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Strategic Foresight

La Prospective

Use and Misuse of Scenario Building

Michel Godet

with Philippe Durance
and Adam Gerber

research working paper (#10)



The Entrepreneurs' Circle of the Future



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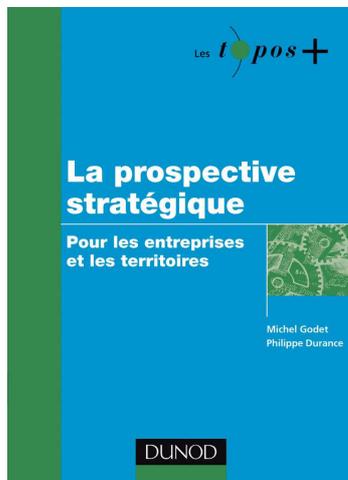
CNAM - 2 rue Conté - 75003 Paris

Tel.: (33) 01 40 27 25 30 Fax : 01 40 27 27 43

Secretaría: sec.prospective@cnam.fr

Jean-jacques.perseil@cnam.fr

Internet: www.lapropective.fr



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Working paper #10 actually serves as an introduction to the *Manuel de prospective stratégique* (2 tomes or 700 pages) published by Dunod and now in its third edition (2007). English-speaking readers may refer to *From Anticipation to Action, a Handbook of Strategic Prospective* (UNESCO, 1994) and *Creating Futures: Scenario Planning as a Strategic Management Tool* (Economica, 2006), both available to download free from the LIPSOR website.

The Circle of Future Entrepreneurs, founded in 2003, has some fifty member-organizations and partner-companies which share the same civic-minded spirit. In other words, a desire to form “the public good using private liberalities. Without becoming like the wealthy Roman benefactor of Antiquity who lost their fortunes building theaters or aqueducts in the name of public interest! Since 2005, the Circle has been guided by the National Center for Entrepreneurship (CNE). The main goal of the Entrepreneurs’ Circle of the Future is to think and act differently while contributing knowledge to society and supporting entrepreneurship as well as local development initiatives.

In fact, since 2003, the Circle has devoted much effort to making available for free and throughout the world the strategic prospective methods (workshops, scenarios, actor games) as developed at the Laboratory of Innovation, Strategic Prospective and Organization (LIPSOR) at the CNAM. The relevant software programs have been put online by Epita and downloaded over 30,000 times so far from the LIPSOR website.

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■ Foreword

The translation of this book, which is an introduction to the fundamentals of strategic prospective¹, begins with a difficult choice concerning how to translate the French term prospective into English. In Spanish, as with other Romance languages, the word is effectively the same. However, up until very recently, there had been no equivalent of *La prospective* in the English language. There have been several contenders, such as futurology, future studies, and forecasting; however, none of these terms do justice to *La prospective*. In English, the term forecasting is too often used in the context of economic modeling and technological forecasting, and therefore does not capture the true essence of prospective. In many of my previous English publications, I managed to skirt the problem. In one book, prefaced by Igor Ansoff, the term prospective had been effectively replaced throughout by the term scenarios². In another book, prospective was loosely defined by the English title, *Creating Futures*³. The publication of the book *From Anticipation to Action: A Handbook of Strategic Prospective*⁴ was the one instance where I refused to compromise. Ironically, the book is available on Amazon.com with the following parenthetical information “(future-oriented studies)” deliberately appended alongside the title so as not to confuse the potential buyer.

In the early 1990s, a prospective cell entitled “Forward Unit” was created at the European Commission. During a meeting with Ian Miles at ISPRA⁵ in 1993, we introduced the concept of “profutures” which is a contraction-concatenation of both prospective and futures. At the time, the department at the University of Manchester where Miles had been conducting research was entitled “strategic prospective”. Given the adoption of prospective among English academics, we had hoped that the concept would secure a place in the Anglo-Saxon lexicon⁶. The heroic efforts of authors such as André Cournand, Maurice Lévy⁷, and Philippe de Seyne⁸ to

¹ Godet (Michel), Durance (Philippe), 2008, *La Prospective stratégique, pour les entreprises et les territoires*, Paris, Dunod, collection « Topos+ ». We are grateful to the publisher for allowing us to translate this book into English.

² Godet, Michel. *Scenarios and Strategic Management*. London: Butterworths, 1987.

³ Godet, Michel, 2006, *Creating futures: Scenario Planning as a Strategic Management Tool, Economica*, 2nd edition. This book is available for download free-of-charge at the LIPSOR website; www.cnam.fr/lipsor/eng/publications.php

⁴ Godet, Michel, 1994, *From Anticipation to Action: A Handbook of Strategic Prospective*, UNESCO. This book appears under the title *From Anticipation to Action: A Handbook of Strategic Prospective (Future-oriented Studies)* at the Amazon.com site. This book is available for download free-of-charge at the LIPSOR website; www.cnam.fr/lipsor/eng/publications.php

⁵ “Towards a European Network in Strategic Prospective”, Institute for Prospective Technological Studies (PROMPT), Joint Research Center, Commission of European Communities, Ispra, Italy, September 30 – October 1, 1993.

⁶ Bain, Donald, & Roubelat, Fabrice, 1994, « Profutures. The birth of the Strategic Prospective and Futures Studies International Network for Applied Methodology », *Futures*, April ; Institute for Prospective Technological Studies, 1995, *Scenario Building, Convergences and Differences*, Proceedings of Profutures Workshop, European Commission Joint Research Center, EUR-17298-EN

⁷ Cournand, André & Lévy, Maurice (eds), 1973, *Shaping the Future. Gaston Berger and the Concept of Prospective*, Gordon & Breach Science Publishers; with a foreword by Oskar Morgenstern

introduce prospective to the United States in the 1960s were in vain; so the appearance of a department of strategic prospective at an English university was promising, but ultimately disappointing when the department changed its name. Without the support of the European Commission in Brussels, which nevertheless drew much of its own inspiration from the French school of prospective, the term prospective would fade into relative obscurity in the Anglo-Saxon world. Since English is the dominant language, the term foresight, introduced in the 1990s, was adopted. Perhaps the best possible translation of *La prospective* as we intend it is strategic foresight; and so we will use the term strategic foresight to mean as for a possible prospective throughout this volume.

So, the concept of prospective has never really been properly translated into English. In French, we use the term “la prospective” to designate a discipline which seeks enlightened anticipation by clarifying actions made in the present through the thoughtful examination of both possible and desirable futures. It wasn’t until 1996 that Ben R. Martin published an article in which he introduced the term foresight, which for the first time approximated the French word prospective. Martin wrote, “[...] the starting point of foresight, as with la prospective in France, is the belief that there are many possible futures⁹.”

Despite this explicit reference, Martin’s translation is only approximate. As with prospective, foresight puts an emphasis on group processes and participatory debate; however, foresight lacks pro-activity, an integral aspect of prospective. Pro-activity, as we intend it here, is the deliberate construction of a project or projects which compel(s) an organization to take action leading to a desirable future. That is why we’ve chosen the term strategic foresight, which we believe more closely approximates the meaning of the French word prospective. Prospective is an intellectual approach which seeks to clarify present actions with the aid of a collective vision which an organization creates for itself. This vision is based upon the organization’s perception, right or wrong, of the past as well as possible and desirable futures

Prospective is characterized by a global and systemic approach where various actors and variables, particularly those within an organization, can play a determinant role in the outcome of any given future. Prospective considers the future to be the result of human agency, which, in turn, is strongly conditioned by human desires, projects, and dreams.

The French philosopher, Gaston Berger, is considered the spiritual father of prospective following a seminal 1957¹⁰ publication in which he outlined the fundamentals of the discipline. Berger himself had been a disciple of the philosopher Maurice Blondel who considered that the future could be constructed from elements carried over from the past. Blondel once said, “The future is not forecasted, rather it

⁸ Michel Godet, *The Crisis in Forecasting and the Emergence of the "La Prospective" Approach with Case Studies in Energy and Air Transport*, Translated by J.D Pearse and Harry K. Lennon, Foreword by Philippe de Seynes, Pergamon Press for UNITAR, 1979.

⁹ Martin, Ben R., “Technology Foresight : capturing the benefits from science-related technologies”, *Research Evaluation*, V6, n°2, August, 1996, p.158.

¹⁰ Berger, Goston 1957 “Human Science and Forecasting”, *La Revue des Deux Mondes*, 3, February 1st.

is prepared.” Berger went further by stating that, “the future is the *raison d’être* of the present” and he considered that most of our behavior can be explained and justified by the goals (projects) we set for ourselves.

In truth, Berger’s ideas were not particularly novel and can be found in the Classical philosophy of Aristotle who distinguished between means and ends, or more specifically between an efficient cause (one which provokes any given effect) and a final cause (one which justifies our actions with the aim of producing a goal). Likewise, advocating the use of a project with a corresponding action-plan is borrowed from Seneca who wrote, “Not a fair wind blows for him who knows not where he goes.”

For those who practice strategic foresight, the future is not written in stone. Rather, the future is constructed by human agents, particularly those who are prepared to sacrifice in order to manifest their projects into reality. That is why we speak of anticipation as having two complementary attitudes; pre-activity and pro-activity. The former is concerned with anticipating possible changes in the global environment so as to best prepare oneself and take advantage of such changes. We find this attitude among the various approaches to the future including; future studies, forecasting, and scenario planning. The latter attitude, which is decidedly anti-deterministic, seeks to provoke desirable changes through the actions of human agents, e.g. innovation to capture market share.

The legacy of Berger’s prospective is first and foremost a process where current decisions (and subsequent actions) are enlightened by possible and desirable futures¹¹. If this optimistic and anti-deterministic attitude is embraced by those familiar with strategic planning, it is often regarded with suspicion by free-market advocates who distrust anything resembling social engineering. Nevertheless, the concept of sustainable development and our responsibility towards the planet and future human generations is born out of this prospective attitude.

This book is an introduction to the practice of strategic foresight (*la prospective*). Its goal is to provide the reader with an understanding of strategic foresight’s fundamental concepts which draw upon my experiences as a researcher, professor, and consultant for close to 35 years. One of my professional goals is to pass on my knowledge to future generations. I’m thrilled to co-author this book with two colleagues; Adam Gerber, an American and PhD in management science at the Conservatoire National des Arts et Métiers, who both translated and edited this volume, and Philippe Durance, associate professor at the Conservatoire National des Arts et Métiers, who is the most authoritative scholar on Gaston Berger’s philosophy.

¹¹ The “futuribles” approach (a contraction/concatenation of *futurs-possibles*) introduced a few years later by Bertrand de Jouvenel is more speculative in nature than *la prospective*. Furthermore, in de Jouvenel’s book “The Art of Conjecture” written in 1964, de Jouvenel does not refer to the word “prospective” at all. In the late 1970’s, I asked de Jouvenel why he never cited Berger’s work. His response was simply “What purpose does that serve, it’s effectively the same thing [as conjecture].” History has retained the concept of *la prospective*, but not that of conjecture. Conjecture concerning possible futures is not without risk because it leads to an endemic problem that we often observe in strategy; too many scenarios and not enough projects.

The spectacular growth of the French school of prospective, which began in the 1950s, continues apace. We have carried the flame by continuing to develop methods which are both rigorous and participatory. The rationality of these methods allows users to deal with the complexity of their business environment, while stimulating imagination and reducing the incoherencies that often appear in group processes.

I have had the great pleasure to apply these methods and their associated software thanks to the generous support of the Circle of Entrepreneurs of the Future¹²— an organization which includes fifty global corporate sponsors. The software that accompanies the methods of prospective is available free for download in French, English, and Spanish at www.lapropective.fr and allows users to identify key variables and factors, construct scenarios, and then assign probabilities to these scenarios. Since we've been offering these powerful software tools, there have been more than 25,000 downloads throughout the world (40% to Latin America) which clearly demonstrates the range and influence of the French school of prospective.

Unfortunately, we haven't been able to elicit the same interest in our own country of France, where public administration continues to carry out foresight studies without ever calling upon the rigorous methods of prospective or properly training participants how to use such methods. These administrators undoubtedly believe that such studies require neither preparation nor professional facilitation. In a political context, we observe that prospective is more often used at the regional/city level than at the ministerial/national level, but even then it often lacks professionalism and rigor.

One last word on the French school of prospective; the fact that it has successfully spread throughout the world has not stopped divisions from forming among competing camps within France. These divisions have less to do with competing ideologies and more to do with economic competition among consultants; after all, strategy consulting is a profitable activity. We believe that consultants, be they in France or elsewhere, are too often concerned with articulating an elaborate set of scenarios regarding the external business environment, and pay little or no attention to the strengths and weaknesses of the organization which is undertaking the study, or the development of internally driven projects which would allow the organization to create its desired future. We also observe a general abuse of certain methods, particularly morphological analysis, which is a method that allows users to create scenarios from Lego-like building blocks; however, the quality and relevance of the resulting scenarios is directly proportional to the knowledge and experience of those who create them. We hope to redress some of these issues in this book. The principal goal of this volume, along with those which preceded it, is to contribute to the human capital of strategic foresight and planning.

Michel Godet

¹² The Circle of Entrepreneurs of the Future was created in 2003 and includes some 50 corporate members. Its principal objective is to encourage the creation and dissemination of knowledge, support entrepreneurship, and help companies think and act boldly.

■ Introduction: The Fundamentals of Strategic Foresight

The methods and philosophy of *prospective* (strategic foresight) have been passed on from one generation to the next. While lifestyles change, the same old problems remain the same. Therefore, to understand *prospective*, its scope, its objectives, and its methods, it's best to return to the philosophy which is at the source of this practice so widespread today throughout the world.

Prospective began in the mid-1950s with the French philosopher Gaston Berger who formalized the practice around what we would call *decision science* today. Starting in 1955, Berger argued that decisions must be made with the future in mind. Berger began to trace the outlines of *prospective* by describing how decision-makers might reconcile both knowledge with political power, as well as ends with means. *Prospective* provides decision-makers in both the political and business domains with the opportunity to transform their visions into reality by taking specific, goal-oriented action. Later, in 1958, Berger would develop the methods of this new approach, and after his death in 1960, Berger's philosophy would be carried forward by a group of loyal disciples who were well-connected in the economic and political life of 1960s France. These disciples took it upon themselves to diffuse the methods and principles of *prospective* and would successfully apply them to several important public policy decisions in France.

The Idea of a Science Concerning the Future of Humankind

The intellectual climate of 1950s France which conditioned Berger's *prospective* was at once optimistic and pessimistic. Despite the fantastic technological advances and unprecedented economic growth, the recent memory of war atrocities as well as the specter of nuclear weapons dampened much of the enthusiasm for technology in France. For many French intellectuals of the 1950's, science and technology posed as many problems as they were supposed to resolve. Furthermore, the pace of technological change was accelerating. In other words, the situations in which humankind will find himself are always new, and the consequences of a decision made in the present will ultimately occur in the world that is totally different from the one in which the original decision was made.

For Berger, classical methods for strategy and decision-making, which were based primarily on extrapolation and past experiences, were ineffective. Despite his conviction regarding the value of considering the future, Berger never discounted the value of history in making decisions. Indeed, history and *prospective* have much in common, as both deal with potential facts. The past serves to demonstrate those things which do not change, as well as to identify prevailing trends which are useful in formulating hypotheses and guidelines. However, the past is insufficient for models whose simple application might be applied at the expense of thoughtful analysis. In other words, the retrospective attitude is simply no longer adapted to contemporary problem-solving. Trying to anticipate the future from past events, even in its most scientifically extrapolated form, means assuming the phenomena under study will remain static. We simply cannot afford to make such assumptions in a world which is changing so rapidly.

Gaston Berger developed his philosophy with public policy decisions in mind. While still serving at the French Ministry of Education¹³, he observed that the French authorities often put means before ends; however, the reverse situation is actually required. In other words, public officials must first determine the ends, and then articulate the corresponding means. Berger observed that in practice, the distinction between ends and means is not so well-defined. Human will, knowledge, and ability all coexist in a sort of flickering *chiaro-scuro* which confuses the decision-maker. Decision-makers often resign themselves to the means with which they have at their disposal at any given time, reducing their decision-making logic to *least of all evils*. According to Berger, decision-makers may very well give up trying to find a better solution because they may believe, erroneously, that their vision is unrealizable simply because the means to achieve their goals have not yet been considered.

For Berger, *prospective* needed to be focused on human values; an anthropologic focus which would have the following functions; 1.) study the various situations in which humankind might find himself in the future, and 2.) elicit human values and aspirations. The mission of *prospective* would be carried out by specialists from diverse fields who were capable of indicating the way in which the future might evolve. One of the ways to achieve these goals was to bring together those who could determine the desirable, with those who could determine the possible. Articulating the characteristics of possible future worlds can only serve to clarify judgment in advance of an effective decision. That is why Berger called *prospective* the normative science.

The Prospective Mind

Beginning in 1958, Berger would formalize several important principles of his approach. This effort coincided with (and was applied to) several projects undertaken at the *Centre International de Prospective* (International Center for *Prospective*) which Berger founded in 1957. Berger believed that his theories required concrete examples, and that any formalization of such methods would be the result of field experience. Berger and the founders of the *Centre* would study such subjects as; the consequences of the emerging technologies (atomic energy policy, cybernetics, astronomy, aeronautics, etc.), the relationship between the West and the rest of the world, and the role of progress in society, etc. Berger and his colleagues also traveled abroad to participate in important conferences and share their ideas in the field of strategic foresight. The projects at the *Centre International de Prospective* implicated people from various fields including; researchers, university professors, government officials, and leaders in business. Furthermore, teams were assembled with complementary expertise in mind.

Berger (1957) advocated the following fundamental virtues with respect to considering the future. The first virtue is to remain calm, which is necessary in order to provide some psychological distance from the subject and to master your emotions. Imagination is another important virtue which ought to be employed in *prospective*. According to Berger, imagination is the complement of reason, and opens the door to innovation and entirely new perspectives on the world. Being a

¹³ Gaston Berger had been the Adjunct General Director of higher education at the Ministry of Education (in France) in 1952, and then General Director from 1953 to 1960.

team player is also indispensable for effective action, along with enthusiasm which allows the team to be creative. The team must also have the courage to veer off the beaten path, to innovate, and to undertake the inherent risks involved in decision-making. Finally, considering human values is the most important of these virtues as humankind must be at the center of any decision. Understanding human cultures allows one to appreciate the numerous culture-specific solutions to universal human problems. Culture, in all of its various forms, shows how humans are ultimately the masters of their own destiny.

Beyond the requisite qualities to confront this new future world, Berger also developed the foundations of a *prospective* attitude. These foundations ultimately serve to widen the range of possibilities and help one prepare an effective plan of action. In a world where the time between causes and their effects is diminishing, it is no longer possible to consider merely the immediate effects of one's current actions. *Prospective* therefore considers the medium- to long-term future as its subject, as opposed to merely the short-term. This distant horizon is not a problem however. In fact, it allows one to consider broader situations and arrive at higher levels of certitude since we can effectively ignore intermediate events. It is always easier to articulate a general trend than to try to determine the specifics of any intermediate future event.

However, *prospective* is not opposed to short-term forecasting; in fact, short-term forecasting and *prospective* complement one another quite well. Furthermore, trying to understand possible future worlds requires the input of several competent experts, whose opinions will ultimately coalesce to form a complementary and common vision. Finally, *prospective* is a global synthesis and must reconcile interdependent phenomena. Those who practice *prospective* must systematically reject the utilization of methods which merely analyze human behavior as the aggregate of independent routines. To identify and truly understand the determining factors for the future, as well as the motivations of human actors, sufficiently sophisticated methods are required. The fundamentals of *prospective* as Berger articulated them are; see far and wide, and analyze thoroughly. *Prospective* is about envisioning the consequences of current actions and seeing how these consequences might ripple throughout various domains of activity.

Berger also added two important dimensions to the *prospective* attitude. The first dimension which Berger considered to be of utmost importance was to take risk. *Prospective* favors audacity and risk. Risk is permissible because unlike short-term decisions whose consequences unfold in the near future—and are thus irreversible and require a greater degree of prudence—long-term decisions can be continually updated depending upon unfolding circumstances. Risk-taking is also required in a world which is becoming less and less predictable. In such a world, organizations must innovate; and provoking change requires a high degree of risk. The second important dimension that Berger articulated concerns human values or what Berger called “*la finalité de prospective*”. *Prospective* is a normative philosophy and must be concerned with desirable futures as well as possible ones. *Prospective*, therefore, allows an organization to construct its own desired future. For Berger, even if it were possible to anticipate all possible future outcomes, doing so is futile. What matters is to anticipate what would happen if humankind did nothing to change the course of

the future, then determine which human actions would be required to provoke the desired future. *Prospective* thus liberates humankind from the grips of determinism (Berger, 1959). Berger reminds us of the important distinction between means and ends, where human values may be considered the ends. According to Berger, human values must be at the center of both human decisions and their subsequent actions.

Prospective: from Theory to Practice

Between 1959 and 1960, the principal characteristics of *prospective* would be articulated and the first *prospective* studies undertaken. The philosophy of Gaston Berger would be elaborated by close colleagues of Berger, particularly Pierre Massé and other members of the *Centre International de Prospective*. Together, Massé and Berger would clarify and articulate the nuances and practice of *prospective*, as well as define pragmatic guidelines for *prospective* studies.

The future ultimately belongs to human agency. Thus, the subject of *prospective* is how to take effective action in light of human desire. *Prospective* is also a practical science which goes beyond merely applying scientific methods to human problems. To be effective, *prospective* must induce a veritable shift in perspective among those who participate in *prospective* studies. The goal is not to observe the future from the present, but rather to observe the present from the future. This virtual retrospection allows one to make more effective choices in the present by first considering one's ultimate objectives. Of course, the ultimate objectives cannot be separated from the possible means to achieve them. *Prospective* allows one to reconcile ends with means, as well as the current situation and the range of choices it affords. (Berger, 1959). Therefore, *prospective* requires that participants reconcile both possible futures with desirable futures.

Prospective starts by collecting facts and then analyzing them in order to discern general patterns and trends. Then, *prospective* elaborates various options and determines possible objectives. *Prospective* eschews the following; preconceived ideas, posing irrelevant questions, and falling prey to wasting time elaborating dead-end ideas. "*Prospective* must continuously challenge organizational objectives as well as the rules which govern organizational action." (Berger, 1960). To achieve these ends, reason alone is not enough; we must call upon the imagination.

Every organization must deal with the randomness of its operating environment. Every possible applicable strategy corresponds to a limited set of possible futures. *Prospective* allows an organization to determine these possible futures and evaluate them both qualitatively and quantitatively. In those cases where the most likely futures include unfavorable elements, the role of *prospective* is to determine which strategies will eliminate or minimize these unfavorable elements. (Massé, 1959).

The practice of *prospective* is often complicated by the difficulty of considering multiple time-horizons simultaneously. The overwhelming complexity and interdependence of activities occurring in these multiple time-horizons, requires the team to agree upon a single, common time-horizon. This time-horizon must extend beyond the problem under study, however extending it too far discourages action. Furthermore, the definition of this time-horizon also serves as a timeframe within which projects must be carried out, and an effective deadline such that project planning can be done accordingly.

Prospective is ultimately about discerning hidden factors which drive and condition social change. Practitioners must avoid the *status quo* hypothesis which is often "...an ignorant prayer, a sign of weakness, and a retreat from the responsibility of profound analysis and decision-making" (Massé, 1959). It is always a good idea to question the validity of permanence, which is belied by; the fact that determining factors are prone to reversals in the long-term, by the risks involved in taking the easy route (and conversely the virtues of taking the difficult one), and above all by inevitable social change. Again, it's not enough simply to assume that such reversals will take place, rather you must determine their potential impact and the timeframe within which they will occur. Therefore, participants must corroborate intuition with reason by considering key factors as a group. Even if these key factors may seem insignificant today, they may have enormous consequences for the future.

***Prospective* in America**

An important bridge in Foresight between Europe and the United States was the late (1921-2007) Wharton professor, Hasan Ozbekhan. Ozbekhan was born in Turkey, studied law in Paris, and management in London before cofounding the influential Club of Rome with Aurelio Peccei and Alexander Christakis. Ozbekhan was also the Club's first director. Among Ozbekhan's most famous publications were; "Toward a General Theory of Planning" published by the OECD, and "The Predicament of Mankind" which was a summary of the goals of the Club of Rome's subsequent work. A polyglot, Ozbekhan consulted to companies, nations and regions around the world, particularly those in Europe and North America. Michel Godet once asked Ozbekhan how he would translate *prospective* into English. Ozbekhan replied that there is simply no English word that can adequately capture both the pre-active and proactive aspects of *prospective*.¹⁴

Another bridge between Europe and the America with respect to Strategic Planning and Scenarios was Fritz Zwicky, a Swiss-born astronomer working at Caltech in the United States, who had developed a method for analyzing complex problems called morphological analysis. Zwicky published his results in 1969. The idea behind morphological analysis is that one is able to explore all possible solutions to a multidimensional problem. Initially used for the development of jet propulsion systems, morphological analysis quickly transitioned to areas of sociological interest and eventually, by way of Michel Godet, to Scenario Planning. It's quite possible that Zwicky had been influenced by TRIZ (Теория решения изобретательских задач or Teoriya Resheniya Izobretatelskikh Zadatch which means 'The theory of inventor's problem solving' in English). TRIZ was developed by Soviet engineer Genrich Altshuller beginning in 1946 and uses its own form of morphological analysis which has been evolving ever since. Morphological Analysis is also the foundation for Russell Rhyne's Field Anomaly Relaxation method, which shares similarities with some Scenario Planning approaches. Zwicky's contributions had been all but forgotten until Michel Godet revived them in the 1970's.

¹⁴ Based on conversations with Michel Godet and the book; Godet, Michel. Creating Futures: Scenario Planning As a Strategic Management Tool. London: Economica, 2006

Among the most active champions of the French school of *prospective* was the late medical doctor and Nobel Prize laureate André Cournand (1895-1988). It is often the case that those involved in science and technology are attracted to foresight for the simple reason that the evolution of science and technology has had, and continues to have, an increasingly important impact upon social change. Cournand was awarded the Nobel Prize in Physiology (Medicine) in 1956 along with Werner Forssmann and Dickinson W. Richards for the development of cardiac catheterization.¹⁵

Cournand was born and educated in Paris and at the age of 36 he moved to the United States where he became a faculty member at Columbia University College of physicians and surgeons. Despite having moved to the United States, Cournand never forgot his French roots and became chairman of the Lycée Française of New York. Cournand had been introduced to and was profoundly influenced by the work of Gaston Berger and the French school of *prospective*. Cournand stated that the paradox that Berger discovered was the following: "...in a world in which change is ever more rapid, the ability to foresee the future with clarity becomes progressively more essential, and yet it is in just such a world that the inadequacy of conventional techniques for linear forecasting an extrapolation becomes most obvious."⁴⁶ Upon retirement from medicine, Cournand dedicated himself to the diffusion of the methods of Berger and the French school of *prospective*, particularly in the United States.⁴⁷ In his autobiography, Cournand wrote; "Persuaded of the need to introduce prospective thinking and methods into this country, particularly as they relate to conceptualization and planning of education, I became a missionary on its behalf in the United States."¹⁶

Cournand courted Christopher Wright who was then director of the Columbia University Council for Atomic Age Studies. After attending several fortnightly luncheons, Cournand was successful in establishing in 1964, the Institute for the Study of Science into Human Affairs (ISSHA). Unfortunately, the institute would have a relatively short life and was effectively dissolved in 1968 when Columbia University leadership changed. Nevertheless, at the College of physicians and surgeons, where Cournand continued to exert some influence, ISSHA projects began to bear fruit. In particular, Cournand was successful in implementing three programs at Columbia University in; 1.) the history of medicine, 2.) computers and medicine, and 3.) medicine and society. Lectureships and symposia were established, and courses taught in these subjects were made available to Columbia students at large, and these subjects were integrated into the medical school curricula as electives. The goal of these programs was not to communicate historical facts, but rather to put the history of medicine into a broader philosophical and sociological perspective, thus facilitating greater understanding and better decision-making about medical research, biomedical engineering, and medical technology.

In a presentation given at a symposium on education held at the University of Geneva, Cournand said the following; "It will be my purpose in the first part of this presentation to describe a new form of thought; a new attitude towards planning of the future and decision making in the present, conceived in the 1950s and identified

¹⁵ Cournand, André, and Michael Meyer. From Roots—to Late Budding: The Intellectual Adventures of a Medical Scientist. New York: Gardner Press, 1986. Chapter 6.

¹⁶ Cournand, André, and Michael Meyer. From Roots—to Late Budding: The Intellectual Adventures of a Medical Scientist. New York: Gardner Press, 1986. Chapter 6.

as *prospective* by the French philosopher and educator Gaston Berger. The need for a radically new form of education has surely been felt for some time but finds most succinct expression in the perspicuous statements made 40 years ago by Paul Valéry, the French poet and philosopher: 'La responsabilité des éducateurs est de préparer les hommes à faire face à ce que qui n'a jamais été,' which I translate: the responsibility of the educator should be to prepare man for what has never been. Indeed, the impact of science and technology on the life of the individual, and on society, has become so important and increases in such an accelerated rhythm, that it is no longer possible to forecast the type of activity that young and adult men and women may have to pursue in the future. Therefore, at least as great a weight should be given to the education of the mind, as to the acquisition of specific knowledge or the development of technical skills which, at the time they will be applied, stand great chances of having become obsolete already."¹⁷

In 1963, a colloquium on *prospective*, sponsored by the Twentieth Century Fund, was held at the Institute for Advanced Studies at Princeton, chaired by Robert J. Oppenheimer. The purpose of the colloquium was to introduce the ideas of Gaston Berger and *prospective* to the United States. The colloquium was precipitated by discussions in the early 1960s amongst Edouard Morot-Sir (then French cultural attaché and close to both Cournand and Berger), Cournand, and Adolf Berle (former assistant deputy secretary of the US State Department, and then chairman of the Twentieth Century Fund). The purpose of the colloquium was to bring together members of the International Centre of Prospective and leading Americans in governments or other responsible positions of planning and decision-making. Among those in attendance include; Arthur Schlesinger, André Cournand, and Pierre Massé.¹⁸

Although Cournand had some influence on American science and technology policy, had not been particularly successful in introducing the term “*prospective*” to the United States, at least not beyond what prospective normally means in everyday spoken American English.⁵² Nevertheless, there has always been, and continues to be a fruitful cross-pollination of ideas and philosophies concerning strategic planning across the Atlantic.



Between 1955 and 1960, Gaston Berger and the members of the *Centre International de Prospective* would outline the foundations of a practice which would ultimately spread to organizations in France and throughout the world. Among these important ideas; the necessity to separate the exploratory from the normative, the importance of weak signals¹⁹, the role of imagination, and the difficulty of considering multiple time-horizons, etc.

¹⁷ Cournand, André, and Michael Meyer. *From Roots—to Late Budding: The Intellectual Adventures of a Medical Scientist*. New York: Gardner Press, 1986. Chapter 6.

¹⁸ Cournand, André, and Michael Meyer. *From Roots—to Late Budding: The Intellectual Adventures of a Medical Scientist*. New York: Gardner Press, 1986. Chapter 6.

¹⁹ Paraphrasing wikipedia, weak signals may be understood as advanced, noisy and socially situated indicators of change in trends and systems that constitute raw informational material for enabling anticipatory action. Furthermore, the fact that they are weak today, does not mean they won't be important in the future.

After the death of Berger in 1960, the *Centre* would continue its mission thanks to the support of a dedicated group of strategists, including; André Gros, Louis Armand, Pierre Massé, and François Bloch-Lainé. During the same time, Bertrand de Jouvenel wrote *The Art of Conjecture* (1964) and introduced the concept of *futurible* (a word derived from the combination of the French words *futur* and *possible* translated simply into English as *possible future*). Bertrand de Jouvenel's work borrowed much from the work of 16th-century Spanish Jesuit, Luis de Molina. Unfortunately, de Jouvenel never referred to Gaston Berger's *prospective*. In 1972, Bertrand de Jouvenel would carry on the legacy of the *Centre International de Prospective* at *Futuribles Association International*, a think-tank which had been created a few years earlier in 1967. *Futuribles'* consulting practice as well as the journal *Futuribles* were both developed subsequently in 1975 by his son, Hugues de Jouvenel. Since the early 1970s, beginning with his work at SEMA²⁰, Michel Godet has contributed significantly to the theory and practice of *prospective* as well as promoting *prospective* throughout the world.

²⁰ SEMA stands for *Société d'Economie et de Mathématique Appliquées* and had been an important research center contributing significantly to the domains of; operations research, decision-making, surveys, and of course, *prospective*. Within *prospective*, there were two principal research areas; regions and business. The latter was directed by Michel Godet.

■ Chapter 1: Some Rigor for Global and Systemic Approach

Action is taken in the anticipation of a producing a goal; and so action taken in the absence of a goal is meaningless. Therefore, *prospective* cannot be readily dissociated from strategy. Nevertheless, the complexity of contemporary problems and the need to resolve them collectively compels us to use methods as rigorous and participatory as possible, lest their solutions be rejected as partisan or arbitrary. At the same time, we must keep in mind the inherent limits of quantitative models, and remember that people are guided by intuition and passion as well as rationality and logic. Our mental models are merely inventions of the mind and represent a world unwilling to be constrained by equations. If everything were predetermined, then individuals would have no role to play in affecting the outcome of their lives or their social environments, and therefore life in general would have no meaning. Surely, we must employ our faculties of reason; however, we must recognize both their inherent limits and virtues. We should remember that intuition and reason are not opposite, but rather complementary faculties. Thus, in order to remain a productive and credible discipline, *prospective* requires rigor.

The debate concerning human agency with respect to change and the utility of using strategic methods to produce desired outcomes is often encumbered by a recurrent skepticism which surfaces despite the soundness and veracity of arguments which favor the use of such methods. The debate is further muddied by: confusion between the concepts of *prospective*, planning, and strategy; the interest in assigning quantitative probability to scenarios; the desire to further complicate the already complex tools of *prospective*; and the attempt to apply the tools of corporate *prospective*, which have proven to be very useful in that context, to other domains. The accumulated experience of the last thirty years working in the field of *prospective* permits us to bring clear responses to all of these questions, and each shall be covered in turn in the following sections.

Prospective essentially involves anticipation (pre-activity) to clarify present decisions and actions in light of possible and desirable futures. Nevertheless, preparing for foreseeable change doesn't preclude one from provoking desired change (pro-activity). Anticipation can only be transformed into action with the emotional investiture (appropriation) of the stakeholders involved.

There appear here two symmetrical traps which one should avoid. The first consists of imposing the advice of the experts without first buying into the solution. It's a bad idea to want to impose a good one. The second consists of favoring the consensus of the group and participatory process at the expense of expert advice and other rational inputs. Without a good measure of rationality and reflection, a participatory process yields little. Change requires the kind of courage that groups often find difficult to muster. Consider the case of sustainable development. Current generations will always place their own interests before those of future generations, and are therefore reluctant to make sacrifices which would change the *status quo*, even if they understand that they are simply transferring burdens to future generations.

Courageous decisions are rarely consensual. Therefore, if *prospective* must be participative, then the strategic decisions which follow must be left to competent and courageous executives or government officials, so as to avoid the trap of participatory tyranny.

Let's return to the sources of *prospective*. According to Gaston Berger, *prospective* requires “seeing far and wide, analyzing thoroughly, thinking about humankind, and taking risks” (Berger, 1959). Since the 1970s, we have encouraged others to adopt the following three additional characteristics of *prospective* often neglected by our forerunners: (1) see differently (distrust preconceived ideas); (2) see collectively to ensure that all those concerned are properly vested; and (3) use methods as rigorous and participatory as possible to reduce the incoherencies which often accompany group processes.

Humankind thrives on hope. Nevertheless, the collective desire for a better future is best expressed when it is channeled through rigorous methods. The Basque region study (Mousli, 2004) and the isle of Martinique study (Derné et al., 2008) are exemplary *prospective* studies in this regard. The Basque country study began in 1992 with the support of *DATAR* (a name derived from an acronym describing the French Ministry of Regional Development) and the participation of key stakeholders living and working in the Basque region. The *prospective* workshops at St. Palais in South-western France assembled more than 100 people (elected officials, economists, academics, etc.) and lasted two full days. The workshops were featured prominently in regional news media in South-western France and ongoing news coverage lasted almost two years. The isle of Martinique study began in 2006 at Fort-de-France under the auspices of the Martinique regional authority and lasted more than a year. The study mobilized representatives from the French republic, regional administrators, local executives, as well as representatives from the civilian population. The goal of the study was to define a plan for economic development for the island. Considerable effort was made to ensure that each citizen had the opportunity to participate in the project. Both projects were outstanding successes and remain references to this day.

