

Methodologies in Futures Studies and Foresight – a State of the Art and Future Directions [Pre-Print Draft]

Andy Hines

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Abstract

This chapter explores the state of the art and future directions in foresight method. It includes new variations and innovations on existing methods as well as describing new ones. Given that foresight is still a relatively young discipline it has been heavily reliant on practitioners and has a small academic base. This has historically contributed to more emphasis on innovating around existing methods than inventing new ones. But this has been changing. Interest in the field has grown, including a significant surge of interest by the public sector and global NGOs. The tool kit is indeed expanding along with growing client interest. A Foresight Competency Model has been developed that captures key agreed-upon components of foresight work. Alongside that a variety of new methods and techniques have emerged and state of methodology in the field is healthy.

Keywords

Foresight, methods, framing, scanning, futuring, visioning, designing, adapting

1. Introduction

This chapter looks at methodology from the practical perspective of doing project work. There are several positive and promising developments in foresight, perhaps none more important than converging toward agreement on the basics of doing project work. This convergence is accompanied by a healthy divergence as well leading to the development of new methods and techniques. It is converging on the key steps and divergence on different ways to carry out these key steps.

The chapter will not cover the theoretical grounding behind the methods. There have been calls to do this important work and there are efforts underway. There are initiatives around anticipation (Miller 2018), foresight science (Fergnani and Chermack 2020), post-normal studies (Sardar 2010), integral futures (Slaughter 2001), and so on as new ways to think about the future. But here the focus is on carrying out foresight project work.

Note that the chapter will use capital F Foresight as the preferred name for the field rather than small f foresight as a subset of futures studies that is preferred by some. The naming issue has gotten sporadic attention over the years, with often heated discussions that gradually dissipate without consensus (Cornish, 1977; Horton, 1999; Becker, 2002; Schwarz, 2005; Amsteus, 2008; Rohrbeck, 2011). Every few years the discussion re-emerges, often initiated by someone new to the field, and the arguments are revisited without conclusion. Simply note that Foresight is the author's preferred term, and it is recognized that there are different views on this.

One who is new to foresight may be overwhelmed by the seeming proliferation of varieties of foresight. One might call it "fill-in-the-blank" foresight. Some examples include:

- social foresight (Slaughter 2004)
- corporate foresight (Daheim & Eurz 2006)
- adaptive foresight (Eriksson 2008; Smart 2019)
- strategic foresight (Slaughter 2009)
- technology foresight (Martin 2010)
- participatory foresight (Kuosa 2015)
- transformative foresight (Inayatullah and Sweeney 2021)

The simple advice here is to proceed with a degree of caution. There is some branding activity that goes in which individuals or groups will claim or come to be seen as leaders in this or that type of foresight. The caution is to look closely at the underlying process or method to see what if anything is really new or different. In the author's experience, for example, there seems to be no discernable difference in the methodological approach of corporate foresight compared to foresight done for non-corporate organizations.

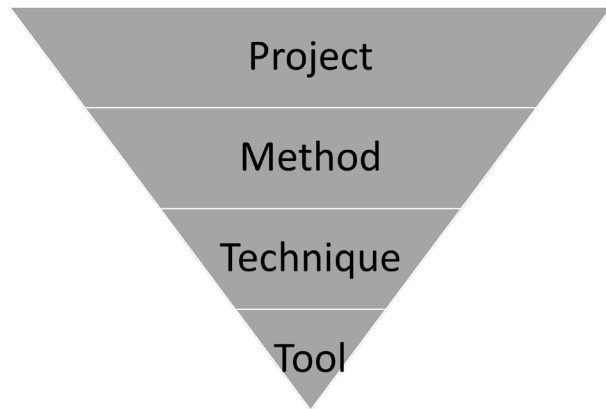
While the primary job of this chapter is to report on the current state and future directions of methods as relates to project work, the author would also like to offer a brief perspective on the perception of methods in the field. The author's experience in the field over three decades is that there is a fairly widespread notion that futurists do not agree on much and certainly don't agree on how to do foresight work. The chapter hopes to persuade readers that there is much more agreement on how to do foresight work and methods than is commonly believed.

1.1.1 Some definitions around projects and method

It is useful to view all foresight **project** work as being done for clients in some capacity. Even if the work is not paid for and there is not a clearly identified client, it is still a useful mechanism. If one is writing an essay or a book, for example, it can be thought of as a project with the client being the intended reader or audience. Having even a hypothetical client in mind sharpens the focus of the work. It is helpful to begin with the end in mind and adjust whatever method is being used to produce a deliver that is useful to the client whoever they are. Conway (2015) observes that practitioners have their preferred methodologies, but the choice of which to use should align with what is appropriate for the particular **client**. And in the course of carrying out

the various steps of the method, it is useful to remind oneself of how that activity will be of use to client.

The terms **methods**, **techniques**, and tools are often used interchangeably in the literature and in practice. This can cause some confusion within the project team as well as with the client. There are subtle, but useful differences in the terms, described below: (Hines and Bishop 2010)



Project. A foresight project is the largest unit of professional work. It includes the sum total of the objectives, the team, the resources and the methods employed in anticipating and influencing the future. Projects may be simple, involving just one product and method, or complex, involving many steps, each of which produces one or more products and uses one or more methods.

Method. This is the systematic means or specific steps used by the approach to generate a work product. It consists of an ordered series of steps to accomplish the objectives and produce the deliverables of the project. The deliverables are the final result of the work done in the approach--as a report, a database of trends, scenarios in various forms, a strategic plan and many more. Usually each step in the approach generates a product and together they form the deliverable from the project. Method and technique are often used interchangeably in the literature. The distinction here is that the method involves the specific steps for carrying out a project, whereas technique relates to the style or manner of carrying out the steps.

Figure 1. Terms

Technique. Relates to the particular style or manner in which a method is carried out; can be thought of as variations of a particular method that relate more to style than substance.

Tool. A tool is a (physical or software) device that provides a mechanical or mental advantage in accomplishing a task, e.g., video projectors, questionnaires, worksheets, and software programs.

One very handy principle is "one method, many techniques." Lists of methods often get very long because many are really just techniques, or different ways of carrying out a method. This contributes to the perception that futurist don't agree much on methods. Hines and Bishop (2007), however, in their review of the state of the scenario method, identified 23 techniques or variations on how to carry the method out. Most futurists use scenario, they just have different ways of carrying out the basic steps of the scenario method.

It is suggested that one recognize the reality that sometimes the terms are used interchangeably, and not get too hung up on the distinctions. For instance, Bishop et al (2007)

in their piece on the state of the art in scenarios, noted that alternative futures should encompass scenarios as well as other ways of describing the future. But in practice the terms had been used interchangeably for so long that they concluded it did not make sense to fight the battle for a more precise definition. The most practical advice is to be consistent in your organizations in how these various terms are used.

