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# The Discipline of Anticipation: Exploring Key Issues

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## 1. Introduction

Over the past few decades questions have periodically surfaced regarding the nature and basic features of Futures Studies (FS). Fruitful initial answers have been provided by what have now become classics of the field, such as the pioneering *Art of Conjecture* by De Jouvenel (1967) or the extensive *Foundations of Future Studies* by Bell (2003).[4] More recently a series of workshops, codenamed the Futures Meeting (FuMee) – originally devised by Ted Fuller, Riel Miller, Roberto Poli, and Pierre Rossel – served to facilitate research on "futures" issues, focusing not on methods but on founding principles, cross-cutting foundations and key concepts that define the evolving field of futures studies.[5] A recent issue of *On the Horizon* (2013:1) on *The Theoretical Basis of Futures Studies*, edited by Roberto Poli, adds further elements to the discussion. A few months ago, the Association of Professional Futurists (APF) asked some of its distinguished members (Peter Bishop, Jennifer Jarratt, and Riel Miller) to present their visions of FS; their papers are presently under preparation and will soon be made available. The present document arises from the UNESCO project, supported by the Rockefeller Foundation, named "Networking to Improve Global/local Anticipatory Capacities".

This document starts from the underlying acknowledgment that FS as a whole is such an extremely rich and varied a field that any effort to straightjacket the field into the boundaries of a discipline will impoverish its richness. For this reason, we will work from within a delimited section of FS, which we call the Discipline of Anticipation (DoA).

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[4] For a slightly less compressed reconstruction, see the first sections of Poli (2011).
[5] FuMee emerged from two sources: the theory of anticipatory systems developed by Robert Rosen and brought to FS by Roberto Poli and some of the work carried out within the European program COST A22 (2004-2007: "Advancing Foresight Methodologies: Exploring new ways to explore the future" (see http://www.costa22.dk/). Four FuMee meetings have been held until now (Rovereto, Lincoln, Paris and Copenhagen); the 5th one will take place in Lausanne (EPFL), Sept. 9-10, 2013. So far, only few selected papers from the first FuMee have been published (see the special issue of *Foresight* 2010:3 on "Anticipatory Systems and the Philosophical Foundations of Futures Studies", edited by Riel Miller and Roberto Poli).

# 2. The Discipline of Anticipation

We discuss the DoA firstly by focusing our attention on the "Anticipation" component, then moving to the "Discipline" component.

## 2.1 The Discipline of Anticipation

All efforts to "know the future" in the sense of thinking about and using the future are forms of anticipation. Equally the future is incorporated into all phenomena, conscious or unconscious, physical or ideational, as anticipation.

The DoA covers all "ways of knowing" the later-than-now as anticipation, from those forms of anticipation that are observed, for instance, in a tree that loses its leaves in the Autumn to human planning that attempts to colonize the future and efforts to make sense of emergent novelty in the present by finding inspiration in systemically discontinuous imaginary futures. Looked at as a "way-of-knowing" the DoA addresses the codification of the myriad of systems of anticipation, both conscious and non-conscious. The DoA develops, sorts, and diffuses descriptions of the processes/systems of anticipation or how the later-than-now enters into reality.

One important rationale for investing in the DoA is that it may improve the conscious use of the future in the present. This rationale takes as its starting point the contention that perfect anticipation of change is both practically and theoretically not achievable in our universe.[6] On the practical side the trouble is the unavoidable incompleteness of both the data and models used to attempt to predict the future. On the theoretical side the impediment to predicting tomorrow is that our universe is "creative" in the sense that novelty happens – provided that suitable enabling pre-conditions are given. If we accept this latter reason as part of the explanation for the change that characterizes our universe then humanity's conscious relationship to reality faces an additional challenge – how to take novelty into account in our perceptions of the present. This is where the DoA has a particularly important contribution to make.

