a whole, the areas of strength and weakness indicate a profile suggesting a significant impact of the Covid-19 crisis on procurement in mid-2020, as the focus has been on cash retention rather than long-term development. Compared with 2016, support for suppliers in implementing lean management techniques, which is a long-term investment, was less of a priority, whereas active support to increase efficiency improved somewhat.

Figure 15: To what extent do the following criteria apply to your supplier development? (Please evaluate each of the criteria.)

Supplier Management: Integration

The survey measured supplier integration against eight criteria, again on the "Does not apply" … "Applies fully" spectrum. Overall, the responses indicated that the level of supplier integration is low, and that the majority of respondents' organizations are neglecting important activities. The concept of building partnership models with suppliers and implementing standardized systems and processes to maximize supplier integration, are still the exception, not the rule, and these are criteria for adjudging an organization "best-in-class". There has been some, though not significant, progress in these areas compared with 2016, but they will need more decisive action moving forward. There is also room for more discussions with suppliers at the top management level, which has barely changed since 2016. The majority of respondents reported that they have no program for regularly presenting awards to top performing suppliers, which we believe to be highly motivational and an excellent way to ensure that suppliers take a direct interest in their customers' success.

One area in which the panel has shown significant progress since 2016 is through the integration of suppliers with ERP and inventory management systems.

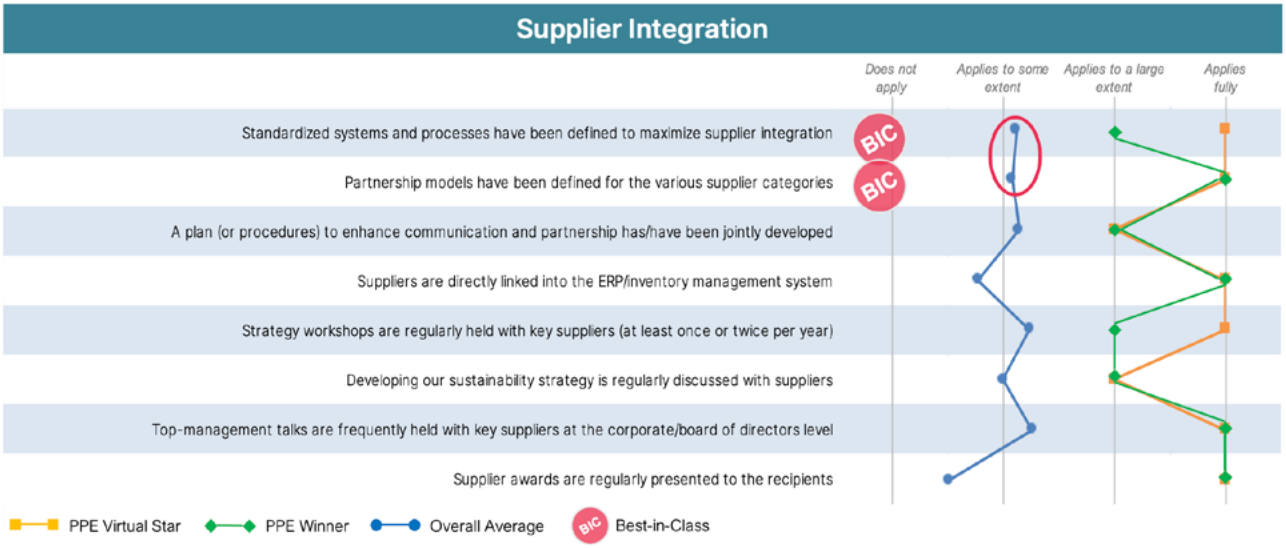


Figure 16: How well do these criteria apply to your current supplier integration? (Please evaluate each of the criteria.)

Supplier Management: Portfolio Management

Portfolio approaches to improving procurement and supply chain management practice have gained ground in recent years. It is currently the highest level of strategic supplier management and can only occur when the procurement function builds competence in understanding the "big picture" of the entire supplier portfolio as opposed to managing suppliers on an individual, one-to-one basis. Only in this way can you develop strategies to optimize the portfolio (often modeled as a pyramid of needs and/or objectives) to meet objectives such as supplier diversity, risk mitigation etc. as well as cost reduction.

Respondents rated their performance on supplier portfolio management against nine criteria on the "Does not apply" ... "Applies fully" spectrum.

Optimization through supplier portfolio management, a focus on total cost of ownership (TCO) and proactive risk management are all weak competences that will require more attention now and in the near future, although there has been progress since 2016. These are characteristics of a best-in-class organization. Many procurement organizations need to invest in appropriate initiatives and related supplier management tools.

Overall, the development since 2016 has been positive, with the exception of consistent optimization of supplier portfolios as a fundamental strategic objective. The biggest positive shift – and it is considerable – was in proactive risk management. These two shifts strongly suggest a Covid-19 effect: it is difficult to pursue consistent portfolio management during a crisis, whereas risk management and mitigation to cope with supplier failure have obviously come to the fore. We are convinced that these two areas, as well as the classification of supplier data based on TCO will merit closer attention in the years ahead.

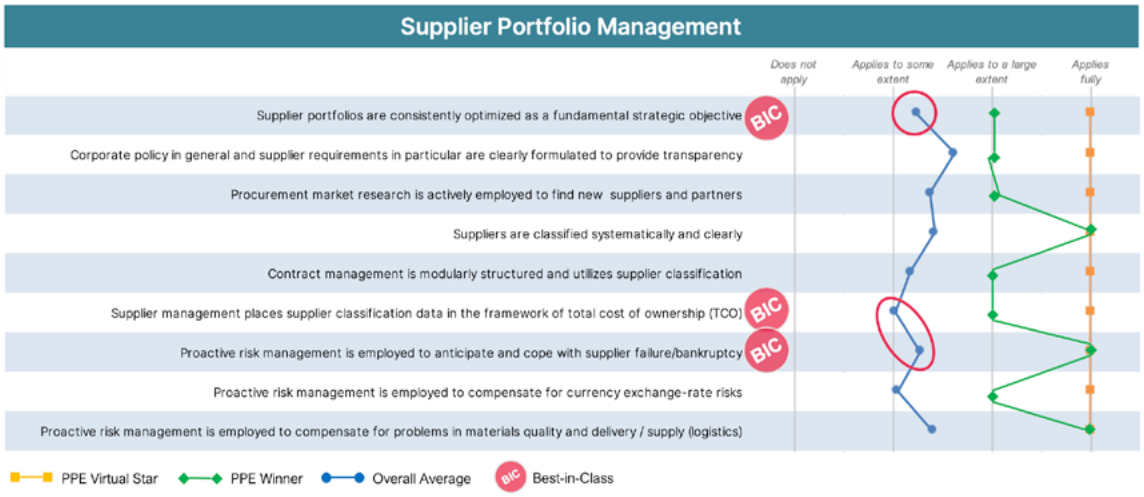


Figure 17: To what extent do these criteria apply to your supplier portfolio management? (Please evaluate each of the criteria.)

Technology Management

Digitalization

The survey asked respondents to assess their current state of digitalization. 87% of all companies see value in digitalization and have made significant progress, with 55% having digitized core processes and a further nine percent have fully digitized their supplier communication. The most commonly implemented digital technologies are big data/data lakes, which are a necessary starting point for gaining transparency and end-to-end process efficiency, and robotic process automation (RPA) for automating routine tasks in procurement. Bots, e.g., for guided buying, artificial intelligence and natural language processing are less well developed in procurement organizations but they are new and there is growing interest. We expect the usage of AI technologies to grow as organizations develop the necessary competences and an awareness of the many possible use cases.

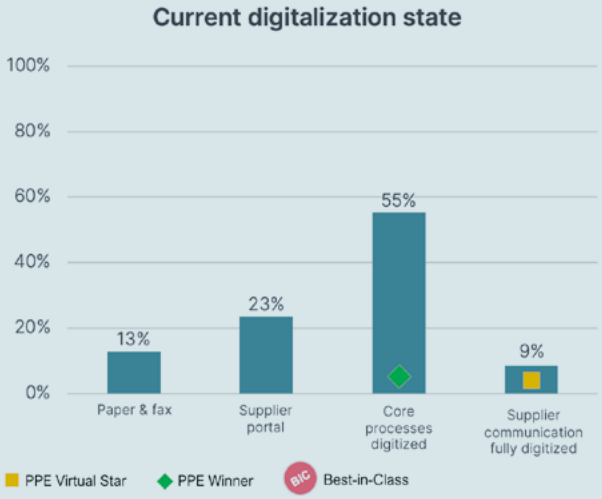


Figure 18: Please assess your current digitalization state (Single choice allowed.)

