THE FOR-UNI BLUEPRINT
A Blueprint for Organizing Foresight in Universities

EXECUTIVE AGENCY FOR HIGHER EDUCATION AND RESEARCH FUNDING – ROMANIA

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BLUEPRINT FOR ORGANIZING FORESIGHT IN UNIVERSITIES
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In order to fully develop their potential, universities need to widen their focus beyond the short-term needs of the immediate environment, and explore new challenges, as well as future opportunities. Foresight is a key element in creating more future-oriented strategies and policies. But, even though many university managers understand the need for a way to tackle an uncertain future, doubts about the usefulness of a foresight process undermine efforts to develop systematic approaches towards understanding the university's future. There is a distinct deficit of knowledge regarding the importance of foresight activities, as well as about the practical know-how for designing and implementing a foresight project. Easy to understand ***blueprints*** *are needed, providing knowledge on how to set up foresight activities that suit the specific circumstances of university management.*

A blueprint for organizing foresight in universities is not a how-to guide, and certainly not a substitute for foresight manuals. It does not provide a roadmap for developing foresight exercises in every single university in the world. However, this report offers insights on the problems an academic manager might face while trying to put together a foresight process in his university, and possible ways to tackle such problems. It is built upon real questions from real universities, with strong stakeholder involvement.

The expert group which produced the report was composed out of high-level experts on foresight processes. Their initial work was put to test during a focus group research conducted in Romanian universities, and the results were incorporated in the final report. The work started in November 2009 and ended with the dissemination conference on September 30, 2010.

Professor Adrian Curaj, Chairman
President of the Romanian National Authority for Scientific Research

CONTENTS

1. INTRODUCTION

There is one dream that humanity has been chasing since its most early ages, and that is the dream of understanding the future. From the shaman altering his consciousness to produce vivid images of the tribe's fortunes to the televised pundit of a post-modern era, experts who claim to posses unique understandings of past and present events had always been called in by the *phulē* in uncertain times, and asked to predict the future. As much as, at one moment in time, the Temple from Jerusalem was hosting a school of prognosticators, with thousands of students. Even though only the stories of those predicting doom were included in the canon laws of Abrahamic religions, we must assume that the bond between education and futurism had already been forged in those distant times.

The purpose of this report is not that ambitious. *Foresighting* the future is not the same thing as *foreseeing* it. For its proponents, *Foresight* seems to mean shared visions, inclusive methodologies, and collective learning. It is not aimed at predicting the future, but rather at understanding it. During the foresight processes strategic dialogues are created, and common anticipations are proclaimed.

If educators are guardians of the gate towards the future, than what do we make of the ancient question *quis custodiet ipsos custodes?* In other words, how can educators – citizens who perform one of the most future-oriented services for the community – be educated about challenges and opportunities that their students are expected to face? And what kind of challenges and opportunities are we actually talking about? How do universities react to these types of challenges? And how does this process alter their strategic management capabilities? All these questions fall within the scope of this report.

The *Blueprint for Organizing Foresight in Universities* is a report produced during the project *Quality and Leadership for Romanian Higher Education*. Its primary purpose is to help generate or enhance the prospective function

of Romanian universities. However, most of its content is not aimed specifically at Romanian higher education institutions, and any university manager might find it extremely useful. This is an outcome that the reader would surely expect after a reflection on futurism and higher education, given the intimate nature of the University, which is being both universal and local at the same time.

The *Blueprint* has been structured as follows. Chapter 2 outlines specific challenges which concern higher education. Chapter 3 deals with the actual stages of a foresight process. The reader is expected to get a clear picture of what is usually involved in a Foresight process. However, we must underline that the Systemic Foresight Methodology presented in this *Blueprint* is not considered by the authors to be an optimal approach, or even a recommendable approach, but rather one alternative among many. Chapter 4 examines cases which may resemble the type of studies we expect to be carried out. Five cases of university foresight from Ireland, Malaysia, Turkey, Canada and US were chosen, providing essential findings and diverse alternatives. Other studies were also deemed as worthy to be mentioned, for they are offering us an interesting thematic substance and geographical-institutional diversity. Chapter 5 is dedicated to ways in which foresight studies influence organizational strategic management, and also to speculations on the university's strategic management. The final Chapter 6 deals with the more delicate question of the transformations a university might undergo during the foresight process, and introduces the challenging concept of *futures literacy*.

2. MAIN CHALLENGES FACING THE FUTURE OF HIGHER EDUCATION

By ALAIN MICHEL[1]

The pace of change in our societies is such that, more than ever, those in charge of higher education, including of course the teaching staff and the students themselves, must make decisions or choices by regarding not only the present situation but also the future. This is not only because the nature of jobs and the working conditions are changing faster, but more generally in order to adapt as early as possible to the fundamental evolutions within our world. Moreover, higher education must take into account the possible alternative futures in order to make every student aware of the consequences of some current trends and enable them to have some impact on the course of events. It is why in a way *foresight* – or *forward-looking activities* (FLA) – can be regarded as the opposite of fatalism and resignation.

But beyond this general reason for adopting a foresight posture, there are some more specific challenges which concern higher education. One such challenge is certainly the process of internationalisation/globalisation in this domain, which has been steadily increasing, particularly over the last 20 years, leading to both issues of increasing cooperation and competition between universities, and more and more at a national policy level [1]. One dramatic aspect of such internationalisation at a political level is the implementation of the Lisbon Strategy and the Bologna process that led to the gradual building of a real "European Area of Higher Education" [2] by facilitating student and teaching staff mobility within Europe and developing new patterns of governance, evaluation of learning outcomes, and quality standards and procedures [3].

Another challenge which deserves much attention is the fact that higher education must meet the need of mass education, for both equity and efficiency reasons – because the so-called knowledge society requires new competences and a higher level of qualification of the manpower –, but also

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the need of excellence in the context of a keener economic competition among countries. New current trends in higher education show also an increasing tension between two objectives: raising the level of general culture and better fitting to the needs of the labour market by giving more importance to the notion of employability. This, in particular, requires new ways of cooperation between business and the academic community.

Another issue which makes the future of the organisation of higher education still more uncertain is the change of the landscape enhanced by the fast transformation of information and communication technologies (ICT), the development of networks, and the dynamic interaction between technological innovation and social organisation [4].

Last but not least, most of the major innovations seem to be more and more related to interdisciplinary or trans-disciplinary research, and some outcomes of such research are raising new fundamental ethical issues (such as brain research or genetics) [5].

All these challenges and their implications for the future of higher education are now going to be further analysed. But already, it is worth to underline that they imply, more than ever in the past, strategic and forward thinking. In particular, the speed of all these fundamental changes requires analysing the possible long-term consequences of today's choices. This was well illustrated by the French philosopher Gaston Berger's metaphor: "When you travelled at night in a handcart drawn by a horse, in order to see the road, you only needed a lantern, when you are driving a fast car, you need long-range headlights."

2.1. UNIVERSITIES MUST PREPARE STUDENTS TO LIVE IN A FAST CHANGING WORLD

The simultaneous development of the virtual global village and the resurgence of nationalism and regionalism tropisms brought about new challenges for education at all levels and not only for higher education [6]. Globalisation and instant network communication along with the acceleration of scientific and technological change are pushing towards a predominance of immediacy to the detriment of an appreciation of the longer term, towards a preference for zapping and surfing on the web over a continuous effort for acquiring

real knowledge. The bywords of such "short-termism" are mobility and flexibility. Fast adaptation and speed of reaction are regarded as more important than strategic thinking based on societal visions in the long run.

The blind belief in self-regulating mechanisms instead of strategic governance has been without a doubt the main cause of the recent financial and economic depression worldwide. Indeed, the dominant ideology in the recent period was to believe in the capacity of competition and market mechanisms to optimise the welfare of people, forgetting that the "invisible hand" needs some strategic vision and governance in order to operate efficiently in the medium and long run. If the cybernetic regulation through the signals given by the price variations on a market can be efficient in the short run, subject to certain conditions, it is not the case in the long run, because, as it is well stated in economic theory, markets are short-sighted.

Thus, it appears that if education must prepare students to accept fast change as a quite usual thing, which requires questioning any previously acquired knowledge, it must also prepare students to question the results of change and to assess them with respect to some basic ethic values related to humanist principles. One must remind of Rabelais's warning stated as early as the 16th century: "Knowledge without conscience is but the ruin of the soul".

To prepare students to be able to react and innovate in fast changing contexts also requires thinking about the new competences and skills which should be most enhanced. For example, the ability to anticipate, the ability to react quickly to a new context, and the ability to communicate in inter-cultural environments are likely to become increasingly crucial competences in the near future. Moreover, as it was previously mentioned, more and more innovations require interdisciplinary research. In this respect, universities are still very often conservative in their organisation and in their curriculum. Strategic thinking based on foresight activities is a "must" in order to adapt the curriculum to the future needs of the students and to new paths for research. Such evolutions require a new organisation of universities and new relationships between disciplinary departments.

The new context also requires developing new links with industry and business so as to try to anticipate as early as possible new competences and skills, especially transversal competences, which will be required by the labour market in the next 10 or 15 years. This must not be done in an "adequationist" perspective but rather in a perspective that takes into account the dynamic interaction between the supply of qualifications by the universities and the demand of qualifications by the labour market.

2.2. UNIVERSITIES MUST FIND OUT THE RIGHT BALANCE BETWEEN COOPERATION AND COMPETITION, AS WELL AS BETWEEN MASS EDUCATION AND EXCELLENCE

In the context of globalisation, Stephan Vincent-Lancrin suggests six possible scenarios for the future of higher education, each of which could be pursued by some universities, while others could follow other paths [7]:

- a traditionalist scenario, which stops or slows down the movement towards mass education, marketisation, use of ICT and adult education;
- an embrace-change scenario, bringing in private funding under the control of the higher education institutions;
- a market-driven scenario, in which organisations look for some specialised niches, developing international partnerships and use of ICT for distance learning;
- a lifelong learning scenario, with some universities certifying courses and other traditional functions moved to the private sector;
- a learner-led scenario, in which learners design their *cursus* and select courses from a global network of universities and industrial partners;
- an informal learning scenario, in which formal higher education is shrinking and eventually disappearing[2].

As it is well mentioned in the chapter 5 (“The future of Higher Education”) of the UNESCO World Report *Towards Knowledge Societies* (2005, *op. cit.*), in the context of an increasing international competition, very few universities can pretend to be “world-class” and belong to the “happy few”. But international rankings, like the Academic Ranking of World Universities (ARWU), compiled by the Shanghai Jia Tong University[3], or the Times Higher Education World university ranking, had an important impact that needs to be analysed. Beyond the methodological limits of the different parameters used to set up such rankings, one should underline that they are not relevant for all higher education institutions. The main criterion for establishing such rankings is the quality of research recognised by prestigious awards (Nobel Prize, Fields Medal, etc.) or publication in international scientific journals (such as “Nature”). The ranking also takes into account the fame of these institutions through surveys among university professors, which is much correlated with the previous criterion.

[2] These scenarios can be compared with those related to education as a whole and built by the CERI/OCDE: Michel, A. (2001), “Six scenarios sur l’école”, *Futuribles*, no 266. This analysis of the scenarios by A. Michel can also be found in the UNESCO World Report 2005, “Towards Knowledge Societies”, pp. 76–77.

[3] The methodology of this ranking designed by N.C. Liu and Y. Chang in 2003 has been criticised by many authors.

Only few universities can aim at such international recognition. Therefore, each country and each higher education institution must organise some strategic thinking in order to consider what are the best choices given today's constraints and what will be possible in the next years.

Given the increasing strategic importance of higher education and research in the Knowledge Society and of attracting good students and scholars, debates about the priorities to set up have been organised at European, national, and university levels. In order to introduce a European point of view, the European Commission has launched a long-term project of designing a European ranking aimed at helping European universities to assess their respective positions internationally and thus improve their strategy of development [8]. The call for tenders published by the Commission in December 2008 invited bidders to design and test a new multi-dimensional ranking system that would include the various missions of higher education institutions (education, research, innovation, impact on local development, internationalisation, etc.).

Nationally, many initiatives were taken over the last years in order to create *pôles d'excellence* able to compete with the best universities internationally: It was the case for instance in Germany and in France where 10 universities were selected for receiving special grants.

These initiatives at European and national levels were generally taken along with initiatives for giving more autonomy to the universities and setting up new modes of governance, most of the time inspired from the model of the most famous American Universities (such as Harvard, Stanford or Berkeley).

The ongoing changes raise important issues which need large forward-looking debates at national, regional, and university levels. One first issue is about the division of labour between universities. Indeed, pragmatism and realism are leading to the singling out of a few universities that concentrate financial efforts and competences, in search of excellence, in some domains of research. But to what extent should we have a specialisation of universities, with some prestigious institutions mainly oriented towards research and some others specialised in mass tertiary education? If it sounds reasonable to establish some specialisation, is it socially relevant to separate two kinds of institutions as they have them in the US, *i.e*. colleges and universities? In other words, is it relevant to consider that some universities must specialise in teaching (initial and lifelong education), without any commitment to research activities?

Another aspect of the division of labour between universities is related to the issue of the contribution to the regional economy and to town and country planning. As one of the missions of universities is to contribute to the development of human and social capital within their regional environment in order to enhance regional development but also social cohesion by decreasing unemployment in their area and increasing the real income of the population, this also needs to be taken into account in any debate about the future role of any university.

Still another aspect of the division of labour is the importance which should be given to adult education in the perspective of lifelong learning. What complementarity should there be between education provided by the university and education/training provided by the employers? How should such a balance evolve in the next years? Should the priorities change, mainly at the regional level given the economic evolution and the development of new economic activities?

Even though a small-sized higher education institution does not have the vocation to do fundamental research, is it not relevant to maintain some applied research or R&D activity in relationship with the local and regional firms? Many examples of important innovations can be attributed to such small institutions.
Another aspect to be taken into consideration, when having a debate about the “strategic positioning” which would fit best the possibilities, the constraints, and the future perspectives of any university, is how to define the quality of the services provided. In particular, the definition of the curriculum and the assessment of student learning outcomes must guarantee a certain level of quality without discouraging too many students. The curriculum and the assessment tests must be demanding but not at the cost of high drop-out rates. “How good is good enough” is an important question which should not be eluded as it is too often the case.

Taking into account all these issues raises the question of the possible evolutions of the relationship with other higher education institutions at regional, national, and international levels, with business and various public utilities, associations, unions, etc. This implies a debate with all the stake-holders involved. Another important issue is the most appropriate public policy and the possible modes of governance of the universities themselves necessary to increase efficiency and equity.

