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Evolution of futures studies☆

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ABSTRACT

This article discusses the evolution of futures studies. The article starts with an evaluation of the different rival taxonomies and definitions for futures studies, and proceeds to discuss the very concept of paradigm. Are there paradigms in this discipline? If we think there are, what kind of arguments can we use to define those? I argue that there have been two paradigms in the evolution of futures studies so far, and there are signs of emergence of a new one. Both of the existing paradigms have had many rival macro-level methodological approaches, ontological and epistemological branches, and phases of evolution. The first paradigm is the age-old prediction tradition that combines thinking about the future into mystic explanations. This line of thinking bases its argument on the deterministic future and effects of the world of spirits. The second paradigm was basically started in the U.S. military after World War II. This modern line of thinking bases its argument on indeterministic futures, probabilities, aim to control and plan, modelling and systems thinking, and the effects of external trends. The new emerging paradigm may base its line of thinking on disconnecting from the western control based technical thinking, and accepting internal dynamic fluctuations, paradoxes and dialectic thinking.

1. Introduction

What are the past, the present and the future? What is the relationship between pro-activity, pre-activity, re-activity and passivity? What is linear thinking and what is non-linear? What in this world of subjective perceptions, subconscious interpretations and socially constructed reality is simple, complicated or complex after all? If the world is a set of logical and universal laws, could not we just build software to predict everything, at least on a macro-level? On the other hand, if the world is random and just a consequence of a set of initial conditions and billions of interactions that cause unpredictable critical trigger points and cascades of bifurcations, are not we just doomed to be logs in a river? Furthermore, if both of these postulates carry some truth, what does it mean for foresight or futures research? When can we proudly say that we know? When should we admit that this issue is too random or complex for us to understand? When should we just try a bit harder to reach better foresight? What should a project be like, if we really would like to systematically grasp the complex future, or get a deeper knowledge of what may be called the human and social interiors?

Of course, there are almost as many answers to these questions as there are answer providers. After all, futures studies are a mosaic of approaches, objectives and methods, and many parts of it are in different stages of evolution. One way to approach these questions is to study the extension of the contending taxonomies, or other alternative types to divide or

☆ The work bases on my PhD thesis where I have discussed this theme more thoroughly. The PhD thesis can be found from link: http://info.tse.fi/julkaisut/vk/Ae8_2009.pdf.

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categorize the basic set of practices, objectives, interests of knowledge, futures orientations, approaches, views, or even the epistemology or ontology of futures studies. One possible approach to categorize futures research orientations is the method that Borg [1] uses. He does not divide futures research into all-encompassing paradigms. Instead, he focuses on grand areas of futures research that have different research objectives. Borg states that if the ancient prediction orientation and the modern utopia/dystopia imagination are considered as a unified approach, it can be described as the first grand area of research objectives in futures research. That would be the *creation of interesting future images, visions and scenarios*. The second grand area of research objectives in futures research is its *ability to support planning and decision making*. Here, its applicability in planning is the focal point. The third grand area of research objectives in futures research is *solving the great global questions of all humankind*. According to Borg [1], Flechtheim [2] was the pioneer in defining the questions and goals of this third large problem area. Finally, Borg defines a fourth grand area of research objectives in futures research as *developing applicable interdisciplinary methodology*.

Alongside Borg's categories, the following views can be considered as contending taxonomies for the extension of futures studies: Linstone's [3] division to technical, organizational and personal; Inayatullah's [4] division to predictive, interpretive, critical and action learning; Amara's [5,6] categories of possible, probable and preferred and his focus areas of expert evaluations, scenario processes and structural modelling; Sardar's [7] taxonomy of colonizing and decolonizing; and Bell's [8] categories of subjectivist, realist and critical.

If we focus on futurists who use the word paradigm and who claim that there is going to be some sort of a paradigm shift in futures research, one of the most solid presentations is made by Mannermaa [9,10]. He attempts to divide the research field into three simultaneous and alternative paradigms. His paradigms are as follows:

- The descriptive paradigm. This refers to an attempt to present highly probable predictions that are based on observed development in the past. Here, the view towards the future is both static and optimistic. The future is believed to be something that can be predicted. The research objective is non-turbulent, the methods are mainly quantitative and the time span is short.
- The scenario paradigm. This refers to an attempt to describe the different manual scripts to the future. The value of scenarios is not based on its ability to predict anything but to its ability to aid current decision making by imaging what is possible and making interesting discoveries of the possible development.
- The evolutionary futures research paradigm. This refers to an attempt to describe and understand the futures in the turbulent world more accurately and is based on evolutionary laws. It is based mostly on the discoveries of complexity research and the acknowledgement of the evolution in general.

The background of this division lies in the suggestion by Amara [6] that futures research should attempt to focus on expert evaluations, scenario processes and structural modelling, which mainly refers to Prigogine's [11] theory and the work that has been done in GERG (General Evolution Research Group [12]) since 1984. Laszlo, e.g. [13] has been one of the key figures behind the idea of evolutionary approach.

