GAME THEORY AND DIGITALISATION
A NEW AGE MATCH MADE IN DATA HEAVEN
Digitalisation is fast establishing a formidable reputation as a transformative disruptor across industries. Mobility, Automotive, Pharmacy, Transportation and many other sectors feel the inevitable change coming and leading global players are jumping onboard.

Business as usual processes are updated, existing operations optimised and data is collected yet few have identified the true value of digitalisation. It is not about optimisation but about new. It is not just about quicker but about better. It is about powerful algorithms marrying game theory’s strong strategic capabilities, resulting in an extremely potent mixture.

**HOW TO JUMP ONBOARD THE FULL STEAM, UNSTOPPABLE TRAIN OF DIGITALISATION**
Digitalisation provides an unprecedented number of opportunities for businesses to create change. With all the changes to business, there is discussion around those who can be called the first movers vs fast followers. In the case of digitalisation though, we need to alter our perspective. All established businesses have seized the moment to digitalise their existing processes but accepting this as digitalisation is a common fallacy. At best this is comfortable change, while actual first-movers achieve true disruption by challenging their status-quo.

The latest CIPS survey from 2019 gives an indication of the ‘comfortable changers’ who often praise digitalisation and new software in Procurement mainly for its value to automate existing processes (see picture).

Undoubtedly there is value and even necessity in the optimisation of established processes via new technology. Standardised and automated transferal of data across multiple functions frees up time to focus on development-based topics. But true innovation waits further down the road. And the question is no longer how can one optimise the existing solutions but whether we are still tackling the right problems?

### COMFORTABLE CHANGE VS TRUE DISRUPTION

**IN WHICH AREAS DO YOU CURRENTLY NOT USE SOFTWARE BUT BELIEVE IT WOULD BE BENEFICIAL?**

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Let’s explore the example of three companies, all facing a similar situation, who challenged their status-quo and immensely improved their heavy machinery maintenance system.

Heavy machinery maintenance has two cost elements. The visible immediate costs of repairs and the opportunity costs created due to unplanned downtime of key machinery. The latter significantly outweighs the former. In the past, the goal was to reduce downtime via fast, efficient repairs.

Caterpillar with ‘predictive diagnostics’, GE with ‘Predix’ and Joy Global Inc. with ‘Smart Services monitoring program’ saw an opportunity in digitalisation to change this goal. Rather than an increase in efficiency of their reactive repairs, they aim to anticipate machine failure thereby eliminate unplanned downtime all together. This means not only digitalising existing processes but collecting new data and installing new maintenance procedures to pre-empt the breakdown of machinery.

New sensors were installed in machines and correlations between use-patterns and breakdowns were identified, thus allowing proactive maintenance and significantly reduced unpredicted downtime. Instead of purely making their repair process quicker, they created a new and better process (previous graph).

For all three companies the breakdown rates of machinery decreased substantially, and reliability increased. Value was created by not only asking how to optimise, but how digitalisation can foster new solutions for overarching issues.
How can these opportunities be reliably identified? All signs point to the combination of digitalisation and game theory. Digitalisation creates a fundamental change to the way we interpret and use data. While game theory provides the quintessential mindset to think complex problems all the way through and also think outside the box.

Game theory started with John Nash’s approach to analyse interactions purposefully. With the famous ‘prisoners dilemma’ he kicked off a new, rapidly growing field of studies using logic to evaluate strategic behaviour. The basis of the studies being that all options of all parties, as well as all possible outcomes, are considered to develop a complete ‘if then, else’ strategy system.

This is where digitalisation and game theory come together. Digitalisation provides new data and game theory gives guidance for new strategies. Game theorists first define all options in a given situation via a ‘decision tree’. A decision tree is a full end-to-end outline to depict all decision nodes and outcomes including all own, as well as all other players’, options. Now we use the ‘backwards induction’ principle to define the best strategy. Game theorists approach every problem from the end and work their way backwards to map the optimal branch in the decision tree.

Based on this full ‘if, then else’ system, a definition of the best solution can be logically identified and achieved. It can enable even surprising solutions to be found, becoming a true disruptor in the digital era.
The intrinsic compatibility of digitalisation and game theory is what makes next generation digital projects ideal for this synthesis. twsNEX stands for Negotiation EXpertise and is TWS Partners’ product portfolio of digital services and applications.

twsNEX aims to improve not only the speed of a Procurement process, but also strengthen the better in digital transformation and hence strengthen Procurement’s role as a value driver.

The twsNEX portfolio covers a growing range of products for Procurement and strategy related issues in the digital landscape. Below are three of the most prominent and unique products developed with TWS Partners’ expertise; allocation optimisers, data & indexes and strategy advisors.
‘Allocation Optimisers’ can be used in Procurement to find the optimal supplier allocation in complex situations with lots of parts, suppliers and constraints. It is as complex and comprehensive in the back end as it is easy to use and flexible at the front end.

‘Data & Indexes’ allows you to track the right data helping you to steer your sourcings in the right direction before it is too late. This is based on TWS Partners expertise to tell strategic data from transactional data and comes all complete with the tracking infrastructure and intuitive dashboards.

‘Strategy Advisors’ are used in Procurement to guide buyers, providing recommendations based on data inputs and underlying decision algorithms. They provide advice on various topics along the Procurement lifecycle like sourcing approach, bundling strategy or contract type. They are based on TWS Partners’ expertise and can be tailored to the needs of each individual organisation.

In digitalisation a key mantra to success is leveraging complexity, rather than simply reducing it. Understanding the ever-evolving role of digitalisation in the market place is key. However, only when married with the strategic power of game theory, does this unstoppable train steer true north, making it the perfect match in data heaven.

Via the twsNEX endeavour, TWS Partners aims to unlock this new door of re-evaluating a challenge to seek better and smarter solutions. It thus takes us beyond simply optimising existing solutions and nudges one to new insights. twsNEX brings us to the top right quadrant (see figure 1) where one finds not just quicker but better solutions.

SOURCES
www.boardofinnovation.com/staff_picks/digital-transformation-examples
We are passionate about the development of new digital products based on our core expertise in game theory. This provides a new mindset to the era of digitalisation and allows an approach to change that is fundamentally more strategic. We don’t look to only digitalise the existing but question how new technological opportunities can transform the way we do things. This approach can help your Procurement department to take a giant leap forward. Key aspects of your processes can be advanced to give you a competitive edge in the market.
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