2.3. WHAT PUBLIC POLICY AND WHAT MODE OF GOVERNANCE FOR HIGHER EDUCATION?

We will use here and comment the conclusions and recommendations of a recent report written by a commission coordinated by Philippe Aghion, Professor of Economics at Harvard University about "University excellence: Lessons from International Experience"[4] [9]. These conclusions could be an initial contextual framework for strategic foresight thinking at university level.

In November 2009, the commission was invited by the French Minister of Higher Education and Research (Mrs Valérie Pécresse) to formulate some conclusions and recommendations based on an analysis of the recent evolution of some higher education institutions worldwide. The interim report presented in January 2010 aims at feeding a debate about the possible ways of developing some poles of excellence, able to compete with the best universities worldwide, while ensuring some quality of performance throughout the higher education system and, in particular, a good insertion for students on the labour market.

The observation of various policies shows that promoting excellence is not aiming only at improving a few universities with an exceptional potential but creating a positive impact on a higher education system as a whole. The main conclusions are the following:

- Academic excellence is a major factor of potential growth for industrialised countries. In order to enhance such excellence 3 main instruments must be used simultaneously: increase university autonomy, increase financial support, and adopt an incentive policy in providing financial resources for research.
- Academic excellence requires a mode of governance ensuring a balance between administrative and academic functions with, on one hand, a "board of trustees" including a large share of external partners, which appoints the president of the university and an executive committee, and, on the other hand, an "academic senate" which advises the president and the ad hoc committees (including teaching staff of the university and outside) that approve or reject the proposals of appointments or promotions submitted by the various departments. The core of any pole of excellence

[4] The other 9 members of the commission of the report included professors from various countries (Belgium, Germany, Netherlands, and USA) and former professors involved in university reforms. The other 9 members of the commission of the report included professors from various countries (Belgium, Germany, Netherlands, and USA) and former professors involved in university reforms.

should be the doctoral college of the department in various disciplines. But a university looking for excellence must accept a strong leadership allowing for a certain coherence and unity of the set of disciplinary departments.

At the European level and in some European countries, some policy measures were taken, with some common features: pluri-annual funding concentrated on some institutions for enhancing their attractiveness and their competitiveness, implication of the scientific community in the steering of such initiatives, bottom-up approach through calls for projects. These initiatives were taken in the context of overall reforms of the modes of governance and financing procedures (more autonomy of the universities: curriculum, finance and human resources management), and they were supported by a large part of the scientific community. More importance is given to interdisciplinarity and coordination between scientific departments.

The incentive policy is considered as fundamental in stimulating relevant research and its quality. The main characteristics are:
- transparency (explicit rules);
- bottom-up approach;
- evaluation by peers;
- assessment of the peers themselves.

Such an incentive policy was adopted by the European Council for Research, and many European countries like France, Germany, and the UK. But this logic of incentives must avoid taking into account only short term objectives. In order to allow for some risk taking and creativity, the quality of research must be assessed in the long run. Also, it does not prevent cooperative strategies between universities. All these challenges require that every university should include in its organisational chart a strategic body able to develop a foresight reflection about the evolution of the curriculum[5], of the missions of the university and of the new possible ways to accomplish them, the best way of combining cooperation and competition, the new partnerships to be developed, the required changes in the internal organisation of the universities, and the possible ways of gradually changing mindsets and attitudes of all the stakeholders involved.

[5] The impact of globalisation on the curriculum must be considered in a lifelong learning perspective. This is the main theme of a recent issue of the *European Journal of Education (EJE)* (2010) vol. 45, issue 1: “Knowledge, Globalisation and Curriculum”. See, for example: Young, M., and Muller, J., “Three Educational Scenarios for the future: Lessons from Sociology of Knowledge”.

3. SYSTEMIC FORESIGHT METHODOLOGY (SMF)

By OZCAN SARITAS[6]

As an unavoidable human trait of thinking about the future, “foresight” is not a new concept. It has been there since the existence of the first human being on the earth surface, and humans have always been concerned about their future actions and the consequences of those actions on them. The use of individual foresight in a collective and participative way is a rather new phenomenon, which led to today’s more formal, “institutional”, Foresight practice. More recently Foresight has been a widely acclaimed activity associated with policy making by government, industry, and other organisations to shape the future of the society.

Foresight practice as an institutional activity has evolved in time as the situations in the world changed. Societies have been more concerned with the future and endeavoured to predict and shape it in times when they faced uncertainty and transformations. These are the times when Foresight practice evolved and new ideas were introduced due to a growing need for dealing with changing contexts and related situations. These emerging new situations became increasingly complex and more difficult to deal with, and earlier approaches were usually unable to deal with them.

The 2000s have witnessed increasing complexities in societies. Although the world has got better for some, for the vast majority it appears vulnerable to social and economic instability and hostility due to the economic recession, lack of fresh water, food, and energy supply, climate change, regional conflicts, and respective population movements. The new global context suggests increased financial, trade and investment flows in leading to a more interconnected and interdependent world, which is accelerated by rapid technological progress in areas such as ICTs, biotechnologies, fuel cells and nanotechnologies. The new ICT-enabled society demands inclusiveness and equity through freedom of association and expression, with full protection of

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human rights. There is now an emerging need for new international regulations and standards to govern trade, quality, labour, environment, and intellectual property rights.

As a result of these developments, it has been observed that the scope and focus of foresight activities widened to cover a wide variety of issues. Although, it is observed that the nature of the situations has changed and has become more complex and uncertain, the way foresight deals with them remains largely unchanged. “Systematic” method-bound foresight processes are suggested to tackle with “systemic” situations involved in human and social systems, which are “open” in nature. The notion of “open” system comes from the unpredictability of the behaviours of the system elements. In this respect, systems, particularly human and social systems, behave differently, both spatially and in time, under different circumstances. Therefore, investigations into these systems require specific approaches each and every time, which are developed following a comprehensive “understanding” phase, which includes understanding the context, content and process of Foresight (Saritas, 2006).

Any change activity, like foresight, should be linked to a broader context. The lack of attention to the context, whether it is global, national, or regional, leaves the critical issues unrecognized, which has been the case in methodologically-bound activities. Thus, it is recognized that foresight should not strive to understand the issues as episodes divorced from the historical, organizational and/or economic and social systems from which they emerge. The content of the foresight activity is constructed from its context by capturing the promising points of leverage that can provide social, economic and environmental benefits in the future. The process of foresight under the guidance of the systemic foresight methodology (SFM) is then designed in line with the characteristics of its context and content.

Another important feature of SFM is its emphasis on inclusivity and behavioural matters involved in foresight. Because of their overt techno-economic purpose, earlier foresight studies relied on the opinions of a relatively narrow body of technologically-oriented people. However, there is now a greater need for widening the scope of consultation in foresight to turn it into a much wider social process. This need is largely prompted by the recognition of the limitations of foresight regarding participation, the lessons learned from the corporate sector regarding the benefits of

stakeholder inclusion, and trends for increased inclusivity across all areas of policy making. In order to achieve this inclusivity, the practitioners of the activities need to put much effort into understanding the behavioural matters. Therefore, the important drivers for the development of SFM are:

- To learn to anticipate, with the intention of being prepared for or preparing for whatever might follow from the ongoing and future social, economic and political mayhem, with a rich understanding of existing systems and procedures, their history and possible futures.
- The analysis of different stakeholder perspectives and their social relations in the system, which can affect and be affected by the process.
- The impacts of formal and informal networks and procedures, which can be in favour or in conflict with other systems.

SFM suggests a "systemic" foresight approach, beyond usual methodology-based approaches, in order to place thinking and understanding situations at the forefront of the foresight process.

3.1. SYSTEMIC FORESIGHT METHODOLOGY (SFM) PROCESS

The SFM sets out to create systemic concepts that are useable for future-oriented idea creation in complex human and social systems. It considers the Foresight activity as a "systemic inquiry" where the actual design of the system can only be partially specified in advance of system operation. This is because, when human and social systems are dealt with, the most thoughtful and carefully designed systems may have unintended consequences. System behaviour and informal structure emerge only through system operation regardless of the detail or diligence in design efforts prior to system deployment. The over-specification of a system's requirements (i) wastes limited resources, (ii) reduces system autonomy, which means the agility and flexibility of the system to respond to environmental shifts are reduced, and (iii) fails to permit subsystem elements to self-organise based on their contextual knowledge, understanding and proximity to the operating environment.

The SFM sees the design of an institutional Foresight activity as a creative process that will be engaged in designing a future system to fulfil goals and expectations. Therefore, the SFM specifies only the minimal requirements necessary to achieve the systems objectives. Thus, the SFM suggests a learning system, which structures a systems-based debate to formulate the basic "mental acts":

1. Systemic understanding
2. Systems synthesis and modelling
3. Systemic analysis and selection
4. Systemic transformation
5. Systemic action.

The mental acts aim at guiding Foresight practitioners to set their agendas for the different phases of the Foresight activity and to give direction to their thinking processes. The benefits of this approach lie with its systemic guiding (1) to design a Foresight methodology, which fits well with the context and content of the exercise, and thus (2) to make decisions involved in thinking about the future and connecting the future with the present.

The mental acts explain how systems such as human and social systems, industrial and sectoral systems, and innovation systems are understood, approached and adjusted for a successful change process. They follow each other, just like the steps of the Foresight process, but they are iterative and can be repeated as many times until the practitioners believe that their complete function has been fulfilled.

Therefore, methods are not the departure points of the Systemic Foresight approach. Methods are used to support and develop understanding of the situations, to discuss and develop alternative models of the future. Methods are selected and integrated following a comprehensive 'understanding' exercise. In this way, methodological solutions are produced after a diagnosis of the situations.

3.1.1. Systemic Understanding

The first phase of the systemic process of inquiry is understanding, which starts from the beginning of the Foresight process and provides input for the overall activity. Understanding starts out seeking to attain a reasonably comprehensive view of situations. The aim is to gain a shared understanding and mutual appreciation of situations, issues, and influencing factors as systems within their own contexts by uncovering uncertainties about the values and preferences of actors and stakeholders, and clarifying the goals of the entire activity. In this way, the SFM offers a mindset for understanding how systems work and behave. The aim is not necessarily to bring about a convergence of views; however, at least a partial convergence is likely to emerge from this process in practice.

When a system is approached, two kinds of understanding can be mentioned:
1. Understanding the system “spatially”
2. Understanding the system “dynamically” and “historically”.

With regard to space, attention is paid to the nature of the system under study and its structure (*i.e.* organisational and functional structure). Understanding the system dynamically and historically refers to seeing the system as an evolutionary entity by considering its behaviour in time. The SFM places a great emphasis on scanning and modelling in order to understand systems and their behaviours. When situations are examined, first systems are searched for and analysed; and then information on those systems such as history, formal and informal structures, and stakeholder perspectives are collected by reviewing and scanning. Looking at the interrelationships and interdependencies between systems and their elements, the boundaries of the systems are negotiated, which is a matter of philosophical and epistemological importance. Models are produced as an outcome of the boundary setting process. These models can initially be linguistic and figurative; therefore, this process should not be seen as an immediate engagement with mathematical or empirical forms of modelling.

The initial models ought to promote understanding of systems and situations within the limits of uncertainties, which are involved in the surrounding formal knowledge and information flows. The models produced are open to revision if interpretation does not support the premises of modelling, bearing in mind that the model is not reality. Quality checks on interpretation, though subjective, depend on the notions of relevance and reasonableness, and to lesser extent on robustness. Some modelling work might benefit also from quantitative modelling techniques at the later stages of inquiry.

Modelling, which should not be confused with methods, is at the core of Foresight by formalising thought experiments and, through feedback, their extension. Modelling leads to the further development of the Foresight process and, similarly, to the presentation of the outcome.

Understanding, appreciation, and then visualisation of systems allow for:
1. A holistic view where the attention is turned not only on the systems under investigation, but also on the other external systems and interrelationships and interdependencies between them;
2. A step towards understanding the context within which the organisation looks for ongoing cycles, trends or emerging issues of change, such as innovations, value shifts, and deviations;
3. A step towards developing ideas on how to intervene into systems in order to create a lasting change.

As a result of this process, the initial boundaries of the system under investigation can be drawn and the content of change can be defined by capturing the key factors or "weak signals" of change that would have strong potentials to change the existing system into a more desirable future system.

Thus, understanding helps to set out the rationales and objectives of the exercise and to scope the exercise by defining its boundaries. Following the appreciation of systems and diagnosis of issues, understanding provides a background for the design of the methodology and helps to identify the stakeholders and actors in the system. Decisions can be taken on the shape and size of the activity after this phase.

3.1.2. Systems Synthesis and Modelling

Following the gaining of a shared understanding and mutual appreciation of systems, this mental act encourages practitioners to explore alternative images of the future. Thus, the next step is the development of future models, based on anticipation. These models will cover a range of possible, plausible and desirable future systems. Independent from existing systems and their influence, fundamentally new systems can be suggested with the involvement of a high level of creativity. New actors and stakeholders can be brought in, existing ones can be removed, and/or new roles can be suggested for them. Similarly, new relationships between the system elements can be established, and existing ones can be modified and/or removed. The overall aim is to create a desirable future system.

Visual representation tools are extremely valuable to understand systems, their elements and the relationships between them. Systemic models represented can portray how the impacts of trends and emerging issues move inward and outward and influence the structure, behaviours, opportunities, and constraints. The output of this phase are the "models of the future", which do not necessarily pretend to be complete and quantifiable. These models lead to the creation of various alternative scenarios for the future. Modelling, Scenario Planning, Gaming, and Simulation are the methods which may be of help to explore alternative futures.

3.1.3. Systemic Analysis and Selection

Following the construction of alternative models of the future, this phase is concerned with the systemic analysis of those alternatives and selecting the most desirable one. The analysis and selection of a desired system is

multifaceted as there is a variety of worldviews and expectations to be negotiated. According to Ackoff (1981), for a system to be viable in the long term, the claims of different stakeholders must be considered adequately, and, therefore, attention must be given to ethical and aesthetic aspects for the pursuit of ideals such as beauty, truth, good, and plenty. During this process, decisions on the desired future system need to be aligned with the normative goals and values. An inclusive process, where the creative exchange of ideas and information sharing among participants is experienced, is beneficial. The definition of the "most desirable" future system is a matter of "prioritisation". The end product of this phase is an agreed model of the future. Methods like Delphi, Cross Impact Analysis, Multi-Criteria Analysis, SWOT and/or Cost/Benefit/Risk Analysis can be considered among the methods to support this process.