Alongside the paradigms, Mannermaa [14] has located two grand approaches in futures research that are technocratic orientations and whose origins are in military, technology foresight, etc., and humanistic orientation, whose origins are in the futurology, etc. of Flectheim [2].

The presentation of Mannermaa is a valuable comment in the discussion about different futures orientations, especially since it explains the orientation shift during the 1960s and 1970s, but its third paradigm is a problematic one. During the past 16 years, it did not become a dominant set of research practices, as Mannermaa had predicted. In contrary, after the 1980s and early-1990s the popularity of the evolutionary has decreased in futures research. Many reasons can be found to explain why futures research did not adopt the ideas of evolutionary to its methodology and philosophy as such. Already in 1989, Masini [15] predicted some key reasons why, such as the idea that evolutionary thinking will not be utilized in the research field. According to Masini [15], from then on, futures research will stick to the existing methods, and the method development work will mostly just present small variations to existing methods. The meaning of world models is decreasing, scenarios will be used more alongside with strategy work, Delphi will still be used in many fields, environmental analysis is increasing in general, and strategic planning is increasing in both public and private sectors. So far, Masini's estimation of the development of futures studies has been quite correct.

Other possible reasons why evolutionary futures studies never became mainstream or a real paradigm at all are discussed in Kuosa [16] and can be summarized as follows:

> Adopting evolutionary approach to futures research is difficult and time consuming. It ultimately challenges the existing principles of foresight. Establishment of new methodological tools require financing which hasn't been available sufficiently so far. And finally, the promoters of evolutionary futures research in 1980s and in early 1990s couldn't develop models which would have attached the discoveries of complexity research to futures research.

To continue the discussion over alternative paradigms, Hideg [17] suggests that there are two alternative and rival new paradigms in futures research. The paradigms are rival in relation to her criteria, which include the role of the human being as the subject, the role of interpretation and differences in methodological premises. In her division, the first alternative new paradigm is the evolutionary futures research, which echoes the work of GERG, Laszlo and Mannermaa by stating that current futures research is not satisfactory because its subjects are simplified and its theories, applied methodology and

methods are not adequate to explore a reality in constant change or its future conditions. The second alternative paradigm is critical futures research, which states that the future can be interpreted not only as something that will materialize as time passes but also as something that already exists in the present in people's thoughts and emotions [e.g. 18–23]. Hence, according to critical futures research, such future affects the present and forms an organic part of the rules of life. It evokes expectations, objectives, plans and the scheduling of future acts, and is therefore not only a peculiar form of cognitive interpretation but an emotional attitude (optimism, pessimism, hope or fear) as well. In other words, at the present level of human development, thinking about the future and having a notion of the future can no longer be regarded as separate forms of thinking [17]. Furthermore, critical futures research provides many methodological approaches that help one to reveal, for example, the deep worldviews and commitments behind surface phenomena or behind the litany of a certain policy.[1]

However, saying that there are two emerging rival paradigms in futures studies can be a problematic accusation from the point of view of using word paradigms. Thomas Kuhn gives the contemporary meanings to the concepts of paradigm and paradigm shift in his book, *Structure of Scientific Revolution* [24]. As defined by Kuhn, a paradigm refers to the set of practices that define a scientific discipline during a particular period of time. It contains, for example, the following questions: (i) What is to be observed and scrutinized? (ii) What kind of questions are supposed to be asked and probed for answers in relation to this subject? (iii) How are these questions to be structured? (iv) How should the results of scientific investigations be interpreted? In a strict sense, the only real paradigm shift in science took place when the mechanical theory of physics of Newton was shifted to the relativity theory of physics of Einstein. In other words, there can be only one prevailing paradigm in a scientific domain at once, not many rival ones. Thus, in this case, it may be more accurate to speak, for example, of rival macro-level approaches instead of paradigms. Furthermore, Richard Slaughter, who can be considered as one of the creators of critical futures studies, has preferred to divide the domain into critical and integral futures studies, and populists and systems, all with different views, objectives and approaches to reality, and all representing different types of ontology and epistemology [18–20].

Nevertheless, if we accept the idea that we can talk about paradigms in futures studies or foresight as long as we are talking about eras that have certain types of prevailing all-encompassing mindsets, then we may say that there have been two paradigms in futures studies so far, and there are signs of emergence of a new one. Both these paradigms have had many rival macro-level methodological approaches, ontological and epistemological branches, and phases of evolution. Before going to details and stages of the both paradigms, I will discuss the archetype futures orientation in human nature, which lives strong even in modern people.