I. STRATEGIC PLANNING, *LA PROSPECTIVE* AND STRATEGY: WHAT'S THE DIFFERENCE?

The three concepts of *prospective*, strategy, and strategic planning are intimately related in practice and each one refers, in part, to the others. All of these approaches refer to a set of definitions, problems, and methods whose specificity is weak, given the vague terminology. With all the buzzwords and false synonyms, some readers may wonder how we can make sense of anything related to strategy. Some might ask if these approaches are not all quite similar. After all, do we not already have a series of practical methods that are actually more useful insofar as their limits are known? We can answer with equanimity and without hesitation; there already exists a well-defined toolbox for *prospective*. Informed managers would do well to acquire this toolbox whose benefits include; creating a common language around a particular project, effectively harnessing the power of collective thought, and reducing the inevitable biases among participants. To achieve all this, however, we must return to the fundamental concepts of *prospective* and to its history.

In order to be fruitful, the marriage between *prospective* and strategy must be incorporated into daily operations. *Prospective* must be appropriated by all the stakeholders involved, from the top of the hierarchy to the bottom, thereby mobilizing the collective intelligence of the organization. Although the union between *prospective* and strategy may have been inevitable, it has certainly not cleared up any confusion in terminology. In the end, however, these ideas are much closer than is generally admitted. In fact the definition of planning put forth by Ackoff (1973), “to conceive a desired future as well as the practical means of achieving it”, does not differ much from the one we suggest for *prospective* in which the dream infuses reality, where desire is the productive force of the future, and where anticipation sheds light on the pre-active and the pro-active.

Managerial fads may come and go but they always have one common denominator—people need to be motivated by new challenges. Of course, the process of getting people involved is considered the objective to be obtained no matter what the outcome. In this way, strategic analysis can generate a synthesis of collective commitment, contrary to the early ideas expressed by Henry Mintzberg (1994). Indeed, the real difficulty is not in making the right choices but in making sure that each participant asks the right questions. Remember the adage, "A problem well stated (and shared by those concerned) is already half solved."

There is a considerable accumulated body of knowledge in the study of strategy. For example, the classic analysis using threats and opportunities (SWOT: Strengths Weaknesses Opportunities Threats) clearly shows that we cannot limit our analysis simply to the competitive environment in search of short-term profits, as the early writings of Michael Porter might lead us to believe. The fact that many uncertainties hang in the balance, especially over the long-term, underscores the need for the construction of scenarios to clarify strategic options and to ensure continued organizational growth.

Therein lays the difference between winning and losing companies, as Hamel and Prahalad (2005) point out in the following paraphrase. *We had to conclude that some management teams were simply more anticipatory than others. Some were capable of imagining products, services and entire industries that did not yet exist and then giving them birth. These managers seemed to spend less time worrying about how to position the firm in existing competitive space and more time creating fundamentally new competitive space. Other companies, the laggards, were more interested in protecting the past than in creating the future.* This paraphrased passage reveals the similarities between strategy and *prospective*. Strategy uses foresight and innovation, while *prospective* uses pre-activity and pro-activity. Nevertheless, we are essentially talking about the same thing.

Given this similarity, the term *prospective stratégique* or strategic *prospective* has been circulating since the late 1980's. We wonder if a strategist is capable of operating in a way different from that which was described by Gaston Berger; “seeing far, wide, and deep, while taking risks and thinking about humankind” (See Gaston Berger, 1959.) Conversely, to quote Gaston Berger once again, “Looking at the future disturbs the present.” We add a conclusion to his remark: “and anticipation encourages action”. By now we are convinced that scenario planning is often

strategic if not through its outcome at least through its intentions. Similarly, strategy calls upon *prospective* to clarify choices made with the future in mind.

1. A Necessary Clarification of Concepts

The so-called *Rise and Fall of Strategic Planning* (Mintzberg, 1994) has not exhausted people's interest in the subject, which may be a relief to Mintzberg himself. Strategic planning will always be of interest to managers because of the independent nature of each of its components and the contingent nature of business. To paraphrase Mintzberg; *an organization can plan (take the future into consideration) without actually committing to planning (a formal procedure) even if it does draw up some plans (explicit intentions)*. In reality, the issue is not really planning, but rather the manner in which planning is executed. The graft of strategic planning only takes hold if it is integrated into the culture and identity of an organization. To use another metaphor, the gears of development depend not only on logic, but also on human emotion and behavior. Hence the idea of strategic management, which is almost a tautology according to Boyer and Equilbey's definition of management (1990), "The art of management is to make the organization serve strategy." Yet management in itself does not constitute a strategy. Strategy shapes management but also presupposes objectives and related tactics (contingent decision-making). One wonders how serious authors like Mintzberg reject these distinctions or continue to use the term *strategic* merely as an adjective to qualify anything which appears important. It's high time we clarify these concepts so as to avoid giving different meanings to the same word, or use different words to mean the same thing.

For traditional authors, such as Lucien Poirier (1987) and Igor Ansoff (1989) the notion of strategy refers to a firm's actions upon its environment and reflection upon that action. Without hesitating, Lucien Poirier used the term *stratégie prospective* which we have called *prospective stratégique* (strategic prospective). Obviously, the two notions are distinct but often associated. However, some authors, including Fabrice Roubelat (1996), maintain that *prospective* is sometimes strategic and other times not. Roubelat bases his comments on Jacques Lesourne²¹ (1994) to conclude that; "A strategic decision is either one that creates an irreversible situation for the entire organization or one that anticipates an environmental change apt to provoke such an irreversible situation."

According to Lesourne, a strategic decision would likely be one "that forces the organization to ponder its very existence, independence, mission, and field of activity." Exploratory planning need not necessarily be strategic in nature—in other words, lead to an irreversible decision. The advantage of using these strict definitions is to avoid applying the word *strategic* to mean anything that merely seems important. Of course prudence and common sense enter into the equation as well; consequently, our efforts are not limited to merely asking about risks of ruptures, and strategy is not reduced only to decisions of an irreversible nature for the company. It is true that the borders are fuzzy and impossible to delimit completely. The same

²¹ According to Lesourne; "For every organization [...] the notion of strategy is inseparable from that of irreversibility on a grand scale".

may be said for decisions, for as Jacques Lesourne²² once put it: “major decisions are rarely made, they become increasingly improbable as the small decisions accumulate”. For the organization, *prospective* is not charity, but rather reflection with a view towards clarifying action, especially action of a strategic nature.

2. From the Desires of *La Prospective* to the Realities of Strategy

It is always tempting to mistake our desires for reality. However, just because certain scenarios appear desirable, we do not have to draft the entire strategic plan of an organization according to this pro-active vision alone. We need to be pre-active too, in order to prepare for expected changes in the future business environment. Every possible scenario is neither equally probable nor equally desirable, and one ought to distinguish the strategic environment from the strategies of its actors. Thus, the success of the word *scenario* has led to a certain amount of abuse and subsequent confusion, which we are now compelled to clarify.

It is thus judicious to distinguish between the exploratory and normative phases of *prospective*. The former explores possible futures, while the latter is focused on the identification of stakes and stakeholders, and the elaboration of strategic choices which will permit an organization to provoke its desired future despite the inevitable challenges which lay ahead. The distinction between these two phases is all the more important when the strategic choices are conditioned by a relatively strong uncertainty in the strategic environment.

It is also important not to confuse scenarios with strategic options, since they implicate a distinct, though not necessary mutually exclusive set of internal stakeholders. The exploratory/anticipatory phase of *prospective* (that which includes the elaboration of scenarios) is duty bound to be as participatory and collective as possible, and assumes the implication of a large number of participants. This early phase, therefore, requires the rigorous application of the tools of *prospective* in order to organize and structure the proceedings in a transparent and efficient manner. On the other hand, for reasons of confidentiality and responsibility, the phase of *prospective* which elaborates strategic choices, is left to the competencies of a limited number of persons, generally the executives, elected officials, or the members of the board of directors of an organization.

Strategic decisions should be made by executive management. This latter phase, therefore, does not require as much structure. The executives will be presented with a deliverable (a report) from the first phase. Then, after reviewing possible strategic options, they will make their decision(s). It's not necessary to impose a formal procedure here, as one assumes that executives are used to making decisions in a manner to which they are accustomed. The tools of *prospective* therefore are useful for preparing strategic options, but they mustn't interfere with the liberty of executive decision.

3. Which Strategies for which scenarios?

²² Stated during a conference given at the Conservatoire National des Arts et Métiers in Paris in 1982.

There are no statistics on the future, and therefore, when faced with an uncertain future, personal judgment is often the most reliable element available. Therefore, it's important to gather as many informed judgments as possible and then forge a consensus. As with a good gambler in a casino, a single bet doesn't count for much; rather, it is the net winnings which make the difference in the end. Also, the value of consulting outside expertise is often the subject of controversy. Our conviction is simple in this regard; insofar as an expert represents a fresh perspective, his or her point of view should be taken into consideration. In the end, the participants will make up their own minds as to the reliability of expert advice and orient their action accordingly.

The uncertainty of the future can be evaluated across a number of scenarios which share the field of probable futures. In principle, the more scenarios elaborated, the greater the uncertainty. However, it's important to take into consideration the content of the various scenarios since the more probable among them may be either very similar or quite contrasted to one another.

In theory, two possible situations may present themselves. If certainty is strong, which is to say, a limited number of rather similar scenarios occupy a majority of the field of probable futures, then one could then either opt for a risky strategy (taking a gamble on one particular scenario among the more probable), or for a robust strategy which will likely withstand any possible foreseeable scenario. If the certainty is weak (the majority of possible scenarios cover a wide field of probable futures, or the more probable scenarios are highly contrasted), then one ought to adopt a flexible strategy which includes the maximum number of reversible choices. Of course, the risk with this approach is risk aversion. Adopting a relatively conservative strategy will not likely lead to great losses; but neither will it lead to great gains. In the end, such a strategy may ultimately represent a lost opportunity. Also, experience shows that in general, a small number of scenarios are enough to cover most probable futures.

4. Four Attitudes when Faced with the Future

Pressing problems which require urgent action today are the direct result of a lack of anticipation in the past, and often draw resources away from more important tasks like long-term organizational development. In a world that is constantly changing and whose trends are prone to quick redirections or even reversals, an increased effort in foresight (specifically in the domains of technology, economics, and society) is crucial for an enterprise which aspires to have a flexible strategy—which is to say, the ability to both react nimbly to the forces of change and stay the course. In order to master change, organizations must correctly anticipate shifts in technological, competitive, and regulatory environments, and then do so neither too early nor too late.

According to Hasan Ozbekhan,²³ humankind has the choice between four attitudes when faced with the future; (1) the passive actor, who accepts change without challenging it; (2) the reactive actor, who waits for the alarm to sound before extinguishing the fire; (3) the pre-active actor, who prepares for foreseeable changes

²³ Hasan Ozbekhan was a professor at the Wharton School at the University of Pennsylvania and scientific counselor to the research group on the future at the University of Quebec. He was one of the founders of a theory of planning in which scenarios play an important role. I had notably participated in a study commissioned by DATAR on the scenarios method (DATAR, 1975).

because an ounce of prevention is worth a pound of cure; and (4) the pro-active actor, who acts to provoke desirable change.

In the context of a crisis, reactivity trumps the other attitudes. Likewise in the context of growth, pro-activity is the most important attitude, notably in the form of provoking change through innovation. *Prospective*, which is anticipation in the service of action, is necessarily the combination of all three attitudes.

5. Five Fundamental Questions Strategic Foresight

If the concepts of, *prospective* and strategy are intimately related, they remain distinct entities and it is necessary to distinguish between: 1) the anticipatory phase: in other words, the study of possible and desirable changes, and 2) the proactive phase. In other words, the working out and assessing of possible strategic choices so as to be prepared for expected changes (pre-activity) and provoke desirable changes (pro-activity).

The dichotomy between *exploring* and *preparing* for a proactive course of action implies the following five questions: (Q1), what could happen? (scenarios) (Q2), what can I do? (strategic options) (Q3), what will I do? (strategic decisions) (Q4), how will I do it? (actions and operational plans) and an essential prerequisite question (Q0), who am I? All too often ignored, the prerequisite question (Q0) is the starting point of Marc Giget's strategic approach (1998). Question zero (Q0) is not dissimilar from the admonition inscribed above the entrance to the temple of Apollo at Delphi, "*Gnothi seuauton*" or "Know thyself" and forces one to consider one's strengths and weaknesses before embarking upon any strategic process.

Only *prospective* is concerned with (Q1) what could happen? The moment an organisation begins to inquire (Q2) what can I do?, the inquiry moves into the strategic realm. Once these questions have been broached, the strategic inquiry continues with two more questions; (Q3) what will I do?, and (Q4) how will I do it? The relay between *prospective* and strategy is between (Q2) and (Q3).

Naturally, there are exploratory *prospective* studies which do not have a particular goal in mind, and are therefore not strategic *per se*. There are also strategic analyses in which the *prospective* component is embryonic or absent altogether. For the sake of clarity then, the expression *prospective strategique* (strategic *prospective*) will be reserved for studies having strategic ambitions and objectives for those who undertake them.

6. The Factors of Economic Development are Principally Endogenous

Unfortunately, anticipation is hardly practiced among today's managers. Lack of anticipation in the past has led to present situations in which yesterday's apparently irrelevant questions become today's urgent matters that require immediate attention. Although reactivity is not desirable in the short-term as an end in itself, the ageless advice of Seneca rings true here: "Not a fair wind blows for him who knows not where he goes." Anticipation enlightens action and lends it meaning as well as direction. If there is no direction for the future, the present is void of meaning.

Similarly, a dream is not the opposite of reality but rather the incubator of it. All projects must be driven by desire.

Why and how to anticipate? What are the strategic consequences of mutations in the business environment? How can we challenge individuals and motivate them to act? And finally, what is the future of management? The responses to these questions are related, as organizational motivation (internal) and strategy (external) mutually reinforce one another.

For a number of enterprises in difficulty, the shipwreck can be best explained by management's internal deficiencies, rather than by a raging external storm—a good captain is the key to any winning team. The ideal CEO must know how to anticipate, motivate, persist, and react quickly. A good destination is not enough for a good strategy; one needs a well-motivated, flexible, and competent team. With respect to strategy for any given enterprise, the interior front and the exterior front are one in the same. The battle can only be won on both fronts simultaneously, or on neither. In other words, faced with the changes in one's strategic environment, the future of an enterprise depends in great part on its internal strengths and weaknesses.

The *strategic gap*, i.e. the disconnect between the company's objectives and its overall growth is perhaps less important than the *performance gap*. What ultimately counts is being profitable in those markets where the enterprise is active. One of the reasons to bridge the *performance gap* is to make up for the *management gap*. Bridging the latter requires adaptation of both structures and behaviors at the heart of the enterprise. The principal factor limiting the development of an enterprise is the human factor—in other words—the time necessary to train employees and motivate them around particular projects. Of course, any action that does not have a concrete goal does not have meaning. It's anticipation which clarifies action and gives it both meaning and direction.

Whatever uncertainties loom on the horizon, every organization is confronted with the same trends and must deal with the same ruptures in the future. So, as always, it's the behavior and qualities of people which make the difference between winning and losing organizations. Events in the external business environment require the enterprise to react both quickly and flexibly according to the means with which they are disposed. Furthermore, since change is constant, managers must avoid radical structural changes which would render the organization recalcitrant to subsequent adaptation.

II. FIVE KEY IDEAS OF *PROSPECTIVE*

Strategists don't predict the future, and those who predict the future are not strategists. The future is not written, rather it remains open. The future is multiple, undetermined and open to a large variety of possibilities. That which will happen tomorrow depends less on prevailing trends or any sort of fatalistic determinism, and more on the actions of groups and individuals in the face of these trends. If the future is, at least in part, the fruit of human desire, then the following five key ideas of *prospective* should keep in mind.

1. The World Changes, but Problems Remain

After almost a quarter century of reflection on *prospective* in an urban planning and corporate context, and working to solve the major issues which confront contemporary society, we are able to make the following observation, which is both widely known, and yet generally ignored. The observation is this: *it is always humankind and his organizations that make the difference*. Thus, if a company is in trouble, it doesn't do any good to make a scapegoat out of technology or unfair foreign competition, and then proceed to rectify the apparent problem by subsidizing the failing company. All too often the failure of an organization can be attributed to incompetent management which is incapable of anticipation, innovation, or simply motivating its workforce.

The world changes but the same problems remain. Such is the observation that recurs every time that we find ourselves faced with a problem that has already been dealt with five, ten or even twenty-five years earlier. This axiom applies equally to problems related to material resources like energy, air traffic control, and the postal service, as it does to broader social issues like employment or education. Any rational observer would come to the same conclusion—intellectual investments made in the past make the difference. By studying such past problems and their proposed solutions, we can more easily find the mechanisms at work in our own contemporary problems. Denis Diderot, the editor of the *Encyclopédie*, described his project this way, "The goal of the *Encyclopédie* is to encapsulate all the knowledge of the world, and expose its general pattern to current and future generations, so that the work of past generations will not be lost."

"Change is accelerating!" How many times have we heard this affirmation? In the 1950s, Gaston Berger founded *prospective* on a similar observation. The acceleration of change requires humankind to envision their actions differently, since tomorrow's problems will not be identical to either those of today or yesterday. Indeed, as far back as 1872, the 74 year-old French historian Jules Michelet observed that, "[...]one of the most important and least appreciated facts of our era is that the pace of change is accelerating at an extraordinary rate. In my lifetime alone [...], I have seen two great revolutions which in earlier times would have taken perhaps two millennia to transpire."

Humankind has a short memory, and we tend to ignore history and its lessons. History doesn't repeat itself, but human behavior certainly does. Throughout recorded history, human behavior has remained a constant. Faced with similar problems, humans tend to react in astonishingly similar, and therefore, unsurprising ways. Thus, there are many important, though often forgotten lessons we can draw from the past. The cycles of scarcity and abundance linked to speculation of price, the alternating pattern of long periods of inflation followed by deflation, or even the troubling coincidence between the demographic transition and the economic and political decline of a country. All of these phenomena bear witness to this reality. It is no mistake that Gaston Berger got along so well with French historian Fernand Braudel who revolutionized the way in which we understand history by studying long-term, macro-historical patterns.

Every generation has the impression that it lives in an age of unprecedented change. The bias is natural because this age is the only one in which each of us will ever live.

This bias is also the source of much exaggeration regarding the pace of change, especially with respect to technology.

2. Human Will Is Required in the Face of Chance

As the American meteorologist Edward Lorenz (1972) demonstrated, mathematical models of complex systems have limited utility. Despite the fact that these models are highly deterministic, their behavior is unpredictable due to feedback which serves to amplify or dampen minute mis-measurements taken at the initial state. The results of such models are therefore unreliable beyond a very short period of time.

The real world is way too complex for anyone to hope for a mathematical model which might reveal some sort of hidden determinism. And even if we found it, the uncertainty, inherent at every measurement, especially related to social data, would keep it open to a broad range of possible futures. Chaos theory tells us that determinism is indeterminable. Therefore, one must act as if all bets were off, and as if human desire will dethrone the tyranny of chance.

Attempting to understand and imagine ruptures (bifurcations) in the future is a difficult exercise. "What events or innovations are going to remain without consequence, and which are likely to have global impact and irreversibly determine the outcome of civilization? Furthermore, what are the zones of choice and the zones of stability?" These are the questions about which Ilya Prigogine (1990) wondered.

These potential ruptures in the Schumpeter sense of the term are on the daily menu of *prospective*. Identifying the range of possible futures through the use of scenarios allows one to discover possible bifurcation points, the paths which might lead to them, as well as the consequences which might result from them. Thus, the parameters of these bifurcations are the key variables of *prospective* analysis.

3. Let's Stop Complicating the Already Complex

Do we really need complex tools to decipher the complexity of reality? We think not; in fact, quite the contrary. The great geniuses throughout time—those who have been blessed with an ability to think about highly complex ideas, also know how to think abstractly, and thus are able to discover the relatively simple laws which describe the elegant behavior of our universe. Two of the more famous examples of such elegant thinking are the principles of thermodynamics and the theory of relativity.

Maurice Allais (1989), a champion of simplicity and one of the greatest economists of his time said the following, "*A theory in which neither the hypotheses nor the consequences can be reconciled with reality is of no scientific interest.*" He adds that there are never perfect models, but rather only approximate ones, "*given two different models of reality, the better will always be that which both represents a scientific observation and yields its data in a more simplified way.*" This observation is reassuring for those of us who have forgotten our Greek, and perhaps disquieting for those who like to confuse complicated with complexity, and likewise simple with simplicity. The challenge of creating elegant models is more ambitious than it seems, because it's always easier to make a model more complicated, or stated conversely—more difficult to make it simple.

4. Ask the Right Questions and Distrust Preconceived Ideas

Too often, one forgets to ask if the questions posed are well founded. There is no good response to a bad question. So, what are the criteria for a good question? Since there can be no right answer to a wrong question, how can we ensure that we are indeed asking the right ones?

Light creates shadow. Logically then, if the media promote certain problems, they mask others or make them disappear altogether. Popular ideas, which dominate the news media, must be regarded with a certain degree of skepticism because they often result in erroneous analyses. Maurice Allais figures among the more objective allies in this battlefield of ideas. Similar to Noam Chomsky, Allais denounces what he refers to as "the tyranny of dominant ideas". Information is often censored by conformism to consensus which agitates to situate itself within the dominant opinion and thus rejects the minority opinion. In other words, that which may be correct often has little chance of being heard. It's no wonder why certain subjects are never broached at all.

So, one of the major objectives of *prospective* is to break organizational silence (Morrison, Milliken, 2000) which limits the expression of different, and thus divergent ideas. In any given process of collective expression, collective rationality (assuming that it is harnessed correctly) is not always superior to that of the individual. Notwithstanding the bias for confirmation—the fact that most individuals are only interested in information which complements their own, thus leading groups to study only the most obvious and least interesting ideas—several forms of self-censure may take hold among inquiring groups (Morel, 2006). Among them are; the natural attenuation of weak signals (including alarm signals) and disagreements among group participants. These observations render preconceived ideas highly suspect. Thus challenging members' comfort-zones, and pointing out their false certitudes is an indispensable part of *prospective*.

Strategy does not escape the throes of conformism—the ultimate complacent and passive attitude. How many investment or acquisition opportunities have been missed due to the myth of "critical mass" which states that volume is imperative to compete on a global scale? The reality is that in any given sector, there are always small, successful firms. The best question to ask is how a company can be profitable at its current size, and the appropriate size of an organization is most often dictated by practical matters.

5. From Anticipation to Action via Appropriation

A global vision is necessary for local action. Breadth of vision is needed if anything is going to happen, first, on a small scale, and then within the larger scheme of things. Mobilizing intelligence is all the more effective if it takes place within the framework of a specific project known to all. Internal motivation and external strategy are thus like two sides of the same sheet of paper. They are also two goals that cannot be reached independently.

It is through the process of emotional investiture (appropriation) that projects ultimately succeed. Due to its transparency, a collective process cannot lead directly to strategic choices, which are by nature confidential and must be taken by

executives. However, a group process provides the impetus for collective mobilization, and permits the emotional investiture of the strategic plan among stakeholders who are already intellectually and emotionally invested in the strategic process.

Intellectual and emotional investiture (appropriation) is a compulsory stage if anticipation is to crystallize into effective action. We turn to the ancient Greeks to conceptualize this idea, the Greek triangle illustrated below. “Logos” (thought, rationality, discourse), “Epithumia” (desire in all its noble and not-so-noble aspects), and “Ergo” (action or realization). The marriage of passion and reason (of heart and mind) is the key to successful action and organizational self-actualization.

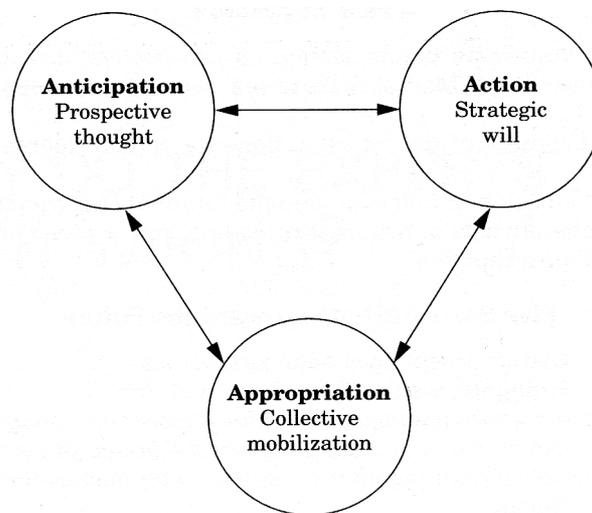


Figure 1: The Greek triangle of *prospective* (conceived in 1995). We can express the same message in color: the blue of cold reason mixed with the yellow of warm feelings produces the green of brilliant action.

The age-old dialectic between intuition and logic and the link between thought and action appears clearly here. Once it is time to act, it is too late to think. Likewise, when one thinks, one should take time and not be rushed by an emergency. Action is commanded by a reflex whereas reason is generally dominated by intuition. This impression fools us into thinking that the reflex to act happens without any prior meditation. William Blake (1790) put it nicely, “Without contraries there is no progression. Attraction and repulsion, reason and energy, love and hate, are necessary to human existence.” In the end, there really is no opposition between intuition and reason, but rather only complementarity.

III. STRATEGIC FORESIGHT

Many of the tools that we require to solve contemporary problems, complex as they may be, have already been invented. Indeed, though the world changes, there remain, throughout time, certain invariants and similarities in the nature of the problems with which we are confronted. There is no need to reinvent the wheel. We

do a disservice to the profession of management by discarding the accumulated legacy of strategic methods already developed. We must maintain the core methodologies of our profession and continue to enrich them.

1. *Prospective* Using Scenarios

Prospective, with its long-term trends and risks of bifurcations, changes the present and calls upon strategy. Strategy considers possible choices and the risks of irreversibility²⁴. Nevertheless, the approaches and tools of *prospective* and strategy are often separate.

Strategic *prospective* puts anticipation at the service of action and relies upon the strong potential synergies which exist between *prospective* and strategy. The ideal synthesis is an integrated approach to strategic planning using scenarios outlined in this book. The objective is to study scenarios and propose various strategic orientations and subsequent actions which correspond to the competencies of the organization.

What Is a Scenario?

In reality, there is not a single approach to scenario planning, but rather two principal approaches—that introduced by Herman Kahn²⁵ in the United States in the 1950s at the Rand Corporation, and that developed by Hasan Ozbekhan and DATAR, a French acronym meaning (Délégation à l'Aménagement du Territoire et à l'Action Régionale) which roughly translates to the French Ministry of Regional Development (DATAR, 1975). Kahn had been the first to elaborate and use scenarios at the Rand Corporation and then at the Hudson Institute. For Kahn and Wiener (1968), a scenario is a “[set of] hypothetical events set in the future constructed to clarify a possible chain of causal events as well as their decision points.”

More simply put, a scenario is a description (usually of a possible future) which assumes the intervention of several key events or conditions which will have taken place between the time of the original situation and the time in which the scenario is set. The word “scenario” is often used in an abusive manner to qualify any particular set of hypotheses. However, these hypotheses must satisfy five simultaneous conditions in order to be considered a scenario. These conditions are; pertinence, coherence, likelihood, importance, and transparency. Furthermore, a distinction must be made between the two major kinds of scenarios; exploratory and normative. Exploratory scenarios are concerned with past and present trends and lead to likely

²⁴ Since the early 1980s, the term scenario has been codified within academic study of management, notably by the management guru Micheal Porter (1999).

²⁵ Herman Kahn (1922-1983), was a physicist and mathematician, and worked at the RAND corporation in the late 1940's, 1950's and early 1960's. At RAND, he co-directed the United States Air Force projects which inspired his first book entitled, "On Thermonuclear War" [1960], in which he analysed the the possible effects of a global nuclear war. H. Kahn resigned from RAND in 1961 to found the *Hudson Insitute*, a think tank which provides independent counsel on multiple issues. Kahn is considered one of the founders of *futures studies*, and contributed both to the theoretical and methodological (scenarios, using mathematical models for forecasting, etc.) rhealms of the discipline. The scenarios method was described in two books; *The year 2000: A framework for speculation on the next thirty-three years* (1967) and *Things to come; thinking about the seventies and eighties* (1972). The *Hudson Insitute* also worked closely with the French ministry, DATAR, in 1970 and 1971.

futures. Normative scenarios are constructed from alternative images of the future which may be both desirable and feared, and are conceived in a retro-projective way. Thus, exploratory scenarios are devoid of human values, whereas normative scenarios are the expression of human values.

Both exploratory and normative scenarios can be either highly similar or highly contrasted to one another, depending upon whether they take into consideration the most probable or the most extreme trends respectively. Today, there exists two scenario methods which are used most frequently—that which we had developed at SEMA in 1974²⁶ and then subsequently at CNAM (Conservatoire National des Arts et Métiers), and those developed at SRI (Stanford Research Institute). The two approaches are very similar and the various stages and functions differ only slightly.

2. The Stages of the Process

Strategic *prospective* includes three principal stages; collective thought, preparing for a decision, and subsequent action.

Collective Thought

The collective thought stage includes six steps (see figure 2 below). The most important of these steps allow participants to identify key variables (1 through 3), analyze stakes and stakeholders in order to pose better questions about the future (step 4), and reduce the uncertainty in these questions in order to create the most probable scenarios based on the opinions of experts (step 5).

The **first step** of the methodology analyzes the problem(s) posed, deconstructs the system under study and situates the process in the proper socio-organizational context. This first step essentially sets the tone for the entire process which will then continue with the aid of subsequent workshops.

The **second step** is a 360 degree x-ray of the organization²⁷, its *savoir-faire*, and its productive capacities. This diagnostic is represented as a tree of competencies.

The **third step** identifies the key variables of an enterprise within its business environment with the aid of structural analysis.

The **fourth step** attempts to understand the dynamic of an enterprise, its history, its strengths and weaknesses, and the principal actors within its strategic environment. The analysis of the strategic “battlefield” and the stakes involved allow participants to derive key questions for the future.

The **fifth step** attempts to reduce the uncertainty concerning the key questions of the future by using a method of inquiry supported by the testimony of experts in order to elaborate prevailing trends and risks of rupture, and then finally to tease out the most probable scenarios.

²⁶ SEMA stands for *Société d’Economie et de Mathématique Appliquées* and had been an important research center contributing significantly to the domains of; operations research, decision-making, surveys, and of course, *prospective*.

²⁷ The term organization should be taken in the general sense. It includes not only businesses (both public and private), but also regional organizations. A regional approach to *prospective* is presented further along in the text.

The **sixth step** elaborates the most coherent strategic projects—those which are both compatible with the identity of an enterprise/organisation and the most probable scenarios in its given environment.

Preparing for the Decision

The following two steps are devoted entirely to the decision-makers or executives of the organization.

The **seventh step** is consecrated to the evaluation of strategic options. This is a highly rational approach which relies upon a method of multicriteria choices. However rational it may be, this step rarely produces actionable options.

The **eighth step**, which concerns strategic choices, is a crucial transition from thought to action. These strategic choices as well as their ranking by importance are left to the most senior executive body, usually the board of directors of an organization or its equivalent.

Action

Finally, the **ninth step** is devoted entirely to the practical application of the strategic plan, which incorporates the use of 'contracts' to meet strategic objectives, the development of a system of coordination, and a system of horizon scanning (scanning for trends and changes in the business environment).

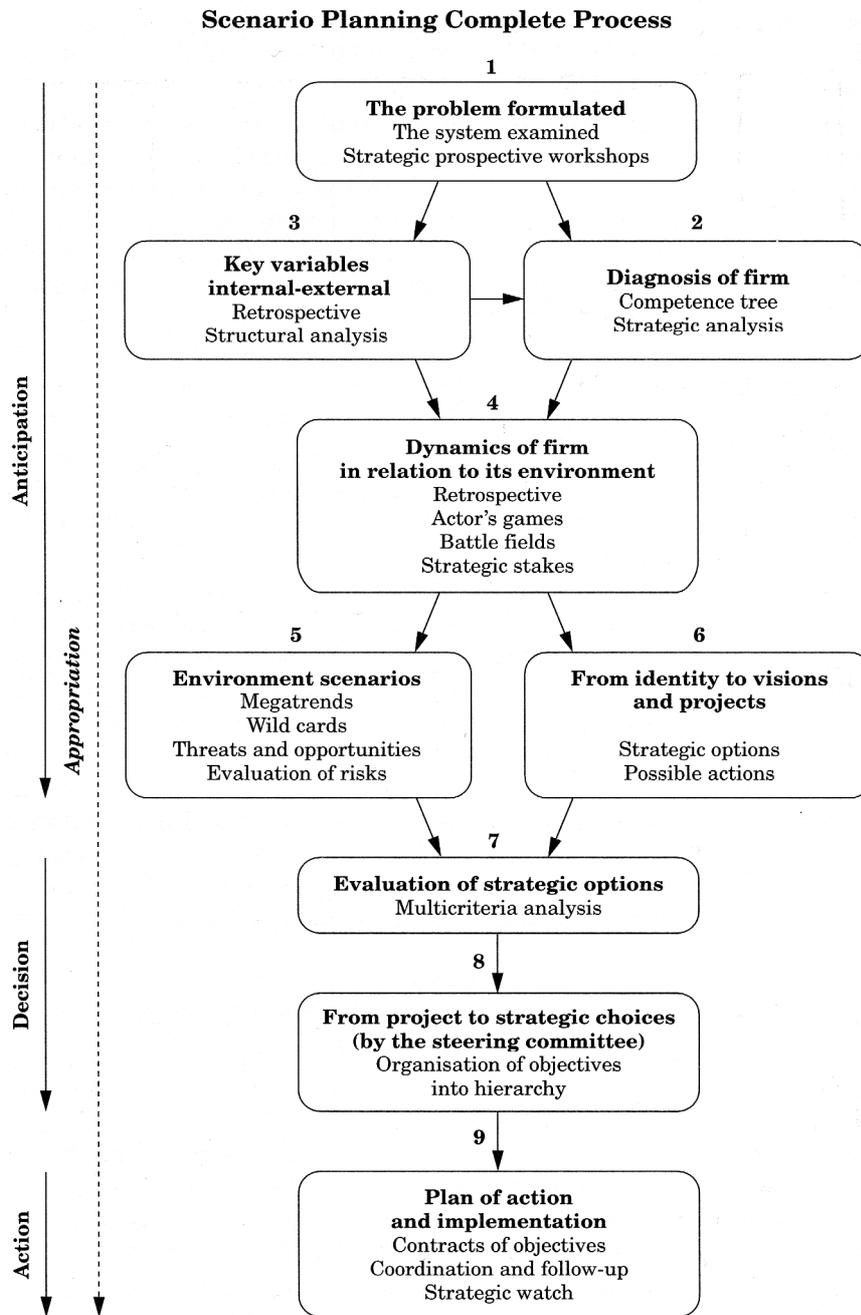


Figure 2 – Strategic Planning using Scenarios: an Integrated Approach

We should remind readers that the process is not necessarily linear, and may take several loops, notably between steps **nine** and **four**. The application of the strategic plan along with the data gathered from horizon scanning, could lead, in some cases, to a complete revision of the organization and its relative position in its business environment.

The passage from thought to strategic action assumes, at every moment, an appropriation (emotional investiture) by the stakeholders involved. That is to say that all the personnel, and not only management, must be implicated as much as possible in these different stages while not altering the confidential nature of certain strategic choices. To succeed, the passage from thought to action should pass through appropriation—and once again, one is reminded of the three components of the Greek triangle.

The diagram here is principally aimed at enterprises for which it is possible to develop a representative model in the form of a tree of competencies. The tree has also been adapted for use with regional *prospective*, i.e. working with regional governments and other stakeholders who share both common geography and interests. This claim of cross-adaptability to regional *prospective* has elicited some rather dubious reactions among our colleagues. Their doubt is nevertheless belied by the successful adaptation of the tree of competencies to various regional *prospective* projects, including; the Basque region (Mousli, 2004), Reunion Island, Lorraine, Ardennes, Vierzon, Toulon, Dunkerq, and the isle of Martinique (Derné et al., 2008), to name a few.

3. Tools for Methodological Rigor

Since the beginning of time, humankind has considered the future (Cazes, 2008). As long as *prospective* remained a solitary exercise, it had no need for rigorous tools. As anticipation began to be used in the service of collective action, the need for rigorous tools arose naturally. To respond to these needs, *prospective* first exhausted the tools of operations research, then systems analysis, then strategy, and then it finally developed its own set of tools.

Although *prospective* is a soft science, there is a need for rigorous methods to orient action towards a desired future. The toolbox of *prospective* allows one to apply rigor to the foresight process by posing the right questions and reducing incoherencies which often accompany group processes.

Several tools have come to the aid of strategic *prospective*. They include: **structural analysis** for identifying the key questions concerning the future; **stakeholder analysis** to identify the influence of various stakeholders, establish the relationships amongst them, as well as the stakes involved; **morphological analysis** to consider the entire field of possibilities and construct scenarios; **expert analysis** (such as Delphi or Reigner's abacus) to assign probabilities and reduce uncertainty; and **multi-criteria analysis** to identify and evaluate strategic options.²⁸

Morphological analysis, rediscovered in the late 1980s, has become among the most popular tools. Curiously, it had long been used in technological forecasting, but

²⁸ Since the 1980s, the methods and tools of the French school of strategic *prospective* have been diffused around the world. In the last few years, we have been able to develop a suite of software which corresponds to each of the *prospective* processes. This suite of software was developed at the laboratory LIPSOR in partnership with 3IE-EPITA and several corporations associated with the Circle for Entrepreneurs of the Future. The suite brings a rigorous and participatory approach to identifying key variables, creating the most probable scenarios, and then evaluating strategic options. Among the modules included in the software suite are: Micmac, Mactor, Morphol, Smic-Prob-Expert et Multipol. These tools are used principally for scenario planning. The software is free for download in three languages; French, English, and Spanish at www.lapro prospective.fr/.

seldom for economic or market foresight²⁹. Nevertheless, it lends itself perfectly to the construction of scenarios. Using morphological analysis, a global system can be decomposed into dimensions (key questions concerning the future). These dimensions are; demographic, economic, technological, and social/organizational. Each of these dimensions has a certain number of likely hypotheses (see chapter 2: section 6 below).