3.1.4. Systemic Transformation

Following the decision on the most desirable/preferable future, this phase aims to connect this future with the present and suggests actions to be taken. Thus, transformation establishes the relationship between the future and the present for a successful change programme. The transformation from the present system to a desirable future system requires taking strategic level decisions. In this process, the following factors constitute conditions for the successful transformation strategies:

1. Assessment (*e.g*. processing information; developing an understanding of the continuously changing context; and becoming an open learning system)
2. Leadership (*e.g*. having a context-sensitive leadership; creating capabilities for change; linking actions with resources; and constructing a climate for change)
3. Linking strategic and operational change (*e.g*. supplying visions, values and directions; implementing intentions over time; and implementing supportive activities)
4. Management of human resources (*e.g*. raising human resource management consciousness; demonstrating the need for change in people and behaviours; creating a longer term learning process with successive positive spirals of development)
5. Coherence (*e.g*. achieving the consistency of goals, creating an adaptive response to environment; and maintaining competitive advantage).

A backcasting or roadmapping procedure would be beneficial to define the steps of the transformation process in the long, medium and short run.

3.1.5. Systemic Action

Any Foresight exercise has to inform policies and actions. This is the final phase, which is concerned with the creation of plans to inform present-day decisions concerning immediate change actions to implement structural and behavioural transformations. Actions suggested at this stage aim to give messages on the first and most immediate interventions on the existing systems. Operational level questions are asked for actions, such as “what and how”, “where and how”, and “who and how”. The actions for change are determined by considering the following capabilities of the system under investigation:

1. Adapting
2. Influencing and shaping its context
3. Finding a new milieu or modelling itself virtuously in its context
4. Adding value to the viability and development of wider wholes in which it is embedded.

Action Plans, Operational Plans, Priority Lists, Critical/Key Technologies can be among the outputs produced at this stage.

All phases of the SFM described above are systemically interrelated. Each of them builds on the previous one, culminating in policies, strategies, and actions for the design of a future system. However, information and action flows between the phases do not necessarily occur in a linear way, but from one to the others in a systemic way. Each phase can be iterated more than once until the outputs and process outcomes planned are achieved. Upon completion of the process, the phases link back to create a full circle of Foresight, in a continuous loop similar to Argyris and Schon’s double-loop learning and Vicker’s Appreciative System. This allows for the continuous development and adaptation of systems. It is important to highlight that the process of Foresight is just as important as the end-product, and that the commitment to the process by participants is essential if the policies and strategies are to be successfully implemented.

The SFM process described above does not take the methods as a starting point. The methods are regarded as process and decision aids (“means”), not as the overall aims of the exercise in themselves (“ends”). They fulfil specific functions in the overall process. Thus, the SFM does not impose any particular method. Instead, it benefits from a pool of available foresight and forecasting methods and other planning and policy tools. However, it is considered useful to specify various methods, which might be of use for each phase of the Foresight process (Figure 3.1).

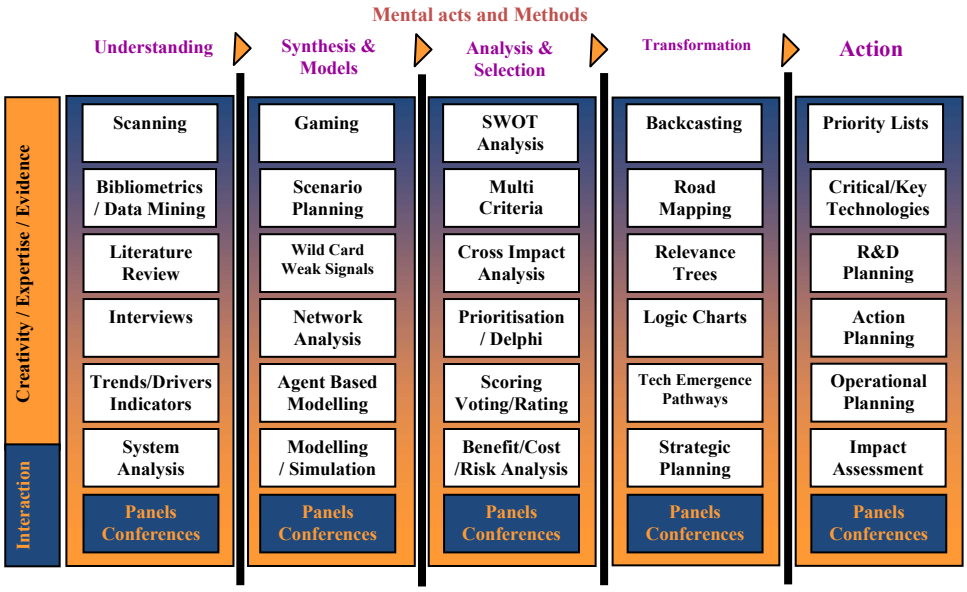

Figure 3.1. Classification of Foresight Methods.

Each column in the figure indicates one phase of the systemic foresight process. The selection and integration of methods in the list are done under the guidance of the mental acts, in a close interaction with the context where the Foresight activity takes place and is expected to improve. All methods involve a certain degree of information input, creativity, expertise, and participation. The list can be extended to include other methods given that they fulfil the functions of the different phases described above. It is important to note that the use of the methods will also be determined by available resources including expertise, skills, time, and budget, along with the level and type of participation required.

3.2. INTRODUCING SYSTEMIC FORESIGHT METHODOLOGY IN UNIVERSITIES

The SFM would help universities to overcome the barriers preventing them from looking into a longer term future, such as limited funding, infra-structures, and human resources. In this regard, two broad motivations for using SFM in universities can be mentioned:

1. Setting future directions for academic institutions
2. Developing strategies for human resources.

Some of the rationales for setting future directions for academic institutions are:

- Broad strategies and the issues. These generate points of leverage and priority lists with detailed action plans for implementing a long-term visionary strategy for the positioning of universities in a wider higher education context;
- Thematic strategies for new areas of research and new research in established themes. The broad research themes identified at the institutional level and the more specific research themes within these broad themes will indicate the areas where universities should make research applications relevant to the long, medium and short term future;
- Identifying new research areas within the existing areas based on maintenance of continuing capability in those areas, and in new areas supported by the broad strategies and their thematic components and research outcomes;
- Programmes to form a coherent pool of themes suitable for creating new topics for PhD and MSc theses and dissertations allowing academic institutions to benefit from their current and future graduate students' contributions to the research topics identified at the departmental level and research theme level for the next 10–15 years;
- New courses, teaching methods and media. New courses to be delivered for the next 10–15 years. Future R&D areas identified should also be considered to be potential areas for education and training. Along with the content, novel teaching methods and media can be developed. Modification of existing undergraduate and graduate curricula in light of identified education and training areas; including the identification of new target groups to which universities should offer new research and training programmes.

From the Systemic Foresight process, universities should gain knowledge of all the current potential research and teaching human resources, their areas of interest, and the infrastructure requirements including:

- Improved allocation of research and teaching potential. After the exercise, universities would know which staff members are interested in the identified research and teaching areas now and in the short, medium and long term future;
- Recruitment. Knowing the research potential and the future R&D and E&T areas, universities should decide on the profile of the research and teaching staff it requires and when they are needed. For instance, they should know that researchers working on "alternative energy sources"

might be needed around 2010–2015, since this topic might be high on the agenda after 2010. This would also mean that universities should select graduate students willing to work in this field immediately to produce potential researchers by 2010;

- New infrastructure requirements. Knowing the human resources needed for the future, the university should determine its infrastructural needs, which could come into existence in the following years in relation to the allocation of its budget;
- Collaborations. During and after a Systemic Foresight exercise universities would be clearer with whom to collaborate. By showing the other relevant systems, the Foresight process can help universities to identify the actors to take collaborative actions in the future, including other academic institutions, public and private sector organizations, and NGOs;
- Knowing themselves. The Systemic Foresight process would open new communication channels between the university academic and research staffs who usually have limited interaction during the problem-driven departmental meetings and who do not know actually who does what, and who wants to do what in the future.

4. LOOKING FOR INSPIRATIONAL STUDIES

By PIERRE ROSSEL[7]

4.1. INTRODUCTORY REMARKS

The purpose of this section is to identify cases which may resemble the type of studies we intend to carry out in this *Blueprint for Organizing Foresight in Universities*, or at least allow us to capture inspirational ideas on the kind of channels, features and solutions envisaged, which could prove to be useful for our own goal. This objective seems rather simple and straightforward. In reality it is not entirely so, for two main reasons. Firstly, there is probably no exact previous study involving at the same time all the characteristics, institutional boundaries, and contextual expectations as the *Blueprint for Organizing Foresight in Universities*; which does not mean that several similar studies, in their aim and scope, cannot provide interesting material for our own purpose. Secondly, the very notion of university foresight has been dealt with in a variety of ways and often approached within a broader agenda or differently formulated assignments. This is why this section does not present cases and then draw conclusions, in a linear mode, but instead aims at introducing the cases and their contribution in a bigger picture, which they are actually part of.

Scanning for studies on university foresight, one can be only fascinated, indeed, by the diversity of channels through which contributive ideas have been expressed. Let us mention in particular:

- Formal foresight on universities, of course, but also on higher education as the most obvious broader topic involved, or on the contrary on various specific sub-dimensions of the university as an institutional reference unit, as well as, on the one hand, cross-cutting themes such as science and technology, national or regional systems of innovation (or the Triple

[7] Ecole Polytechnique Federale de Lausanne (Switzerland), email: pierre.rossel@epfl.ch.

Helix Model)[8] of which the universities are considered to be key elements, or specialized issues such as research, science-industry linkages, institutional governance or the future of learning for instance;

- In terms of formats, just the same, we find participatory foresight studies, studies carried out by experts, studies providing conclusions and clues for the future out of surveys, debates, blogs, collective books[9], university presidential addresses on the future of universities[10], colloquia[11], just to mention the most important ones.

All this production has generated numerous ideas, references and views on the future of universities, and suggestions on the usefulness of university foresight one way or another. Let us be more precise on this point: All of them envisaged as main concern the future of universities and higher education, some of them stressing more specifically the need for foresight to become part of the normal activity of university planning or strategy. The diversity of issues covered is also a synonym of wide bandwidth substance for anyone wanting to achieve a serious endeavour in the area of university foresight, including the inventory of key problems, limits and common pitfalls or the risk of adopting a normative knowledge perspective rather similar to

[8] See for instance: Ughetto, E., (2007), "Foresight as a Triple Helix of Industry, University and Government Relations", *Foresight*, vol. 9, issue 5, pp. 14–22.

[9] Let us mention here in particular:
Thorne, M., (ed.), (2001), "Universities in the Future" (Office of Science and Technology Foresight Programme), London, Department of Trade and Industry. This book examines in particular and from several angles the key question "What universities are for?"
Landon Dard, M. (ed.) (2009), "Beyond 2020: Envisioning the Future of Universities in America", American Council on Education and Rowman & Littlefield Publishers. This book also puts a heavy emphasis on governance issues, envisaging, through the contribution of more than 20 authors, the perils and promises of the university in the future (among others: financing, continuing education, the international market, technology role, marketing, legal issues, partnerships, etc.)

[10] Some of them are really insightful, see for instance:
http://www.elearnspace.org/blog/2008/11/03/the-future-of-unibersities/,
http://www.manchester.ac.uk/aboutus/facts/vision.
The most interesting one, however, is a fully-fledge study, produced by the president of the Berlin-Brandeburg Academy of Sciences and Humanities, Guenter Stock, profiling the ideas and framework conditions for a new university paradigm in the future, in a Conference given in Goeteborg, Sept. 1st, 2009, on "The Knowledge Triangle Shaping the Future of Europe", in the Panel "The changing role of universities in the knowledge triangle", and also, in the full text delivered by the same author in 2008: "The Current Status and the Future of Universities within Society":
http://www.portlandpress.com/pp/books/online/univmark/084/0079/0840079.pdf

[11] *E.g.*, Galway (2008) ("The Galway Symposium on the Future of Universities") and Pari (2000) ("The Future of the Academy", Pari, Italy, 8–11 September 2000).

what everyone does, for instance, at the European level (which may even mean ending up suggesting missions, priorities, excellence objectives, and competition assertiveness that could have been obtained without passing through the stage of a costly study). The variety of processes is important too, in a way: There is indeed, in the EU, the overall claim to carry out foresight mainly in participatory form, but in most studies available, the concrete participatory process that was carried out and its particular value added are most often non obvious, or even rather opaque, or absent in the outcome. This aspect of the problem probably requires specific care and explicit uptake efforts to promote and use participatory undertakings not just as a regular (ritual?) manner of carrying out foresight but, on the contrary, as a truly value-added endeavour of its own (getting local knowledge clues, proposals or feed-back on findings, linkage with the context, as well as suggestions of particular forms of foresight readiness and usages it should prepare for).

Out of all this material, and bearing in mind the big picture as conveyed by this literature (including broad boundaries, several stimulating focal perspectives, key issues, major societal challenges linked with the university as an institution, and the local effort to be envisaged when confronted to the global world), we chose 5 cases worth reporting upon, providing essential findings, purposely or not. They present forms of university foresight from Ireland, Malaysia, Turkey, Canada and US, for which we will specify each time the precise context.

Other studies and intellectual productions would be worth mentioning, although not completely tailored to our own criteria, but which could nevertheless provide us with interesting thematic substance and geographical-institutional diversity, eventually useful to position a foresight undertaking in the Balkan context. These contributions will be leveraged as a collective intelligence package in the conclusion to this section.

4.2. INTERESTING CASES OF UNIVERSITY FORESIGHT

4.2.1. A Case from Ireland

The Dublin City University (DCU) foresight exercise is to be understood as part of a wider reflection on the role of knowledge in society, on knowledge creation, and the supportive effect it can have in the context of a needed

institutional transformation of the university[12]. Building upon an Australian university foresight case that had taken place between 1999 and 2006[13], the DCU exercise develops both an in-depth and wide-angled reflection on the future forms of learning and the role of universities for the citizen as well as the market. The concerns and values are impressive: educational innovation, health management, always-on networks, sustainable resources for a carbon-neutral world, ties between development and security. The exercise involved external consultants and support from more experienced foresight bodies in Ireland and outside. From the outset, it was decided that the foresight was not an end in itself; it was probably more about exploring options, re-affirming values and goals, and developing a wide constituency, capable of conveying both operational and strategic goals.