2. Introduction to the mindset behind the first paradigm of futures studies

The human endeavour to be better prepared for the challenges of the future is ages old. It may even be considered as a natural part of human nature. This almost eternal endeavour of humankind is always changing and has taken many forms in the past. We may say that the first predecessors of the general futures research paradigm consisted of representatives of early animism, magic, herbalism and shamanism. These lines continued in classical antiquity in many forms of predicting the future; classified into inductive prediction (by detecting and interpreting signs of the future) and intuitive fortunetelling orientation (by internally "perceiving" the future). The seeds of the tradition of utopia/dystopia imagination have been sown since Plato's time and they have become inherent in futures thinking as well. This prediction tradition of classical antiquity contained more than 100 documented methods which are described or represented, for example, in texts by Cicero, Seneca, Aristotle and St. Augustine, and in prophecies by the oracles of Delphi see [27].

The deterministic prediction orientation, where the postulate of the possibility of receiving "knowledge" of the future, either inductively or intuitively, is valid and has not vanished from our operational landscape. According to some sources, it may even be strengthening in certain areas, e.g. [28]. Magical thinking is still common, especially among people who have low tolerance for uncertainty, e.g. [28]. Once a person believes in supernatural phenomena, it is extremely easy to find signals from the environment that seem to verify the fixed beliefs of the person in question. Supernatural belief systems help people to get the complex and unpredictable world into order c.f. [29]. A structured and predictable world helps certain types of people make their plans for the future, make everyday decisions and stop worrying about unpredictable incidents. It also helps such a person to save energy as he/she does not have to constantly reason complex phenomena and many sources of information. In many cases, it is too big a burden for an individual to carry all the responsibility of every decision they have made during their lifetime just by themselves. Furthermore, if the phenomena that the person has to deal with become more hectic and complex, it is even more tempting to give up the rational science-based reasoning and select some forms of fixed external explanations. Astrology is a good example here. If the past, present and the future are written to the stars, it is no longer worthwhile to worry about actions or decisions. Following this line of thought, you are no longer responsible [30].

Astrology is not the only form of foretelling in modern days. The deterministic prediction orientation lives strongly in Tarot-card reading, interpretations of Nostradamus' predictions, graphology, psychic seeing, automatic writing, Quija board, soul map reading, hand or crystal ball reading and even in animal-organ reading for weather prediction [30]. For example,

[1] Compare to Jürgen Habermas' emancipatory knowledge interest and the objective of critical science, whose purpose is to facilitate emancipatory transformation. Its projected outcome is to attain more rational social institutions and relations, so that unnecessary domination and exploitation are removed [25,26].

the so-called "frog-men" give annual weather predictions through the Finnish Broadcasting Company YLE, and this is certainly not the ultimate case in the Western world. Furthermore, even esteemed publishers seem to be publishing books from these fields, which tells us about the overall consumer demand in the markets.

Playing with the supernatural basic instincts of people is big business in Hollywood productions, too. Hollywood movies and series are constantly pushing supernatural schemes. Sometimes, ghosts and spirits depicted in the shows are real. Sometimes, wizards or witches shown are actually casting real spells and only fools do not believe in them. UFOs are here or some undercover people are visiting other planets. Sometimes, there are deterministic predictions or curses that will happen unless a hero prevents the future by magical intervention. Sometimes, psychics solve present or forthcoming crimes for the police. Sometimes, people use time machines to visit the past in order to change the present or they visit the future to know what to do in the present, and so forth. As presented, these may be entertaining shows but there is a flip side to the coin. When people constantly see supernatural things happening and solving otherwise tricky problems, some people may get used to such easy explanations. Even if they know that movies are one thing and the real world is another, such shows may feed their basic supernatural instincts and needs in a harmful way. It may lead people to look for answers from a wrong direction, waste their money, or make wrong assumptions and decisions [30]. It can be especially devastating for serious modern futures studies.

It is not to say that before modern futures studies (second paradigm) emerged, the inductive or intuitive prediction paradigm would always have been the dominant and unquestioned way of producing future knowledge. For instance, in the peripatetic school of ancient Greece, cynics such as Cicero and Epicureans were determined opponents of foretellers and oracles. Aristophanes, Demosthenes and Lucian even attempted to reveal the ridiculousness of the entire oracle institution [31]. Nevertheless, it did not help matters. Predictions became even more popular and the leaders supported them into a new renaissance.

3. Characteristics of the first paradigm of futures studies

As already presented in the previous chapter, the prediction tradition that combines thinking about the future and mystique explanations has always been part of human culture. In a sense, it has never vanished from our functional environment. The deterministic prediction and mystique orientation has merely found new methods as an adaptation to the modern world. This all-encompassing mindset can be called the first paradigm of futures "studies", based on the following arguments.

