

Forward looking analysis: investigating how individuals ‘do’ foresight and make sense of the future

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Abstract

The purpose of this paper is to contribute to the growing field of foresight process theory. Scanning the environment and assessing uncertainty are among the most important managerial activities in strategizing and decision-making. Although their significance in the strategy process is well documented, there is limited research on how uncertainty captured is analysed and interpreted by individuals without any formalised processes in order to anticipate the future. This paper examines how analysts from a professional service company, which specialises in forward-looking analysis, develop foresight, and how they determine the potential impact of their judgements. Within this in-depth inductive case study, firstly we explore forward-looking analysis as a foresight process. Secondly, we investigate how sensemaking takes place within forward-looking analysis. Thirdly, we advance the knowledge on the relationship between foresight and sensemaking; and specifically we show with empirical evidence that prospective sensemaking can be both ‘future perfect’ (Weickian) and ‘future oriented’ (post-Weickian).

Keywords: Foresight Process Theory, Individual Foresight Process, Prospective Sensemaking, Forward Looking Analysis

1. Introduction

Making sense of uncertainty is part of every manager's daily routine. The process of anticipating the future is generally described as foresight (MacKay and Constanzo, 2009; Tsoukas and Sheppard, 2004). Miles et al (2008) cite Coates's definition of Foresight, which is a '*purposeful process of developing knowledge about the future of a given unit of analysis or system of actors*'. From a more practical perspective, Gavigan et al (2001) suggest that foresight '*involves bringing awareness of long-term challenges and opportunities into more immediate decision making*'. From the seminal work of Ansoff (1975), it is well recognised that triggering events in the external environment create uncertainty about the future (Peter and Jarratt, 2015). Vecchiato and Roveda (2010) observed that the '*literature on strategic foresight focused on how to design methodological approaches and organizational processes for anticipating the likely evolution of drivers of change*', as academics and practitioners have developed a large number of prescriptive: i) signal scanning methods (Carbonell et al., 2015); and ii) foresight methodologies (Popper, 2008). Nevertheless, we still know very little about how, in practice, the signals from the environment that are attracting the attention of managers and decision makers, are 'processed', without using formalised techniques (such as scenario planning, Delphi, roadmapping etc), in order to create foresight about the future (MacKay, 2009).

This article answers the recent calls, by Rohrbeck et al. (2015), to enhance our understanding of how individual foresight shapes perception, and how this is linked to prospective sensemaking; and by Piirainen and Gonzales (2015) to develop the theory of foresight. Synthesising the works of Slaughter (1995) and Hideg (2007), we conceptualise individual foresight to be the activities undertaken by individuals to foresee the future; individual foresight can occur both as part of a participatory process and as an isolated individual process.

Moreover, individual foresight can be performed either with or without the use of standardised foresight methods/tools (such as horizon scanning, scenario planning etc).

Positioning our research within foresight theory, we consider Piirainen and Gonzales' (2015) pyramid of foresight theory the starting point. Piirainen and Gonzales have identified three levels of foresight theory: i) epistemology of foresight; ii) theory of foresight process and impact; and iii) foresight as development and application. In this paper, we focus on the second level as our research contributes to the understanding of the foresight process. Although, there are theoretical models of organisational scanning and capturing weak signals (Schoemaker et al, 2013), there is limited research on how individual managers foresee the future without using formalised foresight methodologies. To address this gap, we build on recent studies (Sarpong, 2011; MacKay and Tambeau, 2013; O'Brien, 2015), and have investigated how analysts in a professional service company produce forward-looking analysis (FLA). We conceptualise FLA as the process individuals follow to produce foresight without any standardised methodology. In this paper, we untangle the sequence of activities of 'looking forward' under conditions of uncertainty, when no established foresight method is used.

Inductive analysis of the data led us to realise that FLA is ultimately a sensemaking process. Hence, on a second level, we examined how sensemaking about the future takes place within FLA. Sensemaking focuses on the interpretation of uncertainty and explanation of how managers make sense of unexpected triggering events (Maitlis and Christianson, 2014). Focusing on future sensemaking, we draw on the literature to debate whether this is a backward or forward-looking exercise (Weick and Sutcliffe, 2001; Gioia, Corley and Fabbri, 2002; MacKay and Parks, 2013; Sandberg and Tsoukas, 2014; Maitlis and Christianson, 2014).

This paper makes two contributions: i) we contribute in the field of foresight process/theory (Oner A. M., 2010; Piirainen and Gonzales, 2015) as undertaken by individuals; we have identified five distinct activities in this process, explored their interlinks, and determined that

‘developing system of relationships’ is the most influential activity in the FLA process; ii) we contribute to the understanding of the relationship between foresight and prospective sensemaking (Aaltonen and Holmstrom, 2010, Rohrbeck et al., 2015; MacKay and Parks, 2013), as we show that prospective sensemaking can be both of the Weickian view of ‘future perfect’, which is retrospective (i.e. envisioning an expected future and then look backwards into how this could emerge) , and of the post-Weickian view, which makes sense of the future by looking forward into it in a future-oriented manner.

The structure of our paper is as follows: the next section presents a literature review starting with foresight theory, foresight process, sensemaking and individual foresight. The final section of the literature review presents the relationship between individual foresight and prospective sensemaking, after having introduced prospective sensemaking. The following section presents the methodology, which explains how data were collected and analysed. Afterwards, we present the analysis of the data as a multi-layered process, which firstly identified the activities, and then revealed the sequence and interrelationship of the activities within the process. The next section includes two discussions that address our research questions: i) FLA as a process of individual foresight and ii) sensemaking as an element of the FLA process. The paper ends with our concluding remarks.

2. Literature Review

2.1 Foresight Theory

A growing number of articles have pointed out the lack of a theory of foresight (Öner, 2010; Hideg, 2007; Marien, 2010; Mermet et al., 2009; Piirainen and Gonzales, 2015). Hideg (2007) suggests that foresight praxis is practiced in the absence of theory, driven by practical needs.

Thus, the existing literature on the theory of foresight includes various definitions of the concepts and multiple tools of practicing it, in an organised and standardised format. Slaughter (1995) suggested that foresight is a human activity of looking into the future, which becomes a social activity when the future is shared among different members of an organisation. Thus, some authors (see for example Miles et al., 2008) consider foresight to be a participative process among members of one or more organisations. However, it is now recognised that foresight also can be an individual activity (Rohrbeck et al., 2015) either in the form of individual effort to make sense of the external environment and the future, or in the form of individuals making sense of the future in collaboration (Konnola et al., 2013). Apart from distinguishing between individual versus participatory foresight, there is another variation in the terminology: corporate versus strategic foresight. Although there is not a commonly accepted definition of each term, corporate foresight stands for an organization's overall ability and efforts to detect change and anticipate the impact and outcome in order to strategise accordingly (Rohrbeck, 2010). While strategic foresight is used interchangeably with corporate foresight, it is more associated with the use of standardised methods or strategy tools, such as scenario planning (Heger and Rohrbeck, 2011).

Karlsen et al (2010) explored the ontology of foresight, and observed that in social science. This could range between realism, empiricism, positivism and postmodernism, depending on how the future is perceived. Hence, the same authors conclude that foresight is '*some kind of temporal (operation of fantasy) or self-conscious reflexivity, in which meaning is reconstructed from the process of interpretive feedback*', with reference to Weick and Sutcliffe's (2001) notion of sensemaking. Cunha (2004) proposed that foresight should be considered as subjectivism against objectivism, which leads to thinking about the future as invention or as prediction. Cunha's conceptualisation of foresight links it to the various foresight methodologies that can be applied, varying from quantitative to qualitative.

According to Kuosa's (2011) review of future studiesⁱ, there are several taxonomies for classifying futurists' work, depending on which dimension of the work is considered. The taxonomies concern: i) the *focus* of producing foresight; for example, Linstone (2007) separates between technical, organisational and personal; ii) the *outcome* of foresight, such as Inayatullah's (1990) typology of predictive, interpretive, critical and action learning; and iii) the *process* for foresight, for example, Amara's (1984) division into expert evaluation, scenario based and structural modelling, and Mannermaa's (1991) paradigms of description, scenario and evolutionary futures research; and iv) philosophical underpinning, such as Bell's (1996) division into subjectivist, realist and critical. Futuring work tends to vary, depending on whether the analysis is based on quantitative or qualitative data and whether multiple alternatives are being considered.

Recently we have observed that the 'practice turn' (Corradi et al, 2009; Jarzbakowski and Spee, 2009) in organisation studies has influenced research on foresight, with studies researching how environmental scanning is done at micro level (Bowman and Ambrosini, 2000; Sarpong, 2011; MacKay and Tambeau, 2013; Muller-Seitz, 2014). Burt et al (2014) have conducted a micro-level study of the impact of a strategic foresight tool (scenario planning), and have determined that its use can be associated with future hyperopiaⁱⁱ. Another recent study (Bowman, 2015) found that the same foresight tool is equivalent to a simplicity processⁱⁱⁱ (Colville, 2009). Most practice studies in strategic foresight have examined the use of formalised strategic foresight tools (Peter and Jarratt, 2014). Sarpong et al (2013) explain that strategic foresight should be viewed beyond episodic strategy events (e.g. strategy workshops using strategy tools) as a continuous everyday managerial activity, which incorporates reflexivity in practice. Hence, there is a need to examine foresight beyond events where formalised methods are the contextual background. There is scope for investigating the foresight process at an individual level, as we have set out to do in this article.

