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LIPSOR Working Paper

STRATEGIC FORESIGHT

LA PROSPECTIVE

PROBLEMS AND METHODS

by Michel Godet

with
Philippe Durance and Adam Gerber

– Issue n°20 –

The Entrepreneurs' Circle of the Future




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LA PROSPECTIVE

Problems and Methods

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In collaboration with Philippe Durance and Adam Gerber

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Foreword

This Lipsor Working Paper is the sixth edition of its kind and includes a synthesis of problems and methods of strategic foresight. The project began in 1990 as a companion to the *Manuel de prospective stratégique*, now in its 2004 edition (Godet, 2004). This volume replaces the fifth edition entitled *Toolbox* which is still available in English, Spanish and Portuguese online via the Lipsor web site. (www.laprospective.fr – then click on the English flag).

This version, completely reviewed and updated, integrates the software developed by Lipsor. With the generous support of the Entrepreneurs' Circle of the Future, these software programmes are available for downloading free-of-charge at (www.laprospective.fr). This version also includes a summary of the Global Business Network's method of scenario planning, as well as a new bibliography.

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Some Rigour for an Intellectual Non-Discipline

Action is taken in the anticipation of a producing a goal; and so action taken in the absence of a goal is meaningless. In a strategic context, therefore, scenario planning cannot be readily dissociated from strategy, hence the term "strategic scenario building" or "strategic scenario planning". 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 formalization 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. In order to remain a productive and credible *intellectual non-discipline*, foresight requires rigour.

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 scepticism which surfaces despite the soundness and veracity of arguments which favour the use of such methods. The debate is further muddied by: confusion between the concepts of *la prospective*, planning, and strategy; the interest in assigning quantitative probability to scenarios; the desire to further complicate the already complex tools of *la prospective* (strategic foresight); and the attempt to apply the tools of corporate foresight, which have proven to be very useful in that context, to other domains such as regional foresight. The accumulated experience of the last thirty years working in the field of *la prospective* permits us to bring clear responses to all of these questions—at least in our mind.

La prospective (strategic foresight) essentially involves anticipation (pre-activity) to clarify present actions in light of possible and desirable futures. Nevertheless, preparing oneself for foreseeable change doesn't preclude one from provoking desired change (pro-activity). In the logic of the Greek triangle[1] then, it is only by mixing the blue of anticipation with the yellow of appropriation that we arrive at the green of action.

There appear here two symmetrical errors which one should avoid. The first consists of imposing the advice of the experts without appropriating the solution. It's a bad idea to want to impose a good one. The second consists of favouring "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.

[1] This triangular relationship amongst Anticipation, Appropriation, and Action came to mind in 1984 following *Operation Midas* at Renault (Godet, 2001).

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 *la 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".

Let's return to the some of the earlier sources of *la prospective*. According to Gaston Berger, *la prospective* requires “seeing far, wide and deep; thinking about humankind and taking risks”. (Berger, 1959) Since the 1970s, we have lobbied within the Futuribles Association (http://www.futuribles.fr/) to add three characteristics often neglected by our forerunners: (1) see differently (distrust preconceived ideas) (2) see collectively (appropriation) and (3) use methods as rigorous and participatory as possible to reduce the unavoidable biases in a group.

Humankind thrives on hope. Nevertheless, the collective desire for a better future is best expressed when it is channelled through rigorous methods. The case of the Basque country 2010 regional foresight study is exemplary in this regard (Mousli, 2004). It started in 1992 with the support of Datar (name derived from an acronym describing the French ministry of regional development) and the participation of key players living and working in the region. The *prospective* workshops which assembled more than 100 people (elected officials, economists, academics, etc.) at St. Palais, lasted two full days. The workshops were featured prominently in the regional news media in South-western France and ongoing news coverage lasted almost two years. The final product, which was based upon a rigorous structural analysis and several elaborated scenarios, was a template for regional development which remains a reference to this day.

Planning, La Prospective and Strategy: What's the Difference?

The three concepts of *la prospective*, strategy and planning are intimately linked in practice; and as a result, "strategic planning", "strategic management" and "strategic *prospective*" will all be mentioned throughout this volume. Each of these approaches refers 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 strategic foresight. 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? The answer is a resounding “yes”. A toolbox for *la prospective* and strategic analysis does exist. 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 *la prospective* and its history.

In order to be fruitful, the marriage between scenario building and strategy must be incorporated into daily operations. It must be appropriated by all the actors involved, from the top of the hierarchy to the bottom. (Note that here the word 'actor' is used here as it is in management theory.) Although the union between scenario planning and strategy may have been inevitable, it has certainly not cleared up any confusion in concepts. In the end, however, the ideas are much closer than is generally admitted. In fact the definition of planning put forward 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 *la prospective* in which the dream infuses reality, where desire is the productive force of the future, and where anticipation sheds light on the preactive and the proactive.

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*."

In the practice of *la prospective*, one ought to avoid managerial fads and focus on sound strategic methods. For example, the classical analysis using threats and opportunities 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 *la prospective* to clarify strategic options and to ensure continued organizational growth.

American president (1923-1929) Calvin Coolidge once said, "The business of America is business." So, it's not terribly surprising that the management market is characterized by an overwhelming dominance of tools and approaches developed in this self-proclaimed Mecca of commerce. Examples abound, but the most outstanding is the Strategic Business Unit (SBU) approach. Indeed many American companies actually became victims of the SBU approach. Yet in the end, the relative or even absolute decline of entire sectors of American industry, with respect to Japan and Europe during the 1960s and again during the 1980s, made any debate over the superiority of the classic American approach moot. As Marc Giget (1998) put it: "The revival [of the American Economy] in the 90s was generated from analyses labelled *Made in America* which were inspired directly by foreign models." Hence managers rediscovered the virtues of positioning themselves against the best (benchmarking), the value of a complete rehaul of processes and structures (re-engineering), as well as the importance of lean organizations (downsizing) and lastly, the power of innovation (core competencies).

Therein lays the difference between winning and losing companies, as Hamel (2005) points out: "*We had to conclude that some management teams were simply more foresightful 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 passage reveals the similarities between strategy and *la prospective*. Strategy uses foresight and innovation, while *la prospective* uses pre-activity and pro-activity. Nevertheless, we are essentially talking about the exact same thing.

Given this similarity, the term strategic prospective has been circulating since the late 1980's, especially in France—better late than never. 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 paraphrase Gaston Berger once again, "Looking at the future disturbs the present." We add a conclusion to his remark: "but 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 *la prospective* to clarify choices made with the future in mind.

The Abusive Use of the Term Strategy

The so-called *Rise and Fall of Strategic Planning* has not exhausted people's interest in the subject. This may be a relief to an author like Henry Mintzberg. Strategic planning will always be of interest to managers because of the independent nature of each of its components. According to 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 organisation. To use another metaphor, the gears of development depend not only on logic, but also on human emotion and behaviour. 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 and Rumelt reject these distinctions. Rumelt states that "the tactic of one person is the strategy of another" and, "The term *strategic* can be used as an adjective to qualify anything relatively 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 *06/11/2006* which we have called *la prospective strategique*. Obviously, the two notions are distinct but often associated. However some authors, including Fabrice Roubelat (1996), maintain that *la prospective* has two sides to it. Roubelat bases his comments on Jacques Lesourne (1994)[2] to conclude that "*a strategic decision is either one that creates an irreversible situation for*

[2] "For every organization […] the notion of strategy is inseperable from that of irreversability on a grande scale".

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 foresight need not necessarily be "strategic" in nature—in other words, lead to an irreversible decision. The advantage of these strict definitions is to avoid using the word 'strategic' to merely mean anything that seems important. Of course prudence and common sense enter into the equation as well; consequently, our efforts are not limited to asking about the 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 here and impossible to redraw completely. The same may be said for decisions, for as Jacques Lesourne[3] once put it: "*major decisions are rarely made, they become increasingly improbable as the small decisions accumulate*". For the organization, *la prospective* is not charity, but rather reflection with a view to clarifying action, especially action of a strategic nature.

