



ELSEVIER

Contents lists available at ScienceDirect

## Journal of Purchasing and Supply Management

journal homepage: [www.elsevier.com/locate/pursup](http://www.elsevier.com/locate/pursup)

## Articles

## Researching the future of purchasing and supply management: The purpose and potential of scenarios

Louise Knight<sup>a,\*</sup>, Joanne Meehan<sup>b</sup>, Efstathios Tapinos<sup>c</sup>, Laura Menzies<sup>b</sup>, Alexandra Pfeiffer<sup>d</sup><sup>a</sup> Faculty of Behavioural, Management and Social Sciences, University of Twente, PO Box 217 (Ravelijn), 7500AE, Enschede, the Netherlands<sup>b</sup> University of Liverpool, Management School, Chatham Street, Liverpool, L69 7ZH, UK<sup>c</sup> Hunter Centre of Entrepreneurship, Strathclyde Business School, 199 Cathedral St, G4 0QU, Glasgow, UK<sup>d</sup> DBFZ Deutsches Forschungszentrum für Wirtschaftsinformatik, Torgauer Str. 116, D-04347, Leipzig, Germany

## ARTICLE INFO

## Keywords:

Scenario planning  
Procurement  
Future studies  
Prescience  
Critical management  
Covid-19 coronavirus

## ABSTRACT

Drawing on prior research, the value of scenario planning as a methodology for researching the future of purchasing and supply management (PSM) is explored. Using three criteria of research quality – rigour, originality and significance – it is shown how developing scenarios and analysing their implications present new, important research opportunities for PSM academics, practitioners, and leaders of the profession. Researching the future of PSM supports the identification of uncertainties and anticipates change across many units and levels of analysis of interest to PSM scholars and practitioners, such as the profession/discipline, markets/sectors, or organisations. Scenarios are particularly effective for: considering how the complex interaction of macro-environmental factors affects the PSM context; avoiding incremental thinking; surfacing assumptions and revealing significant blind spots. PSM research using scenarios aligns with Corley and Gioia's (2011) call for prescience-oriented research in which academics aim for more impactful research, enhancing sense-giving potential and theoretical relevance to practice, to better perform their adaptive role in society.

## 1. Introduction

Responding to the Journal of Purchasing and Supply Management's 25th Anniversary Special Issue's aim to help purchasing and supply management (PSM) to 'look forward', this Notes and Debates article discusses the use of scenario planning in PSM research. Looking back at past research on the future of PSM reveals a set of articles which is limited both in terms of the number of studies and the range of methods used. The purpose of this article is to encourage more research on the future of PSM, and advocate for a wider range of methods especially suited to future-focused research. The scenario planning approach is explained and positioned in the repertoire of methodologies available for exploring the future of PSM which to date has predominantly been conducted via desk research, interviews and surveys. The focus of this article is on research that is specifically about anticipating how (some aspect of) PSM will 'be' in the future, rather than exemplar cases which can frame aspirations for PSM development in a less capable firm, or the implications for future practice and research that conclude most academic papers. Future of PSM research can be broad in scope, for example digitalisation of PSM (Legenvre et al., 2020) or more specific,

for example concerning competences for public procurement personnel (Bals et al., 2019).

Qualitative inquiry about the future that is co-produced with practitioners is clearly a non-traditional form of research in the field of PSM, where most research has focused on measuring current and past phenomena using quantitative techniques. This article predominantly addresses three groups of PSM researchers – engaged scholars (Bäckstrand and Halldórsson, 2019), qualitative interpretivists (Welch and Piekkari, 2017) and those who study (aspects of) the future of PSM. It makes the case that more research on the future of PSM is needed, and for the value of scenario planning as a research methodology. The article has three inter-linked objectives: i) to position scenario planning as a research methodology (as well as a technique for practitioners) ii) to serve as a resource by signposting further literature on scenario planning iii) to suggest appropriate criteria for evaluating the outcomes of scenario planning.

Contemporary business environments are marked by rapid, constant transformations (Kamann et al., 2016; Steiber and Alänge, 2016) that impact organisations' competitiveness and sustainability, and raise challenges for PSM. Despite many opinion pieces by consulting and

\* Corresponding author.

E-mail addresses: [l.a.knight@utwente.nl](mailto:l.a.knight@utwente.nl) (L. Knight), [jomeehan@liverpool.ac.uk](mailto:jomeehan@liverpool.ac.uk) (J. Meehan), [e.tapinos@strath.ac.uk](mailto:e.tapinos@strath.ac.uk) (E. Tapinos), [l.a.menzies@liverpool.ac.uk](mailto:l.a.menzies@liverpool.ac.uk) (L. Menzies), [alexandra.pfeiffer@dbfz.de](mailto:alexandra.pfeiffer@dbfz.de) (A. Pfeiffer).

<https://doi.org/10.1016/j.pursup.2020.100624>

Received 8 August 2018; Received in revised form 15 April 2020; Accepted 24 April 2020

Available online 28 April 2020

1478-4092/ © 2020 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license

(<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

professional associations on the future of purchasing and supply management, academic studies are scarce. Research tends to be limited in scope, focusing on certain industries (Allal-Chérif and Maira, 2011; Khripunova et al., 2014), or on the impact of specific supply-side macro-environmental challenges on PSM.

High levels of uncertainty and complexity can lead to inertia in resource-constrained PSM organisations (Lorentz et al., 2019). Counter-intuitively, they can prevent radical responses and instead embed business-as-usual approaches (Wright and Nyberg, 2017). In uncharted territory, or situations requiring a longer temporal framing such as PSM's role in mitigating the climate emergency, research grounded in predictive methods may provide insufficient data to help navigate future unknown challenges; they reduce our ability to identify the significance of future inter-related issues and research agendas (Thorén and Vendel, 2019). By contrast, scenarios (which are *not* predictive, as explained below) are specifically aimed at assessing the significance of potential events/contexts before they occur (Millett, 2012).

Scenario planning is one of several well established methods in academic research. Other methods include, for example, Delphi study (Seuring and Müller, 2008), and other methods are sometimes used in combination with scenario planning.<sup>1</sup> Its importance is increasingly recognised across all fields, including natural sciences and engineering. As discussed in *Nature*, top-down approaches such as modelling need to be complemented by bottom-up participatory methods to promote stakeholder engagement and to explore the possible societal consequences of technological change (Contestabile, 2013; Conway et al., 2019; Editorial in *Nature*, 2018). Between 2014 and 2019, the US National Science Foundation funded 10 projects worth \$6.45 million, with 'scenario planning' listed as a key term. For the same period, the main Web of Science indexes (SCI-EXPANDED, SSCI, A&HCI) lists 729 articles with topic = 'scenario planning', of which 174 are in business and management journals. In business and management, much of the research concerns firms and their strategies. Other units and levels of analysis are however also found in future studies. For example, the topics of the 67 articles include: impact of 3D printing on supply chains (Ryan et al., 2017); the Internet of Things and supply chain (Pishdar et al., 2018); system dynamics in the clothing sector (Serrano et al., 2018). All these studies demonstrate an orientation towards 'prescience' which – in management studies – is "a way of achieving scope and fulfilling our scholarly role of facilitating organisational and societal adaptiveness" (Corley and Gioia, 2011:12).

Our central argument is that scenario planning broadens the range of research methodologies used to explore the future of PSM - methodologies that present valuable opportunities for new insights and research, enabling the discovery of critical knowledge which can be hidden within supply networks (Gualandris et al., 2018). Methodologies and methods typically used in past research (e.g. interviews, surveys) are limited for futures research, in three crucial ways which the use of scenarios can overcome: (i) they focus on linear projection/prediction; (ii) they fail to consider how *complex interaction* of macro-environmental factors affects the PSM context; (iii) they tend to encourage incremental thinking. The points made in this article about the use of scenarios are not new; rather, the contributions here are a) in relating scenarios to PSM field, and b) in focusing on the future of the discipline, whereas scenario work is usually firm or sector related.

## 2. Looking forward: future studies and prescience-oriented research

*"We live not just in times of continuous change but continuous discontinuous change ... on the one hand, because in times of flux the past*

*no longer serves as a reliable guide to what is going on, and on the other, because when continuous change is also discontinuous change, it is difficult to know how to act in a world that is not just equivocal but unpredictably equivocal."* (Colville et al., 2012: p7).