Specifically, the DoA provides ideas and tools that can alter and expand the role of anticipation in shaping what humans perceive, including our capacity to make sense of novelty. This is because the theory and practice of the DoA develops and extends the categories and methods of anticipation that can be used to improve discovery and sense making. By enlarging and enhancing the analytical and operational approaches to incorporating the later-than-now into our thinking the DoA can improve anticipatory capacities in a wide range of circumstances. Initially the DoA helps anticipatory thinking to move beyond the approaches that most humans acquire without effort or reflection, such as our "natural" aptitude for understanding both the future trajectory of objects in motion, helping us to avoid being hit by cars, and direct cause and effect, helping us to avoid putting our hand on a hot stove.

Subsequently, as the reach and refinement of the discipline benefits from more reflection and purposeful

[6] Raising awareness of the limitations of the forecasting approach does not mean that we negate the reality of common practices and the myriads of situations where an immediate or less immediate future is anticipated using probabilistic approaches with "reasonable success". The fact that excessive dependence on these methods not only generates the costs of false-negatives and false-positives but also blinds us to the fruit of non-probabilistic or complex ways of thinking does not erase the utility of this currently dominant approach.

experimentation it may help to create the condition for other novel changes. In this respect the DoA is like other "disciplines", it is an effort to put a fuller classification of the various types of anticipation and a more systematic inventory of the ways in which anticipation is understood by different sciences and disciplines (biology, anthropology, sociology, cognitive science, etc.) at the service of human knowledge. Like all such efforts to gain a better understanding of a subject there is no assurance that the knowledge so acquired will of necessity serve good or ill, nor generate only the intended consequences.

While anticipation has been widely studied within a number of different disciplines – including biology, anthropology, cognitive and social sciences – to date nobody has collected and systematically compared the results. A preliminary survey by Poli "The Many Aspects of Anticipation" (2010a) and a bibliography by Nadin (2010) signal the scale of the task. Two figures stand as central contributors to the discipline of anticipation: the mathematical biologist Robert Rosen (1985, 2000) and the anthropologist John W. Bennett (1996). The former established the theory of anticipatory systems; the latter the connection between anticipation and resilience. The issue of anticipation is presently a hot topic. The following are a few selected recent references to anticipation (for a more extensive list, cf. Poli 2010):

- Anticipation in biological, psychological and social systems – aka the theory of anticipatory systems (Louie 2009, Louie and Poli 2010, Poli 2009, 2010, 2011).
- Anticipation and Resilience (Almedom et al. 2007, Almedom et al. 2009, Martin-Breen and Anderies 2011, Zolli and Healy 2012).
- Anticipation and Futures Literacy (Miller 2006, 2007, 2011, 2012).
- Anticipatory Governance (Fuerth 2009, 2011, Fuerth and Faber 2012, Karinen and Guston 2010).

Not surprisingly, from the point of view of FS and the DoA, the primary focus of attention falls on explicit anticipation as a combination of capacities that allow human beings to consider and evaluate future options. In this sense, explicit anticipation (individual and collective) can be considered as a key element or contributor to the human activity of decision-making.

Anticipation is a means to imagine actions that can only be tested once the future reality happens. Such simulations provide one way of thinking about the consequences of decisions, including errors that could turn out to be irrevocable. As Fuerth and Faber (2012) aptly note, "*reality has no 'do over' function*", and therefore, "the ability to experiment in a virtual setting safely, without suffering real-world consequences of trial-and-error, is an invaluable tool". Clearly it calls attention to the potentially unforgiving nature of reality and the costs arising from what may turn out to be wrong decisions. But excessive fear of error, the desire to always be so well prepared, so perfectly planned, that the target is never under- or over-shot, can crowd out one of the other strands of anticipation, learning from failed or mistaken experiments by reconsidering the anticipatory assumptions that help us make sense and evaluate the present. This strand of anticipation can be obscured when we lose sight of the fact that conscious efforts to prepare for the future or shape it are but part of a larger mix of elements that make up difference and repetition in the emergent present, including novelty that cannot be known in advance.