2.2 Foresight process

According to Miles et al (2008), there are several conceptualisations of foresight, and hence several descriptions of the foresight process. The main difference between most of these is how the assessment of uncertainty is used. Popper (2008) has classified 33 analytical foresight methods into three categories: quantitative; qualitative; and semi-quantitative, showing that the type of data used will determine the analytic method employed. While some link foresight to planning (see Coates, 1985) or decision-making (Slaughter, 1999), in this study, we focus on the process of producing foresight through FLA, without examining how those buying these reports use them.

One of the most widely-cited descriptions of the foresight process states that '[it] *involves intense iterative periods of open reflection, networking, consultation and discussion*' (Cassingena Harper, 2003, cited in Georghiou and Keenan, 2006). This emphasises general characteristics of the process, but does not provide any further insights into how foresight is produced. Cuhls (2003) compares foresight with forecasting processes to deduce that although they may interact, foresight is based on qualitative analysis, which is a more participative process. A fundamental difference between foresight and forecasting is that forecasting develops a path into the future via forecasted points, while foresight examines the implications for the present from short-, medium- and/or long-term uncertainties.

Helmer and Rescher (1959) were among the first authors to link 'inexact science' and 'future studies'. They claimed that it is not possible for all sciences to be exact and predict everything objectively. Particularly in social sciences, it is impossible to claim the future is predictable and can be modelled. Hence, they introduced the need for expert judgement and simulation as means of interpretation and sensemaking. Later, Helmer (1983) described the functions of futurists as: i) constructing mathematical models using the past to extrapolate into the future;

ii) synthesising disciplines to investigate complex phenomena; iii) using intuitive expert judgement; and iv) investigating the interconnection/system of their subject matter.

Reviewing the literature on foresight process, it is evident that the focus is on organisational foresight with significant contributions on corporate foresight (see latest special issue in this journal, Rohrbeck et al., 2015), which concerns organisational and standardised activities that produce foresight. Georghiou and Keenan (2006) argue that the foresight process involves ‘*reflection, consultation, networking and discussion*’. Recently, Boe-Lillegraven and Monterde (2015) tested a number of propositions for the practice of foresight from a cognitive perspective and deduced that mental models change and those involved in foresight activities reap greater cognitive benefits.

Authors (see for example Voros, 2003; Cuhls, 2003) have produced conceptual and generic frameworks that are prescriptive in nature, and suggest which analytic method should be used. These frameworks have three basic stages: topic definition, background research and analytical futuring exercises. Miles’ (2002) framework of foresight process includes five stages.

However, only two are actual futurizing activities: pre-foresight and generation. According to Popper (2008), ‘pre-foresight’ involves the setting up of objectives and ‘generation’ involves exploring uncertainty, analysing the relationship between the features of the uncertainty, and anticipating their outcome; the other three activities concern recruitment for the foresight exercise, action, and renewal/change from the foresight. A significant contribution on methodologies of foresight is Causal Layered Analysis (Inayatullah, 1998), which identifies four levels of ‘reality and knowing’ (Riedy, 2008): i) the *litany*, which concerns how an issue is covered by the mass media; ii) the *systemic causes*, based on the idea that past experience and data can provide trajectories of the future; iii) the *discourse*, which concerns the stakeholders involved, ideological propositions, the civilizational angle in the viewpoints, and the epistemic philosophical stances influencing the futuring process; and iv) the *metaphor and*

myth, which concern visualisations of narratives of the future. The most popular formalised foresight process is scenario planning, which is a process of disciplined imagination aimed at bringing together managers from the same organisation, and through a step by step approach helping them to develop shared mental models of uncertainty, which are used to construct plausible images of the future (Wright et al., 2013).

2.3 Individual Foresight Process

The concept of foresight as produced by individuals is considerably under researched. Even the limited attempts to do so have examined it as part of an organisational activity (BoeLillegraven and Monterd, 2015; Hideg, 2002). One of the most significant contributions comes from Portaleoni et al (2013), who demonstrated the diversity of the conceptualisation of foresight conducted by individuals by identifying four modes: i) foresight as human behaviour; ii) foresight as a human attribute in interpreting and understanding; iii) foresight as neurobiological processes; and iv) foresight as thinking and acting. Amasteus (2008) has championed the idea that foresight is a natural human behaviour, as individuals tend to try to interpret the uncertainties they are confronted with (McMaster, 1996). Hideg (2002) takes a different view at individual foresight and suggests that it is a result of hormones and neurobiological processes. A stream of authors (Chia, 2004; Slaughter, 1995) propose that individuals, and subsequently managers, will always try to interpret and understand cues from the environment, while Pina e Cunha et al, (2006) concluded that foresight is used to anticipate the future and strategize.

Indeed, Pina e Cunha et al (2012) provided an alternative view on the process of foresight by individuals, introducing the concept of ‘real time foresight’, which they suggest is based on improvisation. This process is described as ‘*acting upon weak signalling and imperfect*

information', which is enacted and made sense of, in order to be turned into action (with reference to the strategy as practice literature (Jarzabkowski and Spee, 2009; Carter et al 2008)). Pina e Cunha et al (2012) contrasted 'real time foresight' with corporate foresight, concluding that individual foresight is a natural reaction to everyday external triggering events, and leads to higher levels of preparedness and spontaneity.

To sum up, although understanding uncertainty and looking into the future are important managerial activities, most of the foresight literature is focused on formalised applications for looking into the future and/or looking foresight as a group activity. We believe that this is consistent with the overall directions of the relevant literatures, which did not consider individual activities until very recently (Whittington, 2007). The limited studies that have looked into foresight as an individual activity show an interest in the understanding of the concept. However, there have been no systematic attempts to map the process followed.

2.3 Sensemaking

Managerial life involves continuously being confronted with unexpected events, which create uncertainty about their outcomes and wider implications. When managers face uncertainty, they have two key questions to answer: 'what is going on?', which starts a process of interpretation; and then a second question that concerns the action: 'what do we do next?' (Colvile and Murphy, 2006). Organisational psychologists (see Schneider, 1997) have established that trigger events from the environment are open to interpretation from each manager through the prisms of understanding. Beck and Plowman (2009) provide an in-depth analysis of the temporal dimension^{iv} of interpretation. This concerns the sequential stages of the interpretation process. Isabella (1990) has identified four stages: 1) anticipation; 2) confirmation; 3) culmination; and 4) aftermath. Within this process, we are particularly

interested in the first two stages, which concern the ‘exploration’ of the event. In the anticipation stage, the manager identifies the cue in the environment and develops a (confirmation) interpretation as a prediction for the future. Isabella (1990) emphasises that the explanation of what will happen in the future is based on the experiences of the past.

The sensemaking literature has covered extensively the interpretation of uncertainty (Thomas et al, 1993; Maitlis and Christianson, 2014). According to Weick (1979), sensemaking refers to the social processes that people employ to understand their environment. Sensemaking has three basic processes: scanning the environment, interpretation and action (Weick, 1979; Gioia and Chittipeddi, 1991; Thomas et al, 1993). Authors, like Starbuck and Milliken (1988), suggest that schemas (or mental models) are frameworks, which facilitate the process of giving meaning to environmental stimuli. According to Dane (2010), schemas are frameworks of knowledge, which capture factors and their interrelationships that are associated with a concept. Gavetti et al (2005) point out that while the importance of schemas in giving meaning to interpretations is well documented in the literature, there is limited research on how these emerge. While there is an extensive classification of schemas (see Harris, 1994), in this paper we are focusing on individual schemas, which are individual managers’ mental models, and not necessarily shared across an organisation. George and Jones (2001) identify a number of uses of schemas in different organisational activities: guiding perception; information processing; making sense of behaviour; and understanding change. The same authors developed a model of how schemas evolve during episodes of change, which starts with the cue that challenges the understanding of the manager, causing them to focus on a particular event. In order to make sense of it, information is collected and processed. This leads to the development of a new schema returning to the first step of the process and creating a continuous cycle.