1.1 More interest in the field....and methods

It would be the subject of a separate paper to prove the case for growing interest foresight and its methods. Below is some support that is hopefully sufficient to make the case here:

- More than 7,9000 members of LinkedIn are self-identifying as futurists in choosing their descriptors (lest one get too excited however, there are 34,000 pet sitters).
- The profession is growing slow and steady with membership in the Association of Professional Futurists approaching 500 members.
- The number of students in the Houston Foresight program has nearly tripled in the last two years from the mid-30s to 90 in the Fall of 2021.
- A Houston Foresight study found 25% of the Fortune 500 doing some formal foresight (Schlehuber 2020).
- It may be that the greatest growth in foresight interest over the last decade has probably been in the public sector (Dreyer and Stand 2013; Greenblott et al 2019). This includes national governments, as well as the global NGO community such as the World Economic Forum and UNESCO.
- There is growing interest in the foundation/philanthropy sector (Tully 2019; Prince 2021).

Smart's Foresight Guide (2019) has a section on "Foresight Becoming More Popular" that reinforces the points made above. He notes a cyclicity of "winters and springs" in professional practice. In the 1960's and 1970s, futurists made inroads into boardrooms and governance with forecasting and planning. These gains were reversed in the re-engineering phase of 1980's to mid-1990's, at least for a while. He also observes that unlike the waxing and waning interest in professional foresight, the general public's interest in all things future-related has steadily grown.

Given the uneven interest and that foresight is still a relatively young discipline of 75 years (Hines 2019b), and has a small academic base, it has been heavily reliant on practitioners. Recent work by the author on behalf of the new Accreditation Service for Foresight academic programs by the World Futures Studies Federation, identified less than a dozen foresight graduate programs in the world (WFSF 2021). This has contributed to more emphasis on innovating around existing methods than inventing new ones. Practitioners by necessity or practicality have been more willing to borrow methods from other fields. In more mature disciplines, the academic base provides a forum to experiment with methodologies.

1.2 Purposes

Before getting into the details of methods, it is helpful to reflect on the purposes of the projects that the methods are supporting. Slaughter (2009) developed a simple and useful framework for thinking about purposes:

- Pragmatic: doing today's work better
- Progressive: moving beyond today's practices
- Civilizational: creating the foundations of the next world civilization

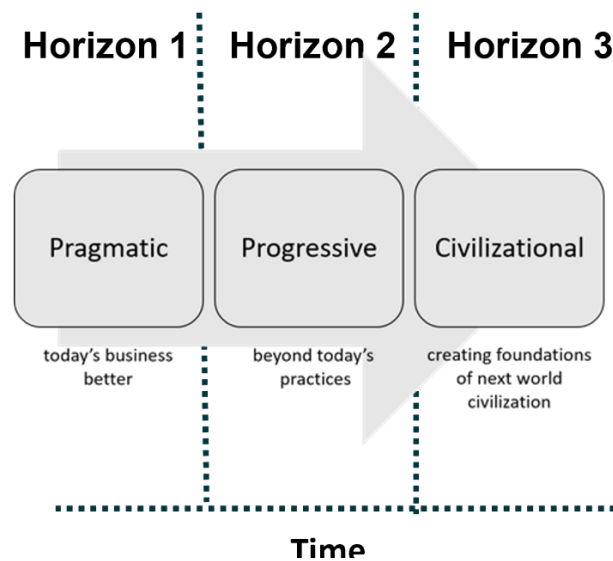


Figure 2. Purposes along three horizons

Figure 2 overlays these purposes on the popular Three Horizons framework (Curry and Hodgson 2020). Most pragmatic work will typically be in Horizon 1, the current system. Progressive work will most often be aimed at Horizon 2, the zone of transition. Civilizational work, which is seeking to create a new system, will most commonly be aimed at Horizon 3.

Slaughter classified several hundred foresight works globally by the three interests. Perhaps it was no surprise that most work was in the pragmatic category, followed by progressive, and the least amount of work being civilizational. A key objective of his futures work has been to encourage more progressive and ideally more civilizational foresight work (Hines 2021a). When a member of Slaughter's original research team, Chris Riedy (2021) revisited the work, he did not see a significant shift in the purposes of foresight work, although he did cite several positive developments in the field.

Rather than an exclusive focus on one purpose or another, perhaps futurists' project work engages all three? Futurists mostly focus on exploring horizons 2 and 3, but recommendations will engage H1 in order to tie the future to the present. And multiple horizons can be engaged within a project, thus touching on all three purposes. Futurists may encourage clients to stretch their thinking by engaging H3, extend their thinking in H2, and pragmatically consider what needs to be done in H1.

1.3 A brief review of foresight methods compilations

To get a sense of the evolution of foresight methods, a search was conducted for representative historical compilations. Perhaps the earliest that attained a degree of popularity was Jib Fowles (1978) *Handbook of Futures Research* that remained the standard for next few decades.

Interestingly, there was not a focused methods book that took its place, but rather it was Wendell Bell's (1997) popular overview *Foundations of Futures Studies* with a chapter on

methods that became the new de facto standard. It became the most-cited foresight work in the history of the field as of 2020 (Popper 2020).

The next and arguably current de facto methods standard -- with apologies to Poppers (2008a) - is Glenn and Gordon's (2009) *Futures Research Methods 3.0*.

There has been a trend to more compilations since then, but first the three historical compilations that are roughly 20 years apart will be compared. Table 1 list the methods in the three collections.

Table 1. Historical foresight methods compilation

Fowles (1978)	Bell (1997)	Glenn and Gordon's (2009)
1. Cross-Impact Analysis	1. Chaos Theory	1. Agent Modeling
2. Delphi	2. Cohort Component Projection	2. Causal Layered Analysis
3. Envelope Curves	3. Content Analysis	3. Chaos and Non-Linear Systems
4. Growth Curves	4. Contextual Mapping	4. Cross-Impact Analysis
5. <i>Morphological Analysis</i>	5. Cross-Impact Analysis	5. Decision Modeling
6. Relevance Trees	6. Delphi	6. Delphi Techniques
7. Scenarios	7. Ethnographic Futures Research	7. Econometrics and Statistical Modeling
8. Simulation Gaming	8. Future Workshops (Jungk)	8. Environmental Scanning
9. Simulation Modeling	9. Issues Management	9. Field Anomaly Relaxation
10. Social Indicators	<i>10. Monitoring (Scanning)</i>	10. Futures Polygon
11. Social Forecasting	11. Participatory	11. Futures Wheel
12. Systems Analysis	<i>12. Pragmatic Prediction (Leading Indicators)</i>	12. Genius Forecasting, Vision, and Intuition
<i>13. Technology Assessment</i>	13. Relevance Trees	13. Interactive Scenarios
<i>14. Technological Forecasting</i>	14. Scenarios	<i>14. Morphological Analysis</i>
<i>15. Time Series</i>	15. Simulation and Computer Modeling	15. Multiple Perspective
16. Trend Extrapolation	16. [Simulation] Gaming	16. Participatory Methods
	<i>17. Social Experiments</i>	17. Prediction Markets
	18. Survey Research	18. Real-Time Delphi
	<i>19. Technology Assessment</i>	19. Relevance Trees
	<i>20. Time Series</i>	20. Robust Decision-making
		21. Scenarios
		22. Science and Technology Roadmapping
		23. Simulation Gaming
		24. State of the Future Index
		25. Structural Analysis
		26. Substitution Analysis
		27. Systems Modeling
		28. Technological Sequence Analysis
		29. Text Mining
		30. Toolbox for Scenario Planning
		31. Trend Impact Analysis
		32. Visioning
		33. Wild Cards

One trend is that the lists have been getting progressively longer over time, which supports the earlier point made in this piece about the growing number of methods. However, there is a perhaps a bit of “bloat” in the list. For instance, several items in the Glenn and Gordon compilation are questionable as foresight methods. Table 2 makes some comments on the methods in the Glenn and Gordon list.