Frame 1 – A Few Keywords for *La Prospective* and Strategy

Prospective: Anticipate before acting. *La prospective* is an "intellectual non-discipline" (Pierre Massé) which seeks to see "far, wide and deep" (Gaston Berger) but also differently (innovation) and collectively (appropriation). This global, long-term vision is crucial for giving meaning to action.

Forecast: An estimation about the future coupled with a degree of confidence.

Planning: "Planning consists of imagining a desired future as well as the means of achieving it." (R.L. Ackoff)

Strategy: Code of conduct enabling actors to achieve their goals.

Tactic(s): Almost always used in the plural. Ways and means of achieving subgoals within an overall strategy according to the particular circumstances confronted.

Strategic Planning: Concept launched in the mid-60s, notably by Igor Ansoff, to refer to a kind of organizational planning that is both goal-oriented and highly adaptive.

Strategic Management: Concept launched in the mid-1960s by Igor Ansoff which emphasizes the conditions which enable organizations to adapt to an increasingly turbulent world.

Prospective stratégique (strategic foresight): concept from the 1990s, in which *la prospective* is applied to strategic action.

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 proactive vision alone. We need to be preactive too, in order to prepare for expected changes in the future business environment.

[3] During a conference given at CNAM in 1982.

Every possible scenario is neither equally probable nor desirable, and one ought to distinguish the strategic environment from the strategies of its actors. Thus, the success of the word *scenario* has lead to a certain amount of abuse and subsequent confusion, which we are now compelled to clarify in this paper.

It is thus judicious to distinguish between the exploratory and normative phases of *la prospective*. The former explores possible futures, while the latter is focused on the identification of stakes/stakeholders, and the elaboration of strategic choices which will permit an organization to provoke a 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, which then translates into probable scenarios which are generally more contrasted to one another.

It is important not to confuse scenarios with strategic options, since they implicate a distinct, though not necessary mutually exclusive set of internal actors. The exploratory/anticipatory phase of la 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 *la 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 *la prospective* which elaborates strategic choices, is left to the competencies of a limited number of persons, generally the members of the board of directors of an organization. The strategic decisions which follow should issue from executive management. This latter phase, therefore, does not require as much formalization. The executives will be presented with the product (a report) from the first phase. Then, after reviewing possible strategic options, will have reached a consensus. 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 *la prospective* therefore are useful for preparing strategic options, but they mustn't interfere with the liberty of executive decision.

Which Strategies for Which Scenarios?

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. 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 opinion; his/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 uncertainly of the future can be evaluated across a number of scenarios which share the field of probable futures. In principal, 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 similar or contrasted to one another.

Experience shows that in general, a third of the total possibilities are enough to cover 80% of the field of probable futures (perhaps 10 scenarios out of 32 possible for 5 fundamental hypotheses). If the incertitude is weak, which is to say, a limited number of rather similar scenarios occupy a majority of the field of probable futures on the chart, 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 weather any possible foreseeable perturbation. If the incertitude is strong (it takes more than half of the possible scenarios to cover 80% of the field of probable futures on the chart, or the more probable scenarios are highly contrasted), then one ought to adopt a flexible strategy which includes the maximum number of reversible choices. The risk with this approach is risk aversion. Adopting a relatively conservative strategy will not likely lead to great losses (or gains), but may ultimately represent an opportunity lost.

The Five Fundamental Questions for Strategic Foresight

Like fraternal twins, *la prospective* and strategy 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 preparatory 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 a 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 last question (Q0) is the starting point of Marc Giget's strategic approach (1998). Question zero (Q0) is not dissimilar from admonition inscribed on the front of the temple of Delphi, "Know thyself" and forces one to consider one's strengths and weaknesses before embarking on a strategic process.

Only *la prospective* is centred on (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 *la prospective* and strategy is between (Q2) and (Q3).

Naturally, there are exploratory futures 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 *la prospective strategique* (strategic foresight) will be reserved for futures studies having strategic ambitions and objectives for those who undertake them.

The Five Possible 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 development. The ageless advice of Seneca rings true here: “Not a fair wind blows for him who knows not where he goes.” 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 quickly to the forces of change and hold one's course. In order to master change, organizations must not only anticipate correctly (neither too early nor too late) shifts the in technological, competitive and regulatory environments, etc.

Faced with the future, humankind has the choice between four attitudes; (1) the passive ostrich, who accepts change without challenging it; (2) the reactive fire-fighter, who waits for the alarm to sound before extinguishing the fire; (3) the preactive insurer, who prepares for foreseeable changes because an ounce of prevention is worth a pound of cure; (4) the proactive conspirator, who acts to provoke desirable change. The *anticipactive* actor is one who savvily combines all of the above but adopts an *anticipactive* attitude; in other words, a blend of the reactive, preactive and proactive attitudes. In fact, according to Hasan Ozbekhan[4], 'pre-activity' and 'pro-activity', taken together, form the core definition of *la prospective*[5].

Practical conclusion for executives—from now on, when drafting a plan of action, draw three columns; one for reactivity, one for preactivity and one for proactivity, and then proceed to fill each column in a balanced way—in other words, none should be too full. With respect to your strategic plans, try to adopt the fifth attitude which is more subtle and flexible. Of course, each attitude has its time and place. In the context of a crisis, reactivity trumps the other attitudes. Likewise in the context of growth, proactivity is the most important attitude, notably in the form of provoking change through innovation.

Five Key Ideas of Strategic Foresight

Futurists don't predict the future, and those who predict the future are not futurists. 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 *la prospective* should keep in mind, if desire is to be harnessed effectively.

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[4] Hasan Ozbekhan was a professor 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).

[5] During a diner in Madrid about a decade ago, Hasan Ozbekhan explained to us that the concept of *prospective* does exist in English, especially if one qualifies the language with the use of two adjectives, *preactive* and *proactive*.

The World Changes, But Problems Remain

After almost a quarter century of reflection on regional and corporate foresight, 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 which 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 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 fifteen years earlier. This axiom applies equally to problems related to material resources like energy, air traffic control, and postal service, as it does to broader social issues like employment or education. Any rational observer would come to the same conclusion—the intellectual investments made in the past are hardly obsolete. 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* project 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."

Humankind has a short-term memory, and we tend to ignore history and its lessons. History doesn't repeat itself, but human behaviour certainly does. Throughout recorded history, human behaviour 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 anticipations 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.

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 new technologies.

Key Actors at Bifurcation Points

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, at least in our minds, to a broad range of possible futures. Since determinism is indeterminable, one must act as if all bets were off, and as if human will could dethrone the tyranny of chance and necessity.

How does one recognize points of rupture (bifurcation)? *"What events or innovations are going to remain without consequence, while others are likely to have global impact and irreversibly determine the choice of an evolution, what are the zones of choice and the zones of stability?"* These are the questions about which Ilya Prigogine (1990) wondered. They are also the daily menu of *la prospective*. Identifying the range of possible futures through the use of scenarios—isn't this also recognizing the diagram of bifurcation points? The parameters of bifurcations are they not also key variables of prospective analysis?

One observes as well, in the past few years, a convergence of theories towards the concept of auto-organization, which permits both the adaptation and creation of entirely novel outcomes. Everything happens as if there were *"a reversal in the direction of time"* in such a way that *"actions taken today can be explained not by our current conditions, but rather by the goal(s) which we have previously defined, and towards which we tend to be attracted"* (Dupuy, 1982). One is reminded of Gaston Berger's axiom, *"the future is the raison d'être of the present."* (Berger, 1959) This axiom permits us to advance that *desire*, the productive force of the future, is also the principal motor of auto-organization.

Stop the Complication of 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 have been blessed with an ability to think about highly complex systems, also know how to think abstractly, and thus are able to discover the relatively simple laws which describe the elegant behaviour 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 simple 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.

Ask the Right Questions and Distrust Preconceived Ideas

Everyone remembers Woody Allen's famous retort, *"The answer is yes, but what was the question?"* Too often, one forgets to ask oneself if the questions posed are well founded. There is no good response to a bad question. So, how to pose good questions? The Woody Allen response is all too often what happens when we forget to consider the validity of a question and rush like lemmings to find the illusory answers to false questions. Since there can be no right answer to a wrong question, how can we ensure that we are indeed asking the right questions?