- First, it is based on a dogma that states that the future is deterministic or already existing, and can therefore be seen in advance if the methods are correct.
- Second, it bases its research on many specific mystical methods and rituals that can be done correctly only by professionals.
- Third, it ranks people according to their ability to do futures research. There are laypersons who can mostly just wonder and ask, there are professionals who can see the future, such as pythias, witches, fortune-tellers, soothsayers, shamans, astrologists, graphologies and psychics, and then there are the highest rank of professionals, such as the highest priests, prophets or astrology-book writers, who work as "gatekeepers" of the proper research in the "discipline". They tell what is the right or wrong way to predict the future, and they are also able to change the "methodology" if necessary c.f. [27]
- Fourth, this all-encompassing mindset has been prevailing during a particular era.

Thus, in this sense, the deterministic prediction and mystique orientation can be seen to contain the key elements of a paradigm, as it defines what is to be observed and scrutinized, what are the kind of questions that are supposed to be asked and probed for answers in relation to this subject, how these questions are to be structured, and how the results of scientific investigations should be interpreted.

4. Second paradigm of futures research

The dominance of the first paradigm was challenged much due to new achievements in science in early-20th century, but especially due to the tough lessons of the Second World War. The war taught the human race the value of good planning, strategies, calculations, management of complex situations, trade and treaties. It also demonstrated the destruction powers of fundamental ideologies and modern weapons. The era after the Second World War was also a golden time of belief in strong economic growth, technological development, humanities, global politics, abilities to solve global problems, etc. [14,32].

Modern futures studies has basic paradigmatic characteristics, which form the second paradigm in contrast to the first one, based on the following arguments.

- First, modern futures studies rejects the idea of predicting the future as the future is not there yet. It is constantly forming in many complicated interactions. There are various sources of futures knowledge but the future itself is indeterministic except in some very limited or fixed law like causal areas. Thus, futurists tend to speak of possible futures knowledge and possible future images or making the future by pro-active provocations instead of seeing the future c.f. [5,33,34]. As Jim

Dator puts it in his First Law of Futures, 'The future cannot be "predicted" but alternative futures can be "forecasted" and preferred futures "envisioned" and "invented"—continuously' [35].

- Second, it bases its understanding on empirical knowledge that is produced in all other disciplines, and on all human cultural knowledge. It also attempts to follow basic scientific rules of research such as open debate, objectivity, self-correction, possibility to falsification, iteration and accumulation of knowledge.
- Third, futures research is value-rational, unlike normal sciences. It takes its stance on different alternatives and describes its own desired futures images, instead of aiming to value neutralism. It attempts to explicate the possible prospects and consequences of different decisions in order to question or promote certain values or procedures. It claims that even values can be rationally discussed and studied [36]. Yet, control based foresight and technological assessment, as the other rival macro-level branch of futures studies, tend not to be so value-rational.
- Fourth, it has a broader scope of research than the normal sciences, as its research objective does not exist in an empirical sense, because it is contingent and undefined by nature. However, as this does not mean that we could not get relevant futures knowledge from our present environment in the same way as we can get, say, historical knowledge, it has led the research field into a unique epistemology. According to Malaska [37], modern futures research has three unique areas as epistemology of knowledge. The first is syntax, which contains the methods – such as scenarios, Delphi and Futures Wheel – that are all characteristic for futures research. The second is semantics, which contains the value-rational substance areas of the field. Examples of these interest areas are global issues, late-industrial crisis, information society, technology trends and climate change. The third is pragmatics, which contains the deeds and actions of futures research. What kind of strategies, policies, planning, design, empowerment or provocations are relevant in order to cause desired effects?
- Fifth, (late) modern futures research may divide people into non-professionals, who do not know the research methods, questions or principles;[2] professionals, who have relevant education or have at least adequate knowledge of the methods and are able to produce relevant futures knowledge; and "gatekeepers", who are "responsible" for the quality control and education of futurists, develop methods or methodologies, or debate methodological issues in international arenas such as futurist conferences or journals. The collective "gatekeeping" of futures research is organized under WFSF, WFS and Futuribles. However, there is still a lot to do with the quality control of futurists, research, education and consultation due to the unclear definitions and standards, and overall fragmentation of the field.[3]
- Sixth, we can roughly say when this all-encompassing ontological and epistemological mindset became dominant. Meaning, we can say when this era actually began and why.

5. Phases of modern futures studies

There are roughly three particular phases in the evolution of the modern futures studies, 1940s–1950s, 1960s–1970s, and 1980s to present. The first phase from 1940s to 1950s was a golden time of planning, quantitative methods, positivism, global trade and financing. It was an era of emerging potentials of ICT, space travel, economic growth, urbanization, industrialization and globalization [14]. In this futures boom, there was an increasing demand for organized long-range planning, trend-extrapolations, and technological foresight and assessment in general. The key actors in launching this modern foresight or structured, "problem based" futures research methods were think tanks and research units of the U.S. military, such as RAND (Research ANd Development) project [38–40].