Futures research is a difficult, complex area of study. The future landscape is not necessarily a continuation of the past and present, and developments are not deterministic. Prediction is often limited to short time frames and, even then, unexpected events occur. Paradoxically, these challenges increase the importance of future-orientated research (May, 1982), to help scholars anticipate and conceptualise potential problem domains, expose assumptions (Corley and Gioia, 2011), and present new research directions that may fundamentally shape future debate and theory (Ahuja and Morris Lampert, 2001). In environments with exponential or disruptive change, influence is not confined to traditional lines of communication or power structures (Pang, 2010), and it can be hard to pay attention to issues whose unintended consequences play out in the long term on a global scale (Pang, 2011).

In the futures literature, foresight is a dominant concept. Foresight, as opposed to forecasting, does not aim to predict the future, but helps to explore and consider alternatives (Khripunova et al., 2014). Foresight is based on three core assumptions (Rohrbeck et al., 2015):

- given the uncertainty of future environments, multiple futures are possible;
- the drivers of future change can be studied;
- the future is malleable and open to influence.

Chermack (2007) observes that theory building and scenario planning (Schoemaker, 1997) are both exercises of 'disciplined imagination' (Weick, 1989) requiring future-orientation to assess emerging phenomena or to explore possible new paradigms. Clearly, traditional forms of empirical data are not available for what has yet to occur (Fawcett et al., 2014). Scenario planning helps its participants move beyond the past and present, to envision multiple possible futures (Wack, 1985a, 1985b) and holistic world views (Ozbekhan, 1974).

A central pillar for prescient scholars is to conceptually frame future issues as if they have manifested, and then to infer the theoretical assumptions that need attention or invention (Corley and Gioia, 2011). Rather than filling research gaps for the sake of theory *per se*, prescience aims to develop understanding of a theory's utility in practice (Corley and Gioia, 2011), highlighting the importance of engaged research. The temporary shift to considering various futures as if they have already happened allow for hidden assumptions in our theories and models to be surfaced and unpacked (Patvardhan, 2013).

Prescience is identified as an emerging but critical concept in organisational research (Cassell et al., 2019). Those conducting prescience-oriented research engage with reflexive participants to transform today's thinking and practice (Cunliffe and Scaratti, 2017; MacIntosh et al., 2017). As with engaged scholars (Bäckstrand and Halldórsson, 2019) and action researchers (Maestrini et al., 2016; Meehan et al., 2016), they are not just bystanders or observers. Through their research, they aim to perform an adaptive role in society, rather than a maintenance one (Corley and Gioia, 2011). More radical prescient theorising can introduce new research agendas and trajectories (Corley and Gioia, 2011) that have the potential to transform a field's development (Nadkarni et al., 2018). Through performative theory development, they can shape environments (Garud and Gehman, 2016, 2019). Future-based research thus places different demands on PSM scholars than many of us are used to, in terms of research philosophies, design, methodologies, ethics, skills, and theories.

## 3. Looking forward: past research on the future of PSM

Though most academic articles provide implications for future research, there are relatively few articles specifically about the future of

<sup>1</sup> For example, scenario planning has been combined with roadmapping (Hussain et al., 2017) with Delphi studies (Nowack et al., 2011) and with more traditional computation models (Rouse et al., 2018).

PSM. Predictive approaches are used most often and significant topics identified fall broadly into two themes: human/social issues, and technology. Anticipated human/social issues include sustainability (Schoenherr et al., 2012), internal integration (Mogre et al., 2017), purchasing skills (Bals et al., 2019; Tassabehji and Moorhouse, 2008), behavioural dynamics of individual actors (Wieland et al., 2016), and ethical purchasing (Wieland et al., 2016). Future technologies identified as increasingly important include predictive analytics and big data (Schoenherr and Speier-Pero, 2015), digital/web-based technology (Gallea, Ghobadian and O'Regan, 2008), Industry 4.0, the Internet of Things (Glas and Kleemann, 2016), and e-procurement systems (Alvarez-Rodríguez et al., 2014). The predicted futures include a range of specific cost, service and ethical challenges for PSM, including resource depletion, increasing demand in developing countries, higher customer expectations in traditional markets, and a growth in global competition (Kamann et al., 2016). At a macro level these changes are driven by global themes of sustainability, risk, humans, innovation, analytics, and complexity (Wieland et al., 2016).

Many studies on (aspects of) the future of PSM are based on extensive literature reviews (Schneider and Wallenburg, 2013; Zheng et al., 2007) or expert interviews (Tassabehji and Moorhouse, 2008). These methods have the advantage of collecting and synthesising valuable extant knowledge, but forecasting from extrapolations is problematic and predicting the future, even with the use of experts, is arguably impossible (Tetlock, 2005). Although survey-based research has engaged academics and PSM professionals in their views of the future, the tendency is to search for consensus (see Wieland et al., 2016; Schoenherr and Speier-Pero, 2015), which can privilege dominant perspectives and activities and exclude other viable alternatives or plausible futures. Surveys or literature reviews that look backward to identify trends are inherently past-oriented and limit novelty and fresh perspectives (Näslund, 2002).

A number of empirical future PSM studies use case studies and interviews (Carter and Narasimhan, 1996; Tassabehji and Moorhouse, 2008), but they do not elaborate on *how* respondents are encouraged to be future-focused. In the PSM field more broadly, there are calls for more critical and participatory methods in PSM research (Meehan et al., 2016) to encourage diverse views and foresight (Heidingsfelder et al., 2015). The adoption of methods from different fields is also encouraged to reframe PSM issues, uncover assumptions, and provide new insights (Knight et al., 2016), particularly for exploring dynamic environments and complex societal challenges (Ferraro et al., 2015; Markard et al., 2012).

Much research on the future of PSM considers a shorter-term focus on familiar issues (Mogre et al., 2017; Spina et al., 2013) and incremental performance improvement (Schoenherr et al., 2012; Zheng et al., 2007). Change is viewed as inevitable (Wieland et al., 2016), yet authors tend to assume a stable purpose for PSM in the future with no fundamental changes to its role (Mogre et al., 2017; Spina et al., 2013). Whilst emerging areas including services and sustainability are identified (Zheng et al., 2007), the focus tends to centre on future academic research agendas (Wieland et al., 2016; Zheng et al., 2007) rather than explicit changes to practice. Most studies do not go as far as to envision what the future might look like and some, whilst acknowledging critical macro-environmental drivers, only consider specific supply chain trends. With the occasional exception of the sustainability agenda, PSM's strategic influence is still largely focused on, and bounded by, organisational outcomes rather than consideration of the wider aggregated consequences of supply-side actions or changes to supply markets. Potentially this masks collective responsibilities and accountabilities, and the emergent effect of cumulative decisions. Current approaches can be unsuitable for work on the future of PSM as they reinforce dominant paradigms and theories. Yet, understanding how and why particular issues and frames become dominant is itself potentially insightful for the field. Scenarios can complement existing methods through exposing the underpinning assumptions and biases in

our own models and theories.

#### 4. Scenario planning

##### 4.1. Scenario planning: from philosophy to application process

Scenario planning is an approach for making sense of the future. The origins of scenario planning are attributed to the pioneering work of the RAND institute for the US military, which was later popularised in business when applied successfully at Shell (Chermack, 2017). In the business context, firms develop the scenarios, which are then used directly in business planning.<sup>2</sup>

The underpinning principle of scenario planning is that the future is determined by driving forces (Cairns and Wright, 2018; Ramirez and Wilkinson, 2016; Schoemaker, 1997; Tapinos, 2012; Wack, 1985a). For those trying to make sense of the future, most of these driving forces are 'known unknowns', that is: the force is recognised, but how it will develop and its impact are uncertain. The complexity created by the known unknown dictates the need to anticipate the future via multiple plausible images (scenarios), instead of assuming linear progression of the present, or forecasting specific elements of the environment based on past behaviour. The philosophy of scenario planning has emerged into a methodology that can be applied when examining the external environment and strategizing. The use of scenarios in the anticipation of the future is about sketching out competing futures, which then serve as a mechanism to provoke debate and uncover assumptions. See for example 'Scenarios for the Future of Technology and International Development' produced by the Rockefeller Foundation and Global Business Network (2010).

The evolution of the scenario planning methodology has led to the development of a range of approaches. Bradfield et al. (2005) identified three schools of thought based on data characteristics: qualitative data in the *Intuitive Logic* approach; mixed methods in *La Prospective*; and quantitative data in the *Probabilistic Modified Trends* approach. Of these categories, in this article, the focus is on the Intuitive Logic approach that encourages participatory methods to stimulate diverse discussions and uncover different perspectives, and that conceptually distinguishes uncertainty from risk. Unlike risk, uncertainty is not open for probability measurement (Knight, 1921; Tapinos, 2012). The Intuitive Logic approach aligns well with researching the future of PSM as the combination of complex driving forces that shape the future of a discipline cannot easily be quantified or modelled.