Table 2. Commentary on Foresight “methods”

1. Agent Modeling	Fits with foresight, but more in the systems space
2. Causal Layered Analysis	
3. Chaos and Non-Linear Systems	Seems more of a perspective than a method
4. Cross-Impact Analysis	
5. Decision Modeling	Not a foresight method
6. Delphi Techniques	
7. Econometrics and Statistical Modeling	Not a foresight method
8. Environmental Scanning	
9. Field Anomaly Relaxation	This appears to have been used in practice only a few times
10. Futures Polygon	This appears to be a variation of the futures wheel, thus a technique
11. Futures Wheel	
12. Genius Forecasting, Vision, and Intuition	
13. Interactive Scenarios	Scenarios is the method; different ways of doing scenarios would be techniques
14. Morphological Analysis	While used it as a scenario technique, it has other uses, so it qualifies as a method
15. Multiple Perspective	As the title suggests, it is a perspective that one uses to interpret; not a method
16. Participatory Methods	The degree of participation is a choice one makes in selection or using methods, but is not a method itself
17. Prediction Markets	
18. Real-Time Delphi	Delphi is the method; real-time is a technique
19. Relevance Trees	Seems to be more of a variation of morphological analysis
20. Robust Decision-making	Not a foresight method
21. Scenarios	
22. Science and Technology Roadmapping	Technically more of an innovation method than a foresight one
23. Simulation Gaming	
24. State of the Future Index	Not a method, but an organizing scheme for the author’s publication
25. Structural Analysis	This describes the author’s overall approach to foresight work
26. Substitution Analysis	Not aware of anyone using this today; more popular in the early days of foresight when empirical methods were more common
27. Systems Modeling	
28. Technological Sequence Analysis	
29. Text Mining	
30. Toolbox for Scenario Planning	This is more of an overall approach to foresight
31. Trend Impact Analysis	

32. Visioning	
33. Wild Cards	This is a concept, not a method.

The analysis in Table 2 would cut the original list of 33 methods in half to 16. It supports a basic argument being made here that foresight work has much more in common than generally believed. There are lots of techniques, but they are simply variations from a relatively small number of methods.

Only six methods (bolded in Table 1) were in common across the three lists:

- Cross-Impact Analysis
- Delphi
- Relevance Trees
- Scenarios
- Simulation: Gaming
- Simulation: Modeling

Interestingly, it might be fair to say that of these six, only scenarios are in widespread use among most futurists today.

Four of the methods appears on two of the three lists:

- Morphological Analysis
- Technology Assessment
- Technological Forecasting
- Time Series

None of these four appear to be in particularly wide use today.

Newcomers to foresight methodology may be intimidated by the several long lists of methodologies. The current “record” seems to be held by John Smart’s (2019) Foresight Guide that lists 140 methods. He compiled his list for what he calls Adaptive Foresight, which he organizes into eight categories of learning, anticipation, innovation, strategy, execution, influence, relating, and reviewing. Similar to the commentary in Table 2, it would be fairly easily to shrink this dramatically by limiting the list to foresight methods. Of course, it is a good and useful thing to borrow from other fields, but here the focus is on foresight methods.

Table 3 looks for commonalities among the more recent methods compilations. The Glenn and Gordon list is included for comparison.

Table 3. Contemporary foresight methods compilation

Glenn and Gordon’s (2009)*	Popper (2008a) Handbook	Jackson (2013)	UNDP (2015) Foresight Manual
1. <i>Agent Modeling</i>	1. <u>Backcasting</u> 2. Benchmarking	1. <u>Backcasting</u> 2. <i>Brainstorming</i>	1. <i>Agent-Based Modeling</i>

<ul style="list-style-type: none"> 2. <u>Causal Layered Analysis</u> 3. <i>Chaos and Non-Linear Systems</i> 4. Cross-Impact Analysis 5. <i>Decision Modeling</i> 6. Delphi Techniques 7. Econometrics And Statistical Modeling 8. Environmental Scanning 9. Field Anomaly Relaxation 10. Futures Polygon 11. <u>Futures Wheel</u> 12. <i>Genius Forecasting, Vision, And Intuition</i> 13. Interactive Scenarios 14. Morphological Analysis 15. Multiple Perspectives 16. <i>Participatory Methods</i> 17. <i>Prediction Markets</i> 18. Real-Time Delphi 19. Relevance Trees 20. [Science And Technology] Roadmapping 21. Robust Decision-making 22. Scenarios 23. Simulation-Gaming 24. State of the Future Index 25. Structural Analysis 26. Substitution Analysis 27. Systems Modeling 28. <u>Technological Sequence Analysis</u> 29. <u>Text Mining</u> 30. Toolbox For Scenario Planning 31. Trend Impact Analysis 32. <u>Visioning</u> 33. Wild Cards 	<ul style="list-style-type: none"> 3. Bibliometrics 4. <i>Brainstorming</i> 5. Citizens Panels 6. <i>Conferences/ Workshops</i> 7. Cross-Impact/ Structural Analysis 8. Delphi 9. [Environmental] Scanning 10. Essays/Scenario Writing 11. <u>Expert Panels</u> 12. <i>Genius Forecasting</i> 13. Indicators/Time Series Analysis (TSA) 14. Interviews 15. Key/Critical Technologies 16. Literature Review 17. Modeling 18. Morphological Analysis 19. Multi-Criteria Analysis 20. Patent Analysis 21. Polling/Voting 22. Quantitative Scenarios/SMIC 23. Relevance Trees/ Logic Charts 24. Roadmapping 25. Role Play/Acting 26. Scenarios 27. Science Fictioning 28. Simulation Gaming 29. Stakeholder Analysis/ MACTOR 30. Surveys 31. SWOT 32. Trend Extrapolation/ Impact Analysis 33. Wild Cards & Weak Signals (Wi-We) 	<ul style="list-style-type: none"> 3. <u>Causal Layered Analysis</u> 4. <i>Chaos Theory</i> 5. Cross-Impact Analysis 6. <i>Decision Modeling</i> 7. Delphi Method 8. Environmental Scanning 9. <u>Expert Panel</u> 10. <i>Forecasting</i> 11. <u>Futures Wheel</u> 12. <i>Heuristics</i> 13. Modeling, Simulation, Gaming 14. Morphological Analysis 15. <i>Participatory Methods</i> 16. Personal Futures 17. <i>Prediction Market</i> 18. Relevance Trees 19. Road-Mapping 20. Scenarios 21. <u>Technology Sequence Analysis</u> 22. <u>Text Mining</u> 23. Trend Impact Analysis 24. TRIZ 25. <u>Visioning</u> 26. Wild Cards 	<ul style="list-style-type: none"> 2. Appreciative Inquiry 3. <u>Backcasting</u> 4. <u>Causal Layered Analysis</u> 5. <i>Conference Model</i> 6. Cross-Impact Analysis 7. Delphi Method 8. Drivers Analysis 9. Engaged Foresight 10. Environmental / Horizon Scanning 11. <u>Expert Panel</u> 12. <i>Forecasting</i> 13. Future Search 14. <u>Futures Wheel</u> 15. <i>Heuristics</i> 16. Management By Discovery 17. Modelling, Simulation and Gaming 18. Morphological Analysis 19. Narrative Inquiry 20. Real Time Strategic Change 21. Relevance Trees 22. Roadmapping 23. Scenario Planning / Building 24. STEEP Analysis 25. Stress-Testing 26. <u>Technology Sequence Analysis</u> 27. <u>Text Mining</u> 28. Trend Impact Analysis 29. TRIZ (Theory of Inventive Problem Solving) 30. Wild Cards and Weak Signals 31. Search Conference 32. <u>Visioning</u> 33. Whole Scale Change 34. Windtunnelling
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*Their list has been updated online. Since the initial 2009 compilation, the update includes the addition of The Systems Perspectives, Statistical Modeling, A Toolbox for Scenario Planning, Normative Forecasting, Heuristics Modeling, and Personal Futures. [NOTE: I would argue against almost all of them]