2.4 Foresight and Sensemaking

It is widely acknowledged that sensemaking is linked to foresight and foresight methods like scenario planning (Chermack, 2005; Healey and Hodgkinson, 2008; Ramirez and Selin, 2014). Nonaka (1994) advocates that humans and systems are more concerned about their future rather than their present and the effort to make sense of the future leads to create new meanings. Even though sensemaking frequently is mentioned as an outcome of foresight (Bootz, 2010), there is no literature that describes their relationship. Blackman and Henderson (2004) suggest that when individuals are engaged with foresight, the output of this process is a mental model. Their thesis is based on the idea that foresight is produced as a result of single or double loop doubting of the current status quo. This is an extremely interesting point because it creates a direct link between individual foresight and sensemaking. Some authors consider sensemaking to be an output of the foresight process (Boe-Lillegraven and Monterde, 2015), while others (Schwandt and Gorman, 2004) consider sensemaking to be an activity connecting the elements of foresight. Similarly, Roubelat (2004) extends this idea by showing how sensemaking is a function of scenario planning, while scenario planning is a process of sensemaking about the future. In the foresight literature, it is observed that while there has been significant research on the role of mental models in capturing weak signals, the process of interpretation and foresight is considered under researched (Ilmola and Kuusi, 2006). Day and Schoemaker (2004) present a conceptual model in which mental models are the catalyst and interconnector for scoping, scanning, interpreting, acting and learning/adjusting from weak signals. However, this model does not address how the mental model actually works in the interpretation of the weak signal, and whether the interpretation is linked to foresight. Van der Heijden (2004) considers that there are two ways to 'manage the future': the future perfect approach, which is expressed with foresight as prediction/navigation, and future oriented foresight, which he describes as transformative and an invention of the future. Van der Heijden's observation

relates to an emerging debate from the field of sensemaking, which concerns future or prospective sensemaking. This is reviewed in the following section.

2.4.1 Sensemaking the future

The sensemaking literature is vast, and covers a wide variety of sensemaking circumstances (Maitlis and Christianson, 2014). In this paper, we are interested only in how managers make sense of the future and we seek to contribute to the debate on whether prospective sensemaking can only take place as ‘future perfect’, the Weickian view, or as a future oriented approach, which corresponds to the post-Weickian view. Traditionally, sensemaking concerns the past, which is why Weick’s (1979) seven attributes refer to retrospective anticipation of the future. Gephart et al (2010) distinguish between perspectives of sensemaking that concern cognitive psychological processes, and sociological ones that focus on present or future-oriented sensemaking. Goia et al (1994) have called sensemaking that concerns the future ‘prospective’ sensemaking. In the infancy of the concept, the authors argued that *‘attempts to infer the future consequences of proposed actions as a way of understanding their pre-sent situation showed the committee members to be both proactive and prospective information seekers’* (Goia et al, 1994). Based on this distinction, they define prospective sensemaking as *‘sensemaking that seeks to construct intersubjective meanings, images, and schemes in conversation where these meaning and images project images of future objects and phenomena’*. The concept then evolved (see Colville et al., 2012) to distinguish between sensemaking about the past (retrospective) and future (prospective).

Colvile (2009) suggests that the interpretation of future events is retrospective, as the actor uses existing knowledge from the past. Therefore, the linkage between retrospective sensemaking and future thinking is the assumption that the future has already arrived. Hence, the cues of the

present are predetermined elements of the future, and the future becomes a self-fulfilling prophecy (this theory is based on ‘future perfect’ thinking by Weick, 1979).

Kaplan and Orłowski (2013) argue that there is a ‘post-Weickian’ approach, which examines prospective sensemaking as interpretation and enactment beyond ‘future perfect’ thinking.

Pitsis et al (2003) found that ‘future perfect’ was restricted to more stable environments.

Similarly, Stigliani and Ravasi (2012) challenged the ‘future perfect’ view as inadequate for unclear and ambiguous environments. Gephart et al (2010) found that individuals use their understanding of the past to produce sensemaking about the present, which forms the basis for hypotheses for constructing future-oriented sensemaking. The same authors deduce that *‘future-orientated projections are thus shaped through selective reconstruction and creative elaboration of prior entities or through the invention of new ones’*. MacKay (2009) suggests that future-oriented sensemaking can be counterfactual and prefactual in order to move beyond ‘future perfect’ interpretations of the future.

To sum up, the debate on prospective sensemaking centres on the process of making sense of the future. The Weickian ‘future perfect’ view suggests that managers firstly construct an image of the future and then work backwards to interpret it. In this paper, we call this process ‘predictive hindsight’^v. The opposite of the traditional view is the ‘post Weickian’ view, which suggests the future is anticipated by building potential images of it. We call this ‘futureoriented’ sensemaking.

3. Research Design

The research design involves a single in-depth case study (Yin, 2003). The case study organisation, FutureCo¹, is a professional services company specialising in forward-looking analysis, based in the UK, with offices in a number of other countries. It is a small company and has regular external expert contributors. It offers a range of products and services, which are mostly concerned with different types of forward looking analysis. The data were collected via twelve interviews, which lasted between 45 minutes and two hours. To ensure greater depth and richness of data, interviewees came from all levels of organisational hierarchy: CEO; Managing Director; Head of Forward Looking Analysis; three Senior Analysts; five Analysts; and one external contributor. Each of the interviewees was responsible for a different field/area, so between them, we interviewed futurists for: Africa; Middle East; Latin America; Asia in general; East Asia; North America; South America and Europe. FutureCo has a significant online presence. As well as its website, it uses social media for marketing. Although we accessed several documents from the public domain and used them in our background research, we have not included them in the data analysis so as not to use quotes or figures that could be traced back to the company, to protect its anonymity.

Although there is a growing literature on the work of analysts (Jay and von den Gracht, 2015), we have found the literature to be dominated by conceptual work and practitioner-influenced opinions/descriptions. To overcome this limited conceptualisation of FLA, we used an inductive approach (Silverman, 2001). To collect our data, we adopted a practice lens (Corradi et al, 2009). We concentrated at micro level of practice (Jarzbakowski and Spee, 2009), examining how analysts in the FLA industry do their jobs. In order to connect our theoretical background to the research design, the starting point is the foresight process theory as the

¹ FutureCo is a pseudonym to protect the identity of the company

overarching framework of this project. Although, foresight is considered a participatory group activity, this paper answers recent calls to study foresight as an individual activity. Thus, in our case study we investigated how the activities undertaken by professional analysts produce FLA reports without using any established foresight method or tool. In particular, in order to address the gaps in knowledge identified by Rohrbeck et al (2015), we asked interviewees general questions on how they go about doing their job. The semi-structured character of the interviews allowed us to ask additional clarifications and to focus on how foresight is developed as an individual activity (Piirainen and Gonzales, 2015). In order to explore more effectively the individual process of doing foresight we examined how the interviewees capture and interpret uncertainty (Pina e Cunha et al, 2012). In addition, our review of the literature (Schwandt and Gorman, 2004) indicated that sensemaking is an element of the foresight process. Thus, our interview questions focused on how the analysts identify, interpret the uncertainty as means of understanding the future in order to produce foresight.

Given that the overall aim of this research was to map the process of forward-looking, we followed a multi-layered analytical process (Mahareji et al., 2015; Dingler and Enkel, 2016), which involved grounding and organizing the data with several codings (Pozzebon and Pinsonneault, 2005; Chiles et al., 2004). Given the lack of theory and inductive orientation of our work, for grounding we used a data-driven approach. Firstly, we identified distinct stages within the process, naturally occurring from the data. One of the authors coded all interviews for each stage (using NVivo). The other author checked all the coding to ensure inter-coding reliability. Similarly to Goia and Chittipeddi (1991), the first order analysis looked for *‘underlying exploratory dimensions [...] not necessarily apparent to the organizational members, but [...] important if the study is to be meaningful to other researchers’*. In this stage, our coding was guided by relative pronouns of time (when, then) and time related adverbs (e.g.

after, afterwards, later, subsequently etc). Then, we organised the data in a ‘*systematic organized form*’ (Pinsonneault, 2005). This led us to create descriptions for each FLA activity. Then, we explored the sequence and linkages between the activities. To strengthen how we presented the FLA process we created a visual map, ‘*a graphical way to depicting theoretical ideas*’ (Chiles et al., 2004). This includes all the activities identified in the FLA process, using arrows to present their sequence and interactions. Finally, we coded for ‘predictive hindsight’, looking for expressions of looking backwards, such as ‘we started from the end’; ‘we worked backwards’, and for ‘future-oriented’ expressions that show a forward progression, which builds the future as an image.

4. Data Analysis:

4.1 Activities within FLA

4.1.1 Capturing Uncertainty

The identification of what merits producing a piece of FLA, is the cornerstone of the process. The starting and finishing points of this stage had a specific time frame; it was the first thing happening in the morning “*every morning there was a meeting^{vi} to [...] come up with a list of things that looked like we might write about them*” (Analyst). One of the senior analysts summarised how capturing uncertainty takes place: “*we would hear about the event either directly from somebody on the ground or through a news organisation, or just because we had somebody out in the particular area who came back and said this has just occurred^{vii}*”; hence we deduce that capturing uncertainty could be a personal choice or a suggestion by someone with special knowledge. Our interviewees received a large number of suggestions about potential uncertainties^{viii}, “*like the oil price, like the US economic outlook, like the economic outlook for the Euro Zone, how impending political events like, [...] the US election would be likely to*

unfold". Hence we explored how they determined whether an event was worthy of a FLA. One of the senior analysts indicated that there are no specific criteria for selecting an event other than its potential impact: "*we have got to actually see the consequences*". Thus, FLA is produced for important events whose impact is significant for a range of factors within a given field of interest (region, country, industry).