There is a general consensus about the key steps of intuitive logic methodology (c.f. Hussain et al., 2017). The *first* step sets the scene and frames the process: defining the purpose of the intervention; developing an in-depth understanding of the organisation or concept whose future is examined; and selecting the planning horizon for the scenarios. The *second* step identifies the wide variety of driving forces for the general/macro environment, through PEST frameworks or similar (Burt et al., 2006). In the *third* step, driving forces are ranked based on their level of uncertainty and impact (see O'Brien (2004) for a full description of the ranking and categorisation process). In the *fourth* step, scenarios are developed either inductively from a few of the uncertainties identified (Frith and Tapinos, 2020), or deductively pairing uncertainties to create a  $2 \times 2$  matrix with four scenario themes (Ramirez and Wilkinson, 2016). In the final *fifth* stage of scenario development, narratives (as stories of the future) are constructed in order to make the scenarios more accessible to their intended audience (Burnam-Fink, 2015). The

<sup>2</sup> The term 'scenario planning' reflects this early use in business, involving both the development of scenarios and their use in strategic planning. Often, a research project concerns just the scenario development stage, but the methodology is nevertheless called 'scenario planning'. The focus of this article is scenario development. The article covers both methodology (overall research strategy and design) and methods (tools for collecting and analysing data).



developed scenarios have practical applications in strategic planning and for theory development through surfacing assumptions and gaps in our attention.

Scenario development as a managerial practice can be demanding and complicated (Chen, 2009), with leadership, group-thinking (Roubelat, 2000), and cognitive bias (Bradfield et al., 2005) identified as risks in the process. Similarly, breaking out from myopic behaviours is difficult even for very senior leaders who can struggle to 'think the unthinkable' (Gowing and Langdon, 2016) and, when they do, the attention to supply-side aspects is very limited (see, for example Schwab, 2017). Scholars also identify 'hyperopia' (the condition of paying too much attention to the distant future, neglecting the present and near future) as an additional potential dysfunction of scenario planning (Mackay and Burt, 2015). To address these risks a series of mechanisms are developed to support the process including: avoiding fragmentation; making issues explicit; conversation; memorable stories; articulating assumptions; detailed analysis; contrasting scenarios; remarkable people; inductive development; and internal generation (Frith and Tapinos, 2020).

#### 4.2. Scenario planning as a research methodology

In the last couple of decades much scenario planning work has been published. However, its use as a research methodology is relatively new, and growing in popularity (Ramirez et al., 2015). Unlike forecasting (Schoemaker, 2016) the methodology is not about prediction. It is an opportunity to identify critical drivers and uncertainties (Schoemaker, 1997) and explore their potential impacts. Scenario planning as a research method (Ramirez et al., 2015) engages academics and practitioners in a step-by-step approach to create multiple plausible images of the future.

Scenarios support theory building by making sense of the future through storytelling (Wright and Goodwin, 2009). The process of envisioning the future of a discipline, and making sense of how it might unfold, produces new awareness and valuable insights for those involved in the process or those exposed to its outcomes (Mietzner and Reger, 2005). Moreover, the use of scenario planning in academic research is an effective methodology for interdisciplinary research (Kröger and Schäfer, 2016) by widening the stakeholders involved in the development of the scenarios (Bohensky et al., 2011), to encourage discussion among participants from different disciplines, backgrounds or parts of the organisation (Roubelat, 2000).

The defining feature of scenario planning is the production of multiple plausible images of the future to address a wide range of uncertainties (Tapinos, 2013). Use of these contrasting future viewpoints encourages participants to think holistically and systemically over longer time frames, examining a range of interacting factors (Öborn et al., 2013). Once developed, the scenarios are considered as if they have already occurred (Candy, 2010), inviting participants to 'become' their future self. In comparison to prediction-based studies, the temporal framing epistemologically distances the present and future; the future as 'now' allows the present to function as an 'other', rather than vice versa (Inayatullah, 1993) to open up new lines of sight and reduce paradigmatic constraints.

Traditional methods that search for probable futures generally are based on research gaps corresponding to 'what/how' and 'how/why' research designs, whereas scenarios use plausible futures to provoke 'what if?' questions (Ravetz, 1997). Foresight exercises contribute theoretically by creating new knowledge from progressive discussions that reframe issues and challenge implicit assumptions (Dufva and Ahlqvist, 2015), thus enabling epistemological contributions through identifying knowledge of the future (Piirainen and Gonzalez, 2015). There have been various criticisms of scenario planning (Mietzner and Reger, 2005), notably concerning confusion over the proliferation of terms, methods and techniques (Bishop et al., 2007). The field's response has always been very clear that scenario planning is not a

process of calculating a singular future but a creative, participative and strategic conversation that is highly dynamic, requiring judgement, a tolerance of uncertainty (van der Heijden, 2004), and an explicit acknowledgement of values (Voros, 2001) within disciplined, robust processes (Chermack, 2007).

The use of scenario planning to examine the future in settings other than organisations is quite common without necessarily being explicitly recognised. Some examples include the future of sustainable tourism (Gössling and Scott, 2012), technology adoption (Hussain et al., 2017), healthcare (Cairns and Wright, 2018), Arctic futures (Arbo et al., 2012), the future of marketing (Moutinho et al., 2002), the future of transportation construction (Kim et al., 2017). Despite the fact that many disciplines are now using scenario planning as a research method, there has been limited emphasis on the scope of scenarios (in the sense of level and unit of analysis). In one of the few articles to examine the utilisation of scenario planning to investigate the future of a discipline and a field, Ramirez et al. (2015) demonstrate that the use of *Intuitive Logic* supports the development of new insights about a discipline.

## 5. Using and valuing scenario planning in PSM research

### 5.1. Potential applications of scenario planning in PSM

Considering the examples in the preceding paragraph, it is clear that scenario-based research could be usefully deployed for many aspects of PSM research, with varying contexts and perspectives, and various units and levels of analysis. It could, for example, be used to describe contrasting plausible futures for:

- The evolution of a supply market, for category management
- A strategic external resource, for risk management
- The PSM function within an organisation, to develop its strategic contribution
- The PSM profession, or discipline, to inform its strategic development by relevant professional associations, or academic networks
- A wide range of focal topics relevant across various levels (sector, organisation, etc) such as regulatory environment, ethical standards and norms, technological change, PSM leadership

All these themes are relevant and important to PSM policy leaders and practitioners across sectors, and therefore of interest to academics who value doing impactful research, although they do not always require an explicit future focus. However, the most pressing and important issues for PSM are necessarily future-oriented. Consider for example Montabon, Pagell and Wu's (2016: p11) highly cited article which sought "to move the [SCM] field from the question of how can firms merely diminish environmental or social problems to how supply chains can become truly sustainable". Among many researchers, this shift in attention is understood but not yet realised. PSM scholars can contribute to this conceptual shift through exploring how firms manage commercial transactions within these 'truly sustainable' supply chains. Yet, given the lack of such supply chains in practice, where and how could this research be conducted? As with many aspects of the more radical sustainability agenda, their question lends itself to future-focused research, including scenario planning, to provide a more nuanced analysis of critical uncertainties and the boundaries of PSM's existing theoretical frames.

Exploring the future of PSM through methods such as interviews, surveys, literature reviews, road mapping or modelling is feasible, but subject to constraints and shortcomings that can be addressed through scenario techniques. The more complex, dynamic and novel the issues, the greater the relevance of scenarios. Scenarios are ultimately a method for sensemaking and sensegiving, providing meaning and focus for action (Gioia and Chittipeddi, 1991). The adoption of future-focused and engaged methods shifts a study's purpose and methods away from 'knowledge-first' (Miller, 2013) modes that are familiar in PSM

research, towards a 'process-oriented' approach (Miller, 2013), but they are still 'real' research – see for example the OECD's definition of research (e.g. OECD, 2015).<sup>3</sup>

Building on the preceding critique of past research on the future of PSM<sup>4</sup> and recognising the need to facilitate sensemaking about the future of PSM, the authors derive a set of design requirements for such studies. Whether following a scenario-based methodology, or other approaches, future studies should:

- Contextualise: Place PSM in the wider context of commercial landscapes, or professional environments
- Integrate: Consider a wide range of factors in an integrative way
- Engage: Involve a broad range of stakeholders in the process
- Challenge: Surface assumptions of linear, incremental change
- Observe: Attend to weak signals and identify blind spots
- Specify a (distant) timeline: Provide explicit time horizons

## 5.2. Probable, plausible and preferred futures

Discussions on scenario planning in the various literatures are commonly framed away from *probable* futures (i.e. which favour prediction with a view to planning change), and towards *plausible* futures (i.e. favouring new thinking with a view to uncovering assumptions and (re)framing alternatives). This position can be extended further through the consideration of *preferred* futures, which arise when multiple scenarios are compared and one or more futures are found to be particularly (un)appealing, with a consequent direct influence on action. It is possible to envisage circumstances in which practitioners' actions would influence the system's trajectory, for example a supply market scenario anticipating growing market concentration could lead a powerful buyer to take measures to avoid this outcome.