4.2.2. A Case from Malaysia

A research was carried out in the context of a Malaysian State University, "Universiti Sains Malaysia", Penang Island (from here on USM), ending up in a 2005 workshop. It produced 5 interesting scenarios, asserting the need for futures thinking (as well as the taking into consideration of the past as part of a strategy meant to envisage the university as creating its futures). The workshop was well prepared (various inputs and foresight methods being used, but with a clear reference to the well known "Art of the long view" approach) and consisted of brainstorming, group work, role playing, visual presentations, and forms of follow-up consultations, with a clear roadmap as outcome and a four quadrant mapping as compass. The initial aim was clearly set to be getting out of the conventional view of the university, envisaging futures thinking as transformative. Legacy included the kind of economic specialization the Penang Island had shaped for itself: tourism, manufacturing, R&D, as different from other parts and universities of the country. A constant assertiveness prevails, which we will find in many studies: The traditional university does not exist anymore, technology changing its premises in an open, more global and community-oriented knowledge. Let us stress that USM is presented as the only Malaysian APEX university[14] striving to achieve world-class status. The five scenarios

[12] This case is to be understood as different but related to the more specialized exercise called "Technology Foresight and the University Sector" (prepared by the CIRCA Group Europe Ltd., Dublin, for the Heads of Irish Universities (2000).
[13] See for that: Slaughter, B. A., (2002), "Universities as Institutions of Foresight". http://www.foresightinternational.com.au/resources/Universities_as_IOFs.pdf.
[14] To know more about this highly stimulating concept: http://www.usm.my/my/apex% 20download.asp, and in particular the proclaimed determination to look for a Blue Ocean strategy.

produced were the following: State (symbiotic with context, specialization), À la Carte (transdisciplinary, life-long), USM Inc. (cost recovery, commercial), Garden (sustainable, creative, holistic learners), Invisible (democratization, open education, ICT-based)[15]. The goal of such careful scenario outlines is to provide the shared vision and knowledge for academics and administrators to make dynamic choices and maintain lively futures thinking as a mainstream component of university development, increasing altogether the staff's and students' preparedness for change, including new learning models and more diversified missions for the university.

4.2.3. A Case from Turkey

This case is part of a PhD study [11] presenting two foresight exercises envisaged within a systems approach (holistic, constantly looking for all forms of meaningful interdependencies); one concerning The Division of Project and Construction Management (a Part of the Architecture "faculty") and aimed at developing a strategic plan, the other one being the Department of Civil Engineering, which carried out a survey, based on text analysis and a statistical framing conveying important foresight characteristics for the 2023 horizon. Both organizations are linked to the Istanbul Technical University. The exercises involved tools and provisions for participatory steps with major stakeholders (including "external" ones like Chambers of Commerce and professional associations, for instance). The author's design of these studies promoted with similar dedication a success factor view and an actor view of main issues and fields of interest. The purpose of the second study in particular was to deliver a visionary statement of the domain. The author, apart from developing his own systems thinking approach, made sure to connect his reflection with standard foresight practice in Europe (in the UK and at EU level). The overall result is quite specific to the sector concerned (construction) and provides for a tentative list of strategic technologies and application areas that this sector should bear into the future. Also interesting is the list of factors supposedly affecting the success or competitiveness of the construction sector, finally leading to recommendations for the general orientation of the department, with some key visionary messages. Tools were given a high importance when it came to representing essential issues with the idea of roadmapping them into potentially effective action.

[15] Very interesting is the comparison of these 5 scenarios with the 6 OECD scenarios for universities as presented by Vincent-Lancrin, S. (2004), "Building Future Scenarios for Universities and Higher Education, an International Approach". *Policy Futures in Education* vol. 2, issue 2 (available at: http://www.wwwords.co.uk/PFIE): Tradition, Entrepreneurial, Free market, Open and lifelong, Network, Diversity/Disappearance.

The process is interesting and consistent all the way through, the author stressing in detail, in the two cases, the shaping of foresight values and needs specific to a particular sector of activity, including industry targets and university curriculum development. At the end, however, the conclusions seem rather unsurprising, as if there was, beyond the need for foresighting, a normative alignment with international standard expectations (such as "targeting excellence in research and education"). This is not so much a problem of the case in question or its treatment by the author but should, on the contrary, be considered as a serious problem for most university foresight (see further, the issue inventory). The question is indeed open: Is there a trend towards a global European view on what foresight should be, ending up in an average foresight culture, which each specific domain or local context has the duty to encompass and enrich, at the cost of leaving in the shadow local knowledge and institutional strengths? In this particular case, it is difficult to know if the absence of wildcards or potentially disruptive futures envisaged by the study is due to the systems approach chosen by the author (the approach bears its advantages and drawbacks), or if the study did not have sufficient provision or leeway upfront for such possibilities (see further, how we formulated this rather cross-cutting problem, that studies referenced in this section translate one way or another as a "trade-off" issue: one cannot have it all and makes choices)[16].

4.2.4. A Case from Canada[17]

We deal here with a case which is mainly presented as a strategic plan into the future (initiated in 2004–2005, supposed to produce its main deliverables in 2010 and ultimately targeting the 2020 horizon), with interesting future-looking aspects and undeniable participatory involvement of academics, administrative staff and board of governors in a series of roundtables, eventually ending up in a discussion paper as intermediate step. Although it is rather "medium-termist" (reflecting on the 2020 horizon), the endeavour is far-reaching in its goal as it is mostly value-based (alongside a few more traditional university objectives): students are of core importance, research-driven modus operandi, valuing cultural diversity and the maintenance of Canada's official languages, promoting partnerships to fulfil university social responsibilities and community orientation ("in the service of others"),

[16] In support of that idea, see for instance Schoen (2006), whose ideas on basic foresight options regarding the scale and scope of particular university foresight exercises are presented in the next section.
[17] http://strategicplanning.uottawa.ca/vision2020/context-conferences_18.html.

equal opportunities to its staff members, achieving prominence on the international stage but also “to create knowledge, to discover, and to invent”. As compared with EU-oriented types of foresight, this approach is strikingly different, as it focuses primarily on the construction of a visionary substance, the procedural dimensions being envisaged as a component of that build-up.

4.2.5. A Case from the US

Worth mentioning also, for methodological diversity reasons, is the study on roles and contents of the South Florida University carried out through an environmental scanning approach [11]. This study places environmental scanning in the Assessment stage, the first one out of four that make consistent strategic planning according to their author (followed by the stages of Plan development, Implementation, and Evaluation). The idea of the environmental scan is to identify external challenges and opportunities on the basis of a SWOT pointing out internal strengths and weaknesses. The overall goal is, through the Plan development, to define a master plan to identify strategies and allocate resources to achieve institutional goals. The authors described their work as a standard endeavour in university environmental scanning, covering six major areas: population trends, public K-12 education trends, information technology, economic trends, social trends, regulatory trends. The particular higher education trends examined are: financial resources, national enrolment, Florida enrolment, degrees granted, cost, faculty, facilities, research, and public service. This approach resembles an industry analysis of the university market environment. An interesting part of the author’s contribution resides in the very wide understanding of what environmental scanning is, namely a package of methods ranging from Monte Carlo simulations to Delphi studies and cross impact analysis, passing through various sorts of more or less automated trend analyses. The end document is a cross-summary of opportunities and obstacles. In spite of the fact that the study was primarily the result of the activity of a three-person team, some level of participatory activity was involved, through a series of reviews made by chairs of departments, administrative officers, and directors of offices who, through their feed-back, were said to have helped make the final product useful.

The authors confess that it is hard to track or anticipate change in the environment. Their scanning activity within the strategic planning activity was partly aimed at increasing the visibility and uptake options of the main

opportunities and obstacles (together defined as challenges). In this perspective, this university is envisaged as a "normal"[18] institution (missions and societal issues remained un-discussed), belonging to the higher education domain at large, and having to adapt to the changes taking place within its local (Florida universities) or more global environment (the US). The result is a tool for the university decision makers and stakeholders, mainly to be more capable of working on the enrolment issue, defining globally the attractiveness (and therefore the future) of the university. This is obviously a narrow and low profile view of the university role, but worth presenting as it is not so rare an option involving a certain level of foresight activity[19] in the case of a rather standard American institution. Let us observe here that the tool takes up all the space, and the in-depth discussion traditionally linked with university foresight is almost absent. We could call it a functionalist approach. It is somehow based upon the idea that the future we have to adapt to is already "out there" or in the making, as opposed to the idea of a future that we want to explore and also help to construct. Let us mention that a few years before a similar study had been carried out for Arizona universities [12][20].

4.3. BEYOND SPECIFIC CASES: GENERIC CONTRIBUTIONS

Most of the studies carried out in the European context, one way or another, have to do with a common culture of how to conduct a foresight exercise and, beyond that best practice idea, how to conceive the future of universities in the EU. Several studies have provided the substance for such a convergence, which should be seen at the same time as a collective wealth and a normative pressure, with all sorts of comparative advantages but also limitations as is the case with the emphasis on the bottom-up feature.

[18] "Normal" taken here in the Kuhnian sense: typical, aligned with the dominant paradigm.

[19] To compare and/or see how "normal" this approach is in the US context, see for instance: Hearn, J., Heydinger, R. (1985),"Scanning the University External Environment: Objectives, Constraints and Possibilities", *The Journal of Higher Education,* no 56, issue 4 pp. 419–445.
Morrison, J.L., Held, W.G. (1989), "Developing Environmental Scanning/Forecasting Systems to Augment Community College Planning", *VCCA Journal,* vol. 4, issue 1, pp. 12–20.
Farrell, J. (2000), "University and Corporate Research Partnerships: Developing Effective Guidelines to Promote Change and Transformation". Occasional papers on "Institutional Change and Transformation in Higher Education", Center for the Study of Higher Education and Postsecondary Education, University of Michigan.

[20] This short report puts more emphasis on the need to incorporate foresight in the educational system than in the Florida case.

One of the first (but still modest) attempts of the kind is Ginkel's article (1996) on the futures of universities from a European perspective [13]. Things get more serious and systematic with the productions of Schoen (2006) [14], Georghiou and Harper (2006) [15], and Havas (2008) [16]. Schoen identified a series of driving trends (marketisation, managerialisation, flexibilisation, and internationalization), looking in addition for key driving differentiation processes as well as proposing some trend-spotting for the "third mission of the university", namely its relationship with non university partners, as well as governance and strategic issues. He suggested considering, on the one hand, the EU university as a system of systems, raising its load of difficulties for a foresight exercise, and, on the other hand, a double level of institutional belonging, to the state and the EU systems. These difficulties call for tactical solutions, one of them being to chase primarily intra-university problems and solutions (forgetting about other stakeholders), the other one, on the contrary, being to focus on the multi-governance level of the problem. A remaining question would be to decide whether there are ideal types that would constitute shortcuts for any foresight endeavour.

Georghiou and Harper, as for them, emphasize the historical perspective of such future-looking interest, building upon mainly two such exercises (CHEPS and Strata-ETAN), emphasizing different contexts and rationales but also key drivers for change: globalization, of course, along with competition and student consumerism, rise of new agents and functions, demographic pressure, technological advance and its configurational potential, collaboration with industry and transdisciplinarity. These drivers are building blocks for scenario design and the authors provide a term-to-term comparison of the scenario proposals provided by the two programmes they examined, with for each dimension a brief description of aims and substance, before concluding that the future scope of such research will include the needs for tracing policy focus, trends and impacts.

To some extent, it is exactly what Havas (2008) has done in a rich article shaped through a broad policy approach. He brings up key questions such as the role of universities in knowledge production (it may look obvious, but it is not), with all the changes taking place in the international research landscape, and also, as many other authors already mentioned, he comes up with key drivers for future changes. In this examination, Havas emphasizes a series of EU problems and some complex open-ended questions on the models that can support a policy-relevant steering activity in that domain.

This distance allows the author to re-examine the basic missions of the universities but also such issues as mobility of researchers (and competition for talents), integration of RTD activities, the growing importance of multi-disciplinary research to whether the considered institutions are "largely unchanged" or on the contrary "largely reformed" universities. He finishes reminding us that to some extent the Humboldtian model of the university (*i.e.*, higher education and research envisaged as inseparable) is still strong in the academics' mindsets, although a closer look shows that universities are not first-class research performers; his remark suggests the existence of a rather clumsy *bricolage* rather than a crystal-clear set of obvious missions, this *bricolage* bringing nevertheless some advantages to the citizens and policy makers in the short term but showing limits when it comes to reflecting on the future (entrenchment). This study also suggests thinking about strategic options and needs before undertaking a foresight exercise, so as to draw a maximum benefit from such endeavour or, in other words, not to forget about the crucial participatory nature of foresight, also valid in the higher education domain.

4.4. PRELIMINARY CONCLUSIONS

4.4.1. Issues

Such issues, as "market or public good", "most appropriate level or scale of action", "method as a solution *versus* open-ended reflection to start with", "roles and missions revisited", "world competition *versus* community services", "value-driven strategic goals *versus* functional excellence targets", "is technology changing it all?", etc. come up again and again. Many of these concerns have already been evoked. These issues, in their various formulations, are captured through scenarios which represent various options for which we need to increase our level of reflection, some form of readiness associated with stakeholders' involvement.

4.4.2. Risks

Major risks are linked to the overestimation of the power attributed to tools (methods but also software in some cases) and the blind compliance with the idea of methodological best practice, even in the case involving elaborate methodological combinations (Turkey, Malaysia, for instance). The benefit of such an alignment is the production of state-of-the-art quality in foresight

exercise design and management and, indeed, ends up in robust reflections on either the future of universities or the seminal role of foresight in the shaping of that future. However, if one wants to avoid pitfalls or trivial outcomes, more diversified framework conditions and efforts are necessary to trigger original, out-of-the box or local knowledge forms and help them make their way through. The danger is repeating everywhere almost the same thing and producing an average narrative which nobody can really identify with or build a proper path with. In this sense, the overall umbrella of the European research area provides both the strengths and comparative fuel, but also some level of normative pressure not actually compatible with local creative emergence and the emphasis on original bottom-up values.

4.4.3. Modalities

Let us have an overall look at what the cases as well as some other similarly intentioned studies and intellectual debates have tried to achieve:

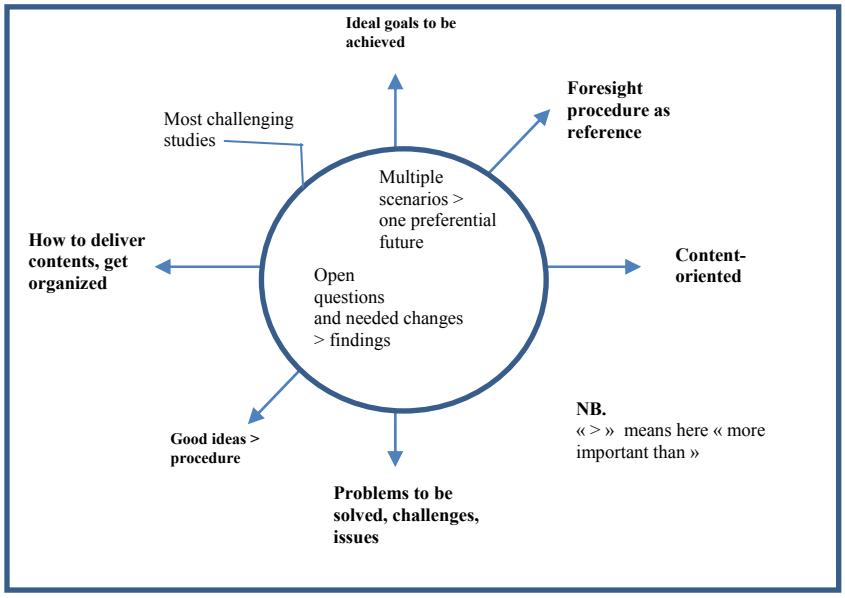

Figure 4.1. A General Typology of University Foresight.

