

The challenge of systemic change

Is it time to change the way Governments use the future? Questions Inspired by the Republic of Korea's Strategic Foresight Initiatives from 1999 to 2010[1]

June 30, 2017 · Academic

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Miller R. The challenge of systemic change: Is it time to change the way Governments use the future? Questions Inspired by the Republic of Korea's Strategic Foresight Initiatives from 1999 to 2010[1]. Emergence: Complexity and Organization. 2017 Jun 30 [last modified: 2017 Nov 26]. Edition 1. doi: 10.emerg/10.17357.99297bb988774f37d01d1edd6c986870.

Abstract

Governments of the Republic of Korea have an exemplary record in providing leadership through published visions and strategies. This review is inspired by seven such endeavors conducted since 1999. All of these efforts use the future to motivate changes in the present. However, over time there has been a gradual shift in the content of the visions, revealing an unresolved tension between predictive targets based on benchmarking that is effective for emulation and a recognition that on the frontier of socio-economic change there are no knowable targets. As a result the capacity of strategic foresight processes to bring complexity and emergence to bear on the identification of opportunities in the present becomes more important. The perspective presented in this review can be summarized in three hypotheses: one is that South Korea is now at the frontier of existing socio-economic models and therefore catch-up and benchmarking are no longer sufficient foundations for South Korea's vision, although still highly important for incremental improvement and competitive positioning on already existing markets/organizational aspects of society; two is that recent developments in strategic foresight theory and practice are enhancing the capacity to focus on complex, emergent systems that are rich with unforeseeable novelty and, critically, make a practical connection to the processes of sense making and making sense that are the basis for action; and three that South Korea is in a good position to invest in developing its strategic foresight capabilities on the basis of the outstanding track record of previous efforts to use the future for the benefit of all South Koreans.

Introduction: The challenge of strategic foresight in government

All governments have a responsibility for the future¹. This means that governments must articulate the intentions of society—what are its aspirations for the future. And then give expression to these hopes by exercising state power to turn volition into action (see for instance ⁵⁸). On both counts—aspiration and implementation—the future is a fundamental ingredient². The processes of reflection, articulation, and implementation all require one way or another of “knowing” the future⁴. However, what it means to “know” the future is changing². This means that in order to continue to exercise its leadership role governments of the Republic of Korea need to change the way the “future is used.”

Korea's leaders and civil servants, like those of all other nations, use the future all the time. This review considers seven studies (see Table 1) of how the future has been used by government in South Korea. This is a modest study, based on a limited number of cases and documents available in English as well as a targeted but restricted number of interviews of key actors in these projects.

This aim of this short, exploratory paper is to begin a process of inquiry, not to reach conclusions, by asking a series of questions about how Korean governments might best use the future to act in the present. The Review begins with a brief assessment of efforts by the South Korea's governments during the period 1999 to 2010 to use the future. Next the article offers a quick overview of recent advances in both the way the future is defined and how it is used for decision-making⁶. The paper concludes with a series of questions about what governments of the Republic of Korea might do to use the future in ways that take greater advantage of historical context.

A decade of government strategic foresight in South Korea

Two key observations emerge from an assessment of the sample of seven South Korean government strategic foresight exercises (Table 1) reviewed³ for this article: one with respect to content and the other related to method. The observation related to content is that there has been a gradual shift from a bench-marking and catch-up approach to an evolutionary and more open perspective. The observation related to method is that the conceptual and practical tools deployed to produce the government's strategic foresight have faced critical challenges in adapting to the shift in content. This is not unusual, almost all current efforts to use the future face this problem^{5,6}. How to simultaneously address the significant and urgent demands for immediate effective action while at the same time taking into account the nature of the today's changes, some of which are hardly detectable but may open up new fields of action⁷.

Table 1: The Selected Sample of Government of Korea Strategic Foresight Exercises Used in This Study

<ul style="list-style-type: none"> • 1999: DJnomics: A New Foundation for the Korean Economy, Korea Development Institute, 1999 • 1999-2000: Vision 2025 Korea's Long Term Plan for Science and Technology, Min. of Science and Technology, 178 pages • 2001: Open World, Flexible Economy: 2011 Vision Agenda, Korea Development Institute • 2002: e-Korea vision 2006, e-Korea Vision 2006: The Third Master Plan for Informatization Promotion (2002-2006), Ministry of Information and Communication, Republic of Korea, 89 pages • 2004: Dynamic Korea: a nation on the move, Korea Development Institute • 2004- 2006: Vision 2030 <ul style="list-style-type: none"> ◦ WOO, Cheonsik, The Korean Economy: Challenges, Policy Responses, and Prospects, presented at Korea Herald, Feb. 24 2007, Seoul, Korea ◦ WOO, Cheonsik, Korea's Lessons Learned in Pursuit of a Knowledge Economy Strategy', presented to World Bank, May 3 2006 • 2010: Vision 2040 <ul style="list-style-type: none"> ◦ SUH Joonghae, Korea's Seven Challenges in Coming Thirty Years, Global Green Growth Summit 2011, June 20-21 2011, Seoul, Korea (slides) ◦ SUH, Joonghae, Future Vision and Policy Agenda for the Korean Economy, Prepared Global Green Growth Summit 2011, June 20-21 2011, Seoul, Korea (slides)
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After reviewing the strategic foresight efforts listed in Table 1 a key observation is that over the last decade there has been a significant change in the core message. In DJnomics (1999) the future is described explicitly in terms of catch-up and convergence to an existing model. By 2011, in the work around Vision 2040, it is recognized, albeit largely implicitly, that emulation is no longer adequate for the realization of the South Korean people's aspirations. This shift in the nature of the vision occurred gradually and changes can be detected in the issues, analyses and conclusions drawn in intervening strategic foresight work, in particular Dynamic Korea (2004) and Vision 2030 (2004-2006).