The importance of the DoA may well be that it enables a more explicit and considered approach to these two strands of anticipation. Bringing additional perspective and systematic knowledge, not only to efforts at preparing for external events that are assumed to be predictable and to planning that aims to achieve specific goals in the future, but also to the less familiar challenge of grasping the meaning of what may look like a failed experiment yet turns out to be an emergent success when judged against a new

framework. One may be thought of as conscious anticipation that addresses closed systems and the other anticipation that addresses open systems. Obviously both are important as part of humanity's effort to make choices in the present, but the anticipatory systems that make up the former strand are much more familiar than the latter.

In conclusion to this sub-section it is worth noting that much of our understanding of anticipation remains cursory and fragmentary. Yet even if this leads us to refrain at this point from making strong or general claims regarding the nature and role of DoA it seems fair to note that anticipation does play a basic role in many different fields from biology, sociology, and economics to medicine and architecture, and politics. Thus developing our understanding of anticipation and the DoA would seem to be of general relevance to humanity's endeavor to better grasp our reality.

## 2.2 The Discipline of Anticipation

Human efforts to appreciate the nature and functioning of anticipation in the world around us are undertaken on the basis of specific concepts and practices (tacit or explicit). This is the field of knowledge that explores, invents, accumulates, and transmits the frameworks and information that make up our understanding and experience of anticipation. The DoA as a field of knowledge is made up of the many different "ways of knowing" anticipation. The term DoA can be applied to both the practice of a skill (an apprentice learns a discipline from a master) and the parameters that define (delimit) a body of knowledge that is "studied" (a student acquires the knowledge of a discipline).

As a field of knowledge the DoA can be sustained and improved through scientific effort. Like similar fields of practice and theory of knowledge, such as economics or sociology but also more applied crafts, the field of knowledge provides specific ways of knowing – describing – understanding such activities. Anticipation is pervasive, but there are specific anticipatory processes that can be identified, used, and made the subject of hypothesis testing through experimentation and analytical efforts. A better understanding of different forms of anticipation is helpful for engaging in economic and sociological analysis, just as theories and practices that help to understand economic and sociological phenomena can clarify aspects of anticipation.

The DoA, like other fields of knowledge, has sub-fields and there is a history and weighting of different sub-fields. Furthermore certain sub-fields are more preponderant in other fields of knowledge, such as forecasting in economics or climate science. Also, like with the emergence of other fields of knowledge, historical context matters. In the case of DoA a series of factors have served to push[7] and pull,[8] enable and demand, the development of a more sophisticated body of knowledge.

Apart from content side (to which we shall soon return), a complementary way to characterize the DoA is to take into consideration the accountability criteria that its practitioners should follow. The simplest way to summarize this aspect is to take FS as the covering term, the most general umbrella including all the

[7] For instance complexity theories offered new tools for thinking about the future.
[8] Efforts to elaborate strategies in the face of changes in the conditions of change have also provided practical experiences – a demand side pull for the elaboration of the DoA.

ways to study, think and use the future – ranging from visionary and utopian futures and pop futurism to participatory, critical or integral futurism and the extrapolatory projections of simulations, formal modeling and forecasting. FS is inclusive. Every aspect, type, and way of including the future within one's analysis, theories or actions is a legitimate component of FS.

Some components of FS are more subject than others to constraints, however. In particular, futures exercises conducted by professionals and futures teaching require forms of accountability that may be inappropriate for the field of FS as a whole – such as responsibility toward clients and students, and basic research. We shall adopt the expression "DoA" for this subfield of FS.