4.1.2 Understanding Uncertainty

After having filtered a number of events and decided what to concentrate on in the previous activity, in this activity one, the analysts seek to understand the uncertainty by determining what is important within the issue or event that they are covering

At this stage, the analysts formulate an opinion about the characteristics of the triggering event that they are studying as an uncertainty. An analyst explained: "*first thing is checking whether the event, ... could be near-term trend that started to emerge*", the same interviewee elaborated about this activity using an example "*there were a range of trends, which were things about the attitude of the ruling party towards the opposition, foreign investors, economic policy priorities [...] these were sort of baseline assumptions*". The external contributor described this stage to be heavy on information collection: "*I would go through the main new sources [...] to find out as much as I can as a sort of short sweep*". Moreover, another senior analyst indicated that to understand the uncertainty they had to frame its boundaries in order to use them in their subsequent analysis: "*I would set out a list of questions or points or a framework for the piece and then say, technically these are the issues*".

4.1.3 Developing System of Relationships

The majority of our interviewees indicated that after deciding what the uncertainty is, the analysts draw on their attempts to understand the issue that they are looking at and the nature of the factors surrounding it. The key ‘output’ of this stage is a mental model of system of relationships that influences the uncertainty and its outcome. One of the analysts referred to an example of how he analysed the future of a country during a change of government: *“you start to think [...] does that change the way people involved in these dynamics are viewing their position, [...] or change the facts on the ground, while there is some chance to speculate, and just start to think about those different factors”*. With this example, this analyst showed us that during the FLA he continuously challenges his assumptions, while developing the system of relationships. The same interviewee explained that the system of relationships is not static but *“four or five assumptions that we might want to check in light of something that has happened”*, giving a dynamic perspective to this stage of the FLA.

The system of relationships passes through three phases (Figure 1): i) initially, before the FLA starts, it is a set of relationships based on the knowledge and experience of the analyst; ii) once a triggering event has been identified, which disrupts the equilibrium of the system, one of the factors (F_3) becomes an uncertainty (U_3), and all the factors affected (F_4 ; F_5) by it are also of unknown outcome ($?_4$; $?_5$); iii) when foresight has been produced, the uncertainty is a ‘foresighted factor’ (FF_3), and the factors affected ‘foresighted impact’ (FI_4 ; FI_5).

Insert Figure 1

4.1.4 Foresight Uncertainty Outcomes

Once analysts have developed adequate understanding of the uncertainty, they develop foresight about its outcome. This means that they offer a prediction of what is going to happen with regards to this uncertainty. All the interviewees admitted that there is no standardised process for doing this. When they were asked to describe the various processes followed, they mentioned foresight to be the result of a systemic outcome triggered by the uncertainty examined *“you are breaking down, it is not just one event, it is lots of smaller trends that all come together to form a larger [...] [for the foresight] you have to draw all the strands together”* (Analyst); a senior analyst suggested that foresight is answering potential questions about the future: *“I’d be anticipating those clients might be asking [...] other questions I can imagine that need to be dealt with if possible”*.

A series of interesting comments were made about this stage of the FLA process. One analyst explained that past experience is used: *“we are much more conscious about not shaping your forward looking view just because of past experience”*; however, the same analyst stated that when producing foresight about the uncertainty’s outcome, he tried to step back from the detailed analysis that he had carried out to get to that point: *“the more detail you give to the story, the more the tendency is to concentrate just on those sorts of issues, so it becomes a dangerous exercise because it becomes too detailed and then you start to imagine this reality and attribute more significance to it than you should, because it is just a narrative, it is just a story that we are creating”*. While another analyst said *“you kind of have to use your imagination”*, explaining that when data from the past and the system of relationships do not indicate a specific path, foresight about the future has to be more intuitive.

4.1.5 Foresight Wider Impact

At this stage, analysts explore the wider implications that arise from from the uncertainty that they have examined. For example, a senior analyst told us ‘*so the fact that the prime minister [...] had disappeared [...] would have an influence on various aspects of the [...] outlook*’. The Head of FLA provided a very good example of how analysts foresee implications: “*in Egypt for instance there are whole categories of implications [from the uprising in 2011] [...] political stability, [...] foreign relations, [...] economic implications [...] so you started from an event and you went down to politics, to tourism, to economics and it was very systemic way*”.

The activity undertaken, to foresee the wider impact, was sometime described as imagination ‘*initially you kind of have to use your imagination because there won't be any evidence*’ (Senior Analyst). However, the same interviewee admitted later in the interview that disciplined imagination drives this activity. Similarly, another senior analyst explained that ‘[the uncertainty] *fed in to a range of trends, underlying trends*’.

Summing up, analysts foresee the impact of uncertainty by considering the factors affected by it. Most of the interviewees referred to a systemic relationship between them. Using their experience and disciplined imagination, they can determine how each uncertainty will affect each aspect investigated. Therefore, we have identified five key activities in the FLA process, as summarised in Figure 2.

Insert Figure 2 about here

4.2 Links between FLA Activities

The next step of our analysis was to investigate how the activities within the FLA process are connected: how the analysts go from one activity to the other. Initially we had considered that process was linear, with analysts going from one stage to another sequentially. However, our analysis revealed that the system of relationship used was not only to ‘understand uncertainty’, but for every activity. Responders kept on going back to it, explaining how they were developing its dimensions or using it in order progress with the FLA. Hence, in our data we looked at how the analysts progress from one activity to the other, and the overall linkages with the activity that develop the system of relationships.

As the analyst determines whether an event merits a piece of forward looking analysis, they begin to seek to understand the uncertainty. To some extent, this is done using pre-existing knowledge about the region or issue being examined (see phase 1 in Figure 1). As one analyst stated “*you [...] need to have a framework of the whole region or of the country, of the sector you are looking at, because that is the only way you can really put them into perspective and understand [...] how big is this compared to similar previous developments and trends*”. Some of the interviewees explained that developing the system of relationships was an ongoing process during the FLA process. For example, it could be developed at different instances through conversations with peers: “*either it would be obvious odd, there would be some sort of discussion between the analyst and somebody who had a more specific focus on that particular country or that particular issue*” (Senior Analyst).

Examining how the systems of relationships leads to foresight, a senior analyst stated: “*I got to the point where I wanted to start making my own judgements about how things were going*”. Indeed, the MD explained the danger of not updating and challenging the system of relationships: “*the past is something that we have to overcome in order to make effective*

judgements about the future. We have to be able to escape or be aware that we sometimes throw out our analytical framework that has served us well in the past [...] in response to certain contingencies that will absolutely change the way that we address certain things about that society, or sometimes everything about that society, in ways that are very radical.”

A senior analyst provided a good example of an analyst’s progress from capturing to understanding uncertainty via the system of relationships: *‘the first thing you do is [...] check [...] baseline assumptions [about] how these fit in the pattern or not’*. This statement shows that analysts do not ‘jump’ to conclusions/foresight. Once they identify the issue to analyse they enact with the system of relationships (*‘fit in the pattern’*) in order to test their understanding (*‘assumptions’*). Another example was provided by an analyst who was referring to foresight outcome and impact. This interviewee explained that he tries to *“understand the motivations of the policymakers that affect outcomes and events”* and when he was asked how he does that, he explained that there was an enactment with the system of relationships which is developed further at this stage *“reading ...academic books and articles... and discussing things with a variety of people that are mainly academics, but also policy people”*.

Some of the interviewees explained that the key driver of success was to make a correct predictive judgement: *“I feel more proud if I can make a more accurate prediction”* (MD); *“It is obviously nice to call something right and clients applaud you for it a lot, nice to know that you made a call and got it right about something”* (Senior Analyst). However, other analysts were less concerned with their forward looking judgements being correct: *“If I get the driver of the story, even if I do not get the timing or the way in which it manifests correct, I will feel successful if I help someone say that of all the things to watch, that’s the one to watch, even though I cannot tell you when it will manifest”*. That showed us that the system of relationships is an integral part of the foresight produced, and its outcome and impact. This is reinforced by

the fact that part of the FLA document produced as the final ‘product’ includes a description of the system of relationships “*say I failed to see instability in a country but I did say that if instability comes it will be from inside the military*” (Sn Analyst).

Examining the systems of relationships is a fundamental part of seeking to understand uncertainty. While understanding the nature of the uncertainty surrounding an event is a fundamentally backward looking step, which involves looking at the event through the lens of what has happened in the past, examining the systems of relationships is where the analysis begins to become forward looking. Therefore, these steps overlap at the point where the analysis has reached a level of depth that allows foresight to begin to be formed. The CEO of the company explained that this happens incrementally: “*the focus of your analysis is going to start from that economic process and say, OK, the economic process is based on what is going on with the climate in that area or what is going on with that particular mining they are doing, or it is based on the type of companies that are in there, the type of government*”. A senior analyst explained very elaborately the process of foreseeing the outcome of an uncertainty: “*I think what we sometimes try to do is identify what issues are static or predetermined and are affecting the process, but themselves are not likely to change [...] almost like an equation, it’s not just one event, it’s lots of smaller trends that all come together to form a larger [...] so you have to pull on those strands together to judge this new event*”. This shows us that the process of producing foresight is a forward-looking synthesis of factors related to the uncertainty, as understood by the system of relationships, whose projected future determines the outcome of the uncertainty.