Starting with DJnomics, few nations have been as clear in describing the attributes and logic of the emulation. In DJnomics: A New Foundation for the Korean Economy there is a lucid and unflinching analysis of the failures of the past that are then benchmarked against the historically successful combination of democracy (regular elite turnover) and the competitive market's allocative fluidity (birth, death, entry, exit) found in a number of other OECD countries. In DJnomics and the subsequent Open World, Flexible Economy, the OECD market democracies are set as the goal for the future and steps are laid out, starting from the reality of South Korea and adapted to its context, to achieve the selected benchmark. For instance, in DJnomics it is argued that:

“ ... the crisis is fundamentally rooted in the failure of previous governments to respond in a timely manner to the demands of the changing world environment and accordingly transform philosophies, practices, and mechanisms of the Korean economy.” p 14.

For the policy-makers authoring DJnomics these errors can be overcome, as they were in other OECD countries in the past, and a course set for the future, through efforts to achieve openness in both society, based on democracy, and in markets,

“The parallel development of (democracy and the market economy) is essential to prepare for the upcoming 21st century, when globalization and the information revolution will make national borders meaningless. To cope with these changes while achieving continuous progress, Korea should establish an open society where private initiatives and creativity are nurtured, and diversity is respected. Democracy and a market economy are exactly the systems that can make such a society possible.”
p. 27

In explaining “why democracy and a market economy” South Korea’s leaders offered an exceptionally clear statement, not only of the congruence between means and ends, but crucially what model they were aspiring to emulate. Sensitivity and awareness of the contrast between South Korea’s situation in 1999 and the past and current workings of the majority of OECD countries was amplified by a number of factors^{9•10•11}. One was certainly the 1997 crisis, which made evident the comparative immaturity of South Korea’s institutions and regulations. In addition South Korea had joined the OECD club in 1996, providing enhanced access and legitimacy to a wealth of comparative information and detailed insights useful for benchmarking purposes¹². As well, in the late 1990s it was hard to miss the growing importance of globalization and the emerging knowledge society with the dot.com boom in full swing and Europe on the cusp of signing the Lisbon Agenda (to make the “EU the most competitive and dynamic knowledge based economy in the world”).

The title of the Vision 2011 exercise in strategic foresight, published in 2001, says it all: Open World, Flexible Economy. Pushed from behind by the take-off of the BRIC economies and others, pulled from ahead by the achievements of leading OECD countries, South Korea’s leaders targeted: “Transformation of the economic structure through liberalization and industrialization (that) is what the Korean economy needs at this point.” (p. 6). Ambition on this scale¹³, the scale of “transformation”, demanded a detailed and comprehensive set of policies. Vision 2011 targets the “engines of growth and profitability,” including R&D, service sector development, human capital, and much more. These details on how to move from vision to “reality” are critical for understanding the gradual shift over the last decade in the nature of the vision being articulated by the South Korean governments.

The starting point, beyond the general goals of democracy and competitive markets, was to move up the industrial value chain. Here Vision 2025 (1999-2000) echoes the existing policy consensus amongst OECD countries on the need to invest in science and technology (see also private sector consultancy reports Monitor, etc. in Annex B). Using rousing language and providing a sense of the imperative Vision 2025 opens with:

“We are standing at a turning point in history. We have just crossed the threshold into a new millennium. Futurists have given us many different pictures about what the world will be like in the 21st century. They all agree, however, that science and technology (S&T) will be the driving force behind the changes and developments that shape our world.” (preface, p. 1).

This was a theme that was already prominent in DJnomics: “It is expected that the importance of knowledge, technology, and information will be much greater in the 21st century. Thus the government will strive to build a knowledge based economy by fostering human capital and expanding the basis for the development of science and technology.” p. 48. What is interesting is that these conventional ways of implementing the catch-up/benchmark agenda are being combined with the language of transformation. This sets the stage in subsequent strategic foresight exercises to go beyond the closure that is implied by an emulation type focus on the industrial value chain and the role of tools—for production processes efficiency and for consumer market success.

Dynamic Korea a Nation on the Move as well as both Vision 2030 and Vision 2040 begin to push beyond the boundaries of achieving existing best-practice. Partly this is because elements of the South Korean economy have now achieved world-class status. Partly this is because the existing “advanced models” of effective social policy or social cohesion¹⁴ have either shown clear signs of dysfunction amongst so-called leading nations or simply cannot be emulated mechanistically. Weaving a new fabric for social cohesion is a locally specific, culturally bounded and lived process^{15•16}. But perhaps more importantly is once again a negative signal, one that is identified and given weight by conventional ways of using the future. This is the clear expectation that South Korean economic growth and in particular rates of productivity increase will converge towards the OECD average. As a result it was clear that South Korea needs to be as inventive as many other OECD countries already at the frontier of what works and are right now in the throes of inventing new ways of doing things.

In any case, whatever the reason, the critical issue for this review is that the emphasis within the visions of South Korea’s future begin, even if ever so slightly, to shift away from the grueling challenge of maturation—or “growing-up”—to posing questions about what is beyond the catch-up horizon. The evolutionary discourse, already present in the text of Dynamic Korea provides fertile ground for starting to acknowledge the openness, indeed fundamental indeterminacy, of complex systems. This thread is evident in the following quote from Dynamic Korea:

“The world has continuously evolved going back to the agricultural society nearly 10,000 years ago, followed by the industrial society which has lasted for the last 200 years. Now the evolutionary path has brought the world into the knowledge-based society, bringing with it a new competitive paradigm. In the agricultural society it was land, while in the industrial society, it was labor and capital. In the knowledge-based society, competitiveness is achieved through S&T.” Dynamic Korea, p. 108

Which brings us to the crux of the analysis and sets the stage for a discussion of the changes in the way the future is used in the next section. An unacknowledged tension can be detected in the strategic foresight texts between on the one hand the acknowledgment that societal change is the outcome of long-run evolutionary openness and on the other the narrow, industrial era targeting of specific benchmarks and tools/organizational forms. Dynamic Korea is quite explicit:

“The government has selected ten future growth industries that will be developed into key sources of technologies. Korea will acquire and develop world-class technologies and products in certain fields by focusing on the development of new technologies in high growth industries, thereby, lay the foundation to produce new leading products.” Dynamic Korea, p. 112

Some of the blame for the inability to build a bridge between change as complex emergence and change as planned implementation of measures to achieve set targets anchored in the past is rooted in the lack of conceptual and practical tools to help identify different kinds of change^{17·18·10}. This problem, which is not at all unique to Korea, is compounded by many factors, not least the resilience of existing systems that continue to adapt to survive and, equally if not more important, the resistance mounted by entrenched habits and power¹⁹. The strong conclusions found in Vision 2030 and Vision 2040 regarding the need for inventive responses, ones that go beyond emulation, underscore this dilemma.