The number of methods appearing on each list were as follows:

- The 10 bolded items appeared on all four lists
- The 7 underlined items appeared on three of the four lists
- The 11 italicized items appeared on two of the four lists
- The 43 items in regular font appeared on just one list

The total number of single items, 43, exceeded the combined total of the multiple items, 28. This suggests that the core tool kit used by most futurists is relatively small and that there are many single variations used occasionally by a handful of practitioners. There are also some methods that continue to appear on lists that may not be in widespread use. For instance, the author is not aware of any use of relevance trees, which appeared on three lists in Table 3 on contemporary methods, among any of his colleagues or in the literature he has reviewed.

It was interesting to see that Environmental Scanning, which many futurists would say is arguably the most important method, is not on the Fowles 1978 list and appears on Bell's 1997 list as monitoring. It makes its first appearance as Environmental Scanning on Glenn and Gordon's list in 2009.

It was interesting to see Causal Layered Analysis (CLA) include in Glenn and Gordon in 2009. But none of the lists include Integral Futures as a method yet. In the Future Directions section below, point 2.2.4 suggests that Integral Futures is like to join CLA as a mainstream method. But it is not there quite yet.

This may seem to be quirky or a quibble, but the author would argue that some of the inflation of the list size has to do with adding "analysis" after a category. Drivers analysis is a good example. Futurists analyze drivers, but need it be listed as a separate method? STEEP analysis is another example. STEEP is a handy acronym for organizing the external context in a domain, but the method is horizon scanning.

There are different schemes for organizing the methods. Glenn and Gordon (2009) make that point that no agreement exists on the proper way to organize futures method. One of the common ways to understand different foresight approaches was proposed by Popper (2008a) in his Foresight Diamond. He distinguished the following dimensions of foresight: Creativity vs. Evidence, and Expertise vs. Interaction. This means that the Diamond maps methods depending on whether the approach is based more on expertise (e.g., expert panel) or the interaction between stakeholders (e.g., citizen panel). On the other axis, methods differ from those that seek empirical evidence (e.g., modelling) and those that are based on creative work (gaming). Table 4 in Section 2.1.1 below organizes methods and techniques according to which of the six foresight competences it aligns with.

1.4 Other notable methods pieces

Popper (2008b, 62) investigated how futurists selected methods for their projects and found that the process was “dominated by the intuition, insight, impulsiveness and – sometimes – inexperience or irresponsibility.” This appears to be an area ripe for further development in that framework for aiding the selection of methods does not appear to be available or is at last not in widespread use.

Feurth’s (2011) *Project on Forward Engagement* proposed an anticipatory governance approach that gained some attention by those doing foresight work in the US government. It was based on a course he developed at George Washington University. His approach involved (1) integrating foresight into policy-making (2) developing networked governance, and 3. Making use of feedback. This proposed whole-of-government approach to foresight would be similar to those successfully adopted by several foreign governments, such as Singapore, Finland, Canada, the UK, the Netherlands, and Korea (Kuosa 2011; Padbury 2021, Heo and Seo 2021). Also in the public sector, the EU has had various initiatives that include compilation of methods available online, such as an Online Foresight Guide and individual European governments have put out methods compiles such as the UK’s Office for Science (2017) that has put out a Futures Tool Kit.

Hammoud and Nash (2014) reported on Nash’s dissertation work assessing the state of corporate foresight that included a focus on methods being used. He interviewed a sample of 14 foresight practitioners (including the author) working in or with US corporations. Out of the 33 known foresight methods identified in prior research [assuming the authors are referring to Popper 2008a), interview participants noted 24 methods used, with 13 of them used by more than one, and 11 mentioned only once. The five most frequently mentioned methods were:

- scenario planning (18%)
- trend analysis (16%)
- environmental scanning (10%)
- workshops (6%) [NOTE: not a method from this Chapter’s perspective]
- looking for weak signals (5%) [NOTE: part of scanning from this Chapter’s perspective]

Fernani (2020) provides a comprehensive visual review of the structure of the scholarly field of Futures Studies in fifty years of cumulated scholarship (1968–2017) in ten journals using bibliometric mapping techniques. From this mapping work, six clusters or themes were identified: *Corporate foresight, Past and futures, Humanity at the limen, Environmental future, Post-normality and complexity, Technological trends*. It is interesting to see that methods did not emerge as a top theme from the academic journals (although the purpose was not to look for methods pre se). There was mention of the well-established methods of scenario planning, technology forecasting, the Delphi. Also mentioned was Roadmapping. New methods such as CLA and Integral Futures also were noted.

An area that might be considered missing is global models. It was interesting to note that fading of interest in global models was noted back in 1989, barely 15 years after the great success of *Limits to Growth* (Masini 1989) and follow-up work sponsored by the Club of Rome. Since then

Hughes (1999) and colleagues have more or less carried the banner with their Interactive Futures modeling project. They have developed increasingly sophisticated global forecasting models -- currently on their seventh generation -- both as a teaching tool and for policy analysis for clients (Frederick S. Pardee Center for Internal Futures 2022).

2. State of the Art and Future Directions

The author, having spent a good portion of the 2019 and 2020 co-editing *the Knowledge Base of Futures Studies 2020*, will use that as a launching point for focusing on methodological developments of the last 15 years since that aligns with the task here. This was the 3rd edition of KBFS, which began in 1993. The last update was in 2005. It is a useful chronicle for tracking ongoing developments in the field.