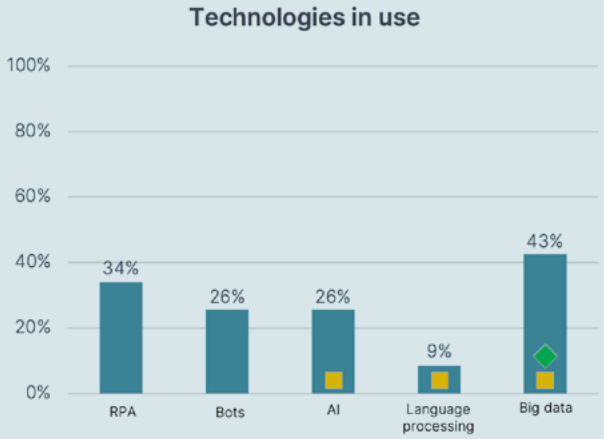


Figure 19: Which of the following technologies are already in use by the procurement department? (Multiple choices allowed.)

Supplier Management

Respondents were asked, "What is the maturity level of your supplier relationship management? To what extent are you using your supplier relationship solution?" It appears that companies are struggling with rollout and change management: 68% have a supplier relationship management solution in place; however, a mere two percent have fully implemented it and nearly a third (30%) have no solution implemented. Thus, more than two-thirds of companies have implemented supplier management in one or more areas only, or else they have implemented a full solution but have not yet rolled it out across the organization, perhaps because of a lack of human resources capacity with the right competences, or because of the way the organization and its procurement function is structured, or possibly some areas of the business have simply not embraced change.

In essence then, the technology is there but human and structural factors are preventing full implementation. These findings are consistent with what we found in the previous section under supplier integration, in which most of the statements "apply to some extent".

"Fully implemented" here does not necessarily mean that all suppliers are included in the system; we know from experience that this is rarely if ever the case for historical reasons.

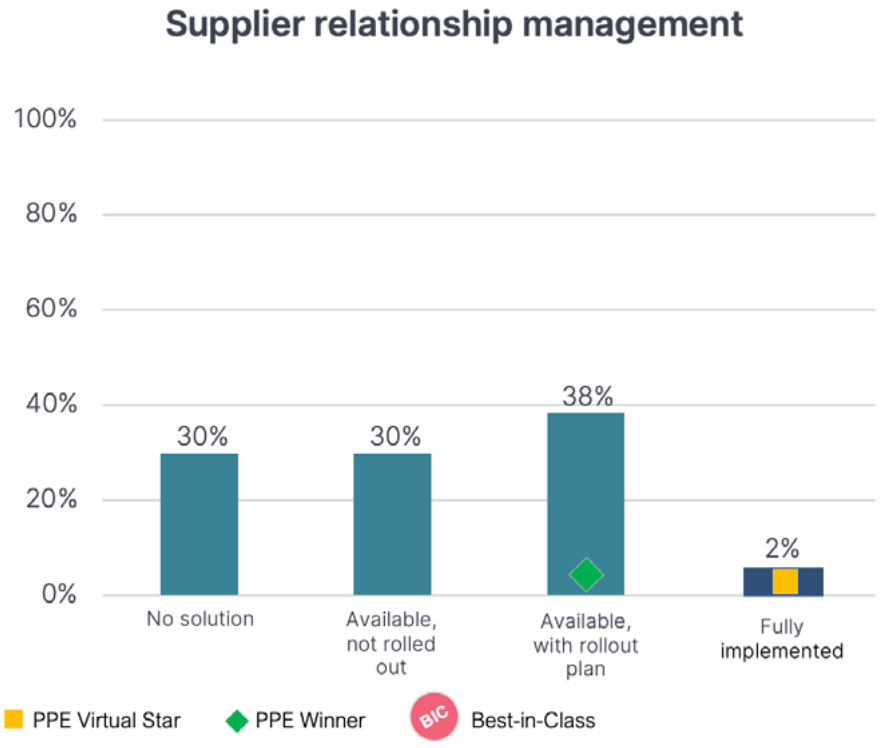


Figure 20: What is the maturity level of your supplier relationship management? To what extent are you using your supplier relationship solution? (Multiple choices allowed.)

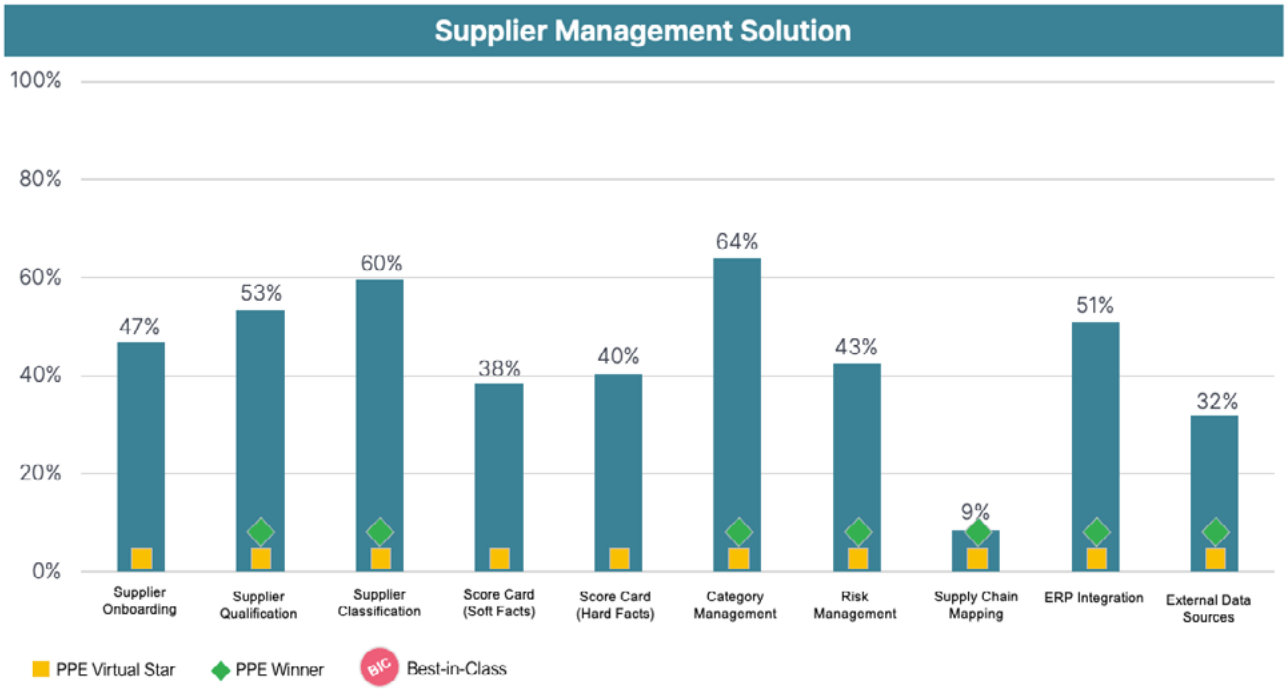


Figure 21: Which of the following functions are available in your supplier management solution? (Multiple choices allowed)

Supplier Management Functions

Digital supplier classification and category management are key drivers for SRM solutions, respectively implemented in 60% and 64% of organizations. However: a note of caution. It is likely that in answering this question, some participants interpreted "category management" in the purely technical sense of grouping major product categories, and not in the active sense of strategically managing categories. This is an assumption, but one that is well founded based on the lower scores on the other functions, which one would expect to be higher if category management really is being treated as strategic in nature.

This would also explain the fact that supplier classification rated a high score, yet lower than category management.

Modern supply chain mapping is the process of engaging across companies and suppliers to document the exact source of every material, every process and every shipment involved in bringing goods to market. Supply chain mapping via SRM solutions is rarely used and is quite a new discipline. But any organization that wants to have full visibility over its supply chain and the way it changes in real time will need to develop this function.