In this sketchy mapping, we see that some promoters of foresight are rather interested in "foresighting as a process." Others work at getting at clue-providing mechanisms on changes already perceived as needed. Some exercises end up in emphasizing how content should be created and

delivered and how to get organized for that, while others want the contents to be produced to directly bring them on the verge of excellence and competitiveness.

4.4.4. The Big Picture

University foresight should not be seen only as a type of exercise carried out with a specific focus, aimed at solving the problems of a single institution, and only valid for a particular geopolitical context. It is also a means to question the possible futures of a concept and the forms it may take for various categories of goals (educate, research), which universities are usually considered as contributing to, and through that supporting endeavour tackle general problem-solving capabilities of future generations regarding emerging challenges. It is therefore useful to put the various inputs of all the studies taken into consideration in a comparative overview:

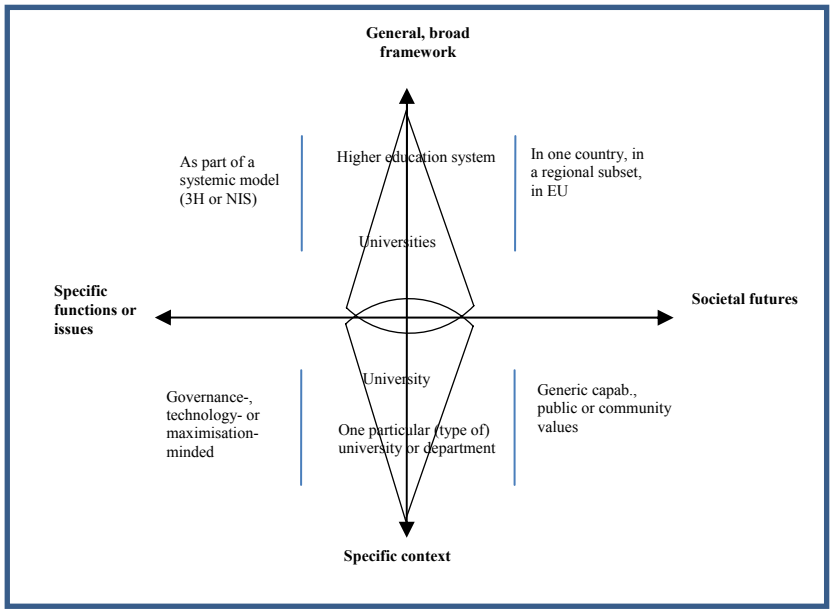

Figure 4.2. A Framework for University Foresight.

We see here how some foresight exercises privilege values and key societal issues, while others aim at identifying building blocks of their future performance. In that sense, it is of minor importance whether exercises are mainly focused on a narrow institutional configuration (a specific department or

university) or on a wider arrangement (the universities of one region, one country, EU level, higher education policy). The way and reasons why things are done the way they are done seem to be more important.

4.5. CONCLUSION

The *Blueprint for Organizing Foresight in Universities* will have to make choices, one cannot do everything. The danger to produce, even through a bottom-up form of participatory uptake, a normative expression of goals and priorities re-asserting at local level intentions and procedures that have been coined as best practices in the matter is great. Although this alignment allows for a considerable level of comparison and further bench-marking, there should be room for local specificities and prospects of channels into the future, not merely reproducing a procedure and the affirmation of goals already expressed elsewhere. State-of-the-art foresight should remain compatible with the taking into account of strengths and weaknesses, even historical traditions when valuable, and more certainly so, forms of alliances and commonalities worth pursuing from a regional perspective. In terms of methods, beyond standard participatory procedures, some trade-offs may be necessary to consider in order to help design university foresight exercises capable of coping with several diverging constraints and expectations.

5. FORESIGHT-AWARE STRATEGIC MANAGEMENT

By ILKKA TUOMI[21]

5.1. INTRODUCTION

As Henry Mintzberg noted long time ago, strategies are not always based on foresight. Often business firms and public organizations find themselves locked in strategic positions that emerge through incremental decisions and choices. Strategic thinking and action, then, become constrained by historical events that no-one thought to be “strategic”.

Universities often find themselves implementing unintended strategies. Universities are among the most robust social institutions existing today. Even when organizationally new, they typically copy and replicate standard models, structures, and processes that embed centuries of experience on how learning and research happen, how universities interact with their social and economic environment, and how the creation and diffusion of knowledge is best organized.

Strategies are always path-dependent, and sometimes the path is a dead-end. Due to the fact that the European university system has avoided dead-ends for several centuries, universities in Europe can trace back institutional success that almost proves that their emergent strategies have been the right ones.

Today, however, societies and economies are transforming towards a knowledge society where learning, knowledge creation, innovation and decision making occur under radically new conditions. Educational systems based on Humboldtian, Confucian, and commercial principles interact and collide in the globally connected world. Many of the administrative procedures and institutional structures in universities code centuries of knowledge that is now rapidly becoming outdated. In the current socio-economic landscape, universities struggle between the old and the new, and many university managers face the challenge of adapting to a world that changes too fast.

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In this new world, university management faces new requirements. An increasing effort is spent on continuous development of existing processes and procedures. Change management is becoming a new critical competence in university administration. In the universities, change is no more limited to incremental accumulation of knowledge and gradual adjustment of curricula; at present, also the modes of knowledge production and the models of learning and education are changing. More profoundly, perhaps, the dynamics of change itself are changing, requiring new approaches in planning and decision making.

The transformation towards the knowledge society has in recent years led to quite radical changes in business strategies. Strategic actors now live every day in the future, and expectations have become an increasingly dominant part of the present. Organizational and individual identities that used to be constructed through narratives that told where we came from, are now defined by where we are planning to go.

In the knowledge-intensive sectors of the economy, business firms use substantial and rapidly increasing resources to generate and process future-oriented knowledge. Business firms deploy a large portfolio of foresight methodologies, tools and techniques, and implement systematic foresight processes to support their strategy development. Foresight underlies almost all business action, and it has a rapidly growing role also in public policy. Strategies are still emergent as many critical choices are made without contemplating their future consequences. Yet, it is also true that today there is no strategy without foresight.

At present, strategy thinking is undergoing a substantial and subtle change. Strategic planning, in its traditional form, was based on the assumption that the future is “ontologically real”, something that can be predicted. In the strategic planning tradition, prevalent up to late 1980s and even up to today in areas such as econometric forecasting, this future was expected to unfold from the present in an essentially continuous and manageable way. Not anymore. Now business success increasingly depends on peripheral actors and constant redefinition of competitive niches, value propositions, and visions. Predictable futures are gone.

Strategic management is therefore now trying to figure out how to embrace complexity that can not be simplified anymore. Strategy is becoming a real-time effort. Foresight and strategy are not isolated from the everyday organizational activity anymore, and they have become integral elements in a continuous organizational learning process. Strategy development, in turn, is now increasingly focusing on ongoing long-term development of strategic

capabilities, instead of drafting plans for later implementation. Strategy is not anymore about carefully drafted plans and presentations; it is about making organizations more intelligent and capable of creating and processing meaningful knowledge.

Strategy is always about reacting to the future. When different conceptualizations of future are adopted, we end up with very different forms of strategy and different spaces of possible action. When deterministic narratives about historical trends provide the basis for strategic thinking, we end up with traditional industrial-age models of management and control[22]. When the future is understood to be open, undefined and full of interpretative flexibility and latent opportunities, we need new theories of anticipation, causality, and management.

One critical capability in this new world is that of sensemaking and imagination. Organizations that are able to imagine multiple possible futures are better able to recognize important events when they occur. They can also engage their intellectual capacity and mobilize stakeholders in efforts that actually turn some of these future possibilities into realities.

5.2. THE IMPACT OF FORESIGHT ON STRATEGY

Foresight influences organizational strategies in three fundamental ways. First, the various methods and tools of foresight generate knowledge about *opportunities* that the focal organization should address today. In this role, foresight helps strategy developers in universities to discover important new areas of research and refine curricula so that they better align with future needs.

Second, at a more systemic level, foresight puts the focal organization in a larger context that highlights changes in the *key assumptions* that underlie strategic thinking and decision making in the organization. In this role, foresight asks the fundamental question, what are the functions and

[22] As Mircea Eliade (1991) beautifully illustrated, narratives rapidly acquire the prototypical structures and causality that match with our cultural expectations. We tend to retrospectively find causal chains that inevitably lead to the future. In practice, many stories of important scientific and technical advances have been reconstructed in this fashion, often re-arranging historical facts so that they fit the required narrative structure and model of causality (Tuomi (2002), chap. 9). Eliade, M. (1991), "The Myth of the Eternal Return: or, Cosmos and History",NJ, Princeton; Tuomi I. (2002), "Networks of Innovation: Change and Meaning in the Age of the Internet", Oxford University Press, Oxford.

objectives of universities in the emerging knowledge society, where many of university's historical roles are becoming redefined and perhaps obsolete. There are several alternative ways to address the ongoing society-wide transformations, and these lead to different strategic options for universities.

Third, the outcomes of state-of-the-art foresight studies have some interesting and important *methodological implications* for strategy development. Various foresight projects have pointed out that an essential characteristic of the emerging socio-economic order is its complexity and unpredictability. All models are based on simplifications. Leading-edge theory of foresight and strategy, therefore, struggles at present with the methodological challenge of modeling worlds that cannot be modeled. What is strategic management in a world where complexity makes planning impossible?

Below, I shall first outline some key features that contrast the near history and currently emerging future contexts for universities. The ongoing socio-economic transformation towards the knowledge society is already clearly visible in the everyday life of universities. It is, however, useful to make explicit some key drivers that underlie the emerging processes and structures of the "university of the future". The discussion, therefore, focuses on the first two linkages between foresight and strategy, highlighting both the changing key assumptions that have shaped the universities and opportunities that emerge as old constraints erode. I shall, in particular, discuss the impact of global real-time access to knowledge, emerging new competence development models, and new knowledge creation and innovation models.

The transformation towards the knowledge society also leads to new ways to think about strategy and planning. Although we tend to think that the knowledge society is the traditional industrial society with more knowledge added, in fact we are currently in the midst of a profound transformation that will lead to a qualitatively new socio-economic model. At present, we are reorganizing the infrastructures of space and time, and redefining what societies are and how they create knowledge. The paradox of planning in deeply complex and reflexive worlds can only be resolved by changing the way in which foresight and strategy are understood. Eventually, the ongoing research on the re-conceptualization of foresight will lead to new models of organizational and social anticipation. In the present context, I shall discuss the new emerging possibilities for planning, briefly addressing the third methodological linkage between strategy and foresight. After that, I simply point out some possible implications and entry points for university strategy development.

One implication is that it is not always enough to copy traditional foresight or private sector strategic management approaches in universities. When foresight is implemented in universities to support their strategic management and development, it is important to consider how the present tools and methods of foresight should be aligned with the emerging new requirements of the learning-intensive network society. It is possible to rigorously follow existing blueprints and conduct both foresight and strategic planning in the way they have been done during the last decades. In some concrete university settings, this may be useful. In general, the changes in the planning context should also be reflected in the methods and the content of the process. The “copy-and-paste” approach could be called “the low road” to university foresight, and sometimes it is the best and easiest way out. Choosing “the high road” requires more effort, more climbing, and more intellectual effort, but it also opens the possibility to see the emerging big picture, rethink the rules of the game, and redefine the dimensions of success that will matter in the future.

5.3. THE CHANGING CONTEXT

Think yourself as a visionary university decision maker, forty years ago. With hindsight, what would be the most salient features of today that were not clearly visible in 1970? What are those now “dominant” drivers that were barely distinguishable a generation ago?

Below, I shall point out three major changes that are leading to substantial transformations in the social functions of the university. Each of these would deserve extended analysis and discussion. Here I shall only briefly argue that these changes, in fact, imply important changes in the context where universities operate. I shall discuss real-time access to explicit and tacit knowledge, new ICT-facilitated social learning and competence development models, and new distributed and open innovation and knowledge creation models. In addition, I shall briefly explore the implications of the ongoing socio-economic transformation for planning itself.

5.3.1. Real-Time Access to Knowledge

In the last two centuries, access to scientific knowledge required physical access to university libraries and university teachers. Today physical proximity plays a rapidly declining role. Knowledge repositories are distributed and

networked globally, and expertise is accessible independent of geographical location. Leading universities provide extensive electronic access to centuries of published scientific literature. High-quality open educational resources are widely available in many languages, and the Internet is increasingly allowing anyone to search and study vast amounts of scientific and educational literature and content on demand.

Although learning often requires contextual, tacit and pedagogical knowledge that is best available in interactive and physically situated settings, the almost real-time accessibility of information and knowledge is substantially changing the conditions for learning. As facts and data can often easily be checked when required, the relative value of pre-structured information is declining and the value of sensemaking is increasing. “Knowing that” is something that Internet search engines can do well; “Knowing why” is more difficult. Already today answers to most known questions are cheap; what matters is the capability to formulate new relevant questions and frame problems in imaginative and creative ways. Inter-generational knowledge transfer plays an increasingly redundant and trivial role in universities, and the leading universities focus increasingly on facilitating cognitive development through active construction of knowledge among students. Cultural transfer is still important in institutions of higher education; learning and knowledge creation skills, however, are increasingly in demand.

Historically, the university was a critical access point to systems of knowing. This allowed the university to control and organize knowledge flows and utilize its unique position to shape learning processes in the society. Today, this implicit power to structure learning is distributed and diluted over many different actors. The rapidly expanding access to knowledge therefore also requires a profound change in the professional identity of university teachers. In the future, the teacher is not a source of information or knowledge; instead, she or he is someone who allows learning to happen.

In general, scientific knowledge is often contextual, situated, “sticky,” and even personal, as Michael Polanyi pointed out half-a-century ago[23] [17–25].

[23] See, for example, Tuomi (2000), Bowker (2005), Collins and Evans (2007), Knorr Cetina (1999), and Brown and Duguid (2001). Polanyi (1998) pointed out in his Gifford lectures in 1951–2 that explicitly articulated knowledge requires a peripheral structure of tacit knowing, and that there is a dynamic relationship between peripheral and focal knowledge. The importance of locally situated and informal knowledge was highlighted in economics already by Alfred Marshall (1890) and later by Friedrich Hayek (1973), quoting Michael Polanyi, and it forms a key theme in the research on regional innovation systems, see *e.g*. Langlois and Robertson (1995), chap. 7, Oxford: Routledge.