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 scepticism because they often result in erroneous analyses. Maurice Allais figures among the more objective allies in this battlefield of ideas. He denounces what he refers to as "the tyranny of dominant ideas". Information is often censured 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. This observation obviously doesn't give any extra credit to wacky predictions, but renders suspect a number of conjectures and preconceived ideas. In this sense, challenging comfortable and false "certitudes" is indispensable to *la prospective*.

In the past, we have been able to harness this healthy scepticism to successfully crush several erroneous ideas. This mental reengineering led us notably to perceive the overabundance of energy, to denounce technological mirages, and the myth of Japanese management superiority. Strategy doesn't escape conformism. The spectre of information technology and its unmet promises are not the only clichés which have currency these days. 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.

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 can not be reached separately.

It is through the process of appropriation that projects ultimately succeed. Due to its transparency, the collective process can not lead directly to strategic choices, which are by nature confidential and must be taken by executives. However, the group process concerning external threats and opportunities provides the impetus for mobilisation, and permits the appropriation of the strategic plan among personnel who are stakeholders, i.e. already intellectually and emotionally vested.

Intellectual and affective 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), "Ergo" (action or

realization). The marriage of passion and reason, of heart and mind, is the key to successful action and individual fulfilment (the body). We can express the same message in colour: 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. Moreover, 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, but rather complementarities between intuition and reason.

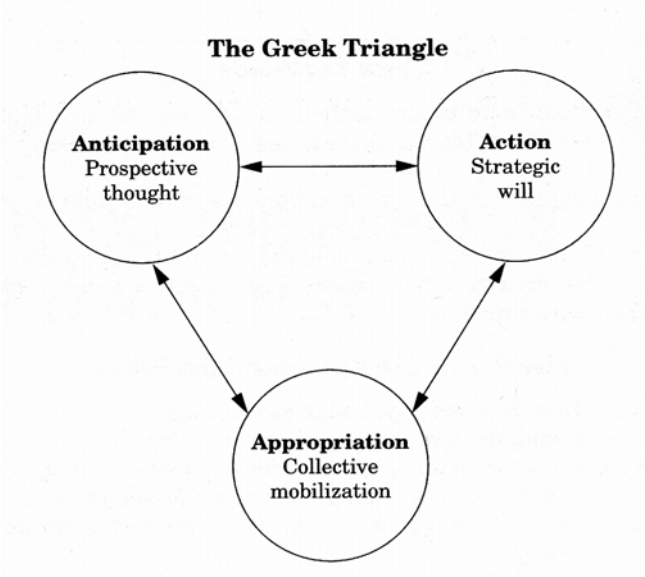

Figure 1 - The Greek Triangle

The Methods of 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 by disposing with the accumulated heritage of strategic methods already developed. We must maintain the core methodologies of our profession, so that we may enrich them.

The Dream of the Nail and the Risk of the Hammer

When working with the methods of strategic foresight, we ought to recall their utility, which is; to stimulate the imagination, to reduce incoherencies, to create a common language, to structure collective thought, and to permit appropriation. We mustn't, however, forget the limits of these same methods, nor delude ourselves with the illusion of absolute control through formalization. These methods, useful though they may be, mustn't replace thoughtful analysis, nor restrict freedom of choice. We are also determined to eliminate two symmetrical errors which are often confronted when dealing with formalization and the methods of *la 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 *la prospective*, the more we are compelled to disabuse neophytes of their limits. The methods of la 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 materials.

These tools are simply a means of appreciating, in a manner as objective as possible, the realities of multiple unknowns. 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 rigour, notably in the domains of; posing the best possible questions (relevance), and in reducing the incoherencies of reasoning. Furthermore, although their utilization may stimulate imagination and creativity, they can't guarantee creation—that must be done by the participants themselves.

The skill of a strategist also depends on natural talents such as intuition and good judgment[6]. If *la prospective* requires rigour to broach the complexity of contemporary problems, then it also requires methods and tools sufficiently simple enough to remain accessible to those who would use them.

To facilitate the choice of methodologies (tools), we have developed a 'toolbox' of *la prospective* (strategic foresight) which allows users to select a particular tool based upon the typology of problems which are confronted. Following the stages of *la 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 players, sweep the entire field of possibilities and reduce the uncertainty, establish a complete diagnostic of an enterprise 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 practice, and we vouch for both their rigour and their

[6] For more information, the reader can refer to the *Manuel de prospective stratégique* published in two volumes by Dunod in 2001 (2nd edition). The first volume, *Une indiscipline intellectuelle* (An Intellectual Non-Discipline) presents the concepts and key ideas of *la prospective* and provokes the reader to see the world differently. The second volume, entitled *L'art et la méthode* (The Art and the Method) elaborates the toolbox for *prospective strategique* (strategic foresight) as well as the essential principals of management with particular emphasis on human agency in both social and corporate rhealms.

ability to elicit fruitful communication, if they are applied judiciously and with enthusiasm.

Strategic Planning using Scenarios

La prospective stratégique (strategic foresight) puts anticipation at the service of action and succeeds by circulating throughout an organization. The 1980s and 1990s were also marked by the adoption of scenarios by those practising strategic planning, especially in large corporations in the energy sector such as Shell, EDF and Elf. This trend is no doubt in response to oil shocks, past and present.

Since the beginning of the 1980s, we have worked to develop strong potential synergies between *la prospective* and strategy. The result has been a tightly integrated approach of strategic planning using scenarios. The objective of this approach is to propose several strategic orientations and options, based upon the organisation's competencies and according to the scenarios of its competitive environment.

La prospective and strategy are quite complementary. *La prospective* with its uncertain trends and volatile ruptures, compels the use of strategy. Strategy, which is concerned with possible choices and the irreversible risks, has relied upon the use of *la prospective,* particularly scenarios, since the 1980s as Michael Porter (1999) has well noted. We have worked diligently to integrate the two approaches since 1989, beginning with the tree of competencies developed by Marc Giget (1998). The integrated (combined *la prospective* + strategy) approach of course doesn't preclude one from using strategy or *la prospective* separately.

Quite naturally, the strategic approach, defined by a tree of competencies, needs the foresight of the competitive environment. One understands therefore that the marriage between *la prospective* and strategy started with a rapprochement—the method of scenarios with that of competency trees. Before presenting the model of strategic planning using scenarios in nine stages, let's summarize the origins of the *scenarios method* and then define it.

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.

Let's recall that the hypotheses of a scenario must satisfy five conditions simultaneously; relevance, coherence, likelihood, importance and transparency.

One distinguishes, in fact, two major types of scenarios:

- exploratory: extrapolating past and present trends which lead to likely futures. These scenarios are objective, insofar as any story can be objective, and value-neutral.

- normative (also called anticipatory): constructing scenarios based upon alternative images of the future that are either desirable or feared, and are conceived retrospectively. These scenarios are subjective and value-laden.

These normative scenarios (often called scenarios of anticipation) may indeed be the most likely and/or the most contrasted, assuming they take into consideration the most probable or the most extreme among the possible hypotheses.

In reality, there is not a single approach to scenario planning, but rather two approaches—those introduced by Herman Kahn[7] in the United States in the 1950s at Rand, and those developed by Datar in France (Datar, 1975). Today, there exists two scenario methods which are used most frequently—those we have developed at Sema and then at CNAM (Conservatoire National des Arts et Métiers), and those of SRI (Stanford Research International) developed in Palo Alto. The two approaches are very similar and the various stages and their functions hardly differ.

The principal stages of the *scenarios method* are the following:

- identify the key variables (the result of structural analysis).
- analyze the interplay of the actors involved in order to pose key questions about the future
- reduce uncertainty around those key questions and tease out the most probable scenarios based upon, among other things, the input of experts.

You can find these stages illustrated on the left side of figure 2 labelled above (1, 3, 4 and 5)

The **first stage** of the methodology analyses the problem 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 stage** is a 360 degree x-ray of the enterprise, its savoir-faire, and its productive capacities. This diagnostic is represented as a tree of competencies.

The **third stage** identifies the key variables of an enterprise and its general environment with the aid of structural analysis.