4. Modular and Contingent Applications

It is rare to see a *prospective* study undertaken which uses all the stages outlined in this book. The constraints of time are simply incompatible with the inherent delays of such an endeavor. Each of the tools in the *prospective* toolbox may be used individually. Thus, the facilitation and client teams agree upon the most appropriate tools, and then apply them in a modular way, and in some cases modify them to fit their needs. The following examples demonstrate the modular aspect of the *prospective* toolbox.

Two Examples of the Modular Approach

In the late 1980s we were commissioned by the French Ministry of Defense and Armed Forces, to describe the world of 2010 in which French soldiers might operate, and define the criteria for a new weapon entitled “multi-arm-multi-projectile” abbreviated as PAPOP in French. PAPOP is an individual combat weapon with indirect aiming that enables an infantry soldier to fire upon stationary, armored, or moving targets with various projectiles. The project lasted three years. First, we identified 57 unique variables and then proceeded to analyze them using structural analysis (MICMAC). After reducing the initial field, we were left with 15 variables, nine of which were technical characteristics of the PAPOP weapon (projectile, sight, source of energy, etc.), while six were evaluation criteria (cost, competitiveness, anti-personnel effectiveness, etc.). The morphological analysis of the nine technical characteristics of the weapon resulted in a morphological space of 15,552 possible technical combinations. Combined utilization of multi-criteria analysis (MULTIPOL) and morphological analysis (MORPHOL) allowed us to reduce the morphological space to approximately 20 promising combinations, taking into consideration the above evaluation criteria. Ten years later, an operational prototype of one of these combinations made front-page news.

In 1997 we conducted an innovative prospective study with Électricité de France (EDF) with a time horizon of 2010. Using structural analysis we identified 49 variables which led us to six key questions concerning the consumption of energy, energy rebates, competition, margin for action, etc. and then regrouped them under six general stakes for the future. Morphological analysis of possible responses to each of these key questions and their combinations allowed us, after probabilizing them with the tool Smic-Prob-Expert, to select the most probable scenarios. We also used the MACTOR tool to analyze the stakeholders and the various possible alliances and conflicts among the 20 or so stakeholders and three stakes. The strategic positions of actors were then optimized according to the scenarios we developed.

5. Case Study: Scenario Planning at Axa France

In 1994, one of the leaders of the French insurance industry, Axa France, gathered all of its subsidiaries for a *prospective* study. The French subsidiaries decided to undertake the study in order to create a strategic plan for the years 1996-2000. The previous plan (1992-1996) had been consecrated to restructuring Axa, which had made several previous acquisitions, and was enjoying increased profitability. The

²⁹ See the article by Stephen M. Maurer (2001) dedicated to Fritz Zwicky, the “father” of morphological analysis available on the LIPSOR website under the archives tab (www.lapropective.fr).

former strategic plan was centered around organizational objectives and distribution channels, and generally ignored the evolution of the business environment.

Having achieved their objectives, Axa now needed a new strategic plan focused on the imperatives of quality and profitability. The objective was to understand the business environment with its challenges, and create a strategy for the next five years based on a time horizon of ten years. Note that this *prospective* study took place two years before the merger between Axa and UAP (Union des Assurances de Paris).

The procedure adopted by Axa France provides a textbook example of how the practice of *prospective* has developed and how it is integrated into the strategic planning process. Today's companies have less time to think and an urgent need to act. So, how can such managers consider the future in a relevant and coherent way, given all the uncertainties and trends of the future?

Axa France, a recently established group known for its rapid integration of numerous acquisitions as well as its mobile and highly decentralized structure, could not consider any sort of strategic exercise which might be time- or labor-intensive. Thus, creating a specialized department which would require divesting and reallocating directors from various subsidiaries to take part in the process was out of the question. However, a solution was found by encouraging the company's general managers to work together for the duration of the exercise. The overall goal was to look to the future with a shared vision in order to identify threats, opportunities and potential ruptures. In so doing, Axa was preparing for anticipated changes while fostering desirable ones. Furthermore, Axa took the time to consider undesirable changes and how it might avoid them. In short, participants elaborated possible futures and identified which among these would be the most probable. The horizon adopted for this exercise was 2005.

Scenarios were built following the ten-phase schedule listed below:

1. Futures seminar: acquisition of analytical methods, identification and hierarchization of the factors of change affecting Axa, choice of the most pivotal environmental components for Axa in France (mid- March 1994).
2. Small group sessions: drafting of scenarios grouped into broad fields (April-June 1994).
3. Joint sessions: presentation of results from various groups and the construction of environmental scenarios (June 1994).
4. Survey on the future of insurance in France (July-September 1994).
5. Probabilization, selection and analysis of scenarios (October 1994).
6. Selection of one main scenario and identification of alternative hypotheses (November 1994).
7. Presentation of the main scenario and the alternative hypotheses to the various subsidiaries (December 1994).
8. Appropriation and integration of the main scenario and hypotheses in the plans of the different subsidiaries (January 1995).
9. Drafting of a plan in each subsidiary (February-June 1995).
10. Negotiation and allocation of resources (4th term 1995).

This study had been led by the members of the *Comité Management France* (The Committee for Management in France) from March of 1994 to December of 1995, under the direction of *Plan Budget Résultat* (Plan, Budget, Result) (Benassouli, Monti, 1995). Given the nine-month timeframe, we opted for two basic *prospective* tools: structural analysis to find key variables, and stakeholder analysis to explore possible developments. In the end, we used three methods—*prospective* workshops,

morphological analysis and the Smic-Prob-Expert—which enabled us to construct scenarios while respecting the basic conditions of relevance, coherence, likelihood and transparency. All of the above must be accomplished while using time efficiently and encouraging appropriation and transparency.

6. Foresight with stakeholders from Upstream to Downstream.

The Agricultural Division of BASF supplies fertilizer and other agricultural chemicals to cooperatives and wholesale distributors. BASF had acquired a dominant position in the French market around the middle of the 1990s. In order to consolidate this position, executives at BASF wanted to strengthen their relationships with both their suppliers and their customers from pitchfork to table fork.

The *Cercle prospective des filières agricole et alimentaire* (The Agri-foods Special Interest Group) was thus born in 1995 at the behest of BASF Agro France. Along with its clients, the *Cercle* attempted to anticipate and to understand changes which might affect the agricultural world of tomorrow, as well as industry stakeholders such as; suppliers, distributors, and the agri-foods industry in general.

Representatives from wholesalers and consumer associations quickly joined the study. Four or five times a year, representatives would meet for a day of collective work in order to exchange ideas, analyses, and to create a common understanding of possible futures. A final synthesis was then presented and debated during a seminar at which various experts and stakeholders could critique and complement these ideas.

The work which took place at the *Cercle* allowed each participant to understand the major stakes involved. Each company could then integrate these findings into their own company-specific strategy.

In the first phase (1995 to 2000), the *Cercle* was concerned principally with expectations of various links along the distribution chain, including; farmers, agrochemical producers, farm cooperatives, and others involved in the agricultural trade. The *Cercle* also considered certain themes of growing economic importance, including; the environment, food safety, regulation, etc.

After the first phase and since the year 2000, the *Cercle* has widened the study by carefully considering the relationship amongst farmers, the agribusiness, and the ultimate consumers.

The *Cercle* organized its work along themes, and every year a new theme would be treated along with a corresponding method in the *prospective* toolbox. The following subjects were thus treated: BASF and the future of agricultural distribution (1995-1996); agriculture and the environment, three possible scenarios with a horizon of 2010 (1997); food security, stakeholder analysis (1998); agriculture and the Internet, analyzing stakes for various stakeholders (1999); standards for a reasonable agriculture (2000); who will be farming what in the year 2010 in France? What will be acceptable by French society? (2005); and possible consequences of increased globalization and market liberalization for vegetable production in France? (2006-2007).

Around the year 2000, the time horizon of 2006-2010 appeared to be the source of much uncertainty concerning the agri-foods business in France. Several major events portended to dramatically affect the agri-foods business during this time period.

-The transformation of global business regulation concerning agriculture and food.

-The reform of the CAP³⁰, with an intermediate review in the year 2003, which did in fact lead to major changes during agreements signed in Luxembourg. This reform portends to have several major consequences for the French and European agricultural and foods businesses.

-Serious doubts about the role of the European Union, particularly in light of the recent admission of member states from Eastern and Central Europe in 2004.

-Social and economic transformations taking place in rural agricultural communities.

In 2001 and 2002, a questionnaire was distributed to the *Cercle* and an external panel of industry experts, wherein 23 key questions were asked concerning the future. The convergence and divergence of responses resulting from this questionnaire form the basis for the construction of possible futures.

In 2006 and 2007, the *Cercle* transitioned into a new phase of work aimed at analyzing the possible consequences for certain crop (cereals, and vegetable oils) producers in France. They developed a scenario describing a world of open borders and free global markets. In 2008 and 2009, they considered the consequences of increasing energy, seed, and fertilizer costs vis-à-vis the CAP and its global effects.

The *prospective* study led by the agricultural division of BASF and its principal clients is exemplary in many regards³¹;

-To our knowledge, this was the first time that an enterprise had undertaken such a study with its partners in order to better prepare for and create a common future.

-The study was a fine example of appropriation (emotional buy-in) whereby a large cross-section of enterprise as well as the executives themselves were creating the deliverables.

-Finally, the study was a fine example of the liberty of expression which always has a salutary effect. Throughout the study, participants were never censured; neither during the process nor after.

-The principal instigator of the study, BASF, took advantage of this communal exercise to examine its strategic orientations towards the natural environment and revise its policies vis-à-vis its clients. One of the results of the study was an ethical charter.

-Another interesting point about this study was the effective use of some of the principal methods of strategic foresight, including; morphological analysis for the

³⁰ CAP is an acronym meaning Common Agricultural Policy and is an agreement concerning tariffs and trade protections for agriculture.

³¹ This particular prospective study was the subject of six complementary but distinct publications. They are; (Monti, Meunier, Pacini, 1996), (Chapuy, Monti, 1998), (Chapuy, Godet, 1999), (Chapuy, Lafourcade, 2000), (Chapuy, Crabit, Godet, 2006) et (Bourse, Chapuy, Meunier, 2006).

construction of scenarios, interplay of actors, tree of competencies, multi-criteria analysis. The efficient use of these methods allowed BASF to complete the study in less time.

A *prospective* study on the future of an enterprise or a region is the ideal occasion to move beyond the constraints and contradictions of the short-term. A *prospective* study underscores the need to change habits and behaviors to deal with mutations in the strategic environment.

To achieve these goals, it's best to rely upon internal skills and expertise and take advantage of the *prospective* exercise to focus energies which would otherwise be dispersed. The role of external consultants must remain as limited as possible. Finally, never forget that the best ideas are most often not those that we have initially, nor those which are given to us, but rather those which we elicit through careful deliberation.

IV. THE PROPER USE OF METHODS AND TOOLS

Throughout the last 20 years we have seen the rise of systemic, long-term, global thinking in strategic planning. Nevertheless, the classic tools and methods of *prospective* have remained relatively unchanged, with the exception of stakeholder analysis (MACTOR). All of these tools have been used extensively in various applications.

In fact, *prospective* is very well suited to collective thinking about mutations in the strategic business environment, and has thus become a tool of choice for both regional planning and business strategy.

We are thrilled that the methods of *prospective*, formerly relegated to rarefied specialists, have been adopted so widely³². However, we regret that their implementation is often mired in poor facilitation and weak methodological rigor. All too often, strategists will attempt to practice scenario planning without first learning the fundamentals. Shamefully, if you ask these same strategists if they've ever heard of morphological analysis, their eyes usually glaze over with ignorance.

Certain tools specific to *prospective*, such as structural analysis, have had an unsettling success in strategic planning, particularly seen from the eyes of those who've played a role in their development. Too often, these tools are applied in the mechanical way thereby replacing the task of actually thinking, which, of course is not at all the point of the exercise.

1. The Dream of the Nail and the Risk of the Hammer

When working with the methods of *prospective*, we ought to recall their utility, which is; to stimulate imagination, to reduce incoherencies, to create a common language, to structure collective thought, and to permit appropriation. We mustn't,

³² This is one of the reasons why we initiated the *archives of prospective* project in 2004. The goal of the project is to promote the concepts and foundations of *prospective*. The project was launched because of the inaccessibility of *prospective* studies done since the 1950s (the studies are not available, have fallen into obscurity, or have been scattered around). The lack of accessible archives is the source of much misunderstanding about the tools of *prospective*. The project had been initiated by a dedicated group of strategists at LIPSOR as well as DATAR. Many of the texts have been made available on the LIPSOR website, as well as interviews with major figures in the field of *prospective*.

however, forget the limits of these same methods, nor delude ourselves with the illusion of absolute control through quantitative methods and formalization. These methods, useful though they may be, mustn't replace thoughtful analysis, nor restrict freedom of choice. Gaston Berger was eager to point out the errors caused by putting means before ends. Decision-makers often believe erroneously that a certain mean *must* be used to solve a problem, when in actuality; it *may* be used simply as one choice among many possible means (Durance, 2007). We find the same bias in strategic action as we often do what we know rather than what we ought to do.

We are determined to eliminate two symmetrical errors which are often confronted when dealing with the methods of *prospective*. The first error is forgetting that the hammer's utility is derived from its ability to drive nails (the dream of the nail) or, conversely, believing that we already know the utility of the hammer, and therefore finding unfinished nails in every problem we confront (the risk of the hammer). Paradoxically, the more we champion the methods of *prospective*, the more we are compelled to disabuse neophytes of their limits.

The methods of *prospective* do not pretend to lend themselves to the kind of scientific precision that one might find, for example, in calculating the precise resistance of polymers. These tools are simply a means of appreciating, in a manner as objective as possible, the realities of multiple unknowns. Nevertheless, don't confuse mathematical formalization with complexity. Scenarios, though less formal than quantitative models or cross-impact matrices, allow users to approach the rich and nuanced complexity of their business environment.

Moreover, the proper application of these tools is often hampered by the constraints of time and/or lack of resources; intellectual or otherwise. Their application is simply inspired by a desire for intellectual rigor, notably in the domains of posing the best possible questions (relevance), and in reducing the incoherencies of reasoning. Although their utilization may stimulate imagination and creativity, the tools of *prospective* can't guarantee the creation of good scenarios—that must be done by the participants themselves. Furthermore, the skill of the facilitation team depends on natural talents such as intuition and good judgment. If *prospective* requires rigor to deal with complexity, it also requires methods which are sufficiently simple and accessible.

To facilitate the choice of methodologies (tools), we have developed a 'toolbox' of *prospective* which allows users to select a particular tool based upon the typology of problems which are confronted. Following the stages of *prospective*, the tools of the toolbox may be used to; initiate and model the process, pose the right questions and identify key variables, analyze the stakeholders, sweep the entire field of possibilities and reduce uncertainty, establish a complete diagnostic of the enterprise/organization within its environment, and finally identify and evaluate strategic options.

It goes without saying that this inventory of tools is not exhaustive and there exists other tools which may be just as effective. We simply cite here those tools which we have found to be most effective in our own practice, and we vouch for both their rigor and their ability to elicit fruitful communication if they are applied judiciously and with enthusiasm.

2. What Good is a Scenario?

The elaboration of scenarios offers numerous advantages. Starting with any given situation, they allow users to consider multiple possible futures without getting caught in the trap of simply describing trends. They require users to consider the interdependence of the elements of the system under study and they help users identify problems, relationships, or forgotten questions—or those voluntarily set aside because they are simply too controversial.

The use of the word “scenario” is not without risk for those who practice *prospective*. There has been a recent wave of success of less scientific narrative methods such as Storytelling (Salmon, 2007). In the case of Storytelling, the narrative is often the objective itself, rather than as an aid to strategic decision-making, thus diminishing narrative’s legitimacy and casting a shadow of doubt over the use of narrative in an organizational context.

The simple fact of calling any combination of hypotheses, as seductive as they may be, a “scenario” does not make it so. In other words, in order for a “scenario” to be worthy of that title, participants must ask the right questions, formulate the proper key hypotheses, and appreciate the coherence and likelihood of possible combinations. If these conditions are not met, you risk obscuring 80% of the probable. With the proper tools such as Smic-Prob-Expert, scenario planning can be done by a group both quickly and effectively.

Between 1990 and 1991, EDF and Usinor undertook a prospective study which lasted several months on the iron and steel industry in France (horizon 2005). This study enabled participants to identify six relevant and consistent scenarios (S1 to S6) constructed around three general hypotheses; economic growth, constraints related to the environment, competition from other materials. The first scenario combined the following hypotheses; weak economic growth associated with strong competition from other materials (the black scenario). The second scenario combined the following hypotheses; weak economic growth and little competition from other materials (The morose scenario). The third scenario was a continuation of the current trends (the baseline scenario). The fourth scenario described a future of severe environmental constraints. (the ecological scenario). The fifth scenario described a world characterized by strong economic growth associated with a competitive environment favorable to steel. (the pink scenario). The sixth and last scenario described a world characterized by strong economic growth associated with a competitive environment favorable to alternative materials (the pink plastic scenario).

The use of the software allowed us to determine that the six additional scenarios only covered about 40% of the field of probable futures. Three new scenarios appeared which were much more probable. Nevertheless, these scenarios were not identified by the experts initially because their hypotheses went against their preconceived ideas either implicit or shared. Any particular bias tends to be reinforced by group processes and is much stronger than if it had never been stated at all, the three new scenarios which covered 60% of the field of probability, each had a likelihood of occurring that was far superior to the most probable of the initial six scenarios. These new scenarios were named; (ecological black), (green steel), and (green plastic).

The first scenario (ecological black) was eliminated because environmental constraints seemed like an unlikely luxury in a world of weak economic growth. Likewise, green steel had been eliminated because at that time environmental constraints were rather favorable to steel and thus a world in which alternative materials posed little competition.

3. How to Judge the Quality of a Scenario?

A scenario is not a future reality but rather a means to represent it with the aim of clarifying present action in light of possible and desirable futures. To be effective,

prospective must master the constraints of the present. In order for scenarios to be both credible and useful, they must respect the following five conditions; pertinence, coherency, likelihood, importance, and transparency.

Curiously, certain strategists refuse to submit their work to methods which would detect possible contradictions and reduce incoherencies in their reasoning. Nevertheless, they are right in asserting that assigning probability to scenarios does not excuse one from considering scenarios of low probability and high impact.

Transparency is another indispensable condition for both the credibility and usefulness of scenarios. The same goes for defining problems, the choice of methods used, and the results and conclusions of the scenarios. Too often, unfortunately, scenarios are meticulously written but then the reader has difficulty drawing the pertinence and coherence of its content; or the scenario is so poorly written that the reader quickly loses interest. Thus, without a careful and attentive reader, many scenarios pass as credible—as if the reader is guilty of not having understood the underlying meaning.

Without this transparency, participants will not be vested in the results of the scenario planning process, and the intended audience will not believe the scenarios. Of course, transparency and attractively written scenarios do not guarantee quality. There is also the risk of what is known as scenario entertainment, rather like “infotainment”. Catchy titles, emotional terms and high anxiety do sell, as in Alvin Toffler’s “Future Shock”; however, the genre remains fiction similar to Orwell’s “Nineteen-Eighty-Four” and such scenarios are rarely pertinent, coherent, or likely.

4. The Devil Is (Often) in the Details

Scenarios are not a requisite part of *prospective*, and *prospective* and *scenario* are not synonymous. Too many *prospective* studies get bogged down because the group has decided to write scenarios. However, a scenario is not an end in itself—it only has meaning as an aid to decision-making in so far as it clarifies the consequences of current decisions.

Scenario planning requires time to be done right, and a 12- to 18-month timeframe is not rare. Time is required, among other things to assemble an operational team. Consider the OECD Interfuturs team (Lesourne, Malkin, 1979) whose leaders declared that during the three-year study, there was little time to properly consider the scenarios they had developed. In addition to the time it takes to undertake the *prospective* study, you should plan on extending the schedule an extra year to accommodate the distribution and integration of the results.

In most corporate and administrative organizations, such teams will be required to report within the year. In extreme cases, policy-makers may launch a *prospective* study that they wish to see finished in a matter of weeks. In this event, the prevailing conditions are rarely ideal, though it is better to light a candle than curse the darkness. Good judgment dictates which questions should be addressed, given the limited timeframe and the means available. The question then becomes: How can the work be done in such a way as to remain both credible and useful to the decision-makers?

Given a short time-frame, it is often advisable to limit the scenarios to several key hypotheses, say four to six. Beyond such numbers, the sheer magnitude of possible combinations is overwhelming. On the other hand, limiting the number of scenarios to four by combining two hypotheses, as the GBN and SRI methods advocate, is far too reductive. Scenarios constructed around five or six fundamental hypotheses, set the background for further strategic thinking focused on simple questions like, “what if... ?” or “what for... ?”.

This shortcut requires the team to do a quick, but in-depth preliminary study on the key variables, trends and stakeholders involved. One final difficulty that arises when building scenarios and selecting methods relates to lead-times. Even if one had months or a few years to finish the assignment, there is an inherent risk in the start-up phase because team members or even the team leader may change as the study progresses. A futures study rarely survives after the departure of its initiator. In large organizations—given the mobility of personnel—it is preferable to limit the length of the project to one year and to plan for interim status reports.

5. The Strategic *Prospective* Workshops

If *prospective* requires rigor to broach the complexity of contemporary problems, its tools need to be sufficiently simple so as to remain accessible to those who will use them. Since the mid-80s, we have developed workshops which were set up to respond to these concerns, notably at Renault.

Before diving headlong into a *prospective* study, it's wise to take one's time and consider the nature of the problems posed, the manner about which one intends to inquire, and finally the way in which one intends to apply the solutions. It's useless to waste time treating false problems. Let's not forget that a problem well posed, is already half solved.

During the preliminary stages of a *prospective* study, before engaging dozens of people for several long months, it's useful to simulate the entire process, keeping in mind the inevitable setbacks and intermediate failures. The choice of methodologies used is not only subordinate to the nature of the problem(s) identified, but is also constrained by the time and means allocated for the study.

In the beginning of 2001, we were commissioned by the board of directors of the *Agence nationale pour l'Amélioration de l'Habitat* (ANAH) or National Agency for Improved Housing which wanted to anticipate potential changes in its operating environment by relying upon, principally, its own personnel to conduct the study.

The objective was to facilitate the application of development strategies, and more precisely, to prepare for possible changes in the private housing market (horizon 2010), anticipate the policies and strategies of local actors (Regions, cities, etc.) towards the private housing market, and take into account the strengths and weaknesses of the various actors involved. We also needed to forge a common mission, given the present and future competencies of the agency (5 to 10 years). Finally, we needed to identify the stakes and define the various strategic orientations and options.

To initiate this process, the board of directors chose to organize a strategic foresight seminar, during which several workshops were held. This seminar, which lasted two days, gathered close to 40 people. The seminar was highly participatory and its objective was to construct a common language and common goals, in addition to giving some meaning to their mission. The seminar was quite

useful in that it allowed us to get a head-start by producing the first elements of our study. It also allowed us to; establish a good foundation for the forthcoming process, identify important themes and concerns, and finally prepare the teams for the important work ahead.

The seminar was total immersion to *prospective* in view of creating a viable strategy. The participants were not only consumers of the study, but also its authors. The five workshops allowed us to:

- define several exploratory scenarios for the operational environment (horizon 2010) given principal stakes, key questions and major uncertainties.
- decypher the structure and mechanisms which formed the interplay of actors and understand the strategic influences amongst them, their relationships and their positions vis-à-vis the objectives associated with the principal stakes.
- deconstruct and move beyond preconceived ideas about housing by imagining the Agency of the future, its activities, values and relationships with its clients.
- develop both a current and future tree of competencies.
- define the strategic objectives and associated means.

The workshop was a precious preliminary stage on *prospective* and lead the successful reorganization of this state agency³³.

Whatever approach is adopted, it's useful to begin the process with a two-day work-training seminar. The seminar will serve to introduce the methods of strategic foresight to its participants, and also gather important preliminary data. The seminar will also get teams used to working together. Ideally, this two-day seminar will involve several dozen people³⁴ and be an immersive introduction to the exciting work ahead. The workshops' objectives are; to pose the best possible questions, and to rid the team of limiting beliefs and preconceived ideas. The seminar also permits the team to collectively identify and rank the principal stakes of its future in various contexts. At the end of these two intense days, the participants are in a good position to elaborate the organization's priorities, objectives, as well as which tools of the *prospective* toolbox will be used as well as their schedule of implementation. The choice of methods (tools) should not be imposed on the team. Nevertheless, these tools are indispensable for the effectiveness of the meetings. Without method there is no common language of exchange, no coherence, and no structured ideas.

However, the method is not an end in itself and one shouldn't be a slave to process. The methods are simply a way to structure the process for the best possible results. A formal process is also a crucial factor for the cohesion of the group and its motivation, which will ultimately produce the intermediate report.

Finally, the choice of method(s) must be made according to the problems confronted, the allotted time, and the accessibility of the method. The method must be sufficiently simple to remain accessible to those who would use them, as well as to the uninitiated to whom the results are often aimed.

³³ The entire *prospective* process carried out at ANAH is presented in detail in *Cahier du Lipsor* (Cordobes, Durance, 2004).

³⁴ In certain cases, a seminar of this type could include up to a 100, perhaps even 200 people, working together at the prospective workshops. The implication of a large number of stakeholders is ideal for a regional *prospective* study.

■ Chapter 2: Introducing the Methods

Throughout this volume, we have worked to keep *prospective* fresh while underscoring the rigor applied in our approach; and we're proud that these methods have stood the test of time. The accumulated legacy of *prospective* and strategic analysis reveals the convergence and complementarity between these two approaches; and it allows us to compile the best methods from each in a single toolbox. Contrary to popular opinion, creative thinking actually requires organization. So, once a problem has been identified, we can simply choose the appropriate tool from the combined toolbox.

However useful these tools may be, they are not ends in themselves, and should be applied according to the needs of the organization, the problems confronted, the constraints of time, and the means available. Moreover, the use of these tools should never become a solitary activity—their correct application necessarily requires collective participation. Without a common language or formal method, the work of *prospective* is difficult indeed. The methods we have developed here have proven useful in multiple applications—throughout France and around the world.

These methods excel at structuring thought and stimulating imagination; however, they do not guarantee the quality of the ideas generated. *Prospective* is an art which requires non-conformism, intuition and simply good judgment.

Naturally, other approaches exist, and it's desirable for researchers to continually innovate by creating new methods and drawing on the large body of management literature. Potential innovations in management methods only represent progress insofar as they increase the relevance of a particular line of inquiry, reduce incoherencies in reasoning, or allow for a better appreciation of the likelihood and importance of speculation. Nevertheless, any new methods will have to be sufficiently simple to remain accessible. Adding layers of complexity is not the best way to approach complexity.

To facilitate the choice of methodologies or tools, we have developed a *prospective* 'toolbox' which allows users to select a particular tool based upon the typologies of the problems with which they are confronted. Following the stages of *prospective*, the tools of the toolbox may be used to; initiate and stimulate the process, pose the right questions and identify key variables, analyze the stakeholders, sweep the field of possibilities and reduce uncertainty, establish a complete diagnostic of an enterprise within its environment, and finally identify and evaluate strategic options. Later on, we shall treat an inventory of this toolbox in the form of a table which correlates each tool with a particular application, and will include such metadata as; the goal of the method, a description, utility and limitations, practical conclusions, and a bibliography.

I. THE SCENARIO METHOD SEEN IN ITS ENTIRETY

The integrated approach to *prospective* aims to reposition an organization within its competitive environment, while taking into consideration the organization's

particular competencies, strengths and weaknesses. The integrated approach is the result of tightly integrating methods which were previously separate. The objective of this approach is to propose strategic orientations and actions while relying upon the competencies of an organization according to the scenarios of its general and competitive business environment.

The scenario method aims to construct possible representations of the future, as well as the means to achieve strategic objectives. The goal of these representations is to reveal the prevailing trends and the seeds of possible ruptures in the competitive business environment.

Although there is no single approach to developing scenarios, the integrated approach that we have developed here is more rigorous than most, and puts an emphasis on the systematic analysis of possible futures (see figure 3 below).

1. The Scenario Dynamic

It's important to distinguish between two major kinds of scenarios. Exploratory scenarios “[...] start with the present and describe a future situation by extrapolating certain trends and considering possible ruptures. These scenarios can be deconstructed to trace the necessarily logical chain of events which might lead to such a possible future.” (*DATAR*, 1975) Exploratory scenarios can be trend-based, in other words, based upon prevailing trends and the inertias of the system under study. An exploratory scenario can also be based upon ruptures from trends in order to explore contrasted hypotheses at the limit of possibility. In the end, exploratory scenarios seek to explore those futures which are most likely.

Normative scenarios begin with a desirable future, and their purpose is to show how certain objectives can be realized as well as the paths to achieve these objectives. These scenarios are value-laden and conceived in a retrospective way. Normative scenarios are often created in relation to exploratory scenarios. In this way, they either describe the collective desire of the organization or they are a synthesis of exploratory scenarios.

2. The Elaboration of Scenarios

The elaboration of scenarios includes three phases.

Constructing the Base (Phase 1)

This phase plays a fundamental role in the construction of scenarios. It consists of constructing a model which represents the current state of a system—the subject under study and its environment. The “base” is therefore a model of a system whose dynamic elements are linked to one another, and the system itself is linked to the larger universe beyond.

Constructing a model means delimiting the system under study, determining the key variables, and analyzing the strategic actors. To define the scope of the system and its environment, classic structural analysis (see figure 4 below) is an indispensable

tool. Among the variables which result from the analysis, it's important to drill-down on each in detail in a retrospective way. This retrospective analysis will spare the team from favoring or exaggerating the current state of the system, which is the natural tendency. The analysis of past trends reveals the dynamic of the system—the forces within the system—that affect various elements or actors. These forces, often called feedback in systems terminology, may be either positive (reinforcing) or negative (stabilizing). What's more, each actor must be defined according to its objectives, problems, and means of acting. Then one must examine how to position the actors in relation to one another. Finally, it's possible to construct a table of actors with the aid of the MACTOR method (see figure 5 below).

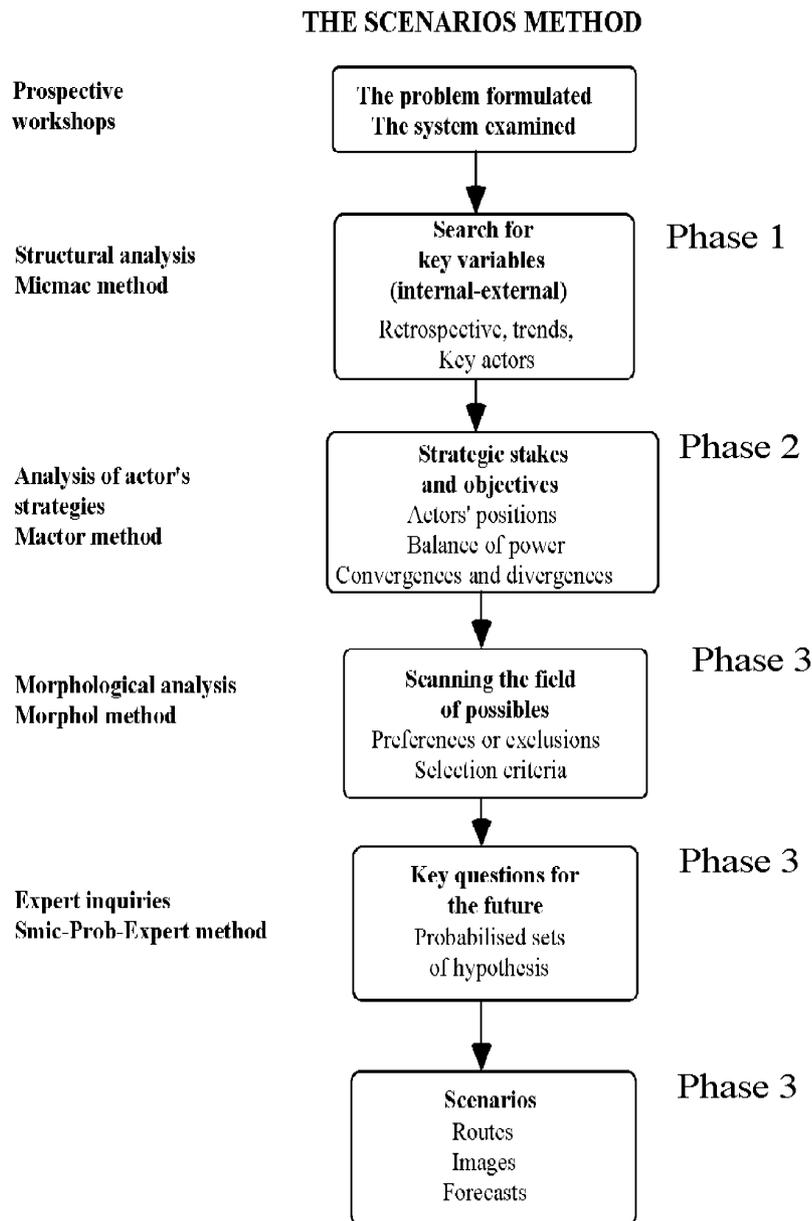


Figure 3. The Scenarios Method (Michel Godet, 1977)

Sweep the Field of Possibilities and Reduce Uncertainty (Phase 2)

Having identified the key variables and analyzed the stakeholders, it now becomes possible to identify the possible futures using a list of hypotheses such as; status quo, trend reversal, rupture, etc. Morphological analysis (see figure 6 below) permits the team to deconstruct the system under study into its essential dimensions and study possible re-combinations which may be numerous.

The 'survey of experts' methods such as Delphi, Régnier's Abacus, or Smic-Prob-Expert allows the team to reduce the above uncertainty by estimating the subjective probabilities of the various re-combinations or various key events for the future.

Elaborating the Scenarios (Phase 3)

At this stage, the scenarios are still in an embryonic state since they only correspond to the hypotheses chosen. So here, one must elaborate the scenarios by describing the intervening events and conditions which would lead up to a particular scenario (future situation). This part of the process is called the "diachronic phase".

Certain parts of the system may be further analyzed by subjecting them to some computational number-crunching. However, data calculated in this way doesn't have indicative value; they simply illustrate the evolution of the system and allow the team to verify the coherence of their hypotheses.

3. Utility and Limitations

Scenarios represent an indispensable tool for orienting strategic decisions and they reveal the major stakes involved for an organization. Ultimately, scenarios allow an organization to determine the best strategy for realizing their objectives.

The logical course of action for Scenario Planning has been well-defined; from defining the system to retrospective analysis to stakeholder analysis, and finally to the elaboration of scenarios. Nevertheless, you are not required to follow this process either sequentially or entirely. Your choice of procedure will depend upon the degree of knowledge of the group, the time allotted, and the nature of the system under study.

The scenario method is a modular approach and it is therefore easy to choose the most appropriate modules. For example, a team may employ one or a combination of tools as need dictates. So, by using structural analysis we can clarify key variables; or by using the stakeholder analysis we can study the actors implicated in the system; or by using expert analyses we can identify key hypotheses for the future. All the same, it is frequently the case that one must be content with simply presenting prevailing trends, ruptures or key events, without spending precious time analyzing the detailed paths which might lead up to them.

One of the principal limits of the scenario method is time. In general, it takes several months to complete the procedure in its entirety, of which most of the time is devoted to constructing the base. If it's not possible to complete the entire procedure³⁵, then it's preferable to concentrate on those modules which seem most relevant to the organization and their strategic objectives.



³⁵ It's important to distinguish between two types of prospective studies; those which are merely exploratory and those which are strategic in nature and lead to strategic decisions and subsequent action. The former is often commissioned and then undertaken independently by a consulting firm on behalf of the sponsoring organization. The results, usually in the form of a report, are then delivered to the sponsor.

The term scenario is often used in an abusive manner to qualify any set of hypotheses about the future. Let's recall that for *prospective* and strategy, the hypotheses of a scenario must meet five conditions simultaneously; relevance, coherence, likelihood, importance, and transparency. Even if "scenario" and "*prospective*" are not synonymous, the construction of scenarios often plays a central role in most *prospective* studies. Whether the different steps presented above are followed in their entirety, or only some of the modules are utilized, the presentation of scenarios (even reduced to combinations of hypotheses) greatly contributes to elaborating the principal stakes of the future.