Knowledge forms systems of interrelated concepts, practices and methods, and it is not easy to de-contextualize. “Know-who”, therefore, remains important in learning, innovation, and knowledge creation. The new communication networks do not only provide access to explicitly represented knowledge, scientific articles, text books, and other learning content; they also provide access to people and facilitate communication of contextual knowledge.

The Internet, thus, combines access to both explicit and tacit knowledge in an interactive fashion that provides radically new platforms for learning and knowledge creation. This is something that only very few visionaries were dreaming in 1970s.

5.3.2. New Competence Development Models

Today, learning occurs increasingly peer to peer. With some exceptions in post-graduate and post-doctoral education, formal learning has traditionally been organized for effective transfer of knowledge from a single teacher to multiple students. The underlying assumption was that the critical resource in the learning process is the teacher, not the learner[24].

Researchers of open source software development communities were among the first to point out that this assumption does not always empirically seem to be the correct one[25][26–28]. The Internet has enabled self-organized peer-to-peer learning models that can be highly effective for competence development. When skill profiles and content evolve in rapidly changing environments, such self-organized processes may easily become more effective than pre-planned and well-designed learning processes.

[24] The Humboldtian university model originally emphasized the facilitatory role of teachers and the importance of peer-to-peer learning. As access to universities expanded in the 20th century, teacher-centric models have become dominant. They are particularly dominant in countries that are categorized as hierarchical by organizational and cultural scholars. These include many European countries and, in particular, many Asian countries where Confucian values provide the historical foundations for organizing public life.

[25] Tuomi I. (2002); Tuomi I. (2001). Critical pedagogies, of course, have also emphasized peer-to-peer learning and learner-centric models, and, from a different point of view, pedagogies based on cultural-historical activity theory have argued that learning is and needs to be coupled with social practices and communities that exist outside the educational context, see, *e.g.*, Engeström (1996). Open source communities, however, were among the first concrete and economically important examples of communities of practice where effective learning occurred completely without teachers. Although the role of communities of practice in learning has been pointed out before, the effectiveness of this model became clear only towards the end of the 1990s as researchers started to study competence development and knowledge creation in open source software development communities.

For example, during the last two decades many leading computer programmers have learned and upgraded their skills outside the formal system. Their learning activities have been problem-oriented and embedded in communities of practice, allowing social learning to accumulate in collectively created knowledge and artifacts. In such project- and practice-oriented activities, learning and production emerge as two facets of the same activity, and the produced results can relatively easily be used as evidence for learning and competence acquisition. The informal social learning models can thus simultaneously lead to rapid competence development and a concrete proof of the acquired capabilities. As a result, the importance of formal educational certificates is rapidly declining in the information and communications technology job market.

In open source software development, a common answer to political controversies, technical progress claims, and competence evaluation is: “Show me the code”. In many other domains of learning, where an underlying technical design does not provide such a simple “objective” evaluation criterion, the development and evaluation of competences may be more complex. Software and computer experts have perhaps been unintentional pioneers in utilizing and realizing the emerging new opportunities of the Internet in competence development partly because their domain of learning fits optimally with the tools and technologies available. It is, however, clear that similar learning processes now play an increasingly important role in many sectors of life.

In general, the teacher is now less a bottleneck in the learning process, and economically and socially important competences are often developed outside the formal system and without teachers. Competence development routes are increasingly varied and unpredictable. The university crosses the learning paths of individual learners in potentially many points in time and space, and fills multiple roles in the mosaic of competence development. Informal learning has probably always been more important for competence development than acknowledged. The Internet, however, has rapidly expanded the opportunities for informal learning at the global scale[30].

For educational planning, the new dynamics of competence development pose a new challenge. This is because the new social, networked, and practice-oriented competence development models highlight the fact that competences can not always be defined in relation to a pre-defined performance objective. Competences can evolve in parallel with the problem

at hand, and problem articulation often occurs across disciplinary and meaning boundaries that produce new interpretations of the nature of the competence in question and the objectives of its deployment. Indeed, the conventional concept of skill to an important extent relies on an underlying structure of division of labor that generates relatively stable and socially well fixed performance requirements. The concept of skill would be rather empty without underlying assumptions about prevailing industrial structure, the job requirements it generates, and the existing technologies, tools and knowledge that is needed to get the job done.

Under the conditions of mass-production and industrial society, it is to some extent possible to catalogue competences and their constituent skills, and plan education so that it produces skills according to the expected demand. Indeed, without society-wide statistical systems that provide detailed aggregate data on both available human resource inputs and economic outputs, it would be difficult to operationalize the concept of skill. When competences are productive and generative, in other words, when they evolve with the task at hand, such an analytic approach fails. This is typically the case in tasks that require innovation. To the extent that the concept of “skill” is an artifact generated by the specific conditions of the industrial age mass-production model, the transformation of that model clearly requires that we reconsider the role of universities as institutions that generate skills and competences[26].

5.3.3. New Models of Knowledge Creation

During the last two decades, leading business firms have realized that the traditional linear innovation model is a very inaccurate model of knowledge creation in most industries and domains of knowledge[27]. In the linear

[26] The concept of skill emerges as a response to the practical problem generated by the need to allocate workers efficiently to those work tasks where they are efficient. This problem exists in a context where value production occurs in closed systems of production. The idea of "learning skill" can, therefore, be a contradictory idea to start with; something akin to "deterministic creativity", or a "leopard-like zebra". The concept of skill is closely related to the need to attribute performance capabilities to individuals, as an internal attribute of the individual person. In practice, performance capabilities are often distributed, and the focal actor mobilizes complex networks of social and socio-technical capabilities to get things done. Thus, the concept of skill also unrealistically associates performance capabilities with de-contextualized individuals. This approximation only works if the context is stable and can be taken for granted.

[27] See, for example, Nonaka & Takeuchi (1995), Chesbrough (2003), von Hippel (2005), and Tuomi (1999, 2002).

model, “upstream” ideas and scientific discoveries are gradually developed into product and service concepts and diffused in the market. This model rarely describes the reality of innovation processes well, and it neglects the critical role of “downstream” innovation. As a result, open, distributed and user-driven innovation models have become highly popular both among corporate strategists and policy makers in the recent years. “Triple-helix” models of regional innovation systems that couple academic institutions, business firms, and the government [30, 31] are now similarly extended towards downstream actors and replaced by quadruple-helix models that incorporate users as the fourth key element in the innovation system. Innovation theory, itself, is moving towards multi-focal downstream innovation models, where new knowledge is created in and across multiple knowledge communities. At the same time, the traditional distinction between basic and applied research has become blurred and conceptually inadequate.

The traditional linear model pushes universities that aim at high scores in international rankings towards investments in basic research. Academic research, however, now forms only one particular mode of research within a broader innovation ecosystem. The dynamics of this ecosystem is often driven by actors that are only loosely coupled with the system of academic research. New important theoretical insights and empirical knowledge are frequently created outside academic institutions.

In the new dynamically changing and networked context of knowledge production, participants in innovation and knowledge creation processes do not have stable positions. As new research tasks are addressed, the extant and latent capabilities in the innovation ecosystem are reconfigured and the participants take complementary roles that work optimally in the present situation. The participants, therefore, have to play a variety of dynamically changing roles.

For universities this is a major challenge today. From the point of view of business firms, academic research is often characterized by long planning horizons, inflexibility, and difficulties in engaging in research that produces actionable knowledge and concrete results. The long planning horizons emerge because of the need to conduct research projects that can generate academic theses. The difficulties in conducting business-relevant research,

Chesbrough, H.W. (2003), “Open Innovation: The New Imperative for Creating and Profiting from Technology”, Boston, MA.: Harvard Business School Press.
Von Hippel, E. (2005),”Democratizing Innovation”, Cambridge, MA: MIT Press.

in turn, often have their source in administrative and legal restrictions. In most disciplines, the academic research system is strongly geared towards "pure science" and the system has therefore great difficulties in coupling with the rest of the innovation ecosystem.

As universities are often regulated as public institutions, many universities now struggle with the challenge of dynamically playing different types of roles in the various innovation ecosystems they are involved with. The historical assumptions about the role and function of university research are deeply embedded in the existing rules, procedures and practices, and they are often legislated in ways that make autonomous change and agile decision making difficult or impossible for university managers. This mismatch between the historical assumptions and practices, and the concrete demands of the continuously evolving innovation ecosystems is a major source of inefficiencies and frustrations in universities today.

The new distributed, networked, multifocal, and open innovation models have become increasingly visible because the world is changing. It is clear that also the university governance and management models will change as we move towards the knowledge society. This is one of the key drivers that will shape strategy formation in universities in the future.

In this situation, the emerging new principles of management do not necessarily consist of only a revised set of managerial principles and operational procedures. The emerging world is essentially a world of constant becoming, where the key organizing principles are change and complexity. This has some fundamental implications for the ways in which planning and decision making can and need to be done. The change is not only in the principles of management; instead, we have to rethink the idea of management itself.

5.3.4. Planning at a New Level of Abstraction: Strategy as a Combination of Foresight and Improvisation

In this new world, traditional planning becomes in many ways a contradictory effort. Planning requires a model that structures the world and allows change to be studied in a context that is assumed to remain stable. Planning works best when the dimensions of the problem remain the same. In innovation research, such change is sometimes characterized as "parametric" change, in contrast to architectural and systemic change. When new aspects of the world become relevant, parametric planning breaks down.

Universities have frequently used long-range planning to predict future demand for education in different segments and skill levels of the job market. As noted above, such planning implicitly assumes that industrial structures, professions and skill-profiles remain stable. In practice, such long-range plans have missed new occupational categories and industries[28].

As experienced planners know, plans almost always fail. The world is always more complex than our models of it, and we often miss key parameters in our modeling efforts. This failure is not because of inadequate or inaccurate data. Conventional parametric planning requires extrapolation of trends and continuous time-series data that are typically collected based on their perceived relevance at the time when the data collection starts. Methodologically, the models that underlie planning can not, therefore, see change that is discontinuous or qualitatively new.

This blind spot is a key challenge for all strategic management theory and practice today. To the extent that the emerging world is a world of constant reconfiguration and production of qualitatively new phenomena, the fundamental assumptions that underlie conventional planning are incompatible with the empirical reality. When change is qualitative, the models that underlie anticipation have to evolve, and it is not enough to adjust input parameters to gain better predictions of the future[29] [32, 33].

One response to this challenge is to shift to a new level of abstraction in planning, where the required stability of the underlying models can be found. This, indeed, was what resource-based strategies implicitly tried to do in the 1990s. Instead of focusing on long-term planning based on strengths and weaknesses and related strategic positioning in a competitive context, resource-based strategies focused on dynamic capabilities and competences. As a result, many business firms and public sector organizations have spent considerable effort in defining their core competences and capabilities that can produce competitive advantage.

In its knowledge-based forms, resource-based views on strategy have emphasized organizational learning, innovation capability, knowledge creation,

[28] For example, educational planners missed the emergence of web designers as a new profession, see Kotamraju, N.P. (1999), ”The birth of web site design skills: making the present history”, *American Behavioral Scientist,* vol. 43, no 3, pp. 464–74.

[29] For the same reason, the predictive power of long-wave theories of economic growth [(*e.g.*, Perez (2002)] may break down, even if they would accurately describe earlier phases of economic development. For further discussion, see Tuomi (2009), chap. 3, "Policy at the End of Kondratieff Waves".

and intellectual assets such as intellectual property. Strategic management can, then, become strategic development that allocates resources for learning to those areas that are considered to be critically important for the future success of the organization. Strategic management becomes a form of capability building. As knowledge-related capabilities are often slow to develop, strategy becomes an activity that aims at simultaneous development of internal capabilities and management of external capabilities through, for example, alliances and partnerships. Theoretically advanced forms of such views on strategy as development lead to, for example, questions on how to augment the meaning processing capabilities of organizations and how to create intelligent organizations[30].

Whereas traditional strategic management was based on the distinction between planning and implementation, in the new context a more useful distinction can be made between foresight and improvisation. Collective improvisation is a synchronous and self-organized process that uses accumulated knowledge, tools, and skills. Its underlying dynamic is based on mutual adjustment. It lacks central coordination, and there is no distinction between planning and implementation. In improvisation, history, future and the present coalesce into a unified act[31] [34, 35].

In a strategy model that embraces complexity, improvisation is complemented by foresight that plays two key roles. First, foresight generates themes that guide distributed and local performance. Second, foresight also defines performance contexts and infrastructures that make effective improvisation possible. In a simplified way, foresight defines when and what to play, what is the overall composition of the jointly produced piece, who are the players, and where to play. Foresight can therefore also turn into planning, for example when it leads to a construction of a concert hall that provides the physical and material conditions for improvisations.

In this context, strategic development then needs to address the two facets of organizational life: When focusing on the internals of the focal organization, the question is how to make the organization more intelligent and agile than

[30] Such an inquiry, therefore, also leads to analysis of the key functional characteristics of biological and social cognition and communication, c.f. Tuomi (1999) (see above reference).
[31] Weick and Roberts (1993), studying coordinated action on large aircraft carrier ships, called this heedful interrelating. Improvisation has been a frequently used metaphor in organization cognition research since the 1970s, see, *e.g*. Bougon *et al*. (1977). In Futures research, Riel Miller has pointed out that the murmuration of starlings, where up to several millions of birds can flock in rapidly changing configurations without colliding with each other, presents a similar example of effective decentralized and spontaneous coordination.

it is now; When focusing on the external environment, the question is how the focal organization can shape the evolutionary processes in its organizational ecosystem to create strategic advantages. In contrast to traditional competitive strategies, such ecosystem strategies can often be non-competitive and they always have an explicit collaboration or co-evolution component.

In this setting, strategy also reveals its nature as a form of risk management. The key starting point of traditional management theories was that management is about control. Planning, therefore, has become a tool that addresses the perceived need for increased control; an instrument that manufactures belief in control, even when we instinctively know that such hubris will eventually be punished. In the current turbulent context, the punishment will come without much delay, and the risk-reducing capacity of planning is increasingly revealed as an illusion. Strategy, however, still needs to address risk.

When strategy is based on a combination of improvisation and foresight, risk needs to be addressed in its true probabilistic sense, at two levels. First, improvisation implies uncertainty, and there exists a risk of local collisions. These risks can be addressed by procedural agreements and through the development of shared performance "styles"[32]. The second type of risk is related to the allocation of resources. Lack of foresight imagination can lead to the neglect of key emerging themes, and the resulting development efforts can lead to dead-ends.