A mere nine percent of our respondents have implemented supply chain mapping, but we will see this increase for a number of reasons in different industries over the coming years: regulatory compliance, risk mitigation, proof of provenance etc. In particular, strategic procurement professionals will be asking themselves the question, *"Where in this complex supply chain are we most vulnerable?"* Only supply chain mapping, combined with proactive risk management, will provide the answers. The Covid-19 situation has undoubtedly put the current lack of transparency, and the potential exposure to disruption, into sharp focus. For it not yet to be implemented, or even on the radar, is a matter for concern.

eSourcing Tools

Respondents were asked, *"To what degree is your procurement organization using eSourcing tools?"* and asked to name specific features and functions provided by their eSourcing solution (with multiple choices allowed). We can define eSourcing broadly as the process of obtaining bids from different suppliers via an online portal. The benefits of eSourcing are well known and include streamlining the sourcing process, reducing prices by maximizing supplier competition, creating a repository for sourcing information, and compliance.

Given the benefits, it is surprising that eSourcing solutions are less of a priority than SRM and order management:

43% of respondents said they have not yet implemented any solution, which was an unexpectedly high number especially when you consider that the equivalent figure for supplier relationship management was 30%.

It may also be that some organizations are as yet unable to implement eSourcing because other strategic supply management functions are not yet in place. Among those that have implemented eSourcing, the use of category templates and leveraging supplier management data are drivers for efficiency and compliance. I.e., information generated and stored from other upstream activities can be used to support eSourcing.

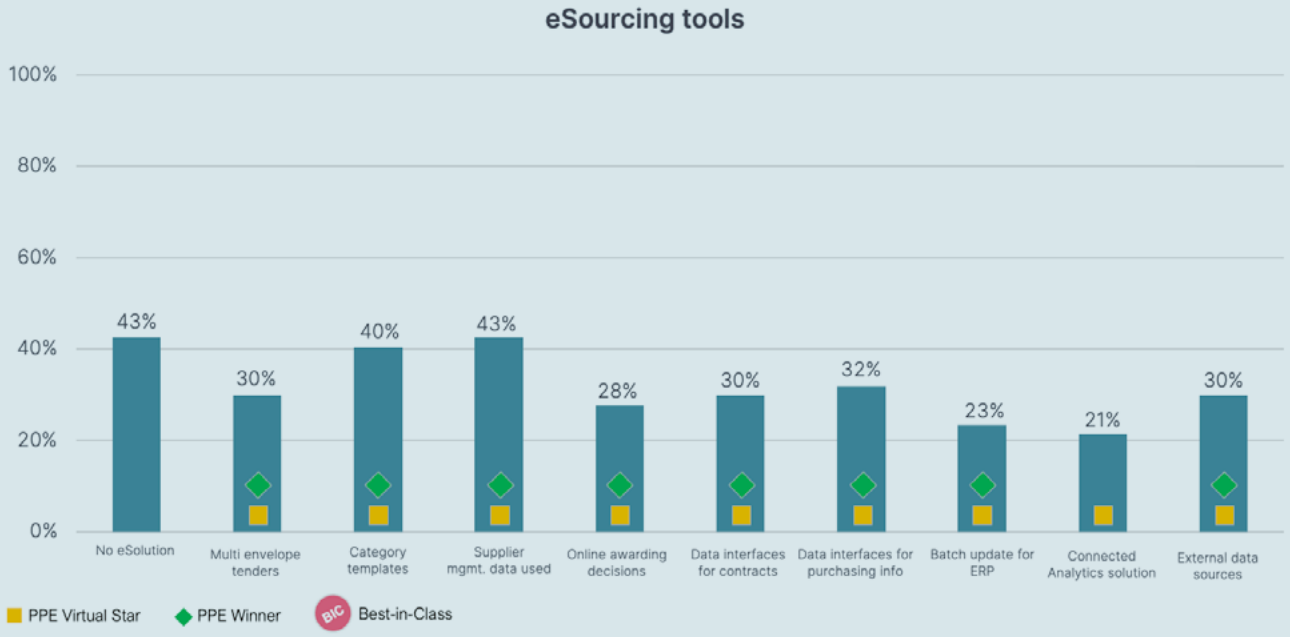
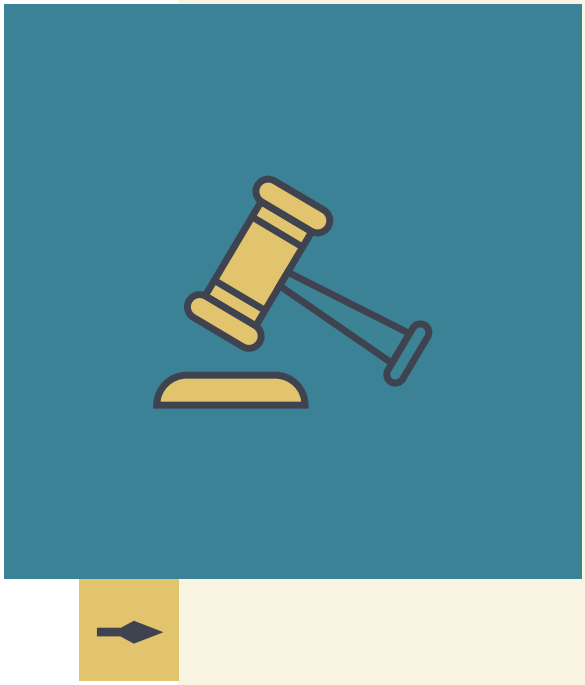


Figure 22: To what degree is your procurement organization using eSourcing tools? Your eSourcing Solution provides the following features and functions? (Multiple choices allowed.)

eAuctions



An eAuction is a transaction between sellers and bidders (suppliers in business-to-business scenarios) that takes place on an electronic marketplace and allows suppliers to bid online against each other for contracts against a published specification. There are two main benefits: first, to stimulate competition to achieve savings, and second, to reduce the burden of lengthy "manual" negotiations with potential suppliers. eAuctions have been around and in use for a good quarter of a century. We asked, *"What is your organization's level of expertise when it comes to eAuctions?"* Inevitably, the number answering "not at all" had to be higher than the 43% of non-users we registered for eSourcing, but we were still a little surprised to learn that a clear majority (55%) do not do eAuctions at all.

Perhaps even more surprising was that only 17% consider eAuctions a strategic topic and only 11% have key performance indicators (KPIs) to measure the performance of eAuctions. This shows a low level of maturity and missed opportunities not only to achieve savings but also to achieve other objectives from sourcing, such as risk mitigation and increasing supplier diversity. There are many possible reasons and explanations for the low penetration of the eAuctions approach in the organizations that responded to the survey. It is likely that many organizations are wary of eAuctions and the possible risks that they pose, such as the oversimplification of relationships with suppliers. Others, especially among medium-sized companies, may simply lack the necessary competence. Another reason is a lack of clarity around the motivation: is it to cut costs, to save time, or to identify new suppliers?

To get maximum benefit from eAuctions requires buyers to understand when they are appropriate and when they are not, and both buyers and suppliers to be well trained and experienced. All parties need to be fully briefed on the process and rules of each event. If any party suffers

from a bad eAuction experience, then it is likely they will be reluctant to enter into the process again. All of which presents a few obstacles, but with the right vendor providing appropriate support, and by running a trial or pilot project including suppliers, getting their feedback and acting on it, these doubts can be overcome and eAuctions can be implemented with a high degree of maturity and confidence, even for complex categories, so long as the right tool is used. Yet the survey results indicate that few – just 11% – are engaging external support for eAuction projects.

In our opinion, eAuctions make most sense at both ends of the buying spectrum.

First, for expensive goods that are of extreme strategic importance to an organization. Such eAuctions take a lot of planning and analysis to prepare; there are typically many variables and therefore many scenarios that require some automation; but at the end of the day, you can save a lot of money, even if it costs you a lot of time. At the end of the spectrum are tail spend commodity purchases, where there are savings to be made but there is little point in spending a lot of time on the project because one supplier is much the same as the next. These are very different events but, in both cases, you need some expert help to set things up.