Academic research has agency too, and prescient approaches can enhance researchers' influence on societal issues (Corley and Gioia, 2011). PSM scenarios can help surface blind spots and assumptions in PSM theories and models. Blind spots are critical issues obscured by institutional or field-level conformity (DiMaggio and Powell, 1983) or enactment of their interpretations (Weick, 1969), both of which result in the normalisation and dominance of particular worldviews. Exposing assumptions and blind spots is an important resource in critical action research (Meehan et al., 2016) and other forms of co-production aimed at engendering significant, positive developments in PSM practice (Bäckstrand and Halldórsson, 2019).

## 5.3. Three criteria for valuing scenario planning research: rigour, significance and originality

The academic legitimacy of using scenarios is extensively considered by scenario planning scholars (Blass, 2003; Spaniol and

<sup>3</sup> According to the Organisation for Economic Cooperation and Development (OECD) (2015), research and experimental development (R&D) comprise "creative and systematic work undertaken in order to increase the stock of knowledge – including knowledge of humankind, culture and society – and to devise new applications of available knowledge ... R&D is always aimed at new findings, based on original concepts (and their interpretation) or hypotheses. It is largely uncertain about its final outcome (or at least about the quantity of time and resources needed to achieve it), it is planned for and budgeted (even when carried out by individuals), and it is aimed at producing results that could be either freely transferred or traded in a marketplace. For an activity to be an R&D activity, it must satisfy five core criteria ... (it) must be: novel; creative; uncertain; systematic; transferable and/or reproducible".

<sup>4</sup> A recent application of scenario planning to the future of PSM (Knight and Meehan, 2018) identified two plausible scenarios for 15 years ahead. The study highlighted the potential impact of a range of factors related to the future of PSM from 'ownership and data systems' to 'innovation rate and drivers' and from 'value of brand' to 'character of infirm interactions'.

Rowland, 2018). Scenarios can be academically significant in terms of developing research agendas, and providing a site for combining knowledge from different fields. They can be seen as descriptive 'theories of the future' – sensemaking resources – which can catalyse more formal theorising, potentially with performative effects (Marti and Gond, 2018).

It is important to recognise that scenarios-based research faces a double hurdle in demonstrating its value relative to more traditional methods used in PSM research, since it is both close to practice and future-focused. In this section, to critically assess and illustrate the suitability of scenario planning as a research methodology, the discussion is framed around three research evaluation criteria: rigour, originality and significance. These have been adopted by the UK Government's Research and Innovation department in its regular strategic quality evaluation of all research across all disciplines in all UK universities, known as the Research Excellence Framework (UK REF). These criteria, as well as being relevant to all types of research, help take the discussion beyond the more often used rigour and relevance (Pettigrew, 2001) criteria, to consider also the impact, or influence, of the research (see Table 1).

### 5.3.1. (How) can scenario planning for PSM research be rigorous?

Whereas rigour is often discussed in terms of theoretical underpinning and use of method (ologies), the UK REF definition is more widely scoped. In general terms, combining insights about prescience in research (Corley and Gioia, 2011) and scenario methods (Bradfield et al., 2005; Chermack, 2007) provides a coherent basis for PSM scenario based research, positioning it clearly in relation to the adaptive role of academic researchers. As with every research project, the integrity of the project relies on clear specification of its aim and systematic execution, which must then be carefully reported (Gioia et al., 2013). As indicated through the examples in Section 5.1, the study may relate to a wide variety of PSM topics, levels, and units of analysis. As discussed in Section 5.2, the choice of scenario planning to investigate the topic needs to be clearly centred on an interest in plausible rather than probable futures.

At a practical level, scenario planning research can be more rigorous if the 'best practice' advice is followed in applying the method (see 4.1 paragraph 4). Relating to the *first* step, a recent global study of scenario planning practice (Ramirez et al., 2020) showed that clarity of the purpose is an essential feature of effective application. For the *second* step, rigour can be achieved by involving participants with a wide range of backgrounds and expertise in brainstorming the driving forces of future (Cairns and Wright, 2018). van der Heijden (2004) focuses on value added by including participants with wider knowledge of the focus of the scenarios who are not necessarily directly linked to the organisation or the researchers developing the scenarios. Regarding the development of the scenario themes, in the *fourth* step, it is important that the researchers consider the causality of the driving forces in order to effectively explore the linkages between them (Derbyshire and Wright, 2017). Concerning the construction of narratives, in the *fifth* step, the advice for the researchers is to consider their audience (O'Brien, 2004) and adapt the stories of the future in a language and symbolism that will support the imagination of their audience. Authors of PSM related scenarios would need to consider whether the audience is other PSM experts, or aimed at PSM external stakeholders.

Drawing on Pettigrew (2001), Morgan (1983), Sandberg and Tsoukas (2011), (Ramirez and Wilkinson (2016)), highlight that the goal of scenario development and application is to challenge the status quo, and to push knowledge boundaries. Evaluating scenarios developed through the inductive logic process is not about assessing their validity in terms of verifying them in retrospect (Bradfield et al., 2005, see Table 1). Researchers exploring the future of PSM should assess their scenario planning work against the key characteristics of 'good scenarios' (Kahane, 1992) which are: plausible, challenging and internally consistent.

**Table 1**

Definitions of the three criteria for assessing research quality (as used in UK REF - Research Excellence Framework, 2019: 34–35).

Criterion	Definition
Rigour	The extent to which the work demonstrates intellectual coherence and integrity, and adopts robust and appropriate concepts, analyses, sources, theories and/or methodologies
Originality	The extent to which the output makes an important and innovative contribution to understanding and knowledge in the field. Research outputs that demonstrate originality may do one or more of the following: produce and interpret new empirical findings or new material; <u>engage with new and/or complex problems</u> ; develop innovative research methods, methodologies and analytical techniques; <u>show imaginative and creative scope</u> ; <u>provide new arguments and/or new forms of expression, formal innovations, interpretations and/or insights</u> ; collect and engage with novel types of data; and/or <u>advance theory or the analysis of doctrine, policy or practice</u> , and new forms of expression
Significance	The extent to which the work has influenced, or has the capacity to influence, knowledge, and scholarly thought, or the development and understanding of policy and/or practice

### 5.3.2. (How) can scenario planning for PSM research be original?

Original research is both innovative and important. Compared to other methodologies deployed in past research (see Section 2), scenario development is more likely to deliver originality in the forms highlighted in the underlined text in Table 1. Scenario planning is specifically designed to encourage contributors to be imaginative, and to enable a holistic view of complex settings. Scenarios are not predictions to be evaluated by their subsequent accuracy. Rather, images of plausible futures are assessed according to their richness, plausibility and value in framing, strategizing (Ramirez et al., 2017), and sensemaking (Bowman, 2016). When well executed, the scenario method enables novel insights through revealing assumptions, exposing blind spots and directing our attention to theories in allied fields. Scenarios may lead to reframing practice or, from an academic perspective, can support problematising (Alvesson and Sandberg, 2011; Ramirez et al., 2015) and so lead to new research avenues.

### 5.3.3. (How) can scenario planning for PSM research be significant?

Increasingly, research is evaluated not just according to its rigour, relevance and short-term outputs, but also on its longer-term impact, or influence, as captured in the UK REF significance criterion. Significance is often considered primarily in terms of its scientific utility, and this is often treated as if synonymous with theoretical contribution. The UK REF definition challenges us to take a broader view of significance. The potential significance of scenarios in PSM research is determined by the scenario research's ability to impact and influence either within, or beyond, academia. In the PSM context, impacts can cover, for example, changes to a company's strategic direction, sourcing strategies and practices, a change of policy for a professional association or a public authority. From a sensemaking perspective, more subtle influences could include new shared awareness of taken-for-granted assumptions or consequences of current behaviours (Cassell et al., 2019), and shifts in norms and discourse, for example notions of stakeholders' interests in procurement, or values reflected in decision making criteria. These changes ultimately then turn back to academics, influencing the issues and topics that are researched and studied.