The **fourth stage** attempts to understand the dynamic of an enterprise, its history, its strengths and weaknesses, and the principal actors in its strategic environment. The

[7] 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 considerd 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 com:; thinking about the seventies and eighties* (1972). The *Hudson Institute* also worked closely with the French ministry, Datar, in 1970 and 1971.

analysis of the strategic battlefield and the stakes involved permit the working group to derive the key questions for the future.

The **fifth stage** 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.

The **sixth stage** 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.

The **seventh stage** 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 stage rarely produces actionable options.

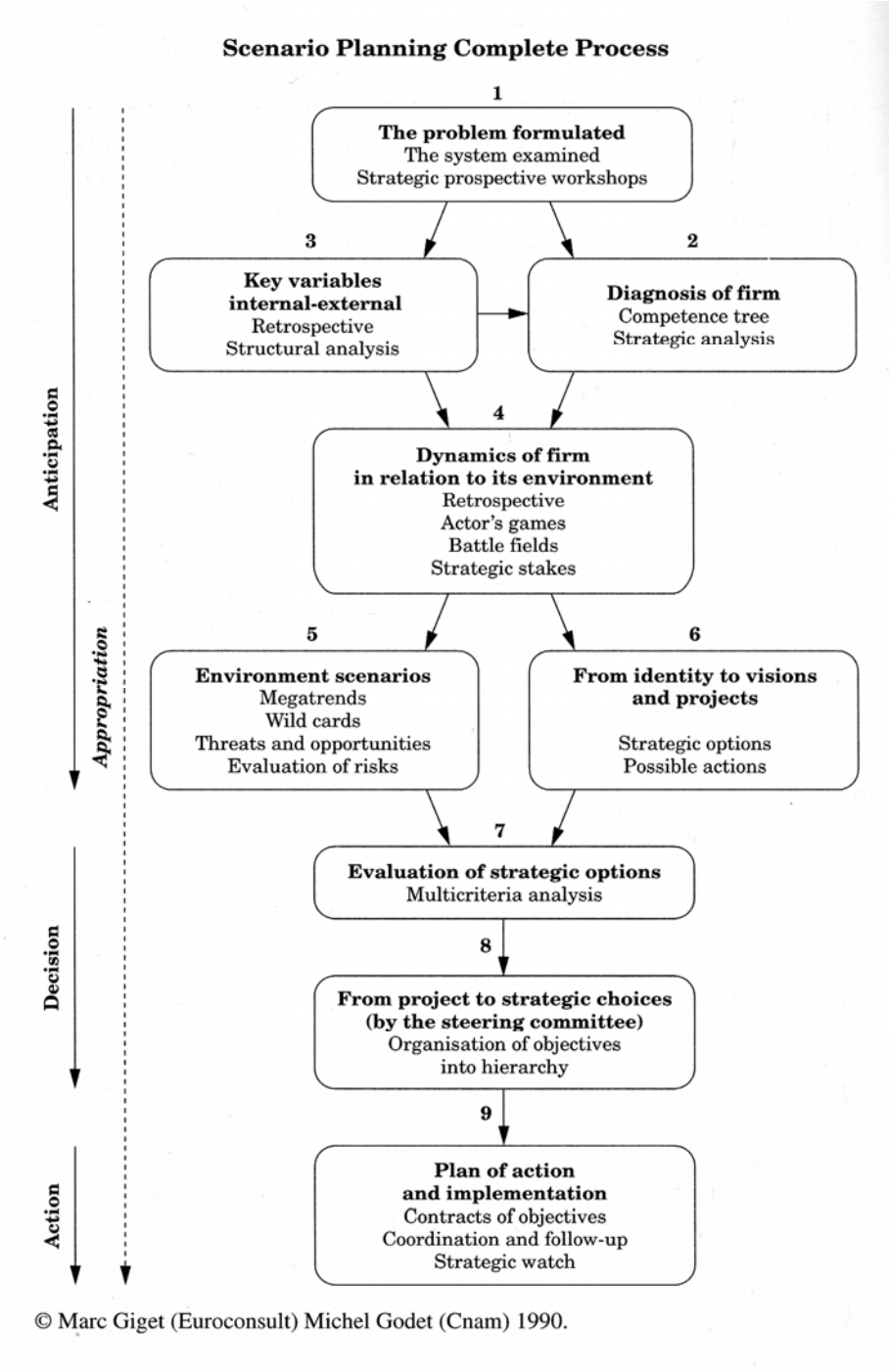

Figure 2 – Strategic Planning using Scenarios: an Integrated Approach

The **eighth stage,** which concerns strategic choices, is a crucial transition from thought to action. The strategic choices and their ranking of importance are left to the board of directors or its equivalent.

Finally, the **ninth stage** 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 external horizon scanning.

We should remind readers that the process is not necessarily linear, and may take several loops, notably between stages **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 dynamic of the enterprise and its position in the marketplace.

To borrow a biological metaphor for the methodology of scenarios, the rational skeleton (process and formalization) doesn't prevent the irrational marrow (imagination and freedom of choice) from circulating. Collective appropriation prepares the organization for more effective action without spoiling the confidential nature of the strategic decisions which are often left to the executives.

The passage from thought to strategic action assumes, at every moment, an appropriation by the actors involved. That is to say 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 foresight, i.e. working with regional governments or other parties who share both common geography and interests. This claim of cross-adaptability to regional foresight has elicited some rather negative reactions among our colleagues, who are nevertheless belied by our successful adaptation of the tree of competencies to various regional foresight projects, including; the Basque country (Mousli, 2004), Reunion Island, Lorraine, Ardennes, Vierzon, Toulon, and Dunkerk, to name a few.

Examples of Ad-Hoc Applications

As with any good toolbox, the utilization of a particular tool depends on the application. In the case of our toolbox, selecting a tool will depend on the problem posed, and the various constraints of time and available information. This means that one is not limited to using these tools strictly as part of an overall process, but rather one may pick and chose the proper tool(s) according to the demands of the problems at hand. In fact, the sequential logic of these tools is rarely followed nor is the process usually completed from A to Z. This is often due to the fact that the time required to carry out an entire study is rarely compatible with the time allotted. Thankfully, as is the case with all the tools, each one may be used in modular way.

In many cases, one can work quite successfully with a combination of tools, even if it means modifying the tools to fit the needs of the subject under study. In other words, a screwdriver may be quite easily adapted to be used as a bottle-opener. The following are good examples of the contingent, ad-hoc application of the tools of *la prospective* (strategic foresight) and their recombinatory potential.

Two Examples Using Specific Combinations of Tools

At the end of the 1980's, we were asked to lead a study that was commissioned by the French DGA (Direction Générale de l'Armements) to consider weapons which would be used by French infantry in the year 2010. The study required a structural analysis developed from scratch and which lasted three years. The ranking of 57 variables, derived with the aid of the Micmac method, allowed us to elaborate fifteen key variables. After some reflection, is became apparent that nine of these variables dealt with the material components of the weapon (nature of the projectile, sight, source of energy, etc) while the other six variables were related to evaluation criteria (cost, competitiveness, antipersonnel effects, etc.). The morphological analysis of the nine material components alone and their various combinations resulted in 15,552 theoretical solutions. The combined use of the Multipol method for the multi-criteria choices and the Morphol method for the calculation of exclusion and preference restrictions enabled us to decrease the morphological space to fifty then to some twenty solutions which were worth examining more closely using additional economic and technical analyses. Ten years later, one of these solutions made the headlines at a public presentation of the operational prototype. The selected solution: a 'polyarm-multiprojectile' model called PAPOP. This model has indirect sighting and allows the soldier to remain hidden while firing target-specific projectiles at stationary, mobile and/or armoured targets.

At another consulting engagement, this time for the commercial development of the French electrical company (EDF), the toolbox acquired a new, innovative use. The horizon was the year 2010. The structural analysis of the 49 variables considered led us to identify six key questions, such as energy consumption, competitiveness and margin of manoeuvre. We then grouped these questions under three battlefields. The morphological analysis of the possible answers for each of the six key questions and their various combinations enabled us to select the most probable scenarios. Of course the Smic-Prob-Expert method had already 'probabilised' the scenarios. In parallel, the Mactor method was used with some twenty actors involved in the three battlefields. Their strategic positions were later optimised according to the scenarios studied[8].