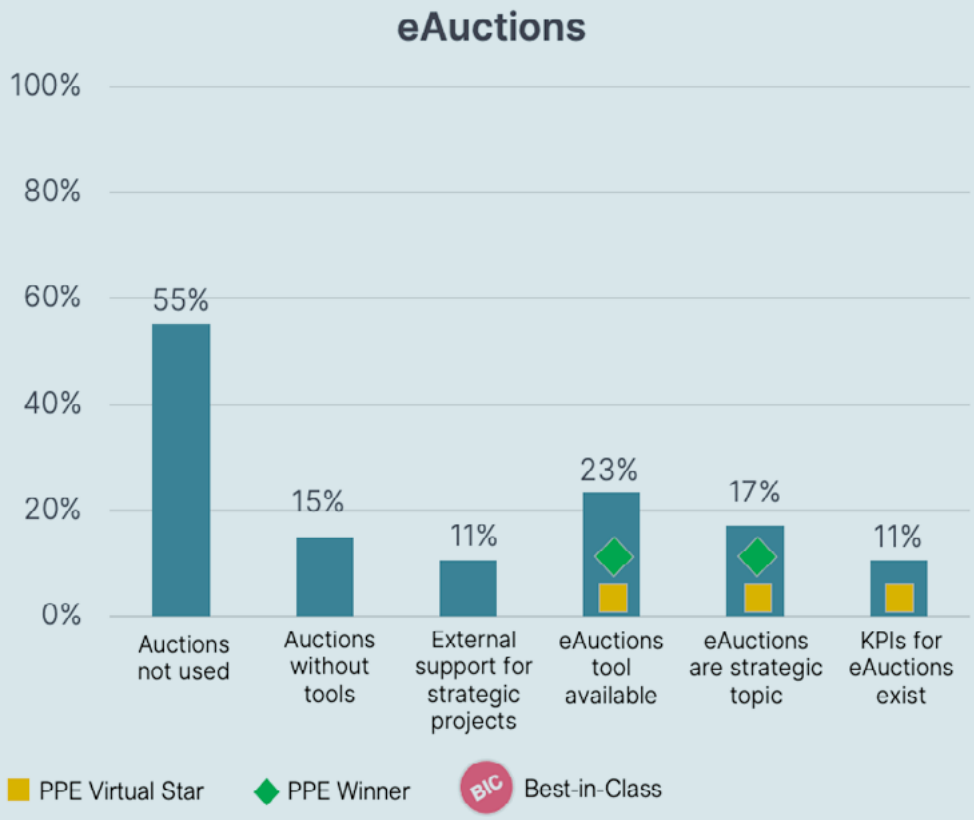


Figure 23: What is your organization's level of expertise when it comes to eAuctions? (Multiple choices allowed.)

Contract Lifecycle Management

Respondents were asked to state the level of maturity of their contract lifecycle management, choosing one level only. The overwhelming majority (85%) have digitized contracts to some extent, but only a relatively small minority (17%) have fully *digitalized* contract management.

This is reflected in answers to a further question about their track and trace process; in this case multiple choices were permitted. Nearly three-quarters monitor, manage and where necessary escalate important facts. More complicated processes such as contract creation and backend integration have not yet been adopted in the majority of organizations. Only six percent have automated the updating of fulfilment grades.

Thus, the level of maturity is by and large limited to digitization and surfacing of information if a contract is not being fulfilled or is unlikely to be fulfilled; any analytics that go deeper and would bring greater efficiency, such as contract performance analysis, or integrations, for example with automated contract generation and e-signature software functionality, has not yet been widely adopted.

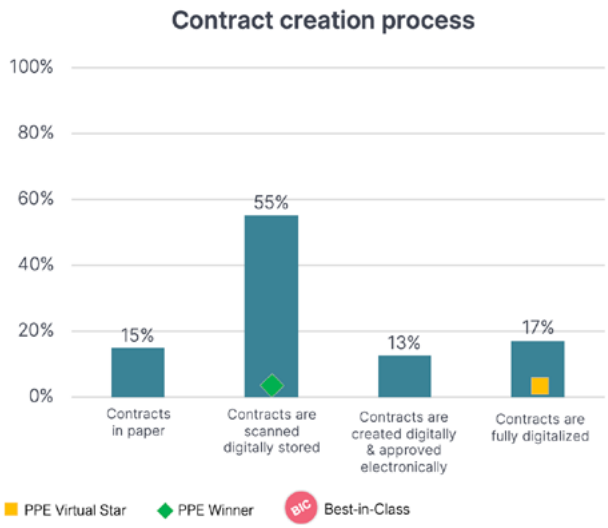


Figure 24: What is the maturity level of your contract creation process? (Single choice allowed.)

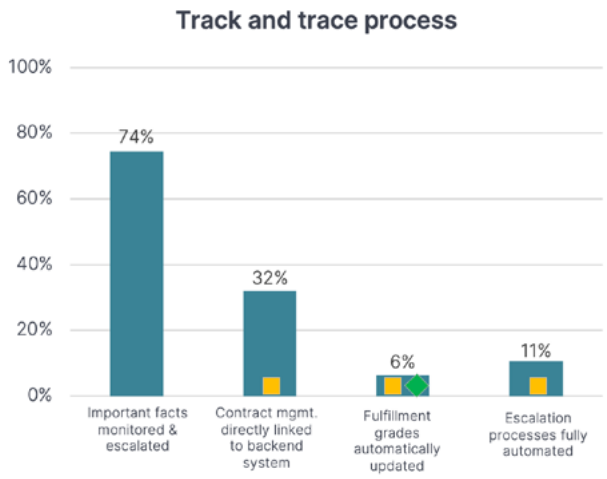


Figure 25: How does your track and trace process look? (Multiple choices allowed.)

Supply Chain Digitalization

The survey asked "What is the degree of supply chain digitalization? Is your organization using the following digital supply chain management tools?"

SCM methodologies have been around since the seventies (the actual term was coined in 1982) and SCM norms are embodied in ISO and other international standards.

More than two-thirds of all participants have digitalized their purchase order management, the highest figure within supplier management, and a very positive development. The high level of penetration is best explained by the relatively standardized nature of purchase order management software implementations. That said, this is the "bread and butter" of SCM, and we can only make assumptions about the level of digitalization and automation. Some will have implemented robotic process automation (RPA) for purchase order management at the upper end of the scale, others basic ERP functionality. Given that less than a quarter of procurement full time employees are working in strategic procurement we must assume that the other three-quarters spend a lot of time on manual tasks. Less than a third of participants have implemented more advanced functionality such as vendor managed inventory (VMI).

Close to a half (43%) are exchanging documents with suppliers digitally.

It is likely that the Covid-19 crisis, which has forced home-office working on many procurement functions and generated awareness that physical documents increase the risk of infection, has boosted digitization of PO management (as well as other processes such as contracts and invoices). More advanced processes such as vendor managed inventory (VMI) have some way to go. To put it another way, the 70% figure indicates that companies have at least started the journey, but it is difficult to say how far they have progressed or how well they are managing the solution. Systems have been digitized or digitalized, core data may be stable, but in our experience systems and data are typically not yet optimized. The reality on the ground is sometimes a very high level of suppliers' confirmations deviating from the original request while companies get on top of data management. Participants were also asked, "Which

of the following technologies are used to integrate your suppliers into your supply chain processes?" Exchanging documents digitally is very popular. Nearly half are using classical EDI, which is a starting point, but no more. When many companies made their last EDI technology investments, they were not facing the challenges they face today as they fill a supplier or intermediary role in the value chain. They must support new shared processes, transactions, document types, and communication methods while meeting more stringent service levels.

Partner-driven and IT-driven integration changes are propelling a wave of modernization and "classical EDI" point-to-point solutions are being replaced by WebEDI (28% of respondents) and networked EDI integration solutions (9%) in response to changes in internal business processes, on-premise and cloud (SaaS) applications, and new platforms. 15% of respondents reported having outsourced EDI (multiple choices were permitted).

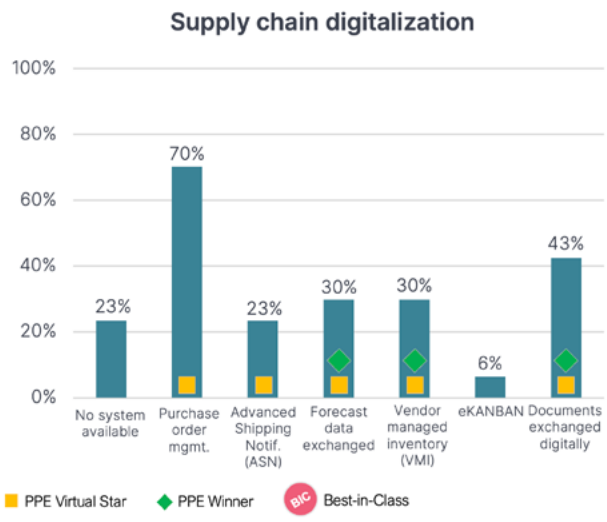


Figure 26: What is the degree of supply chain digitalization? Your organization is using the following digital supply chain management tools. (Multiple choices allowed.)