On the other hand, the MD of the company stated that the best way to do this was often to start with a particular forward looking outcome and work backwards: “*what you are trying to do is to understand the process you are using, in as clear a way as possible, to see how the outcomes*

are and then analyse the outcomes to go back to the process you have been using [...] that is effectively a kind of short-term scenario analysis because we stipulate the negative contingency and the positive contingency”. An analyst agreed with this approach “sometimes I start at the end, so, that is the issue [...] so then we will put that up there and then try and track our way backwards. But in other cases we start at the beginning or even before the beginning, we go backwards and say ‘where has this issue come from and then we start from that and draw forwards in that way””.

Insert Figure 3 about here

5. Discussion

5.1 Forward Looking Analysis as an individual foresight process

This paper aims to contribute to the theory of foresight process, and particularly FLA process, the individual foresight without the use of standardised methods. Our inductive case study showed that this process consists of five activities, one of which is connected to all the others. Given that the interviewees in our case study are professional analysts, we could provide confirmation that individual foresight concerns interpretation and understanding (Amasteus, 2008), while simultaneously being a process of thinking the future (Pina e Cunha, 2006) in order to improve preparedness (Slaughter, 1995). Our paper contributes to the field of foresight by extending the notion of ‘system cause’ (Inayatullah, 1998; Riedy, 2008), explaining how

the system of relationships emerges within foresight and how it influences the overall FLA process. Considering that our case study organisation is producing foresight based on qualitative analysis, we observed that the FLA process is quite ‘inter-disciplinary’, with emphasis on the interconnections of the system (Helmer, 1983). Based on the quotes in the previous section, we observe that the system of relationship that each analyst produces involves a very clear clustering of factors for different categories of general or industrial/country specific environments. Despite the fact that the FLA process in this case study fits the ‘expert evaluation’ type only (Amara, 1984), we have observed that its outcome fits all four modes of Inayatullah’s (1991) typology. The FLA report produced focuses on a critical issue as expressed by the uncertainty considered, and interpretations are developed internally and offered externally as the pathway to predicted outcome and impact.

The activities of the FLA process resemble those of the theoretical models of foresight (Voros, 2003; Cuhls, 2003). In all the models of foresight, a series of activities take place in order to capture and understand the dimensions of the triggering event before engaging with anticipating the future. A noticeable finding of our study is the role of ‘developing systems of relationships’. This stage creates a reference point for the whole process, as efforts to understand uncertainty leads to the identification of the forces that influence it and how it is linked to other important aspects that are needed for decision-making. What we describe as the ‘system of relationship’ is the equivalent of mental models and schemas (Dane, 2010). The importance of mental models in sensemaking weak signals from the environment has been suggested in the past. In fact, our model supports the foresight process theory coming from the weak signals field (Day and Schoemaker, 2004). However, our findings extend the understanding of how foresight is produced, as we have showed that to create a foresight for the future the analyst challenges the initial mental model, and the outcome of the foresight process is a new mental model.

The importance of the system of development in producing foresight shows that those engaged in FLA should seek to develop a more holistic model for the dimensions of triggering event.

The participants in our case study explained that their understanding of the dimensions is a result of: i) their educational and professional background; and ii) their sources, which provided them information in order to update their system of relationships. Thus the quality of the foresight produced is dependent on the capability of the analyst to create systems of relationships, and their access to information. As mentioned before, in this case study, the FLA concerned relatively short time horizons which means that the system of relationships was adequate to produce 'single point' foresights of the future. This is in contrast with traditional foresight methods like scenario planning, which have planning horizons that are significantly longer, and thus involve developing multiple plausible images of the future. In addition, in this case study, the results concern individual foresight, which does not feed to some participative foresight activity. The person involved does not have interaction with others and particularly co-production of foresight. In the case of participative foresight, it is anticipated that the interactions will have a direct impact on each stage of the FLA process as there should be a shared understanding of the relationships and consensus achieved upon the foresighted outcome and impact (Day and Schoemaker, 2004; Ilmola and Kuusi, 2006).

5.2 Sensemaking the future in Forward Looking Analysis

As presented in the theoretical framing of this paper, sensemaking is an integral part of the foresight process. In our paper, we provide empirical evidence on how individuals produce foresight as they try to make sense of the future. There is general agreement in the literature (Maitilis and Christianson, 2014) that sensemaking consists of interpretation and enactment. Although, it is widely stated that sensemaking is linked to understanding uncertainty, there are limited attempts to map the process that connects these two (see, for example, Webber and

Manning (2001)). Most of the sensemaking process models do not show the interplay between enactment and interpretation (Sandberg and Tsoukas, 2014).

Goia and Chittipeddi's (1991) work explains that sensemaking is a continuous process of interpretation and enactment. In our case, interpretation concerns external cues from the environment. However, as we have shown in the previous section (Figure 2), individuals do not take direct action from the effort to interpret the cue, but their actions concern a series of steps that analyse uncertainty of the cue in order to understand it better and produce foresight. Sandberg and Tsoukas (2014) explain that the concept of enactment within sensemaking is confusing, as some studies consider enactment to be embedded in every stage of the sensemaking process, while there is the notion that enactment is only the last stage of the sensemaking process. Recent evidence (Bowman, 2016) shows that a well-known formalised foresight tool (scenario planning) is a process of simplicity, where participants 'enact' with the process in order to make sense of uncertainties. Our data show that every interpretation is followed by an enactment with the system of relationships, which facilitates moving forward while it is being continuously redeveloped. Thus, we see that FLA is a process of engaging with uncertainties from the environment trying to interpret them while enacting within the system of relationships as shown in Figure 3.

INSERT Figure 4

As presented in the literature review, the most important debate in prospective sensemaking is whether it is ‘prospective hindsight’ (which corresponds to Weickian ‘future perfect’) or ‘future-oriented’ (the post-Weickian view). When we analysed the interviews, as set out in previous sections, we found most of the interviewees to describe a forward looking process of foresight, which is based on the systemic relationship between the factors connected to the uncertainty examined. Moreover, we found that the ‘final product’ of the FLA process is a report in which the emphasis is on the pathway to the foreseen outcome and impact through discussion of the factors affecting the uncertainty as recorded in the analysts mental ‘system of relationships’. Most of our interviewees do not create an assumption about the future and then try to justify it, but move step by step towards producing a judgement about the future, which is justified with the analysis produced. This process fits the description of future-oriented sensemaking (MacKay, 2009), providing support to the claims that foreseeing the future is not necessarily a future perfect exercise (Aaltonen and Holmstrom 2010, Rohrbeck et al., 2015; MacKay and Parks, 2013).

Nevertheless, in section 4.2 we presented two interviewees’ view that are different from the others. These start from the end by foreseeing a potential outcome, and then work backwards to deduce the pathway of factors that will create that outcome. This predictive hindsight process fits the description of the Weickian view. However, there is an additional difference. These analysts considered multiple potential outcomes (scenarios) until the pathway fitted current circumstances within their system of relationships. Although multiple futures/scenarios are common in futuring exercises, it is uncommon for the FLA process that we studied, because even the FLA report does not present multiple scenarios. This dichotomy in the prospective sensemaking process within FLA is explained by the philosophy of scenario thinking (Raboulet, 2005), which clearly follows the Weickian view. Amado and Ambrose (2001) explains that scenarios are tools for transitioning into the future, while authors like Wright

(2005) and Wilkinson (2009) reemphasise this view, explaining that multiple futures provide the opportunities for backcasting from the future into the present, while learning how to move forward.

6. Concluding Remarks

This study investigated the process of individual foresight, which we call forward looking analysis, as conducted by professional analysts. The overarching framework for this research is the foresight process theory. Within this, this paper makes two significant contributions. We provide the first empirically based depiction of the process that individuals follow in order to produce foresight. In this process we have identified five activities which are all linked to a system of relationships. As part of developing the foresight process theory, we have shown how the system of relationship is developed during the process and how it is used to produce foresight of the future. Secondly, in this paper we provide further insights into the individual foresight process, by showing how the process of producing foresight is a process of sensemaking the future. Our research has produced empirical evidence on how future oriented foresight takes place in sensemaking. In addition, we have shown how prospective sensemaking can be both future perfect (Weickian view) and future oriented (post-Weickian view). The results of our paper have direct implications for foresight process theory. Our research has shown that the process of individual foresight has distinct activities that are linked by the system of relationships, demonstrating that the field of mental models is key for enhancing foresight process theory. Similarly, our paper advances foresight process theory showing how making sense of the future takes place within the individual foresight theory. We acknowledge that our research is based on a single case study, with professional analysts, in which the individual foresight did not lead to participative foresight, as would have happened

in inter or intra organisational foresight interventions (Konnola, 2013). Therefore, we call for future research to investigate individual foresight as part of participative foresight in both formal and informal settings. In particular, it would be valuable if similar research could be developed for managers who are not engaging with foresight professionally. Moreover, we hope that our research will stimulate new research on the role and emergence of mental models within individual and participative foresight.