The Rediscovery of Morphological Analysis

Morphological analysis experienced a renaissance at the end of the 80s and became one of the most utilized management tools during the era. Oddly enough, morphological analysis had long been popular in technological forecasting but not in economic or general industrial foresight[9]. The following examples show how this tool works well in constructing scenarios.

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[8] During the 1980s, the methods of *la prospective strategique* (strategic foresight) of the "French school" were distributed widely. Developped at Lipsor, these methods are both rigorous and participatory. These tools allow a team to indentify both key-variables and probable scenarios, and finally evaluate strategic options. In the last few years, the support of numerous companies has allowed us to develop powerful software tools which assist in developing scenarios and decision-making (Micmac, Mactor, Morphol, Smic-Prob-Expert and Multipol). Advances in information technology and the unmet global demand for these powerful tools, led us (Entrepreneur's Circle of the Futur, Lispor and 3IE-EPITA) to develop these tools in three languages (French, English and Spanish) and then make them available for download free-of-charge at our website www.laprospective.fr

[9] See the article by Stephen M. Maurer consecrated to Fritz Zwicky, the father of morphological analysis, available on the Lipsor web site under the tab called "Memory of Prospective".

Frame 2 - The Relevance, Likelihood and Coherence of Scenarios Using Morphological Analysis

A system may be deconstructed into dimensions where key questions are categorized into the following rubrics; demographic, economic, technological, and societal/organisational. Each dimension has a certain number of likely hypotheses.

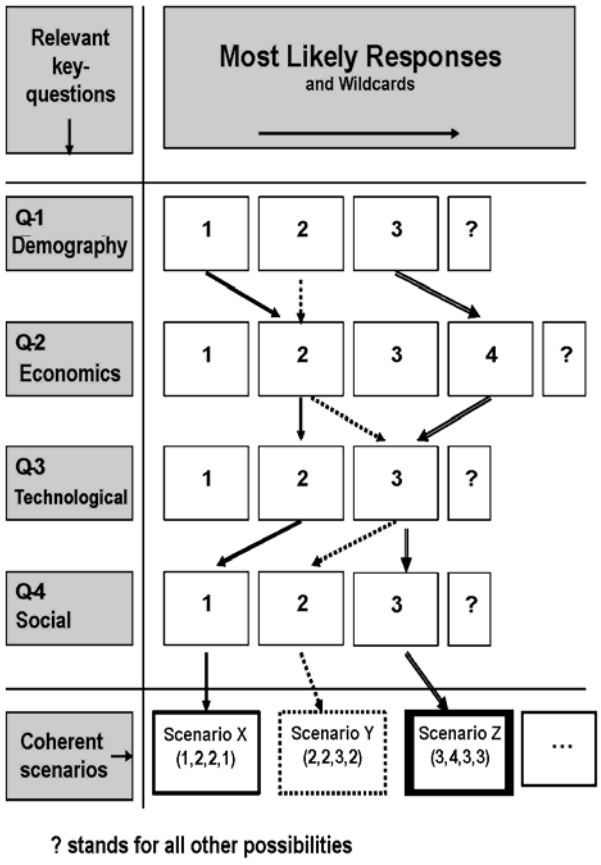

Figure 3 - Example of Morphological Space

The above figure is read in the following way. The question marks "?" indicate all other possible, though less relevant, hypotheses. In this example, there exist at least 108 possible scenarios (3 x 4 x 3 x 3).

To assemble a scenario, one passes through the morphological space like a pachinko ball, gathering a single hypothesis from each rubric (subsequent hypotheses needn't be below nor adjacent). The morphological space encompasses the entire range of possible futures.

In 1998, the corn growers association (AGPM) held a session that lasted only four or five working days. Given this timeframe, we turned to morphological analysis for the two classic phases; i.e., the foresight and strategic phases (Bassaler, 2000). The initial analysis provided scenarios relevant to the future of corn production and its technical, economic and legislative environments. Each scenario poses strategic questions to which one may respond with various answers. Once again, morphological analysis enabled us to structure the group's thinking on the strategic response profiles that were both the most relevant and coherent.

The Case for Scenarios in Planning[10]

Axa France, a leading French insurance company, brought together all the French subsidiaries of the Axa Insurance Group. The French units decided to explore future possibilities before drafting the 1996-2000 strategic plan. The previous plan (1992- 1996) had focused on reorganising new acquisitions, the fruit of various buyouts, and on improving overall profitability. Since this previous plan stressed organisational goals using the distribution chain, no specific research had been carried out on the company's strategic environment.

Having reached their internal goals, Axa developed a new plan to integrate outside challenges and thus define the strategic axes for the next five years. The same plan had to take into account the Axa group's global objectives, quality and profitability requirements, plus clarify the strategic axes with a ten-year future timeline. For those familiar with the insurance industry, note that this exercise took place two years before the AXA / UAP merger.

The procedure adopted by Axa France provides a textbook example of how the practice of *la prospective* has developed and how it is integrated into the planning process. In this example, we had very little time in which to work. We did not want to rush AXA to thoughtless action, though we believed that we could meet their needs. The principal problem for us became then: How then can we deliver a relevant, coherent and realistic study on the uncertainties and major trends of the future in the small time frame allocated? In other words, what can we really achieve in six working meetings?

Actually, for a relatively recently formed group like Axa France, marked by rapid integration, several acquisitions, shifting structures, and heavy decentralisation, it would be impossible to carry out the 'full procedure' using a specialised department and taking executives from various subsidiaries away from their responsibilities for the entire process. The objective was to get general management actively involved. The ultimate goal was to set a common strategy. To achieve this end, we needed to approach the future with a common vision, which would identify threats, opportunities and potential ruptures so that the corporation would be ready to confront unexpected changes, and would be

[10] This strategic group process had been led by members of the French Management Committee from March 1994 to December 1995 under the direction of the Budget Plan (Benassouli, Monti, 1995).

prepared to foster desirable changes while combating undesirable ones. The task was to construct scenarios for Axa France with a horizon of 2005.

Frame 3 - One Approach for Constructing Scenarios

Axa France case study

1) Hold prospective workshop: participants acquire analytical methods, identify and rank factors of change affecting Axa France. Participants select the most influential components for the future of Axa in France (mid-March 1994)
2) Construct broad scenarios within small groups (April-June 1994)
3) Synthesise results of the various working groups and construct the scenarios (June 1994)
4) Survey evaluating the future of the insurance industry in France (July-September 1994)
5) Determine probability, select and analyse scenarios (October 1994)
6) Select the principal scenario and identify alternative hypotheses (November 1994)
7) Present the principal scenario and alternative hypotheses to the different subsidiaries (December 1994)
8) Appropriate and integrate the main scenario and alternative hypotheses according to the needs of the various subsidiaries (January 1995)
9) Draw up a plan in each subsidiary (February-June 1995)
10) Arbitration and allocation of resources (4th quarter 1995)

Given the nine-month timeframe, we opted for two basic prospective tools: structural analysis to find key variables, and the interplay of actors 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 (transparency).

The Proper Use of Methods

Over the past twenty years, the overall, systemic and long-term state of affairs has become important—in other words—the big picture. With the exception of the Mactor method for issues analysis and the interplay of actors, standard methods for futures research have experienced little significant progress but have been widely distributed by means of multiple applications. It all happened as if practitioners had followed J.-N. Kapferer's recommendation: "*An operational imperfection is better than a perfection that doesn't exist.*" Indeed, to broach complex problems, what are needed are simple and accessible (appropriable) tools.

Increasingly, *la prospective* takes the form of collective thought—a mobilisation of minds in the face of change within a particular strategic environment. *La prospective* is enjoying more and more success with regional organisations, local communities and corporations. If some satisfaction may be found in this trend towards greater distribution and appropriation of *la prospective*, a field formerly restricted to specialists, there is also some regret that methodological weaknesses survive, and even thrive.