## 6. Conclusion: connecting to our PSM FUTURE(S)

Engaged, future-focused methods are arguably more relevant than ever before. With the goal of encouraging more scholars to work in this critically-oriented space, this article draws on the long-standing evidence base of futures research in other fields to discuss how scenarios can deliver rigour, originality and significance in PSM research.

The pressure on PSM is clear as organisations face a growing need to innovate and react faster to cope with external resource scarcity, supply crises, and tightening margins and operating budgets. As key contributors to the management of their organisations' strategic external resources (Van Weele and Van Raaij, 2014), PSM practitioners need to understand the long-term development of the supply-side business landscape. The development of useful, practical knowledge cannot be achieved just by observing current and past practice. To remain

relevant and make a significant positive impact, PSM researchers must have "an orientation toward prescience in trying to anticipate, conceptualise, and influence significant future problem domains" (Corley and Gioia, 2011: 13) – theorising which, in turn, provides scientific utility.

This Notes & Debates article presents the case for extending the repertoire of methods/methodologies used to explore the future of PSM to include scenario planning. The review of past research on the future of PSM highlighted several methodological drawbacks in past studies. In literature reviews, researchers are looking forward by looking backward, which is especially problematic in highly uncertain and dynamic environments. Cross-referencing between studies creates an 'echo-chamber'. Questionnaire based surveys drive a fragmented view of the future, whereas holistic stories are needed for sensemaking (Colville et al., 2012).

The value of scenarios for PSM lies in their potential to support more radical thinking about the future (Ramirez et al., 2015; Schoemaker, 1997). Scenarios research can yield knowledge that challenges the assumptions embedded in PSM theories about the existing order of the field, and understanding of more complex interdependencies within the supply landscape. Scenarios move academic theories beyond predictable futures, to exploring plausible futures and identifying preferable futures (Amara, 1974, 1991; Candy, 2010; Henchey, 1978; Voros, 2017). The findings from scenario research can enable academics and practitioners to address the gaps that remain between PSM's intended strategic role and the prevailing reality (Knoppen and Sáenz, 2015).

## 7. POST-SCRIPT: reflecting on the COVID-19 coronavirus pandemic

In the two and half years since the call for papers for JPSM's 25th anniversary special issue was published, much has changed. Fuelled in part by a step change in environmental activism, there is a far greater sense of urgency to address the climate emergency. Then, on March 11, 2020 (a month before the final changes to this article were made), the World Health Organisation<sup>5</sup> declared the Covid-19 coronavirus had reached pandemic status.<sup>6</sup> As the pandemic brings illness and death to millions of people worldwide, this 'greatest crisis since World War II' (UNDP, 2020)<sup>7</sup> is also generating profound social and economic disruption.

During the pandemic, all businesses' supply chains are facing unprecedented challenges. For some organisations, there are also exceptional opportunities, for private profit and/or to demonstrate 'good citizenship'. Public sector procurement functions have a crucial role in

<sup>5</sup> <https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19—11-march-2020>.

<sup>6</sup> The epidemic's trajectory and consequences so far are uncannily well reflected in 'Lock Step', one of the four scenarios developed by the Rockefeller Foundation/Global Business Network project (2010).

<sup>7</sup> <https://www.undp.org/content/undp/en/home/coronavirus.html>.



crisis management, including urgently acquiring critical materials for health services such as personal protective equipment and ventilators. The case for (legitimate) stockpiling of critical health and safety consumables and medical equipment as part of emergency preparedness planning is easy to make.<sup>8</sup> Understanding that government emergency stockpiles are valuable does not need scenario planning, nor PSM expertise.

Clearly, scenario planning is relevant for all sorts of driving forces, and not only in the context of a global pandemic. The relevance of scenario planning is reinforced whenever there is increased uncertainty. Studies of the popularity of management tools have shown that scenario planning became more popular post 9/11 and post the 2008 financial crisis. At times like these, the value of scenario planning is widely recognised, both as an intervention that should have taken place before the crisis, and for use during the crisis. Could a PSM-specific scenario analysis have yielded valuable insights which, with appropriate political will and funding, might have reduced some of the current challenges? What novel insights relevant to coping with the pandemic might have arisen from – for example – a ‘public procurement in times of crisis’ scenario planning study?

Using the intuitive logic approach, the third step of a ‘public procurement in times of crisis’ study might identify the key uncertainties as 1) the nature of the crisis: epidemic, social/political unrest or environmental catastrophe and 2) the scope of the crisis: regional or global, which in combination lead to six scenarios, one of which is a global pandemic. The scenario narratives would describe public procurement in each situation. The narratives would encompass many aspects of public procurement, including *function related dimensions* such as organisation, stakeholder commitment, policies, practices, processes, technologies, people and capabilities, and *external dimensions* such as supplier relationships, market power and dynamics, legislation and regulation, political priorities.

Cross-referencing these themes to some of the supply problems identified in current news stories about the Covid-19 coronavirus pandemic indicates a crisis scenario study might have helped procurement experts foresee some of these issues:

- In relation to shortages and prices<sup>9</sup>
  - o The inadequacy of existing legislation to deal with price gouging in times of crisis might have been recognised and addressed in anticipation<sup>10</sup>
  - o The need to prioritise supply chain mapping, for example to investigate active pharmaceutical ingredients sources and reveal critical, hidden dependencies<sup>11</sup>
  - o Fast tracking supplier evaluation and product certification processes
  - o Coping with escalating threat of corruption, when ‘normal’ regulations are suspended<sup>12</sup>
  - o The role of state or federal governments in coordinating healthcare product acquisition in decentralised/independent healthcare system<sup>13</sup>
- In relation to market capacity
  - o Contracting authorities competing for scarce supplies and the

<sup>8</sup> if not to execute effectively. See <https://www.nytimes.com/2020/03/29/business/coronavirus-us-ventilator-shortage.html>.

<sup>9</sup> <https://www.open-contracting.org/2020/04/08/5-procurement-strategies-for-navigating-the-covid-19-crisis-from-around-the-world/>.

<sup>10</sup> <https://theintercept.com/2020/03/19/coronavirus-vaccine-medical-supplies-price-gouging/>.

<sup>11</sup> <https://www.vox.com/2020/3/9/21163356/coronavirus-drug-shortage-potential-fda-china-india>.

<sup>12</sup> [https://www.transparency.org/news/feature/corruption\\_and\\_the\\_coronavirus](https://www.transparency.org/news/feature/corruption_and_the_coronavirus).

<sup>13</sup> Thomas Tighe, CEO of Direct Relief (<https://www.directrelief.org>) interviewed on BBC World Service *Newsday* programme (06:06) April 13, 2020.

influx of new intermediaries<sup>14</sup>

- o Evaluating the (mis) alignment of assumptions about international sourcing, reshoring, trade barriers, etc., between ‘normal’ versus crisis times
- o Rapidly building market capacity, including where intellectual property is pivotal and producers lack experience

With the benefit of hindsight, an appreciation of foresight research, and knowledge of PSM research and education, the evidence in current news suggests scenario planning might have helped surface critical assumptions and identify important blind spots. This deeper understanding of risks could then have helped shape further research, education and training, management processes, and policy planning.

Nevertheless, it is important to note that scenario planning's scope has never been to predict a crisis, but to help those involved in the process to imagine and make sense of the future as multiple alternatives. In these days of the greatest crisis in humanity's recent history, scenario planning is relevant to help researchers and practitioners to make sense of what the world will be like after the coronavirus pandemic (Mair, 2020). Mass media are dominated by linear projections of how the future will, or will not, be different compared to the past. Optimists speak of major advancement in the evolution of technology and collaboration between nations, while pessimists predict a more isolationist world in which every nation will work for itself with limited international collaborations. Optimists foresee the establishment of new, desirable practices (e.g. less travelling, more teleconferences); pessimists predict a great recession, the collapse of the global economy and consequent changes in the political landscape (similar to 1930's). Scenario planning today for varying purposes would determine the key driving forces of the future, drawing on wide range of policy and advisory sources (e.g. Future Agenda <https://www.futureagenda.org/the-world-in-2030/>) as well as academic research). Different focuses would require different planning horizons. For example, the owner of a SME might look to when the lockdown will be relaxed; while the manager in a multinational might focus on future resource availability and restrictions, or macro-political changes following the strengthening or the collapse of global institutions like the World Health Organisation. Scenarios would help those involved in their crafting to consider a range of uncertainties and make sense of different plausible images of the future. None of them has to turn out to be true. The value of scenario planning lies in the learning achieved in the journey of the development of scenarios and related critical reflection.