The second phase ran roughly from 1960s to the 1970s. It can be described as the second phase of modern futures studies. Bell [8] calls it an era of international futures research movement, as that was the time when futures research went beyond U.S. military researchers. The mid-1960s was a time when the field of futures research grew due to increasing awareness of the long-term consequences of population, economic growth, social movements, the threat of nuclear war and the energy crisis. Back then, Ossip Flechtheim introduced his ground-breaking book *Futurologie* [2], where he stated that futurology should attempt to solve the following great problems of all human kind: (i) preventing wars and guaranteeing peace, (ii) preventing famine and poverty, (iii) preventing oppression, (iv) enhancing democracy, (v) ending extortion of nature and enhancing conservation of nature, (vi) fighting against alienation, and (vii) creating the new Homo Humanus. It was also a time of strong foresight method development.

[2] Besides the more or less frequently demonstrated methods such as scenarios or Delphi, futures studies methodology is not so well known to the academia.

[3] Michael Marien [41] has divided all futurists to three general categories which are Mainstream Futurists (those who call themselves "futurists" as a primary identity), Marginal Futurists (those who are only secondarily "futurists", and Non-Futurist Futurists, which again can be divided to a typology of 12 special types of futurists as follows: Among *Mainstream Futurists* there are: the Synoptic Generalist (more an ideal than a reality), the General Forecaster, the Normative Generalist (Willis Harman was the prototype), the Pop Futurist (John Naisbitt was the prototype), the Multi-Identity Futurist (Zia Sardar is a pertinent example here—none of his recent books on cultural matters identify him as a futurist!), and the Specialized Futurist confined to one or two sectors. Among *Marginal Futurists*, there are: the Futurized Specialist (one who uses e.g. just scenario or Delphi methods), the Closet Futurist (Peter F. Drucker was the prototype, explicitly not calling himself a futurist; Donella Meadows was another example), the Future Futurist (students), and the Forgotten Futurist (the deceased and retired). Among *Non-Futurist Futurist* there are: the Pseudo-Futurist (who uses futures language but offers no insights), and the Straw Man Futurist (an invention by ignorant outsiders to be easily knocked down for poor forecasts and other sins—'TK, could we add the "common village fools" to this type as well'), the Conference Futurist or Casual Futurist who attends World Future Society conferences and/or subscribes to *The Futurist* magazine in the worthy capacity of learner (i.e., teachers, students, planners, interested citizens, etc).

The third phase of futures studies has been roughly running from the 1980s to the present time. The four key characteristics of this latest phase may be named as follows:

(i) The almost complete cease of development of new foresight methods (related to second paradigm of futures studies). Only one fifth of the methods in futures research methodology [42] have been developed during the latest phase of the second paradigm [43]. It is much less than what was expected during the 1960s, e.g. [14,6].
(ii) The stabilization of the field. According to the WFSF, in 2003 there were over 40 tertiary education units providing studies related to futures research, and in 2010, there were about 20 doctoral dissertations related to futures research in Finland alone, and more than 50 around the world.
(iii) Discussion of the identity of the field has been quite regular topic in the Futures journals in past 30 years. The namesake—What are the concepts that we should use to name our field and ourselves as futurist? What is and should be the role of futurists? What is and should be the identity of futures studies in the field of science, is it, e.g. a discipline, discourse, field or interest area, and is it multi, inter- or trans-disciplinary field, and how should we discuss all this to the public? [44,41,45,46].
(iv) Overall fragmentation of the field [41].

6. Why futures studies has been evolving?

Alongside with the general societal, political and environmental awakening of 1960s, the other key reasons for the shift from first to second phase on that time, were related to the change in science. By that time, there were many new discoveries made in chemistry, physics, mathematics, and biology, which started to effect the understanding of systems functions in many fields. Lorenz [47] discovered the meaning of initial conditions in weather forecasting models and established the foundation for chaos theories. Ilya Prigogine discovered dissipative self-organisation in chemical processes and established the foundation for understanding organical and dynamical systems [48,11], and Mandelbrot found the fractal nature of self-organised structures [49,47]. Thus, new type of non-mechanical systems thinking started to emerge in organisational studies, which again started to effect futures studies. Its management oriented principles, objectives, epistemology, and method development work adapted to a more systemic or holistic nature (see Fig. 1).

However, still in late-1970s, the discoveries of different disciplines stayed mainly in their own domains. It was not until in 1980s when the new discoveries started to merge into a new science of complexity. Soon after that merging, there were more discoveries done, now under this new label of complexity studies. Bak and Chen [50], discovered self-organised criticality, Maturana and Varela discovered autopoiesis [51,52], and Kauffman discovered autonomous agents, and so on. Back then, it became more obvious to many futurists, that the "old" historical time series and expert knowledge based methods are not enough to control or predict the future, and they tried to harness new complexity studies for use in futures studies [12–14,36,53,54]. Some other futurists, stayed in the second phase methods and principles, and some started to specialize in other ways. Which again resulted in general fragmentation of the field. The other possible reasons behind the fragmentation [16] are discussed in the next chapter.

