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A note on the classification of future-related methods

Roberto Poli

Abstract

If futures studies aims to become someday an autonomous field of research and application, it must prove that it contributes knowledge, methods, and viewpoints different from those distinctive of other already established fields. A futurist's toolbox requires both collecting the methods that make futurists different from other academics and practitioners (without implying that futurists must limit themselves to those methods alone) and organizing those methods according to future-based criteria, that is, according to a futures literacy typology.

Keywords: Future-based method, Knowledge base of futures studies, Futures research methodology 3.0, APF methods anthology, Foresight, Anticipation, Bloch, Future generating method, Scenario, Delphi, Foresight diamond

Introduction

The classification of futures methods is one of the field's weakest points. Most available classifications score poorly on at least two different criteria. Firstly, many classifications do not distinguish specifically future-related methods from other methods usually exploited by sociologists, economists, and policy scientists and not specifically tailored to the future: to wit, brainstorming and Delphi are tools usefully exploitable by futurists as well as by many other scholars and practitioners. There is nothing in either brainstorming or Delphi that is specifically unique to the futurist, even when, as in the case of Delphi, it has been invented by futurists [14, 15]. If futures studies aims to become someday an autonomous field of research and application, it must prove that it contributes knowledge, methods, and viewpoints different from those distinctive of other already established fields. To establish a new field, the path usually traversed includes opening new journals, writing textbooks, appointing new chairs, and establishing new professional associations. Furthermore, the exhibition of specific methods distinct from those of other fields may definitely help. This paper is focused on this last aspect only.

The first criterion should therefore distinguish the futurist's toolbox from those used by other academics and practitioners. While many methods are exploited by different social sciences, there also are methods that are typical if not exclusive of one science and not the others. The issue, therefore, is finding methods that typically distinguish futures studies from say sociology, economics, policy science, or anthropology. Secondly, future-related methods may be distinguished according to the different ways in which they use the future. My suggestion is to consider this second criterion as part and parcel of whatever "futures literacy" may become [19, 20, 22]. A futurist's toolbox requires both collecting the methods that make futurists different from other academics and practitioners (without implying that futurists must limit themselves to those methods alone or that other scholars never use the futurist's methods) and organizing those methods according to future-based criteria, that is, according to a futures literacy typology. Let me state these two criteria explicitly:

- Criterion 1. Select specifically future-based methods
- Criterion 2. State principles for organizing previously selected methods according to the ways in which they address the future

Exemplifications from the literature

The following exemplifications are meant to provide some preliminary data, without implying that they cover all the classifications that over time have been presented. Their purpose is to pave the way towards a thorough-going analysis to be developed subsequently.

Correspondence: Roberto.poli@unitn.it
Department of Sociology and Social Research, University of Trento, Trento, Italy

Three primary sources of information on future methods are the five volume collection *Knowledge Base of Futures Studies* [32], the *Futures Research Methodology 3.0* [12], and the special issue of *Compass* entitled *The APF Methods Anthology* [5].

The *Knowledge Base* devotes Part 2 of Volume 2 to methods. Table 1 below lists the chapters included in it. The classification provided by Glenn in his introduction to the *Futures Research Methodology 3.0* lists a variety of methods used by different communities, classified according to the oppositions between quantitative and qualitative and between normative and exploratory (see Table 2) ([11], pp. 7–8). Finally, the chapters composing the *APF Methods Anthology* are listed in Table 3.

While the opposition between quantitative and qualitative is well-known, the difference between "normative" and "exploratory" requires an explanation. Glenn presents their difference as follows "Normative work is based on norms or values. Hence, normative forecasting addresses the question: what future do we want? What do we want to become? Exploratory forecasting explores what is possible regardless of what is desirable" ([11], p. 7). After which he adds: "This general division of futures work into normative and exploratory can be misleading when applied to methodology. Many techniques can be used for both normative and exploratory forecasting. Some tend to be used more for one than the other. Futurists' 'tools' are often quite flexible and adaptable to specific purposes".