“Vision 2030 proposes a meaningful revision of the old growth strategy in view of the changed internal and external environment. Specifically it emphasizes investment in human resources and setting up an advanced social welfare system for an ‘equitable growth.’” Vision 2030: Background and Main Contents, Woo, C., p. 13.

Both exercises stress the strengths and weaknesses of South Korean society held up, in large part, to the metric of OECD best practice. This continues to be a reasonable and important benchmarking approach and provides many clear targets and tools for government action. The same can be said for the reasons presented for going beyond “business-as-usual” due to the familiar “mega-trends”: demographic, technological, values, global competitive, ecological, and geo-political. But these admonitions, arising from the challenges posed by the advent of the so-called knowledge society²⁰, remain in most respects well within the familiar pyramid type organisational structures typical of the more tangible form of industrial economy. Reforms are largely linear, just with the additional imperative of harnessing innovation and knowledge management for achieving greater efficiency and quality in the services/intangible sectors. Although Vision 2040 articulates the challenges of both improving on existing practices and inventing new approaches, underscoring the tension between predictive and emergent futures, it does so without providing a practical way forward:

“It is necessary to maximize opportunities for national development by using Korea’s strengths, while preemptively responding to changes in future trends. ... A fundamental systemic change is called for so as to help each sector accept future changes and actively respond to them... Transforming the paradigm for development—sustainable growth through innovation—integration—openness.” Slide 26, SUH Joonghae, Future Vision and Policy Agenda for the Korean Economy, KDI, 2011.

The current state of Korean strategic foresight illustrates the central difficulty facing the way governments in general use the future. On the one hand there is an awareness that many “wicked problems” are symptoms of systemic dysfunction that cannot be solved by the paradigms that created the problem (cf Einstein “We cannot solve the problems using the same kind of thinking we used when we created them”). On the other hand there is the comfort of the old familiar legacy systems and a fear of the taking risks with new and systemically innovative experiments that serves to preserve yesterday’s perspectives and practices. One avenue for addressing this impasse is to begin to think about changing the way the future is used.

What is the future and how to use it?⁴

“Science is driven very much by how we perceive the world and the mental models that we use to think about observed phenomena. Given the importance of our mental models, which determine the data that we collect, the questions that we consider “interesting,” and the ways in which we change our views of the world to accommodate new results, it is perhaps

surprising that we do not have a more clear-cut approach to characterizing the essential components of complex systems and the ways in which they interact with one another. The problem is symptomatic of the more general philosophical problem of how best to select discrete, manageable entities to study within a continuous environment.” 15

The evidence presented in the previous section regarding the difficulty of spanning simple and complex phenomena can be seen as supporting the hypothesis that current efforts at strategic foresight are missing certain conceptual and practical tools for using the future. Very briefly, given the context of this short review, this section outlines some recent developments in both the theory and practice of using the future.

The starting point is the conventional definition of strategic foresight (see Box 1). This foundation is now widely deployed throughout the OECD. In addition the academic literature, arising from a number of peer-reviewed journals⁵ and university or government funded centers⁶, also offers numerous assessments of the nature and effectiveness of government strategic foresight^{21·22·23} (Annex A).

“Foresight is neither prophecy nor prediction”. According to Godet²⁴ foresight consists of three critical elements: (1) anticipation, (2) appropriation and (3) action. In the European FOREN project a fully-fledged foresight model was introduced. According to this fully-fledged foresight model the critical elements of foresight activities are (1) the foresight methodologies, (2) networking (3) a shared vision and (4) strategic decision-making.²⁵ It invites us to consider the future as something that we can create or shape, rather than as some- thing already determined. According to FOR-LEARN²⁶ in the Foresight On-Line Guide there are four foresight principles: (1) action orientation, (2) an openness to alternative futures, (3) the use of participatory methods and (4) a multidisciplinary research orientation.”

Source: Jari Kaivo-oja & Jouni Martinen, Foresight Systems and Core Activities at National and Regional Level in Finland, 1990-2008, Developing Foresight Systems for a Better Life in Finland and Europe, Finland Futures Research Centre, Turku School of Economics, 2008.

One of the dominant themes of recent work in the futures field is how to address complexity^{27·28·29·22}. The approach advocated here entails, at a minimum,³⁰ thinking about the future in terms of anticipatory systems and being able to distinguish three types of future. Taking into account anticipatory systems is a critical first step because it provides the foundation for considering the different kinds of future that exist in the present. Since we live in an anticipatory universe^{31·32·33} characterized by time and motion, it is not surprising that many phenomena and organizations exhibit or contain anticipatory systems. Thus trees lose their leaves in anticipation of winter and humans plant crops in anticipation of hunger. Understanding the future from an anticipatory systems perspective takes into account animate and inanimate, conscious and unconscious mechanisms for integrating the non-existent future into the present.^{28·34}

Once the diversity of futures in the present can be made meaningful using an anticipatory systems analytical framework the next step is to distinguish the three dimensions of the future in the present.³⁵

Contingency

Contingency futures are phenomena expressed within a system that emerge due to the intervention of an extra-systemic event. One can prepare for or pre-empt a contingency future but when it happens it arises from an exogenous force. This potential of the present rests on the threats or opportunities posed by external forces that can be named or imagined (there is no way to make specific preparations for the unimaginable). Threats can take the form of known predators or disasters such as tsunamis, earthquakes, pandemics or other wildcard events that can be named. Contingency futures can also be positive such as winning the lottery or finding resources beneath desert sands that suddenly become valuable (although the latter are more open in nature and thus harder to prepare for other than general fantasies of what it might be like to be wealthy).