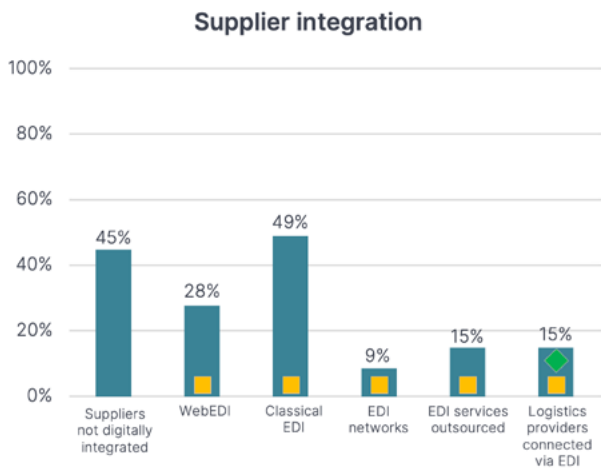


Figure 27: Which of the following technologies are used to integrate your suppliers into your supply chain processes? (Multiple choices allowed.)

Procure-to-Pay (P2P)

Procure-to-pay (P2P) is commonly understood to mean the downstream procurement processes, i.e., excluding sourcing and supply management, and integrating with accounts payable (AP). Automation brings efficiency and eliminates a lot of time-consuming manual tasks.

When asked, *"To what extent is your organization leveraging P2P solutions?"* and given a range of nine responses (with multiple choices permitted), 30% of respondents stated that they have no system in place and therefore 70% have a P2P system of some sort implemented. This is consistent with our result on supply chain digitalization, but likewise we cannot extrapolate precisely at what level of maturity or sophistication P2P is being executed, though the figures on the most commonly implemented functionalities give a good indication. 57% stated that they have a system for sending purchase orders to suppliers automatically. This is a fairly basic requirement of a P2P system, so of the 70% it is reasonable to deduce that a considerable number are not far advanced. And again, the imbalance between strategic and operational FTEs in procurement suggests there is still some way to go in relieving the burden of routine manual effort.

A significant number (40%) have a digital catalog system in place. Thirty percent manage invoices within the P2P system and 32% of respondents stated that they have fully integrated P2P with their ERP system.

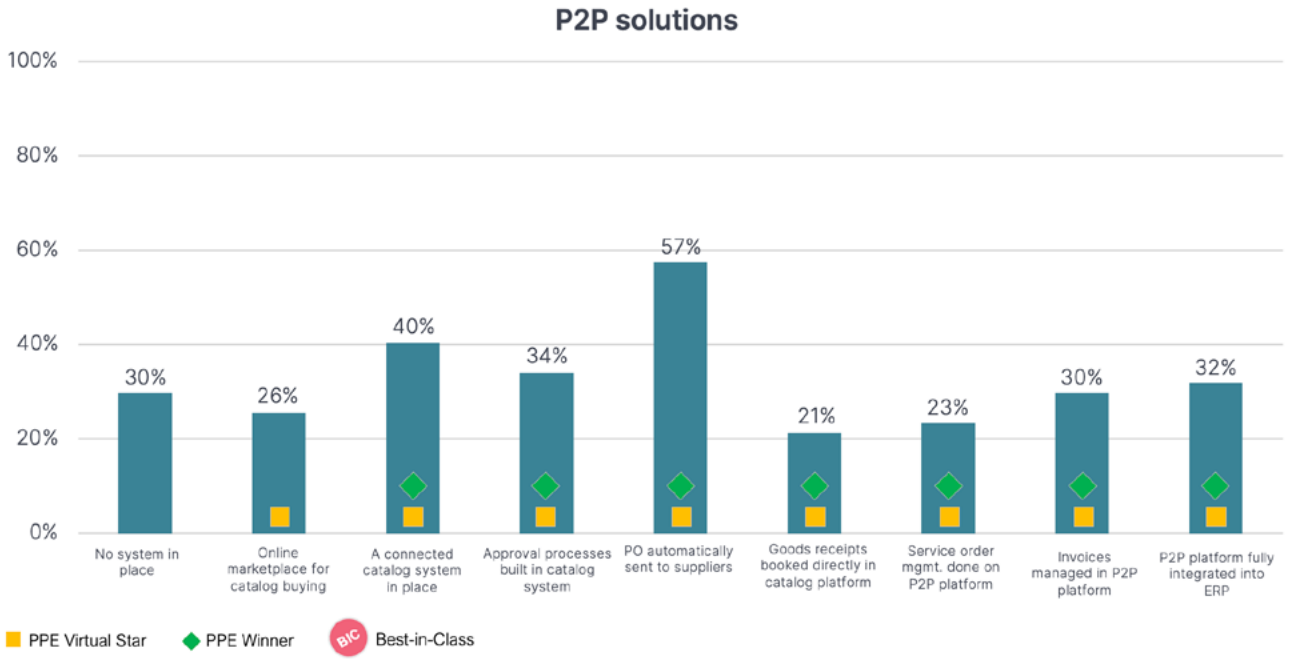


Figure 28: To what extent is your organization leveraging P2P solutions? The following P2P functions are used. (Multiple choices allowed.)

Tracking KPIs

The survey also asked which KPIs are used to measure the success of the P2P platform (multiple choices permitted). The majority (55%) measure the volume of managed spend but less than a third measure contract compliance (32%) or the maverick spend quota (28%). This is rather surprising as contract compliance and eliminating maverick spend are two of the main benefits of a P2P solution. A significant number (43%) do not use any metrics – presumably in a lot of cases because they are not yet collecting reliable and consistent big data in a data lake or similar.

Business Intelligence

The next step is to deploy the tools (data mining etc.) to interrogate the data. The survey asked what business intelligence and analytics software was being used in the participants' procurement organizations. Unsurprisingly, the majority stated that they were using some form of "reverse mirror" analysis, with two-thirds having implemented spend analysis and controlling and 47% KPI dashboards. Fewer are at the stage of implementing more sophisticated forward-looking business intelligence tools, although 40% have planning dashboards. Just 17% are doing simulations and a tiny 2% are already doing predictive analytics. We expect this figure to increase significantly by the time we do the next survey. To what extent will depend on organizations' success in capturing data and measuring the success of any initiatives, as the availability of such data is the prerequisite for predicting what will happen in future. If this happens, we will also see the first appearance of prescriptive analytics, i.e., artificial intelligence tools that not only predict what will happen but guide you through the best responses.

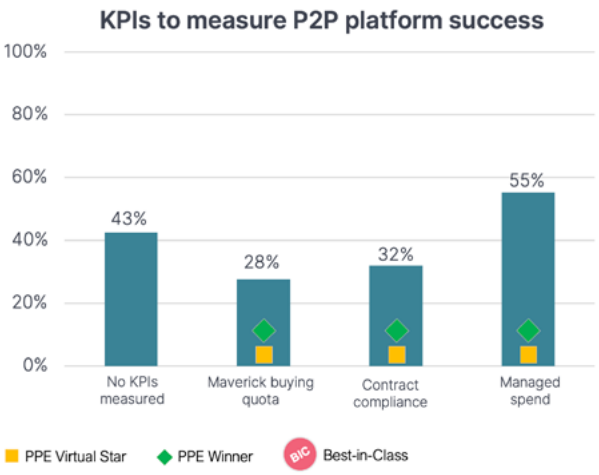


Figure 29: These KPIs are measured to check the success of your P2P platform. (Multiple choices allowed.)

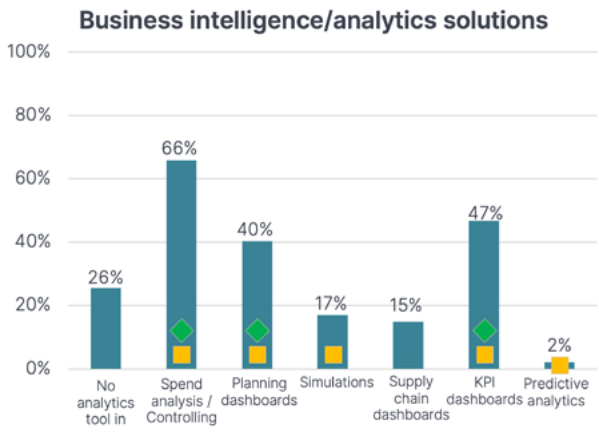


Figure 30: How is your organization using business intelligence/analytics solutions? These are the tools which are available in your procurement organization. (Multiple choices allowed.)