While some topics occur in all three collections (notably, wild cards), there are also remarkable differences among them. However, what I take to be the most serious issue is that the three mentioned collections are all "mixed bags" including both future-based methods and methods of other kinds, as well as chapters on different issues, such as the remarkably relevant one of how to evaluate the maturity—that is, correctness—of a future exercise (i.e., the Foresight Maturity Model). As important as it is, FMM is not one of the methods with

Table 1 Chapters from *Knowledge Base of Futures Studies*

1. A Generic Foresight Process Framework, J. Voros
2. Planning and Implementing Futures Studies, M. Garrett
3. The Prospective Approach: Contingent and Necessary Evolution, F. Roubelat
4. Causal Layered Analysis: Post-structuralism as Method, S. Inayatullah
5. From Future Workshops to Envisioning Alternate Futures, J. Dator
6. The Visioning Method, C. Bezold
7. The Spiritual Foundations of Envisioning the Future, W. Ziegler
8. Wild Cards: Thinking About Big Future Surprises, J. L Petersen
9. Ten Questions Every Organisational Futurist Should Be Able to Answer, A. Hines
10. Becoming a Foresight Practitioner, E. Robinson
11. Defining Futures Fluency, W. Schultz

which to conduct a future exercise. In short, all three of the collections fail to respect criteria 1 and 2 above.

The classification proposed by Deutsche Bank Research organizes methods along two dimensions: the opposition between qualitative and quantitative analyses, and the opposition between directed prognoses and alternative futures (Fig. 1). The qualitative-quantitative opposition may perhaps be understood as an approximation to the difference between forecast and foresight, as distinguished for instance by [24]. The opposition between directed prognoses and alternative futures is closer to criterion 1 above. A glance at the methods listed in Fig. 1, however, shows how poor the Deutsche Bank classification is. Of the eight methods listed, only two have an explicit connection with futures studies proper, namely "Trend Projection" and "Scenario Analysis".

While the Deutsche Bank classification is interesting for its poverty, it is one among a number of similarly conceived classifications (for another case, see, e.g., Reger [28]).

A richer framework has been proposed by Heinzelbecker [16]. His classification is based on two levels: the first level clusters methods into "Foresight Tools", "Early Warning Tools" and "Trend Research"; the second level, called "Future Management", distinguishes among "Risk Management", "Strategic Planning" and "Innovation Management" (Table 4). Let us focus on the methods clustered by Heinzelbecker's first three groups. Interestingly, each group is left open, suggesting that in principle new methods may always be added. Furthermore, the distinction between "Foresight Tools" and other groups of methods comes close to our criterion 1 above. Closer inspection, however, proves disappointing. On the one hand, the "Foresight Tools" group is a mixed bag including different kinds of tools: ones that distinguish futurists from non-futurists such as scenario analysis, and general-purpose ones such as War Gaming and Delphi Survey. On the other hand, the same confusion characterizes the other two clusters. The "Early Warning Systems" includes future-specific methods such as Environmental Scanning and Trend Extrapolation, as well as general-purpose tools such as Competitor Monitoring and Customer Satisfaction Surveys. "Trend Research" is more homogeneous in the sense that it includes various kinds of trend analysis. However, it does not distinguish clearly between a generic "Mega Trends" entry and a variety of domain-related trends (Technology Trends, Environmental Trends, Economic Trends, etc.). The rationale for distinguishing between "Trend Extrapolation" (placed under "Early Warning Systems") and all the remaining forms of trend analysis (placed under "Trend Research") is unclear at best. Moreover, within Trend Research, the distinction between the single entry "Mega Trends" and all the other sector- or market-specific entries is shallow.