Contingency futures, based on closed models for estimating closed or specific future targets, can be imagined and even calculated probabilistically. Although statistics and odds are just informed guesses and “black swans” can pop up at any time, human beings have become fairly good at preparing for contingent futures. We use simulation and rehearsals (emergency drills) to generate adaptive capacities (open minds, transparency, good communications) that allow us to react to contingency futures that emerge from outside forces.

Optimization

Optimization futures are things we believe can be “caused” to happen in the future through premeditation and planning, generally in circumstances where the rules and resources are assumed to be given. The idea is to impose our will on the future—imagining, if ‘all goes well’, that we can ‘colonise’ tomorrow so that it conforms to our desires and expectations. Here the potential of the present is like a chess game, with many possible permutations and alternative paths, but the ends, means and

rules of play are given. Farmers plant seeds with the expectation of a future crop, knowing full well that many factors can intervene in the meantime: from locusts and war to good weather and enough “hands” to bring in the harvest.

Like with contingency futures humans are pretty good at optimization futures. And even when we suspect that our efforts to shape the future will only be partially successful, we have generally offered the rationale that the end (e.g. having food to eat later in the year) justifies the means (imposing a plan).

Exploration-discovery

The potential of the present goes beyond contingency and optimization futures. The blacksmith forging utensils and horseshoes may have a top-notch plan to improve the product line and beat the competition but as reality emerges novelty renders the plan obsolete. Toyota may beat GM because the way it plans its production of cars is better than that of GM, but the decline of the automotive era can leave both high and dry. Of course emergence driven systemic transformation need not be fatal for pre-existing systems, but the question is how to perceive it and use it. The first step is to recognize this distinctive category of the future.

Exploratory futures are those aspects of the present that need to be sensed and made-sense of through invention or creativity in framing. Exploration is about “seeing” the present differently; novelty and discontinuity are the hallmarks of this dimension of the present. Exploratory futures involve anticipatory systems and processes that facilitate identifying and making sense of phenomena that are unknowable in advance. Think of the Internet or cell phones, discerning and inventing the emergent possibilities calls for the capacity to imagine the future beyond what is already known. Exploring this dimension of the potential of the present calls for a delicate balancing act between the search for probability and appreciation of ephemeral and ambiguous emergence. When compared to optimization or contingency futures the appreciation of novelty depends on the paradoxical, even contradictory task of building a scaffolding that enables the “rigorous imagining” of discontinuity.

The danger is that formal, preconceived sources of inspiration, intended to enable discovery, are all too often exactly what snuffs it out. By insisting and imposing the patterns, words, and ideas of the past on the present, the new and non-yet-meaningful cannot be invented and brought into our sensing and sense-making processes. Exploration is not about the paths not taken—which are only the possibilities of the past brought to life by the present. Instead, it is about futures unimagined and hence a present that does not yet make sense.

Until recently, most familiar anticipatory systems and processes meant to bring the future into the present have only addressed the first two of dimensions of the future: both of which are closed systems approaches and hence incompatible with efforts to detect and invent complex emergent novelty³⁶⁻³⁷. As a result it has been particularly difficult to bridge the gap between probabilistic closed futures and novel emergence that is evident not only in recent Korean strategic foresight efforts but more generally in attempts at ‘strategic thinking’ that aim to set goals and reduce uncertainty. Although most studies do abide by the scientific practice of spelling out a few key anticipatory assumptions, in the vast majority of cases such assumptions take the form of justifications for the selection and weighting of “trends”. Although not usually anchored in an explicit rationale of trying to impose closed systems thinking such approaches do, even if implicitly, promise to serve as an antidote to the disturbing reality of uncertainty when the aim is to plan the future. More often than not trends or “mega-trends” are put to work as underlying anticipatory assumptions, the parameters that frame the description of the future and, in addition, are often embodied with causal force. This is the familiar policy model where the underlying anticipatory assumptions are left largely implicit because such assumptions are:

- considered “reasonable” or “conventional” simplifying depictions/predictions of “reality” in the present and future, or
- taken as implicit “givens”, perhaps considered exogenous to the mode—imposed for a variety of reasons, including the cost of questioning them.

For the most part such limitations do not pose a problem when it comes to “contingency” and “optimization” futures since in such cases the subject is already constrained, either by specific operational aspects of the system or precisely because the goals, rules and resources are assumed to pertain in the future³⁸⁻³⁹⁻²⁹. In these circumstances no systemic level changes in the conditions of change need to be taken into account.

Douglass North made a similar point when he explained that most of the models being used for policy analysis are ergodic,⁷ failing to incorporate changes in the conditions of change. In talking about the global environment, a “wicked” policy problem if there ever was one, North explains the distinction:

“I want to assert that almost all of the issues that we are concerned with in this room are uncertainty issues. Some result straightforwardly from simply not having enough knowledge. Faced with that kind of uncertainty, we can acquire more

knowledge and therefore convert uncertainty into risk, which is what human beings have done for a long period of time. Other uncertainty issues, however, arise from the non-ergodic aspects of the systems with which we are concerned. That is, the systems in which we are interested reside in a world of continuous change, in many dimensions—not only in terms of physical change but also change in the social structure and behavior of human beings. Furthermore, to make our lives even more difficult, all the theory that we have in economics, at least all of the theory that is well developed, is static theory. Whether one looks to neoclassical price theory or its derivatives, it is all a static body of theory. However, all of the important issues with which we are interested here concern a dynamic world, one of continuous change.⁴⁰

Here North is pointing out that most policy analyses fail to consider how the policy goal might change or be achieved differently under different conditions or when looked at in the light of other models. North makes an appeal for the development of “dynamic theory” without, however, offering much guidance. This is the challenge of addressing complex systems rife with emergent novelty. Is there a practical alternative to using the future for planning based on “best guesses” of what is considered probable? The challenge is to find practical ways to use the future in an open way, one that can capitalize more effectively on novel emergence and even, perhaps, change the conditions for such invention. This is different than undertaking optimisation or contingency oriented tasks, it is not about finding better ways to know the future and then set direction, take action on that basis. Rather it is about using the future to understand the present by changing what kind of future we attempt to imagine. This is an ontological difference and involves changing the why and what of using the future. Once the need to distinguish ontologically different anticipatory systems and processes becomes apparent the next question is how to make such an open approach practical? How can we constantly invent more open anticipatory assumptions, ones that foster frames for imagining and using the future that expand what we can sense and make-sense of? And, in this way, build bridges between the probabilistic and novel aspects of the world around us. This is a practical challenge that now needs to be addressed.