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References:

- Aaltonen M. and Holmstrom J., 2010, Multi-ontology topology of the strategic landscape in three cases, *Technological Forecasting and Social Change*, 77(9): 1519-1526.
- Ansoff H., 1975, Managing strategic surprise by response to weak signals, *California Management Review*, 18(2): 21.
- Amara R., 1984, New directions for futures research: setting the stage, *Futures*, 36(1-2):43–47.
- Amsteus M., 2008, Managerial foresight: Concept and measurement, *Foresight*, 10(1)
- Barr PS. 1998. Adapting to unfamiliar environmental events: a look at the evolution of interpretation and its role in strategic change, *Organization Science*, 9(6): 644–669.
- Bell W., 1996, *Foundations of Futures Studies; Human Science for a New Era*, Transaction Publishers.

Bell W., 2002, What do we mean by future studies?, in Slaughter (ed), *New Thinking for the New Millennium: the knowledge base of future studies*, Routledge.

Beck, T. E., and Plowman, D. A., 2009, Experiencing rare and unusual events richly: The role of middle managers in animating and guiding organizational interpretation. *Organization Science*, 20(7):909-924.

Bingham, C. B., and Kahl, S. J. 2013. The process of schema emergence: Assimilation, deconstruction, unitization, and the plurality of analogies. *Academy of Management Journal*, 56: 14-34.

Blackman D. A., Henderson S., 2010, How foresight creates unforeseen futures: the role of doubting, *Futures*, 36: 253-266.

Boe-Lillegraven, S., Monterde, S., 2014. Exploring the cognitive value of technology foresight: The case of the Cisco Technology Radar. *Technological Forecasting and Social Change*. doi:10.1016/j.techfore.2014.07.014

Bowman G., 2015, The practice of scenario planning: An analysis of inter- and intraorganizational strategizing', *British Journal of Management*, (forthcoming).

Bootz J. P., 2010, Strategic foresight and organizational learning: a survey and critical analysis, *Technological Forecasting and Social Change*, 77: 1588-1594.

Burt G., Mackay D. J. and Perchard A., 2015, Managerial hyperopia: A potential unintended consequence of foresight in a top management team?, *Technological Forecasting and Social Change*. (forthcoming).

Carbonell J., Sanchez-Esguevillas A., Carro B., 2015, Assessing emerging issues. The internal and external approach, *Futures*, 73(1): 12-21.

Carter C., Clegg S.R., Kornberger M., 2008, Strategy as practice?, *Strategic Organization* 6: 83–99

Cassingena Harper J. (Ed.), Vision Document, eFORESEE Malta ICT and Knowledge Futures Pilot, 2003 (January).

Chia R., 2004, Re-educating attention: What is foresight and how is it cultivated? In: Tsoukas, Shepherd. (Eds.) *Managing the future: Foresight in the knowledge economy*. Wiley-Blackwell

- Chiles T., Meyer AD., Hench TJ., 2004, Organizational Emergence: The Origin and Transformation of Branson, Missouri's Musical Theaters, *Organization Science*, Vol. 15, No. 5, September–October 2004, pp. 499–519
- Coates J. F., 1985, Foresight in Federal Government Policy Making, *Futures Research Quarterly*, 1, 29-53.
- Colville I. D., Brown A. D. and Pye A., 2012, Simplicity: Sensemaking, organizing and storytelling for our time, *Human Relations*, 65: 5
- Colville I. D., 2009, On the (be)coming and going of organizational change: Prospect and retrospect in sensemaking. In: Clegg S and Cooper C (eds) *Handbook of Macro-Organizational Behaviour*, vol. 2. London: SAGE, 162–191.
- Colville I. D. and Murphy A. J., 2006, Leadership as the enabler of strategizing and organizing, *Long Range Planning*, 39(6): 663-677.
- Corradi, G., Gherardi, S. and Verzelloni, L., 2010, Through the practice lens: Where is the bandwagon of practice-based studies heading?, *Management Learning*, 41(3):265-283.
- Craig-Lees M., 2001, 'Sense-making: Trojan horse? Pandora's box?', *Psychology and Marketing*, 18(5): 513-26.
- Cuhls K., 2003, From Forecasting to Foresight Processes—New Participative Foresight Activities in Germany, *Journal of Forecasting*, 22(1): 93–111
- Daft R.L. and Weick K.E., 1984, Toward a Model of Organizations as Interpretation Systems, *Academy of Management Review*, 9(2): 284-295
- Dane, E., 2010, Reconsidering the trade-off between expertise and flexibility: A cognitive entrenchment perspective. *Academy of Management Review*, 35(4): 579–603.
- Day, G. S. and Schoemaker, P. J. H., 2004, Driving Through the Fog: Managing at The Edge, *Long Range Planning*, 37(2); 127-142.
- Gavigan J. P., Scapoio F., Keenan M., Miles I., Farhf F., Lecoq D., Capriati M., Di Bartolomeo T., 2001, Practical guide to regional foresight, FOREN Network [online] foresight.jrc.ec.europa.eu/documents/eur20128en.pdf (accessed: 10/12/15)
- Gavetti G. and Levinthal D., 2000, Looking Forward and Looking Backward: Cognitive and Experiential Search, *Administrative Science Quarterly*, 45(1): 113-137.

- George, J. M., and Jones, G. R. 2001. Towards a process model of individual change in organizations, *Human Relations*, 54(4): 419-444.
- George D. S. and Schoemaker P. J. H., 2006, *Peripheral Vision*, Harvard Business School Press
- Georghiou L. T., Keenan M., 2006, Evaluation of national foresight activities: Assessing rationale, process and impact, *Technological Forecasting & Social Change*, 73 (6): 761–777
- Gephart, R. P., Topal, C., & Zhang, Z. (2010). Future-oriented sensemaking: Temporalities and institutional legitimation. In T. Hernes & S. Maitlis (Eds.), *Process, sensemaking, and organizing* (pp. 275–312). Oxford: Oxford University Press.
- Gioia, D. A., and Chittipeddi, K., 1991, Sensemaking and sensegiving in strategic change change in academia: The dynamics of sensemaking and influence. *Organization Science*, 5(3), 363–383.
- Gioia, D. A., Corley, K. G., & Fabbri, T., 2002, Revising the past (while thinking in the future perfect tense). *Journal of Organizational Change Management*, 15(6), 622–634.
- Gioia, D. A., Thomas, J. B., Clark, S. M., & Chittipeddi, K. (1994). Symbolism and strategic initiation. *Strategic Management Journal*, 12(6), 433–448.
- Harris, S. G., 1994, Organizational culture and individual sensemaking: A schema based perspective, *Organization Science*, 5(3): 309–321.
- Healey M. P. and Hodgkinson G. P., 2008, Troubling futures: Scenarios and scenario planning for organizational decision making, In Hodgkinson, and Starbuck (Eds), *The Oxford Handbook of Organizational Decision Making*, Oxford University Press.
- Heger T. and Rohrbeck R., 2011, Strategic foresight for collaborative exploration of new business fields, *Technological Forecasting and Social Change*, 79(5): 819-831.
- Helmer O. and Rescher N., 1959, On the Epistemology of the Inexact Sciences, *Management Science*, 6(1): 25-52.
- Helmer O., 1983, *Looking forward: a guide to future studies*, Sage.
- Hideg E., 2002, Implications of two new paradigms for future studies, *Futures*, 34: 283-294.
- Hideg E., 2007, Theory and practice in the field of foresight, *Foresight*, 9(6): 36-46.
- Ilmola L. and Kuusi O., 2006, Filters of weak signals hinder foresight: Monitoring weak signals efficiently in corporate decision making, *Futures*, 38: 908-924.
- Inayatullah S., 1990, Deconstructing and reconstructing the future: predictive, cultural and critical epistemologies, *Futures*, 22 (2): 115–141.

- Inayatullah S., 1998, Causal layered analysis: Poststructuralism as method, *Futures*, 30(8):815–829.
- Isabella, L.A. 1990, Evolving Interpretations as a Change Unfolds: How Managers Construe Key Organizational Events, *Academy of Management Journal*, 33(1):7-41.
- Jarzabkowski P. and Spee A. P., 2009, Strategy as practice: A review and future directions for the field. *International Journal of Management Reviews*, 11(1): 69-95.
- Jay G. and von den Gracht H., 2015, The Future of Foresight Professionals: Results from a Global Delphi Study, *Future*, (forthcoming)
- Kaplan S., Orlikowski W. J., 2013, Temporal work in strategy making, *Organization Science*, 24(4): 965–995.
- Karlsen, J. E., E. F. Øverland, H. Karlsen., 2010, Sociological contributions to futures' theory building, *Foresight*, 12(3): 59-72.
- Konnola T., Salo A., Cagnin C., Carabias V., and Vilkkumaa E., 2013, Facing the future: Scanning, synthesizing and sense-making in horizon scanning, *Science and Public Policy*, 39: 222-231.
- Kuosa T., 2011, Evolution of futures studies, *Futures*, 43(2) 327–336.
- Linstone H.A., 2007, Science and technology: questions of control, *Technological Forecasting and Social Change*, 74 2 230–237.
- MacKay B. R and Costanzo L. A., 2009, Introduction, in Costanzo L. A. and MacKay B. R., *Handbook of Research on Strategy and Foresight*, Edward Elgar Publishing, UK.
- MacKay B. R. and Parks R. W., 2013, The temporal dynamics of sensemaking: A hindsight–foresight analysis of public commission reporting into the past and future of the “new terrorism”, *Technological Forecasting and Social Change*, 80(2):364–377
- MacKay R. and Tambeau D, 2013, A structuration approach to scenario praxis, *Technological Forecasting & Social Change*, 80(4): 673–686.
- MacKay, B. 2009, Strategic Foresight: Counterfactual and Prospective Sensemaking in Enacted Environments, in Costanzo and MacKay (eds), *Handbook of Research on Strategy and Foresight*, Edward Elgar.