Table 2 Taxonomy from [11], *Futures Research Methodology 3.0*

Method	Quantitat.	Qualitat.	Normat.	Explorat.
Agent Modeling		X		X
Causal Layered Analysis		X		X
Chaos and Non-Linear Systems	X			X
Cross-Impact Analysis	X			X
Decision Modeling	X			X
Delphi Techniques		X	X	X
Econometrics and Statistical Modeling	X			X
Environmental Scanning		X		X
Field Anomaly Relaxation		X		X
Futures Polygon	X	X	X	X
Futures Wheel		X	X	X
Genius Forecasting, Vision, and Intuition		X	X	X
Interactive Scenarios		X	X	X
Morphological Analysis		X	X	
Multiple Perspective		X	X	X
Participatory Methods		X	X	
Prediction Markets	X		X	
Relevance Trees		X	X	
Robust Decisionmaking	X			X
Scenarios	X	X	X	X
Science and Technology Roadmapping	X	X	X	X
Simulation-Gaming		X		X
State of the Future Index	X	X	X	X
Structural Analysis	X	X		X
Substitution Analysis				
Systems Modeling	X			X
Technological Sequence Analysis		X	X	
Text Mining		X	X	X
Trend Impact Analysis	X			X
Visioning		X	X	
Wild Cards	X	X		X

Table 3 Chapters from *The APF Methods Anthology*

1. More about a new typology of wildcards, O. Markley
2. Working with Verge, R. Lum
3. Three Horizons and working with change, B. Sharpe
4. A 'World Game' for complex foresight, A. Hodgson
5. The Foresight Maturity Model, T. Grim (interview)
6. The thing from the future, S. Candy
7. Manoa: The future is not binary, W. Schultz
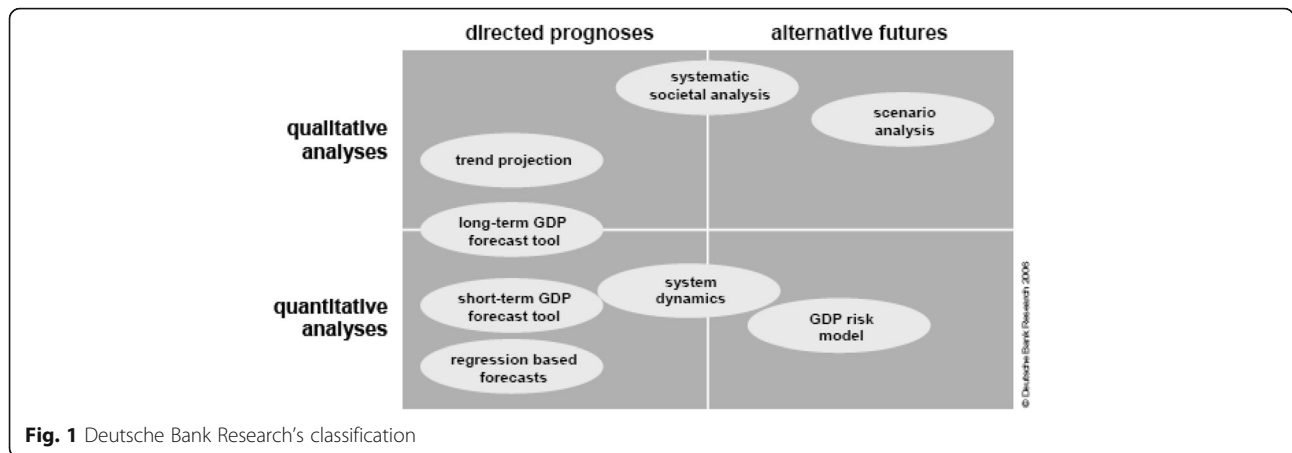8. The colors of the system, D. Hendricks (interview)

In a paper presented to the Futures of Food conference, Vinnari and Tapio [33] distinguish among:

1. Methods for data collection (Expert Methods, Delphi, Questionnaires)
2. Analysis methods (SWOT, Trend Analysis and Cross Impact Analysis)
3. Tools for data organization (STEEPV and Futures Tables)
4. Tools for representing results (Scenarios, Backcasting and Futures Images)
5. Concepts for interpreting futures information (Weak Signals, Megatrends and Wild Cards).