2.1 State of the art

There has been some concern that methodological development is characterized by incremental improvements and tweaks rather than breakthroughs. Veteran futurist Jim Dator suggests that Causal Layered Analysis (CLA) was the first major new futures theory and method since the Delphi 40 years prior to that (Inayatullah, 2004). The 2003 APF's Futures of Futures Scenario Planning project also noted an aging tool kit and whether it would be updated as a critical uncertainty (Hines 2003). More recently, Rohrbeck's (2011) benchmarking study concluded that there was a need for method development and best practices identification. And the most recognizable foresight method, scenario planning, has been adopted by several other fields.

Perhaps the lack of new methods was a reflection that they were not needed? Most futurists tend to rely on a small number. What seems almost heretical in today's world of process-obsession is that the greatest example of foresight work routinely touted by every futurist -- and deservedly so -- the early 1970s Shell scenarios were created without a formal methodology. Chermack (2017, 90) in chronicling the work of Pierre Wack and colleagues at Shell, observed that there was "no manual, no 2x2, no process for creating scenarios. He notes that Wack said he could not actually articulate how he did it. To be clear, this is not an argument for abandoning methodological development, but rather putting it in proper perspective.

The other side of the story stemming from the author's work on the KBFS 2020 suggests that this situation has been changing and new methods are being developed, as will be shown in Section 2.2 on Future Directions.

It is a bit challenging to make a distinction between state of the art and future directions, as the proposed future directions are already underway today. The state-of-the-art will focus on two key developments and the rest will be covered in future directions. The two key developments:

- Converging and diverging, as exemplified by the development of a Foresight Competency model

- Confusion, as exemplified by the development to “new” schemes for doing foresight work

2.1.1 Converging and Diverging

The field is experiencing a nice blend of converging and diverging. The best example of the convergence is the develop of a Foresight Competency Model by APF and the divergence is seen in the development of new approaches and methods such as experiential futures and sci fi prototyping.

Perhaps the single most important methodological development of the last 15 years is the publication of APF’s Competency Model in 2017. APF had launched a “Future of Foresight” project in 2011, beginning with three white papers, moving on to Town Halls, and the Chicago meeting, which spurred a Professionalization Task Force that eventually led to the Foresight Competency Model. A competency model is not a methodology, of course, but it symbolizes what’s agreed by professional futurists in APF as central to doing foresight work. Although a competency model is not intended to describe process work, in this case, the competencies emerged from process work in an iterative fashion. Hines and Bishop (2006) gathered key guidelines from a few hundred futurists globally and bucketed them into a set of competencies and arranged them in a process flow. This work, update in 2015, reflected an ongoing iterative approach to developing both the competency and the process flow at the same time each reinforcing the other. This work provided a launching point to the development of the competency model.

The development of the competency is intended to illustrate a basic framework that is not meant in any way to suggest a “one right way” or to detract from the many other wonderful developments in the field, such as the much greater use of CLA, the contribution of Integral Futures, the influence of design thinking, and the development of Experiential Futures among others. It simply says there is a common core around a range of methods, techniques, and tools can be developed.

The basic components of project work are similar across a full range of project and a full range of clients. If one is writing a book about the future for an audience, one is likely to – or ought to – employ a basic foresight methodology – just as one would do for a paid client with a specific deliverable. Of course, there is a lot of variation, but again there is a lot of common ground. Houston Foresight uses the six APF competencies in its Framework Foresight methodology, which is but one way to carry out foresight work for a client (Hines and Bishop 2013; Hines 2020). In trying to explain methods to students, they are sorted in two very simple ways. Some methods are project methods in that they contain the steps to complete a full foresight project, such as Framework Foresight. Others include Padbury’s (2021) Horizons Foresight Method, Woodgate’s (2004) Futures Frequencies, Sohail Inayatullah’s (2008) Six Pillars, and Amy Webb’s (2020) Future Forecasting.

There has also been a great deal of convergence around scenario planning as a core method. A 2007 piece reviewing the state of foresight found 26 different techniques that were grouped into 8 categories (Bishop, Hines and Collins 2007). Many of those scenario techniques are also referred to as methods, i.e., the 2x2 “method.” The authors acknowledged in that piece that fighting the battle over the proper use of method and technology was probably not worth the effort, but in a piece on methodology the point is pertinent.

Some other methods do part of a full foresight project or aimed at one or more competencies – techniques in this paper’s lexicon, but this is probably not worth quibbling about. Table 4 shows some examples.

Table 4. Various methods and technique for carrying foresight competencies

Competency	Methods/techniques
Framing	Cynefin, domain mapping, organizational foresight audit, integral futures
Scanning	Environmental scanning, content analysis, data mining, monitoring, stakeholder analysis, trend identification
Futuring	CLA, cross impact matrix, Delphi, emerging issue analysis, games/simulations, integral futures, personas, predictive markets, scenarios (2x2, archetypes, backcasting, incasting, etc.) morphological analysis, presencing statistical modeling (time series), systems analysis, technology forecasting, roadmapping, patent analysis, trend analysis
Visioning	Appreciative inquiry, aspirational futures, CLA, Futures Search, futures wheel, implications analysis, implications wheel, visualization
Designing	Artifacts, decision modeling, [future] personas, prototyping, risk analysis, simulations, strategic planning, technology assessment
Adapting	Action research, change management, foresight maturity model, issues management

Table 4 shows how there is a great variety of different methods and techniques for carry out the competencies. If one needs to do futuring, for example, there are dozens of possibilities to select from. The *KBFS 2020* update included new or updated approaches, perspectives, methods, tools, and techniques since the 2005, including:

- Aspirational Futures (method)
- Bibliometric mapping (tool)
- Anticipatory Governance (approach/perspective)
- Design futures (approach/perspective)
- Ethnographic Experiential Futures (method)
- Four Futures Archetypes (technique)
- Foresight Competency Model (tool)
- Foresight Maturity Model (tool)
- Framework foresight (method)

- Integral Futures & Integral Strategy (approach/perspective)
- Polak Game (technique)
- Presencing (method)
- Science Fiction Prototyping (method)
- Three Horizons (tool)

In short, the convergence around competencies has not hampered the development of new methods.

2.2. Future Directions

The future directions section identifies a dozen key themes of change emerging regarding foresight methods. The author would like to acknowledge that aspects of several of these future directions were identified by Daheim (2020) in her 2020 paper on emerging practices in foresight. The nine directions are summarized here and described below:

1. Moving down the value chain
2. Re-imagining imagining
3. Rethinking wildcards
4. Mainstreaming of critical and integral futures
5. More nuanced approach to time using Three Horizons
6. Greater integration of qualitative and quantitative
7. More participatory approaches
8. More experiential approaches
9. More focus on evaluation

2.2.1 Moving down the value chain

Probably the biggest shift over the last thirty years is the move down the value chain towards application and implementation. It continues to gain momentum as foresight clients increasingly ask for more help on what to do. Godet (2012) neatly summed up the challenge: “Making scenarios is fine, but so what? Once a scenario is drafted, what do we do to take action, to make whatever we want to happen or not to happen? We should really be turning them into a project-based approach.”