The next phase of using the future: How to embrace novelty

Today it is commonly expected that politicians will attempt to articulate visions of the future and seek endorsement from citizens. The administrative wing of the state, the expert civil service, will attempt to provide the best advice possible regarding how to turn politically validated visions into reality. In both cases, as already noted, the future plays a pivotal role. It is the image of the future that shapes intention and volition.¹⁹ It is the image of the future that privileges the instruments to be used and the way to use them in order to make the vision happen.⁴¹⁻⁴

Finding ways to discover and articulate images of the future is therefore central. However identifying something that, by the laws of our universe (as we currently know them), does not yet exist is impossible. Fortunately, as already noted, anticipation is also an attribute of our universe, as in the example already mentioned of the tree that loses its leaves with the approach of winter. The fact that there is a range of anticipatory systems, not exclusively reserved for conscious forms of anticipation, does not relieve humans who wish to exercise their volition and intention from working to understand the nature and functioning of our anticipatory systems.

In short, there is no reason to exclude the way we use the future, the attributes of our anticipatory systems, from the same exigencies that we apply to such topics as physics or economics. Inventing and testing hypotheses as a way to deepen, extend and sometimes reject accumulated knowledge applies equally to the future as a distinctive field of inquiry.⁴² In the context of an applied science, such as the development and implementation of collective action on behalf of citizens – policy, one of the primary questions is how to use the future to achieve the goals of governors and government.

Today considerable effort is being made to improve sense-making capabilities. However, one of the most powerful and efficient tools for understanding the complex present remains underdeveloped and less generally applied—it is the future.⁴³⁻⁴⁴ The main reason is that most people do not think very much about how they use the future. Leaders and policy makers, continue to use the familiar and intuitive methods of every-day experience (contingency preparedness and project planning) and yesterday’s successful techniques (such as forecasting, horizon scanning, scenarios, expert opinions)⁴⁵⁻²¹⁻⁴⁶ In part this reflects the apparent adequacy of these techniques based on past perceptions of our needs and capacities⁴⁷ In part it is only recently that advances in understanding complexity, uncertainty and novel emergence have opened up new ways of defining the future and hence begun to point towards alternatives ways of using the future.⁴⁸⁻⁴⁹⁻⁵⁰⁻⁵¹

None of this would be particularly salient except for the fact that at a practical level and in the case of Korea’s Vision 2030 and Vision 2040 business-as-usual approaches to the future are now confronting important limitations. One is a growing perception that we are living at a moment when so-called “wicked problems” are proliferating and uncertainty mounting. In this respect perception is reality⁸ and the present is calling into question the decision-making capacities (ability to take complexity into account) of everyone from the head of state and senior executive to the street vendor and parent in their home⁵² Another critical motivation to search for new ways of using the future for strategic foresight is the concern raised here regarding the gap between the probabilistic and complex-emergent attributes of the choices being identified and made by decision makers⁵³⁻¹⁵⁻⁵⁴

These perceptions of inadequacy coincide with a confluence of specific changes in values, tools and accumulated knowledge. The values are those that privilege diversity, tolerance and self-expression⁵⁵ The tools are those that enable interactivity and

fluidity, like the internet, mobile communications, shared languages, and easy transportation. The accumulation of knowledge is evident in our growing appreciation of the emergent nature of the universe and the role of creativity/novelty. All of this adds up to the need to bring our capacity to use the future into better alignment with both our perceptions of the world around us and our aspirations. Overcoming the lack of sophistication in the way we use the future could go a long-way towards enabling decision makers to embrace complexity, enabling novel emergence to become a larger part of how we understand and act in the present. Then the question would not be how to cope with a universe that seems to be getting more complex but how to improve our ability to take advantage of the novel emergence that has always surrounded us.¹⁰

South Korea is not alone in its efforts to assess and enhance public sector strategic foresight as systemic dysfunction and glimpses of disruptive change become more pervasive.^{56,22} Over the last few years initiatives aimed at improving the quality of strategic foresight have been launched in the UK, Singapore, Finland, Ireland, the Netherlands, France, the European Commission, and in the United States, for instance at the Pentagon.⁹ But Korea's exemplary work to develop visions and put those visions into practice now faces a new challenge: to use the future differently than in the past. The main general conclusion of this brief review of a decade of South Korean futures thinking is that in order for the government to continue to play a leadership role in using the future it will need to develop its capabilities in this field. Without coming to specific conclusions on the basis of this review there are still a number specific challenges that can be posed—directions for enabling Korean strategic foresight to identify and distinguish different forms of the potential of the present, to use the future in the same way that an accomplished reader can distinguish and invent (co-create) many meanings from a given text.

The challenge is to engage in participatory policy making, organizing structured conversations that treat the future as an explicit part of shared sense-making.⁵⁷ The goal is to embrace complexity not by abandoning assumptions about the future, but by better understanding the different kinds of futures we use when we make decisions and enhancing the richness of each.²⁸ The challenge then is not to ignore the traditional techniques for discovering what might happen in the future—contingency and optimization futures that are depicted with the help of a vast range of familiar predictive and probabilistic methods. It is to go beyond these familiar methods in order to take a more explicit anticipatory systems approach capable of distinguishing and applying different ways of using the future (Futures Literacy)⁴², ways that are appropriate to the context. For many governmental efforts at strategic foresight this means questioning both the theory of the future and the processes of knowledge creation used to address the future.

Korea's approach as reflected in the work reviewed here displays high technocratic standards and the excellent quality of the experts involved in the processes. However, such approaches are not fully capable of detecting emergent novelty or building the capacity to do so through action research that can generate multiple and continuously evolving imaginary futures as a means to question the systemic attributes, boundaries and relationships in the present.