- Maitlis S. and Christianson M., 2014, Sensemaking in Organizations, *The Academy of Management Annals*, 8(1), 57-125,
- Mannermaa M., 1991, In search of an evolutionary paradigm for futures research, *Futures* 23 (4) 349–372.
- Marien, M. (2010) Futures-thinking and identity: why “Futures Studies” is not a field, discipline, or discourse: a response to Ziauddin Sardar’s ‘the namesake. *Futures*, 42(3): 190–194.
- McMaster M., 1996, Foresight: Exploring the structure of the future, *Long Range Planning*, 29(2): 149-155.
- Mermet L., Fuller T., van der Helm R., 2009, Re-examining and renewing theoretical underpinnings of the Futures field: a pressing and long-term challenge. *Futures*, 41(2): 67-70.
- Mezias, J. M. and W. H. Starbuck. 2008. Decision making with inaccurate, unreliable data. G. P. Hodgkinson, W. H. Starbuck, eds. *Oxford Handbook of Organizational Decision Making*, Chapter 4. Oxford University Press, Oxford, UK, 76–96.
- Miles I., Cassingena Harper J., Georgiou L., Keenan M. and Popper R., 2008, The many faces of Foresight, in Georgiou L., Cassingena Harper J., Keenan M. Miles I. and Popper R. (eds) 2008, *The Handbook of Technology Foresight*, Edward Elgar.
- Miller C.C. and Ireland R. D., 2005, Intuition in strategic decision making: Friend or foe in the fast-paced 21st century?, *The Academy of Management Executive*, 19(1): 19-30.
- Mitchell D. J., Russo J. E. Pennington N., 1989, Back to the future: Temporal perspective in the explanation of events’, *Journal of Behavioural Decision Making*, 2(1): 25-38.
- Müller-Seitz, G., 2014, Practising uncertainty in the face of large-scale disease outbreaks. *Journal of Management Inquiry*, 23(3), 276-293.
- Nonaka, I., 1994, A dynamic theory of organizational knowledge creation, *Organization Science*, 5: 14–37.
- O’Brien F., 2014, On the roles of OR/MS practitioners in supporting strategy, *Journal of Operational Research Society*, 66: 202-218.
- Oner A. M. 2010. On theory building in Foresight and Future Studies: a discussion note, *Futures*, 42(9): 1019-1030.

- Orton, J. D. (2000). Enactment, sensemaking and decision making: Redesign processes in the 1976 reorganization of US intelligence. *Journal of Management Studies*, 37(2), 213–234.
- Peter M. K. and Jarratt D. G., 2014, The practice of foresight in long-term planning, *Technological Forecasting & Social Change* (forthcoming).
- Portaleoni C.G., Marinova S., Ul-Haq R., Marinov M., 2013, Corporate Foresight and Strategic Decision. Lessons from a European Bank, Palgrave Macmillan.
- Piirainen K. A. and Gonzalez R. A., 2015, Theory of and within foresight — “What does a theory of foresight even mean?”, *Technological Forecasting & Social Change*, 96(2), 191–201.
- Pina e Cunha M., 2004, Time travelling: organisational foresight as temporal reflexivity, in Tsoukas and Shepherd (eds) *Managing the future: foresight in the knowledge economy*, Wiley.
- Pina e Cunha M., Palma P., da Costa N. G., 2006, Fear of foresight: knowledge and ignorance in organisational foresight, *Futures*, 38(8): 942-955.
- Pina e Cunha M., Clegg S., Kamoche K., 2012, Improvisation as ‘rea time foresight’, *Futures*, 44(3): 265-272.
- Pitsis T, Clegg S, Marosszeky M, and Rura-Polley T., 2003, Constructing the Olympic dream: A future perfect strategy of project management, *Organisation Science*;14(5): 574-90.
- Popper R., 2008, Foresight Methodology, in Georgiou L., Cassingena Harper J., Keenan M. Miles I. and Popper R. (eds) 2008, *The Handbook of Technology Foresight*, Edward Elgar.
- Pozzebon M. and Pinsonneault A., 2005, Challenges in Conducting Empirical Work Using Structuration Theory: Learning from IT Research, *Organization Studies*, 26(9): 1353–1376.
- Ramirez R. and Wilkinson A., 2014, Rethinking the 2×2 scenario method: Gid or frames?, *Technological Forecasting and Social Change.*, 86 (3): 254–264.
- Ramírez R., Selin C., 2014, Plausibility and probability in scenario planning, *Foresight*, 16(1): 54 – 74.
- Roubelat, F. (2000), “Scenario planning as a networking process”, *Technological Forecasting and Social Change*, Vol. 65, pp. 99-112
- Rouleau, L. (2005). ‘Micro-practices of strategic sensemaking and sensegiving: how middle managers interpret and sell change every day’. *Journal of Management Studies*, 42, 1413–41.
- Rohrbeck R., 2010, Corporate Foresight: Towards a Maturity Model for the Future Orientation of a Firm, Springer Series: Contributions to Management Science, Heidelberg and New York.

- Rohrbeck, R., Battistella, C. and Huizingh, E., 2015. Corporate Foresight: An Emerging Field with a Rich Tradition. *Technological Forecasting & Social Change*, 101: 1-9.
- Riedy C., 2008, An Integral extension of causal layered analysis, *Futures*, 40 (2) 150–159.
- Sandberg, J., and Tsoukas, H., 2014, Making sense of the sensemaking perspective: Its constituents, limitations, and opportunities for further development. *Journal of Organizational Behavior*, 36(1): 6-32.
- Saritas O. and Smith J. E., 2011, The Big picture – trends, drivers, wild cards, discontinuities and weak signals, *Futures*, 43(3): 292-312.
- Sarpong D, 2011, Towards a methodological approach: theorising scenario thinking as a social practice, *Foresight*, 13 (1):4-12.
- Sarpong D., Maclean M., Davies C., 2013, A matter of foresight: How practices enable (or impede) organizational foresightfulness, *European Management Journal*, 31, 613– 625.
- Schneider, S. C., 1997, Interpretation in organizations: sensemaking and strategy, *European Journal of Work and Organizational Psychology*, 6(1): 93-102.
- Slaughter R., 1999, *Futures for the Third Millennium*, Routledge.
- Schoemaker P. H. J., Day G. S., Snyder S. A., 2013, Integrating organizational networks, weak signals, strategic radars and scenario planning, *Technological Forecasting and Social Change*, 80(4): 815-824.
- Schwandt D. R. and Gorman M., 2004, Foresight or Foreseeing? A social action explanation of complex collective knowing, Tsoukas H., Shepherd G. (Eds.), *Managing the future: Foresights in the knowledge economy*, Wiley-Blackwell, UK.
- Slaughter R., 1995, *Foresight Principle*, Adamantine.
- Starbuck, W. H. and Milliken, F. J., 1988, Executives' perceptual filters: What they notice and how they make sense. In D. C. Hambrick (Ed.), *The executive effect: Concepts and methods for studying top managers* (pp. 35–65). Greenwich, CT: JAI Press.
- Stigliani, I., and Ravasi, D., 2012, Organizing thoughts and connecting brains: Material practices and the transition from individual to group-level prospective sensemaking, *Academy of Management Journal*, 55: 1232–1259.
- Swanson D., and Tomar S., 2009, Integrated and forward-looking analysis, in: D. Swanson, S. Bhadwal (Eds.), *Creating Adaptive Policies: A Guide for Policymaking in an Uncertain World*,

Sage

Swanson D., Barg S., Tyler S. Venema H., Tomar S., Bhadwal S., Nair S., Roy D., Drexhage J., 2010, Seven tools for creating adaptive policies, *Technological Forecasting & Social Change*, 77 , 924–939

Thomas J. B., Clark S. M. and Gioia D. A., 1993, Strategic Sensemaking and Organizational Performance: Linkages among Scanning, Interpretation, Action, and Outcomes, *The Academy of Management Journal*, 36(2):239-270.

Tsoukas, H., 1994, Introduction: from social engineering to reflective action in organizational behaviour. In *New Thinking in Organizational Behaviour*, ed. H. Tsoukas, pp. 1–22. Butterworth and Heinemann.

Tsoukas H., G. Sheppard, 2004, Introduction: Organizations and the Future, from Forecasting to Foresight, in: Tsoukas H., Shepherd G. (Eds.), *Managing the future: Foresights in the knowledge economy* Wiley-Blackwell, UK.

Van der Heijden K., 2004, Insights into Foresight, in: Tsoukas H., Shepherd G. (Eds.), *Managing the future: Foresights in the knowledge economy*, Wiley-Blackwell, UK.

Van Notten P., 2005, *Writing on the Wall: Scenario Development in Times of Discontinuity*, dissertation.com.