Looking forward, many very recent news articles debate what the future holds – considering questions such as how long social distancing will need to continue, the economic, social and political consequences of lockdown, and implications for demand and supply chain structures. From a PSM perspective, many factors will influence the supply-side landscape (e.g. reduced consumer demand, widespread bankruptcies, the rapid growth of new suppliers and new intermediaries in some sectors, trade barriers) and purchasing processes and decisions (e.g. changing attitudes to privacy impacting the rate of digitalisation, changing priorities regarding sustainability and regeneration, changing forms of communication, different power structures and relational priorities). A scenario planning study of the ‘future of PSM in the UK medical equipment manufacturing sector’ would review these driving forces (intuitive logic step 2), and select the most critical (step 3) around which to develop the scenarios (step 4 and 5). For example, the two key uncertainties could be supply management digitalisation and degree of change in the supply landscape (as used in Knight and Meehan, 2018).<sup>15</sup>

<sup>14</sup> <https://www.theguardian.com/world/2020/apr/02/global-battle-coronavirus-equipment-masks-tests>.

<sup>15</sup> The Chartered Institute of Procurement and Supply study reported in Knight and Meehan (2018) motivated this Notes and Debates methods article.

Science is not limited to meticulously developing a better understanding of what is extant or has previously occurred. It is a fundamental function of science to imagine and engage with the unknown and what has not (yet) happened. Scenario planning is a valuable research technique to anticipate, shape and develop the future of PSM. Researchers would be conducting “creative and systematic work undertaken in order to increase the stock of knowledge” (i.e. research within the OECD definition, see footnote 2). They would take a process-oriented approach (Miller, 2013) for “the creation and maintenance of spaces for societal learning” (Wittmayer and Schöpke, 2014: 493), which engages researchers in several, interconnected roles. Roles include: reflective scientist (closest to knowledge ‘production’ and to what is conventionally understood as ‘research’); process facilitator; change agent; knowledge broker; self-reflexive scientist (Wittmayer and Schöpke, 2014) – many of which PSM academics are actively engaged right now as they volunteer to help practitioner colleagues deal with the Covid-19 coronavirus crisis.

### Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

### Acknowledgements

This study which motivated this article was funded by, and conducted in partnership with, the Chartered Institute of Procurement & Supply (CIPS) (UK). We are very grateful to interviewees, workshop participants and the knowledge team at CIPS (Sheena Donaldson, Nicola Robinson, Helen Alder).

### References

- Ahuja, G., Morris Lampert, C., 2001. Entrepreneurship in the large corporation: a longitudinal study of how established firms create breakthrough inventions. *Strat. Manag. J.* 22 (6-7), 521–543.
- Allal-Chérif, O., Maira, S., 2011. Collaboration as an anti-crisis solution: the role of the procurement function. *Int. J. Phys. Distrib. Logist. Manag.* 41 (9), 860.
- Alvarez-Rodríguez, J.M., Labra-Gayo, J.E., de Pablos, P.O., 2014. New trends on e-Procurement applying semantic technologies: current status and future challenges. *Comput. Ind.* 65 (5), 800–820.
- Alvesson, M., Sandberg, J., 2011. Generating research questions through problematization. *Acad. Manag. Rev.* 36 (2), 247–271.
- Amara, R., 1974. The futures field: functions, forms, and critical issues. *Futures* 6 (4), 289–301.
- Amara, R., 1991. Views on futures research methodology. *Futures* 23 (6), 645–649.
- Arbo, P., Iversen, A., Knol, M., Ringholm, T., Sander, G., 2012. Arctic Futures: Conceptualizations and Images of a Changing Arctic. *Polar Geography*, pp. 1–20.
- Bäckstrand, J., Halldórsson, Á., 2019. Engaged Scholar (ship) in purchasing and supply management (PSM): creative tension or squeezed in the middle? *J. Purch. Supply Manag.* 25 (4), 100557.
- Bals, L., Schulze, H., Kelly, S., Stek, K., 2019. Purchasing and supply management (PSM) competencies: current and future requirements. *J. Purch. Supply Manag.* 25 (5), 100572.
- Bishop, P., Hines, A., Collins, T., 2007. The current state of scenario development: an overview of techniques. *Foresight* 9 (1), 5–25.
- Blass, E., 2003. Researching the future: method or madness? *Futures* 35 (10), 1041–1054.
- Bohensky, E.L., Butler, J.R.A., Mitchell, D., 2011. Scenarios for knowledge integration: exploring ecotourism futures in milne bay, Papua New Guinea. *Journal of Marine Biology* 1–11 2011.
- Bowman, G., 2016. The practice of scenario planning: an analysis of inter-and intra-organizational strategizing. *Br. J. Manag.* 27 (1), 77–96.
- Bradfield, R., Wright, G., Burt, G., Cairns, G., Van Der Heijden, K., 2005. The origins and evolution of scenario techniques in long range business planning. *Futures* 37 (8), 795–812.
- Burnam-Fink, M., 2015. Creating narrative scenarios: science fiction prototyping at Emerge. *Futures* 70, 48–55.
- Burt, G., Wright, G., Bradfield, R., Cairns, G., Van Der Heijden, K., 2006. The role of scenario planning in exploring the environment in view of the limitations of PEST and its derivatives. *Int. Stud. Manag. Organ.* 36 (3), 50–76.
- Cairns, G., Wright, G., 2018. *Scenario Thinking*. Palgrave Macmillan.
- Candy, S., 2010. *The Futures of Everyday Life: Politics and the Design of Experiential Scenarios* (PhD thesis). University of Hawaii at Manoa.
- Carter, J.R., Narasimhan, R., 1996. Purchasing and supply management: future directions and trends. *J. Supply Chain Manag.* 32 (3), 2–12.
- Cassell, C., Radcliffe, L., Malik, F., 2019. Participant Reflexivity in Organizational Research Design. *Organizational research methods online*, (in press), 1094428119842640.
- Chen, J.-K., 2009. Utility and drawbacks of scenario planning in Taiwan and China. *Journal of futures studies* 13 (3), 105–106.
- Chermack, T.J., 2007. Disciplined imagination: building scenarios and building theories. *Futures* 39 (1), 1–15.
- Chermack, T.J., 2017. *Foundations of Scenario Planning: the Story of Pierre Wack*. Taylor & Francis.
- Colville, I., Brown, A.D., Pye, A., 2012. Simplicity: sensemaking, organizing and storytelling for our time. *Hum. Relat.* 65 (1), 5–15.
- Contestabile, M., 2013. Participatory planning. *Nat. Clim. Change* 3, 861.
- Conway, D., Nicolls, R.J., Brown, S., et al., 2019. The need for bottom-up assessments of climate risks and adaptation in climate-sensitive regions. *Nat. Clim. Change* 9, 503–511.
- Corley, K.G., Gioia, D.A., 2011. Building theory about theory building: what constitutes a theoretical contribution? *Acad. Manag. Rev.* 36 (1), 12–32.
- Cunliffe, A.L., Scaratti, G., 2017. Embedding impact in engaged research: developing socially useful knowledge through dialogical sensemaking. *Br. J. Manag.* 28 (1), 29–44.
- Derbyshire, J., Wright, G., 2017. Augmenting the intuitive logics scenario planning method for a more comprehensive analysis of causation. *Int. J. Forecast.* 33 (1), 254–266.
- DiMaggio, P.J., Powell, W.W., 1983. The iron cage revisited: institutional isomorphism and collective rationality in organizational fields. *Am. Socio. Rev.* 147–160.
- Dufva, M., Ahlqvist, T., 2015. Knowledge creation dynamics in foresight: a knowledge typology and exploratory method to analyse foresight workshops. *Technol. Forecast. Soc. Change* 94, 251–268.
- Editorial in Nature, 2018. Learn to tell science stories. *Nature* 555, 141–142 March 7th.
- Fawcett, S.E., Waller, M.A., Miller, J.W., Schwieterman, M.A., Hazen, B.T., Overstreet, R.E., 2014. A trail guide to publishing success: tips on writing influential conceptual, qualitative, and survey research. *J. Bus. Logist.* 35 (1), 1–16.
- Ferraro, F., Etzion, D., Gehman, J., 2015. Tackling grand challenges pragmatically: robust action revisited. *Organ. Stud.* 36 (3), 363–390.
- Frith, D., Tapinos, E., 2020. Opening the ‘black box’ of scenario planning through realist synthesis. *Technol. Forecast. Soc. Change* 151, 119801.
- Gallea, D., Ghobadian, A., O’Regan, N., 2008. Digital/web-based technology in purchasing and supply management: a UK study. *J. Manuf. Technol. Manag.* 19 (3), 346–360.
- Garud, R., Gehman, J., 2016. Theory evaluation, entrepreneurial processes, and performativity. *Acad. Manag. Rev.* 41 (3), 544–549.
- Garud, R., Gehman, J., 2019. Performativity: not a destination but an ongoing journey. *Acad. Manag. Rev.* 44 (3), 679–684.
- Gioia, D.A., Chittipeddi, K., 1991. Sensemaking and sensegiving in strategic change initiation. *Strat. Manag. J.* 12 (6), 433–448.
- Gioia, D.A., Corley, K.G., Hamilton, A.L., 2013. Seeking qualitative rigor in inductive research: notes on the Gioia methodology. *Organ. Res. Methods* 16 (1), 15–31.
- Glas, A.H., Kleemann, F.C., 2016. The impact of industry 4.0 on procurement and supply management: a conceptual and qualitative analysis. *International Journal of Business and Management Innovation* 5 (6), 55–66.
- Gössling, S., Scott, D., 2012. Scenario planning for sustainable tourism: an introduction. *J. Sustain. Tourism* 20 (6), 773–778.
- Gowing, N., Langdon, C., 2016. Thinking the Unthinkable; A New Imperative for Leadership in the Digital Age. *Chartered Institute of Management Accountants*, pp. 1–58.
- Gualandris, J., Legenvre, H., Kalchschmidt, M., 2018. Exploration and exploitation within supply networks. *Int. J. Oper. Prod. Manag.* 38 (3), 667–689.
- Heidingsfelder, M., Kimpel, K., Best, K., Schraudner, M., 2015. Shaping future—adapting design know-how to reorient innovation towards public preferences. *Technol. Forecast. Soc. Change* 101, 291–298.
- Henchey, N., 1978. Making sense of futures studies. *Alternatives* 7 (2), 24–28.
- Hussain, M., Tapinos, E., Knight, L., 2017. Scenario-driven roadmapping for technology foresight. *Technol. Forecast. Soc. Change* 124, 160–177.
- Inayatullah, S., 1993. From ‘who am I?’ to ‘when am I?’: framing the shape and time of the future. *Futures* 25 (3), 235–253.
- Kahane, A., 1992. Scenarios for energy: sustainable world vs global mercantilism. *Long. Range Plan.* 25 (4), 38–46.
- Kamann, D.-J.F., Dullaert, W., de Leeuw, S., 2016. Preparing for new competitive challenges: special issue on the 24th annual IPSERA conference. *J. Purch. Supply Manag.* 22, 155–159.
- Khrapunova, A., Vishnevskiy, K., Karasev, O., Meissner, D., 2014. Corporate foresight for corporate functions: impacts from purchasing functions. *Strat. Change* 23 (3–4), 147–160.
- Kim, A.A., Sadatsafavi, H., Anderson, S.D., Bishop, P., 2017. Preparing for the future of transportation construction: strategies for state transportation agencies. *J. Manag. Eng.* 33 (3), 04016045.
- Knight, F.H., 1921. *Risk, Uncertainty and Profit*. Houghton-Mifflin, Boston.

