RESULTS OF THE THIRD CIPS AND TWS PARTNERS SURVEY

GAME THEORY IS ON THE RISE
CIPS and TWS Partners recently conducted their third annual survey designed to explore the awareness, understanding, and application of game theory within Procurement.

Building on the findings of their previous surveys conducted in 2017 and 2018, the results show that increasingly more Procurement organisations are discovering and applying game theory. However, despite both this trend and participants’ expectations regarding the future importance of game theory, adoption levels seem to be constrained by a lack of available learning resources and limited knowledge transfer opportunities. Further contributing to this is a lack of software applications that enable and facilitate game-theoretical applications in Procurement – despite an overwhelming perception that existing software is useful and has its place, today it only allows the capture of benefits in less complex categories and areas of sourcing, leaving Procurement and game theorists with inefficient toolsets.

Overall, building on the trend seen in 2017 and 2018, game theory is growing in application. However, to further develop the use of game theory within organisations, results suggest that both improving access to training and implementing effective software aids will be crucial.

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KEY FINDINGS FROM THE SURVEY ARE:

- **Usage of Game Theory is growing**
  Application of game theory in Procurement increased – now at 19% across all respondents

- **Game Theory is expected to trend further**
  > 65% of participants predict game theory applications to grow

- **Appetite and interest are not translating to knowledge**
  > 70% of respondents have only a basic or a below basic understanding of game theory

- **Availability of training appears limited**
  < 20% of participants had on-the-job training in game theory

- **Existing software tools do not suffice**
  > 50% of respondents desire new or improved software solutions

- **Advanced software solutions are not widely available**
  90% of respondents do not have the software they need for their work
WHAT IS GAME THEORY?

As Nobel Prize-winning branch of economics, game theory is the scientific modelling of interactions between different parties, each pursuing their own interests. The parties interact and choose their actions mindful of what the other parties might think and do.

Economists call these interactions ‘games’ and the decision makers ‘players’. In business, the application is twofold: Firstly, game theory is a method for understanding the ‘rules’ of an interaction and for finding the best strategy in that setting, e.g. in negotiations. Therefore, game theory finds the best strategy for you in a specific setting. Secondly, game theory is a method for structuring interactions such that the participating parties are steered towards a desirable outcome. This means game theory helps to design and shape a playing field where everyone is working towards the best outcome for themselves.

In Procurement, the design aspect of game theory is particularly effective, as the buyer typically sets the rules for the negotiation process and the clauses that govern contractual relationships following supplier nomination.
Upon launch of their knowledge partnership in 2017, CIPS and TWS Partners conducted their first global survey on the application of game theory in Procurement to investigate the current level of awareness for the topic and the degree of its application. The results demonstrated a genuine and pronounced interest amongst Procurement professionals in game theory and the value it can add, yet they also uncovered uncertainties about what game theory is really ‘all about’ and how it can be effectively used to improve the performance of Procurement.

Recognising the value of the insights gained, CIPS and TWS Partners decided to conduct further surveys on an annual basis to both track the usage of game theory across time and to deeper explore the details of game theory’s application within organisations. The second survey in 2018 thus explored the use of game theory across countries and regions, and this third survey has examined in depth the composition and availability of game theory training within corporations, as well as the current status of technology that can facilitate game-theoretically optimised negotiations and tenders within Procurement.

Overall feedback from the survey participants once again reassured CIPS and TWS Partners on how important it is to be at the forefront of this development and to provide continuous thought leadership to CIPS’ members across the globe. The results will help CIPS and TWS Partners to further create content tailored to the needs of professionals working in Procurement, offering CIPS’ members a leading resource for game theory knowledge.
SURVEY PARTICIPANTS

263 PROCUREMENT PROFESSIONALS FROM DIVERSE BACKGROUNDS IN TERMS OF NATIONALITY, INDUSTRY, POSITION AND COMPANY SIZE COMPLETED THE SURVEY.

COUNTRY

WHICH COUNTRY DO YOU LIVE IN?

Responses came from as far as Australia, but the majority (60%) of participants were from the UK.

INDUSTRY

WHICH INDUSTRY SECTOR DOES YOUR ORGANISATION OPERATE IN?

Participants came from a broad range of industries. Most participants worked in governmental and public services (18%), followed by manufacturing and engineering (16%) and education (9%).
ROLES

WHICH OF THE FOLLOWING BEST DESCRIBES YOUR CURRENT ROLE IN YOUR ORGANISATION?

Participants worked in a broad spectrum of roles across their organisations and represented all relevant levels of seniority, from operational (33%) to senior management (26%).

COMPANY SIZE

WHAT IS YOUR ORGANISATION’S ANNUAL SOURCING VOLUME IN GBP?

Companies of all sizes were represented, ranging from larger organisations with sourcing volumes above GBP 500 million (32%) to small companies with an annual sourcing volume of less than GBP 100 million (39%).
In general, the majority of game theory applications continue to be in optimising supplier negotiations, tenders, and sourcing decisions, with supplier negotiations being the most common area of application (93%) and the development of incentive schemes the least common (71%).

The number of people adopting game theory in their day-to-day job has significantly increased and more than doubled between 2017 and 2019. Previous findings have also been confirmed. Adoption levels are substantially higher (26%) in larger organisations with an annual sourcing volume over GBP 500m compared to smaller businesses with volumes under GBP 100m (17%).