In an open world, strategic evaluations are bounded by our limited capacity to formulate anticipatory models that extend beyond closed micro-worlds. In itself, this is nothing new, and our cognition works under the same limitation. There is no guarantee that collective strategy choices avoid dead-ends. The basic nature of all intelligent activities, however, is that they allow us to

[32] One might also note that this form of risk management problem underlies social contract theories that have further led to social and political theories of institutions and law. In effect, the classical social contract theories of Hobbes, Locke, Kant, and Rousseau generate and legitimize institutional order that aims at avoiding local collisions. This connection points to the fact that there is a link between "rules of improvisation" and theories of justice. At present, this connection between strategy theory and political theory has received very little attention, partly because much of the extant strategy research implicitly adopts the utilitarian models of agency and value. As the improvisation model of strategy implicitly assumes autonomous agents, the theory of justice becomes an essential element in the theory of strategy and foresight.

operate in unpredictable and open worlds, and to explain our actions so that they can be communicated. This is necessary both for collective action and learning.

In a complex and deeply unpredictable world, foresight, therefore, needs to be organized in a way that embraces complexity, instead of simplifying it. The resulting new approach to strategic thinking is radically different from traditional strategic planning and management. The historical concept of strategy was based on an idea of rationality that implicitly assumed that important organizational decisions can be made within a domain where the complexity of the world remains under control. This domain is now shrinking. Strategies have to be formulated also when we know that we don't know what the relevant parameters of the world are going to be.

The emerging new strategic thinking therefore requires managerial attitude that facilitates inter- and intra-organizational network coordination, distributed decision making, and opportunistic learning. Furthermore, strategy now needs to extend beyond organizational boundaries. It needs to consider, for example, institutional and structural couplings among ecosystem participants, and the processes and tools with which knowledge and meaning are translated and transformed across local systems of meaning.

This is a major departure from the classic theory of management. Information does not flow from bottom up, and knowledge and decision making capacity rarely accumulates at the top of hierarchies. There can be no single line of control in a networked world, nor in a world that cannot be controlled.

5.4. STRATEGIC MANAGEMENT IN UNIVERSITIES

Strategic management in universities is considerably more challenging than in traditional business settings because universities simultaneously fulfill several essentially independent functions. They act as institutional nodes in regional innovation ecosystems and global knowledge creation networks, they provide educational services, they spin-off new businesses and technologies, and they also function as socially and culturally important hosts that integrate and process knowledge flows for public and political debate.

Furthermore, universities act as institutional hosts for unallocated intellectual capital and they provide absorptive capacity that facilitates social change and development. They also provide skilled and programmable labor, access

points to knowledge and expertise, and generate and diffuse knowledge-related capabilities that form the socio-political infrastructure of modern societies.

Also business firms have multiple roles. From a strategic management point of view it is, however, usually possible to focus on one key role which dominates over the others. Today, the ultimate function of business firms is often thought to make profit for their investors, and the final valuation of organizational activities can, at least in theory, be made using this single-dimensional criterion. For universities, such a simplification is not possible. It is not an easy task for strategic thinkers to define what is the dimension at which a university should be "better" than its competitors. Indeed, it is not easy to tell what its competitors are, if any, or to what extent the concept of competition actually makes sense in university settings.

In other words, universities, in general, are not business firms. They play several socially and economically important roles in parallel, and there is no single objective that could be used to define "optimal" strategies. This is in contrast to business or military strategies, where profit or "winning the war" can provide the ultimate criterion for success. Universities provide educational services, and many of these could also be provided by commercial entities, thus defining a niche where competitive strategies could make sense. Similarly, universities can, at least in theory, compete among other universities on research excellence. In general, such a reductionist view on the objectives of the university is a gross and inaccurate simplification.

Due to the multifaceted nature of universities as social institutions, traditional strategic management and planning approaches quickly lead to frustrations. The emerging new strategic thinking, based on ecosystem strategies and capability development, is better suited for university strategic management, as the underlying models allow for a multitude of qualitatively different interactions and relationships among ecosystem participants. Foresight has a critical function in supporting strategy development in this new context.

5.5. CONCLUDING REMARKS

Above I briefly described three visible trends that generate a new context for universities as social institutions, organizations, and participants in local and global innovation ecosystems. These three trends – the rapidly expanding access to knowledge, the increasing economic impact of informal, social and networked competence development, and the new distributed and

open innovation and knowledge creation models – will challenge long-standing assumptions that underlie many current practices in universities. More importantly, perhaps, they are the three key dynamics that drive the socio-economic transformation that we often call “the Knowledge Society”. One of the defining characteristics of this emerging world is its essential complexity, which in many practical cases cannot be simplified without losing the object under study.

In this setting, as discussed above, strategic planning becomes a contradictory effort, and strategic management shifts toward strategic development. In many ways, strategy becomes a question of strategic learning. Learning becomes an explicit part of strategy, and strategic thinking rests on new concepts that cannot be found in existing text-books.

Although universities are fundamentally more challenging organi-zations for strategic management than business firms, the emerging new concepts of strategy are well-suited also in the university context. The application of these new concepts, however, requires considerable intellectual effort. There are no pre-existing blueprints to follow; instead, university managers need to draft their own blueprints for action.

In the traditional approach, strategic planning assumed that we describe and explore alternative futures, thus creating understanding of critical choices that should be made today. The decisions are then expected to lead to action. This sequence of reflection, choice and action is widely considered to be an obvious model of how people think and how organizational decision making occurs. To an important extent, Western culture can be defined by this specific conceptualization of rationality. Although mainstream studies of organizational decision making have pointed out that decisions are often articulated and formulated only after the fact, for example to communicate and legitimize routes of action already taken, conventional models of rationality are deeply rooted in the belief that thinking comes before action, and that rational action can only result from selecting between pre-mediated alternatives.

This view neglects the fact that our action is not just implementation of thoughts. All our action is intelligent action, oriented towards anticipated futures. It is the richness of imagined futures that makes our action more or less intelligent, in the conventional sense. Rational thought becomes possible only in retrospection, structuring, categorizing and simplifying what we already know.

In improvisation, thinking and action can not be separated in time. There is no obvious causal chain from thought to action. Instead, improvisational action is intelligent action that simultaneously expresses knowledge, skill and interpretation of the context of action. We rarely think what we say: instead, our speech expresses and articulates our thoughts. Yet, we speak using culturally embedded languages and utilize conceptual systems that allow us to make important distinctions.

The linear sequence of analysis, selection and action is today widely understood to be a highly interactive process. Yet, the underlying model remains linear. Our concepts of rationality, decision making and causality are tightly coupled, and it is not easy to revise any of these without changing the others. Indeed, this tight bundle of fundamental concepts has to an important extent defined how philosophers since Aristotle have understood the problems of ontology and epistemology.

These Western conceptualizations of rationality, knowledge, action, and cause and effect have been highly successful in practice. They have allowed us to simplify the world in ways that make repeatable and predictable interventions possible. They have allowed us to project a mechanistic picture on the world, thus facilitating mechanical interventions and inter-actions with it. As Henri Bergson noted more than a century ago, the human intellect simplifies the reality in ways that allow us to grasp it. Indeed, according to Bergson, that is why we have intellect. One expression of the collective force of the human intellect is the industrial society, where technology-enabled large-scale production now dominates value creation.

Yet, as Bergson also noted, this capability comes at a cost. The human mind has great difficulties in comprehending change, flow, and complexity that are the essential characteristics of living systems. Bergson's claim was that the human intellect can only operate if it reduces the world into a reality that lacks the essence of life and where the “durée” of biological life is replaced by a sequence of timeless ticks of a mechanical clock.

As a living process, human intelligence, however, still interacts with the complex world of change through action and instinct. Perhaps, therefore, we could say that improvisation, guided by intellect, knowledge, and educated instinct, can provide us a productive access route to the world of complexity. Improvisation provides the foundation for real-time strategic action. Foresight, in turn, generates the imagined futures that guide thinking, knowledge creation, competence development, and education. Together they make strategy possible in the emerging world.

6. WHICH ANTICIPATORY SYSTEM FOR UNIVERSITY FORESIGHT? A POSTSCRIPT

By RIEL MILLER[33]

> *"The straight warp of necessity, not to be swerved from its ultimate course – its every alternating vibration, indeed, only tending to that; free will still free to ply her shuttle between given threads; and chance, though restrained it its play within the right lines of necessity, and sideways in its motions directed by free will, though thus prescribed to by both, chance by turns rules either, and has the last featuring blow at events".*
>
> Herman Melville, *Moby-Dick*

As the university changes and the society in which it functions also changes, there are people who ask the question: How *should* the university change? Generally, these people, some of whom feel responsible for what happens, want to answer this question because they want the university to serve a specific purpose. They believe that the university should change in ways that make for a better future for the university and, usually, for society as well. As a result, in order to think about how the university should change they need to think about what the future might be like. This is where foresight comes in and the question of which anticipatory system to use to think strategically about the future.

6.1. FORESIGHT

Foresight is an action. In its most general form, it is any kind of act that takes into account the future. This means that foresight is an activity, a process. It is an action that in one way or another uses the "reality" of time in our universe. In other words, foresight depends on the fact that, as far as we know, the present is a point, a special one that is stuck between a forever inaccessible past and an eventually accessible future. Now is special.

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Of course the past exists in the present in many different ways and so too does the future. There are differences and similarities in the way the past and future exist in the present. The past is with us in memories, both conscious and unconscious, and in all sorts of artifacts and phenomena, from monuments like the pyramids and literature to ideas like equality or "Arabic numerals". Past and future share the impossibility of (re)creating what did/will happen. From the now it is impossible to go backwards or forwards to "be there" since there is no there to *be* in. A photo or movie of the past are the past now.

The future is also from the past – mostly in two ways. First, when the future is created using the past as precedent. This is the past extrapolated into the future. Second, when the idea of the future is just taken from what was imagined in the past. This is what Barrows Dunham called "past futures." There are future futures, which are clearly unknowable now, but will exist when later on, in some future now, someone imagines the future. Strictly speaking none of these futures is really "the future" since it is either the past in the present or the present in the future but never the future in the present, since the future does not exist. In the end the past *is* the main way that the future exists in the now.

Where the future differs from the past is in that it has not existed. As a result, the only way to make the future "exist" is to imagine it. This is anticipation. Not all anticipation takes a conscious form, as Robert Rosen pointed out, trees anticipate by shedding leaves before winter and, as Juan Ferret argues in a recent Special Issue of Foresight, the entire universe anticipates because it is moving "in time". Both conscious and non-conscious forms of anticipation can be described as operating within systems that enable the act of foresight – "imagining" what does not yet exist.

6.2. ANTICIPATORY SYSTEMS

Anticipation is such a familiar activity that we often do not think about it. Look at the cartoon of Bugs watching Elmer depicted below, it is clear that the clever rabbit is many steps ahead of the plodding hunter. Bugs has a better anticipatory system than Elmer. A schematic representation of Bugs' anticipatory system can be reduced to a subject (S), in this case Bugs, a model (M) of Bugs, and an effector system (E), which in this example is Bugs' capacity (volition) to direct himself (S) to get out of his rabbit hole.

The input, that gets the whole process going, is when Bugs hears Elmer coming. This sound is a source of information, data that is fed into M – a model of Bugs and his survival. The model allows Bugs to speed up time, to imagine a point in the future, a little story about what Elmer might do when he arrives at the rabbit hole. This imaginary, model-generated story of the future is then transmitted (1) to Bugs' effector system (E) leading to a decision and instructions (2) to Bugs' legs (S) to get him out of the burrow right pronto – the output being that the object system (S – Bugs) can then look at Elmer when he fires the shotgun into Bugs' burrow.

Bugs is not a machine and he doesn't think about the inputs, models, effectors, and outputs of his anticipatory system. He just does it. The drawing in Figure 6.1b is a simple depiction of an "anticipatory system", it compartmentalizes and sequences in ways that are much too neat, real anticipation is a much cloudier process, with a myriad of inputs and outputs, conscious and unconscious perceptions and motivations.

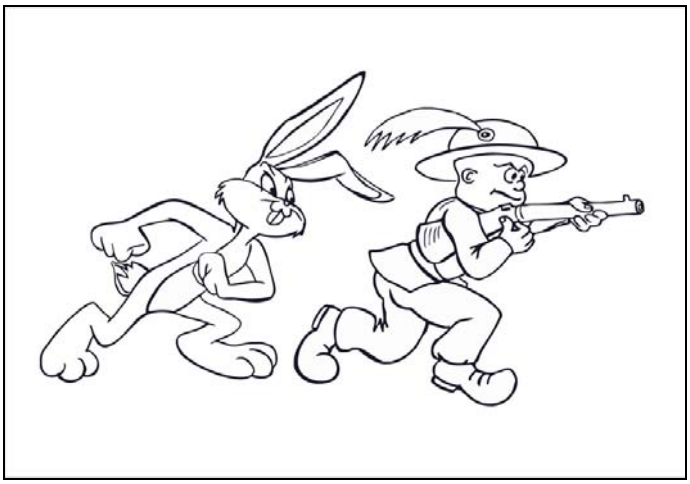

Figure 6.1a. Bugs Bunny outsmarting Elmer Fudd.

The fine print: The idea of anticipatory systems and the schematic illustration of how such systems work is useful for thinking through a part of the process whereby the future enters into our actions. Depicting anticipation in this mechanistic linear fashion need not deny that almost all of the inputs and outputs, as well as the attributes and "functioning" of the model and effector systems, are constructed and shaped (reflexively) by our ways of seeing and through interactions. Myths of good and evil spirits, ghosts and gods combine with instinctive fight or flight reflexes in ways that are layered on our internal and external rules of what is good or safe or dangerous.

What we do and how the future enters into it, is multi-faceted and can, if we make the effort, include a recognition of fundamental indeterminacy and the creative novelty of what happens.

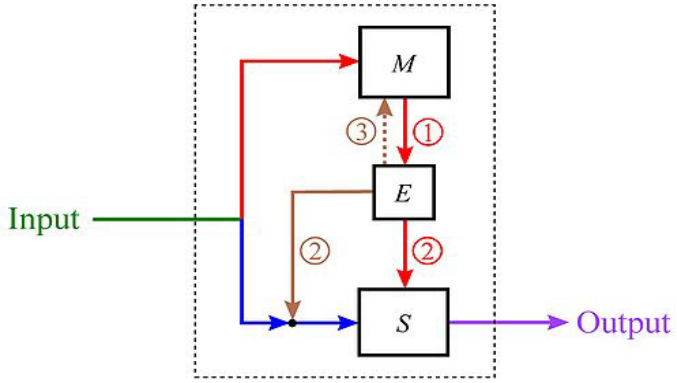

Figure 6.1b. Robert Rosen's M-model in Rosen R., 1985, "Anticipatory Systems: Philosophical, Mathematical, and Methodological Foundations".