7. Main reasons behind the current fragmentation of futures studies

It is not possible to give any exhausting list of reasons why future studies has became so fragmented field, but alongside with the different scientific ambitions as discussed above, we may name at least the following additional reasons:

- As there is almost no formal education, nor defined qualifications to futurist's profession, basically anyone can start calling him/herself a futurist.
- There is simply too much information flowing around us, and too many fields and themes to be followed by just one person. Therefore, futurists need to specialize, and establish research teams, and own niches.
- Many private customers have very technical interests of knowledge, meaning that they want to "know directly" and enhance their abilities to control and manage functions. This is why they seek consultants who can provide strategic intelligence, pattern management, visualizations, or some other inductive (software-based) analysis or project management tools. Many types of search engines, text or data mining tools, self-organizing maps, environment scanning tools and agent-based modelling tools have recently been developed at the fringe between futures research, business consulting, mathematics and ICT software development. Usually when something really new has been developed for (technically) studying or "controlling" the future, there is no reference made to futures studies. Hence, due to the various styles of business consultations, the scope of futurists' work becomes more and more narrow and blur in the eyes of the general public, and companies.
- And finally, it should be noted that futures orientation is really not "owned" by futurists alone, which leads to fragmentation. Practically all disciplines, fields of society and forms of applied research have their own interest in the future. They have their unique ways of producing future knowledge that is beneficial from their own point of view. Many enterprises, organizations, universities, ministries and development centres have their own planning, technology development, risk assessment, design or strategy units that produce futures knowledge in a structured way. Despite the obvious similarities and linkages, this planning or research work is usually not called futures research, foresight, emerging issues detection or horizon scanning.

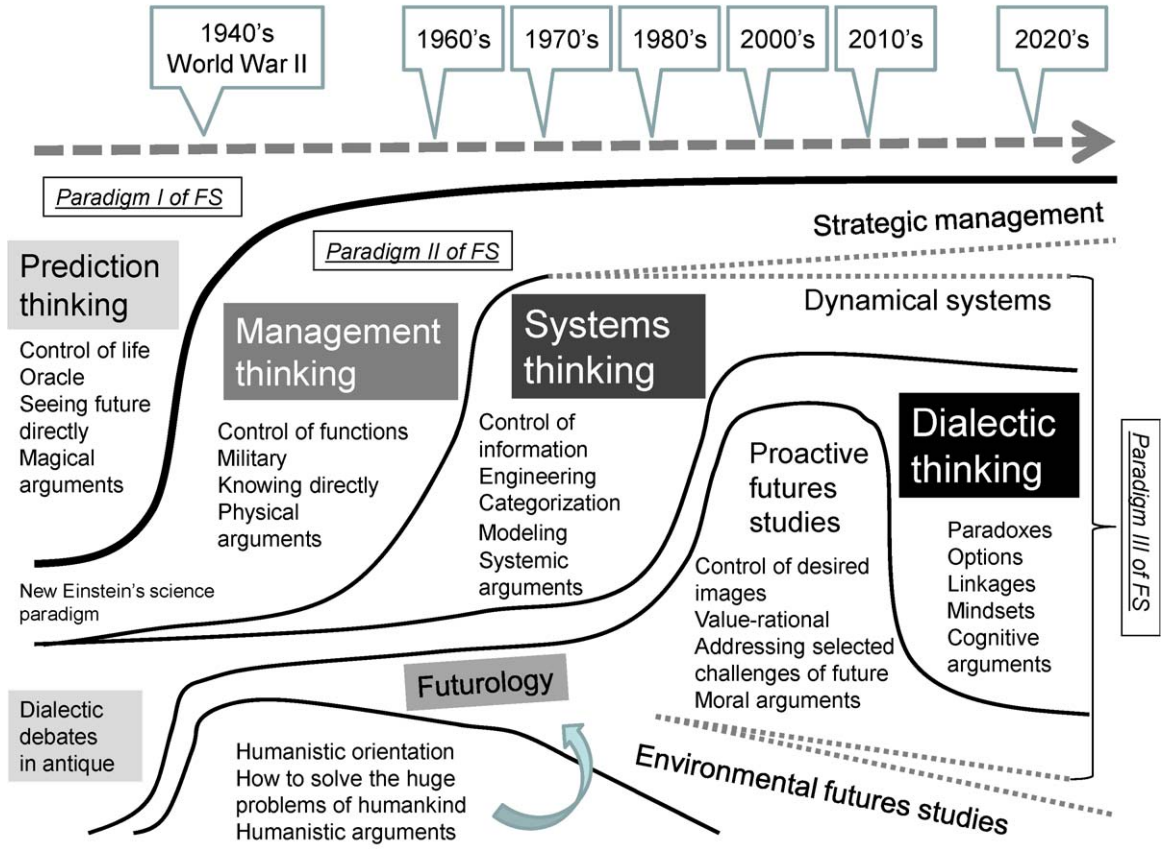

Fig. 1. Evolution of futures studies.