Two further demarcations help distinguishing different versions of the DoA (or differently nuanced DoAs). Firstly, professionals and academics have partly different needs and respond to different accountability criteria. Secondly, two preponderant foci can be distinguished when looking across current theory and practice within the DoA. Using familiar labels from the foresight community, futures generated by closed anticipatory assumptions are part of the "forecasting" strand, futures invented by combining open and closed anticipatory assumptions are part of the "foresight" strand.[9] Much forecasting practice rests on the well-established modeling approach that tests predictive hypotheses using past data. If the model and data are deemed to accurately describe the past behavior of the variable(s) being predicted the model is considered more or less robust for extrapolatory purposes. Economic and climate change forecasts work along these lines. Sophisticated forecasters, working within the carefully developed and tested closed models used for extrapolation of variance can integrate advanced systems theory – together with the implied issues of multi-stability, discontinuity, phase transitions, etc. However these simulations remain bounded by the strict requirements of using models to project the past into the future.

Foresight as a practice, when distinguished from forecasting, is formally premised on the unknowability of the future and hence attempts to be more systematic in imagining futures that are not constrained by projecting the past. This does not mean that foresight practitioners do not use extrapolation and models to imagine the future, nor that they do not often arrive, by paths that usually differ from those of the forecaster, at making probabilistic statements. But in general foresight claims both a more creative and participatory mission, aimed at discovering new options and exploiting different forms of knowledge. As a result, foresight as a practice has experimented, somewhat haphazardly as is wont at the outset of new frameworks, with the challenge of making sense of whatever anticipation of the future we may develop.

Given the divergent priorities of these two groups of practitioners it is not surprising that there is often little cross-fertilization or joint efforts. Overcoming this divide could be quite productive since there are numerous issues, such as Futures Literacy and complexity (see below), that are of relevance to both groups.

Summarizing, a discipline offers at least three advantages:

[9] While these terms do not fully capture all the nuances of FS as practice, in particular the nature and range of open futures, the current discourse falls roughly into these two camps. This is not the place to review taxonomic efforts (van Notten, Slaughter, etc.), however part of the research to be conducted by this Scoping project involves developing a more comprehensive inventory of existing futures practices.

- Depth**:** by distinguishing its focus, a discipline can develop an expertise (specialization), deepening its theory and practice;
- Identity**:** through such specialization, both the practitioner and the layperson can identify the discipline as concerned with a specific subject-matter and why it is trustworthy;
- Legitimacy**:** depth and identity help to foster responsibility and legitimacy (which include reputational assets and attention to excellence) (Miller 2012, 39-40).

Deciding whether the DoA, as we see it, is a discipline and what makes us think so and with what degree of legitimacy, is a challenging task. As an initial contribution the following addresses three questions:

1. What is a discipline, what do we mean by that?
2. Is what we call the DoA a discipline? What would qualify it for that claim?
3. What would be the key components of the DoA as a discipline?

## 3. The Idea of a Discipline and the Issue of Disciplinarity

Etymologically, "discipline" is related to the "code of conduct" of a "*discipulus*", a person subjected to an explicit training. With the coming of age of modern science the term "discipline" started to encompass the idea of a sub-field of knowledge, bearing its own focus, knowledge models, procedures and set of issues to work upon.[10] The DoA is a discipline precisely because it has its own territory of knowledge (the future or, better, the future-as-linked-to-the-present). The disciplinarity of the DoA includes both the clarification of the relevant models, procedures and issues (which to some extent may overlap with those of FS and eventually with those of other disciplines too) and the criteria of accountability mentioned in Section 1 above.

If we push this proposition further, we must specify the knowledge territory addressed by a discipline and the ways to address this knowledge territory. The following are some general features presented by most if not all the disciplines we are aware of:

- A focus (or a variety of foci) characterizing the discipline. Clarifying the foci of interest is more relevant than establishing clear-cut boundaries, because the latter can overlap with an endless number of other disciplines.
- Key theories, explanatory of some real world references or issues.
- Public traces, in the form of documents that can be analyzed and discussed, and eventually revisited and reused years afterwards. In this sense, building a discipline is a historical process that may or may not be cumulative – building up assets. Furthermore, the process itself of generating traces is valuable and permits to focus on and distinguish different learning dynamics.
- Peer-evaluation of some kind regarding the works of participants by other participants, occasionally participants from other disciplines. The habit of referencing the work of others upon which, or in contrast to which, one attempts to build new knowledge is considered a fair code of conduct. Two sets of criteria apply: (1) standard practices for complying with scientific debating and evaluation patterns; and (2) practices specific to the discipline, to be identified and discussed within the DoA arena, and related to the particular issues and challenges of the DoA.