Figure 1 sketches an exploratory strategic foresight process, one that pays equal attention to:

1. Narrative—developing sense making frameworks and stories that are meaningful to the participants in the process and the “targets”/decision makers relevant to the process;
2. Collective intelligence—generating evidence through action research that uses imaginary futures to invent and create collaborative maps that enable all participants to bring their deep and specific knowledge into the “story”;
3. Reframing—using “rigorous imagining” to develop and question the theories and models that define the variables and relationships, metrics and definitions being used to make sense of the present (note: pattern recognition/data mining is insufficient).

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Fig. 1: Futures literacy as a learning process

In summary form the challenge is to improve capacity in each of these three distinct inputs to state-of-the-art strategic foresight as well as the design principles that bring all of the elements together in an on-going developmental process. Building capacity in each area should enable South Korea's strategic foresight to continuously and rigorously discover and invent anticipatory assumptions, enhancing the sophistication of South Korea's anticipatory systems.

ANNEX

Annex A: Recent European forward looking studies. (Warnke, P.)

Table 2

³http://www.strategie.gouv.fr/article.php3?id_article=811

⁴<http://www.bmbf.de/en/12673.php>

⁵ Technology and Innovation Futures UK Growth Opportunities for the 2020s

⁶ Estrategia Nacional de Ciencia y Tecnologia (ENCYT) 2020. Ejercicio de Prospectiva a 2020

⁷ Edwin Bendyk: Poland 2020. A Look from the Future. Alternative Visions of Poland's development based on the National Foresight Programme Poland 2020 scenarios

⁸ Technology and Innovation in Flanders: Priorities. Summary report and recommendations. <http://www.vrwi.be/en/publications/study-18a>

⁹<http://www.foresight.fi/>

¹⁰ Sharing our Future: Ireland 2025 – Strategic Policy requirements for Enterprise Development

¹¹ Étude Technologies clés 2010 http://www.industrie.gouv.fr/techno_cles_2010/html/sommaire.php

¹² FNR FORESIGHT – THINKING FOR THE FUTURE TODAY, <http://www.fn foresight.lu/>

¹³ Horizon Scan Report 2007: Towards a Future Oriented Policy and Knowledge Agenda

Forward looking Study (Short title)	Country	Time Horizon	Time of conduct	Approach
France2025 ³	France	2025	2009	Panel work, scenario development, web2.0 dialogue
BMBF-Foresigh ⁴	Germany	2015-2020	2007-2009	Desk research, expert workshops, online-survey, interviews
UK TIF ⁵	UK	2020	2010	Desk Research, j interviews, expert workshops
ENCYT2020 ⁶	Spain	2020	2007	Panel work, expert survey
Poland2020 ⁷	Poland	2020	2007-2009	Expert panels, SWOT analysis, Delphi survey, PEST analysis, cross-impact analysis, and scenario-building
T&I Flanders ⁸	Belgium (Flanders)	2020	2006	Expert panels
FORSK2015	Denmark	2015	2007-2008	Internet consultation, workshops, survey
Foresight.fi ⁹	Finland	Long-term, Not fixed	Ongoing (assessed 2009/2010)	Blog debate on various future challenges among futurists, experts and stakeholders
Ireland2025 ¹⁰	Ireland	2025	2009	Scenario Exercise
ClésTech ¹¹	France	2010-15	2010	Expert groups assessing and ranking technologies
FNR ¹²	Luxembourg	2017 (ten years)	2007	Trend analysis, interviews, SWOT analysis, survey, workshops
NL Horizon Scan ¹³	Netherlands	Not fixed, scanning of current signals	2007	Literature analysis, signal scanning, consultations, creative sessions, clustering

Annex B: A few private sector strategic foresight studies

Monitor Company (1998) “*Knowledge for Action – Transforming Korea into a Knowledge-driven Economy*.”

Monitor report—shows how industrial knowledge economy can be seen:

At the heart of knowledge-driven economies are knowledge-driven companies. These firms use public and proprietary

knowledge to identify and create market opportunities. Because these companies are able to differentiate themselves from their competitors—by offering superior products or by making them more efficiently—they are able to generate higher returns. Of the many characteristics of knowledge-driven companies we have illustrated in this report, three stand out:

- *Effective management of organizational knowledge* Knowledge-driven companies do not leave the use of knowledge to chance. They actively identify and capture organizational knowledge. And they put it to use to improve operations and develop new strategies.
- *Significant investment in market and managerial knowledge as well as production technology* These firms also invest in all types of knowledge, not just technical knowledge. Knowledge-driven companies realize that knowledge about customer needs and competitor behavior is just as important as technical knowledge, if not more so.
- *Robust incentive systems to encourage use of knowledge by employees* Finally, knowledge-driven firms create a learning environment that stimulates knowledge development through the use of performance-based incentives for knowledge workers.

Mckinsey (1998) “Productivity- led Growth”

Same thing, industrial focus: The purpose of this study is to shed light on Korea’s medium and long term growth potential by building on a detailed industry-level understanding of Korea’s current performance. During our year-long research project, we analyzed how the prevailing regulatory environment has affected the performance of Korean companies relative to world best practice in eight key industries: automotive, steel, telecommunications, food processing, semiconductors, retail banking, general merchandise retail, and housing construction. Based on this microeconomic understanding, we were then able to generalize our findings to assess the output and employment growth potential for the whole economy under different assumptions on economic reforms.

World Bank—OECD (2001), Korea and the knowledge-based economy: making the transition

World Bank report—also industrial and convergence, catch-up inspired: Moreover, the majority of this growth can be attributed to knowledge accumulation, rather than to the accumulation of traditional factors of production of capital and labor. Korea had achieved this knowledge-based growth by investing heavily in education and training, boosting innovation through intensive research and development, and developing a modern and accessible information infrastructure, all coupled with a stable economic and conducive institutional regime that enabled the knowledge-related investments to flourish. Due to this, Korea has ably made its transition to a knowledge economy, that is, an economy that uses knowledge as the key engine of growth. Its successful knowledge-based development

Footnotes

¹ Primary work on this article was completed by the author in 2011 prior to joining UNESCO as Head of Foresight in June 2102. Recent revisions to this article reflect current work being done at UNESCO on Futures Literacy (Transforming the Future) and by a community of researchers exploring anticipatory systems (Conference 2017).