II. INITIATE THE PROCESS: THE *PROSPECTIVE* WORKSHOPS

The goal of the *prospective* workshops is to initiate the participants and explain the methods that will be used throughout the process. During this module, the participants familiarize themselves with the methods and tools of *prospective* and collectively identify and rank the principle stakes for the future. Participants also identify preconceived ideas and possible courses of action to be taken.

At the end of the workshop, the participants are in a good position to define the problem and chose an overall approach (and associated tools) which will suit their strategic needs.

1. The Various Types of Workshops

In *prospective*, the term "workshop" is frequently used to designate organized sessions of collective thinking. These strategic workshops are fairly common in France as well as throughout the world³⁶. The approach presented here was developed during training sessions of managers at Renault in 1985.

Most often, these workshops last one or two full days. During the workshop, the participants are initiated to the methods and tools which might be useful to them. It's important to point out that the group is not only being trained, but also beginning the work of thinking strategically about the problems and systems under study.

The rules of the game are simple. The working group splits up into subgroups each composed of eight to ten people which reconvene throughout the day every two to four hours. Each subgroup chooses a theme among the following three:

- identifying pre-conceived ideas about the enterprise and its activities.
- identification of change and inertial factors
- construction of competency trees; past, present and future

Working on preconceived ideas is an indispensable step. A preconceived idea, whether founded or not, is an idea which is generally admitted without necessarily being challenged. Establishing a large range of preconceived ideas about one's

³⁶ The Austrian, Robert Jungk, who is the cofounder of the World Future Studies Federation (WFSF), was the inspiration for the *prospective* workshop. The workshop is effectively a group method or what Jungk qualifies as, "a laboratory for social discourse" (Jungk, Müller, 1980).

organization, and one’s environment is crucial as these ideas have the power to shape attitudes and behaviors. Such an inventory allows the team to deconstruct beliefs and unspoken truths which in turn shape the attitudes and strategies of various actors. The analysis of preconceived ideas allows the team to describe the consequences of adhering to these potentially misleading ideas. Furthermore, such an exercise is a rich and imaginative learning experience which may reveal previously hidden paths to future strategic actions. It little matters whether these preconceived ideas are true or not; the key is to challenge and deconstruct them.

The second workshop leads to the classification of principal stakes for the future (changes that are both important and remain poorly mastered).

The third workshop is especially important because it concerns what strategists call endogenous factors, in other words, those factors which are proper to the organization itself such as; core competencies, strengths, weaknesses, and organizational knowledge concerning past, present, and future. (see figure 3 below). In order to know where you want to go, it’s necessary to understand from where you came.

In the second phase, the strategic workshops are also organized with a duration of 2 to 4 hours. This phase concerns translating the principal stakes for the future which are the result of the “identification of change and inertial factors” workshop into various orientations and objectives; and finally actions to be taken in light of the trees of pertinence (see figure 7 below). Two other workshops which start from the same base, “identification of change and inertial factors”, follow either as a simplified analysis of stakeholder analysis or as the construction of scenarios.

Workshop 1	From preconceived ideas...	... to actions
Workshop 2	From the identification of change and inertial factors to actions
Workshop 3		... to the interplay of actors
Workshop 4		... to scenarios
Workshop 5	From the tree of competencies past and present...	... to the tree of competencies for the future (desired, feared)

Table 1. The two phases of the five workshops of *prospective*.

Taken together, these five workshops allow participants to use the principal methods of *prospective*, and in rather short order, participants are able to confront the challenges of their strategic environments and outline several plans of action. Moreover, these workshops allow participants to quickly identify those strategies currently in effect whose goals may no longer coincide with the stakes and objectives recently identified.

2. Implementing the Workshops

The workshops of *prospective* are work/training sessions which not only introduce participants to the problems which will be confronted, but also prepare participants for the process which will follow. The following is a detailed description of the five workshops and their implementations.³⁷

Whatever the theme or subject, the workshops adhere to two major ground-rules;

- 1.) Allow the greatest liberty of expression by all participants, including allocating time to allow participants to collect their thoughts individually.
- 2.) Channel the work of the participants into productive results. This is done, in part, by adhering to a strict schedule with intermediate deadlines, as well as regrouping and ranking ideas.

It's a good idea to have at least two subgroups working in parallel on the identification of change and inertial factors in order to collect the greatest number of ideas. At least one subgroup should be working on identifying preconceived ideas so that any "unspoken" dogma can be collectively confronted by the group at large, which tends to provide some cathartic release for all the participants.

Once the subgroups are finished with their individual workshops, the subgroups reconvene, and then share and compare their results. By reconvening and sharing in such a way, all the participants have a better understanding of the problems at hand. The participants are now in a position to choose the most appropriate tools and to define a procedure which is best adapted to; the constraints of time, the means available, and the objectives desired.

3. Utility and Limitations

These workshops represent an indispensable preliminary stage to any *prospective* process. Their application is simple and the approach is accessible. These workshops essentially serve as a launch pad for subsequent foresight.

Moreover, the modular character of these workshops allows for flexible scheduling. Furthermore, the materials required to implement the workshops are relatively simple and include; a video projector, a computer, a few notepads (both large and small), and some writing instruments.

Finally, the workshop gives plenty of impetus to participants to go beyond what they've discovered in the workshops. The organizers of the workshops may harness this sentiment to elicit greater participation in future workshops, if doing so suits their needs.

The experience founded upon many implementations shows that it is difficult to find many drawbacks to these initial workshops, which have the merit of drawing participation and appropriation from wide cross-section of the organization. In the worst case, the lessons learnt during the exercises will be short-lived; however, training personnel in using such effective methodologies will have been worth it.



³⁷ Several examples and workshop templates are available on the LIPSOR website.

These workshops may implicate any group of persons who are common stakeholders, and who wish to consider the possible and desirable changes in their operating environment in order to best orient strategic action. These workshops may also implicate formerly separate cultures who must now work together due to a merger/acquisition or strategic alliance. These workshops are a great opportunity to gather formerly separate cultures in order to form a cohesive team around shared objectives.

These workshops represent an indispensable preamble to the strategic foresight process, and their application is simple and accessible. Above all, they serve as an initiation to thinking about change in a productive way.

III. ESTABLISH A STRATEGIC DIAGNOSTIC OF THE ENTERPRISE

Understanding one's own strengths and weaknesses is imperative for every organization. As Hamel and Prahalad (2005), suggest, companies must rely upon their distinctive competencies and then transform them into key factors for success in those domains in which they operate or wish to operate. This intimate knowledge of the organization in relation to the evolution of the external environment constitutes a potential source of innovation, and is the subject of the strategic diagnosis described in the following passages.

1. The Tree of Competencies

The representation of an enterprise as a tree of competencies grew out of the strategic analysis of Japanese firms. It seems that, implicitly or explicitly, most organizational structures in Japan are presented in an arboreal form. Thus, for example, three concentric circles symbolize research, production, and commercialization—also equivalent to representing a tree in plan view.

Competency trees represent an organization or enterprise in its entirety, without reducing it simply to its product lines or markets. In these trees, the roots (skills, competencies, techniques and *savoir-faire*) and the trunk (productive capacity) are just as important as the branches (product lines and markets).

Within the scope of the integrated approach of *prospective*, the objective of the competency trees is to establish an x-ray diagnostic of the enterprise in order to understand its distinctive competencies with respect to its possible strategic options.

The tree of competencies is divided into three phases; past, present, and future. The analysis of the past allows an enterprise to understand the constants of their particular industry, how they were able to evolve, and to situate their project in any historical context. The analysis of the future allows the enterprise to identify the risks and opportunities, as well as define the major stakes and challenges with which they will likely be confronted. The analysis of the future also allows the enterprise to determine its desired future and construct a project to realize this future.

Instructions

The elaboration of a full tree of competences requires considerable effort, especially gathering exhaustive data on the enterprise (from *savior-faire* to product lines and markets) and also its competitive environment. This gathering stage is vital to the strategic diagnosis of the tree, e.g. the strengths and weaknesses of the roots, trunk, and branches. The diagnosis must also be retrospective, in other words, it must look back before looking forward. To know where you're going, you need to know where you came from.

It's important not to confuse this approach with that of the tree of technologies in which the trunk (means of production) doesn't exist and where the branches seem to grow out directly from the roots. As Marc Giget (1989) highlights, "These are two distinct concepts with different objectives [...] the elaboration of the tree of technologies is generally done by research and development teams, or by public relations departments who use the tree to present a complete and coherent image of the enterprise to the shareholders and to the public."

Likewise, be careful not to confuse this tree with the tree of knowledge created by the philosophers Michel Authier et Pierre Lévy (1999), which allows one to analyze a portfolio of competencies of a certain population as well as its structures. This tree of knowledge is often used to manage the human capital of organizations, which is not our objective here.

Utility and Limitations

The image of the tree has its virtues. First of all, let's return to Marc Giget's observation that "the enterprise needn't die along with its product". Just because one branch is sick, you needn't fell the tree at the trunk. In this case, it suffices rather to redeploy the sap of competencies towards new branches of activity which correspond to its "genetic code". There are some famous examples such as; *Bolloré Technologies*, makers of cigarette papers switching to special packaging, and *Graphoplex* (slide rules to precision thermo-plastics) or even the store *Règle à Calcul* (Slide Rule in English) the famous Parisian store which converted to selling calculators and computers.

The image of the tree also has its limits, and is not a perfect metaphor for an organization. In reality, the tree is a dynamic organism wherein energy flows are bidirectional. So, for example, the leaves collect the sun's energy via photosynthesis and nourish the rest of the tree. When the leaves die and fall to the ground, they produce humus which is then re-absorbed by the roots. Trees also serve to remind us that an organization has a certain disposition that is not unlike the genetic code in biological organisms. Thus, a pine tree cannot become an oak, nor can a cherry tree grow pears.



This approach, formalized by Marc Giget throughout the 1980s, has been revived by a large number of enterprises such as; Renault, Elf, Péchiney, Sollac and Télémécanique. The principles never cease to be rediscovered under different forms. Thus, Hamel insists, and rightly so, on focusing on core competencies in order to determine the direction of strategy.

For the last dozen years or so, the representations of competency trees have been especially useful as tools of collective reflection in *prospective* workshops (see figure 2 above). This tool is equally useful in an industrial context as it is in a regional one.

2. The Methods and the Tools of Strategic Analysis

As with *prospective*, strategic analysis is composed of a suite of methods and tools. When these tools are used in their various combinations, they assist the manager in his or her choice of strategic activities and orientations.

There exists a vast body of literature on the subject of strategic analysis, and therefore we will not bother detailing all the tools and methods of strategic analysis developed during the course of the last several decades. Some of these methods include; the segmentation of activities into Domains of Strategic Activity (DSA), the product lifecycle, the effect of experience (knowledge theory), the models of various firms (BCG, ADL, McKinsey, etc.) or even the analysis of fundamental resources (value chain, trees of competences, benchmarking, etc.).

These tools are part of the intellectual legacy of modern strategic analysis. Their faded glory, and the often systematic and reductive way in which they have been used, doesn't justify our ignorance with respect to them. If some of these tools are no longer used by major strategy consulting firms, it's because they want to differentiate themselves in the marketplace and create buzz around newer proprietary tools. Nevertheless, these tools are often useful to practitioners of strategy, in large part due to their simplicity.

On the other hand, these same tools are often presented in business schools as abstract "scientific" methods, with few case studies, since the studies which exist remain confidential. These theoretical explanations, lacking concrete application, have very little pedagogical utility. Experience shows that these tools, as well as those included in the toolbox are only relevant when they are used advisedly while keeping in mind their inherent limits.

3. The Strategic Diagnosis

The strategic diagnostic is formulated on two fronts of an organization; internal and external. The objective of an internal diagnostic is to understand strengths and weaknesses at all levels of the tree of competencies of the five fundamental resources of an enterprise; human, financial, technical, productive, and commercial. However, identifying assets and liabilities is not enough. One must also appreciate the importance of these strengths and weaknesses in relation to the threats and opportunities which exist in the general strategic environment—such is the objective of the external diagnosis.

The classic approach has too often led strategists to separate these two diagnoses (internal and external), which have no meaning except in relation to one another—threats and opportunities qualify any given weakness or strength.

A Retrospective X-Ray of the Organization

The internal diagnosis of an enterprise is done before the external diagnosis because in order to query intelligently about changes in the strategic environment, one must first understand the organization's products, markets, technologies, employees and history. Briefly, the internal diagnosis is essentially a retrospective 360° x-ray of the tree of competencies, which enables one to define the scope of the strategic environment under study.

Classically, the internal diagnosis includes the following components; financial, operational (which includes labor and capital) and technological, to which one should append a column of data concerning quality.

The financial diagnostic is conducted with the aid of ratios which allow the team to appreciate both the financial growth of the organization, and its financial growth with respect to its principal competitors. We distinguish the following ratios; structure, activity (or management), and result.

The operational diagnoses of the tree concerns both the branches (the products and markets), and the trunk (resources and production). The banalisation of the tools for strategic analysis (see above) stands in stark contrast to the fact that many enterprises have very little knowledge of; the markets they serve, their history, their competitive position, their costs and margins by strategic segment, and finally their own strategic outlook.

The quality diagnostic concerns the entire tree. We can define 'quality' as the conformity of a product or service to the needs of its client at the lowest possible price. The diagnostic doesn't seek perfection (the quest for which would be useless and costly), rather it seeks global quality, and to define precise objectives whose aims are; ameliorating performance and guaranteeing that processes and products are meeting the needs of clients. Identifying useless or unsalable qualities is just as important as identifying non-qualities.

The roots diagnostic (core competencies) is concerned with technologies, but also the combination of human and organizational *savoir-faire* (know-how) which constitute what we call the expertise of an enterprise.

The importance of strengths and weaknesses, which should have already been identified by the internal diagnostic, depends on the nature of threats and opportunities in the strategic and competitive environment. The enterprise must align itself and its portfolio of activities with the demands of this environment.

The external diagnostic allows the team to consider the enterprise within the context of its competitive environment, and as one player among many. The external diagnostic also allows the team to identify; direct competitors in any given market served, suppliers, clients, potential entrants, producers of substitutes (to borrow some terminology from Michael Porter (1986)). Likewise, the external diagnostic allows for the identification of general players in the environment, such as; governments, banks, the media, unions, interest groups, etc. The enterprise must position itself vis-à-vis each one of the actors in its strategic environment.

In particular, the enterprise must position its Domains of Strategic Activities (DSA) and explore four fundamental questions for each.

-what is its future?

- what is the competitive position of the enterprise?
- what are the key factors of success?
- what are the distinct competencies of an enterprise or those which an enterprise must acquire to better its position?

The future of any particular DSA may be appreciated vis-à-vis the notion of industry maturity, whose rate of growth is only one among many aspects. Thus, we can position an industry itself in one of four phases of growth; birth, growth, maturity and decline.

The competitive position for any given DSA can be measured across a battery of criteria, of which market share is not necessarily the most important. There are other factors to take into consideration such as; the supply chain, production, marketing, finance and technology.

Utility and Limitations

The choice of strategic options by definition an arbitrated process, and will certainly engender several dilemmas for the group. The concern over profitability in the short term must not be an obstacle to long-term development and growth. One shouldn't confuse diversification of activities with strategic redeployment of resources. The latter is done by looking for synergies amongst the core competencies of an enterprise. Simply diversifying the product line ignores this principal and leads too often to a waste of resources.

During the 1970s and 80s, the parceling out of activities of an enterprise into strategic units was done systematically and to excess by financial analysts concerned with separating profitable activities from those which were less productive or even operating at a loss. This has resulted in the dismemberment of large corporations into semi- or completely independent groups. These policies of restructuring and downsizing are often made without taking into consideration the synergies and competencies between different activities. To use the tree metaphor again—by cutting off all the braches, one jeopardizes the trunk, the roots, as well as the future capacity of the tree to redeploy strategic resources (sap) where they're most needed. According to Giget (1998) and Hamel (2005), this dismemberment and the lack of coordination which entails, is highly counterproductive in most cases.

It is not enough to determine the value of the Domains of Strategic Activity (DSA), and its competitive position with respect to one another at any given moment. One also has to situate the enterprise within the dynamic of these changes, and according to the scenarios of its general and competitive environments. Major technological innovations, as well as political, economic or social ruptures could happen, and would then modify the portfolio of possible strategic activities. Therefore, it's necessary to both; identify future key factors of success, and determine which among them correspond best to the organization's core competencies.



The complete diagnosis (360° x-ray) of resources and of an enterprise's strategic environment can be seen as a tree of competencies, and it can be among the most essential steps of *prospective* (strategic foresight).

IV. IDENTIFYING KEY VARIABLES

Structural analysis is a collective process which requires the participation of multiple participants. It offers the team the possibility to describe a system (i.e. the competitive environment) with the aid of a matrix which relates the various elements found therein. The objective of this method is to identify the principal elements (variables) and then to determine whether each is influential or dependent vis-à-vis one another.

1. The Stages of Structural Analysis

Structural analysis begins with a group composed of both internal personnel and outside expertise in the domain under study. It includes three successive phases: creating an inventory of variables, describing the relationships amongst the variables, and then identifying key variables.

Identifying Variables (Phase 1)

This phase consists of creating an inventory of variables which characterize the system under study, as well as its internal and external environment. It's important to be as exhaustive as possible during this phase, and not exclude, *a priori*, any possible avenues of research.

In addition to the *prospective* workshop (see figure 2 above), the collection of variables can be completed by conducting interviews with representatives of the actors implicated in the system under study. The interviewees needn't be selected among the upper echelon of management; in fact, it's preferable that they're not.

A definitive list of both internal and external variables are collected and considered. Experience shows that this list shouldn't generally exceed 70 or 80 variables, assuming sufficient time has been taken to define (and therefore limit) the scope of the system under study.

A detailed description of each variable is crucial, as these variables will condition the rest of the analysis. Furthermore, the relationships amongst the variables will form the "database" upon which further foresight analyses are calculated. This work is often done as a workshop which regroups the factors previously identified into associated categories of more general scope.

It is thus recommended that the team establish a precise definition for each variable. The team should also identify and describe important derivative variables which underlay the principal variables, and then describe how these derivative variables are trending and how they may be likely to cause future ruptures. This process could take up to three days depending upon the complexity of the task. A study with an

average of about 40 variables should roughly take from 80 to 120 days of work. Generally this work is assigned to a committee whose members share the responsibility of completing it. In certain cases, partnerships can be established, for example, between administrative and executive participants. Doing so tends to create a more cohesive team since they now share common strategic objectives.

Describing the Relationships amongst the Variables (Phase 2)

Within a systemic context, a variable exists only in relation to others. Also, structural analysis is concerned with identifying the relationships amongst the variables by employing a two-dimensional matrix called a "Structural Analysis Matrix"

It's preferable that the matrix be filled-in by those who have already participated in Phase 1. This phase may require up to two or three days of work.

The process of filling in the matrix is qualitative. For each pair of variables, the following questions are posed. Does there exist a relation of direct influence between variable *i* and variable *j*? If the response is negative, then one assigns a zero to this cell. If the response is positive, then one assigns a one if the relationship is weak, a two if the relationship is average, a three if the relationship is strong, and finally a four if the relationship does not yet exist, but has the potential to exist in the future.

For *n* variables, *n* x *n-1* questions may be posed (close to 5,000 for a study with 70 variables) of which only a select few will be treated for lack of time. This procedure of systematic interrogation allows the team to avoid errors, and rank and classify ideas. In so doing, the team creates a common language which will then serve them as the process continues. In most cases, it also allows the team to redefine certain variables and therefore refine the analysis of the system. Finally, experience shows that the ideal percentage of the matrix to be filled-in is around 20%.

Identification of Key Variables (Phase 3)

This phase consists of identifying and re-ranking the key variables, i.e. those essential to the evolution of the system. These newly ranked key variables (indirect classification) are derived from a sophisticated matrix calculation we call MICMAC (Matrice d'Impacts Croisés Multiplication Appliqués à un Classement).

Comparing the rankings of the variables from the various classifications (direct, indirect and potential) is a rich source of information. It allows the team to confirm the importance of certain variables, but also to reveal those variables which play a dominant role in the system, and which would have remained undetected if they had only been compared directly.

The resultant data in terms of influence and dependence of each variable can be represented on a two-dimensional graph wherein the x-axis corresponds to dependence and the y-axis corresponds to influence. It is also quite possible, in addition to identify the most influential variables in the system, and to study the different roles played by these variables (see figure 4 below).

2. The Different Variables and their Interpretation

The variables are plotted on a two-dimensional matrix whose axes are defined as influence and dependence. Therefore, each variable is defined by these two criteria according to its position on the matrix.

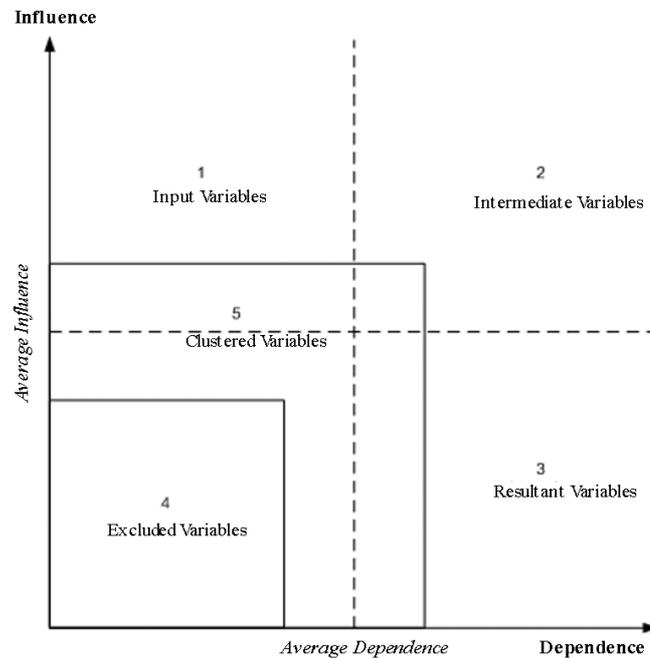


Figure 4 – Different types of variables on the matrix with axes influence and dependence.

The input variables (1) are highly influential and also independent. These variables tend to describe the system under study and condition the system’s dynamic. When at all possible, these variables must be considered a priority when considering strategic plans of action.

At the intermediate variables (2) are both highly influential and highly dependent. Thus, they are, by their nature, unstable. Any action taken on these variables will cascade throughout the rest of the system, profoundly affecting the system’s dynamic.

The resultant variables (3) are not influential but very dependent. Their behavior therefore explains the impacts resulting from other variables, principally input and intermediate variables.

Excluded variables (4) are neither influential nor dependent. Therefore, they have little impact on the system under study. Often times these variables simply describe inertial or prevailing trends which change little over time. Other times, these variables are simply autonomous, and therefore have little impact on the system. Excluding these variables therefore will have few consequences for our analysis.

Finally, there are the clustered variables (5) which tend to congregate together. These variables are not sufficiently influential or dependent to be included among the

previous classifications. We cannot draw any definitive conclusions about these variables and their impact on the system.

3. Influential, dependant and Hidden Variables

One of the benefits of structural analysis is that it allows the team to verify hypotheses concerning how the system functions. In this way, structural analysis may corroborate (or contradict) the group's initial hypotheses concerning which variables are important, influential, or dependent.

Quite often, the results of structural analysis are surprising. For example, between 10% to 20% of the results are counterintuitive. Structural analysis demonstrates that hypotheses concerning the relationships among variables are often misleading, lack evidence, or are ranked with an unexpected dependence or influence.

In 1972, a *prospective* study was done for the French nuclear power industry in which structural analysis was used with much effect. It allowed the team to identify major changes in the ranking of variables.

By adopting various points of view—political, economic, technological, etc.—the group identified 51 separate variables which were to be taken into account.

The following figure illustrates how the ranking of these variables changed with structural analysis.

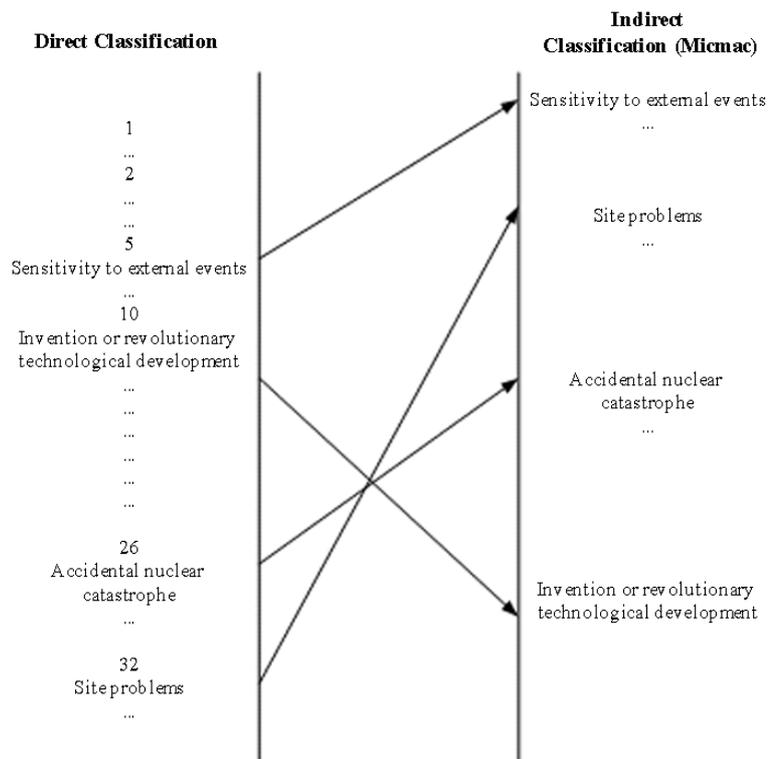


Figure 5 – Classifications and Indirect Classifications using MICMAC

The variable "Sensitivity to external effects" went from the fifth row to the first. As early as 1972, structural analysis allowed us to sense the importance of collective psychology with regards to the development of nuclear energy.

The evolution here is even more striking when you consider the variable "Site problems" which has to do with selecting particular sites from nuclear power plants. This variable went from 32nd row in its direct classification (or ranking) to the 10th row in the Micmac classification. Micmac had elaborated the problems of the type we now see at Electricité de France where installation plans are thwarted by protesting local residents. These issues began in the early 1980s and continue today—Micmac enabled us to sense the impending trouble almost 10 years before the fact.

4. Utility and Limitations

The principal utilities of structural analysis are to; stimulate collective thought, and allow the team to consider the counter-intuitive behavior of the system. The data derived from the structural analysis mustn't be taken as gospel, but rather as a means for deeper reflection on the subject under study. Undoubtedly, there is no single "official" analysis of the data derived from MICMAC. The group must determine its own interpretation.

The limits of structural analysis concern principally the subjective nature of input data, specifically the list of variables elaborated during the first phase, and the relationships amongst those variables determined likewise by the team. Therefore, structural analysis is not a reality per se, but rather a means of representing reality in an abstract and subjective way. Moreover, the analysis itself, is subjective. Nevertheless, the participatory nature of the process, which reduces individual biases, allows a team to arrive at a model of reality which is far better than that which would have otherwise been created by an individual.

Finally, structural analysis is a long process which sometimes becomes an end in itself and should only be undertaken if the subject lends itself to such analysis.

To facilitate structural analysis, and more specifically in direct rankings, LIPSOR has developed a software tool called Micmac which is available free-of-charge on the LIPSOR website (laprospective.fr).



You should count on several months to complete a structural analysis—of course, much depends on the pace of the team and the time allocated to the study.

A few pitfalls to avoid:

- subcontracting the structural analysis altogether, or to those charged with facilitating the study, or worse, to outside third-party consultants. To ensure appropriation of the strategic decisions taken as a result of the study, internal personnel must be implicated during this phase, as it is they who will be later called upon to implement the strategic plan.
- dispensing with the indispensable phase of identifying and describing variables. Doing so will render the filling-in of the matrix completely random, and the resultant

data valueless and unreliable. Furthermore, there will be neither common experience nor common language concerning the system under study.

- parceling out the chore of filling-in the matrix will result in data that has no meaning, since structural analysis was designed as a tool for collective participation.

If these pitfalls are avoided, the appropriate aspects of structural analysis make it the tool of choice for systematic analysis of a given problem. 80% of the results obtained will be rather obvious and will simply confirm your initial intuitions regarding the behavior of the system under study. However, the remaining 20% will be counter-intuitive (unexpected) and provide a much clearer picture of how the system functions, which in turn, can only have a salutary effect on the judgment of those concerned.

V. STAKEHOLDER ANALYSIS AND KEY ACTORS

Strategic stakeholder analysis constitutes one of the crucial steps of *prospective*. It aims at resolving, or at least recognizing, the conflicts amongst actors who are all pursuing their own interests. The interplay of these actors will certainly condition the evolution of the system under study.

The method for analyzing the interplay of actors, also called MACTOR (Méthode ACTeurs, Objectifs, Rapports de force), evaluates the important relationships amongst actors, as well as their respective convergences and divergences vis-à-vis several important stakes and objectives related to these stakes.

The resultant analysis of this method will allow any given actor to forge alliances and manage potential conflicts with other actors.

1. Phase 1: Construction of the Table "Actors' Strategies"

The method includes seven steps:

The Construction of a Table of Actors' Strategies (Phase 1)

The construction of this table concerns those actors which control key variables, previously identified in the structural analysis phase. This analysis describes the evolution of the system based upon the important actors and the variables over which they have control.

The information collected on the actors is formatted in the following way:

- One side, a veritable identification card of each actor will be established, its ends, objectives, its projects under development, and those in their mature phase

(preferences), its motivations, its constraints and means of internal action (coherence), its past strategic behavior (attitude);

-On the other side, we examine the means of action that each actor possesses vis-à-vis other actors in order to achieve their projects.

Evaluating Strong Relationships amongst Actors (Phase 2)

A matrix of direct influence between actors is constructed from the table "Actors' Strategies" elaborated during Phase 1. This is accomplished by considering the means of action of each actor. The important relationships are calculated by taking into consideration both the direct and indirect (an actor being able to act on another through an intermediary) means of actions.

Five levels of relationships among actors are classified according to the degree of influence. An actor may have little or no influence on another actor (0); an actor may disturb (in a limited way) the operations and management procedures of another actor (1); an actor may jeopardize the success of the projects of another actor (2); an actor may jeopardize the mission of another actor (3); or an actor may jeopardize the very existence of another actor (4).

The various actors and their positions are plotted on a two-dimensional matrix where each axis represents influence vs. dependence. This analysis highlights the strengths and weaknesses of each actor, as well as possibilities for serious conflicts.

The matrix influence versus dependence reveals four position-types; dominant actors (very influential and little dependent), dominated actors (little influence and highly dependent), intermediate actors (both influential and dependent), and finally autonomous actors (neither influential nor dependent) with respect to the system under study.

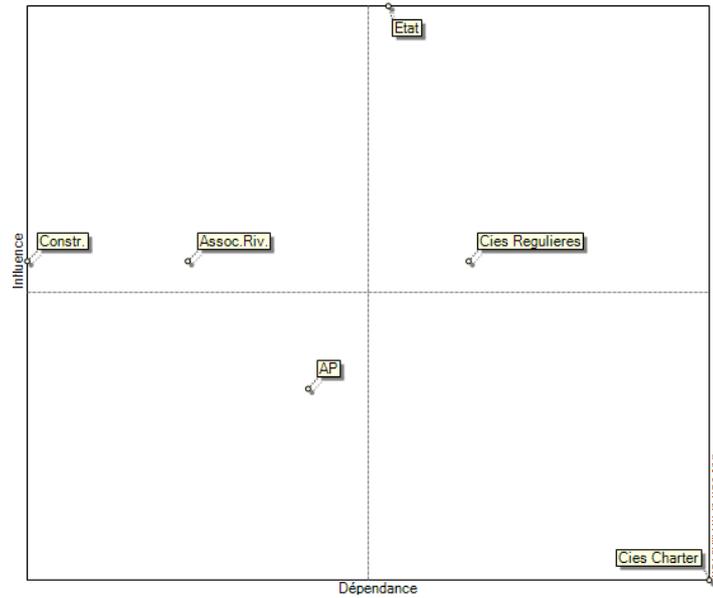


Figure 6 – Example of Matrix Influence versus Dependence of Actors

The Identification of Strategic Stakes and Associated Objectives (Phase 3)

The confrontation amongst actors with respect to their goals, their projects, and the means available to them, reveal a certain number of strategic stakes. The relationship among actors is characterized by convergence or divergence around these objectives.

Positioning of Actors around Objectives and the Identification of Convergences and Divergences (Phase 4)

With the matrix “actors vs. objectives”, the current attitude of each actor with respect to a given objective is indicated with agreement (+1), disagreement (-1) or neutrality (0).

To identify the alliances and possible conflicts, the method clearly shows every pair of actors and the number of objectives they are in agreement or disagreement. Two initial complete matrices showing convergences and divergences are produced. These matrices allow one; to visualize those groups of actors who share interests, to evaluate the degree of their apparent independence, to identify those actors which are potentially threatened, and to analyze the stability of the system.

Ranking the Priorities of Objectives for Each Actor (Value Positions) (Phase 5)

The graphs constructed during Phase 3 are rather elementary. These graphs do not take into consideration the number of convergences and divergences of the objectives among actors. In order to fit the model with reality, one simply needs to take into

consideration the ranking of objectives for each actor. The degree of positioning vis-à-vis other actors is facilitated by the use of ranked objectives.

Integrating the Power Relationships into the Analysis of Convergences and Divergences among Actors (Phase 6)

Let's say that there's an actor which has 2 times more power than another actor. That means that this actor can exercise 2 times more power vis-à-vis common interests. The objective of this step is to adjust the relationships of each actor with respect to particular objectives.

Several new graphs showing possible convergences and divergences among all the actors are then produced. By considering the ranking of objectives and the power relationships among actors, a comparison of a series of graphs allows one to identify potential alliances and conflicts.

Formulation of Strategic Recommendations and Key Questions about the Future. (Phase 7)

Stakeholder analysis clearly demonstrates the potential alliances and conflicts among actors. Thus, it contributes to the formulation of key questions and strategic recommendations—both of which are indispensable steps in the *prospective* process. For example, the method helps to determine how the relationships amongst actors might evolve, and furthermore how particular actors may fade or grow in importance as the system evolves.

Utility and Limitations

The stakeholder analysis method (MACTOR) is highly scalable and will accommodate a large number (and diversity) of both actors and objectives. In this respect, it differs from traditional "game theory" which although often accompanied by powerful software tools, is rather restrictive due to the limited number of inputs. Nevertheless, on a theoretical level, there remains much progress to be made in reconciling "game theory" with the MACTOR method.

MACTOR has a simple interface and is very accessible. Furthermore, it allows the team of analysts to take into consideration the richness and complexity of the system under study by supplying intermediary results which clarify certain dimensions of the problem.

The method includes a certain number of limitations, notably concerning the gathering of required input. Actors are naturally reticent about revealing their strategic projects and their means of external action. Therefore, there remains an irreducible enigma concerning the intentions of certain actors with the system. Moreover, the representation of an actor within the system assumes that the actor will behave rationally—an assumption which is sometimes belied by reality.

The greatest danger in using this method, and particularly with the ease of generating lots of data via the software, is to get carried away with the data and the stream of analyses it will likely elicit. The team must not forget that the quality of the results as well the capacity to sort the most relevant results, depend upon the quality of the input.

To facilitate the analysis of the interplay of actors, and notably to calculate the important relationships amongst actors, LIPSOR has developed the MACTOR software (see figure 13, also the software is available free for download in several languages, including English at: www.lapropective.fr)



On a practical level, the time necessary to conduct stakeholder analysis with the aid of the MACTOR method is generally shorter than the structural analysis phase. However, the time necessary for the collection and verification of data and their consequent analyses mustn't be underestimated.

The MACTOR method may be used alone, or in conjunction with an integrated strategic process. Furthermore, the method may be adapted to global strategic analyses, as well as the analysis of a particular strategic objective.

VI. SWEEP THE ENTIRE FIELD OF POSSIBILITIES AND REDUCE UNCERTAINTY

1. Morphological Analysis

Morphological analysis aims to explore possible recombinations of constituent elements of a given system. This method is principally used for the construction of scenarios, but it is equally well suited for both technological forecasting and elaborating potentially new products through the recombination of technologies, services, etc.

The Construction of Morphological Space

Morphological analysis includes two principal phases:

This first stage is concerned with decomposing the system (or function) into subsystems or components, either as a result of a *prospective* workshop and its factors of change and inertia (see figure 2 above) or as the result of structural analysis. The decomposition of a system is a delicate operation and requires serious consideration if the method is to be useful.

The components must be as independent as possible and taken together must comprise the entire system under study. Too many components will render the analysis impossible, while inversely, too few components will result in poor analysis. Therefore, it's necessary to find a balance.

Each component can take several configurations. In the example of global scenarios whose grid is presented here, a given scenario is characterized by a specific configuration of components. There will be as many possible scenarios as there are possible combinations of components. The possible combinations therefore represent the entire field of possibilities called the "morphological space". The morphological space presented here is composed of seven components each one of

which has three or four configurations which will render 2,916 possible combinations which is the product of $(3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 4)$. The morphological space grows exponentially and therefore there is a risk of drowning in the sheer number of possible combinations.