Fig. 1 Deutsche Bank Research's classification

Interestingly, they distinguish between methods (the first four entries) and concepts (fifth entry). While their understanding of the difference between methods and concepts is far from being crystal-clear, as shown by the fact that other classifications see their concepts as methods, the difference itself may prove relevant (see f.i. [31]; however, I shall not pursue this issue further here).

Vinnari and Tapio then propose a simple multi-criteria analysis of their collection of methods (Table 5). As with the other cases seen above, also Vinnari and Tapio do not distinguish the methods that are unique to futures studies from those that are used by other fields of research and activity and therefore fail according to criterion 1 above.

Finally, in 2008, Popper presented the foresight diamond [26, 27], which displays a remarkable variety of methods arranged according to two oppositions: the opposition between creativity and evidence, and the opposition between expertise and interaction. The latter opposition refers to the difference between back-office individual work and group facilitation and intelligence. Inspection of the diamond shows that also this case fails the two criteria presented above (Fig. 2).

Without claiming to have presented an extensive set of exemplifications, even less a complete set of proposals, all the classifications that we have seen fail criterion 1 above.

Table 4 The classification proposed by [16]

Foresight Tools	Early Warning Systems	Trend Research
• Technological Forecasting • Road Mapping • Scenario Analysis • Future Simulation • War Gaming • Delphi Survey • …	• Environmental Scanning • Trend Extrapolation • Competitor Monitoring • Customer Satisfaction Surveys • …	• Mega Trends • Technology Trends • Environmental Trends • Economic Trends • Industry Trends • Market Trends • …

Selection and organizational criteria

To keep the next step of the discussion as simple as possible, of the three levels of futures studies distinguished by [24]—forecast, foresight, and anticipation—here I shall consider only the second level, foresight. This is not a major restriction, because most futurists acknowledge foresight as the main core of their activities. On the other hand, the focus on foresight allows me to postpone analysis of secondary issues that may interfere with the gist of the proposal. Criterion 1 above will then be understood as referring to those foresight methods that