² There is now a large literature in the fields of systems analysis, complexity, future studies, and the science, philosophy and history of time that point to a “scientific revolution”, in a Kuhnian sense.³⁵

³ In addition to the texts and presentations noted in Table 1 the author also conducted interviews with: Dr. Kim, Dr. Suh and Dr. Woo.

⁴ Sections 3 and 4 are adapted from a variety of personal sources, including a forthcoming publication in Ethos (Government of Singapore), entitled: Futures Literacy: Embracing Complexity and Using the Future.

⁵ Futures, Foresight, Technological Change and Social Forecasting, World Future Review, Journal of Future Studies, etc.

⁶ For an initial list see the OECD International Futures Programme web site
http://www.oecd.org/document/0,3746,en_2649_33707_20600455_1_1_1_1,00.html

⁷ Ergoidc is the technical term in economics used to describe a model or system that remains stable over time. To use the terminology of Karl Popper, it is a system where there is no “change in the conditions of change”.

⁸ “Reality” is not more or less emergent from one moment to the next even if the dominance and stability of systems and hence degrees of openness and adaptation vary over time and context.

⁹ The Organisation for Economic Cooperation and Development’s International Futures Programme (see the IFP programme

description at <http://www.oecd.org/dataoecd/37/54/42332642.pdf>, the European Commission's Institute for Prospective Technological Studies, (<http://ipts.jrc.ec.europa.eu/>) the Risk Analysis and Management Project of the International Relations and Security Network headed by Beat Habegger and the International Risk Assessment and Horizon Scanning Symposium (IRAHSS) organised by the Singapore National Security Coordination Secretariat, the Defence Science and Technology Agency and the Centre of Excellence for National Security are a few examples of international foresight initiatives (http://www.rahs.org.sg/t2_ira_hss08_ats.html. References to recent publications of these groups are included in the bibliography at the end of this document).

Acknowledgements

The author gratefully acknowledges support from the Korean Development Institute and colleagues at KDI, in particular Cheonsik Woo. Thanks are also due to the referees of this journal. The views expressed in this article are those of the author.

References

1. Ostrom, E. (1990), *Governing the Commons: The Evolution of Institutions for Collective Action*, ISBN 9780521405997.
2. Bell, W. (1997), *Foundations of Futures Studies: History, Purposes, Knowledge (Human Science for a New Era)*, ISBN 9781560002710.
3. Bell, W. (1997), *Foundations of Futures Studies: Values, Objectivity and the Good (Human Science for a New Era)*, ISBN 9781560002819.
4. Ogilvy, J. (2002), *Creating Better Futures: Scenario Planning as a Tool for a Better Tomorrow*, ISBN 9780195146110.
5. Wilkinson, A. (2009) "Scenario practices: In search of a theory," *Journal of Futures Studies*, ISSN 1027-6084, 13(3): 107-114.
6. Miller, Riel (2016). "Recent developments in thinking about the future: An overview for policy makers," *Adaptive Governance for a Changing World*, Edited by Wu Wei Neng, Singapore Civil Service College.
7. Miller, R. (2006). *From Trends to Futures Literacy: Reclaiming the Future*, ISBN 1920963391.
8. Sakong, I. and Koh, Y. (eds.) (2010). *The Korean Economy: Six Decades of Growth and Development*, The Committee for the Sixty Year History of the Korean Economy, ISBN 9788980634576.
9. Schlosstein, D. and Park, B. (2006) "Comparing recent technology foresight studies in Korea and China: towards foresight-minded governments?", *Foresight*, ISSN 1463-6689, 8(6): 48-70.
10. Tuomi, I. (2007), "Learning in the age of networked intelligence", *European Journal of Education*, ISSN 0141-8211, 42(2).
11. Woo, C. "'Vision 2030' of Korea: Background and Main Contents, Senior Counsellor to DPM, Ministry of Finance and Economy," *Herald Background Paper*, Feb 24.
12. Webb, M. (2007). *South Korea: Mass innovation comes of age: The Atlas of Ideas: Mapping the new geography of science*, Demos UK.
13. Dator, J. and Yongseok, Y. (2004). "Korea as the wave of the future: The emerging dream society of icons and aesthetic experience," *Journal of Future Studies*, ISSN 1027-6084, 9(1): 31-44.
14. Miller, R. (1997). "Economic flexibility and societal cohesion in the twenty-first century: An overview of the issues and key points of the discussion," *Societal Cohesion and the Globalizing Economy: What Does the Future Hold?*, OECD, Paris, France, pp. 7-26
REFERENCE LINK
15. Cumming, G.S. and Collier, J. (2005). "Change and identity in complex systems," *Ecology and Society*, ISSN 1708-3087, 10(1): 29.
REFERENCE LINK
16. Sen, A. (1999). *Development as Freedom*, ISBN 9780385720274.
17. DeLanda, M. (2006). *A New Philosophy of Society: Assemblage Theory and Social Complexity*, ISBN 9780826481702.
18. Snowden, D. and Kurtz, C.F. (2003). "The new dynamics of strategy: Sense-making in a complex and complicated world," *IBM Systems Journal*, ISSN 0018-8670, 42(3).
19. Ogilvy, J. (2010). "Strategy and intentionality," *World Futures, the Journal of General Evolution*, ISSN 0260-4027, 66(2): 73-102.