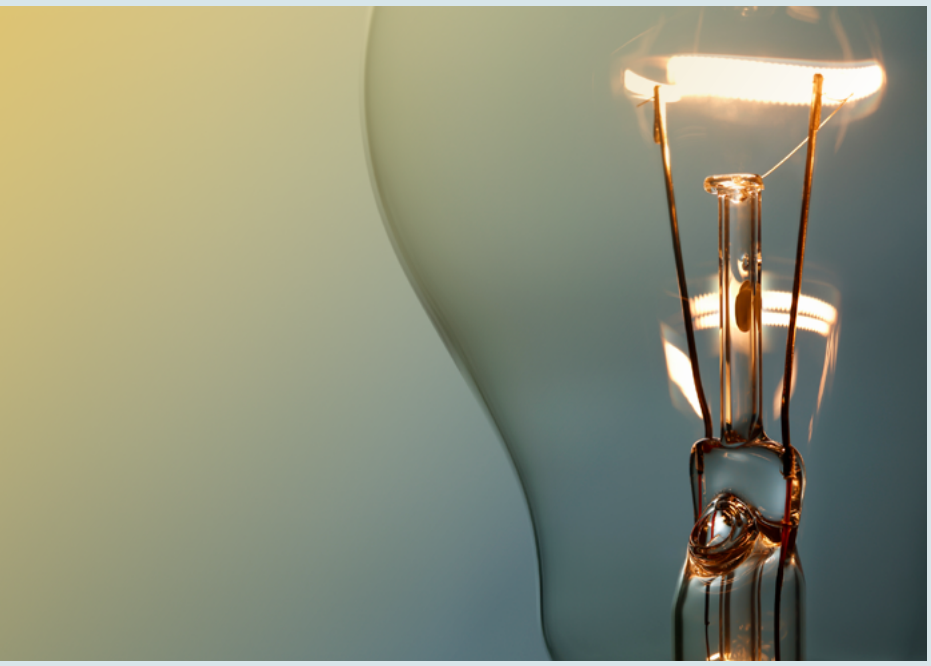
Advanced Procurement & Supply Chain Solutions

Finally, respondents were asked *"With what intensity do you apply the following supply-related advanced solutions and how effective are these solutions?"*, and to provide their estimate of intensity on a five-point scale from "Not applied at all" to "Very high intensity" and their estimate of effectiveness likewise on a five-point scale, from "No effectiveness" to "Very high effectiveness".

But we have already discussed technology – so what do we mean here by "advanced solutions"? Whereas we looked at specific applications and their maturity in the technology section, here we are looking at capabilities that will help to correct some of the performance issues that we identified in the first parts of this report.

They will progressively appear over the coming years as a result of new AI-based technologies but do not necessarily yet fit within a particular traditional procurement software application. Moreover, many of them require a combination of human and IT-based activity, and the boundaries are somewhat fuzzy. Where the software functionality currently sits or will sit in future, may differ, depending on the vendor. That said, they are all real-world solutions that are either already offered by JAGGAER or are part of the solutions roadmap.

In essence, therefore, we are looking here at rather more complex functionalities that the procurement community, from market analysts to practitioners, is only starting to grasp. Nonetheless, we can clearly identify the direction of travel in most of the areas covered. We divided these advanced solutions into three clusters: supply-related, collaboration-related, and demand-related solutions.



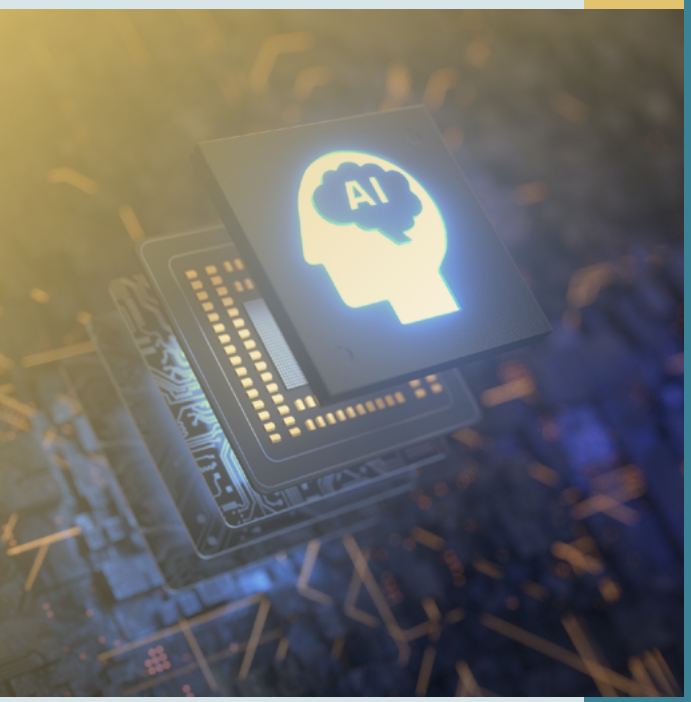
Supply-Related Advanced Solutions

Within this cluster, respondents were first asked if their organizations had implemented an advanced supplier risk management system that includes three actions: *(i) identifying supplier criticality; (ii) monitoring supplier health and lead times; and (iii) ensuring the survival of critical suppliers.* Although the average response was that such a system had been implemented with "low intensity" and was rated as having "low effectiveness", some organizations are at the top end of the scale in regarding this as highly effective. Moreover, this kind of advanced solution scored higher than all the others within the cluster; it is likely that the Covid-19 crisis focused attention on supplier risk and supply chain resilience, pushing up the score.

For all of the other advanced solutions, little progress has been made so far, but these are the solutions that we can look forward to being implemented over the next five years as the procurement function becomes increasingly automated:

Supplier health will be monitored by leveraging all types of internal and external sources, such as buyers' information on the speed at which suppliers are committing to orders or requesting earlier payments, information from plant visits regarding utilization, and newspaper/ industry discussions on sell-and-lease-back deals or the loss of key people to understand the "real" situation of the supplier. To this end, JAGGAER has established collaborative partnerships with organizations dedicated to monitoring and providing supplier data in real time.

Solutions will come on stream that will allow procurement professionals **to identify supply risk scenarios proactively,** based on continuous risk exposure, and to develop and run scenarios for likely and less-likely events, accounting for impacts across the value chain. Supply chains are (often extremely) complex systems comprising multiple organizations, processes and people. This makes it difficult for individual human beings to take appropriate decisions to ensure that supply chains are efficient and effective, hence the interest in sophisticated computational solutions. As supply chains have been extended over the years there is even more complexity as a result of external sources of risks, as the Covid-19 crisis proved all too well. Technology to manage this complexity has grown in capability and with data lakes and real-time fast data from social media streams etc. there is sufficient data available for pattern analysis and decision making.



Artificial intelligence will increasingly be used to harness data and predict supply chain risks (predictive analytics) and prescribe mitigating strategies (prescriptive analytics). JAGGAER has already launched software to predict the probability of on-time delivery of goods, for example, with around 95% accuracy. The future may be a situation where the system takes over the mitigation process after the decision is made, without human intervention. Research and development is moving in that direction, but for the time being the analytics are already providing humans with an enhanced ability to control and mitigate the risks.

AI systems will be able to run scenario analysis based on likelihood and potential impact, identifying the source of risk, quantifying the risk based on the analysis of past impact data, and suggesting the best possible mitigation strategies for that scenario. For example, it could use weather patterns to predict possible disruptions to supply chains and redesign upstream sourcing to minimize the impact by identifying the appropriate suppliers from the portfolio. During the early months of Covid-19 supply chains were severely affected by local and regional upheavals; in such situations AI can be used to decide whether a supply chain redesign is needed to ensure business continuity.

In future, non-compliance with regulations or corporate guidelines (e.g., on sustainability, ethical labor practices etc.) will be a major supply chain risk and AI systems will need to be taught about compliance and its importance within supply chains. Acceptance of AI systems among procurement professionals will depend to a large extent on the level of understanding of the new technology. Among other considerations, a good level of understanding is needed to overcome the natural ingrained bias in humans. For this reason, the technology will need to be able to “explain” the predictive analysis and provide full transparency to the immediate users and senior decision makers.