However, respondents are also using game theory in risk and contract management, as well as in operational areas. Additionally, participants still expect their usage of game theory to increase, with two thirds of respondents predicting that game theory will play an important role in the future growth of their Procurement function.
As the Procurement community shows a strong appetite to adopt game-theoretical concepts, knowledge partners CIPS and TWS Partners aimed the survey towards investigating what could be done to further facilitate and accelerate adoption.

In 2018, a majority of respondents believed that formal training would be highly useful in enabling the application of game theory within their organisation, and respondents said a lack of expertise was a main driver behind the non-application of game theory in their firm.

The 2019 survey directly tested this result: less than one third of survey participants said that they have a sound understanding of the underlying game theory concepts despite their appetite, interest, and belief in game theory’s importance. In addition to this, and potentially explaining the lack of in-depth understanding, only 49 of the 263 (19%) participants had gone through on-the-job training. Interestingly, on-the-job training appears to be one of the most effective means of upskilling Procurement professionals. More participants with a good or very good understanding of game theory acquired knowledge through on-the-job training than through any other method. Other upskilling methods were also utilised (for example, 26% of the respondents received some game theory knowledge from CIPS), but on-the-job training (and university education) appeared to be the most effective in terms of transferring a level of understanding suitable for applying game theory in business.

This explanation is also supported by the country-level differences discovered in the 2018 survey. A majority of German, Austrian, and Swiss respondents, who collectively demonstrated a significantly higher game theory usage rate than their UK counterparts, received their game theory knowledge from university & on-the-job knowledge transfer, whereas the majority of UK respondents received their knowledge through other channels.

In addition to overall usage rates, the structure of game theory trainings may also be making a significant impact – only 42% of respondents’ on-the-job training programmes systematically used in-house (23%) or external expertise (14%), with others occurring either on an irregular basis or with support from perhaps less directly targeted academic knowledge bases.

This would suggest that in addition to making on-the-job training more available, making improvements to existing trainings through the implementation of more systematic and application-focused programmes would boost game theory understanding and application, supporting the 94% of current practitioners who believe their organisations will either continue to use or expand their use of game theory in the future.
In addition to knowing the base game theory skill-set, future adopters and practitioners of game theory will likely use software tools to facilitate their sourcing projects. Given the significant benefits which fit-for-purpose software can bestow on productivity, ease of use, and thus barriers to entry, the 2019 survey asked how well current needs are being met.

Responses suggest a promising future for suitable software. While less than half of respondents currently use software capable of facilitating the preparation of game-theoretically optimised tenders and sourcing activities, 9 out of 10 of those users consider existing software to already be useful. Building from existing usage, respondents expect significant benefits from the application of software to more complex tasks in the sourcing process. Interesting to note is that the relatively less complex step of evaluating non-monetary aspects is perceived as exceptionally beneficial – this could then be a very efficient starting point for development. Otherwise, as task complexity increases, we see perceptions of software usefulness increase. 31% of non-software users, for instance, believe software would be beneficial during the RfX setup process, but a full 65% of non-software users believe software offering full automation of smaller, less complex sourcing projects would be beneficial.

Contrary to what the above result would suggest, the actual usage level of software solutions drops off rapidly as task complexity increases, suggesting that there is currently either less software targeting the more intricate tasks, or that existing software is unsuitable. This is matched by responses: 50% of current users desire either more, newer, or better software solutions.

Therefore, the benefits which software can bring to game theory in Procurement may currently be facing limitations simply because of availability. Particularly in more complex applications in which there is the most demand for software aid, actual usage levels are low.

Programmes addressing these gaps and limitations, when they are released, may then be seen acting as key drivers of future game-theoretical Procurement efficiency, and may then also improve game theory usage rates through improving accessibility.
Whilst game theory is still a relatively new field in academic research, as is its application in business, the results indicate that an increasing number of Procurement professionals are recognising the potential of game theory and applying it in their business operations.

Independently of whether or not they are already applying game theory, the vast majority of surveyed Procurement professionals are convinced that the use of game-theoretical methods will be a key driver of future growth in Procurement. The number of organisations applying game theory, as well as the level of knowledge and experience of the field, is certainly growing fast and is set to continue growing into the future.

This growth will depend on successful transfer of applied game theory knowledge and expertise. Systematic training programmes focusing on the teaching of all relevant aspects of game theory, as well as on the methods by which it can be used in Procurement, may be crucial to speeding up the rate of application. However, even if growth remains steady, further in-depth knowledge transfer will certainly satisfy the high levels of curiosity and interest in what game theory has to offer.

Also crucial will be software designed to match all requirements of a game-theoretically optimised sourcing, no matter the level of complexity. As suitable programmes are developed and applied, Procurement departments are expected to see significant benefits, which would only further increase game theory’s accessibility.

Taken together, game theory is still trending. More systematic upskilling and training initiatives as well as standardisation of programme assisted preparation in game-theoretically optimised negotiations and tenders can significantly increase adoption rates going forward.

If you would like to learn more about game theory and how it can be a game changer for Procurement, you can find articles, white papers, videos and case studies on our CIPS Knowledge page dedicated to game theory: https://cips.org/en/knowledge/Procurement-topics-and-skills/game-theory/game-theory/
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