[10] See the Bellagio Working Paper 2 on Communities of Practice for further discussion.

- Assessment. This is perhaps the most demanding aspect. Strictly speaking there are no data about the future and therefore evaluations of future exercises cannot be based on the realization or not of pre-defined outcomes. There is the further difficulty that even if statements about the future arrived at by practicing the DoA can be eventually tested against what really happens there is nothing that can be used for real-time evaluation. Worse, even if evaluation can wait, in the end it turns out to be very difficult to tell if the statements about the future, true or false, reflect chance (luck or not) or the method deployed for making a prediction. Nevertheless the DoA may offer a number of solutions to this problem, not least because it brings non-predictive purpose to thinking about the future. Equally the viability of input based assessment, checking to see if the ingredients and processes respected state-of-the-art knowledge, can offer a "quality control" approach to assessment, including critical reflections on the assumptions of the discipline.

# 4. Key Theoretical Components of the DoA

As every other discipline, the DoA exploits a remarkable variety of methods. This document, however, intentionally leaves aside the discussion on methods in order to remain focused on basic issues. As far as the theories composing the DoA are concerned, the discussion is at such an early phase of development that very little can be said. For this reason we shortly present only two issues, namely Futures Literacy (FL) and complexity.

## 4.1 Futures Literacy

Skipping over the history of anticipatory thinking, the current situation is one where the capacity to understand anticipation is becoming both more operationally doable and desirable. The emergence of this capacity, in a way that may be compared to the push and pull of the emergence of the universal capability to read and write during the industrial revolution, can be called Futures Literacy (FL) (Miller 2006, 2007, 2011, 2012). As with reading and writing, FL entails the capacity to decipher and categorize as well as produce (design, conduct and interpret) explicit (volitional and intentional) processes of anticipatory knowledge creation, as a necessary and ordinary skill. FL, like language literacy, involves the acquisition of the know-what, know-how, know-when and know-why (to which we could also add problems of know-who and -when), required to "use the future" appropriately – i.e., fit for purpose. FL is knowledge of how to use the future, it is a familiarity with anticipatory processes.

The main strength of the FL proposal is the distinction among different ways of using the future. As said, anticipation (either explicit or implicit) is a way of generating the of necessity imaginary futures on the basis of probabilistic or non-probabilistic thinking in order to understand and act in the present. Concerning explicit anticipation, three main uses can be distinguished: optimization, contingency, and novelty. Optimization futures can be used to "colonize" the future on the basis of closed anticipatory assumptions that inform extrapolation; contingent futures can be used to prepare for anticipated surprises, but as preparation cannot, by definition, take into account unknowable novelty; novel futures can be used to make sense of differences that are not just unpredictable or random but fundamentally unknowable in advance (Miller 2012, 41).

The point of distinguishing these three categories is to assist with the challenge of linking specific tasks to specific methods or approaches for both thinking about and shaping the future.[11] Because optimization actively attempts to impose patterns from the past on the future it privileges causal-predictive methods, often implemented through formal (usually algorithmic) models running historical data. Contingency planning is how we try to prepare for already recognized possible surprises (often with the aim of "surviving" or continuing without systemic disruption). Using novel futures to discover new ways of making sense of the emergent present provides one way of taking advantage of the unknowable as it starts to become knowable, enhancing the capacity to discover the present. Novelty includes objects and processes emerging from our activities and the subsequent actions we exert upon and with them.