The author’s work with the Houston Foresight program has addressed this trend. Historically, the program’s process included three steps of framing, scanning, and forecasting (now futuring). A second set of three steps -- visioning, planning (now designing), and acting (now adapting) -- was added to account for influencing the future and taking action (Hines and Bishop 2013). The “influencing” steps are designed to be flexible enough to accommodate a variety of ways to influence the future, whether it’s strategy, policy, innovation, or design. For example, a set of scenarios can be used as context to develop implications, options, and actions whether for strategy (strategic issues), policy (new initiatives or regulations), innovation (new product or business ideas), or design (new artifacts). This trend toward more emphasis on

influencing than there used to be is a point argued in the Foresight Outcomes Framework (Hines 2016).

It should be noted that there is not unanimous agreement that moving down the value chain is good or useful for futurists. Van der Laan (2019) in a listserv discussion represented the point of view that the proper focus on foresight is on broadcasting and communicating images of the future, not on actual decision-making.

2.2.2 *Re-imagining imagining*

It appears that the field is experiencing a mini-revival on the role of imagination in foresight. Perhaps years of admonishments to focus on the bottom line and application created some neglect or loss of focus on imagination, and it is thus coming back.

The KBFS 2020 included Brian David Johnson's (2020) "Guide to Science Fiction Prototyping" as one of its methodology pieces. He describes Sci Fi Prototyping as developing a short story, movie or comic based specifically on a science fact for the purpose of exploring the implications, effects, and ramifications of that science or technology.

Houston Foresight, which does topical electives for its graduate students each summer, offered "Science Fiction as Futures" taught by alum Tim Morgan in 2020. Several science fiction authors have navigated into professional futurist work. Bruce Sterling and David Brin come to mind from the past, and Karl Albrecht more recently (Hines 2019a). Futurist Tom Lombardo (2021) captured the interest and excitement for using science fiction in foresight with his three-volume magnum opus on the topic.

Closely related new methods and techniques emerging alongside science fiction is Speculative futures and Design Fiction. An international meetup based in Austin has emerged for Speculative Futures, which purports to include speculative and critical design, and design along with foresight.

Finally, the use of future personas seems to have generated renewed interest recently with Fergani's (2019) publication on the topic. Mantey (2021) talks about personas as a key piece of an emerging concept of human-centered foresight, which explores how various user groups (using personas) respond to potential contextual shifts of the future.

2.2.3 *Rethinking wildcards*

For many years John Petersen's (1997) excellent *Out of the Blue*, which described a wildcard as a low-probability, high impact event, was the standard in the field. In 2011, however, Oliver Markley's (2011) piece on "A new methodology for anticipating STEEP surprises" proposed a new typology by adding of a third criteria of credibility leading to four types:

1. Type I Wild Card: low probability, high impact, high credibility

2. Type II Wild Card: high probability, high impact, low credibility
3. Type III Wild Card: high probability, high impact, disputed credibility
4. Type IV Wild Card: high probability, high impact, high credibility.

The classic wildcard is still there – Type 1. Note that the credibility is high, that is, few dispute that the wildcard could happen, or that it would have high impact, but that it is low probability. The next three types are all high probability. It makes the point that a lot of what are being called wildcards are surprising to those not paying attention, but are not a surprise to those monitoring the topic. Indeed Elina Hiltunen's (2006) found that a large number of wildcards are actually gradual changes. Markley's credibility dimension suggests that subject matter experts or others tracking wildcards are aware, but the public is not. Covid-19 is a good illustration. Those following pandemics were well aware of the possibility, but the rest of the world was surprised by it and ill-prepared for it. The pandemic generated interest in wild cards that raised the question to futurists of how to recommend handling them. Should clients be prepared for all or most of them? None? The author proposed the idea that futurists have two responsibilities regarding wildcards: (Hines 2021a)

1. Identify domain-specific wildcards to be monitored.
2. Encourage clients to have a general "disaster response" contingency plan that applies to a wide range of potential disasters.

Domain-specific means that if you are a bank, you are watching for a global financial meltdown, or if you're the forest service, you are watching for wildfires. This assumes that client are doing some monitoring in the first place (Hines et al 2021).

2.2.4 Mainstreaming of critical and integral futures

It is reasonable to suggest that critical futures has been integrated into many futurists toolkits, owing chiefly to popularity of Inayatullah's (2004) Causal Layered Analysis (CLA). CLA has become so popular that it has become synonymous with critical futures.

The case for the mainstreaming is less clear with Integral Futures. None of the methods compilations shown here included Integral Futures as a method. Integral Futures has been championed by futurist Richard Slaughter (2001) in Australia and has always been strongest there, particularly among students of the Swinburne Master's program that he founded. Slaughter (2009) categorized of methods in order from most to least frequent application (number of applications in parentheses):

- systemic methods (167); includes systems analysis and scenario building
- linear methods (158); various kinds of trend analysis, forecasting and extrapolations
- critical methods (66); dealing with cultural construction and understanding
- integral methods (20); a "new" category that he nudged the field to develop further

The author and a colleague published a status update on integral a little over a decade ago that suggested it was moving from a new perspective, to a contested one, and finally seemed to be breaking into the methods and application space (Collins and Hines 2010). But since Slaughter has retired and the Swinburne program was closed and the IntegralFutures.com website shut down, it may have lost some momentum. That said, there are works coming out. Maree Conway (2020) has done a nice job in applying integral futures to her strategy practice, and Perry and Hines (2018) proposed a framework to applying integral for the analysis of future security issues.

2.2.5 More nuanced approach to time using Three Horizons

The futurist rethinking of McKinsey's Three Horizons has provided a useful conceptual framework and user-friendly vocabulary for thinking about and discussing time horizons: (Sharpe 2013, Curry and Hodgson 2020)

- **Horizon 1 (H1):** The current prevailing system as it continues into the future, which loses "fit" over time as its external environment changes.
- **Horizon 3 (H3):** Ideas or arguments about the future of the system which are, at best, marginal in the present. Over time these may have the potential to displace the world of Horizon 1, because they represent a more effective response to changes in the external environment. Although the diagram suggests there is only one such Horizon 3, in practice, especially in the early stages, multiple Horizon 3 arguments will be articulated. This is explored later in the paper.
- **Horizon 2 (H2):** An intermediate space in which the first and third horizons collide. This is a space of transition that is typically unstable. It is characterized by clashes of values, in that competing alternative paths to the future are proposed by actors.

The framework connects the present with desired (or espoused) futures as well as the transition pathways. It connects futures thinking to the current systems and structures and enables clients to see different pathways and different rates of change in the domain (Curry and Hodgson 2020). It is simple and easy to grasp at a high level – it is not uncommon in the author's experience to introduce the tool and have clients referring to it and applying it the same day. The range of applications is proving to be quite wide. The author, for example, has used it through his project work in various ways:

- The initial framing of the time horizon for project work. It helps to set the "type" of project. Are we exploring the shifts of H2, or trying to identify the new system of H3?
- It is also useful in scanning, where the collection of scan hits can be tagged with the time horizon they are indicating. A tagging system based on the domain map categories provides a mechanism to track the number of hits and see if any category is being over-emphasized or neglected (Hines et al 2018).
- The archetype technique the author uses situates scenarios in time horizons.
 - The baseline archetype suggests the current H1 system

- The collapse and new equilibrium archetypes suggest the H2 transitions
- The transformation archetype suggests H3 new systems possibilities
- It can be used to organize issues or recommendations. For instance, in one project to identify emerging issues, the resulting issues were organized on the three horizons (Hines and Dockai 2021):
 - H1: how are we [currently] doing?
 - H2: what should we do next?
 - H3: where do we want to go?
- In monitoring issues or scenarios, one project did a preliminary and promising investigation of whether scanning/monitoring sources could be identified according to which time horizon they seemed primarily aimed at (Hines et al 2021).