Van Notten P.W.F, J. Rotmans, B.A. Marjolein, D.S. Rothman, 2003, An updated scenario typology, *Futures*, 35 (4): 423–443.

Vecchiato R. and Roveda C., Strategic foresight in corporate organizations: handling the effect and response uncertainty of technology and social drivers of change. *Technological Forecasting and Social Change*, 77(9), pp. 1527-1539.

Voros J., 2003, A generic foresight process framework, *Foresight*, 5(3): 10-21

Weick K. E. 1995. *Sensemaking in organizations*. Thousand Oaks, CA: Sage

Weick, K. E., and Sutcliffe, K. M. (2001). *Managing the unexpected: Assuring high performance in an age of complexity*. San Francisco, CA: Jossey-Bass.

Weick, K. E., 1979. *The social psychology of organizing* (2nd ed.). New York: McGraw-Hill.

Wilkinson A., 2009, Scenarios practices: in search of theory, *Journal of Futures Studies*, 13: 107–114.

Whittington, R., 2007. Strategy practice and strategy process: family differences and the sociological eye. *Organization studies*, 28(10), pp.1575-1586.

Wright A., 2005, The role of scenarios as prospective sensemaking device, *Management Decision*, 43(1):86–101.

Wright G., Bradfield R., Cairns G., 2013, Does the intuitive logics method - and its recent enhancements - produce "effective" scenarios? *Technological Forecasting and Social Change*, 80(5), 631-642.

Yin R. K., 2003, Case study research: design and methods, Sage.

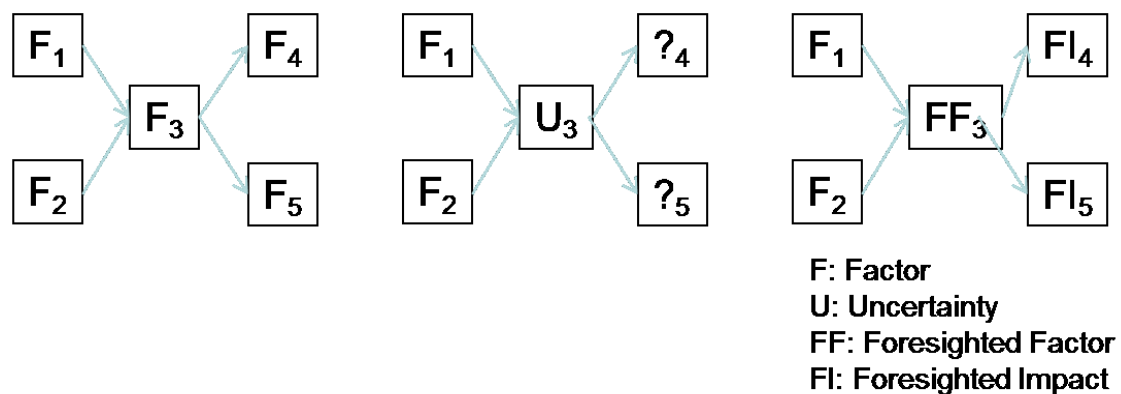


Figure 1: Three phases of ‘Systems of Relationships’

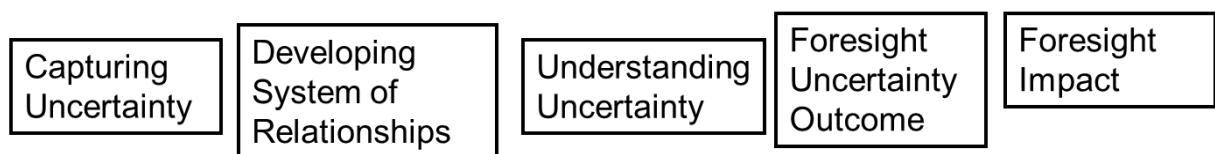


Figure 2: Activities within Forward Looking Analysis process

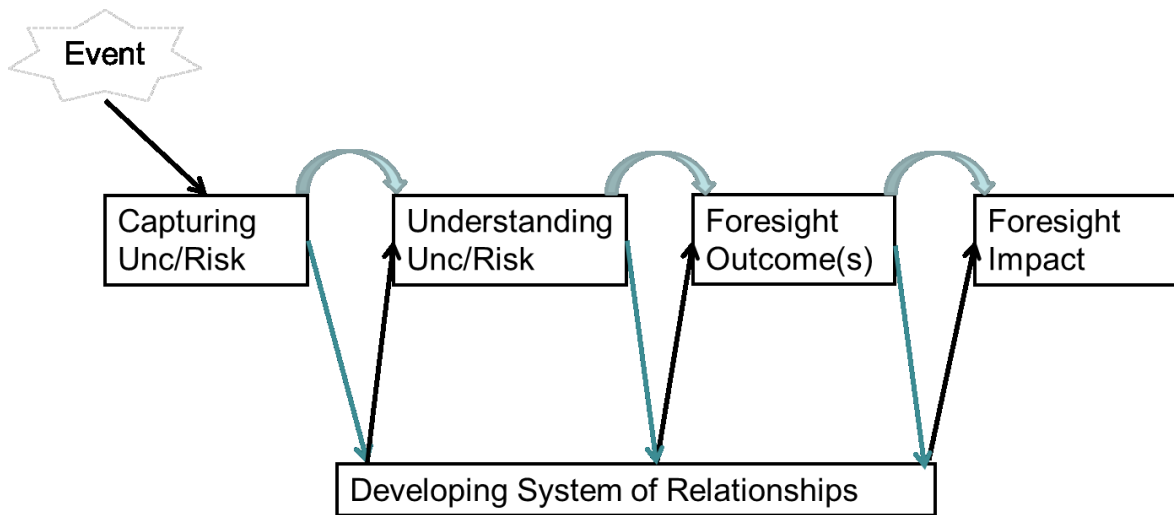


Figure 3: Forward Looking Analysis process

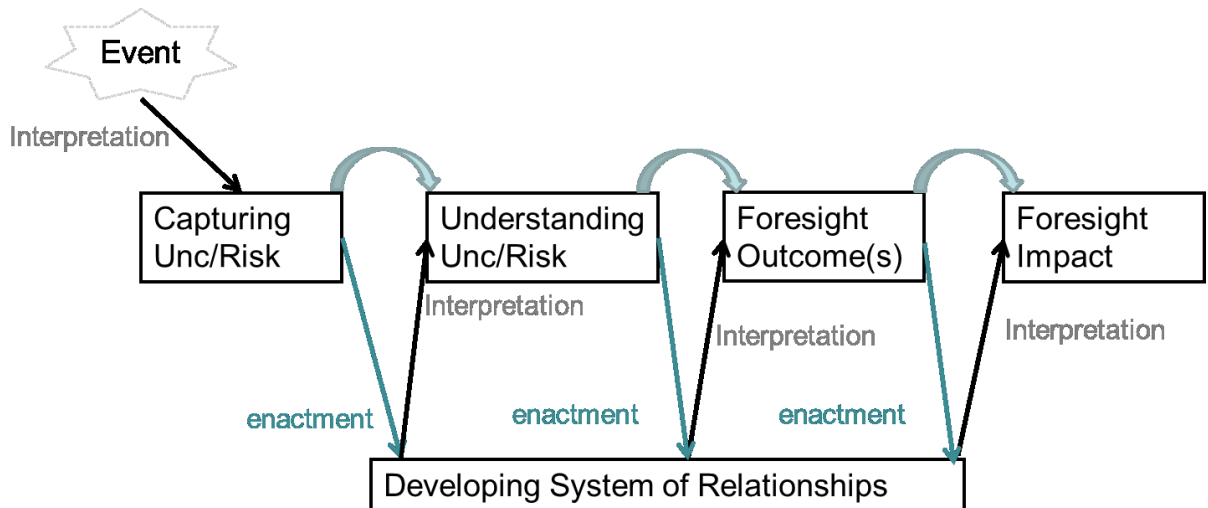


Figure 4: Sensemaking in Forward Looking Analysis process

Endnotes:

ⁱ Future studies is defined as the field of social inquiry whose aim is to ‘*discover, invent, propose, examine, and evaluate possible, probable and preferable, futures*’ (Bell, 2002)

ⁱⁱ Managerial hyperopia: the condition of focusing the far future without being able to ‘see’ the nearby one (Burt et al., 2014)

ⁱⁱⁱ Simplexity is the combination of complex thoughts and simple action which combines sensemaking, organising and storytelling (Bowman, 2015) ^{iv} Beck and Plowman (2009) consider three dimensions of the interpretation; apart from the temporal, they examine cognitive bias and hierarchical which are beyond the scope of our research. ^v We are borrowing this term from Mitchell et al. (1989) who quote Weick (1979) but do not refer explicitly to ‘future perfect’

^{vi} Our data do not show that this meeting had any further impact in the individual foresight process, as none of the interviewees referred back to it at any stage.

^{vii} We looked into all the examples of uncertainties mentioned in the interviews and we identified that from the five types of uncertainties/foresight mentioned by Saritas and Smith (2011) the uncertainties mentioned could be: i) trends; ii) drivers of change; iii) discontinuities and iv) weak signals