(footnote continued)

The published study contains two plausible, competing scenarios and discusses the broad implications for the future of PSM (<https://www.cips.org/en/knowledge/procurement-topics-and-skills/innovation-and-technology/future-of-procurement-supply-chain/>).



- Knight, L., Meehan, J., 2018. The Future of Procurement and Supply Management. Chartered Institute of Procurement and Supply Management.
- Knight, L., Tate, W.L., Matopoulos, A., Meehan, J., Salmi, A., 2016. Breaking the mold: research process innovations in purchasing and supply management. *J. Purch. Supply Manag.* 22 (4), 239–243.
- Knoppen, D., Sáenz, M.J., 2015. Purchasing: can we bridge the gap between strategy and daily reality? *Bus. Horiz.* 58 (1), 123–133.
- Kröger, M., Schäfer, M., 2016. Scenario development as a tool for interdisciplinary integration processes in sustainable land use research. *Futures* 84, 64–81.
- Legenvre, H., Henke, M., Ruile, H., 2020. Making sense of the impact of the internet of things on Purchasing and Supply Management: a tension perspective. *J. Purch. Supply Manag.* 100596.
- Lorentz, L., Laari, S., Engblom, J., Tanskanen, K., 2019. Attention-based view on achieving ambidexterity in purchasing and supply management. *J. Purch. Supply Manag.* (in press).
- MacIntosh, R., Beech, N., Bartunek, J., Mason, K., Cooke, B., Denyer, D., 2017. Impact and management research: exploring relationships between temporality, dialogue, reflexivity and praxis. *Br. J. Manag.* 28 (1), 3–13.
- Mackay, D., Burt, G., 2015. Strategic learning, foresight and hyperopia. *Manag. Learn.* 46 (5), 546–564.
- Maestrini, V., Luzzini, D., Shani, A.B., Canterino, F., 2016. The action research cycle reloaded: conducting action research across buyer-seller relationships. *J. Purch. Supply Manag.* 22 (4), 289–298.
- Mair, Simon, 2020. What will the world be like after coronavirus? Four possible futures. *The Conversation*. <https://theconversation.com/what-will-the-world-be-like-after-coronavirus-four-possible-futures-134085>.
- Markard, J., Raven, R., Truffer, B., 2012. Sustainability transitions: an emerging field of research and its prospects. *Res. Pol.* 41 (6), 955–967.
- Marti, E., Gond, J.P., 2018. Why do theories become self-fulfilling? *Acad. Manag. Rev.* 43, 3.
- May, G., 1982. The argument for more future-oriented planning. *Futures* 14 (4), 313–318.
- Meehan, J., Touboulic, A., Walker, H., 2016. Time to get real: the case for critical action research in purchasing and supply management. *J. Purch. Supply Manag.* 22 (4), 255–257.
- Mietzner, D., Reger, G., 2005. Advantages and disadvantages of scenario approaches for strategic foresight. *Int. J. Technol. Intell. Plann.* 1 (2), 220–239.
- Miller, T., 2013. Constructing sustainability science: emerging perspectives and research trajectories. *Sustainability science* 8 (2), 279–293.
- Millett, S.M., 2012. Four decades of business scenarios: what can experience teach? *Strat. Leader.* 41 (1), 29–33.
- Mogre, R., Lindgreen, A., Hingley, M., 2017. Tracing the evolution of purchasing research: future trends and directions for purchasing practices. *J. Bus. Ind. Market.* 32 (2), 251–257.
- Montabon, F., Pagell, M., Wu, Z., 2016. Making sustainability sustainable. *J. Supply Chain Manag.* 52, 2.
- Morgan, G., 1983. *Beyond Method: Strategies for Social Research*. Sage Publications, London.
- Moutinho, L., Davie, F., Hutcheson, G., 2002. Exploring key neo-marketing directions through the use of an academic “think tank”: a methodological framework. *Eur. J. Market.* 36 (4), 417–432.
- Nadkarni, S., Gruber, M., DeCelles, K., Connelly, B., Baer, M., 2018. From The Editors: New ways of seeing: radical theorizing. *Acad. Manag. J.* 61, 371–377.
- Näslund, D., 2002. Logistics needs qualitative research—especially action research. *Int. J. Phys. Distrib. Logist. Manag.* 32 (5), 321–338.
- O'Brien, F.A., 2004. Scenario planning—lessons for practice from teaching and learning. *Eur. J. Oper. Res.* 152 (3), 709–722.
- Nowack, M., Endrikat, J., 2011. Review of Delphi-based scenario studies: quality and design considerations. *Technol. Forecast. Soc. Change* 78 (9), 1603–1615.
- Öborn, I., Bengtsson, J., Hedenus, F., Rydhmer, L., Stenström, M., Vrede, K., Westin, C., Magnusson, U., 2013. Scenario development as a basis for formulating a research program on future agriculture: a methodological approach. *Ambio* 42 (7), 823–839.
- OECD, 2015. *Frascati Manual. Guidelines for Collecting and Reporting Data on Research and Experimental Development*.
- Ozbekhan, H., 1974. The triumph of technology: “can” implies “ought”. In: Cross, N., Elliott, D., Roy, R. (Eds.), *Man-Made Futures*: 118–28. Hutchinson, London.
- Pang, A.S.-K., 2010. Futures 2.0: rethinking the discipline. *Foresight* 12 (1), 5–20.
- Pang, A.S.-K., 2011. A banquet of consequences: living in the “nobody-could-have-predicted” era. *World Future Review* 3 (2), 5–10.
- Patvardhan, S., 2013. Prospection: review and reflections on forward-looking behavior of firms. In: Paper Presented at Academy of Management Proceedings.
- Pettigrew, A.M., 2001. Management research after modernism. *Br. J. Manag.* 12, S61–S70.
- Piirainen, K., Gonzalez, R.A., 2015. What does a theory of foresight even mean? *July. Technol. Forecast. Soc. Change* 96, 191–201.
- Pishdar, M., Ghasemzadeh, F., Antucheviciene, J., Saparauskas, J., 2018. Internet of Things and its Challenges in Supply Chain Management; a Rough Strength-Relation Analysis method. *Economics and Management*.
- Ramirez, R., Bhatti, Y., Tapinos, E., 2020. Exploring How Experience and Learning Curves Decrease the Time Invested in Scenario Planning Interventions. *Technological Forecasting and Social Change* February 119785.
- Ramirez, R., Churchhouse, S., Palermo, A., Hoffmann, J., 2017. Using scenario planning to reshape strategy. *MIT Sloan Manag. Rev.* 58, 4.