The morphological space can increase very rapidly. By adding a single hypothesis for two subsystems the morphological space increases by close to 80% (3,888 possibilities rather than 2,187). So, the risk of drowning in data is very real.

One way to deal with this exponential growth of the morphological space is to assign probabilities to the occurrence of any given hypotheses.

Certain combinations of hypotheses, even certain groups of combinations of hypotheses, are either not compatible or not coherent when taken together. To satisfy the conditions for quality in scenario planning (see Chapter 1, Section 4), the second phase of morphological analysis consists of reducing the morphological space into a subset which is far easier to manipulate. This is done by introducing criteria which exclude certain combinations for various reasons (economic, technical, etc.) from this original set, so that only relevant combinations can be examined.

The Blocks Method

When the system is very complex, or the system requires a very fine level of analysis (for example with regions), it may be useful to include an additional step to morphological analysis. This step consists of constructing scenarios as combinations of boxed variables and hypotheses.

In the case below, two types of scenarios are produced. The first are partial, and the second are global. In the first set, each subsystem at level n is decomposed by variables (see figure 6 below) at the level below $(n-1)$. A set of hypotheses is then determined for each variable and potential combinations thereof.

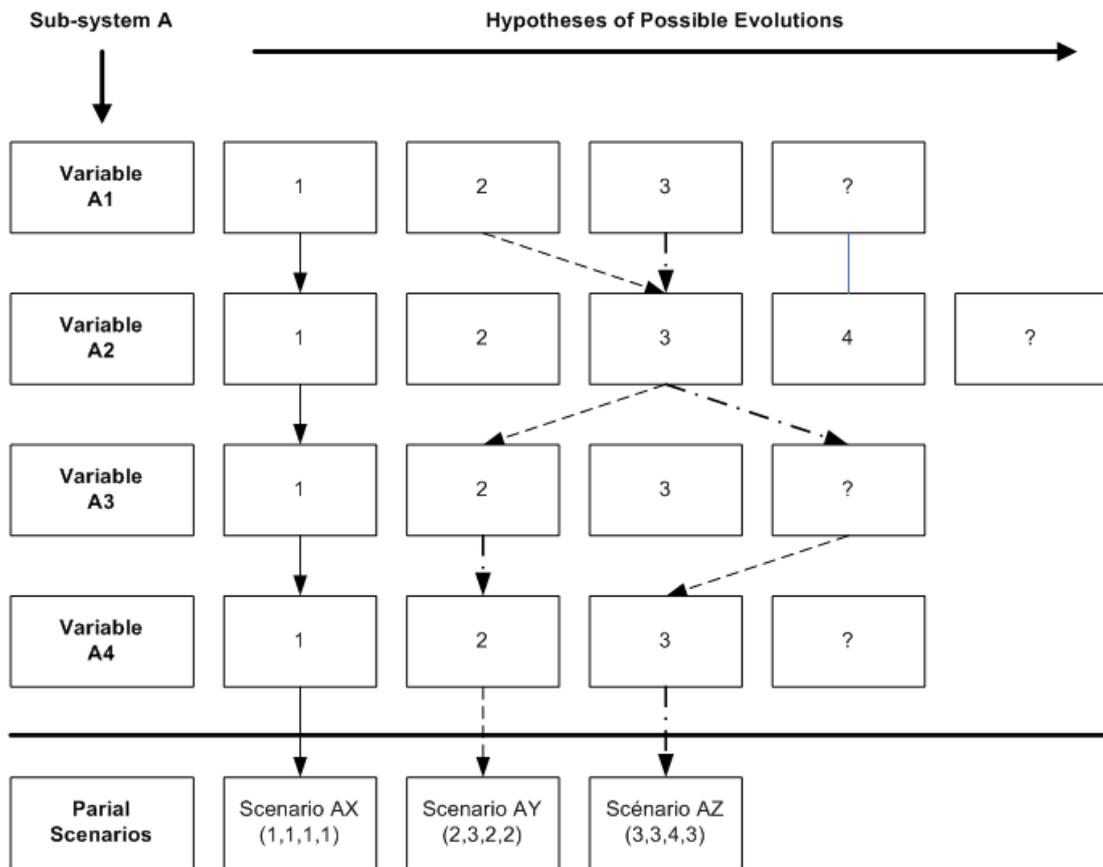


Figure 7 – The Blocks Method Using Partial Scenarios

The following scenarios are created by dropping down through each level like a pachinko ball, though non-adjacent hypotheses may be selected. (see figure 7 below)

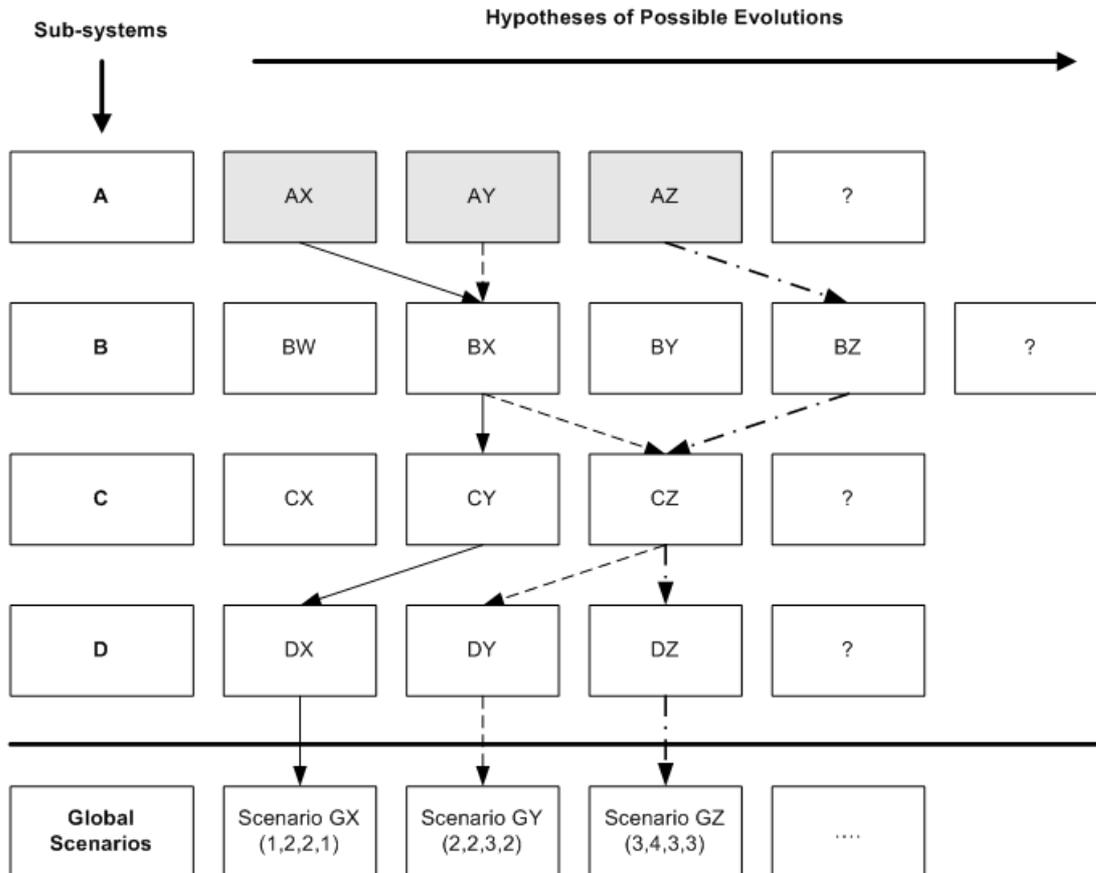


Figure 8 – The Blocks Method Using Global Scenarios

The Blocks Method essentially allows one to reduce the morphological space which would otherwise be too large and unwieldy. For example a system which includes four subsystems with three variables each and three hypotheses for each variable would produce a morphological space of 3^{12} possibilities or more than 500,000 scenarios. By using a blocks and by assuming that each subsystem has three scenarios, we can greatly reduce the number of possibilities. In this case the number of scenarios is reduced to 81 possibilities.

Utility and Limitations

The domains of application for morphological analysis are multiple and include but are not limited to; the construction of exploratory scenarios, new product development, and technological forecasting.

Although morphological analysis is used most often for technological forecasting, this method lends itself to more and more frequently to the development of scenarios. When used to develop scenarios, the morphological space includes the following dimensions (components); demographic, economic, technological, and social. These dimensions are characterized by a certain number of possible states (configurations or hypotheses), and therefore a scenario is nothing but a combination of states for each dimension.

Morphological analysis is great for stimulating the imagination and allows the team to sweep the entire field of possibilities. So as not to be overwhelmed by the sheer number of combinations, it's necessary to learn how to navigate through the morphological space with the aid of selection criteria and rules of exclusion.

The first limit of morphological analysis stems from the choice of the subsystems. By omitting a subsystem or simply an essential hypothesis for the future, there's a risk that you'll end up ignoring a large field of possibilities (which are not fixed but evolve over time).

The second limit is the sheer number of combinations which are produced and quickly overwhelm the user. One of the best solutions is to introduce strict selection criteria, and then proceed to exclude those subsystem hypotheses which are not essential. The other way is to simply use the blocks method shown above.

In order to facilitate morphological analysis, and more specifically to apply selection and exclusion criteria, Lipsor has developed the Morphol software tool which is available free for download from the Lipsor website.



Morphological analysis is rather easy to implement, however there are certain risks associated with the sheer number of combinations which results. Its effectiveness shouldn't give you the false impression that you've exhausted every possible combination. Like the future, the morphological space is not fixed, but evolves over time. By omitting a subsystem or simply an essential hypothesis for the future, there's a risk that you'll end up ignoring a large field of possibilities. Finally, you mustn't lose sight of the fact that constructing scenarios is only one stage of *prospective* and that the point of doing a *prospective* study in a strategic context is that it leads to concrete action.

This approach of Zwicky had been completely forgotten for decades by strategists. These same strategists were likely frightened by the sheer number of possibilities that this method reveals, thus reducing the scope and credibility of their own scenarios. We rediscovered this method back in 1988 for a *prospective* study we did for the French armed forces. Since then, this method has had an alarming success among neophytes to *prospective* who are too often amused by the way in which scenarios can be simply constructed like Lego blocks. These neophytes often forget that quality is more important than quantity.

2. The Delphi Method

Developed by Olaf Helmer³⁸ at the RAND corporation in the 1960s, the Delphi method (Helmer, 1967) aims to reconcile the various opinions of experts on a particular subject, and relies upon successive blind questionnaires.

³⁸ Numerous people working at the Rand Corporation had developed this technique, among them; Olaf Helmer, Theodore J. Gordon and Norman C. Dalkey. The first elements of this technique were presented by Dalky and Helmer in 1953, but the method really took off in the middle of the 1960s as a tool for technological forecasting. The original Delphi technique is presented in the

The most frequent objective of Delphi studies is to bring clarity to a particular decision which may be clouded by a certain amount of uncertainty.

Instructions

The Delphi technique includes three principal phases³⁹.

The first phase is a fundamental step in the Delphi method. As with any method which employs the opinions of experts, defining the precise scope of the investigation is extremely important because all the experts need be addressing the same issue.

The development of the questionnaire must follow certain rules. First of all, the questions must be precise, quantifiable (for example, the probability of a particular event happening by a given date), and independent (each question must be independent from one another, and must not be conditioned by other questions in the questionnaire).

The second step is all the more important considering that the term "expert" is rather ambiguous. Independent of his or her qualifications, function, or rank within an organization, the expert will be chosen according to his/her ability to envision the future.

The lack of expert independence can be a potential problem. To avoid this problem, the experts are "isolated" and their opinions are collected via mail in an anonymous way. Doing so, also avoids distorting the expert opinions by a leading opinion.

The questionnaire is sent to the experts, and at least a hundred copies should be distributed since there will be non-respondents or those who simply give up. The final group should not be smaller than 25. The questionnaire is accompanied by a courteous cover letter describing the goals of the survey, the rules of the Delphi process, tolerable delays in response time, and the necessity for anonymity, etc.

For each question, it is important that the expert evaluate his/her own level of competence.

Successive questionnaires are sent in order to reduce the variance of opinion, and to determine the precise median. During the second round, the experts, having been informed of the results of first round, are required to supply a new response. This new, modified response must also be justified by the expert if it deviates too much from the average. During the third round, each expert must comment on the justifications of deviant opinions obtained during the second round. During the fourth round, each expert gives a definitive response, from which a median may be obtained, as well as a standard deviation.

Utility and Limitations

Analysis of the future : the Delphi method, by Olaf Helmer (RAND Corporation, 1967, P-3558) and in *The Delphi method : an experimental study of group opinion* de Norman C. Dalkey (RAND Corporation, 1969, RM-5888-PR).

³⁹ The Delphi method has had numerous derivations since the 1960s. The method presented here is the original technique.

One of the advantages of using the Delphi technique is that one is almost guaranteed to obtain a consensus opinion after successive rounds of questionnaires, even if converging opinions do not necessarily signify coherence. Moreover, the information collected during the survey concerning future events, trends and/or potential ruptures are usually very rich in content and contribute significantly to the foresight process. Finally, in addition to be well suited to management, technology and economy, the Delphi technique works equally well with broader social science domains.

Several constraints limit the reach of the Delphi method which has proven to be long, costly, tiresome, and somewhat intuitive rather than rational. Using multiple rounds of surveys is debatable, since only those experts whose opinions vary from the norm are required to supply a justification. Nevertheless, from a foresight perspective, divergent opinions are more interesting than those which fall within a certain range. Finally, the possible interactions between the various hypotheses are not taken into consideration and furthermore structurally excluded. This latter weakness has lead champions of the Delphi method to develop probabilised cross-impact method (see figure 4 below).



The Delphi method is a relatively simple procedure, which is easily applicable using a survey to experts. However, the risk of failure and disappointment may discourage the uninitiated. This method does permit the team to obtain a consensus. It is best suited, therefore, to decisional applications, but it must be adapted according to the objectives of the study. In particular, it is not necessary to obtain (at any cost) a consensual median opinion, but rather to highlight several groups of responses by analysing their convergences.

Delphi is a technique which has been the subject of a number of important applications throughout the world for the last 40 years or so. Not everyone relies on the same technique described above. Certain modified "Delphi" techniques borrow the name, but do not keep to the original spirit of the method using successive surveys, etc. Certain other modified "Delphi" techniques rely upon a single round of mailed questionnaires.

There have been several derivative approaches to the Delphi method. The mini-Delphi method is a forum in which experts debate, in real-time, each question before responding to it. More generally, the use of more recent modes of interaction such as video-conferencing, tend to render the procedure more flexible and rapid.

3. Régnier's Abacus

Régnier's abacus is a rather novel method of consulting experts. It was conceived by the French medical doctor, François Régnier, during the 1970's in order to query experts, either in real time or by mail using a colored voting ballot. According to Dr. Régnier; "[Régnier's abacus is] a new approach to interactive communication which uses a colored scale to create tables and graphs. Régnier's Abacus is particularly useful for understanding opinions, as well as the evolution of those options, either of

a group or individual. Recognizing areas of consensus and/or disagreement just became easy and fast [...]" (Régnier, 1989)

As with all the expert methods, Régnier's abacus attempts to reduce uncertainty, compare the point of view of one group with that of others, and take into consideration a large range of opinions.

Instructions

The logic used by the abacus is that of the three colors of the traffic light (green, orange, and red), complemented by light green and light red, which permit even more nuance of opinion. A white cell permits the respondent to vote neutrally and a black cell permits an abstention. Régnier's abacus, then, is essentially a colored scale.

In the first phase, it's important to precisely define the problem under study. This problem will be broached with care and deconstructed into elements (or items). Then, these items will be posed in the affirmative. Each expert will respond individually to the questions posed in the affirmative using Régnier's colored scale.

This phase consists of treating the colored responses utilizing a two-dimensional matrix. The rows correspond to a particular problem and the columns correspond to a particular expert. The resultant matrix is a panorama of qualitative data which clearly shows the position of each expert on the problems posed.

Using this colored matrix, the experts debate the problem(s) under study. An expert may, at any moment, change the color of his/her vote and justify his/her change of opinion.

Utility and Limitations

Régnier's abacus is effective, simple, fast, and allows for a large range of expression. It's essentially a tool of communication. Unlike the Delphi method, it's not consensus which is sought, but rather the exchange amongst the experts.

However, Régnier's abacus modifies the typical working conditions of a group and it is sometimes difficult to convince a team to use it. For example, the boss could find him/herself isolated. Therefore, the method is usually applied to evaluate, *ex-post*, training seminars, when the strategic choices are no longer at stake.



After having existed in a manual form (with the aid of a colored, magnetic matrix), the abacus is now completely automated, accessible online, or through the use of software which allows for wonderful colored graphs and rich analysis along multiple axes.

Régnier's abacus is practical tool which permits the team to collect expert opinions either in real time, or within a relatively short time-frame. It works for large groups as well as for small ones, and data may be collected from remote participants. Furthermore, the abacus may be used alone or in conjunction quite effectively with

other tools such as Delphi (Mirenowicz, Chapuy, Louineau, 1990; Chapuy, Monti, 1998).

4. Probabalized Cross-Impact Method

Early iterations of this method were developed by Theodore Gordon in the late 1960s (Gordon, 1968) and were essentially an extension of the Delphi method. Since Delphi is incapable of considering the interactions of future events, the probabalized cross-impact method aims to redress this problem.

The probabalized cross-impact method determines simple and conditional probabilities of hypotheses and/or events, as well as the probability of specific combinations of hypotheses and/or events. The method calculates these probabilities by taking into consideration the interactions between events and/or hypotheses.

The objective of this method is not only to elaborate the most likely scenarios for the team, but also to examine possible combinations of hypotheses that one may have excluded *a priori*.

Instructions

This method is actually a suite of techniques which attempt to evaluate the changes in probabilities of an ensemble of events after the realisation of one or more among them.

Among these tools, Smic-Prob-Expert software is perhaps the most powerful. In a system with n hypotheses, the Smic-Prob-Expert permits one to choose, from the information supplied by the experts, among the 2^n possible images, those which should (taking account their probability of occurring) be studied.

Smic-Prob-Expert therefore consists of delimiting the most probable futures which will serve as the basis for the construction of scenarios.

In the first phase, Smic-Prob-Expert begins with a base of five or six fundamental hypotheses and a few complementary hypotheses. However, it's not very easy to study the future of a complex system with a rather limited number of hypotheses. This is why there is so much interest in such tools as structural analysis (see figure 4 below) or stakeholder analysis (see figure 5 above) which permits to better identify the key variables and to better formulate the initial hypotheses.

The survey is generally done via mail (a rate of response on the order of 25 to 30% is considered good). You should count on about six weeks to complete the survey process. The experts implicated in the survey are chosen according to the same criteria for the Delphi method (see figure 2 above).

The experts are asked to appreciate the probability of a certain event occurring in the future and scoring that probability from 1 to 5 (from unlikely to very likely). It then asks the experts to consider the conditional probability, taking into consideration the occurrence or non-occurrence of other events.

Keeping in mind all the conditionality, it's necessary for the expert to show the level of implicit coherence in his/her reasoning.

In the second phase, the raw data is analyzed and corrected using the opinions of experts in such a way as to obtain coherent, net results (i.e. satisfying classic rules of probability) and affecting a probability of each of 2^n possible combinations given n hypotheses.

Taking the average of the probabilities assigned to each of these visions, it is possible to determine their ranking, and consequently, the most probable scenarios.

It's important to choose 3 or 4 among the scenarios; at least one baseline scenario (one with a high average probability) which will serve as a reference, and a few contrasted scenarios. Even though the probability of these contrasted scenarios is often weak, they are nevertheless important for the enterprise because of their potential impact.

The last step involves writing the scenarios (path from present to final vision), elaborating the behavior of actors. This last step concerns the scenario method (see figure 1 above)

Utility and Limitations

The so-called "probabilised interactions" methods represent serious progress with respect to Delphi since they have the advantage of taking into account the interactions of potential events. Contrary to the Delphi method, the Smic-Prob-Expert, takes into consideration the interdependence amongst the questions posed and insures coherence. The Smic-Prob-Expert method is easy to apply, the process is rather quick, and the results obtained are, in general, easily interpreted.

The Smic-Prob-Expert method is also an intellectual safety-net which allows the team to catch certain preconceived ideas (see Frame 3) and especially, to verify that the scenarios under study cover a reasonable part of the field of possibilities, i.e. that there is at least, according to the experts, 60 or 70 percent chance that the future reality will correspond to one of the scenarios presented.

For the Smic-Prob-Expert method to be effective, one must remain vigilant and, as much as possible, avoid a thoughtless, mechanical application. One mustn't forget that the probabilities obtained from the method are subjective, i.e. are not derived from data, but rather the opinions of experts.

The information collected during the Smic-Prob-Expert process is considerably large because there is as many types of scenarios as there are experts queried. Therefore, it's sometimes problematic to aggregate all the responses. There are a couple of solutions to this problem. The first involves categorizing experts according to the proximity of their responses. The second involves subdividing the entire group of experts into sub-groups of actors. The second solution helps the team understand the interplay of groups of actors. The raw and resultant data obtained (and representing most often in the form of a histogram), allows the team to arrive at a consensus, and ascertain various "schools" of thought, and classify groups of experts or actors.

To facilitate the probabilisation of scenarios, Lipsor has developed the SMIC-PROB-EXPERT software, which is available for download free-of-charge at (www.lapropective.fr)



Developed in the early 1970's by Michel Godet at CEA [Commissariat à l'énergie atomique] and again at SEMA [Société d'études mathématiques appliqués], the Smic-Prob-Expert method been applied to a number of important studies in France and around the world. Several other "probabalised interactions" methods have been developed since the mid-1960's in the United States and in Europe.

Thanks to the software developed by Lipsor, it is now possible to execute the Smic-Prob-Expert method, either in real time (in a single day, for example) or in a more traditional manner via mail.

VII. EVALUATING STRATEGIC OPTIONS

The choice of strategic options is characterized by trade-offs and must pass through a process of negotiation. The short-term concern for profit mustn't stymie growth and development in the long-term. Moreover, one mustn't confuse diversification with the strategic redeployment of resources. The latter is done by reconciling the synergy among the core competencies of an enterprise. Diversification of product lines generally ignore core competencies, and too often lead to wasted resources.

1. Trees of Relevance

Within the scope of the integrated approach to *prospective*, the objective is most often to identify coherent projects, i.e. strategic options compatible with both the identity of the enterprise and the most probable scenarios of the environment.

The Trees of Relevance method, applied originally in the domains of military and technological R&D, aims to aid the team in its selection of various strategic actions which might be taken to satisfy global strategic objectives.

Instructions

The method is essentially a comparison of various ranked levels of a particular problem. The levels go from general (highest level) to the specific (lower levels). The method includes two phases; the construction of the tree, then its notation.

During this phase, the end-points (high-level—includes policies, missions, objectives) are distinguished from the means (low-level—includes subsystems, sets of actions, and elementary actions). The different levels correspond then to the goals which become more and more detailed as one drills down levels. Taken as a whole, the levels make up a decisional system comprising the various end-points and the means of achieving them. (see figure 8 below). The tree is generally constructed with 5 to 7 levels.

The construction of this tree, which may appear deceptively simple, must respect certain criteria. First of all, there are no relationships between the nodes belonging to

the same level (independence of nodes). Second, there are no direct relationships between nodes belonging to non-adjacent levels. And finally, the levels must be filled-in equally from top to bottom in order to stabilize the model—what one loses in generality, one gains in variety.

The decision-making concerning choices among objectives can not be made before a preliminary analysis using the following two complementary approaches;

- The ascending approach, starting with the collected actions, analyses the effects of these actions and studies the objectives obtained in relations to these effects.
- The descending approach, starting with the list of final, explicit objectives, investigates and analyses the means of action which allow an organization to obtain them, and the variables likely to modify them.

It is necessary to designate each element as either an action or objective in order to preserve its exact meaning (know what you're talking about).

The object of the second phase is to measure the contribution of each action on the objectives in the system. In order to do this, a relevancy score is given to each terminal of the graph (i.e. on the tree). The score attributed to an action on level ($n-1$) conveys its contribution to the realization of actions in the level directly above it (n).

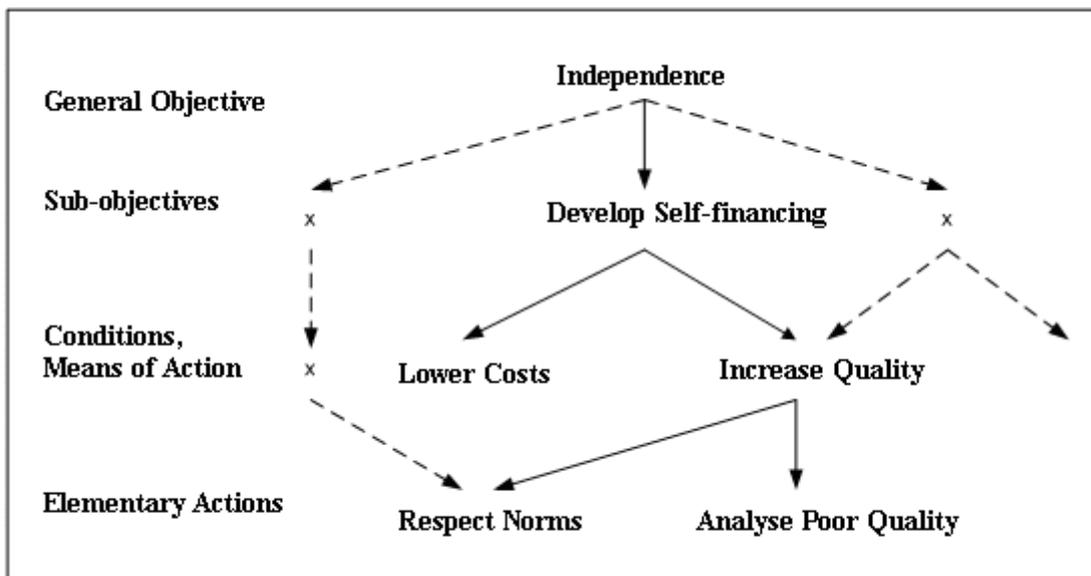


Figure 9 — Example of a *Tree of Relevance* responding to the general objective of greater independence of an organization

At this stage of the study, various methodologies allow the team to rank the decisional paths according the size of their contribution to the initial objective—this is the aggregation phase.

We propose here a simple methodology in which the action of a particular level (n) constitutes an evaluation criterion for the actions on level ($n-1$). Several matrices (multicriteria tables) are established for each level. A row represents the m elements (actions) of level ($n-2$) and the columns represent the n criteria of level ($n-2$) for each criterion. The contribution of each element in satisfying the criteria is evaluated.

Utility and Limitations

This method is an excellent aid to reflection and allows the team; to avoid redundancies (avoiding an imbalanced tree), to discover new ideas (highlight the dark zones, which are objectives not related to the means and visa-versa), and to justify the choices taken, increase coherence, and finally to structure the objective and the means.

The partial qualitative utilization (Phase 1 — i.e. limited to elaboration) of the tree, is relatively easy and may prove to be very useful and highly productive at certain stages to the team.

However, the method Trees of Relevance applied in its entirety (including phase 2 — notation of graphs and aggregation) may prove to be burdensome and delicate in its application due to limits of transmorphing an enterprise into a tree, and the fact that uncertainty is not taken into account.



In practice, this use of this method allows for the dynamic construction of a tree of relevance by a group of people. This method is used notably during the "strategy workshop" in the initial phase of the process, as the construction of the tree of relevance underscores the following fundamental principal, "Good anticipation is one that leads to action." Altogether, this method deserves to be applied in numerous cases due to the rigour it imposes on the process, and the simple and accessible nature of its qualitative part.

2. MULTIPOL

Like all multicriteria methods, MULTIPOL aims to compare different actions or solutions to a problem according to multiple criteria and policies. Another objective of MULTIPOL is to aid the decision by constructing a simple and evolving table of analysis from the different actions or solutions which the decision-maker has at his disposal.

Instructions

The MULTIPOL method, which stands for (MULTIcritère et POLitique) is certainly the simplest of the multicriteria methods, but certainly not the least useful. It relies upon the evaluation of actions using various weighted coefficients, not too dissimilar from grading a class of students.

One finds in MULTIPOL the classic phases of a multicriteria approach, including: the inventory of possible actions, the analysis of consequences and the elaboration of criteria, the evaluation of actions, the definition of policies and the ranking of actions. The originality of MULTIPOL comes from its simplicity and its flexibility of use. Each action is evaluated with respect to each criterion by means of a simple scoring/ranking system. This evaluation is obtained by the use of questionnaires, and holding meetings with experts. Consensus is crucial objective of this method.

Moreover, the judgment brought to bear on the actions is not executed in a uniform way. One has to take into consideration the different contexts linked to a particular object of the system. One particular approach is to assign weights to a set of criteria which convey one of these contexts. These criteria will then correspond to the different value systems of the actors regarding their decisions, to their strategic options still in play, or to multiple scenarios and evaluations including the time factor.

In practice the experts are distributed for each policy a particular weight given on the entire of criteria. For each policy, the MULTIPOL procedure attributes an average score to the actions. A table of profiles of rankings comparing actions according to the policies is also calculated.

Understanding the relative risk of uncertainty, or potential conflicting hypotheses, is done via the use of a graph of stability showing the rankings of actions based upon the difference between the average obtained for each policy and the score of the action. The tool also allows the team to test the robustness of the results of each action, for example, a means with a high score but also diverging from the median could be considered risky.

Utility and Limitations

MULTIPOL is a simple and accessible method. It takes into account uncertainty and allows the team to test the robustness of particular results against various industrial policies. What's more, thanks to its simplicity, it's scalable and flexible. MULTIPOL allows the team to easily incorporate additional criteria, thoughts, and actions, either during or after the session, to enrich the analysis. Finally, the ease of aggregation the criteria makes this tool very useful indeed.

However, if the objective is to elaborate a graph based upon several actions, there are some potential pitfalls that one should try to avoid. In this case the team needs to take into consideration the incompatible synergies, and redundancies among the retained actions. This is a handicap that is common to all multicriteria methods. Therefore, in the case of multiple actions, a more nuanced analysis is required.

To facilitate the multicriteria analysis according to this method, Lipsor has developed the MULTIPOL software, which is available for download free-of-charge. (see figure 21 above and www.lapro prospective.fr)



The necessity to take into consideration the presence of multiple criteria in the problems of decision has motivated the development of numerous methods, more or less sophisticated in a field that is very wide. MULTIPOL is a simple and operational response which avoids the pitfall of excessive formalization and which permits organization and structure to aid decision-making.

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*The author, Professor Michel Godet, holds the chair of "strategic prospective" at the Conservatoire National des Arts et Métiers (www.cnam.fr/lipsor/) in Paris. Professor Godet is a member of Prime Minister's Council of Economic Advisors and the French Institute of Technology. He is also the author of 16 books and more than 200 papers, many of which many have been translated into English, Spanish, Italian and Portuguese. Born in 1948, Godet is also member of the editorial board of the most eminent journals in the field: *Futures*, *Technological Forecasting and Social Change*, *Foresight*, and *Futuribles*. Godet has consulted to some of the largest organizations in the world, including; BASF, Renault, Total, Arcelor, Chanel, Bongrain, Lafarge, AXA...*

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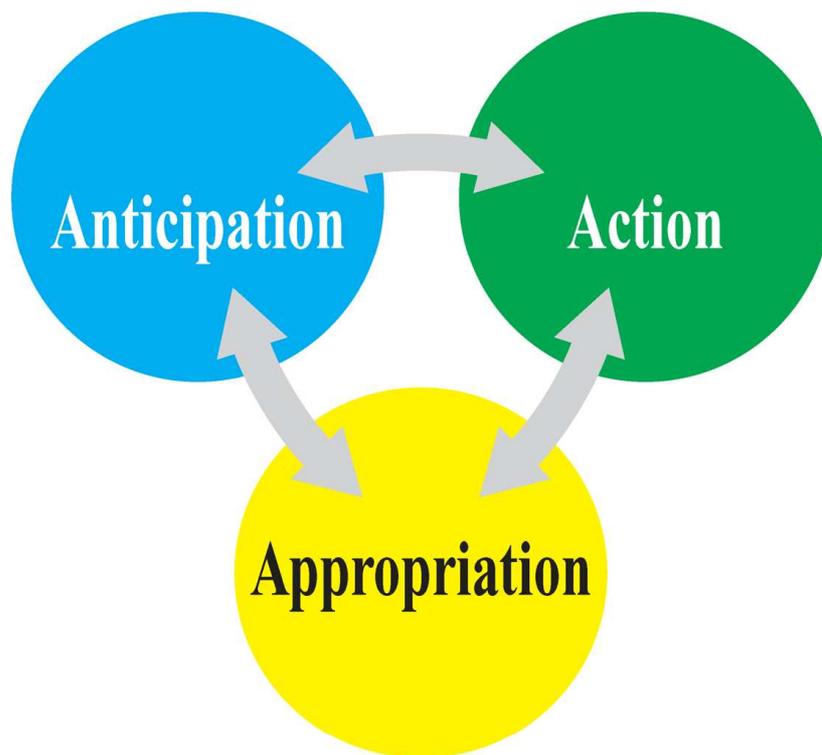


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MICHEL GODET

Creating Futures

*Scenario Planning
as a Strategic Management Tool*



Preface by Joseph F. COATES

■ Chapter 3: Regional and Urban *Prospective*

Regional *prospective* (or *prospective territoriale* in French) obeys the same laws as general *prospective* with one principal difference—the subject is either a city or other geographic region.

The use of *prospective* by and for regions responds to several challenges faced by regional stakeholders. First of all, *prospective* constitutes a unique instrument to understand regional dynamics within a context which is more and more decentralized and whose decisions are more and more autonomous, thus necessitating the need for cooperation at the regional level. Also, *prospective* allows an organization to inculcate a culture of anticipation and collective debate concerning the major stakes about the future and the choices which result from them in the present. This is a necessary step in order to anticipate structural changes and major mutations in the regional context. *Prospective* is also a powerful tool to engage local stakeholders proactively around the convergence of both possible and desirable outcomes which are thus transposed into regional policy and economic development. Often times the result of a regional *prospective* study is a charter or contractual document specifying, for example, general agreements concerning real-estate and economic development, as well as zoning. Finally, regional *prospective* allows regions to explore ignored or neglected data. By taking a step back and examining these difficult questions from a distance, local and regional officials are able to treat important problems before they become urgent.

Given the increased competition among regions and the rise in power of civil society and its demands, regional authorities and stakeholders need to anticipate the future in a different way in order to make the most relevant decisions concerning economic growth, social development, and environmental concerns. These imperatives require a *prospective* approach—i.e. global, anticipatory, and systemic—to understand both ongoing changes and those to come. The discipline of thinking in an exploratory way allows regional stakeholders to discover the major stakes to which they must respond. Such discipline also allows regional stakeholders to identify the major strategic objectives as well as the courses of action required to achieve them.

If the outlook and attitude of *prospective* is today irreversibly anchored in regional practices throughout France and abroad, there are many who would embark upon a regional *prospective* study without understanding its conceptual foundations or its methodological requirements. However, these requirements are necessary to undertake a regional *prospective* study in a rigorous and efficient way. Regional *prospective* approaches, which are often very complex to initiate, contribute to the continual innovation of regions, and should not be undertaken lightly. For example, regional *prospective* plays a role not unlike the re-evaluation of existing policies.

I. THE BEGINNING AND GROWTH OF REGIONAL *PROSPECTIVE*

Even though regional *prospective* is a recent phenomenon, it is not entirely new. Between 1955 and 1975 numerous initiatives would lead to the development of a French practice of applied regional *prospective*. Even if no one spoke about regional

prospective, the foundations, both conceptual and methodological, were forged during this period.

1. Planning, Prospective, and Regional Management⁴⁰

The application of a *prospective* attitude concerning the future of regions began in earnest in 1962 with the creation of the French Planning Commission (otherwise simply known as the *Plan*) by Pierre Massé. The *Plan* was charged with “studying the future and considering what would be useful to know in the context of France in 1985” (Massé, 1964).

The mission of the *Plan* was to assemble groups who would, in turn, promote rapid industrial and social progress. The *prospective* study commissioned by the *Plan* for a team called *Group 85* was to discover several important and intelligible ideas concerning the future which would be useful for subsequent policy. These ideas were destined to guide the decisions of the *Plan*, were both probable and desirable; with a focus on preparing France for the latter. The work done by *Group 85* was one of the very first approaches, if not the very first approach, of *prospective* applied to the future of a region—in this case France. Their work marked a seminal change in the understanding of the future going beyond simple macro-economic projections. For the project, numerous intellectuals and specialists were consulted. Among them were; Claude Lévi-Strauss, Jacques Delors, Paul Delouvrier, and Raymond Aron. According to Decouflé (Decouflé, 1972) “[this work] marked the end of prehistory of planning....” as it was the first meeting between *prospective* and planning. Massé continued, “first of all [...] concentrating its attention on the properties of the future which would be useful for decisions made in the present, second of all [...] compiling a sort of questionnaire about the future of humankind with the aid of analyses about the medium term and beyond” (Massé, 1964)

With the success of the *Plan* and *Group 85*, participants expressed the desire that *prospective* be institutionalized among government administrations, professional organizations, and unions so that these organizations too could benefit from the profound learning and flexibility that *prospective* provides (Monod, 1970). Indeed, upon completion of this initial work, numerous *prospective* cells were created among various French administrative bodies including; the French ministries of foreign affairs, defense, and industry.