Table 5 Vinnari and Tapio's classification

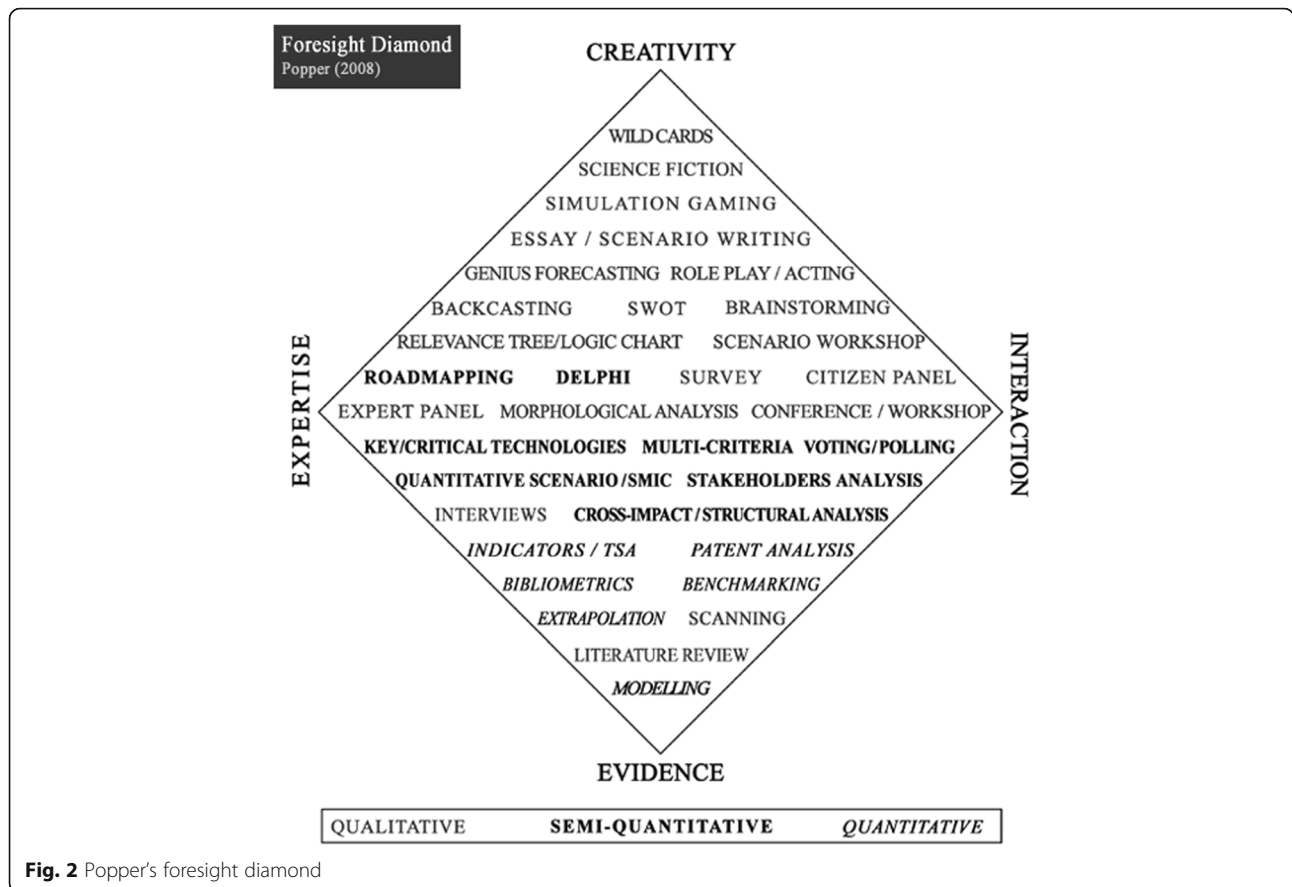|	Methods for data collection	Data analysis methods	Tools for data organization	Tools for representing results
Delphi	***	**		**
Futures workshop	***		**	*
Surveys	***			
Trend analysis	*	***	*	**
SWOT	*	***	**	*
Cross impact analysis		***		*
STEEPV		*	***	
Futures table/FAR			***	*
Top ten-lists		*	***	*
Scenarios		*		***
Backcasting		**		***
Relevance trees		**		***
Futures images				***

Fig. 2 Popper's foresight diamond

define the activities of a futurist. The following are some relevant exemplifications (in alphabetic order):

- Causal Layered Analysis
- Environmental scanning
- Futures wheel
- Morphological analysis
- Scenarios (the French method)
- Scenarios (the Manoa-Houston method)
- Scenarios (the Shell method)
- Strategic interviews
- Three Horizons
- Visioning
- Weak signals
- Wild cards

All of them are part and parcel of the futurist's toolbox and none of them is considered a "normal", "usual", or otherwise taken-for-granted method by any other field or discipline of which I am aware. In this sense, the list respects criterion 1.

Some observations are in order. A "somewhat restricted form of morphological analysis" is known as FAR-Field Anomaly Relaxation ([29], p. 11). A special issue of *Technological Forecasting & Social Change* has just been published on recent developments of morphological analysis [30].

The distinction of scenarios into three main types depends on their underlying assumptions. The French variant developed by Godet maps each variable against any other variable and in this sense it comes close to the morphological analysis and Cross Impact Analysis [13]. The Manoa-Houston variant propounded by Dator and Bishop develops scenarios according to the baseline and its alternatives framework: for a nuanced analysis of their position see [2, 6]. Finally, the Shell variant develops scenarios according to the main axes (usually two) of uncertainty. For an operative description, see [35].

Visioning methods or labs include a number of variants that further refinement of the present proposal may have to expand explicitly. For some references, see [1, 18, 21].

The second abovementioned criterion requires principles for organizing the methods selected. It is well known that items can be organized in many different ways. The question should then be raised as to which principles are most appropriate from the point of view of the field itself of futures studies. My claim is that only principles explicitly based on *ways of using the future* are appropriate, i.e., intrinsic to the features

and needs of futures studies. Any other principle is "external" to the field.