6.3. DISTINGUISHING ANTICIPATORY SYSTEMS BASED ON CATEGORIES OF THE FUTURE

One way to discern different kinds of anticipatory systems, or at least sub-systems, is to consider differences in the objects being considered by the system. As a working hypothesis I offer three different kinds of potential of the present – that is, kinds of future that can be subjects of the act of foresight. Two of these categories of the potential of the present I call **contingency** and **optimization**. These two are quite familiar. Humans are fairly adept at using their anticipatory systems (models, effectors) to act on these two dimensions of the present. The third category is harder to pin down, and we have much less experience with "being" **exploratory**. It takes all three to see the rich potential of the present[34] – to be and become.

6.3.1. Contingency

Contingency futures are those aspects of the present that have the potential to happen due to an outside event. One can hope to prepare for or pre-empt a contingency future but the potential for it to happen is usually

[34] This is a way of connecting a multi-ontology reality with a multi-epistemology design for action. See Aaltonen, M. (2007), "The Third Lens: Multi-ontology sense making and strategic decision making", Ashgate.

not contingent on the phenomenon that is acted upon. This potential of the present exists in the dangers and opportunities posed by outside forces, like predators (tigers, cars), which, if you are not careful, can kill you and which also take the form of emergencies (wildcard events – high impact, low probability) such as a tsunami, an earthquake, pandemics or, alternatively, good things like winning the lottery or the chance discovery of a suddenly valuable resource (oil, gold, lithium) beneath desolate sands or jungle (good for income, bad for preserving a culture in an unchanged state).

Be it a tsunami or winning the lottery, contingency futures can be imagined and even calculated probabilistically. For instance, on average the chances of being hit by a sports utility vehicle while sitting in a Starbucks coffee shop are lower than if you are crossing the street. Although when I was in Berkley a few years ago an SUV did come flying through the door of the Starbucks coffee shop I was in, luckily causing only material damage. Still, statistics and odds, as any punter knows, are just informed guesses.

Yet, humans are fairly good at this kind of “approximation” story that helps us prepare for the unexpected outside force. Here again I have a personal anecdote about how my life was saved by a flight simulator. No, I didn’t pilot a plane based on my experiences landing computer generated bi-planes. Rather the pilot of the twin engine turbo-prop that I was in, on a stormy night in February heading out of Quebec City, explained after we had landed safely, that if he had not practiced in a flight simulator, just the week before, how to recover after losing an engine, none of us would have lived to tell the tale.

When it comes to the contingent potential of the present, games, simulations, practice adapting, openness, stockpiling general purpose tools, etc. are what serve us best.

6.3.2. Optimization

Optimization futures are those aspects of the present that 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 fixed.

Here the potential of the present is like a chess game. There are many permutations, different paths to the goal, but the ends, means and rules of play are given. Farmers that plant seeds in the ground with the expectation of harvesting a crop in the future know that there are many phenomena that

can intervene, from locusts and war to perfect weather and enough hands for the harvest. They play the game, using their best know-how to get to the goal, while fully aware that it is not certain.

Of course it is well known that pursuing a plan (a path of action decided in the past) cannot take into account much of what happens, the messy and complex parts of reality that are continually reminding us that goals, rules and resources are all open to change. But generally speaking, if the end is deemed sufficiently important, like planting grain so that there will be food to eat later in the year, then proceeding as if things will go as planned is deemed acceptable and often necessary.

For much of human history the end (survival) justified the means, including ignoring new information arising out of change and even changes in the conditions of change. Indeed, as the recent financial crisis demonstrates, more effective optimization still matters (superior reform), Toyota beats General Motors in planning to produce cars, but at the same time the end of the automotive era signals that industrial organizations operate in a new context. The potential of the present goes beyond optimization.

Even for the most agile or flexible entity that displays strong resilience, able to sustain or preserve its "nature", the assumption that the goals, resources and rules are given fails to encompass the emergent, spontaneous and serendipitous attributes of reality as it assembles from moment to moment. This brings us to the third potential of the present category: exploration-discovery.

6.3.3. Creation, Exploration, Discovery

Exploratory futures are those aspects of the present that are not yet known but are created – invented, in one way or another, to reveal new patterns or to form part of the necessary, albeit not sufficient conditions for novelty. Exploration is about "seeing" the present differently because what one imagines in the future is different.

Novelty and discontinuity are the hallmarks of this dimension of the present – and in a way it only exists once it is seen. Unlike the *tromp l'oeil* image that is either a glass or two faces, depending on how you decide to look at it, these spontaneous phenomena are not just waiting to be discovered but must happen in that mysterious bang that is part inspiration, part legacy, part chance, and part mystery.

Exploring the potential of the present is a delicate and ephemeral balancing act when compared to optimization or contingency. As intimated by Thomas Edison in his famous quote: “Genius is one percent inspiration and ninety-nine percent perspiration”, explicit efforts to discover the potential of the present (without which it might not even come into existence) depend on the paradoxical, even contradictory task of building a scaffolding for the imagination.

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 non-existent cannot “bang” into existence. Exploration is not about the paths not taken, it is about the futures unimagined and hence the presents that never existed. No dance, no improvisation.

“Dimension” of the future	Example	Teleology	Context	Method
Contingency – Prepare for events that are contingent on other events.	Wildcard, lottery, defined by the capacity to react	Be prepared	Simple – an event which is determinate (limited, specific and definable).	Simulation, drill, transparency, communication, adaptability
Optimization – prepare for purposeful action	Chess game, reform process, climbing mountains, manufacturing a car, going to the moon	Known goal	Known resources, known rules, tries to defy complexity through reduction and imposition, the ends justify the means.	Planning, probabilistic scenarios
Exploration – engage in reconsidering the anticipatory assumptions	Systemic emergence – gaining wisdom, societal transformations – from agriculture to industry	Creativity	Unknowable resources, rules, values in a context with emergent potential that is hyper-complex, *i.e.* not only uncertain but the endogenous anticipatory systems are emergent	Systemic disruption, distancing, inside-out and outside-in

6.4. WHAT IS FUTURES LITERACY?

Futures Literacy (FL) [36, 37], is a particular approach to building up an anticipatory system. FL is an overarching design framework that helps to guide the customisation of specific foresight methods at each step of the process in order to construct and then connect imaginative, analytically coherent strategic scenarios to policy options relevant to today’s decision makers. The findings and methods of scientific research are the source of both the design principles and content of FL processes. FL is simultaneously an action-research methodology and a capacity building exercise.

6.4.1. Futures Literacy as Foresight Practice

Futures literacy (FL), like alpha-numeric literacy, is a capacity. It is the capacity to develop and invent anticipatory assumptions. FL is a practical tool, like reading and writing, that enhances the way we use M, the model, in our anticipatory systems. A futures literate person is able to identify and distinguish the different forms of the potential of the present, just the way an accomplished reader can distinguish fiction from non-fiction, a detective story from a romance novel.

But what is fundamental about FL is that it anchors the future in the act of creating the present. FL only exists within multi-ontology being, a capacity of anticipatory systems to assess and invent the contingency, optimization and exploratory stories that are the simultaneous dimensions of the potential of the present. FL is done through structured conversations that bring disparate elements, depth and breadth of knowledge and information into a partially shared sensemaking framework.

Practicing and acquiring FL entails learning-by-doing processes that go through the typical phases of the learning curve. Level 1 is relatively easy; it calls for the development of a common discourse around values, expectations and, the subject of conversation. Many catalysts work for this discussion, including foresight tools like scenarios and “real-time” Delphi. Level 2 is the steep part of the learning curve and calls for “rigorous imagining”, a structured process that combines analytical and creative framing of rich images of invented futures. Finally, Level 3 closes the circle, comparing and contrasting anticipatory assumptions with the expectations and aspirations revealed in Level 1 in order to clarify how the future enters into current choices – decisions now.

One way to learn how to be futures literate is to engage in a hybrid strategic scenario process that moves step-by-step through the three levels of FL [38, 39]. This approach uses a process of “rigorous imagining” – a learning-by-doing, practical way to become “futures literate”.

The HSS strategic conversation is divided into three phases:
- Level 1 – Understanding Time, Expectations, Aspirations, and the Subject
- Level 2 – Rigorous Imagining: Building a Dual Descriptive Frame (Narrative and Analytical) of the Subject and Constructing Creative Scenarios Within that Frame
- Level 3 – Making Strategic Choices: Taking a New Look at Anticipatory Systems and Assumptions.

An HSS process that develops FL and produces new strategic insights requires careful preparation and implementation. Many specific techniques can be used at each stage in the process, and the tools must be adapted to the context and task. That is why it is called “hybrid”, the processes mixes many different specific ways of action-research and sense making. An HSS process can be done in one day or a year, depending on the depth and participatory requirements.

6.5. WHICH ANTICIPATORY SYSTEM TO USE?

At the moment, humans, particularly in technical-industrial societies, are largely interested in conscious anticipatory systems (even if we have our fair share of non- and unconscious ones too). Some people believe that this pre-occupation with knowingly anticipating is, at least up until now, a survival advantage. Regardless of whether that is true or not – certainly, hindsight and immodesty give the impression that conscious anticipation is useful –, today volitional and intentional anticipation are in a privileged position. We want (volition) to take the future into account when we act in order achieve certain objectives (intention). Another, very familiar term for this combination of volitional and intentional foresight is planning.

For many people and communities (organizations) the conscious act of planning, shaped by our motives and goals, is the dominant form of an anticipatory system. Indeed, at the moment – at least in most OECD countries – planning is largely how the future exists in the present. The apparent success of planning and its self-evident symbiosis with techno-industrial society makes it easy to reduce anticipatory systems and foresight to planning. However, for a variety of reasons this hegemony is under siege. The changing context of our times appears to be altering the effectiveness of anticipatory systems, how we engage in foresight. The attributes of this changed context, in no particular order, can be described very briefly as follows:

First, perhaps most rooted in intentionality, is the generally accepted desire to respect, even encourage diversity and self-expression. This declared right to “liberty” is accompanied for the lucky and most powerful few by a genuine liberation from the imperatives of necessity. This is the second attribute of the present that renders the authoritarian requirements of planning less self-evidently justifiable on the grounds that the ends (survival) justify the means (obedience). The third is a more subtle enabler, the accumulation of knowledge – theoretical and practical – that embraces and

begins to make sense of the discrepancies and outright contradictions of what happens. Complexity and unorder, in Dave Snowden's words, challenge determinacy as an all encompassing rationality of the universe. As Ilya Prigogine puts it, "the past no longer determines the future". Fourth and last, bent to the diversity and creativity of being and becoming, our tools – like mobile phones and the Internet – are starting to operationalize the spontaneous.

As experience builds confidence, we let go of both the will to certainty and our acceptance of passivity, the dominance of planning as *the* anticipatory system is giving way. What might replace it? We may be in the midst of discovering a new kind of swirling multi-dimensional future as potential of the present – a futures literate world. Or as fear runs rampant and survival reasserts the use of any means to reach given ends planning could be restored to its past glory. Of course it is impossible to say what will happen, the future is unknowable. What can be discerned, in the present, are some emergent traces of both endogenous and exogenous change in anticipatory systems. In part the identification of these new systems is an act of creation, consistent with the invitation of a non-planning anticipatory system to embrace the spontaneous emergence of genuine novelty. But part is also about identifying new attributes and new patterns within existing systems, or potentially parts of new systems, which are already present around us but remain obscure, either hidden by the filters of the dominant paradigm or just too nonsensical to be noticed.

The following sections of this chapter describe a few ways of distinguishing the attributes of anticipatory systems without knowing the exact boundaries between those changes that belong to endogenous versus exogenous systemic change. Readers are invited to assess and imagine the boundaries, relationships, and meaning themselves.

6.6. CONTEXT MAKES A DIFFERENCE: MORE OR LESS CONTINGENCY, OPTIMIZATION AND EXPLORATION

Not all moments in the life of a person, an organization, or a community are the same. There are times when the necessity of survival or ideology or chance either allow or impose simplification. When the goal is, for whatever reason, taken as given – surviving a pandemic or producing a given product, with fixed resources and accepted rules, then even if the situation is complicated the appropriate approach is one of simplification, simulation and comprehensive analysis. So a computer can eventually beat the best

human chess player – the goal was clear, the resources set, the rules unalterable – and the computer could simulate millions of solutions per second in order to ultimately find the best one and win.

But many situations cannot and should not be reduced to a given goal, fixed resources and set rules. Much of the world around us is fundamentally indeterminate and so is most of what we care about, like what happens to a person over the course of their life or the path a society actually ends up taking. Spontaneity, giving rise to its mercurial progeny chance, has the final say at events, as Melville pointed out in the quote from Moby-Dick cited at the outset. Accepting the complexity of much of our world, particularly when the immediate question of survival is not constraining our willingness to let go, and choosing openness, particularly when it corresponds to our values, puts the burden on exploration.

Knowing when to think about the potential of the present and in what way is not just a luxury, the moment when we say “oh what the heck, let’s be open minded”. It is a necessity if we are not to confuse and destroy our desire to be free and creative.

6.7. HISTORY: VALUES AND MEANS – LOCATING AN EXPLORATORY LEARNING SOCIETY

As the human desire and capacity to embrace complexity changes then so too does the mix of ways of thinking about the potential of the present. For decision making this is a fundamental question: what is the context for the decision? Is it a context where the organizational solution, the manageability is high or low? Are the actors and tools predetermined, invariable – the man is an employed worker in a factory using a given machine, a lathe, to produce what he is told to produce. Or is there a margin for co-creation, the openness of not knowing, discovering, inventing and transforming the man, the factory, the lathe, into something previously unimagined? In this context the world becomes ambiguous and reflexive; it is emergent and undetermined.

This does not mean that all of reality becomes so open, or that we can do without all layers of necessity and hierarchical management. The world around us is a mixture, an assemblage of contexts that coalesce moment by moment, swirling in clouds with different degrees of inertia and spontaneity, different durations and densities, different weights and degrees of connectedness. Into this mixture comes human volition; our desire to bring values and

rigor to our complex reality. For a long time, particularly in the industrialized parts of the earth, we have been pretentious and successful, imposing our will on a pliable environment that is indifferent to our designs. Optimization and hierarchy worked well, the top-down flow of power – from conception to execution, from preconceived goals with fixed resources and set rules to implementation – prevailed.

Taking a different approach, one that does not abandon the aspiration of living according to our values and searching systematically for the "best" solutions, calls for a more heterarchical, exploratory way. A capacity to put learning, and the banal creativity with which every human is gifted, into practice by inventing stories that are able to discover and include spontaneity. A learning society where the gradual, almost always hard-fought school of experience puts wisdom at the core of being. One way to help make this doable is to build up our anticipatory systems by cultivating Futures Literacy. One way for universities to take on the challenge of thinking about the future would be to develop FL.

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