These three ways of using the future are manifested in the world around us in distinctive ways. People using the future as optimized knowledge tend to understand reality as determined and amenable formalisable – "amenable" in the sense that problems that are relevant can and should be dealt with in this way. Some of the tools deployed by those using the future for optimization are closed system approaches, much of system dynamics and trend extrapolation – all close to forecasting. The contingency planning approach is more flexible in the sense that it must somehow combine qualitative and quantitative methods (such as Delphi and forecasting). This is an intensive framework, however, because it relies on continuous revision based on both closed and open views of the future. Finally, the appreciation of novelty depends even more on the reframing, or questioning of existing sense making, demanding an even greater capacity to invent and explore openness in all its forms. One of the striking aspects of the emergence of the DoA is that it addresses the need and resources that are currently pulling and pushing the development of the capacity to embrace novelty.

The distinction among the three ways of using the future is meant to be analytical. It does not imply that at any given time people, communities or institutions individually use only one of them. As a matter of fact, all the ways of using the future are usually employed together, in different proportions. The analytic distinction into three main types is a conceptual tool for better classifying and understanding the way in which communities and other relevant subjects use the future.

All three uses of anticipation can serve human intention and volition, including the desire to assure individual, organizational and species resilience. By providing distinct categories and methods for integrating the future in the present, the practice of the DoA may enhance the capacity of people, communities and organizations to manage and take advantage of the stress and excitement generated by the only certainty we know – constant change.

While these three categories are derived from extensive experience in concrete anticipatory activities, they are in need of some theoretical polishing. As they stand, these three categories guide practitioners, provide clues for varying perspectives and levels of analysis. As the DoA develops we hope to provide a more comprehensive analysis of the structural features, overlapping practices, and inter-connections.

## 3.2 Complexity

During the past sixty years complexity has been defined in so many different ways that the term risks becoming meaningless. Furthermore, complexity is one of those issues that quickly veers into difficult

[11] See the section on complexity.

technicalities. Leaving aside many otherwise needed details, embracing complexity for the DoA means awareness that complex systems are such that (1) they can never aver be fully captured by any model (i.e., models are always incomplete); and (2) under suitable conditions small changes may generate huge effects.

One of the simplest ways to start grasping complexity is by distinguishing "complex" from "complicated" problems and systems. Complicated problems originate from causes that can be individually distinguished; can be addressed piece-by-piece; for each input to the system there is a proportionate output; the relevant systems can be controlled and the problems they present admit permanent solutions. On the other hand, complex problems and systems result from networks of multiple interacting causes that cannot be individually distinguished; must be addressed as entire systems, that is they cannot be addressed in a piecemeal way; they are such that small inputs may result in disproportionate effects; the problems they present cannot be solved once and for ever, but require to be systematically managed and typically any intervention merges into new problems as the result of the interventions to deal with them; and the relevant systems cannot be controlled – the best one can do is to influence them, learn to "dance with them" as Donella Meadows aptly said (Meadows 1999).[12]

The traditional, bureaucratic structure adopted by organizations and institutions derives from an understanding of systems and problems that precedes the discovery of complexity. These structures are tailored to addressing "complicated" – not "complex" – systems and problems: they work as if problems could be addressed individually and in a piecemeal way, with outputs systematically proportionate to relevant inputs, they aim at managing and controlling the underlying systems. Furthermore, if we expand our consideration of change to incorporate novelty – discontinuity that is unknowable in advance – there is the challenge of being in two (or more) frames at once. How to develop the capacity to see and act in ways that take into account incompatible systems? These are situations where taking the point-of-view of one system not only renders the other invisible but often expresses an existential conflict with the new system. The problem that surfaces here is dramatically urgent: while we know well how to build up a bureaucratic structure meant to act within the existing framework of agency – how to use the future for optimization and contingency, we still are in the deepest fog about how to build up anticipatory structures able to organically deal with complex problems and systems.[13]

## 5. Assessment

There is no possibility for the DoA to improve its professional and academic respectability and social acceptance without establishing a way to assess the exercises of futures that are developed by its practitioners. The obvious problem is how to assess something that, almost by definition, has still to become actual. This means that the usual "true/false" or "it does work/it does not work" dichotomies do

[12] The following are some further aspects that a less cursory analysis will have to consider: (1) the "complicated" perspective point tends to work with closed systems, while the "complex" perspective point works with open systems; (2) the former naturally adopts a zero-sum framework, while the latter can adopt a positive-sum framework; (3) the former relies on first-order systems, while the latter includes second-order systems, that is systems able to observe themselves (which is one of the sources of their complexity).