I shall use the following three rules to organize the foresight methods selected:

1. Methods looking at the future through a focus on the present
2. Methods looking at the future through a focus on the past
3. Methods focused on the links between the past and present on the one hand, and the future on the other hand. I distinguish two subtypes: those linking the past and present to the future (alpha type) and those linking the future to the present, eventually the past (beta type)

Table 6 shows the outcome from application of the three above-listed rules.

Inspection of the table shows that no method corresponds to type 2 focus on the past. This is as it should be. Indeed, no foresight method able to intercept the future by focusing on the past has been developed so far. Reference to Galtung and Inayatullah's macro-history [9] will be off target, because macro-history is not a method for conducting a future exercise; eventually, macro-history is a framework for understanding the patterns of history.

There follows a suggestion about the structural dimensions that might be exploited to develop this missing slot. Historical periods have had very different relationships with (their past and) their future. While for the Middle Ages Greek culture was silent, aphonic, for the Renaissance Greek culture was alive, full of suggestions [4]. For every real situation, the past is not just "past". There are pasts that are alive and active, and there are pasts that are dead and silent. This is especially visible with works of arts. "Classic" works are those that continue to remain meaningful generation after generation. The example of the relationship between Renaissance and Greek culture shows that the past becomes alive if we know how to question it by asking the right questions. A subtler issue, however, is at stake here. Apart from our capacity to raise the right questions, the underlining issue is whether the future embedded in

those pasts is still pushing towards new, open developments and in this case the past is open and new aspects may unfold after it. When instead the future embedded in the past has lost its forward capacity, when it is exhausted, then past becomes closed and silent. Our epistemological capacity to raise the right questions implies the ontological aliveness and openness of the inquired past. A deep clarification is therefore needed before trying to develop a future-based method able to question the past. For some preliminary analysis of the implied difficulties, see Poli [23, 25].

What next?

This paper is little more than a preliminary draft that needs to be developed in different directions. Three issues at least deserve further work. First, the paper considers foresight methods only. Extending the proposed classification to forecasting will raise the problem of the interaction between risk and uncertainty [7, 8] and, more generally, the problem of whether statistical methods either define or complement the professional identity of the futurist. My position is that statistical methods primarily complement the professional identity of the futurist. The decision about megatrends requires sufficiently robust criteria for distinguishing trends from megatrends. Finally, the connection with anticipation presents its difficulties as well, essentially when dealing with the tangled issue of future generating methods [10]. Second, the interaction between futures methods and the methods of other fields, such as those of critical and integral studies, has generated more nuanced versions of futures methods. Analysis of the methods that primarily define the work of a futurist does not deny interaction and mutual development. The old saying "distinguish to unite" remains valid. Third, the paper has not addressed the issue of combining methods; therefore, I have not discussed neither Voros' generic framework [34] nor Inayatullah's six pillars [17] or the six steps models of Bishop and Hines [3]. All this issues require further analysis that I must postpone to subsequent papers.

Conclusions

If futures studies aims to become someday an autonomous field of research and application, it must prove that it contributes knowledge, methods, and viewpoints different from those distinctive of other already established fields. A futurist's toolbox requires both collecting the methods that make futurists different from other academics and practitioners (without implying that futurists must limit themselves to those methods alone) and organizing those methods according to future-based criteria, that is, according to a futures literacy typology. The paper has discussed some of the available classifications and shown that they do not distinguish specifically

Table 6 Classification of foresight methods

Type	Method
1. Focus on the present	Environmental scanning; strategic interviews; Causal Layered Analysis; weak signals; wild cards
2. Focus on the past	
3_Alpha (from the past/present to the future)	Scenarios (Manoa-Houston and Shell); scenarios (the French variant); futures wheel; morphological analysis; visioning; Three Horizons
3_Beta (from the future to the present/past)	Backcasting

future-related methods from other methods usually exploited by sociologists, economists, and policy scientists. Besides selecting specifically future-based methods, the paper suggests that the selected methods should be further organized according to the ways in which they address the future.

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