More serious is the marked decline, especially in the United States, in rationality in favour of intuitive approaches whose commercial success does not justify their drawbacks. Indeed, if we were to follow the procedural rationality of Simon (Simon, 1982), a futures study must remain heuristic, as opposed to algorithmic or "gut feeling"—in other words, an approach that does not reject formal tools when useful. From this point of view, constructing scenarios is often presented as they are in *The Art of the Long View* (Peter Schwartz, 1991). A summary of this methodology is treated in the last section of this working paper. The philosophy of the GBN approach, presented by Peter Schwartz, is close to that which we advocate but the technique is less reproducible due to the lack of formal procedure. This decline in formalisation, as we call it, is accompanied by collective amnesia that includes forgetting important terms and contributors. [11] Far too many budding strategists launch themselves into scenario-building without having integrated the accumulated legacy of the profession into their work. Little wonder that they look surprised when someone asks them about morphological analysis or scenario probabilisation. They usually reply, "What's that?"

Jacques Lesourne's (1989) plea for research into prospective was (and still is) all the more justified in that simple tools are often confused with simplistic ones. Let's recall that the scenario method, as it was designed over twenty years ago, remains as useful as ever and has the great merit of imposing intellectual rigour as seen in the qualitative and quantitative analysis of prevailing trends, retrospective techniques, interaction of players, identification of the seeds of change, tensions and conflicts, and the construction of complete and coherent scenarios.

Some tools specific to *la prospective*, such as structural analysis, are currently experiencing an almost disquieting success for those who have worked on developing them. Structural analysis is too often applied in a mechanical manner that lacks usefulness and works to the detriment of profound reflection. The lesson to be learnt from all this is that time is needed before a tool comes into common usage (almost twenty years) and even more time is required for them to be used correctly. It is also useful to provide a section on pitfalls within the user manuals of these tools, so that neophytes will be able to use them most effectively.

Scenarios: Use and Abuse

The very use of the word "scenario" may prove dangerous for *la prospective*. There is always the risk of an approach being swamped by media success with little or no respect for its scientific grounding.

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[11] This is why we had initiated (in 2004) the project called *"Mémoire de la prospective"* (Record of strategic foresight) consisting of promoting and distributing the fundamental concepts of *la prospective*. This project was launched for two reasons; (1) inaccessibility of certain publications of the last 50 years (out-of-print or difficult-to-find texts). The lack of available resources is a major source of ignorance among those who are supposedly practicing the state of the art. The content and the management of this project are done by a group of French researchers (Commissariat Général du Plan, Datar, Futuribles et Lipsor) and those from around Europe (Collège européen de Prospective territoriale). These contributors have an ongoing commitment to both clarify and make available resources related to strategic foresight. Part of this work includes; developing software, creating a glossary of strategic foresight, conducting interviews, making texts available online (see www.laprospective.fr and see the tab called "Memory of Prospective")

Frame 4 – An Example Using Scenario Building to Reduce Collective Biases at the French Iron and Steel Industry

Between 1990 and 1991, several months of engagement in strategic group process on the future of the iron and steel industry in France (horizon 2005), enabled participants to identify six relevant and coherent scenarios constructed around three general hypotheses: H1 (low GDP growth, below 1.8%); H2 (severe constraints on the environment); H3 (strong competition from substitute materials):

- Black (S 1) poor growth in GDP and strong competition from materials
- Morose (S 2) poor growth in GDP with no strong competition from others materials.
- Trend-based (S 3) continuation of the current situation.
- Ecological (S 4) strong constraints from the environment.
- Pink Steel (S 5) strong growth of GDP and competition favourable to steel.
- Pink Plastic (S 6) strong growth of GDP and competition favourable to other materials.

Use of the Prob-Expert software enabled participants to identify six scenarios which covered 40% of the field of probables:

- S5 Pink steel and S4 Ecology (010) = 0.147
- S1 Black (101) = 0.108
- S6 Pink plastic (001) = 0.071
- S3 Trend-based (000) = 0.056
- S2 Morose (100) = 0.016

Three new, far more probable scenarios thus appeared which the experts had not even selected, let alone identified, because these scenarios went against implicit or shared conventional thinking. This type of consensus, all the stronger since it remained unstated, is the source of major collective biases.

Of the three remaining hypothesis configurations (60% of overall probability), each has an implementation probability superior to the most probable of the scenarios previously retained.

- S7 Ecological black (111) = 0.237
- S8 Steel green (110) = 0.200
- S9 Plastic green (011) = 0.164

The pair (111) in the two scenarios (S7 and S8) had been eliminated because, in a context of low growth, serious constraints from the environment seemed to be an improbable luxury. The pair (11) had also been eliminated because serious constraints from the environment (H2) seemed somewhat favourable for steel. But why did no one imagine plastics that could be bio-degradable with greater efficiency as suggested by scenario (11)?

Let's consider two preliminary questions. Does using the term “scenario” to mean any combination of hypotheses, however attractive they may be, confer a degree of credibility to the solution? Do futures studies necessarily require full and detailed scenarios? The answer is most assuredly: “No!” on both counts, as "*la prospective*" and "scenario" are not synonymous.

In other words, one must ask the right questions, clearly formulate the right hypotheses and ascertain the coherence and probability of possible combinations. Without this procedure, one risks omitting 80% of all possible futures. With probability tools, such as the software *SMIC- Prob-Expert* (see Frame 4), it takes only minutes to provide results.

A scenario is not a future reality, but rather a means of representing the future in order to clarify present actions in light of possible and desirable outcomes. Pragmatism combined with some concern for efficiency, should guide us as we develop our story. Scenarios have neither credibility nor utility unless they respect the following five conditions for rigour; relevance, coherence, likelihood, importance and transparency.

Oddly enough, certain strategists refuse to submit their own thoughts on a particular issue to a software system which would at least reveal contradictions or reduce the incoherencies in their reasoning. In some respects, they're right. Probabilisation should not lead a team to dismiss potential wildcards events which despite their low probability, could nevertheless have a huge impact. Another indispensable condition for the utility and credibility of scenarios is transparency throughout the entire process which implies that: "a concept worth pursuing is one that can always be stated clearly…" (Boileau). This should be the case for any problem, for the methods used to solve it, for the reasoning behind it, as well as for the results and conclusions of the scenarios envisioned. Unfortunately, either the simple reading of scenarios proves laborious because the reader must invest considerable effort in ascertaining the prerequisite conditions (lack of relevance or coherence) or the literary quality is so low that the reader finds the text indigestible and sets it aside. A number of scenarios which do not meet these conditions remain credible anyway i.e., they are given the benefit of the doubt. It is as if the reader were left feeling guilty about not finishing the text.

Without transparency, the results will not be appropriable and will not motivate those involved in developing the scenarios. Naturally the transparency and attractiveness of scenarios do not ensure quality of strategic content. Some scenarios with catchy titles, and presented in either a utopian or dystopian style - such as Alvin Toffler's "Future Shock " (1971) or George Orwell's "Nineteen Eighty-Four"- can be quite entertaining. Nevertheless, they rarely contain relevant, coherent or even likely scenarios.

By replying negatively to the second question about full and detailed scenarios, we want to make it quite clear that anticipation and scenarios are not synonymous. Too many futures studies become bogged down over time because a group decided to launch into "the scenario method". But why, we may ask, did they do so? A scenario is not an end in itself; it only becomes meaningful when its results and implications are embodied into real action. Undertaking a scenario approach is time consuming (12 to 18 months is not uncommon) and there must be several persons involved, to establish a team context and make the process viable.

In fact, after three years, the leaders of the OECD (1976-1979) Interfuturs team (Lesourne, Malkin, 1979) announced that they had had insufficient time to finish exploring their scenarios. Of course, we can safely add an extra year for circulating the results after the exercise.

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

In this case, 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, especially given the short timeframe. On the other hand, limiting the number of scenarios to four by combining two hypotheses, as the GBN or SRI methods advocate, is far too reductive. Scenarios constructed around five or six fundamental hypotheses, set the background for further strategic thinking focused on rather 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 actors 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 major organisations—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.