8. Away from control orientation and towards dialect and diversity

Futures studies are moving away from pursuit to give accurate probabilities and foresight, and attempts to provide technical information for people and organisations to control processes, information and structures. And Futures studies are moving towards critical hermeneutical understanding, emansipatory dialects, and diversity. The reasoning of futures studies has moved from deductive to inductive inference, and now it is moving towards abductive reasoning.[4] All this has became evident in recent discussions in Futures journal, and it became evident in latest International Risk Assessment and Horizons Scanning Symposium (IRAHS) in Singapore in 15–16 March, 2010.

As Sardar [44] put it, "after all, futurists are not discovering gravity or antibiotics. Predictions, forecasts, scenarios etc do not provide us with knowledge of the future but only suggest certain, limited possibilities. Moreover, even if this knowledge was possible we would not be able to recognise it—a point aptly illustrated by Jim Dator's playful but serious Second Law of Futures: 'any useful idea about the future should appear to be ridiculous'; and would be dismissed as such! [35]". Sardar continues,

> "We can have knowledge of forecasts and visions, scenarios and expert opinions, concepts and methodologies of futures studies, but this is, of course, not the same thing as knowing the future. Forecasts and visions are themselves epistemological activities – in the sense that they are based on some theory of knowledge – but they do not yield knowledge of the future itself. All they do is to provide us with manufactured knowledge of restricted number of possibilities. Exploration of the future cannot be a quest for certainty which is exactly what Malaska seeks.[5] Hence, the

[4] Abductive reasoning is a weak form of inferring, which refers to producing new why-questions, and introducing lots of new possible hypothesis and linkages between related aspects. Thus, it is reasoning from surprising ideas and questions to the best explanatory hypothesis. It is actually a why-question-answer step in a process of inquiry [55,56].

[5] The Pentti Malaska's argument [57] which is referred here is: "what futures knowledge is all about—not only epistemologically, i.e. how to acquire knowledge of the future with different techniques for this or that pragmatic purpose (as done in foresight), but especially ontologically, i.e. what the knowledge of the future may mean, in what sense it is possible (and impossible) to know the future, and in what sense futures knowledge can be accounted as a proper scientific field of inquiry parallel with the other scientific fields of knowledge (physics, chemistry, biology, sociology, psychology, anthropology, history, humanities etc)".

> (Malaska's) assumption that the study of futures can be, like physics or biology, a 'proper field of scientific inquiry'. This is technocratic determinism both as utopia and myopia, a tendency that seems to be quite common amongst Finnish futurists".[6]

Tonn [46] emphasizes that, the field of future studies exists because consideration of the future inherently exceeds the limiting boundaries of any academic field. He enjoys the diversity represented in the pages of *Futures*, and he thrives on the diversity of his own futures research, which could be construed to fall into many disciplines. Tonn continues,

> "But, in attempting to describe our field in comparison to other academic and professional fields, we come back to semantics and messages again. Many people will want to treat our field as a discipline, which is fine, but then reject it as a legitimate field that because it is actually multi-disciplinary or interdisciplinary or trans-disciplinary or in the end, indescribable (...) Maybe our field isn't a field after all but represents a collection of people using any tools available to ensure the survival of the human species and other species on earth into the distant future. Maybe we are the guardians of the future. Maybe we are the new shamans, equipped with trend analyses, scenarios, and integral futures instead of chants and potions. We certainly are a purpose driven field, and maybe that is the most important message of all.

The theme of future of horizons scanning, foresight and risk assessment was discussed in many presentations[7] in the International Risk Assessment and Horizons Scanning Symposium (IRAHS) in Singapore in 15–16 March, 2010. David Snowden's conference closing speak summarized the best ideas and lessons learned from the presentations of both days. According to Snowden's presentation,[8] the key errors in western control based thinking and foresight are related to pursuit to control something. For too long we have been taught to avoid failing. However, in real life, people who do not fail, do not live. Hence, it is most important to accept failing. Otherwise there is no development and dynamism. And it is better to understand present and its evolution, if you cannot know about the future and be prepared to it. Thus, we should look evolutionary possibilities, not a range of outcomes. We should use more dialectics than dichotomies, and paradoxes instead of dilemmas, as paradox method helps us to think in a very different way. We tend to confuse correlation that can be found in almost anything and causality that is very specific. We confuse simulation to prediction, yet hindsight almost never leads to foresight. We think it is possible to remove bias from people and computers and obtain objectivity if we try hard enough. We still keep up the meme that human brain has limits, which is quite not the case according to recent brain and cognition research. And in our control based thinking we want to believe in super intelligent computers which start to control the complexity of the world and predict, but that is not going to happen. Computers can hardly ever overtake human brain capacity, as it is so complex and still almost fully unknown entity to us.