To achieve a more efficient and effective supply chain, companies will need to deploy innovative optimization models to understand risk when there are multiple uncertainty factors. The technology will also be able to identify business and operational opportunities by providing **robust supplier alerts management.** The technology is typically built on three functional modules: an optimizer, a discrete-event simulator and a supply chain modelling framework. The optimizer continuously searches through various supplier portfolio and related operational parameters, driving the creation of corresponding simulation models. The supply chain planner is then able to optimize the supplier portfolio, taking uncertainties into consideration. Alerts notify the planner of any changes in circumstances.

As mentioned above, predictive analytics is just beginning to feature in a small number of procurement functions. In future, they will benefit from **built-in anticipation** by embedding predictive analytics into decision-making to identify and react to supplier issues before they arise. This reflects the kind of AI-driven developments in other areas of business (e.g., the shift from reactive to predictive maintenance) and provides similar benefits, such as just-in-time interventions to prevent shortages and expensive late orders while reducing inventory costs. Our survey results indicate a surprisingly low level of application and effectiveness in this area.

Supply risk mitigation will become business-as-usual: organizations will integrate automated risk mitigation workflows, scenarios, and protocols into business-as-usual playbooks to switch quickly from normal operations to disruption response, as needed. Unsurprisingly in the year of Covid-19, risk mitigation became an issue, but it has yet to be integrated into such playbooks to enable organizations to switch from normal operations to disruption response.

Companies will leverage machine learning and cognitive capabilities to automate considerations and execution for **automated decision-making.**

Already in 2019 Gartner was predicting that by 2024, 69% of management decisions would be automated. In today's procurement environment, many organizations are already automating or semi-automating certain tasks using assistive intelligence, which is usually a combination of rules-based processing and low-level robotic process automation (RPA). But, other than in the most advanced sectors, such as automotive manufacturing, it is fair to say that companies are moving forward cautiously; only in rare cases are they moving forward rapidly. This has been characterized as "business as usual with incremental improvements".

At its simplest, automation takes the form of straightforward rules-based decision-making. Basically, "if this, do that". Invoicing is an easy example: "if the invoice is from an approved supplier, below a certain amount, and below a certain tolerance with the amount on a corresponding purchase order, pay supplier." Over time, these rules can be made more sophisticated, progressively reducing the need for human intervention. The potential gains in this area are quite striking, so the relatively low level of application and effectiveness among our survey panel suggest the opportunity (in future, the need) to make more rapid progress.

As we do progress, we will move beyond even more complex rules-based automation to **intelligent automation** in which actions and protocols will be automated once their effectiveness is proven using technologies such as machine learning. JAGGAER refers to this as "cognitive procurement", which enables the machine to learn from large volumes of data in such a way that it drives continuous improvement. This new environment transcends the mere automation of existing capabilities reinventing end-to-end workflows to fully realize the potential of humans and machines working together to complement each other.

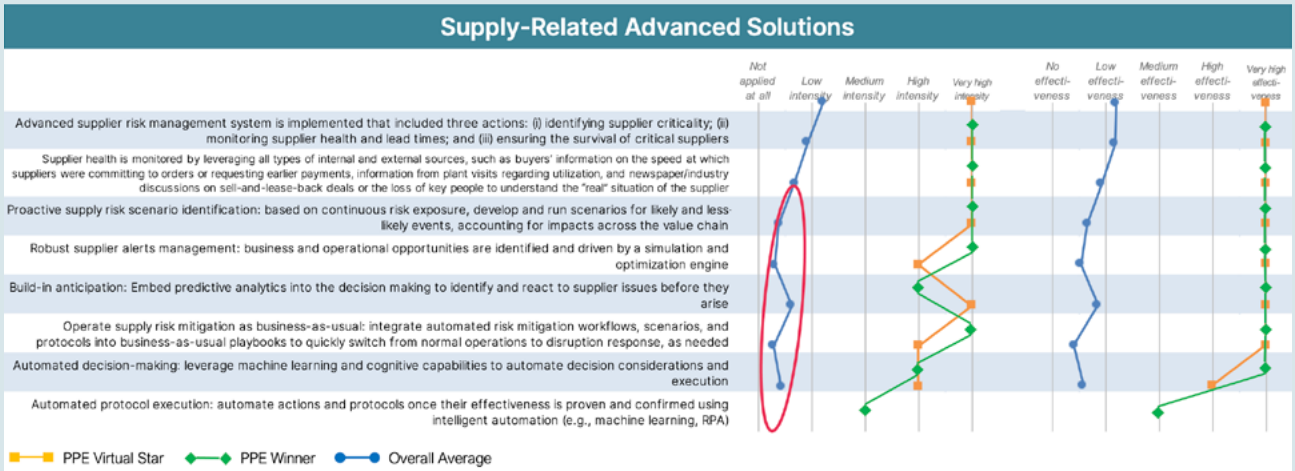


Figure 31: With what intensity do you apply the following supply-related advanced solutions and how effective are these solutions? (Please evaluate each solution.)

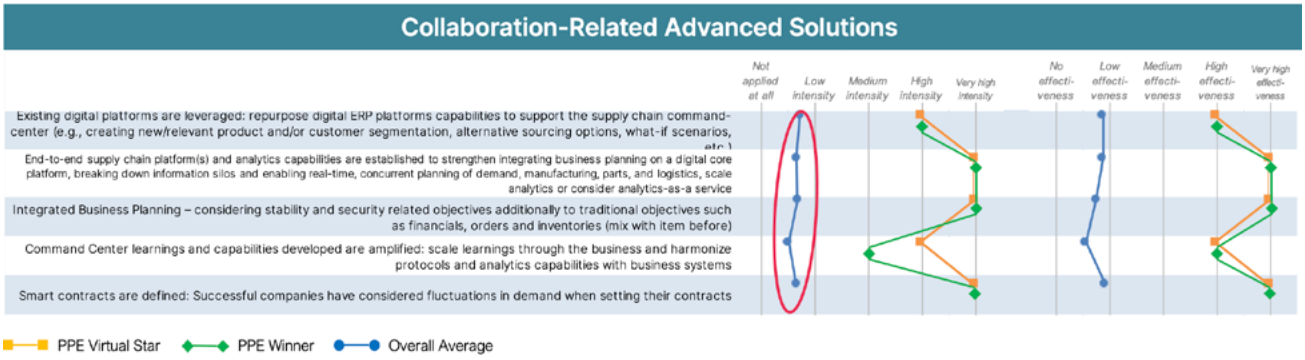


Figure 32: With what intensity do you apply the following collaboration-related advanced solutions and how effective are these solutions? (Please evaluate each solution.)

Collaboration-Related Advanced Solutions

We have even further to travel to achieve advanced solutions that we have grouped in the "collaboration" cluster, with our panel stating that overall, they are being applied with low intensity and low effectiveness. In two out of the five cases, no organization on the survey panel has reached very high intensity and effectiveness.

The advanced collaboration-related solutions that we asked respondents to rate in terms of intensity of application and effectiveness are as follows:

The ability to **leverage existing digital platforms,** repurposing digital ERP platforms capabilities to support the supply chain command-center (e.g., creating new and relevant products and/or customer segmentation, alternative sourcing options, what-if scenarios, etc.) More than anything, the Covid-19 crisis emphasized the need to use collaboration tools and orchestrate activities with shared information systems as supply chains were disrupted and new needs arose. A high-profile recent example is the synchronization of manufacturing lines and material supplies to meet the need for medical supplies and equipment, with companies from other sectors pitching in to help.

During the crisis, command centers needed to leverage ERP-based data in scenario-based what-if models that can be subsequently run to identify possible disruptions, previously unknown dependencies, and to help forecast the cost, time, and effort required more accurately. To secure their longer-term resilience, organizations need to build a collaborative ecosystem around the digital core systems to support the supply chain command centers with greater automation, and intelligent analytics to ensure not only greater speed and agility but also enhanced customer-centricity.