Some Simple and Appropriable Tools: The Strategic Prospective Workshops

If *la prospective* needs rigour to broach the complexity of contemporary problems, its tools need to be sufficiently simple so as to remain accessible to those to would use them. Since the mid-80s, we have developed workshops which were set up to respond to these concerns.

Before diving headlong into a futures 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 futures 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 limited to the time and means allocated for the study.

Frame 5 — The Launching of a Strategic Prospective Workshop

The ANAH Case Study

In the beginning of 2001, we were commissioned by the Comité de Direction de l'Agence

nationale pour l'Amélioration de l'Habitat (ANAH), 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, cites, 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 organise 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 la 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 *la prospective* and lead the successful reorganisation of this state agency [12].

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 people 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 organisation's priorities, objectives, as well as which methods of *la prospective* (strategic foresight) 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

[12] An entire foresight process carried out at ANAH is presented in detail in *Cahier du Lipsor* (Cordobes, Durance, 2004).

indispensable for the effectiveness of the meetings. Without method there is no common language of exchange, no coherence, no structured ideas.

However, the method is not an end it 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 tools 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.

Regional Foresight: Some Recommendations

We have had various opportunities to hone and test the tools mentioned thus far in several futures-thinking exercises (Loinger, 2004) on territories as diverse as the Basque region 2010, Reunion Island, Lorraine 2010, Ardennes, Ille-et-Vilaine, Pyrénées Atlantiques, to name but a few. In this section, we would like to draw several lessons from both their successes and failures.

More than twenty years after the first law of decentralisation, French regions become major political players and began to take their future in their own hands. In the regional context, public action must, more than ever, be clarified by light of possible and desirable futures (Bailley, 2005). However, it would be vain to lead these futures studies simply to record the declining economic indicators of the regions under study. The appropriation of the diagnosis and the treatment is indispensable if one is to pass from anticipation to action.

The development of a region is first and foremost the fruit of its own dynamism. The multiplicity of local initiatives and the mutual symbiosis ultimately stimulate economic activity and employment. Exterior constraints, globalisation, and changes in technology are fewer obstacles to overcome than opportunities to exploit. Collective foresight, using simple and accessible methods, is a powerful lever of change in a regional context. One should keep in mind that the social capital developed around common projects is at least or more important than the actual goods or services which are produced. If "looking at the future disturbs it" (Gaston Berger), then imagining it together is already living the present differently and giving more meaning to action.

To understand each other and think together about the future, we must agree on the concepts, the ends, and even the meaning of certain words. Regional foresight (*la prospective territoriale*) can be confusing given all the popular terms such as; governance, sustainable development, regions, planning, management, projects, strategies, actors, participation, democracy, prospective, etc. These words are delightful for authors and researchers, but often perplex the practitioner. In order for the study to be effective, we need to clarify these terms and more importantly, identify the issues worth studying.

Regional Governance and Its Overly Soft Interpretations

The Commission in Brussels prepared a White Paper listing the principles of good governance applicable at all levels of government: 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 erase 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; otherwise we run the risk of diluting the definition of governance. 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 subordinate, 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 players 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. That is why a free press is an indispensible component to any functioning democracy. The Foresight section of the Economic and Social Council (CESR) of the Ile de France region claimed in a report from the year 2000 (Guieyesse) 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.

More and more the concept of governance is raised in international bodies precisely where what used to be called lack of international regulation. Furthermore, the lack of such regulation is substantial given the greater interdependence created by the globalization of local economies and the very planetary nature of problems like

environmental disasters, natural resources management, health and security issues. There is no world government, so the term 'world governance' is really a misnomer.

Frame 6 — The Three Colours of the Greek Triangle & the Three Phases of Regional Foresight

The three colours of the Greek Triangle (blue of Anticipation, Yellow of Appropriation, and Green of Action) permit one to organise *la prospective territoriale* (Regional Foresight) in three distinct phases, characterised by three different documents.

- The Blue Book. This document provides a global vision of the past, present and future of the region. Relying on a synthesis of key data, it includes the elements of the 360° diagnostic. It also raises controversial points and teases out the probable trends, major uncertainties and the possible risks of rupture. This monograph, for the most part, could very well be sub-contracted to external consultants.

- The Yellow Books. These documents, in which each operational centre makes its proposals for local action to prepare for the overall changes foreseen in the Blue Book (pre-activity), but also to achieve the strategic objectives and local projects (pro-activity). These Yellow Books can be prepared by departments in enterprises or in local and regional authorities, and embody the collective ownership of the forward looking regional foresight;

– The Green Book. This document lays out a global strategic plan for the region. Each objective is associated to a particular action. This document is the result of a synthesis of the Blue and Yellow Books. The Green Book is a strategic document which is aimed at engaging the leaders and elected officials and is therefore developed by them.

Too Many Scenarios and Not Enough Endogenous Projects

One aspect of *la prospective* that must be mentioned here is the systematic use and abuse of scenarios. With respect to regions, rather than learning from the past and analyzing regions comparatively in order to shape development, many forget that *la prospective* (foresight) and scenario are not synonyms. Actually, scenarios hold little interest if not relevant, coherent, and likely for the region and its population. Here we remember one of our own rules: Ask the right questions. Granted, drafting desirable scenarios as a group may serve a therapeutic purpose; however, in this case, the resulting scenarios are less important than the collective effort itself. Once a group has decided to consider the future together, it might as well ask the right question(s). Furthermore, the group might as well begin with those questions for which there is little consensus. Why? Tackling contentious issues tends to shake up the established order and break participants out of their usual patterns of thinking.

The processes of *la prospective* (foresight) and those of strategy, however related, are distinct and correspond to two different phases respectively; that of anticipation and that of preparation for action. 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 *la prospective* doesn't impose a particular strategic orientation or limit freedom of choice, it merely informs executives around important decisions.

The use of scenarios becomes abusive when the team begins with the question (Q1) *What can happen?* This natural query leads regions, like companies, to remake their world and in so doing, forgetting to ask the essential prerequisite question (Q0) *Who are we?* which implies identity, history, strengths and weaknesses.[13] We tend to forget the admonision inscribed on the face of the temple of Delphi: *Know thyself*. 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.

In both regional and corporate foresight, the essential prerequisite question suggesting self-knowledge, history, and desires for the future tends to be forgotten. Ironically, this question remains essential if we consider that the factors of development are endogenous. Considering the 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 strategic foresight upstream.

The future of regions is open. Moreover, it depends less on prevailing trends or any sort of fatalistic determinism, and more on the ability of the actors to unite in collective effort and build what we wishfully call 'a society of projects'.

A New Path: The Common Future of a Supply Chain

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 as BASF wanted to strengthen, in a lasting way, their relationships with both their suppliers and their customers; from pitchfork to table fork.

The approach taken by the Agricultural division at BASF and its principal clients

[13] This five-step process rather than the usual three-step promoted by most authors of strategy stems from my collaboration with Hugues de Jouvenel and Jacques Lesourne in September 1997. When my first textbook on strategic foresight came out we realized that there was a (Q0) which we ourselves forgot at the first meeting. It just proves that no one is immune to blind spots, especially when directly involved in a project. Michel GODET (2001)

is noteworthy in several regards[14]:

- as far as we know, it was the first time that an enterprise had chosen to engage its partners in a foresight study, in order to build a common future together.

- the process was undertaken by the executives themselves, and therefore they had a stake in the success of the project. This corresponds to what we call excellent appropriation.

- the instigator of the project, the Agricultural division of BASF, did not impose any agenda, nor did they insist on any censure of the participants during the workshops, nor after, when it came time to distribute the group's report.

- BASF had already done a complete revision of its strategy, and so was both familiar with the language of strategy and well prepared to engage its partners in developing a veritable ethic of collective development.

- finally, this exercise is noteworthy because of its exemplary use of some of the principal methods of *la prospective* (morphological analysis to construct scenarios, interplay of actors, tree of competencies, multicriteria analysis). Working with such a strategy savvy client also allowed us to organise and structure the process in a limited number of intense sessions.

Let's recall that *la prospective*, whether it be for an organisation or a region, is an opportunity to go beyond the limits and contradictions of the short-term and to set in motion among those who participate a sense of purpose and self-responsibility regarding the necessity to change ones habits and behaviours in order to affect the future.