2.2.6 Greater integration of qualitative and quantitative

Daheim (2020) called attention to a growing integration of qualitative and quantitative. It is fair to say that no futures work is exclusively qualitative or quantitative and the question is really about the relative balance between the two. Most futurist work is primarily qualitative, but this future direction suggests that the quantitative aspect is becoming more integrated. She noted progress toward bridging the gap between numbers and narratives through several case examples. These examples were classified as first steps and she noted there is some controversy about this development. The author's review for this work agrees and suggests that there is some progress toward integration of qualitative and quantitative rather than a completed movement.

To put it in historical context, Ramos (2017, 825) organized the modes of foresight into five traditions: predictive, systemic, critical, participation, and action. The predictive mode in the early days of the field from post WW2 up to the 1970s was focused on forecasting and had a strong quantitative orientation. The systemic tradition that followed it, perhaps best exemplified by the early Shell scenario work led by Pierre Wack, shifted the field toward alternative futures and a much more qualitative orientation that has largely prevailed up to the present. Cuhls (2003) reinforced the idea that forecasting is more quantitative and foresight is more qualitative, but suggested the forecasters and futurists seemed to be moving towards integration greater use of both.

A current example of the integration is the IFS global model housed at the Frederick Pardee Center for International Futures (2022). It first appeared in 1980 and is still going strong today. It draws on a wide range variables and connections from 186 countries for analyzing long-term global change. The integrated dataset creates forecasts across 12 dynamically connected submodules, including agriculture, demographics, economics, education, energy, environment, government finance, governance, health, infrastructure, international politics, and technology. By integrating these systems, IFs can simulate how changes in one module may lead to changes across all modules. It integrates quantitative and qualitative by using the quantitative to reduce some of the uncertainty in policy formation in order to achieve the qualitative goal of strengthening the mental models of decision-makers.

Boysen (2020) chronicles how the explosion of Big Data and data analytics tools in recent years has brought new opportunities for more data-driven foresight. The increased data access and analytics capabilities comes not only speed and accuracy, but also better opportunities to study data directly, such as for discovering patterns that may be early signals of change and correct our misperception of patterns where they don't exist.

Daheim (2020) observed that players from IT-based industries are using increasing computing power, cloud-based technologies, and semantic analysis for making sense of the future. The author, and one assumes other futurists as well, continue to sample these tools. For instance, he was able to use IBM's Watson for scanning on a project. The software was terrific in analyzing and visualizing "clean" data from well-organized datasets, but was not particularly helpful in identifying weak signals, which almost by definition will be on the fringes of clean data. It is very clear these tools are getting better and will eventually become much more integral components of foresight work.

It is useful to bring a degree of caution to work emphasizing its quantitative aspects. It carries a perception of being more rigorous than qualitative work. The popular futurist Amy Webb, for instance, bills herself as a quantitative futurist. It's not clear what that means other than it being linked to her academic background in economics and game theory. One suspects her savvy marketing has found the term attractive to potential clients.

2.2.7 More participatory approaches

Daheim (2020) identified this direction as more open, interactive, and crowdsourced. Each on their own is perhaps relatively weak, thus they are brought together here under the umbrella of participatory approaches. For example, open foresight does not seem to have progressed much since its introduction. It was proposed by Miemis (2011) and has been promoted since by some futurists such as Jose Ramos with the Open Futures Library (Priday, Mansfield, Ramos 2014). It is still being cited as a new approach in 2020 (Wiener, Gattringer, Strehl, 2020). That qualifier aside, the interactive and crowdsourcing aspects do seem to have generated significant momentum.

To a degree, the emergence of participation relates to 2.2.1. Moving Down the Value Chain. As clients have become more involved in project work, they are asking more of the futurists in terms of implementation, which requires a greater degree of working together. In the author's experience, twenty to thirty years ago it was much more common to have a project commissioned by a client, the consulting team worked on it, and then briefed the results with very little interaction in between. This is rare today. Clients typically want more frequent updates, more workshops, and to participate more directly in the project work itself. Learn-by-doing projects are also increasingly common in which the client is trained in the method during the project work.

The growing use of I/T platforms and games are two developments that are both reflections and enablers of this desire for more participatory approaches. Raford (2015) analyzed five cases of the use of participatory platforms, including his own Futurescaper. He specifically explored their impact on scenario planning. He found a positive impact in the early-stage idea gathering, but found that there is still work to do in terms of gaining useful insights from it that apply to outcomes. A similar conclusion about there being great value in increasing the quality of inputs but challenges in incorporating into outputs was reached by a client with Sensemaker, a proprietary collection and analysis platform tool used by some futurists (Mager 2019).

It is reasonable to expect that early versions of such tools will run into challenges. It makes intuitive sense that the data gathering capabilities are ahead of the analysis ones, and there is no reason to believe the analysis cannot eventually be successfully addressed. The jury may still be out, but there are clearly benefits and the challenges seem resolvable.

Foresight games have been increasingly recognized for their contribution to foresight (Parkes and McQuay 2021). The range of games is increasing, from board games such as IMPACT (Romero 2021), card games such as The Thing from the Future (Candy, Watson 2017), in-person interactive games such as the Polak game (Hayward, Candy 2020), and online games such as Superstruct (Kirchner 2010).

Several of these games have been recognized by professional futurists as making significant contributions to the field. The Association of Professional Futurists' Most Significant Works Program (2022):

- One of the most popular online approaches is the IFTF's Foresight Engine, a MOOG that can accommodate thousands of participants at a time. Their SuperStruct game was won an award in 2009 and the Evoke! game won in 2012.
- The Thing from the Future (Candy, Watson 2017) imagination game that challenges players to collaboratively and competitively describe objects from a range of alternative futures won in 2015.
- In 2016, the Scenario Exploration System (SES), which is game used in a workshop setting illustrated how serious games can advance the methodology and practice of foresight in policy contexts related to real-world challenges (Bontoux, Bengtsson, Rosa Sweeney 2015).

The KBFS 2020 selected the "Polak Game" (Hayward, Candy 2020) for inclusion to represent the growing influence of games.

Foresight games provide a fun and interactive way for new participants to engage with foresight. It is still unclear as to what extent they will be usefully incorporated into project work. As note with the online platforms, there is no reason to believe that games cannot be improved and address the challenges of useful applications.

2.2.8 More experiential foresight

Daheim (2020) also noted this direction as embracing approaches that either work with newer formats of visualization and communication (e.g., videos) or that have not been traditionally used a lot in foresight (with its “report dominance”); e.g., those that employ design-fiction based approaches by for example creating or co-creating future artifacts, or that use gaming approaches. The APF MSFW program noted above includes a category that “illuminates the future through literary or artistic works” to include works such as games and experiential foresight.