The creation of DATAR

In February 1963, a French administration with the acronym DATAR (*Délégation à l'Aménagement du Territoire et à l'Action Régionale*) which translates into English as (Delegation for the Management and Political Action of Regions) was established and reported directly to the Prime Minister of France. Among the most important functions of DATAR was coordinating various programs and operations concerning the development and management of geographic regions.

Serge Antoine was among the first directors charged with leading the DATAR and he was known for having a capacity for successfully managing startups. Antoine was also instrumental in the publication of the magazine *2000*. The objective of *2000* was to raise public awareness about the complexity and difficulty of problems pertaining to the future—an unexpected but essential role.

In March of 1968, Antoine organized an international symposium on regional *prospective* and the advanced techniques of regional planning. This meeting was unique insofar as “presenters and papers were focused exclusively on regions and their proper management” (Aigrain et al., 1968) with a time horizon of 2020. Pierre Aigrain coined the new science “*geoprospective*” (Aigrain et al., 1968).

This symposium was a seminal event. First of all, it inculcated the *prospective* attitude among participants concerned with regions, and differentiated regional *prospective* from other *prospective* practices such as *prospective* applied to industry. The symposium allowed participants to codify a common language around regional *prospective* and consider various time horizons. “Each problem has its own horizons, certitudes, probabilities, plausibilities, and utopias. All of these become progressively more abstract as the horizon stretches into the future.” (Antoine, Durand, Monod, 1971). The symposium responded to two important needs; 1.) to understand the specific issues related to various time horizons, and 2.) to reconcile differing views concerning regional *prospective*.

The symposium also formally codified the principles of regional *prospective* which had originated with Gaston Berger and the *Centre International de Prospective*, or International Center for *Prospective*. The symposium also reminded participants of the demands and rigor of the practice of *prospective*. Pierre Aigrain commented; “*Prospective* is a unique opportunity to ask truly important questions and decide one’s destiny. *Prospective* is the ultimate liberating experience because it takes into consideration what could happen. Again, let’s return to the proper definition of *prospective*. *Prospective* is a technique which serves an inquiring state of mind and it feeds on its own energy. *Prospective* doesn’t lead to scenarios with complacent scenes of a carefree future. It’s not about trying to predict what will happen in the year 1985, 2000 or even 2020. *Prospective* is not about indulging in fantasies about determinism or potential events in the future based upon extrapolating the past. *Prospective* simply enumerates the possibilities, and confronts prevailing trends and revealing facts; perspective doesn’t pretend to announce what will happen, but rather offers a method to achieve the desirable. Above all, *prospective* encourages society to choose among fundamental options. [...] Everything will not be decided in one meeting in 1968. Therefore, it’s not about defining an exact solution for 2020 in 1968. *Prospective* is flexible and allows for continual re-evaluation so that society may make the most appropriate choices for the future as events unfold and updated information is available.” (Aigrain et al., 1968).

Finally the minister of the *Plan* at the time reaffirmed the direct link between political power with the general practice of *prospective* and called upon leaders from the national to the local levels, as well as from industry, to utilize this research about the future in their daily operations. This was the first time that such a system concerning the future was actively encouraged.

A System for Studying the Future: the SESAME

After having done various missions abroad and considering the advice of specialists in *prospective* including Herman Kahn, managers at DATAR decided to create a framework that would serve as a reference for policies in the long-term and decisions concerning the proper management of regions at the national and regional levels. The system was baptized *système d'études du schéma d'aménagement* or SESAME. The acronym means system of studies for regional management. The SESAME framework was implemented toward the end of 1968 under the auspices of DATAR and the French *Plan*.

SESAME was defined as a system which would allow managers to make better decisions with respect to the management of regions, i.e. with a better knowledge of anticipatory effects concerning the future⁴¹. The DATAR itself was conceived, in part, as a set of methods and means to analyze the long-term, and about knowledge concerning the future insofar as actions would have to be progressively improved, rendered operational, and then diffused throughout the public and private sectors.

This work concerning the methods and the means to achieve them would take on two major forms; 1.) theoretical research that was essentially allocated to university researchers, and 2.) methodological trials.

The research would follow various directions. Systems science and a greater appreciation for systems analysis would contribute enormously to the burgeoning discipline of *prospective*. The systems approach allowed participants to determine the best action among a greater range of multiple alternatives (DATAR, 1971a).

Secondly, there was a greater appreciation for social phenomena, which was a major preoccupation for Jérôme Monod at DATAR at that time (Durance, Cordobes, 2007). Monod stated; “we must avail ourselves to social phenomena and not be constrained to technological phenomena alone. Human sciences must aid us in thinking about the future and they must also be integrated into the science of *prospective* itself [...] this is the only way to avoid the sort of rational fatalism in *prospective*.” (Monod, 1970). This orientation is diametrically opposed to the Anglo-Saxon practices in which technological factors are favored to the detriment of social factors (Antoine, Durand, 1970). The work was led by a group which gathered several research centers and government administrations. This work put the focus on the necessary distinction among the three aspects of the *prospective* approach, which is today common practice. These aspects are; 1.) collecting facts and analyzing the present, 2.) analyzing those things embedded in the past (analytic phase), and forecasting possible futures founded on the recognition of certain deterministic factors (exploratory phase); and finally 3.) the normative phase which relates possible futures with desirable choices with respect to a an explicit system of values, and then finally returning to present in order to redefine the strategy based upon the desired future. (DATAR, 1972a).

Finally, *prospective* must consider international phenomena. Jérôme Monod traveled abroad frequently, notably to the United States accompanied by Serge Antoine.

⁴¹ The term SESAME makes explicit reference to the keys that the system will furnish to the organization which will ultimately allow it to construct its own future.

These voyages were an opportunity to visit several important centers for North American foresight (*prospective*) and to meet various intellectuals concerned with the future such as Daniel Bell, Herman Kahn, and Hasan Ozbekhan (Durance, Cordobes, 2007). Their travels also allowed Monod and Antoine to establish a good foundation about the public practices of foresight (*prospective*) abroad. The texts of Bell and Ozbekhan were reprinted in the magazine *Prospective* published by the DATAR. It's important to point out DATARs focus on human values. One of the founding members of DATAR, Constantinos Doxiadis, introduced DATAR to his theory of human development, which he called *ekistique*. Always on the lookout for new methods, Monod commissioned a study of France by the Hudson Institute. The Hudson Institute is a think tank founded by Herman Kahn. For the study, Kahn is famous for having surveyed France from an airplane.

The Unacceptable Scenario

Parallel to the theoretical research concerning *prospective* being undertaken at several universities and research centers throughout France and around the world, numerous applied studies were being done. These were methodological trials based upon the elaboration of scenarios in which methods were progressively perfected. Much of the applied work started in 1970 with the aid of the OTAM, a subsidiary of the SEMA managed by Jacques Lesourne.

The principle retained from OTAM was something called a *trending scenario*, which is constructed from current trends in both the economic and social domains. The extrapolation of trends towards the future leads to the appearance of tensions which are capable of jeopardizing the entire system, which are then envisioned vis-à-vis the impacts on the institutions and regulations currently in place. The *trending scenario* is an exploratory exercise, and once the hypotheses and the constraints leading to the trends are defined, the scenario serves as a reference in order to measure other scenarios or appreciate the potential effects of a particular policy in advance (Antoine, Durand, 1970).

The first scenarios concerning regions were elaborated in 1970. Numerous problems arose both conceptually and practically. However, for the most part, all of those problems had been resolved by the time the study had been completed. For the study, three contrasted exploratory scenarios for the year 2000 were elaborated and each defined a possible orientation for possible development. The result of each scenario was an image of society in a geographic context, as well as the paths which might lead to that future society. (DATAR, 1971b) These scenarios were conceived by three distinct groups using two complementary approaches. The first approach was exploratory and consisted of passing from the present to the future by taking into consideration dynamic factors. The second was retrospective starting with future and working backward to the present including the intermediate events and factors.

These multiple regional scenarios would serve as a reference for a subsequent study for France in the year 2000, better known under the name "the unacceptable scenario". From then on out, the method would be well defined. The construction of scenarios is based around three elements; the base "an initial state of the system under study, taking into consideration its laws and trends, including those which are barely perceptible (seed elements)," then a path "which traces the evolution of the

entire system” which could include obstacles “or forks which would offer several different possibilities” and a final image “the results of this evolution”⁴² (DATAR, 1971c).

From these three elements, two methodological possibilities emerge. The first methodological possibility is to determine the path and discover one (or more) final images (scenarios). The second methodological possibility is to imagine a final image (scenario) and trace back the path which would lead there. Even if it seems seductive, the second method poses a fundamental problem. The future is multiple and since it is not possible to retrospectively trace back each scenario, one must choose one scenario from among the many; but how to choose and given which criteria? Or more precisely, which rules should we apply to define what is desirable. To do that, we would need to know “the needs and tastes of the French people of the future” which would require a “sociological *prospective* which remains in large part undefined”. (DATAR, 1971c). It is thus best to operate according to the first method, in other words, choose a path in the present and elaborate one (or more) scenarios. “One of the possible scenarios, the ‘unacceptable scenario’, will emerge and will serve to show what could happen if no one intervenes. This ‘unacceptable scenario’ will act as a deterrent to guide policy-making.” (DATAR, 1972c). Thus, the trending scenario plays a role, not only as a reference, but also of a sounding board. The necessity to distinguish the exploratory phase from the normative phase is clearly demonstrated in this exercise.

Conducted within the framework of the national geographic scope, this study provided the impetus for local leaders to commission similar studies on a smaller geographic scale, thus opening the path to *prospective* on a regional level.

A French Scenario Method.

Several years after the realization of the first scenarios in 1975, the DATAR commissioned a study from a group of researchers at the University of Québec in Canada. The study would seek to analyze the scenario method within the framework of the theory of *prospective* in order to support various past and current applications (DATAR, 1975).

The Canadian team based their study on three principal methodologies which played a crucial role in the development of scenario planning, and represented three rather different schools of thought. The first was that of Herman Kahn, the second that of SESAME and DATAR, and the third that of Hasan Ozbekhan⁴³.

According to the study, the SESAME/DATAR method had many advantages; “SESAME had significantly contributed to the progress of the scenario method”

⁴² In an article published in 1972 by Jacques Durand, then in charge of the mission at DATAR, Durand included a fourth element called the external content. This fourth element was a description of the the most significant constraints issuing from the general environment under study. In the current practice of regional *prospective*, this elements takes a more evolved form--what are called the scenarios of context, which when compared to scenarios of evolution, allow the organization to highlight the principal stakes of the region which must be considered for its own future.

⁴³ These three authors worked on a common project for DATAR. Hasan Ozbekhan developed scenarios for the future of Paris for the year 2000 in the year 1973. The other authors identified here were part of a Canadian research team. They include; Erich Jantsch, Robert Ayres, and Olaf Helmer.

(DATAR, 1975). The SESAME approach, which was gradually and continually improved, was original on several levels.

The first contribution was the normative orientation. Strategic objectives distinguished *prospective* from other practices of foresight, notably that which Herman Kahn had advocated in which scenarios must be free of any value judgments, which is effectively impossible anyway since the author(s) will always bring some subjective judgment to the scenario. Beyond this normative approach, the SESAME team clearly articulated the systems of values which should orient the construction of scenarios, thereby rejecting the so-called objective scientific dogma of the era.

The second contribution was the articulation of what is called the diachronic analysis, which takes into account the various temporal outcomes of phenomena, as well as the synchronic analysis which formalized the process of determining the evolutionary state of society at any given time. A scenario, according to the SESAME/DATAR approach, is a mix of these two dimensions.

The third contribution was the integration of the historical dimension. History serves to determine the elements of the scenario and allows one “to situate one’s thought in the broader historical context” (DATAR, 1971b). This approach doesn’t necessary lead to a cyclical conception of history, but merely helps explain the macro-historical trends.

The SESAME group suggested several improvements in the scenario method. Among them was the use of morphological analysis, initially proposed by Fritz Zwicky in 1962⁴⁴. SESAME also proposed integrating cross-impact matrices originally developed by Theodore Gordon and Olaf Helmer. Cross impact analysis was integrated in the scenario method in the early 1970s.

Prospective and Participation

The normative goal of *prospective* has naturally raised questions concerning the ultimate association between citizens and the definition of what is considered desirable by society. Beginning in the 1970s, certain specialists suggested to simply interview the “man on the street” by posing specific questions about certain scenarios of the future. Some went so far as to suggest staging television shows during which citizens would state their preferences for one scenario or another.

The position of DATAR on this question was clear: “This very direct contact between this rather technical study and the public does not seem productive. We need to involve politicians [...] Tomorrow’s problems require [...] officials at all levels of government, from local to national; essentially those who have a stake in the well-being of the country and are dedicated to it’s betterment [...] I believe that with the aid of systemic analysis, we can effectively demonstrate our efforts and better recruit the public to our causes.” (Monod, 1970).

The separation among the roles of the politician, the researcher/technician, and the citizen is very much in keeping with the ideas of Gaston Berger. However, by

⁴⁴ This technique was presented in *Morphology of propulsive power* (Society for Morphological Research, 1962), and then later in *Discovery, invention, research through the morphological approach* (Macmillan, 1969).

contributing to articulating the questions concerning the possible and desirable futures of a region, *prospective* forces regional officials to situate themselves in their regional contexts and broach new forms of social dialog. The dissemination of *prospective* studies throughout France played a decisive role in changing attitudes and behaviors there. In the 1970s, certain debates concerning regionalization were nourished by *prospective* studies done at the regional level. Furthermore, the public discourse was lively as the results of these studies did not always result in consensual public opinion. (Decouflé, 1972) Starting in the mid-1970's, under the double effect of greater local authority and less Federal intervention, *prospective* would be adopted, little by little, by local administrations concerned with the future.

2. A Recent Favorable Legislative Environment in France and Europe

With respect to the work commissioned within the framework of various French laws (Voynet, Chevènement et Gayssot-Besson-Bartolone (SRU)), many local charters, contracts, agendas, and projects have been created with varying degrees of success.

Among the instruments of strategic and spatial planning implicating a strong *prospective* dimension, the Guidelines of Regional Coherence or in French (*schémas de cohérence territoriale* (SCoT)) was among the most important. SCoT guidelines require a considerable and concerted effort about the future of regions with a time-horizon of 20 years, and to a lesser degree, an urban planning component. This ongoing work has implicated numerous teams, particularly agencies of urban planning and university researchers.

The regions were also more and more concerned with the preparation and organization of public debates. In this context, participants almost always spontaneously offered their own speculations about the future. These debates offered participants the opportunity to critically examine the policies of their regions, and also examine the coherence of their ideas. One of the goals of regional *prospective* is bringing regional stakeholders together so that they may undertake the *prospective* study in a democratic way. There has been much ongoing research concerning new forms of group process, participation and collaboration. There has also been much experimentation with governance of civil society, for example; conferences of consensus, juries of citizens, scenario workshops, Delphi studies, etc.

Although constructing scenarios had long been standard practice in large corporations, such practices were now beginning to be take hold among regional administrations, under various forms. The domain and the goals of regional *prospective* are now more explicit than ever before, and the fundamental principals and concepts have been clarified. The tools and the methods which came out of the French experience are proof positive of regional *prospective*'s effectiveness. Regional *prospective* is truly a useful tool "which serves the strategic management of regions".⁴⁵

⁴⁵ The title comes from a training seminar organized by the *Institut national des études territoriales* (INET) in April of 2008. The summary of the training describes; "... to deal with the profound changes of regions, in the context of growing interdependence of decision-making strata, and the

The contribution of regional *prospective* in renewing regional planning is recognized and supported by recent successful examples which have been widely publicized. (Loinger, 2004 ; Mousli, 2004 ; Derné et al., 2008) Regional *prospective* has created much excitement (Bailly, 2005), as numerous published works on the subject bear testimony these last few years. (Courson, 1999 ; Destatte, 2001 ; Goux-Baudiment, 2001 ; Debarbieux, Vanier, 2002 ; Farhi et al., 2003 ; Spohr, Loinger, 2004 ; Jouvenel, 2004 ; Pacini, 2007).

It is important, however, to distinguish regional *prospective* studies initiated by local administrations in which the collective co-construction is an indispensable ingredient, and regional *prospective* for the State in which strategic thinking is far more important. In the former, the collective (group) process creates a framework for better dialog with local stakeholders. However, there again, the borders between the two are blurry because the State may also benefit enormously from a collective process, in order to ensure smooth collaboration between local administrations and State agencies.

It is now possible to talk about a new age for both regions and for *prospective* for regions. *Prospective* effectively contributes to a new definition of governance, which is far more democratic and participative. This new governance implicates public institutions, and social and private organizations in the articulation and implementation of making collective choices. These collective choices are capable of eliciting broad public participation and effecting enormous change. It is no longer the case that *prospective* be done in advance of a decision, based solely upon the extrapolation of trends. Today, more than ever, *prospective* is a democratic process capable of redefining the questions posed in the public discourse, a process in which weak signals are identified, and a process in which a desirable future is identified implicating the broadest possible public participation.

II. REGIONAL AND URBAN FORESIGHT MAY BE STRATEGIC

Regional *prospective* can be both strategic and exploratory. Throughout this text, we shall refer to the terms *regional exploratory prospective* and *regional strategic prospective*, and further differentiate between these two approaches later in the following sections. Almost every region, at every level (villages, townships, towns, cities, urban agglomerations, metropolitan areas, and regions) are today confronted by the task of implementing regional projects. The implementation of these projects assumes the integration of three distinct approaches. These three approaches are; a *prospective* approach, a strategic approach, and a collective process approach. These are the three facets of regional strategic *prospective*.

1. The Foresight Approach

Every regional project starts with anticipation, and then the construction of a coherent scenario of a desired future. From this desired scenario local stakeholders will collectively consider the options and define their desired future together. The basis of every regional *prospective* study also includes the creation of a strategic and

shortage of resources, regional decision-makers have developed more sophisticated methods of *prospective* in order to orient their strategies and implements public policies.

retro-*prospective* diagnostic set for the long term (strength and weaknesses, threats and opportunities, key questions for the future, etc.), the analysis of prevailing trends concerning the region, and the identification of weak signals, as well as the identification of possible feared and desirable ruptures in the future as well as their consequences. Taken together, these *prospective* elements are articulated through the collective elaboration of scenarios concerning the external strategic environment of a region in a given time-horizon.

Similar to the classic strategic diagnosis, the retro-*prospective* diagnosis has become more and more indispensable to understand the evolution of regions and to comprehend the drivers of its past development. By examining the history of a region and the policies which governed it, one has a much better understanding of the principal changes and inertial forces which have influenced the regional environment in the past. Such an analysis poses important questions related to how change has taken place, which changes were anticipated and which took the region by surprise. Such an analysis is concerned with the quality of the way in which local administrators responded to their environment in the past, and if such policies were appropriate or ill-adapted, as well as what they should have done differently.

2. A Strategic Approach

The use of strategic methods is one of the consequences of the uncertainty that defines the future. Both strategic and *prospective* thought are indispensable to regions; not only because regions must have the broadest regional outlook, but also because they must prioritize the actions of partners in a context that is often largely decentralized. Such an approach also allows the local stakeholders to define the correct conditions in which to act, as well as the knowledge and the *savoir-faire* of coherent policy within the context of regional governance. Therefore, it's important to situate *prospective* within regional strategy. Prospective should be an integral part of any public debate or decision; particularly at the regional level.

What kind of region do the local stakeholders want in 20 or 30 years? What can be done and how can they do it? The response to these questions reveals the goals to be achieved. From these goals, we can define the means, the programs, and the intermediate steps we must take to arrive at such goals.

Regional strategic *prospective*, in its normative phase, seeks to collectively elaborate a desired but realistic future. This future comes clearly into view via a strategic vision – the collective conviction capable of being transformed into a set of strategic actions. This is done by supplying stakeholders with the determination and conviction they require. Such an exercise is about defining a destination, and providing the participants with a common direction. (Latour, 2004)⁴⁶.

⁴⁶ This particular aspect represents one of the great differences between the strategic vision of an enterprise and that of the region. Even if both need to provide collective direction the organization, the former is the exclusive reserve of the executive and is imposed top-down to personnel. Of course, this does not contradict the practice of the process. However, for regional prospective the strategic vision must be constructed by the greatest number of regional stakeholders. The quality of the projects

The elaboration of a strategic vision of a region in the long term is a prerequisite step to defining the strategic orientations, fixing objectives which lead from such orientations, and redefining public policies at the regional scale, developing well-defined partnerships with other important stakeholders in the region, and having the ambition to be a force for change. Once this step has been realized, analyzing the possible futures, and then taking decisions concerning the desired future, is essentially about pragmatically querying the public sphere of action. The future of any region is dependant upon the projects yet to be imagined.

To pass from anticipation to action, several steps are required. Stakeholders must:

- go from hypotheses concerning the evolution of a region to the construction of several possible futures
- decide upon a desirable future which will ultimately be the foundation for future collective action
- formalize the path between the desirable future and the present to best understand the major stakes linked to this evolution.
- elaborate the orientations and the strategic projects.
- elaborate the choices, and take decisions leading to action
- finally, evaluate their progress

Regional strategic *prospective* is robust and is able to deal with ongoing challenges by investing in several simultaneous projects.

First of all, once the team has identified the goal, the objective is to facilitate the application of concrete actions. Elaborating a strategy, even collectively, is one thing; but programming, evaluating and implementing actions which issue from that process is quite another. A regional strategic *prospective* study must take into consideration the strategies of stakeholders, the processes which lead to concrete decisions, and the detailed evaluation of the feasibility of those decisions. If a strategy is not accompanied by implementation conditions, then no one will buy into it, and it'll end up being an excuse not to act.

Here, the question of modified values must be raised. The *prospective* attitude and process naturally modifies both individual and collective values. The value shift usually occurs by giving priority to those values which will ultimately help a region realize their desired future. For example, regional strategic *prospective* usually allows for a different reading of the data from the present, and thus naturally leads to a different understanding of the operational environment of the region. In this way, regional strategic *prospective* is also a learning tool and one which helps build consensus around shared objectives.

Finally, regional strategic *prospective* constitutes the preferred method to create initiative among citizens, as well as a preferred method of group process relying upon civil society and its representatives. Facilitating the use of real social practices, *prospective* authorizes the group to take into consideration the expectations and aspirations of one another. It's not about falling into the trap of participatory tyranny (see below). Rather, *prospective* is about implicating, not only organizations, but also

which ensue from the strategic vision is directly related to the elaboration of a common vision. Therefore, local governments must play an important role.

those individuals in the regions. Regional strategic *prospective* is also about identifying promising projects that the community can get behind. *Prospective* is about an appropriation (emotional buy-in) of discourse about the future, its representations, as well as its alternatives.

Regional strategic *prospective* is sometimes constrained within the domain of the anticipatory thinking, which stands in stark contrast to the practice of strategy or with decision-making in general. Several regional *prospective* studies, such as the Midi-Pyrénées, Lyon-Millénaire, etc. focused on the exploratory character with wide media coverage. We call these studies, regional exploratory *prospective* as these exercises did not lead to “normative” outcomes, or more specifically, a regional project of a strategic nature.

Regional exploratory *prospective* is often as useful as regional strategic *prospective*. In fact, several of these exploratory approaches, lead by a municipalities or regional administrations of the State, have been successful in defining the major stakes involved in its future development and have thus been able to implicate other local and federal stakeholders. Such studies are generally characterized by the use of exploratory scenarios which seeks to create a common understanding among participants and local stakeholders in order to elucidate decisions and to validate and question the vision of the leaders of the region.

It seems both legitimate and desirable for the federal State to create its own visions of the future of its regions, particularly with respect to large spaces and parks, as well as trans-border regions. Some of these operations, such as the one led by the administration of the region in France called *Centre* under the general direction of a team from the DRE, ultimately led to a team of 40 geographically dispersed members who worked over the course of 12 months. The team was comprised of university researchers and regional stakeholders who worked on creating a strategic vision for the future of *Centre* which ultimately led to the reformulation of the strategy of the State vis-à-vis the region. Obviously, such projects must be commended.

Prospective studies led by federal teams are therefore not limited to the details of specific local plans (SCoT, regional projects, etc.) In fact, several *prospective* analyses may be necessary within the framework of determining the overall evolution of a region and its particular strategic orientation and local policies supporting such strategies (PASER, SRADT, regions which are known to excel at certain activities, etc.) as well as in the preparation of policies in anticipation of large public works projects.

The management of regional infrastructure and equipment, beyond the usual roads and housing, is a challenging task which requires innovative solutions. There are several imperative which must be met; employment, environmental factors, sustainable development, existential long-term regional issues, new patterns of immigration, long-term logistical issues and how these needs must interface with existing transportation infrastructure, knowledge about urbanization, etc. Certain subjects must be treated at the local level in cooperation with other regional and State administrations; for example those activities which affect the physical environment.

3. A Participatory Process

Within the framework of regional projects, the *prospective* approach contains the desires and expectations of its citizens, as well as the needs of the local community. So, it seems inconceivable to carry out a regional *prospective* study without making a serious effort to reach out to the local community in order to arrive at a general consensus. This effort relies upon the skills of a talented facilitation team, capable of managing such a public debate and implicating the greatest number of local stakeholders. The participation of a large number of local stakeholders is one of the principal goals of regional *prospective* and ultimately leads to better and more legitimate public decisions. Such participation also allows the team to draw upon significant local competencies and the collective synergy of the implicated stakeholders and partners.

More generally, the collective experience allows the regional stakeholders to transcend the past and move into the realm of a common vision for the future of the region. This is an indispensable learning experience for the public and civic life of a region. (Latour, 2004)

Also, every regional strategic *prospective* study relies upon several collective processes implicating a wide range of local and global stakeholders; much more numerous and heterogeneous than would be the case with *prospective* applied to industry, for example. Regional *prospective* is a far more interactive learning experience than generic *prospective*. Regional *prospective* is a veritable pedagogy of change, investiture, organizational learning, and participation. It likewise raises the issue of how to best structure these collective processes with formal methods.

Regional strategic *prospective* is the favored approach for all regions which are keen to create their own desired future. Regional strategic *prospective* helps regions develop economically by providing its organizations and institutions with a shared vision, which ultimately leads to shared projects.

4. The Three Books: Blue, Yellow, and Green

The three fundamental elements of regional strategic prospective are; anticipation, action, and appropriation (emotional investiture). These three fundamental elements can be separated into three separate books of regional strategic *prospective*.

The blue book seeks to supply a global vision of the environment (past, present and future) of the region. Relying on a synthesis of key figures and statistics, it includes the elements of a diagnostic and reveals contentious issues and probable trends, as well as major uncertainties and possible risks of rupture. The result is simply data about trends and possible ruptures, and so this blue “book” may be sub-contracted to an external consultant, though performing the activities within the blue book in-house is often a rewarding experience.

The yellow book gathers the propositions of local stakeholders elaborated in order to prepare for the prescient global changes detailed in the blue book (pre-activity). This activity ultimately allows for the construction of local projects (pro-activity). The yellow book is the product of the regional stakeholders, and it must be accompanied by collective appropriation (or emotional investiture).

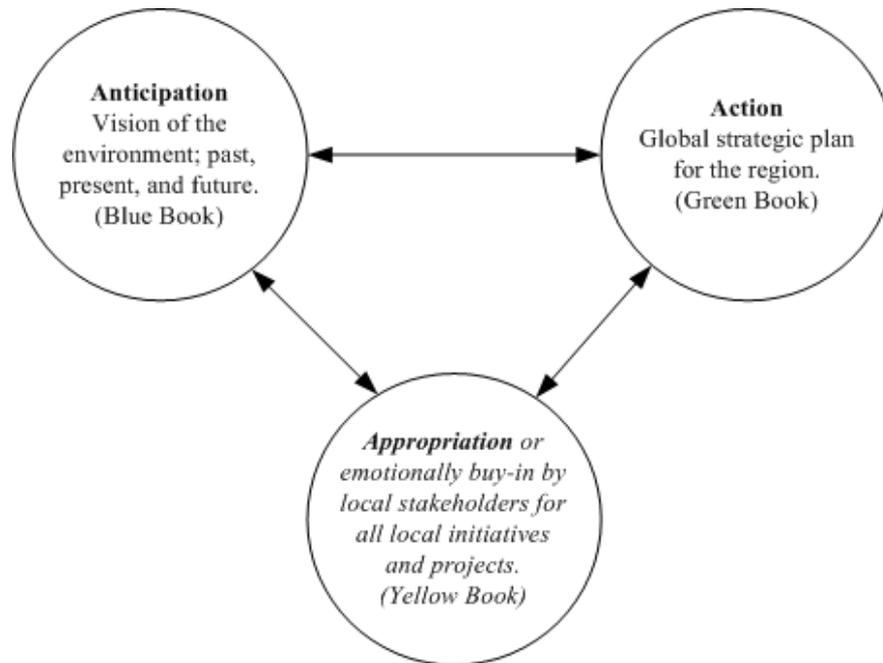


Figure 10 – The Greek Triangle of Regional *Prospective*

Finally, the green book proposes a global strategic plan for the region. Each strategic orientation, and each objective, responds to a clearly identified stake. This stake is also clearly associated with actions and vice versa. The green book is the synthesis of the blue and yellow books. Also, from the color wheel, blue and yellow mixed together create green. The green book has a strategic objective and engages the local authorities and elected officials. Thus, it is produced by them and them alone.

III. REGIONAL *PROSPECTIVE* AND ORGANIZATIONAL LEARNING

Plotting the *degree of strategic impact* of the *prospective* study, and the *degree of participation* on a two-dimensional matrix, we can determine four kinds of regional *prospective* approaches (see figure 10 below).

1. Probing for Trends

Confidential regional exploratory *prospective* studies do little, if perhaps nothing, to call local actors to take action which would have a direct or indirect impact on the strategy of the region. Confidential regional exploratory *prospective* studies are concerned with very specific subjects with a limited scope. These studies effectively encourage strategic thought among the local actors on such issues as housing, habitat, transportation⁴⁷, etc. but don't necessarily lead to concrete action. Such

⁴⁷ Several examples of regional prospective studies are available at *Délégation interministérielle à l'aménagement et à la compétitivité des territoires* (DIACT) www.diact.gouv.fr

exploratory studies are confidential by nature and the participation of the actors is not an objective in and of itself. The confidential regional exploratory *prospective* process includes a pilot group composed of several industry experts, both internal and external, assisted by facilitation experts—which is to say those whose expertise is the methods of strategy and *prospective*. In this framework, the use of formal tools such as structural or morphological analysis is recommended. The organizational learning is limited to the participants of the confidential regional exploratory *prospective* study—that is to say the exploratory phase of the process.

In certain extreme cases, these exploratory studies can be led by one or two external experts; perhaps an expert who is competent in both *prospective* and a particular industrial sector. In some cases, this exploratory process may be sub-contracted to companies who facilitate such workshops. In these cases, there is little or no organizational learning taking place.

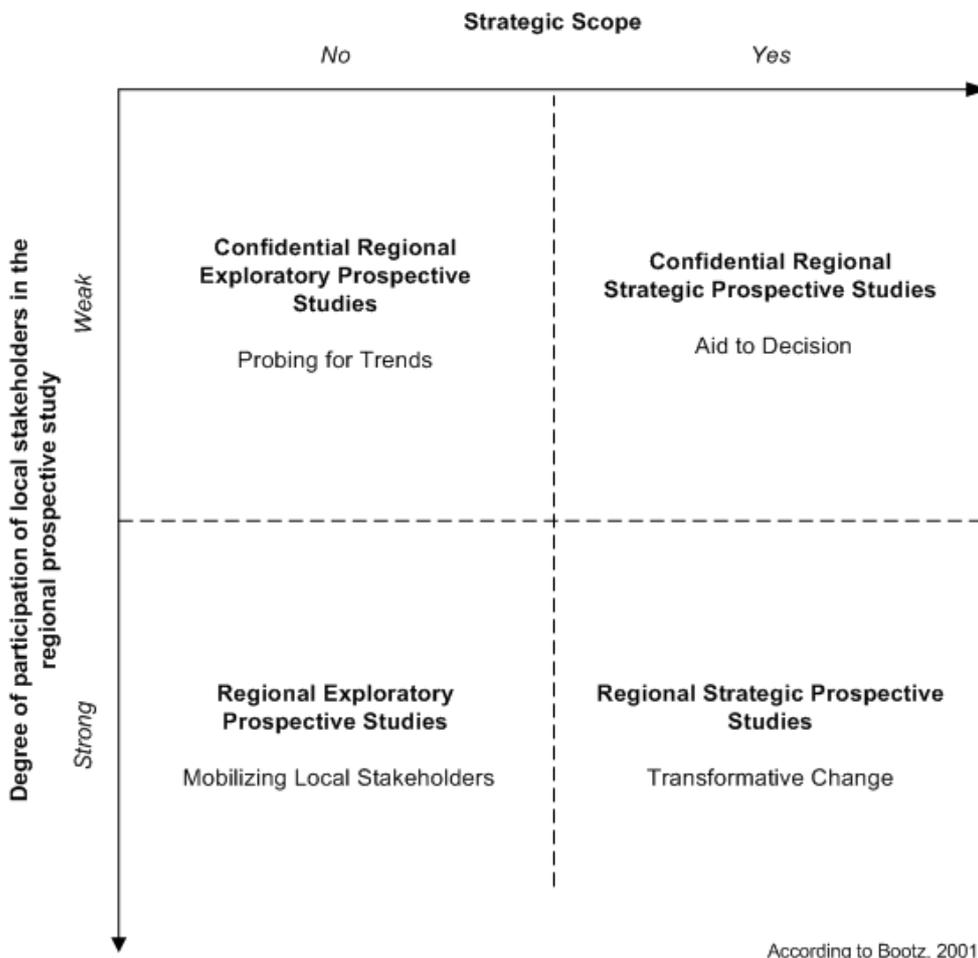


Figure 11 – Typology of Regional *Prospective*

2. Aid to Decision

In those approaches which seek to aid decision, the impact on strategy is direct, but the implication of decision-makers may be rather limited. The highly sensitive nature of strategic information often dictates that strategy decisions be made exclusively by local officials without the explicit knowledge of those who are expected to implement the strategy at the tactical level. Any *prospective* study may be structured in such a way as to respect the sensitivity and confidentiality of strategic information. That is to say that *prospective* may implicate a large number of participants in order to understand the major stakes concerning the future, but that the strategic decisions which ensue are often guarded secrets among regional administrators and elected officials. In some cases, divulging strategic information would undermine an organization's ability to effectively implement a strategy as it would signal an organization's strategic orientation vis-à-vis its competitors. Therefore, when strategic information is sensitive, the process includes a pilot group composed of senior regional officials who are guided by both method and domain experts, and the flexible utilization of the tools of *prospective* is recommended.

3. Mobilizing Local Stakeholders

This type of approach is characterized by strong mobilization of local stakeholders and weak impact on strategy. This type of regional *prospective* leads to changes in perception about a region through the appropriation of trends concerning the region. Such an approach responds to a clear and unique objective and prepares the minds of those involved for possible and desirable changes. The process responds to the widest expression of ideas and can therefore be allocated to numerous working groups coordinated together.

4. Transformative Change

The approach leading to transformative change relies upon the strong mobilization of local stakeholders and directly impacts strategy. It has two objectives. The first is to define a plan of strategic action based upon the deliberations of the group. This step essentially is a pro-active one which aims to anticipate the feared changes and seeks to provoke desired ones. This phase clearly contributes to organizational learning through the creation, distribution, and sharing of knowledge within the regional organization, and the projects which ensue are appropriated by local stakeholders.

The process set in place in this particular approach is very comprehensive. It includes a piloting committee, a technical committee, and several individual working groups.

The approaches which lead to transformative change tend to lead to more organizational learning. Through the re-evaluation of habits and regional representations, they lead to a significant modification of practices by the local stakeholders and a marked evolution of the region. The organizational learning taking place within this context is called "double loop" learning as it mobilizes innovative strategies and ultimately changes the criteria by which an organization is judged (Boetz, 2001).

Regional strategic perspective must be as participatory as generic *prospective* since contrary to the case of prospective applied to enterprise, the strategy for a region will

be ultimately revealed to the public. Therefore, organizational learning, be it individual or collective, is an indispensable step in making choices in a regional context. Organizational learning is also one of the principal goals of regional *prospective*, and is often the very reason for doing the study in the first place. The management of knowledge becomes a sort of tool through which knowledge is transferred and gained (Pesqueux, Durance, 2004).

IV. A FEW TRAPS TO AVOID

In order to understand and to think about the future in its entirety, you need to start familiarizing yourself with the concepts, the goals and even the meaning of certain words. Regional *prospective* is often confused with other popular terms such as; governance, sustainable development, planning, regional management, projects, participation, democracy, etc. It is therefore useful to clarify some of these terms in order to avoid any confusion.