Finally Snowden presented his understanding of the life cycles in foresight. First there was Management orientation or paradigm, which aimed to control functions and knowing directly, it used physical argumentation, it was dominated by military, and it followed deductive reasoning. It was followed by Systems thinking orientation, which aims to control information, it uses structural and categorization argumentation, it is dominated by engineering, and it follows inductive reasoning. Next we are going to see Complexity and Cognition orientation, which aims to identify structures of network, optional connections, constraints and contexts, it uses cognitive argumentation, it is dominated by ecology, biology, humanities and chemistry, and it follows abductive reasoning. Now the systems thinking orientation is coming to an end, but it is not guaranteed that we reach the complexity and cognition paradigm, as reaching it requires hard work and willingness to a new mindset.

9. Evolution of futures studies

Fig. 1[9] summarizes the aspects of the evolution of futures studies that have been presented in this article. To conclude, I see that the third paradigm of futures studies will base mostly on combination of dialectic thinking, critical and integral futures studies including macrohistorical analysis, and on use of abductive[10] inferring and "paradox-methods". The other parts that are strongly connected to it are some pro-active objectives from "futurology", and the new understanding of dynamical systems thinking.[11] I believe that environmental futures studies has been evolving in their own path for years, and

[6] Well ... that is partly true, but I am a Finnish futurist too.

[7] The presentations of Adam Kahane in 16 March at 15.20, Riel Miller in 16 March at 16.35, Paul Ormonde-James in 15 March at 11.15, Rafael Ramirez 15 March at 15.00, and David Snowden in 16 March at 17.30, are especially mentioned here.

[8] Notes taken and edited to official symposium report IRAHS10 by Tuomo Kuosa.

[9] The ground work for the figure has been done in my PhD thesis [16] where I studied the aspects and arguments related to the paradigms of futures studies. Big thanks for introducing the eras of management thinking, systems thinking, and the idea of using paradoxes and dialectic thinking goes to David Snowden's work. Thanks for helping me to outline the prediction paradigm goes to Sirkka Heinonen's work [27]. Thanks for helping me to outline the timeframe between management and systems thinking, and timing the emergence of dynamical systems thinking goes to Pirjo Ståhle's work, as she has been discussing the phases of systems thinking before. Thanks to Olavi Borg for outlining the grand areas of futures studies in his work [1], and thanks to Masini [15] for outlining her view to the future of futures studies' methods. And finally thanks for helping me to summarize all the contains of the evolution of futures studies, goes to all authors who have participated to the discussion of the theme in Futures, and those who provided presentations at IRAHS, and staff of FFRC who commented my previous presentation of paradigms of futures studies in a workshop in Mansion of Mustio in 2008.

[10] See footnote 4.

[11] This refers here to an idea of accepting internal dynamic fluctuations of trajectories, internal attractors and internal initial conditions as triggers to rapid change and self-renewal in a system's functions, information flow and structure. One could consider this as a more "scientific" or at least more formalized explanation to thing which we tend to call just "free will" agents, or living or learning organisations.

it will be considered as an "independent field" in coming years, or it will be adopted to some formal discipline. The same can be said about strategic management, and even its most future-like form, visionary leadership. I guess, it will not end up to be a part of the third paradigm of futures studies, as almost all of its ontology, epistemology, argumentation and objectives base on different type of thinking. It is merely a future-oriented extension to Management thinking.

What actually missing from the figure, is Olavi Borg's fifth grand objective of futures studies, *developing applicable interdisciplinary methodology*. This is because I consider that it is merely a statement of the fact that the field is evolving and "alive"—and it is alive, as we can see from the evolution.

Another part which is not especially emphasized in the figure, is the scientific development of the early-20th century. That is merely just labelled under *Einstein's new science paradigm*, which again is predecessor to management thinking in the second paradigm. Of course the role and influence of management thinking, that pursues to control functions and mechanically know directly, has always been quite significant in human history. Actually the entire mechanical systems paradigm was created as early as in the beginning of the 18th century, when the era of Enlightenment began, echoing the ideals of Isaac Newton's *Principia Mathematica* that was published in 1687. The reason, why management thinking is presented in the figure to replace the prediction thinking's domination as late as in 1940s, is the fact that modern futures studies can be said to begin on that time. And this figure focuses on the evolution of futures studies, not the evolution of human kind or science in general. Changes in science, culture, politics and economics are usually predecessors to the changes in futures studies.

As one can see from the figure, change of paradigm, era, or dominance of certain type of thinking does not mean that the previous path ends. In contrary, all such "forms" live together at the same time in some kind of a co-evolution, but usually only one (new) form can be dominant at a time. That is how social evolution seems to go.

And finally, it is not guaranteed that we will ever reach the third dialectic paradigm. Reaching it requires work and willingness to a new mindset, as Snowden puts it. In other words, we can pro-actively make it happen, or alternatively we can waste the opportunity as well. Future is already here, in our thinking, objectives and actions.

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