[13] A few months ago the *Journal of Futures Studies* circulated a call for paper for a special issue, edited by Roberto Poli, on "Anticipatory Governance", to be published in 2014.

not work for futures exercises at large. While they may work for "optimization" (see the section of FL above) they are at odds with the other ways of using the future. This problem is well shown in a framework such as the Foresight Maturity Model (FMM, Grim 2009). The FMM is designed to help identify the key areas of foresight that could best benefit from focus, allowing resources to be optimized for the most overall benefit. Furthermore, the FMM provides a means to assess progress in a measureable way. The two main features of FMM are (1) devising the main steps of a foresight exercise, as developed by Hines and Bishop (2006) and (2) identifying the series of basic maturity levels (for more details see Table 1 below). The main purpose of FMM is to assess the capability of organizations and institutions to develop strategic foresight by relying on the concept of best practice, a concept that is often elusive (on the problems surrounding "best practice", see Coote, Allen and Woodhead 2004, Auspos and Kubish 2004, Foot, Raleigh, Ross and Lyscom 2011). However, apart from optimization issues (i.e., debates on performance measurement problems), the very idea of "best practice" seems to make little sense for FS, because "best practices" are often obstructions towards the future in the sense that they block efforts to find innovative ways to face emerging challenges.

| Disciplines of a Foresight Exercise | Basic Maturity Levels for Each Discipline |
|---|---|
| **Leadership** (capacity to translate foresight into action on an ongoing basis) | **Ad Hoc** (being only marginally aware of processes; most work is done without plans or expertise) |
| **Framing** (capacity to identify and solve the right problems) | **Aware** (being aware that there are best practices in the field; learning from external input and past experiences) |
| **Scanning** (capacity to understand what's going on in the immediate environment and in the world at large) | **Capable** (having a consistent approach for a practice, used across the organization, which delivers an acceptable level of performance and return on investment) |
| **Forecasting** (capacity to consider a range of future possibilities) | **Mature** (investing additional resources to develop expertise and advanced processes for a practice) |
| **Visioning** (capacity to decide what the organization wants in the future) | **World-class** (being a leader in its field, often creating and disseminating new methods) |
| **Planning** (capacity to develop plans, skills, and processes that support the organization's vision) | |

This approach raises a number of problems which will be discussed in a further paper. One very important blind spot is the absence of complexity in the picture, leading to rather optimistic explanations, in particular for framing, scanning and forecasting activities.

For these reasons, we need a more nuanced framework. Let us call it "Anticipatory Capability Profile" (ACP). ACP will be based on the three components mentioned by its name: The Anticipatory component distinguishes among the different ways of using the future (for instance, according to the different ways of using the future distinguished by FL). The Capability component distinguishes among the different frameworks adopted by professional futurists for performing their exercises. As a preliminary approximation, one can exploit the difference between "modeling" and "reframing" mentioned in Section 1 above. Finally, the Profile component puts together the components characterizing Anticipation and Capability, specifying which constrains they should respect. Needless to say, the above is only a rough skeleton. Much work will be needed before being able to construe an effective assessment framework by finding suitable ways to operationalize the mentioned dimensions.

## 6. Conclusion

The DoA is in its early stages of development. In this regard, the DoA is not different from any other discipline (or science for that matter). Further developments of the DoA require not only theory enhancement but also systematic testing against reality. The latter in particular helps to verify the capacities of the DoA before aiming at its broader implementation. Finally, it is worth noting that there is nothing mysterious in the DoA: as difficult as it may appear, all the components of the DoA *can be learned*. This is especially important for a group working from within a UNESCO project, given the UNESCO's mandate to promote and disseminate the value of learning.

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