1. The Risk of Participatory Tyranny

Let's start with the word *prospective*. *Prospective* is certainly about anticipation in both the pre-active and pro-active sense of the word. Its goal is to clarify action in the present by considering possible and desirable futures. Of course, preparing oneself for foreseeable changes does not preclude one from acting to provoke desirable changes. Within the logic of strategic perspective then, anticipation can only be transformed into action through appropriation by the actors concerned. Let's consider two symmetrical errors here that one should avoid.

The first consists of imposing the advice of the experts on stakeholders without first appropriating the solution. It's a bad idea to want to impose a good one.

The second consists of favoring "yellow" inputs such as the consensus of the group and participatory process at the expense of expert advice and other rational "blue" inputs. Without a good measure of rationality and reflection, participatory process yields nothing. Change requires the kind of courage that groups often find difficult to muster. Consider the case of sustainable development. Current generations will always place their own concerns before those of future generations, and are therefore reluctant to make sacrifices and change the status quo, even if they understand that they are simply transferring the burden to future generations. Courageous decisions are rarely consensual. Therefore, if *prospective* must be participative, then the strategic decisions which follow must be left to competent and courageous executives or elected officials, so as to avoid the trap of "participatory tyranny".

2. Don't Confuse Government from Governance

The Commission in Brussels prepared a White Paper listing the principles of good governance applicable at all levels of government. They are; openness and transparency of institutions; broader participation by citizens at all levels of political decision-making; greater responsibility on the part of institutions and member states, efficiency in policies set out by clear objectives, consistency, and greater understanding of policies.

However, all these characteristics of good governance should not obscure the definition of governance already adopted by international agencies like the IMF, OECD and UN, where the idea of checks and balances and the rule of law are central. Governance should be a participatory process that, according to François Ascher (1995,) “Articulates and associates political institutions, social actors and private organizations in processes which formulate and implement collective choices capable of generating active participation by citizens.” The concept of corporate governance, with its strong oversight and vested shareholders, may also provide some inspiration (Cannac, Godet, 2001).

According to the late Peter Drucker's definition (1957; 1973), “Corporate governance consists of creating and respecting rules that guide and limit the conduct of those acting on behalf of the corporation.” In other words, good governance is a set of mechanisms designed to ensure that the action of the administrators conforms to the will of the shareholders and their interests. Governance is not synonymous with management. Management designates the relationship between managers and their subordinates, whereas governance functions like a 'government for the governors'. Paraphrasing the definition given already by Alexander King in a 1991 report delivered to the Club of Rome, James N. Roseneau (1997) spoke of governance for “all stakeholders who employ the command mechanisms to express demand, set objectives, distribute orders and follow up on policies”.

Transposed to democratic politics, governance is often incorrectly understood as agency—the ability of governments to shape socio-economic systems as desired. Governance is not 'the art of governing', either, as described by Kimon Valaskakis (1998), nor even the 'art of steering the process of government action'. Here are some simple definitions: governance is a relationship of power; government is the operational exercise of that power; and governability is the measure of that power on the systems involved. A system poorly monitored is not very efficient. The Foresight section of the Economic and Social Council of the *Ile de France* region claimed in a report entitled *Living in the Ile de France region in 2025* that “indecision among those in charge [...] insufficient communication and transparency lead to distrust among citizens in terms of their political and administrative institutions.” To paraphrase the same report: the quality of governance, that is the rules and procedures enabling one to 'govern the government better,' is actually an essential element to resolve the crisis of governability.

3. Too Many Scenarios and Not Enough Endogenous Projects

The development of a region is first and foremost the result of its own dynamism. Employment and economic activity is the result of local initiatives, projects, and collective action. In this context, globalization, external constraints, and technological change are less obstacles to be overcome and more opportunities to be seized. Participatory *prospective*, utilizing simple and accessible methods, is likewise a powerful tool for regional transformation.

Though scenarios are useful in regional prospective, they are not obligatory. This is particularly so when scenarios replace thoughtful reflection upon the past, and the lessons which can be learnt by comparing the successes and failures of various regions.

Scenarios are not a requisite part of *prospective*, and *prospective* and *scenario* are not synonymous. Scenarios have little meaning if they are neither relevant, coherent, nor likely. Of course, creating desirable (normative) scenarios using a group process goes a long way towards codifying collective goals, but the result (the scenarios) is less important than the process itself and the strategies which ensue. Considering the future together is often enough, especially if the team asks the right questions, starting with those which are contentious. Asking such difficult questions has the power to shake up the existing order and change attitudes permanently.

The processes of prospective and those of strategy, however related, are distinct and correspond to two different phases respectively. The former corresponds to the phase of anticipation, that's to say possible and desirable changes, while the latter corresponds to the phase of preparing for action, which is to say, the elaboration and evaluation of possible strategic choices in order to prepare for expected changes (pre-activity) and provoke desirable changes (pro-activity).

Furthermore, scenarios should not be confused with strategic options because participants in scenario building workshops are not necessarily those on the front lines. The anticipation phase should be collective and should involve the greatest number of people possible for this is participatory democracy at work. Indeed, this phase employs tools to organise and structure the collective thinking process on what is at stake in the future as well as the eventual evaluation of strategic options. On the other hand, for reasons of confidentiality or liability, the phase of strategic choices should involve a limited number of participants, e.g., the elected representatives only or a company's board of directors. This final phase requires less formality and decisions should be made after roundtable discussions and consensus gathering among the leading participants or those in charge. The tools employed here may be useful in choosing strategic options, but prospective doesn't impose a particular strategic orientation or limit freedom of choice, it merely informs executives around important decisions.

Finally, the use of scenarios has the potential to become all the more abusive when they concern regions which are interested in knowing the answer to the question, "What could happen?". This quintessential *prospective* question leads regional actors to enthusiastically recreate their world without first asking the prerequisite question (Q0) "Who am I?" which would reveal their own identity, history, and strengths and weaknesses. That essential prerequisite question underlies all else and necessitates a return to one's origins, roots or competencies, with the lessons of the regions' past failures or successes.

Regional *prospective* has a tendency to forget the essential prerequisite question (Q0) concerning self-knowledge, strengths, weaknesses, and history. Ironically, this question remains essential if we consider that the factors of development are endogenous. Of course, considering potential futures (Q1) is important, however it has its limits because the future is unpredictable and remains to be constructed. All regions will face the same constraints and opportunities. The difference between a successful region and an unsuccessful one is its capacity to accentuate its strengths and minimize its weaknesses. In other words, count on yourself. Self-reliance is the singularly most effective behaviour and also the one within most regional actors'

reach. Diagnosis and a plan are not sufficient for a region to take action. The success of (Q4) How shall we do it?, depends on the appropriation of the solutions by the actors involved; and for that, nothing is better than a good dose of prospective in advance.

■ Chapter 4: Scenarios; Tools for Strategy and Management

Choosing the best case studies to illustrate the scenario planning process presents some unique challenges. First of all, there are several interesting cases which simply cannot be published for reasons of confidentiality. The flip side of the coin is that many published scenario planning case studies are exploratory with little or no strategic intent or impact.

Below are a few application domains for scenario planning (totally or partially since 1975)

- Determining factors for aerial transport
- Demand for long-range passengers
- Aerospace construction
- The global petrochemical industry
- The offshore industry
- The European automobile industry
- The cosmetics industry
- Conferences and expositions in France
- The distribution of industrial products
- The demand for public transport
- Public transportation in the Parisian region
- Demand for environmental goods
- Nuclear power
- Postal Service
- Insurance services
- Bank of France
- Video teleconferencing
- The evolution of the geopolitical events
- The Sahara region
- The Parisian region
- The William Saurin company
- The aluminum industry
- Personal firearms
- Tourism and leisure
- Catalog and online purchasing
- Noise pollution
- Electric transmission and distribution
- The Basque country
- New information and communication technologies

On the enterprise side, it's best to distinguish those scenario planning studies which are highly confidential and used exclusively by executive managers (e.g. Lafarge, de Pechiney, Mercedes, or Nestlé) and those which are used as a tool for group process in order to mobilize the collective intelligence of an organization faced with a rapidly evolving external environment (Renault, French Regional Transport, French Ministry of Infrastructure, etc.). These latter studies are highly focused on the communication of strategy as a central objective; whereas with the former, prospective is specifically used for developing enterprise strategy.

To illustrate the former, let's take the example of Lafarge. Lafarge represents one of the best case studies where a prospective process has had major consequences on the strategy of an organization. As early as the middle of the 1970s Lafarge had anticipated the decline of the cement industry (approximately 1% decline per annum beginning at the end of the 20th century). Lafarge decided to make an investment in a promising sector—biotechnologies—and acquired the group Coppée, whose only single common element with the cement was the fact that both industries typically employ little labor. Since that time, Lafarge has been focused largely on materials. Companies like Lafarge are always one step ahead of the curve and have already anticipated the consequences of new construction in Eastern Europe.

In the latter case, *prospective* is used as a tool for mobilizing employees and communicating strategy throughout the organization. This is a process which implicates stakeholders across a wide spectrum of the organization and allows the organization to confront possible changes in their operating environment before they happen. It's quite likely that the restructuring that took place at Renault during the 1980s (cutting the workforce by a third between the years 1985 and 1989) had been facilitated by the *prospective* workshops they had done during the years 1982 and 1984 under the name Operation MIDES (*Mutations Industrielles, Economiques Et Sociales*). Several thousand executives, managers, and experts had participated in this exercise. In these cases, transparency is critical, and publications concerning the MIDES Project were distributed throughout the organization. In addition, there were several publications circulated throughout Renault concerning the government's projections for the auto industry. These publications serve as a sounding board for the circulation of ideas.

Between these two extreme types of applied *prospective*, there is one common theme and several intermediate applications which exist on the continuum and between the poles. The common theme is the cyclical nature of prospective which tends to be marked by highlights every five to seven years. In the long-term, the foundation of the study must be of sufficient quality to last several years.

With respect to the intermediate cases of *prospective* which are both a tool for strategy and a means to motivate managers, we should cite large petrochemical companies like Shell which have used scenarios for more than 20 years and even go as far as claiming this practice as one of the key elements of their strategy. With respect to the Shell experience, we have remarked simply that the method they use is less formal than the one used in *prospective*. Scenarios in these contexts have been used to bring together geographically separate and decentralized business units in order to create a common strategy for the organization. The success of the scenario planning method had been largely facilitated by oil shocks which had been anticipated as early as 1971 – 1972 (see frame on the following page.)

After reading several publications by managers at Shell, our impression is that these exercises are used principally to stimulate imagination and allow the management team to consider the future together. Many of these scenarios were

about a technological society where information would replace energy everywhere. Despite their projections, Shell has not abandoned the energy sector for information technology. If these scenarios have a strong internal transparency (useful for communication among managers) and good coherence (intellectual logic) it seems to us that they are much weaker with respect to the verification of the relevance of the questions being posed.

We should also add that much of the Shell scenario planning experience had been inspired by a Frenchman named Pierre Wack (1985) who was in turn inspired by the founders of the French school of prospective. This fact is little known in the Anglo-Saxon world. Similarly, we shall point out that management teams at Shell were not the only ones to anticipate the transformation of the oil market. Jacques Lacoste (1970) of EDF had also made a presentation about the future of energy to the Commissariat General of Planning for France, of which Pierre Wack had been a member. This presentation was entitled, "Petroleum Abundance – Until When?".

Pierre Wack had some spiritual disciples such as Peter Schwartz (who had later succeeded him in 1984 in the foresight and planning group at Shell). Schwartz later returned to the United States in 1986 to found Global Business Network, a group of forward thinking individuals who consult with enterprise on a broad range of strategic issues. Peter Schwartz had popularized scenario planning in the Anglo-Saxon world and has even succeeded in convincing his friend Michael Porter to canonize the idea of scenarios in Porter's publications on strategy.

I. THE INRA (FRENCH NATIONAL INSTITUTE FOR AGRICULTURAL RESEARCH) SCENARIOS CASE STUDY

INRA is a public institution of scientific and technological research, which leads research studies in the fields of agriculture, food, and the natural environment. INRA has approximately 9000 employees of which 4000 are researchers divided among various forms of research (without counting the dozens of associated laboratories). In 2002, the president of INRA, Bertrand Hervieu, launched a *prospective* study with a time horizon of 2020. INRA's budget had been approximately €600 million.

The questions posed in the study were apparently simple. What possible futures would there be for INRA? What was the nature of its future missions? What is its institutional position vis-à-vis other institutions? What are its fields of competencies? What links does it have with economic and social partners? These and other questions were posed. The process, which had been facilitated by Hugues de Jouvenel, and then Rémi Barré of *Futuribles*, was divided into three phases; debate, scenarios, and strategy.

This exemplary case study for the public sector was the subject of numerous articles in the magazine *Futuribles*. The scenario planning process started with four scenarios of the general strategic environment. Scenario (S1) Gulf Stream: a multi-polar world carried by a faith in progress, Scenario (S2) Big Sky: innovation towards comfort and security in gated communities. Scenario (S3) Climate Change: global governance for sustainable development. Scenario (S4)

Microclimates: a fragmented world sustained by local development. Then there were five kinds of strategies for INRA (incorrectly qualified as scenarios in our opinion when compared to the original scenarios). The five strategies were as follows; 1) Preeminence of general knowledge of the life sciences; 2) The troika (agriculture-food-environment) is accepted and affirmed in Europe; 3) Food is a priority; 4) Focus on French agriculture; and 5) Towards sustainable development.

The result of this very participatory approach was further agricultural research in France. The changing of the guard at INRA did not seem to derail this project. It is nevertheless frequent that an exercise of this kind would not be followed through by any successor. To find out more about this case study, see www.inra.fr

II. AERIAL TRANSPORT IN THE YEAR 2050

Since 1975, I've been lucky to have been part of *prospective* studies concerning aerial transportation.⁴⁸ Most often my clients are Parisian airports, DGAC (*Direction Générale de l'Aviation Civile* which is similar to the Federal Aviation Administration in the United States), or scouting missions to find new airport space around Paris (in 1995), and even in the context of a *prospective* club for aerial transport in participation with a European think tank called BIPE. Most of these studies have a similar theme; trying to find a new airport to serve Paris. Aerial transport, as with energy and agriculture, has been fertile ground these last several decades for exemplary *prospective* studies, and has contributed to the progress of the methods of strategic *prospective* as many of the cases in this book bear testimony. The following are summaries of several case studies for aerial transport.

I'd like to thank DGAC for having accepted, within the context of this public mission, to allow us to republish these excerpts. Those who are interested may find more detailed information on the LIPSOR website (www.lapropective.fr). A complete summary of this *prospective* study with scenarios and an analysis of stakes and stakeholders in aerial transport for the horizon 2050 are available there.

In order to prepare for the public debate concerning a new airport for the Parisian area, DGAC organized a *prospective* seminar in February of 2001 in order to explore both possible and desirable sites for a new Parisian airport using scenarios concerning the evolution of aerial transport with a horizon of 2020 which were defined by the French government. The principal issues which concern the demand for airport capacity have evolved profoundly since; and aerial transport has also gone through some major changes. Therefore, in order to understand and evaluate the long-term, we need to re-examine these scenarios.

1. Principal Inflexions and Ruptures

⁴⁸ Here we cite several extracts from a summary of DGAC prepared by GERPA (Nathalie Bassaler, François Bourse, and Elizabeth Bouffard-Savary) in July 2003 entitled "Some clarifications for aerial transport in the year 2050". This summary followed a seminar which we had facilitated in May 2003.

What are the principal inflection points and possible ruptures which could transform aerial transport by 2050 and more specifically in Europe and France? At a time when aerial transport is undergoing the greatest crisis since 1945 (airlines lost \$30 billion within two years according to The Air Transport Association). According to certain experts, this crisis is structural and therefore a *prospective* study that explores possible ruptures through to the year 2050 would reveal possible trend reversals, as well as false ideas about the reversals of these trends. Nevertheless, despite having identified significant inflection points and major evolutions, there were no major ruptures anticipated. The growth of aerial transport—even if it were to be bridled for environmental reasons, the demographic transition, or lack of capacity—seems to be promising.

The incapacity of those who participated in the *prospective* study to think in the long-term and a lack of collective understanding about what the stakes in the medium- and long-term produced disappointing results. In the final analysis, it seems that certain constants, inertia and prevailing trends—insofar as we are able to appreciate them—were all drivers in the evolution in aerial transport. Before proceeding, let's distinguish two types of temporality concerning the evolution of the aerial transport industry.

Long-term (several decades)

Aerial transport is a highly capital intensive service for most operators in the industry including; airplane manufacturers, large airlines, airports, etc. Investments tend to be very large (technology, fleets, infrastructure, etc.) and the lifecycle of this capital tends to be rather long. Here are some facts:

- The duration of a typical airplane program (from conception studies all the way to the end of its commercial life) is typically 25 to 50 years⁴⁹.
- The duration of the life of a commercial airliner is typically 25-30 years, often extended with a second life as a cargo plane.
- Changing the fleet with less noisy planes; 10-15 years (with the exception of leasing and swapping jet engines if possible).
- The duration of time for an airport to go from conception to operation is more than 20 years
- The duration of time to complete a new runway for an airport (along with attendant infrastructure) is 10-20 years.
- The progression of urbanization within proximity of airport networks is slow.
- Certain types of planes will still be in operation in the year 2050, and these planes are for the most part those which are on the drawing boards today.

Change in Demand and Consumer Behavior in the Long-Term

As changes in the demand for aerial transport evolve over the long-term, there is a slow and regular progression of penetration of aerial transport in Europe and impressive increases in passengers (both business and pleasure). Furthermore,

⁴⁹ Certain Boeing 737s will still be in operation in the year 2020. The cabin was designed in 1950, the airplane was launched in 1965, engines were swapped in 1981, and the plane was renovated in 1997.

there is much development in terms of routes between cities as well as the development of relationships with emerging countries. Downturns in the business cycle do not necessarily jeopardize the long-term viability of the airline and aerial transport businesses.

Strategies for Companies in the Short-term.

In the short-term, strategies for the airline industry with very small profit margins is highly competitive and very sensitive to external evolutions (business cycles, regulations, geopolitical problems, etc.)

- The life and death of an airline; it only takes a few years to transform an airline into a major player, or conversely from a major player to bankruptcy.
- Various economic models, for example in the United States at least three different models were imposed on the airline industry. The first was a cartel prior to 1978 which was broken up by the Airline Deregulation Act. Then, the sector was characterized by individual competition until 1988 which resulted in a lack of hubs, and then finally, the development of alliances and low-cost airlines since 1990.
- Economic downturns, since 1970. We have observed the three major economic downturns seriously affecting the airline industry approximately every 10 years.

The greatest uncertainty for the future of aerial transport is linked to the issue of regulation at the local and global level which will seek to reconcile the development of commerce and the preservation of the environment. Three aspects were considered; changes which will play a determinant role on demand, parameters of supply, and issues of regulation.

2. Changes Which Would Play a Role on Demand and Behavior

Economic Growth, International Commerce, and Extreme Mobility are All Related

The relation among these three factors is verified by many experts, and as long as statistics have been available. We know that economic growth leads to an acceleration of international commerce, which in turn, increases the mobility of people. Moreover, elasticity for extreme mobility with respect to revenue is very high. With increasing revenues, we can observe an increase in both the distances and the speed at which people travel. This is especially so for leisure and tourism as opposed to formal business travel.

Global growth will lead to an increase in the weight of various modes of transport (larger planes, more high-speed trains, etc.). Certain participants of the *prospective* workshop indicated the possible substitution of business travel with teleconferences and videoconferencing, particularly intercompany communication. It is generally agreed that information technology is more complementary than competitive with aerial transport, and that any eventual

substitution will remain rather weak (10-15%) which is equivalent to a few years of growth in the industry.

The Increasing Role of Emerging Countries in Long-distance and Intercontinental Aerial Transport

The demographic vitality and potential for economic growth are greater in the United States, China, Southeast Asia (and the South in general), than in Europe-- even if we include the Eastern European countries whose active population will tend to significantly decrease beyond 2020 (-0.9% per year according to IFRI, the *French Institute of International Relations*). Significant inflection points concerning these trends are likely such as; migratory movements towards Europe, bottlenecks in emerging countries (poor infrastructure) and the importance of Asia in the global economy. These trends will thus directly orient demand for aerial transport and the evolution of traffic will not evolve uniformly around the world.

- The development of a middle-class which uses aerial transport is emerging in Asia. In the first phase of this development, most of the traffic will be business but then ultimately tourism will develop with greater and greater distances. This trend will be manifest by a relative increase in air traffic among emerging countries vis-à-vis European countries. The current trend for passengers traveling between the European Union and emerging countries will go from 150 million passengers in 2000 to 430 million passengers in 2020 (according to BIPE, a European think-tank).
- European households express uncertainty about aerial transport due to lack of disposable income and more pressing demands such as health, education and saving for retirement.
- However, the general trend towards greater and greater penetration of aerial transport among the French population continues unabated with only one in five French people affected by the poor economic conditions. According to the group, the aging population does not pose a problem for aerial transport because older people are becoming more autonomous even with increased life expectancy (though there are a few dissenting opinions in the group on this point).

In 2020, passengers from the Asia-Pacific region may be one of the principal drivers of growth in the aerial transport sector. In 2020 it is estimated that 16.4% of passengers will be North American, 11.5% European, and 18.4% Asian. With respect to freight, these changes are already perceptible.

The Growing Role of Tourism in European Aerial Traffic

In 20 years, tourism will surpass business travel in Europe (Europeans traveling among European countries and also to international destinations). Europe will maintain, and possibly increase its position as a desirable tourist destination in the world. Non-Europeans remain strongly attracted by European culture as well as recreational opportunities. France and Paris will both remain highly desirable destinations.

The stumbling blocks we've discussed thus far were not seen as jeopardizing the trend towards the development of sedentary tourism (theme parks, tropical "paradises", etc.) or virtual tourism (less security in cities, eco-tourism, etc.). Participants also considered the behavior of current and potential tourists from emerging countries, notably from China, who are prone to whirlwind tours of large geographic areas in just a few weeks.

Accelerating Growth of Aerial Freight

Increasing international commerce of high added-value goods, the internationalization of companies, as well as shorter lead times in business have all led to an increase in aerial freight (replacement parts, components of very high added-value, express freight and packages). Freight traffic (in number of packages) is even higher than the number of passengers. Though aerial freight represents a very small fraction of world freight (0.3%) it also represents 25% of international commerce from the European Union with an average value of €60,000 per ton transported.

The following are all very favorable to the development of aerial freight; the trends for international exchange, the organizational structure of companies, growth of consumption of expensive products or high-tech products, the decrease in the average size of lots, shorter lead times for each exchange of important products, the need for more flexibility, markets of greater geographic size, integrated management of intercompany supply chains, the expectation of logistics adapted to e-commerce.

After scanning the horizon and assuming continued worldwide growth, it seems possible that the potential demand for aerial transport in Europe will remain strong, with a landscape which will change aggressively. There will also be strong development of business relations with emerging countries, the importance of tourism and the increasing importance of non-European passengers, strong growth of freight traffic of high added-value, among other factors.

3. The Evolutions of the Supply Parameters

Energy Resources for Aerial Transport

If certain participants of the study were concerned about the procurement of hydrocarbon resources in the year 2050, two arguments seem to contradict this thesis. With respect to limited resources, there are who seem to be oriented towards the use of high added-value, and those for whom substitution is weak. In the case of aerial transport with respect to other transport, the estimated global consumption of aerial transport in 2050 may be 0.5 Gigatep as opposed to 0.2 Gigateps today which is 50% of the total consumption of transport rather than 12% in 2000. Ground transport and maritime transport are projected to consume 2.9 Gtep in 2050, down from 18 Gtep today.

-The availability of abundant hydrocarbons appears very likely and at a very acceptable price.

-An increase in the price of energy resources would remain economically viable, keeping in mind that fuel is approximately 11% to 15% of the operating costs of a company.

Airport Capacity Is Saturated in Europe.

In the medium term, there is general agreement concerning a very high usage for airports in northern Europe with the exception of Brussels. Certain European cities are equipped with reserve capacity (Munich, Stansted, Milan-Malpensa, Zurich, Amsterdam, Rome-Fiumicino) which allow them to deal with increased volume up until about 2020. Other airports must deal with a difficult environmental context (Heathrow, Frankfurt, Gatwick) which makes ramping up capacity rather difficult. Increased lead times for the gestation of new infrastructure projects which is notably due to several phases of feasibility studies which must be undertaken at the local and national levels is also a prevailing trend.

Increases in capacity from 5% to 10% at airports are possible with current infrastructure given the increased efficiency of traffic turnaround takeoff and landing. Likewise, larger planes and denser seating arrangements will enable airports to deal with greater numbers of passengers without expanding their runway infrastructure or compromising the environment.

France today is the only one of the larger European countries to envision new airport infrastructure projects on completely new sites. Other countries such as Spain and England are barely in the embryonic stage of such consideration. The rational use of European airports by airlines tends to reinforce the hub and spoke model. Furthermore, passengers coming from the Mediterranean can take advantage of smaller low-cost airports and increased routes towards the south. The participants in the study did not mention the airport capacity issue in Europe which will triple in demand by the horizon date 2020.

European Airspace Becomes Saturated: A Serious Problem to Consider

Faced with difficulties of likely congestion of European airspace, several elements of developing more capacity were brought out in the study. First of all, the management of airspace should be easier in the future as military airspace yields a part of their airspace to commercial traffic. Also, European airspace will be managed by a single air traffic control system. Advances in aerial navigation including such technologies as satellites, autopilot, takeoff and landing and automatic radar will be significant in the upcoming years. Will this increase in airport capacity allow airports to respond to a tripling in traffic by the horizon date 2020, according to the growth projections for demand?

Some Useful but Not Revolutionary Technological Innovations.

The interest in several new concept-planes remains to be demonstrated, for example the famous flying with or next generation supersonics, or planes with vertical takeoff and landing. For the participants, these new concepts, even if they were to be developed, only concern a very specific market segment.

Therefore the classic configuration with runways and traditional fixed-wing aircraft seems to have a bright future.

Among the changes presented, there was an absence of technologies which might completely revolutionize the industry. However, the preparation of several innovations concerning airplanes and related systems as well as those technically viable and economically justifiable innovations will all participate in the reduction of problems and lower costs. This will allow for more mass consumption of aerial transport with security and safety.

Among the most interesting innovations were aerodynamic which will likely be produced by new materials which reduce friction. Likewise, changes in the structures of airplanes such as wings which are self adapting, and recalibration for turbulence, as well as decreased noise. Much of this innovation will be done with the use of superlight and super-strong composite materials (20-65% composite use by 2020), distributed propulsion electric motors, or hydrogen fuel cells for electricity needed for the cabin.

Among the limits brought up during the process was the profitability of airline companies and the slow evolution of fleets. Thus even in 2050 those innovations which will be available would only allow companies to reduce the sound level of airplanes on takeoff and landing. This, of course, is contingent upon the financial capacity and profitability of companies, which would enable them to update their fleets with these new airplanes.

A Medium-term Vision for the Organization of Industry Stakeholders

Contrary to received wisdom, the aerial transport sector in Europe remains highly fragmented (a legacy of national pavilions at international exhibitions). There has also been a doubling of relative power of low-cost carriers due to decreased profit margins in the industry in general.

In the medium-term, principal strategies for airlines will be motivated by economic rationalism and consolidation of profit margins. Several structural reasons might explain these trends;

- The optimization of processes
- Short- and medium-term routes served by homogenous fleets
- Long route traffic of low to medium prices with more dense planes and reduced costs. These two approaches are complementary and correspond to the configuration of new airplanes notably the A380 versus the 7E7 which is a smaller plane of similar range.

The image most often evoked in the medium-term in Europe are three major global companies (relying on capital partners and not only commercial alliances) plus one or two low-cost operators and the continuation of tour operators (charters), and business jets.

This particular configuration may be accompanied by the strengthening of European international hubs, corresponding with a weakening of regional hubs.

Likewise there should be the development of direct flights between European cities, and the coupling of international hubs with inter-European routes.

The configuration mentioned above is the most likely in the medium-term. In the long-term however, several hypotheses can be envisioned:

- A weakening position of airlines in the value chain and a corresponding increase in the position of tour operators. In this scenario, airlines have very little control over prices and their margins are very slim.
- Inversely, there is a risk that the airline business may become less competitive as cartels form. Ultimately, this scenario may require the intervention of the public authorities to break up the cartels (as was the case in the United States in 1978).
- There is also the possibility that new entrants will come along with strong regional coverage and links between non-Hub European cities.
- Faced with a necessity to find more profit making activities, companies in aerial transport will have to turn towards vertical or horizontal integration, diversification of services, including the construction of new airplanes, renting/reselling existing planes, creative maintenance services, etc.

Supply Trends for Freight

The growth of freight traffic is greater than that of passenger traffic. The increase in freight traffic should continue including all kinds of cargo. Likewise, the weight of planes which carry both passengers and freight could be reduced.

However, this trend is not manifested by the specialization of certain European airport regions at least in the medium term for all types of cargo and mixed cargo-passenger flights, which represents most of the traffic. Mixed flights will remain an asset for all of these European platforms. The question of specialization of integrators in terms of airports remains an open one. One hypothesis was brought up which essentially uses airports, first as freight, then as passenger traffic, complemented by a second relatively close airport which is dedicated to pure freight (integrators, express freight, and express mail). This hypothesis however ran up against the reticence of managers of airports with respect to integrators and the dedicated airports.

4. Regulation

Debate Concerning the Environmental Stakes, Global Warming and Related Regulation

There was no consensus on the impact of aerial transport in 2050 on the production of greenhouse gases. For some, the level of emissions is similar to land-based transportation for developed countries, while for others the level is much lower.

Is important to note that according to European experts from l'Acare⁵⁰, European lawmakers have fixed themselves ambitious objectives concerning carbon emissions. These emissions must decrease from 50 to 80% per passenger-kilometer by 2020. These special rapport of 1999 of l'IPCC⁵¹ estimated that by 2050, 5% to 13% of the climactic warming due to human activities may be attributable to civil aviation.

The white paper from the European commission⁵² in September 2001 proposed to reconcile growth of aerial transport with the environment. To this end, one of the measures envisioned is the cancellation of tax exemptions on kerosene for flights within the European Community. Another suggests changing the rebates for aerial navigation taking into consideration the environmental impact of the airplanes.

The Local Environment

The issue of noise pollution for the local population will remain a determining factor. For large majority of participants in the study, this issue will become critical. The environmental capacities of airports will increase slowly but the perception of noise pollution will increase constantly. If technical advances will allow airlines to reduce their average noise, then coercive measures may be needed to convince those who live within proximity of airports.

At a time when the number of European airports platforms are closing down, i.e. Switzerland and Belgium, airports which operate 24 hours per day constitute an asset for France, not simply for the airlines. Thus, conserving this advantage will assume that France create new collateral vis-à-vis routes to other large freight and passenger airports; for example Charles de Gaulle. Because of these limitations the environmental capacities of airports will be much less than their physical capacity.

Multi-modal and Inter-modal Solutions Such as Rail to Air.

Europeans tend to favor the development of rail, but can it scale in order to respond to various environmental stakes. This idea was frequently brought out during the debate. At the European level, even with new countries and at the horizon of 2050, the substitution of air traffic for rail traffic seems rather limited and not economically viable in this case. Much progress of multi-modal transportation is expected to take place, including loading, general logistics and the management of space within the aircraft. Nevertheless, keeping in mind the traffic of passengers, the multi-mobile forms of transportation in Paris is a maximum of 1% to 2% today.

⁵⁰ With respect to noise, the reduction goals were on the order of 10 dB at the margin, which corresponds to a halving of the noise generated today, according to D. Rioli (DPAC)

⁵¹ Intergovernmental panel on climate change.

⁵² The European Policy of Transportation in the year 2010; time to choose. COM 2001. This document concerns work which presented a programme for the decade. The propositions that it contains had served as foundations for discussions undertaken in 2003. This document should not be considered the position of the European business executive.

European countries seem to be engaged in different paths of regulation (United Kingdom, Switzerland, France). These disparities in regulation could determine different outcomes for aerial transport depending upon the country in 2020. Beyond 2022 to 2030 the existing platforms seem to be ready for technical saturation thus beyond environmental capacities. Clearly, new regulations will have to be established.

III. TWO AGRICULTURAL SCENARIOS

To better understand the stakes and to imagine that the choices which are possible in the agricultural and food industry, the *Cercle prospective* (*prospective* study group) lead by BASF (already cited above) had created two extreme scenarios between 2001 and 2002 using morphological analysis (the identification of major uncertainties and key questions) various hypotheses and ultimately scenarios which are the most probable using the method Prob-Expert. This process is detailed in Chapter 2. The following is a public version of these scenarios edited with the help of a journalist.

1. Scenario One: Unbridled Free-market Capitalism Destroys Rural Life.

It's happened. The most economically liberal agricultural countries (The Cairns Group) have done away with all agricultural tariffs. In France, such a measure quickly turns into a catastrophe for the French agricultural business.

Winter 2010

John scratches his head, perplexed and a little disappointed. For the first time in his life he wonders whether it's worth sowing the seeds this year. 2009 had been the year of the dog. Not because of the weather. No, last year's harvest had been rather bountiful. The heat and corn yields had been good. It was more like the economy which was doing poorly, and John was selling at a loss. There are millions of euros that farmers see disappear each year with their seeds. Since the World Trade Organization had imposed a moratorium on all subsidies for export and the disappearance of any protective or controls, John sells his cereals at the global price. Prices are extremely low, and the price of 100 kg doesn't cover the costs incurred in growing the crop. The global market is in fact aligned with several large countries whose cost of production is extremely low or simply results in the clearing price for surplus without any relation to the cost of production.

The Storm Raging off the Coast

John believed to be well-equipped to confront the competition from large agribusiness farms covering thousands of hectares in South America, Africa and South East Asia as well as in Eastern Europe. After all, John had 250 hectares right in the middle of the most arable land in France, extremely high performing combines and tractors, more and more sophisticated agricultural and seeding techniques, and sophisticated antifungal and herbicides. All of this should have

assured John a profit. Furthermore mechanization should have allowed him to do without employees; and he had done everything to keep his operating costs down. Of course buying land represents large financial investments which need to be amortized with every harvest. However, with large silos for storing grain, John hoped to be able to avoid selling when the market was at its lowest. He believes that he covered all his bases. With crop yields at their historical best in France, agriculture should've been a viable way to make a living. But even the large farms are suffering. It didn't take long for John to realize that he was facing a juggernaut. Large agribusinesses in competing countries were using the same sophisticated techniques, only using labor at a fraction of the cost. Furthermore, their crops were genetically selected for the highest yield. Farms across the developing world have been effectively transformed into efficient and low-cost food factories. A worker earns less than €1000 per year and produces more than 1,000,000 kg of cereal each year. Labor costs less than 10 cents per 100 kg and the cost of wheat is even lower. Wheat is currently about €10 for 100 kg on the world market. Weather it had been rather good in Beauce, one of the most arable regions in France. However the weather had also been rather favorable in other regions of the world, and there had been a huge surplus of wheat this year; and the price was dirt cheap. John didn't stand a chance. During the previous season, his harvest could not find a buyer at break-even. He simply had to sell at a loss in order empty his silos. Ever since, meetings at the Chamber of Commerce for Agriculture have taken place regularly. Young farmers talk about returning to ancient practices. All throughout rural France graffiti marks the roadsides; "Farmers has been sold out!"

A Miserable Europe without Borders

In the space of a few months France realizes that even with 70,000 modern farms which are among the most highly performing in the world, she cannot resist the global agricultural market completely free of tariffs. Last night John saw politicians on television warning of a recent disturbing phenomenon. Food provisions in France now depend on 70% of producers outside the European Union. Food independence is something of the past. "The promise that the State would do everything possible to ensure that everyone has access to sufficient quantities of food is one of the fundamental aspects of the social contract of the French Republic. However this contract has just been nullified!" one of the deputies on television said.

Survival of the fittest.

The paradox is that free agricultural markets don't help developing countries. Producers there are less efficient and are quickly swept aside by the large agri-food corporations. Employment and economic development take a turn for the worse as soon as these new rules are in effect. In developing countries, prices increase and the most poverty-stricken among them go hungry. When the selling price for food decreases it's the weakest that get left behind. John wonders if it's not too late. Ever since John's father left the farm to him in 1979, John has consistently modernized the farm and increased yields. John considers himself

more of an entrepreneur than a farmer. Throughout the region people look at each other with distrust and wonder if their neighbor will try to consolidate neighboring farms. Certainly there must be a critical mass where French farmers can compete with the global market. The latest figures from 2009 demonstrate a brutal increase in the number of farms up for foreclosure. 300,000 farms have been boarded up this year alone. John is despondent, and he wants to give up. Due to this year's crop yields, John would have to double the size of his fields. In order to do that he'd have to buy his neighbors farms, one of whom has a son studying agriculture. Those in the region wonder if they'll live to see the impossible--Beauce without farmers.