20. World Bank - OECD (2001). *Korea and the Knowledge-Based Economy: Making the Transition*, OECD, ISBN 9789264182981.
21. Habegger, B. (2010). "Strategic foresight in public policy: Reviewing the experiences of the UK, Singapore, and the Netherlands," *Futures: The Journal of Policy, Planning and Futures Studies*, ISSN 0016-3287, 42(1): 49-58.
REFERENCE LINK
22. Warnke, P. (2011). "Towards transformative innovation priorities: Synthesis of findings from forward looking studies across Europe," Fraunhofer ISI, Karlsruhe, February 2011.
REFERENCE LINK
23. Kaivo-oja, J. and Marttinen, J. (2008). *Foresight Systems and Core Activities at National and Regional Level in Finland, 1990-2008, Developing Foresight Systems for a Better Life in Finland and Europe*, Finland Futures Research Centre, Turku School of Economics.
REFERENCE LINK
24. Godet, M. with Durance P. and Gerber, A. (2008). *The Use and Misuse of Scenario Building*, CNAM-LIPSOR, Dunod, Paris.
25. Gavigen, J.P., Scapolo, F., Keenan, M., Miles, I., Farhi, F., Lecoq, D., Capriati, M. and Di Bartolomeo, T. (2001). "A practical guide to regional foresight," Foresight for Regional Development Network.
REFERENCE LINK
26. Institute for Prospective Technological Studies (2005-2007). *Characteristics of Foresight*.
REFERENCE LINK
27. Aaltonen, M. (ed.) (2010). *Robustness: Anticipatory and Adaptive Human Systems*, ISBN 9780984216468.
28. Miller, R. and Poli, R. (2010). "Anticipatory systems and the philosophical foundations of futures studies," *Foresight*, ISSN 1463-6689, 12(3).
29. Millet, S.M. and Staley, D.J. (2010). "Does future thinking need a philosophy?" *World Future Review*, ISSN 2169-2793, 1(5): 23-30.
30. Miller, R. (2016). "Recent developments in thinking about the future: An overview for policy makers," in W.W. Neng (ed.), *Adaptive Governance for a Changing World*, Singapore Civil Service College.
REFERENCE LINK
31. Louie, A.H. (2010). "Robert Rosen's anticipatory systems," *Foresight*, ISSN 1463-6689, 12(3): 18-29.
32. Poli, R. (2010), "An introduction to the ontology of anticipation," *Futures*, ISSN 0016-3287, 42(7): 769-776.
33. Rosen, R. (1985). *Anticipatory Systems: Philosophical, Mathematical and Methodological Foundations*, ISBN 9780080311586.
34. Poli, R. (2006). "The ontology of what is not there," in J. Malinowski and A. Pietruszczak (eds.), *Essays in Logic and Ontology*, ISBN 9789042021303, pp. 73-80.
35. Miller, R. (2011). "Futures literacy: Embracing complexity and using the future," *Ethos: Journal of the Singapore Civil Service*, ISSN 1793-3773, 10: 23-28.
REFERENCE LINK
36. Bergson, H. (1946). *The Creative Mind*, ISBN 9780837103105.
37. Ulanowicz, R.E. (2009). *A Third Window: Natural Life Beyond Newton and Darwin*, ISBN 9781599471549.
38. Karlsen, J.-E., Overland, E.-F. and Karlsen, H. (2010). "Sociological contributions to futures' theory building," *Foresight*, ISSN 1463-6689, 12(3).
REFERENCE LINK
39. Mermet, L. (2009). "Extending the perimeter of reflexive debate on futures research: An open framework," *Futures*, ISSN 0016-3287, 41(2): 105-115.
40. North, D.C. (1999). "Dealing with a non-ergodic world: Institutional economics, property rights, and the global environment," *Duke Environmental Law & Policy Forum*, ISSN 1064-3958, X(1): 1-12.
REFERENCE LINK
41. Inayatullah, S. (2008), "Six pillars: Futures thinking for transforming", *Foresight*, ISSN 1463-6689, 10(1): 4-21.
42. Miller, R. (ed.) (forthcoming). *Transforming the Future: Anticipation in the 21st Century*, UNESCO Publishing and Routledge.
43. Adam, B. (2009). "Cultural future matters: An exploration in the spirit of Max Weber's methodological writings," *Time and Society*, ISSN 0961-463X, 18(7).

44. Poli, R. (2010). "The many aspects of anticipation," *Foresight*, ISSN 1463-6689, 12(3): 7-17.
45. Georghiou, L., Harper, J., Keenan, M., Miles, I. and Popper, R. (2008). *The Handbook of Technology Foresight: Concepts and Practice*, ISBN 9781845425869.
46. Keenan, M., and Popper, R. (2008). "Comparing foresight 'style' in six world regions," *Foresight*, ISSN 1463-6689, 10(1): 16-38.
47. Bishop, P. and Hines, A. (2007). *Thinking About the Future: Guidelines for Strategic Foresight, Social Technologies*, ISBN 9780978931704.
48. Bussey, M. (2009). "Six shamanic concepts: Charting the between in futures work," *Foresight*, ISSN 1463-6689, 11(2): 29-42.
49. Fuller, T. and Loogma, K. (2009). "Constructing futures: A social constructivist perspective on foresight methodology," *Futures*, ISSN 0016-3287, 41: 71-79.
50. Inayatullah, S. (2009). "Questioning scenarios," *Journal of Futures Studies*, ISSN 1463-6689, 13(3): 75-80.
51. Mermet, L., Fuller T. and Van der Helm, R. (2009). "Re-examining and renewing theoretical underpinnings of the Futures field: A pressing and long-term challenge," *Futures*, ISSN 0016-3287, 41(2): 67-70.
52. Sardar, Z. (2010). "Welcome to postnormal times," *Futures*, ISSN 0016-3287, 42: 435-444.
53. Chermack, T.J. (2006). "Disciplined imagination: Building scenarios and building theories," *Futures*, ISSN 0016-3287, 39(1): 1-15.
54. Curry, A., and Schultz, W. (2009). "Roads less travelled: Different methods, different futures," *Journal of Future Studies*, ISSN 1027-6084, 13(4): 35-60.
55. Sen, A. (2009). *The Idea of Justice*, ISBN 9780674036130.
56. Taylor, A. (2010). "Critical questions answered: Beyond scenarios to strategy with risk assessment and horizon scanning," in A. Low (ed.), *Decisions in a Complex World: Building Foresight Capacities*, National Security Coordination Secretariat, Singapore, pp. 227-240.
57. Rossel, P. (2010), "Making anticipatory systems more robust," *Foresight*, ISSN 1463-6689, 12(3): 72-85.
58. Korean Development Institute (1999). *DJnomics: A New Foundation for the Korean Economy*, ISBN 9788980630615.