- Ramirez, R., Mukherjee, M., Vezzoli, S., Kramer, A.M., 2015. Scenarios as a scholarly methodology to produce “interesting research”. *Futures* 71, 70–87.
- Ramirez, R., Wilkinson, A., 2016. *Strategic Reframing: the Oxford Scenario Planning Approach*. Oxford University Press, Oxford.
- Ravetz, J.R., 1997. The science of ‘what-if?’. *Futures* 29 (6), 533–539.
- Rockefeller Foundation and Global Business Network, 2010. *Scenarios for the Future of Technology and International Development*. Rockefeller Foundation, New York.
- Rohrbeck, R., Battistella, C., Huizingh, E., 2015. Corporate foresight: an emerging field with a rich tradition. *Technol. Forecast. Soc. Change* 101, 1–9.
- Roubelat, F., 2000. Scenario planning as a networking process. *Technol. Forecast. Soc. Change* 65 (1), 99–112.
- Rouse, W.B., Lombardi, J.V., 2018. Modeling research universities: predicting probable futures of public vs. private and large vs. small research universities. *Proc. Natl. Acad. Sci.* 115 (50), 12582–12589.
- Ryan, M.J., Evers, D.R., Potter, A.T., Purvis, L., Gosling, J., 2017. 3D printing the future: scenarios for supply chains reviewed. *Int. J. Phys. Distrib. Logist. Manag.* 47 (10), 992–1014.
- Sandberg, J., Tsoukas, H., 2011. Grasping the logic of practice: theorizing through practical rationality. *Acad. Manag. Rev.* 36 (2), 338–360.
- Schneider, L., Wallenburg, C.M., 2013. 50 Years of research on organizing the purchasing function: do we need any more? *J. Purch. Supply Manag.* 19 (3), 144–164.
- Schoemaker, P.J.H., 1997. Disciplined imagination: from scenarios to strategic options. *Int. Stud. Manag. Organ.* 27 (2), 43–70.
- Schoemaker, P.J.H., 2016. Forecasting and scenario planning: the challenges of uncertainty and complexity. In: Koehler, D.J., Harvey, N. (Eds.), *Blackwell Handbook of Judgement and Decision Making*, (Chapter 14).
- Schoenherr, T., Modi, S.B., Benton, W., Carter, C.R., Choi, T.Y., Larson, P.D., Leenders, M.R., Mabert, V.A., Narasimhan, R., Wagner, S.M., 2012. Research opportunities in purchasing and supply management. *Int. J. Prod. Res.* 50 (16), 4556–4579.
- Schoenherr, T., Speier-Pero, C., 2015. Data science, predictive analytics, and big data in supply chain management: current state and future potential. *J. Bus. Logist.* 36 (1), 120–132.
- Schwab, K., 2017. *The Fourth Industrial Revolution*. Penguin Random House, London.
- Serrano, R., Rodrigues, L.H., Lacerda, D.P., Paraboni, P.B., 2018. Systems thinking and scenario planning: application in the clothing sector. *Syst. Pract. Action Res.* 31 (5), 509–537.
- Seuring, S., Müller, M., 2008. Core issues in sustainable supply chain management—a Delphi study. *Bus. Strat. Environ.* 17 (8), 455–466.
- Spaniol, M.J., Rowland, N.J., 2018. The scenario planning paradox. *Futures* 95, 33–43.
- Spina, G., Caniato, F., Luzzini, D., Ronchi, S., 2013. Past, present and future trends of purchasing and supply management: an extensive literature review. *Ind. Market. Manag.* 42 (8), 1202–1212.
- Steiber, A., Alänge, S., 2016. The world is changing. In: *The Silicon Valley Model: 1-17*. Springer.
- Tapinos, E., 2012. Perceived environmental uncertainty in scenario planning. *Futures* 44 (4), 338–345.
- Tapinos, E., 2013. Scenario planning at business unit level. *Futures* 47, 17–27.
- Tassabehji, R., Moorhouse, A., 2008. The changing role of procurement: developing professional effectiveness. *J. Purch. Supply Manag.* 14 (1), 55–68.
- Tetlock, P.E., 2005. *Expert Political Judgment: How Good Is it? How Can We Know?* Princeton University Press, Princeton.
- Thorén, K., Vendel, M., 2019. Backcasting as a strategic management tool for meeting VUCA challenges. *Journal of Strategy and Management* 12 (2), 298–312.
- van der Heijden, K., 2004. *Scenarios: the Art of Strategic Conversation*, second ed. John Wiley & Sons, Chichester.
- Van Weele, A.J., Van Raaij, E.M., 2014. The future of purchasing and supply management research: about relevance and rigor. *J. Supply Chain Manag.* 50 (1), 56–72.
- Voros, J., 2001. A primer on futures studies, foresight and the use of scenarios. *Prospect: The Foresight Bulletin* 6, 1.
- Voros, J., 2017. Big history and anticipation: using big history as a framework for global foresight. In: Poli, R. (Ed.), *Handbook of Anticipation: Theoretical and Applied Aspects of the Use of Future in Decision Making*. Springer International, Cham.
- Wack, P., 1985a. Scenarios: shooting the rapids. *Harv. Bus. Rev.* 63 (7), 139–150.
- Wack, P., 1985b. Scenarios: uncharted waters ahead. *Harv. Bus. Rev.* 63 (5), 73–89.
- Weick, K.E., 1969. *The Social Psychology of Organizing*. Addison-Wesley, Reading.
- Weick, K.E., 1989. Theory construction as disciplined imagination. *Acad. Manag. Rev.* 14 (4), 516–531.
- Welch, C., Piekkari, R.R., 2017. How should we (not) judge the ‘quality’ of qualitative research? A re-assessment of current evaluative criteria in International Business. *J. World Bus.* 52 (5), 714–725.
- Wieland, A., Handfield, R.B., Durach, C.F., 2016. Mapping the landscape of future research themes in supply chain management. *J. Bus. Logist.* 37 (3), 205–212.
- Wittmayer, J.M., Schöpke, N., 2014. Action, research and participation: roles of researchers in sustainability transitions. *Sustainability science* 9 (4), 483–496.
- Wright, C., Nyberg, D., 2017. An inconvenient truth: how organizations translate climate change into business as usual. *Acad. Manag. J.* 60 (5), 1633–1661.
- Wright, G., Goodwin, P., 2009. Decision making and planning under low levels of predictability: enhancing the scenario method. *Int. J. Forecast.* 25 (4), 813–825.
- Zheng, J., Knight, L., Harland, C., Humby, S., James, K., 2007. An analysis of research into the future of purchasing and supply management. *J. Purch. Supply Manag.* 13 (1), 69–83.