2. Scenario Two: France's Farmers Become Horticulturalists

In 2006 the (CAP) Common Agricultural Policy had subordinated its subsidies to follow agricultural practices principally concerned with maintaining the environment. Rice production is linked to the global market but this policy makes up for the lack of earnings by subsidizing the maintenance of the natural environment.

Today, John "is working for the government". In any case that's what he grumbles when he trims the bushes which surround his house or plants shrubs along the creek which runs through his fields. John is rather reticent about working under highly subsidized conditions where his work is and not directly productive. His job is to grow wheat, not brighten the landscape or leave the land more hospitable to wild animals. But John does it anyway — his very existence depends on it.

Either Submit or You're Finished

Either submit for you're finished. The common agricultural policy (CAP) no longer pays for wheat or corn by the ton. Over half of the subsidies are allocated for the "agro-environment". John had been watching subtle shifts in policy among international institutions from a distance. The World Trade Organization (WTO) grappled with the CAP, where the United States paired off with Europe, and the developing countries battled the developed countries. Europe accepted the end of subsidies for produce and significant lowering of trade barriers. However, Europe continues to help its farmers. To appease the Americans, for whom the use of agricultural subsidies is *de rigueur*, European farm subsidies are allocated for such services as the maintenance of the rural environment, ecotourism, protecting water tables, protecting endangered species, etc.

Is This All Too Excessive?

The job of a farmer has changed significantly since John took over from his father. In 1979 the objective was crop yield. At the farm cooperative, we used to brag about incredible crop yields. John's grandfather, John's father, and in the beginning John, all profited from agricultural innovations such as increased seed quality, better fertilizer, and better pesticides and other crop protection. Urban pollution has also had a deleterious effect on both the physical environment and agriculture. Polluted industrial effluent has significantly decreased the quality of

the water in rural areas. Also, competition for water is fierce and water tables have been drawn down significantly, and intensive agricultural practices are often cited as among the chief culprits.

Agriculture Is Rationed

All of that is finished now or at least almost. John, as a “sustainable” farmer applies “rationed” fertilization techniques. From now on, fertilizer is used only directly after seeding when the crops have the greatest need for mineral nutrition. A vast array of ecologically sensitive products, used to protect crops, is now available and highly optimized to farming practices. During the summer, corn is watered on the meter. Every effort is made to ensure that the water is not wasted. It’s a lot of extra work but John doesn’t mind, and the profession of farmer has just become much more technical.

A Green (CAP) Common Agricultural Policy

John would have definitely adopted the green CAP if he didn’t have to participate so often in community work projects. Even though he recognizes the utility of these community projects, he lives like an indentured servant because his farm is his only financial collateral. Today, John learned on the television that the world price for cereal grains is particularly low. Developing countries continue to fight worldwide agricultural subsidies, which allow their agricultural producers to stay afloat. However, negotiators at the WTO and other organizations are moving towards the creation of exclusive agricultural trading blocs. With these trading blocs, Africa could shelter its population from the agricultural dumping practices of developed countries which often render their efforts useless.

Some Plum Trees

John thinks about the youngest son of his neighbor Louis and can’t help but ridicule their situation. The kid is still in agricultural school, and he was supposed to take over from his father. When he and John meet, they talk about the quality of the water and the need to replant straw. The kid even knows the names of endangered insects, and he’s full of ideas. The kid thinks he’ll continue planting wheat and corn, but a part of the farm will be converted to a bed-and-breakfast for Parisian tourists and maybe a farm museum for schoolchildren. The kid is also going to plant a garden, and perhaps a few plum trees which used to be indigenous to the region. The kid’s future wife will take care of all that. John shrugs his shoulders and can’t help to think that all of this is going to pass. Pretty soon planet Earth will have 7 billion people with one third suffering from severe malnutrition. The most undernourished 800 million belong to poor peasant farmer class. John dreams one day of returning to the intensive practices of farming. In the meantime, he thinks that it’s probably a good idea to support those living in the countryside by diversifying, offering wholesome farm products direct to the consumer, and making an effort to connect with those who live in the city. It’s no longer enough to do just farming,

but rather multiple jobs at once. The most important thing, after all, is to be able to continue to cultivate his golden fields of wheat.

■ **Conclusion: The Keys to Excellence in Corporate and Regional Foresight**

Whatever uncertainties loom on the horizon, every organization and region is confronted with the same trends and must deal with the same ruptures in the future. Thus, as always, it's the behavior and qualities of individuals which will ultimately make the difference between winning and losing organizations in the future. This is also the reason why there are enterprises which are performing well in a so-called declining industries, and conversely, why there are enterprises which are performing poorly in a boom industry. Thus, when a company is in trouble, it doesn't do any good to subsidize it, nor to make a scape-goat out of technology or unfair foreign competition. Most often the failure is one of management, who are simply incapable of anticipating, innovating or simply motivating their workforce. The same observation may be applied to regions in difficulty; before handing out subsidies, consider changing the leadership.

Innovation: Technology is Not Essential

Should an enterprise focus on innovation or profits? Business tends to focus on one of these dimensions while neglecting the other. However, these dimensions are both complementary and necessary. Business must both focus on profits and always be in the process of innovating in order to stay ahead of their competitors.

Innovation is not synonymous with technology; rather it's knowledge that is the driver of innovation. Of course, we're not advocating that businesses do away with R&D. However, innovation is much more than just technology; it includes business processes, services, and innovative financing, among other things.

Let's stop equating hope for the future with R&D expenditures. The greater the expenditure in R&D, the greater the effectiveness of the expense must be. Scientific studies from a sample of international companies clearly show that the highest performing businesses are those which have an average R&D budget, and therefore do more with less expenditure on R&D. Booz Allen (2005) surveyed the fortune 1000 and discovered that there is no direct link between R&D expenditure and success, which was measured in terms of annual growth, profitability, and ROI for their shareholders. The same observation can be made with regard to States. For example, Ireland has a small R&D budget, but an enviable GDP.

The key to competitiveness is not basing one's strategy on technology, but rather integrating the best available technologies into an overall strategy in order to achieve the desired objectives with motivated teams of employees. However, management of personnel is not a determining factor; after all, a good R&D department needn't be gigantic. The R&D department must simply be able to invent new ideas, and assimilate the far more numerous ideas emanating from outside the organization. To achieve that objective, researchers must be in close contact with the marketing team

who often understand the expectations of their clients and suppliers. Serving clients and suppliers in new and creative ways makes up about two-thirds of new innovations.

Towards Community Projects

Beyond the technological mirage, other clichés endure. The critical mass of enterprise is yet another myth we ought to dispel. It is an oft-ignored fact that the smallest businesses in any given sector are also the best performing. In the last few years, the critical mass myth has found renewed justification in globalization and the mega-mergers of large multinational corporations. These events give one the false impression that there is a battle of titans taking place on a global scale, yet now that some of these giants with feet of clay have collapsed, it is useful to recall that in reality, more than one out of two, perhaps even two out of three, mergers fail. This is essentially due to the incompatibility of formerly separate and distinct corporate cultures. Indeed, only about one out of ten mergers create value for the acquiring firm.

This same myth has currency among regions as well. Regional management policies favor urban concentration with the idea that geographic agglomeration creates jobs. However, we are unable to determine whether the jobs were the cause or the consequence of such policies of concentration. In fact, this urban concentration myth is belied by the facts. Certain regions in France, such as Choletais Vendéen or La Mayenne have succeeded by relying upon a network of rural towns. Furthermore, the youth of the region have remained since there was work to do. These regions composed of rural networks have some of the highest per capital business creation rates in all of France.

Whatever happens in the future depends less on prevailing trends and possible ruptures, and more on the initiative of people in the face of these changes. *Prospective* thinking is ultimately less important than endogenous factors such as self-knowledge and self-mastery. To realize one's aspirations, one must know one's own strengths and weaknesses – this is the key to living passionately. Neither globalization, technology, nor reduced working hours⁵³ are required to create a community project. Simply put, we must promote community projects and those involved in order to promote regional growth.

The Magicians of Growth

Henry Ford is quoted as once saying: “Take everything away from me, but leave me the men and I will start all over again.” The mobilization of creative intelligence is even more effective when it is exercised within the framework of an explicit project known to all. Projects succeed when those involved are intellectually and emotionally invested. Internal motivation and external strategy are therefore directly related and cannot be attained separately.

Competitive growth over the long-term requires innovation and risk-taking. The real key to development is entrepreneurship. Entrepreneurs, who are often the formerly

⁵³ We should include a reference here explaining the 35hr work week idea to anglo-saxon readers.

unemployed, are the real magicians of growth. Entrepreneurs stand out because of their personal dedication to their project, their vision, and their ability to lead. The lack of entrepreneurs is also one of the fundamental characteristics of the “French Exception.” The political elite in France often transition to established industry, however management mustn’t be confused with strategy; the former minimizes risks, while the latter optimizes them.

Rather than reacting defensively within existing markets, entrepreneurs ride out to conquer the future. They do not limit themselves to reacting; instead, they deliberately take offensive action inspired by preactivity (preparing for expected change) and proactivity (provoking desired change), with the aid of anticipation and innovation. In fact, an innovative entrepreneur succeeds by changing the rules rather than submitting to them. We already know entrepreneurial activity is what creates employment, therefore, the entrepreneurial spirit should be encouraged even within existing firms (intra-preneurship).

For businesses who want to take on international competition, there is no other way but specialization, innovation, and a high degree of added-value. There are neither condemned sectors, nor insurmountable problems; there is only poor managers or entrepreneurs who have failed to innovate in a world which demands perpetual change. Businesses who are content to sell only what they have previously produce are doomed. To conquer markets, business must produce what is currently selling, that’s to say, goods and services which respond to the latent or real needs of consumers today.

Economic evolution is not fatal. Everything depends on personnel and their capacity to understand possible futures and work together to create their common desired future. Events in the external business environment require the enterprise or region to react both quickly and flexibly according to the means with which they are disposed. Furthermore, since change is constant, managers must avoid radical structural changes which would render the organization recalcitrant to subsequent adaptation.

To Govern Is to Anticipate; To Comply Is to Understand

When faced with challenges, people will only mobilize if they’re motivated. In the same vein, people only do well what they truly understand. In the words of Henri Fayol, “If governing is anticipating then complying is understanding.” Similarly, the ideal manager of pioneer management writer Mary Parker Follet does not issue orders but rather encourages initiatives which go along the same lines as the orders that could have been given. (1924 ; Mousli, 2002).

A manager who understands how to base his authority on his competences and his leadership can simply allow his subordinates to take their own initiatives. He or she needn’t even bother negotiating objectives, they simply arise naturally. In France, we are farther away from this business model than elsewhere; perhaps because of the way we train managers or select them from large businesses.

Managerial fads may come and go but they always have one common denominator—people need to be motivated through new challenges. Of course, the process of getting people involved is considered the objective to be obtained no matter what the

outcome. In this way, strategic analysis can generate a synthesis of collective commitment, contrary to the ideas expressed by Henry Mintzberg (1994). Indeed, the real difficulty lies not in making the right choices but in making sure that each participant asks himself the right questions. Remember the adage, "A problem well stated (and shared by those concerned) is already half solved." This is exactly what Michel Crozier meant when he said, "*The problem is the problem.*"

Beyond managerial fads, there are certain givens in the business world. As we know, if the world changes, problems related to human nature are curiously recurrent. To deal with these organizational problems, nothing is more useful than returning to the fundamentals of management theory (Fayol, Taylor, Mary Parker Follett, etc.). Perhaps returning to the source of military strategy would also prove useful (Sun Tzu, Clausewitz, Beaufre, etc.) in order to consider the organizational models which have stood the test of time. Let's take the Catholic church as an example. The church's longevity may have several explanations; individual engagement in the service of a collective project, obedience to a highly structured community with local authority, and a limited number of hierarchical levels.

The Virtues of Ruptures and Changing Habits

If the principal factor of competitiveness and excellence in business is the human and organizational factor, then implicating personnel and eliciting their motivation should be the primary focus of the organization. The question remains why managerial processes change over the course of time, and from country to country with varying degrees of success. The observation that the keys of excellence for any given organization are contingent upon other elusive factors might give you reason to despair. However, it is indeed possible to draw conclusions about certain managerial principals which stand the test of time.

The idea that good management is contingent upon other (often elusive) factors has arisen in the management literature since the beginning of the 1960s. Lawrence and Lorsch (1968) wrote "There is no one best organizational structure, but rather several ones which work better under varying conditions." Key factors for success that are universal and valid under all circumstances simply do not exist. Just-in-time supply chain management techniques are profitable for certain business, but may be too costly to others. Management theoreticians should keep in mind the lessons of statistics and not confuse correlation with causality. Therefore, we must accept the principal of contingency and admit that various organizational structures which work well under certain circumstances and are not appropriate in every situation.

We may advance yet another managerial principal, that of diversity. We know that boredom is born of uniformity and that variety is indispensable to motivation. Without diversity organizations are simply ineffective; conversely we clearly know that diversity increases productivity. Let's consider the case of General Electric whose Elton May (1933) was able to measurably increase productivity simply by alternating the internal luminosity of the factory.

The only conclusion we can draw about cookie-cutter business formulas is that they don't exist. Enterprise must continually reinvent itself in order to adapt to changing business conditions, and to always guard against atrophy which often becomes

terminal. There are a thousand and one keys to excellence in business (the principle of contingency) and we must always be willing to change (principal of diversity).

A motivated workforce requires challenges; and it must be continually challenged to remain motivated. The unpredictable succession of success and failures keeps people on their toes. Good managers are those who intentionally introduce their subordinates to challenges. These challenges keep the workforce motivated and stimulated; and such challenges are as much a source of novelty as they are the impetus for action; and they are even more relevant if they are introduced with a coherent trajectory.

Such trends explain the succession of management fads, all of which have their pros and cons. The motivation which attends a new management fad always fades once the project has been achieved. Therefore, one must constantly be looking for new ways to motivate the workforce—for example, sustainable development which is a wonderful new project to get the workforce motivated.

Sustainable Development, a Lever for Innovation

Sustainable development is often erroneously perceived as singularly environmental. The changes with which we are confronted are well known; globalization, an ageing population, economic and social disparity, global warming, exhaustion of natural resources, etc. These challenges require businesses and regions to press forward with growth and employment.

All of these problems are related to sustainable development, which dates back to the 1980s and whose definition is; “development which responds to the needs of the present generation without compromising the capacity of future generations to respond to theirs.” (Bruntland, 1987). So, as with *prospective*, humankind is at the heart of sustainable development. There is no sustainable development without children and no economic growth without offices.

Sustainable development is an extraordinary opportunity that business should seize; every constraint is an opportunity. All the challenges of recycling, of retreatment, reducing energy consumption, etc. have innovating and profitable solutions. In the agri-foods business, as with manufacturing, traceability will likely be imposed and lead to the localization of production and supply chains, particularly those supply chains which travel from producer to consumer. Logistical efficiency means that sustainable development promotes localization in every sense (why produce elsewhere what can be produced locally and therefore incurs little or no transportation costs and associated CO₂ ?). Transportation costs act like a barrier to entry to distant, low-cost producers in developing countries without ever imposing a single tariff.

The Question of Direction and the Principle of Mutual Recognition.

People require projects to give meaning to their lives. By following their desires, they ultimately find their essential path. Social relations and mutual recognition implicates common projects. The Germans have a fitting proverb; “*der weg gist das ziel*” or the journey is the goal.

A global vision is necessary for local action; and each one of us at whatever station in life must be able to understand the meaning of our actions; which is to say resituate them in a more general project in which they are implicated. However, it's better to start a business project with discussing it, than to discuss a business project without acting on it. Smaller, realizable concrete projects are better than grandiose projects which will never likely see the light of day. The process of appropriation (emotional investment) is more important than the project itself. The vision of any enterprise must certainly be ambitious and communal, but it must also be realistic and within reach of all those concerned. Creating a grandiose project which is imposed upon others in an indiscriminate way does not lead to productive results.

Organizations will have more and more need to clarify their actions in light of possible and desirable futures. Decision will be taken in a more efficient way. Wealth, problems and their solutions are all manmade. Strategic analysis has now rediscovered the importance of the famous Socratic admonition (know thyself). Before asking yourself where you want to go, or what could happen, or what you can do about it, you need to know yourself. As Vauvenargues points out; "Considering our strengths makes them stronger, while considering our weaknesses, reduces them."

Management must also consider individual growth in the workplace and in life. Though everyone is different, we are also inseparable. In many aspects, the accumulation of quantity has led a reduction of quality. Let's consider human relations; ever more sophisticated communications technology has not kept people from behaving in an anti-social way, nor has it kept people from isolating themselves from society. In fact, the trend tends to be the opposite. A higher quality of economic growth must mean a more humane economic growth. Who ever said that in order to increase your well-being, you need to consume more goods? A responsible enterprise can not simply be content to creating material wealth; it also has responsibilities to contribute to the personal growth of its personnel and of those who consume their goods and services. Business excellence is intimately tied to environmental excellence. In order for employees to be productive, they must live in a clean environment. Likewise, for humans to be happy in the city, he must grow both personally and professionally at work. Thus happiness is inseparable with productivity and good business. Business must consider all of these factors; it's all or nothing.

■ Appendix A: How I Became a Futurist

Philippe Durance: *Prospective*, or foresight as it is sometimes translated, is your passion, one that has been your career for over 30 years. How did you discover this vocation?

Michel Godet: In 1971, I was 23 and developing rigorous scientific methods with mathematical probabilities. This was before the oil crisis. I was working then at the CEA⁵⁴. Later at SEMA⁵⁵, I had the chance to travel round the world as a member of various missions. One stop was North Africa. There, I realized that the keys to industrialization in Algeria were agriculture, education, mastery of urban development and demographics. Soon thereafter, in 1978, in the Far East, I saw that Confucius had got it right long ago: Teach people to fish rather than to give them fish. In other words, good ideas are not those that we have or give but those we elicit. The word is appropriation. The French all know the story of the Parmentier potato. Only by creating an elaborate set-up and having soldiers guard the field did people want to appropriate, or steal, Parmentier's potatoes. Yet from a more basic point of view, we need to ask a few questions. Besides How to? or How? we need to ask Who am I? We need to remember the ancient Greek advice: Know thyself, thyself. We often forget to ask or forget the actual questions. Let's get two things straight. First, what will happen is not written down somewhere. Second, thinking about the future does not eliminate uncertainty. Instead it prepares us better. Everyone will face the same changes; the real differences lie in how each one of us reacts. The elements of both success and failure lie within. All in all, learning how to maximize your strengths and minimize your weaknesses is more effective than trying to change the world.

Philippe Durance: Let's backtrack to how you started out.

Michel Godet: I started as a research engineer at SEMA in 1974. A year later⁵⁶, I was promoted to senior engineer and headed a profit-making center within the SEMA. In 1976, I became head engineer, and then in 1978, I led the *Prospective* department that I had initiated. Only then could I really apply and develop the *prospective* methods and systems analysis that I had studied as an intern in the CEA

⁵⁴ CEA is a French acronym meaning Atomic Energy Commission

⁵⁵ SEMA: Society of applied economics and mathematics. The SEMA was created in 1954 by Jacques Lesourne. It was a research group for companies and administrators. SEMA focused on economic problems including future studies, operation research and cost comparisons for different solutions, to name but a few specific topics. Michel Godet met Christian Goux there in 1970. Goux, the 'master of conjecture' of that era later initiated Godet in *prospective* and supervised his French State PhD in economics.

⁵⁶ That same year, Michel Godet received his doctorate in economics (Paris I, Pantheon-Sorbonne). Much of his doctoral research would appear in the book, *Crise de la prévision, essor de prospective* (1977).

programs from 1971 to 1974. During the same period, I carried out vast projects on the future of energy, industrialization in developing countries, and air transportation. It was around this time that I began leading teams and going further afield; literally, on missions in the USA, Algeria, Egypt, and most of Southeast Asia, a geographic area really taking off then.

At age 29, I became SEMA's youngest director and was in charge of its second profit-making centre. At that time, I began wondering how useful all those interesting reports that usually ended up lining drawers were⁵⁷. I answered an ad in the newspaper *Le Monde* and found myself working as deputy project leader of an EEC program on the future from 1979 to 1980: Ricardo Petrella had recruited me to launch the FAST program⁵⁸. Already then, almost a quarter of a century ago, computerized communication technology and the information society were our main interests. At this time, I wrote a report called, "*Europe en Mutation*" or "Europe in Transition" in English. Over 10 million Euros were spent, but little remains for our collective memory and the general manager of the research department launched *Technology Foresight* without realizing that the same questions asked by new teams are not necessarily better.

Back from Brussels, I tried to get into the CNRS as a prospectivist, often called a futurist in English, but to no avail. Why? There was no department and there is still no such department. I tried the same thing at the *Plan*, another French government planning centre, with the same result. From 1980 to 1981, I worked alongside Jacques Lesourne as a full-time lecturer at the Institut Auguste Comte⁵⁹.

For six years, until 1987, I served as scientific advisor for the *Centre de Prospective et d'Evaluation* (CPE) at the French ministry of research. There I handled international relations. My duties enabled me to participate in several missions and exchanges related to technological change and economic development in Japan, Canada, and the USA, as well as Europe, of course. Some missions were carried out further to requests from the foreign affairs ministries of the American and Canadian governments. This was the case in 1984 and 1993, when our focus was technological change and its impact on growth and employment. In 1986, I also led a mission on the Japanese model, both in society and business. This mission would lead to *Radioscopie du Japon*, published in 1987.

From 1982, I was also an assistant professor at the CNAM. In 1987, I became a full professor and the holder of the chair in industrial foresight. This chair had been

⁵⁷ This situation would become the subject of an article by Michel Godet and J-P Plas, "L'Entreprise sur le divan" that appeared in *Le Monde* on October 14, 1978.

⁵⁸ FAST (Forecasting and Assessment in Science and Technology) was a program directed by Riccardo Petrella from 1978 to 1994. The FAST mission was to study the links between science, technology and society. The focus was on the socio-economic consequences of scientific and technological developments in the short and long term.

⁵⁹ In 1972, Giscard d'Estaing founded the *Institut August Comte*, which sought to train managers from large corporations or very large administrations to solve complex problems by treating all dimensions: legal, economic, social, and international. The *Institut Auguste Comte* has had five research directors including Jérôme Monod, now in the French government, and Michel Crozier, a well-known sociologist. Jacques Lesourne introduced Michel Godet, who was bored by the situation in Brussels, to the institute.

created with me in mind when I came to the CNAM in 1982. Concurrently, I had served as a consultant in *prospective* and strategy for major corporations such as Renault, ELF, Pechiney, Electricité de France, Sollar, Chanel, Bongrain, Lafarge and AXA. I have also acted as a consultant to national and regional administrations. During the same period, I managed to maintain an international perspective through regular missions to North and South America, as well as several European countries.

Philippe Durance: Many people consider the 1970s as the golden age of *prospective* in France. They also lament the fact that *prospective* is little taught at the university or post-graduate level elsewhere. What do you think?

Michel Godet: Personally, I do not see a decline in *prospective* or foresight. On the contrary, I find the field more open and less specialized than when I began. The golden age was actually the work of a handful of individuals — Bertrand de Jouvenel⁶⁰, Pierre Massé⁶¹, Jérôme Monod⁶² and Gaston Berger⁶³. They did not try to fit this soft science into the academy nor did they educate the next generation.

Prospective has a broad crosscutting nature that is a handicap for compartmentalized organizations. However, the cognitive sciences share this breadth and have received research funding from the CNRS and ministry of research. *Prospective* could be considered within this same category. All in all, the learning curve for anything requires patience, persistence, and preparation of the next generation of practitioners. We also need to offer theoretical and practical instruction to those interested so that they can capitalize on experience and maintain the collective legacy of the craft. I am saddened by some practitioners, often the best, who consider *prospective* a profitable business, and do not try to pass on their knowledge to future generations. They forget that knowledge is to be shared.

The same applies abroad, especially in the English-speaking world where there the body of knowledge is poorly maintained, and there a noticeable withdrawal from

⁶⁰ Bertrand de Jouvenel (1903-1987) served as a diplomat, journalist, economist, jurist and professor at several universities in France and abroad. De Jouvenel ran the SEDEIS, or Society for the study and documentation of social and industrial economics from 1954 to 1974. The SEDEIS had been created by a group of managers. Bertrand de Jouvenel was one of the main players in the rise of *prospective* in France and abroad. He wrote *L'Art de la conjecture* and founded the international association called *Futuribles* (1967).

⁶¹ Pierre Massé became an engineer in public works and in the electrical sector in 1928. He was in charge of building hydroelectric plants. He was director of electrical equipment in 1946, then director of economic studies at Electricité de France (EDF) in 1948. In 1957, he became president of Electricité de Strasbourg. He served as general commissioner of the Plan from 1959 to 1966.

⁶² Former delegate at the Datar and president of the Groupe Suez, Jérôme Monod is now advisor to the president of the French Republic, Jacques Chirac.

⁶³ Gaston Berger died in 1960 just before a research and teaching program in *prospective* was inaugurated at the school of higher commercial studies (*Ecole pratique des hautes études*), under the direction of Fernand Braudel. Fernand Braudel wrote the following for a speech: "*Gaston Berger should take his place among us today. He was excited in advance, happy to no longer be just another professor. He also had fun, not to excess, though, with the reversal of our respective roles. He treated me with an amused deference, as one would treat an administrative superior. He proved to himself in this way that he was once again a free man. (...) This fragile science called prospective, that he had created and baptized, he intended to consolidate it and enhance its structure here, in our school.*" (Braudel, 1962).

rational methods. Again, the terms create a problem as *prospective* is translated as foresight usually and reduced to participatory scenario building exercises during which group dynamics and communication take over. As a result, the questions covered, and the level of research involved isn't captured in the translation. You can see this phenomenon in France too, with 'scenario entertainment', which is part of the 'future of the present' trend. We should all remember pioneer Gaston Berger's words of wisdom: See far, wide, deep, and think of Man. I have added three more principals of *prospective*; 'see differently' to avoid preconceived ideas, 'use group processes' to facilitate the emotional investiture and reconcile difference among stakeholders, and 'use rigorous methods' to broach complex issues and identify incoherencies often present in group processes.

I am glad to see that the past 40 years have been marked by the appropriation of our *prospective* methods in corporate and regional management, both here in France and abroad. I'm optimistic about *prospective*; that is to say, the French version. It has taken root and developed well in other countries where Romance languages are spoken. The international expansion of *prospective* does, however, stem from the ongoing efforts to disseminate these concepts and methods by French practitioners. The former have kept the tradition of volunteering from the sixties alive and well. They've also promoted the rigorous approaches to exploring and evaluating ideas that the RAND Corporation⁶⁴ and SEMA developed during the post-war boom and the space race.

The creation of LIPSOR (Laboratoire d'Investigation en *Prospective*, Stratégie et ORganisation) which has recently been rebaptized (Laboratoire d'Innovation, *Prospective*, Stratégie et ORganisation) in the early 1990s has been instrumental in perpetuating the practices of *prospective*. With the support of Jacques Lesourne, Yvon Pesqueux and I have trained dozens of doctorates and thousands of masters in France and throughout the world. To my knowledge, there are around 30 consultants who now make a very good living strictly as *prospectivists* who had graduated from our program.

The publication of my manual in 1985, with the 3rd edition updated in 2007, as well as translated versions in English, Spanish, Portuguese and Italian, have also helped spread the methods of the French school of *prospective*. Writing a manual is an author's effort to help others, although it's more of a thankless task than it seems. Each revised edition represents more than a year of work. In fact, I spent a year and a half on the English adaptation in which I was assisted by a translator who worked on site and attended my corporate workshops. This translation, like those for South America, received partial funding from the French Ministry of Foreign Affairs, which has a translating tradition. In 1986, the same minister granted funding to help publish a special edition of the English language journal *Futures* dedicated to the French school of *prospective*. Similar projects were launched for the journal *Technological Forecasting and Social Change* in the year 2000 which had been dedicated to the methods of scenario planning.

⁶⁴ Cf. *infra*

During the 1990s, I tried in vain to get the Commission in Brussels to structure some form of European *prospective*. I could not generate interest in research through doctoral scholarships either. These scholarships would have been funded by the CNAM, Plan⁶⁵ and Datar⁶⁶. I gave up on these ambitions, as they didn't conform to the academy's idea of academic research. Nevertheless, in 2005 I launched "*le Grand Prix de la réflexion impertinente*" which can be translated into English as "The Grand Prize for Outrageous Scholarship". This initiative was sponsored by the Cercle des Entrepreneurs du Futur and is an opportunity for those in the *prospective* community to re-examine our preconceived ideas.

The status of *prospective* remains fragile, though. Far too much still depends on the good will and persistence of a few people. Chance has always played an important role in preparing the ground for new projects. In fact, this is one of the lessons that I can draw from my own experience in the field. I remember that SEMA's *prospective* department had produced numerous and voluminous studies on air transportation, the post office, etc. Many of these studies stand the test of time, too, but lay buried in filing cabinets. This is much like the academic training in *prospective*; given the lack of academic recognition, training in *prospective* happens by chance, often at the whim of circumstance.

In the early 1990s, after all the seminars organized by Futuribles, and in light of the development of some form of *prospective* in the European Commission, a doctorate in strategic *prospective* was needed and created at CNAM. Again the same question: which academic niche? Economics, history, or management? Management actually offered more possibilities than the others. It is a more open field with an applied strategic dimension well suited to *prospective*. This relationship with management enabled us to network with other centers and thus form credible doctoral defense juries. Credibility is important as the jury legitimates the doctoral program as a whole.

Through this program, I was able to create two full-time lecturer positions; however, it eventually became clear that teaching *prospective*, like teaching strategy, required the practical experience that a young academic can never have. The academic world is increasingly compartmentalized. In fact, the demands inherent in a university career prevent the further development of *prospective*. One must publish abstract theoretical articles in juried academic journals to be recognized. Well, *prospective* does not fit this type of logic. Today's practitioners usually did not follow a traditional academic path; in other words, they came to the field by chance. This often makes them excellent 'deviants', fresh from many different horizons.

Philippe Durance: You talk about the French school of *prospective*, but few people agree with you that it exists. Can you clarify this?

Michel Godet: Let's start with the scenario method as an example. Given American cultural domination, the Americans tend to self-attribute the roots of scenario thinking. But, after all, we do share with the Americans some common historical background. To muddy the waters further, we face the lexicographical problem of the word, *prospective*, which does not translate fully into one English word.

⁶⁵ Commissariat General du Plan is a French governmental agency.

⁶⁶ The Datar is a French paragonmental delegation for regional action and territorial organization.

Futurology is the term that dominates in the English-speaking world. Now you also find foresight and even strategic *prospective*. In any event, the concept of the scenario remains central to the entire process, especially as the scenario appears to be less of the rigorous scientific method that it once was in the 1950's and 60's, under the influence of the RAND Corporation⁶⁷. In those days, the RAND had several researchers, often European immigrants like Olaf Helmer (Delphi method) and Fritz Zwicky (morphological analysis in scenario building). At the same time, Gaston Berger and Bertrand de Jouvenel founded the French school of *prospective* and the *Plan* in France was an official priority. The peak of the idea of a post-industrial society was the publication of Jantsch's book in 1967.

The French school simply kept alive and further developed this legacy of Cartesian methods of systems analysis. It was inherited indirectly from the RAND Corporation, and furthermore combines broad historical, global and voluntaristic perspectives.

Without going into detail, the Vietnam War created a deep mistrust of rational methods of systems analysis. The Americans had failed in their effort to analyze conflict scientifically, so they threw the methods, like the proverbial baby, out with the bath water. You can more or less date a certain decline in logical thinking in the USA from that point on. From one extreme of scientific approaches, the Americans went to the other, intuitive even irrational techniques. This attitude is illustrated beautifully in what they call 'New Age' thinking. As a result, the English-speaking world reduces *prospective* to little more than scenario entertainment. I don't think that gathering a few intellectuals together to play at pleasing or scaring one another with a concept equals research. It is entertainment in the Pascalian sense — a distraction really. In terms of content, though, this approach is simplistic, often binary, so that the future is divided according to two hypotheses (yes or no), hence four scenarios. Scientifically, this comes close to some kind of mystification, especially when people claim that the strategy of such and such a big group was enlightened by these scenarios. As far as I know, Shell built scenarios on communication and information technology but never invested a penny in that sector. In American practice, scenario building is like bodybuilding! The collective and participatory process of futures thinking, as I call it, is positive in its own right but all the more useful for strategy if we ask real questions that are not simply reduced to two possibilities chosen to suit the latest fashion.

Actually, corporate scenario building is an excellent participatory management tool that can get the whole staff involved. Not all issues are suitable to such an exercise due to their confidential nature. However, it is possible to have people think about the environment affecting those strategic options, if not the strategic choices directly. If structured properly, this approach implicates personnel at all levels of the organization without divulging sensitive strategic information which might comprise an organization's ability to implement its strategy. At Renault, in 1983, I was involved in Mides, a futures-thinking exercise involving 3,000 people. The scenario process has been successfully applied to regions, too, as seen in the Pays Basque

⁶⁷ Initiated as a military project in 1945, the RAND Corporation was officially incorporated as such in 1948. Its name is a contraction of research and development. This corporation became a lab and an incubator for the tools used in *prospective*. Examples include Herman Kahn (scenarios), Olaf Helmer (Delphi, 1950s) and crossed impact analysis.

(Basque country) 2010 project⁶⁸. Nowadays, group learning is an integral part of knowledge management; however, in management terms what counts is involvement. A popular American phrase sums it up well: the reward is the journey. The goal is a pretext, almost an excuse, for the shared experience and the relationships created amongst the participants.

Last but not least, I'd like to point out that English-speaking authors and researchers themselves speak of the French school of *prospective*⁶⁹

Philippe Durance: The future being what it is, primarily uncertainty, how can *prospective* separate itself from less scientific forms of speculation like futurology?

Michel Godet: Futurology claims to be a science of the future, just as history would be the science of the past. Although the past is as multifaceted and uncertain as the future; and although we constantly rewrite history, the past is gone. On the other hand, the future is open, thus any form of prediction is tantamount to fraud. For *prospective*, the future is the fruit of desire, in other words, a dream that motivates present action and drives reality towards a desired future. And we know that an action without a goal is meaningless.

Determinism in all its forms does indeed yield to the will and determination of humankind. As Pasteur once said, chance favors the prepared mind—when you have goals and projects, you feel young and alive.

Fortunately, the future is indeed open and uncertain. A totally certain and foreseeable world would be intolerable. If you knew the exact day, hour and circumstances of your death, you would be completely preoccupied trying to avoid it. However, the clock is ticking and each minute lived now is one less to live later. Now you see why happiness is possible only where there is some degree of uncertainty. Uncertainty is life; certainty is death.

Philippe Durance: Where would you tell young researchers to focus their attention in *prospective* today?

Michel Godet: There are many potential research areas. If we start with the most difficult, there is the link between game theory and stakeholder analysis, begun by Francois Bourse. There is also the integration of *prospective* tools in operational research. More broadly, there are the mathematical specialties, such as diagonalisation, proper values, unknown number systems, fractals, graph theories, and many more.

In the soft sciences, there is cognition and organization learning, something Philippe Bootz (2001) has already started to develop.

Finally, let's not forget the essential *prospective* question, question (Q0), Who am I? This dimension allows those who practice *prospective* to transform scenarios into

⁶⁸ This regional study has been published as a LIPSOR Working Paper (Mousli, 2004).

⁶⁹ In 1999, the British magazine *Antidote* produced a special issue on scenarios and forecasting methods. It included an article entitled "Creating the Future: a French School, Prospective, argues against taking a fatalistic approach" (CSBS, 1999). This piece profiled the French school and described the methods developed by Michel Godet.

projects which in turn connects individual and collective desires which in turn provokes a desired future. We should also determine the profound links between *prospective* and psychoanalysis.

Last but not least, we need to bring history and *prospective* together. The past is as multiple, uncertain and controversial as the future, but it affects both the present and future. History, the novel of perceived reality, as Paul Veyne⁷⁰ put it, is constantly being rewritten according to the needs of the present. The whole issue of climate change takes on another light when we are reminded of the past by authors like Emmanuel Leroy Ladurie in his work on the history of climates. If *prospective* aims to enlighten our actions in the context of possible futures, then the goal of history is to do the same, but in light of past futures.

In the end, good anticipation is not predicting what will happen, but rather that which leads to action. I'm not terribly pleased to see some of my own forecasts come true, such as the shortage of professionals and the concurrent overabundance of graduates, or the wastefulness of society vis-à-vis energy resources, or the 'unsustainable' sustainable development in a Europe well into the mature phase of the demographic transition, etc. Wealth is created by an educated citizenry with projects and opportunities to grow in an optimistic society. While it may still be possible to give meaning to lives through the co-construction of collective projects, the task remains difficult in a defiant society with poor social cohesion, rising crime, and a declining quality of life.

I only wish that the younger generation of European researchers find concrete solutions to the problem of integrating millions of foreigners into the economic and civic life of Europe. Europe desperately needs these immigrants to drive its economy and offset its ageing population. I just hope that the politicians have the courage and good sense to apply these solutions judiciously.

⁷⁰ Author, historian and professor at the *Collège de France*.

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