The KBFS 2020 include a piece by Kornet and Candy (2020) that described the development of a family of experiential approaches with the goal of making futures visible, tangible, interactive, and otherwise explorable in a range of modes. The main objective of experiential foresight is to shift from static written reports as key deliverables to more dynamic interactive deliverables, such as videos, artefacts, simulations, from which clients get to experience what the futures might be like. It reflects the movement toward more participatory approaches noted above in 2.2.7.

Candy and Kornet (2020) note that experiential futures is all about making images of the future more legible and concrete and seeing what one can learn from doing so. It is a structure and set of prompts for use in devising projects to promote more diverse and deeper scenarios. They built on the early work of Textor (1980) who developed Ethnographic Futures Research (EFR) as a process for systematically mapping images of the future held by various individuals and communities.”

Experiential futures has evolved to intermingle with design-led futures-oriented activities which have come into prominence over the same period (since the mid-2000s), including speculative design and design fiction. While Candy and frequent collaborator Jake Dunagan -- together they won a 2017 APF MSFW award for Designing an Experiential Scenario (Candy, Dunagan 2017) - there are other futurists active in this space. A terrific example and a 2014 APF award winner, Trevor Haldenby, lead a team that created an “an 8-month narrative told in real-time through an integrated combination of interactive theatrical events and online content. It told the story of the beginning of the end of the world, from a viral pandemic created by ByoLogyc, a fictional Toronto-based biotech company.” They had 8 live events, involved 75 performers, 333 crowdfunders, 3,500 event participants, and 35,000 online engagements. The combination of live events, a fictional website (that looks quite “real”) and the use of social media, brought the future to life in a stunning fashion (APF 2022).

2.2.9 More focus on evaluation

A lack of evaluation of foresight work has been noted. Popper (2010) observed that “there has been relatively little systematic work aimed at evaluating foresight or understanding its effects in aggregate.”

Chermack (2007, 2020) has long been doing terrific work on evaluating the impact of scenarios. But he has been something of a lonely voice regarding the impacts of specific tools until more recent developments. There were other sporadic efforts, such as Curry and Schultz's (2009) fascinating comparison of using different scenario techniques with the same data and participants in order to compare results.

Amsteus took the approach of measuring the impact of foresight in individual managers. He first developed a model for measuring managerial foresight (Amsteus 2008) and then compared that to firm performance. He found a moderate and statistically significant positive relationship between managers' foresight and firm performance (Amsteus 2011).

Rohrbeck also looked at how the use of foresight influenced firm performance. He undertook a seven-year longitudinal study measuring the impact of "future preparedness" that enabled him to sort organizations into one of four segments: vigilant, neurotic, vulnerable, and in danger. He found that firms with a vigilant level of preparedness, based on advanced corporate foresight practices, had a 33% higher profitability and a 200% higher market capitalization growth when compared with the sample average (Rohrbeck, Kum 2018).

Grim (2020) developed a foresight maturity model to enable organizations to assess the level of their foresight performance. The logic of a maturity model approach is that it is difficult to evaluate future project work because the results are too far out in the future. Thus, the maturity model defines, assesses, and recognizes best practices. The model was developed in 2009 before the Foresight competency model, but the six disciplines or activities it measures align with it very closely: framing, scanning, forecasting, visioning, planning, and leadership. The model not only helps individual organizations assess their performance, but it also provides guidance to those purchasing professional services. In addition, it aids the foresight community in providing a system to define and regularly evaluate its practice in order to move forward as a respected profession.

A recent indication of interest in evaluation is that the APF formed a Task Force on Evaluation. The goal is to support increased member evaluation capacity through sharing of evaluation resources, strategies, designs, and methods, and provide suggestions for appropriate foresight outcomes and indicators to guide evaluation design.

Also, although not directly related to methodology, the World Futures Studies Federation (2022) just launched an effort to accredit foresight academic programs. This is first of its kind in the field, and can be viewed as a significant milestone in the maturity of the field.

3. Conclusion

As one probes more deeply into the development of foresight methodology, it becomes apparent that a book-length treatment is really required to do it justice. This survey surveyed the topic and, in many cases, made brief notes or referenced very significant work, and in other cases omit significant works, for which the author offers a humble apology.

Two conclusions stand out from this analysis.

1. Field consensus on methods is greater than believed

There have been complaints for years that futurists could not agree on methods and that the field was fragmenting. There was a feeling that the differences were greater than the similarities. Indeed, the APF's 2003 Futures of Futures Scenario salon noted a high degree of disagreement and fragmentation in the field (Hines 2003).

To provide context and get a sense of the evolution of foresight methods, several compilations of methods were compared. One clear trend is that the lists have been getting progressively longer, which supports the idea of growing number of methods and less consensus. However, a deeper analysis found there is "bloat" in the lists approaching three dozen, that is, there are fine lines in many cases in what is called a unique method, and what is really just a variation on existing approaches or methods.

It seems a reasonable conclusion to suggest that the core number of foresight methods in regular use is under a dozen. Keep in mind that a sharp distinction was made between method and technique --- technique is a way of carrying a method, e.g., there are more than two dozen techniques for employing the scenario method -- and indeed the number of techniques in use is much greater.

Perhaps the single strongest development towards consensus was the development of the Foresight Competency Model. The methods and techniques in the field can be mapped to the six competencies. In short, most futurists that methods ought to contain basic competencies, such as framing, scanning, and futuring, and mainly differ on the techniques for how to carry these steps out. Mastering the basic six core competencies is an excellent entry-way into the field. The Houston Foresight uses the six competencies as central in teaching the future and its core Framework Foresight method. Futurists don't need to learn 33 methods, but can start with the six core competencies, and expand their methodological tool kit from there. Indeed most practicing professional futurists rely on a small handful of methodologies that they continue develop and innovate with.

2. The methods tool kit is healthy and growing.

The author's recent work co-editing the *Knowledge Base of Futures Studies (KBFS) 2020* with a particular focus on the methodological developments of the last 15 years revealed a healthy development of 14 new or updated perspectives, methods, tools, and techniques. The field is innovating from its foundation of agreed up on competencies that comprise the basic methods of doing foresight work. One can analyze the new methods and techniques and see how they align with field's core competencies.

The justified claims about the lack of new methods a few decades ago no longer hold water. New methods and techniques are building upon a foundation of what constitutes good

foresight work, reinforced by the development of tools for measuring and evaluating good work. That said, there is plenty of room for more growth as client and public acceptance of foresight grows. Where else might new methods emerge. Looking at the historical compilation lists, there are some areas where foresight used to play but how doesn't or does so to a much lesser extent. One might argue that a lot of visioning work is increasingly done by non-futurists, despite some excellent developments such as the Aspirational Futures method of the former Institute for Alternative Futures. Futurist Joseph Coates worked in and published a book on Issues Management, but few futurists are in that space today. Change management is closely linked to foresight work, but futurists have a low profile there as well.

There is plenty of room for continued growth and development in foresight methods, and reasons to feel confident that futurists will continue to be up to the task.

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