Collaborative efforts are required to achieve excellence in procurement and supply management, but this is not just a matter of going broader, it is also a matter of going deeper, within your own company. We have been talking about "breaking down the silo mentality" for years, but there is still some way to go. End-to-end supply chain platforms and analytics capabilities will be established to **strengthen the integration of business planning** on a digital core platform, breaking down information silos and enabling real-time, concurrent planning of demand, manufacturing, parts, and logistics. The problem here is more human than technological, with each functional director more concerned about their department's performance than the overall benefit to the company (e.g., the purchasing department wants to buy in bulk to reduce unit costs, the marketing manager wants attractive packaging, but the warehouse manager is tasked with reducing inventory and floor space and minimizing damage to products). The clear implication is that to move forward, top-level management must get involved, sponsoring projects to put end-to-end solutions in place that ensure greater visibility over supply chain dependencies across the entire organization. Our survey showed wide variance between average and best-in-class performance here, especially in terms of intensity of application.

Closely related to this, **integrated business planning** across the entire organization from R&D to marketing, from supply chain management to sales, taking a "global" view, is a precondition for procurement to work with maximum efficiency. It will allow procurement to take into account, for example, stability and security-related objectives in addition to traditional objectives such as financials, orders and inventories. Organizations will scale up their own in-house analytics capabilities or employ analytics as a service (AaaS) to get the necessary insights wo enable integrated business planning. Again, there is a striking gap here between average performance and the respondents who are furthest advanced in terms of application and effectiveness.

Command center learnings and capabilities already developed will be amplified as organizations scale learnings through the business and harmonize

protocols and analytics capabilities with business systems. Our earlier findings and what we see in day-to-day business with customers has revealed that in a lot of cases, companies have implemented advanced technologies and processes at the center and perhaps also at some locations but there is a lack of coordination and deployment across the organization. There can be a number of reasons for this, including the time it takes to roll out solutions or lack of local analytical competence, but the survey shows that even the best organizations are falling short of very high intensity application and very high effectiveness on this issue.

Successful companies will detect fluctuations in supply and demand when setting their contracts to **define smart contracts.** A smart contract is fully "self-executing", which means that it is coded in software using a series of if-then statements to describe every relevant state of the contract. The impulses might come from internet of things sensors or social media and advertising streams (e.g., if advertising generates > 10,000 clicks then increase price per click by $0.002).

Because data is gathered and shared between machines, there is no need for human intervention once the contract has been set up, and it would be an easy matter to change the if-then statement or add another one when the contract is up for renewal. This is a radical change in the practices of many businesses, which brings a number of advantages, many of which are "win-wins". For example, current invoice procedures often involve long periods before payment is made, which is a financial advantage to the buyer but implies some liquidity risk for the supplier. With smart contracts, purchasers might instead incorporate incentives through if-then statements, whereby performance is rewarded with faster payments, bonuses etc.

Technology developments are making smart contracts eminently practical and the survey suggests a slightly higher level of application and effectiveness than in other areas, though there is still some way to go.

Demand-Related Advanced Solutions

In demand-related advanced solutions, too, the overall picture is one of some but limited progress to date, with no organization in the survey yet reaching very high intensity or very high effectiveness in four of the seven listed solution areas. Market intelligence for advanced demand forecasting with customers, and scenario development, are not used by the majority of procurement organizations.

Demand planning is a supply chain management process of forecasting, or predicting, the demand for products to ensure they can be delivered in the right quantity at the right time. The goal for procurement is to leverage this forecasting to strike a balance between having sufficient inventory levels to meet customer needs and overspending on unnecessary surplus. A wide variety of factors can influence demand, including labor force changes, economic shifts, changes in the weather, natural disasters, global crises, or even events. Fairly trite examples include the increase (and decrease) in demand for certain goods if a long hot summer is forecast or easily predictable seasonal shifts (such as the uplift in lawn mower sales in spring months). But there are far less obvious shifts in demand, which can be assessed only with the help of statistical forecasting; moreover, these are moving targets, so organizations will need to be able to **prepare multiple demand scenarios** and plan actions within these scenarios if they are to compete effectively.

Advanced statistical forecasting tools will be increasingly used to generate a realistic forecast for base demand and **market intelligence information** will be integrated into product-specific demand-forecasting models. Using historical data, statistical forecasting creates supply chain forecasts with advanced statistical algorithms such as **regression models** built up to **project a range of demand curves** based on a certain confidence level. A high level of analytical competence is needed here, which many companies do not yet have. For them to be effective, it is important to determine the accuracy of each model, identify outliers and exclusions and understand assumptions.

A further area of demand forecasting in which we expect to see further development is product portfolio management. This oversees the overall product lifecycle, beginning with the introduction of a new product through to its end-of-life planning, which is highly relevant in sectors such as high-tech manufacturing. In such sectors, product lines are interdependent, and understanding how new products may influence demand for other existing new or established products is important to understand the overall product mix required to maximize market share.

The survey revealed a yawning gap between average performance and best practices in demand forecasting, although in more sophisticated areas such as regression modeling and scenario planning no respondent claimed to have attained very high intensity of application or very high effectiveness.

Integrated planning systems and electronic data interchange with customers will be established to obtain **real-time updates on planned volumes**. This is a solution that is already in operation in some best-in-class organizations. They will be able to monitor the **probability of order cancellations,** similar to the processes for monitoring the possibility of winning orders.

Finally, organizations will in future be able to establish **real-time visibility to identify and secure logistics capacity** by tracking the on-time status of freight in transit and monitoring of broader changes, such as airport congestion and border closings. This is a solution that is already in operation in some best-in-class organizations. JAGGAER Sourcing Optimizer is a good example of a solution that is already providing access to real-time market information, and the flexibility to move quickly, which is a vital advantage always, but in particular at a time of intense volatility in the freight market such as we saw in 2020. On average, respondents have made some progress in this area.

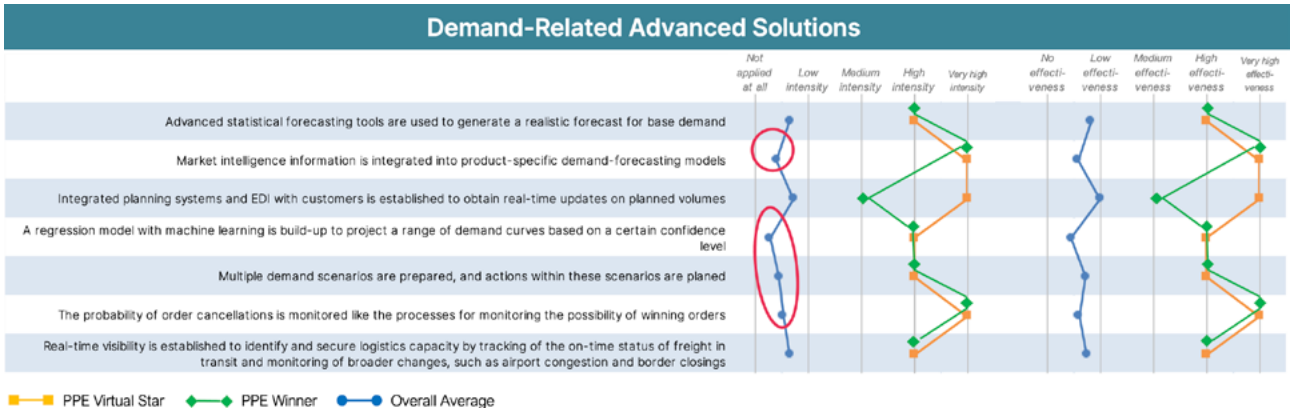


Figure 33: With what intensity do you apply the following demand-related advanced solutions and how effective are these solutions? (Please evaluate each solution.)

Concluding Remarks & Recommendations

In order to take the next big steps forward, organizations that are not yet among the best practice leaders need to create an integrated picture of where they are now and what their objectives are in procurement. There is no simple technology fix: first, they must address the Holy Trinity of People, Processes and Data. People with the right skills (in particular, digital competences); processes that are not only well designed, streamlined and efficient, but also enable cross-functional collaboration with all stakeholders; and data that is clean, consistent and easily accessible.

Once these are in place it is possible to implement tools and solutions that will not just fix an immediate challenge but provide the basis for continuous improvement.

The rewards for getting this right will be considerable, not just in traditional terms of savings (important though this is) but also in terms of aligning with the objectives of the wider business, mitigating risks, making the right build or buy decisions, achieving greater supplier diversity, ensuring compliance etc.

There is no software “tool” that can fix this alone. Organizations that want to progress need to identify and address their needs holistically, systematically and strategically, working with the right partners. On the other hand, our experience tells us that projects to automate standard operational processes can coexist and run in parallel with projects to implement more advanced solutions. If properly managed, technological solutions, and the value they deliver, grow in lockstep with the maturity of the procurement function itself.

About the Authors

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