To achieve this end, the strategist/facilitator must rely upon the talent assembled, and take advantage of the opportunity to channel the otherwise scattered talents of those implicated. The role of the external consultant must remain as limited as possible. If the consultant pretends to be a specialist in the client's domain, he/she risks being rejected by the group. The external consultant is either a process expert, or he/she simply brings fresh ideas to the group. Never forget that the best ideas are not those which one has, nor those which one gives, but rather those which one elicits.

[14] This reflection which lasted for 10 years had been the object of three distinct and complementary papers published in Travaux et Recherches en Prospective (Monti, 1996) and in the *Cahiers du Lipsor*: (Chapuy, Monti, 1998) et (Chapuy, Godet, 1999).

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- **How to avoid clichés and conventional thinking;**
- **How to make sense of the various concepts used in foresight, scenario building and strategic planning.**

Whatever happens tomorrow depends less on prevailing trends, and more on individual and collective decisions taken in the face of these trends. If the future is indeed the fruit of human desire, then we have the power to change it to organizational and personal advantage. In **Creating Futures**, ***Scenario Planning as a Strategic Management Tool***, Godet has collected an impressive arsenal of the most effective methodologies for strategic planning, some of which were developed by Godet himself and his associates at Lipsor (http://www.cnam.fr/lipsor/eng/).

In **Creating Futures**, methods are presented with lively examples and followed up with illustrative and informative case studies. Godet joins the great French tradition of humanism and rebellious rationalism by stressing the human factor while deconstructing sanctimonious clichés which hamper our creative powers. In this handbook for professionals, conventional wisdom is challenged, and rigour is reinstated.

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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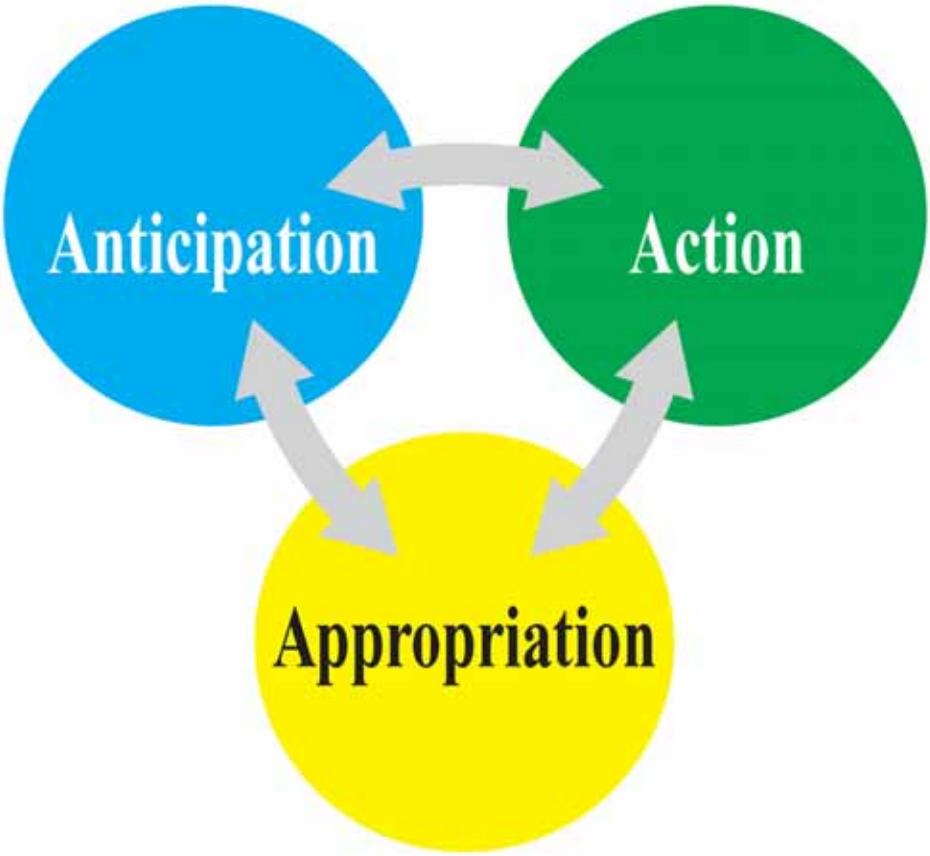
MICHEL GODET

Creating Futures

Scenario Planning as a Strategic Management Tool



Preface by Joseph F. COATES

ECONOMICA

Second Edition

The Entrepreneurs' Circle of the Future

The Entrepreneurs' Circle of the Future, created in 2003, includes some forty member companies who enjoy systematic exposure on the LIPSOR website, www.laprospective.fr (click on the tab *Entrepreneurs' Circle*), and on numerous LIPSOR publications.

The Circle has three principal objectives; (1) contribute to academic knowledge, (2) support entrepreneurship and local, sustainable development initiatives, and (3) share best practices and relevant experiences among its membership.

Since 2003, the Circle has also been engaged in the following activities:

- **Free distribution**, throughout the entire world and in three languages, of **the methods of strategic foresight** (workshops, scenarios, interplay of actors, etc.) developed by Professor Michel Godet at the Laboratoire d'investigation en prospective, stratégie et organisation (LIPSOR) at CNAM. The corresponding software programmes, developed in collaboration with EPITA engineering school, have been downloaded over 15 thousand times from the LIPSOR website (www.laprospective.fr).
- Support of applied research on entrepreneurship and the development of new activities, particularly on regional development, through the introduction of **doctoral and post-doctoral scholarships and grants** (new for 2007).
- Organization of "**Initiative Wednesday's**" (meetings dedicated to the future of business and dealing with change, as well as sharing ideas and experiences on entrepreneurship) with the Centre National de l'Entrepreneuriat (CNE, an Institute created at CNAM in 2000 and managed by Jean-Claude Bouly), la Fédération Nationale des Travaux Publics (FNTP) and Syntec.
- Development of a Forum on the LIPSOR web site allowing members to network and share information and their initiatives.

Potential Pitfalls with the Methods of Strategic Foresight

Throughout this volume, we have worked to keep *la prospective* "fresh" while underscoring the rigour applied in our approach. The fact that tested methods exist is an essential asset. The accumulated heritage of *la prospective* and strategic analysis reveals the converging forces and complementarities between these approaches along with the possibility of listing the methods in a single container or toolbox. We can thus define our problem and then look for the right tool. Contrary to popular opinion, the disorder of creative thinking does require some organization.

However useful these tools are, they are not ends in themselves, and should be applied depending upon the needs of the organisation, 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 absolutely requires collective participation. Without a common language or formal method, the work of foresight is difficult indeed. The methods we have developed here have proved useful in multiple applications—throughout France and around the world.

If these methods then permit us to structure thought while stimulating imagination, they do not guarantee the quality of the ideas generated. *La prospective* is an art which requires non-conformism, intuition and good judgement. It's not enough simply to practice scales everyday to be a great pianist, however if one is to remain a great pianist, one needs to practice scales daily. Naturally, other approaches are possible and furthermore, it's desirable for researchers to carry on the flame of innovation 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 appropriable (accessible). Complexification is not the best means to approach complexity.

To facilitate the choice of methodologies (tools), we have developed a 'toolbox' of strategic foresight which allows users to select a particular tool based upon the typology of problems which are confronted. Following the stages of *la 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 players, sweep the field of possibilities and reduce the uncertainty, establish a complete diagnostic of an enterprise within its environment, and finally identify and evaluate strategic options. We shall treat, later on, an inventory of this toolbox in the form of table which relates each tool with a particular application and will include such metadata as; the goal of the method, a description, utility and limits, practical conclusions, and bibliography.

Initiate and Model the Entire Process

The Scenarios Method

The integrated approach of strategic foresight aims to reposition an organization in its environment, all the while taking into consideration its particular competencies. The integrated approach is the result of tightly integrating previously separate methods. The objective of this approach is to propose the directions and the strategic actions while relying upon the competencies of an organization according to the scenarios of its general and competitive environment.

The scenarios method aims to construct possible representations of the future, as well as the means to achieve those ends. The objective of these representations is to highlight and the prevailing trends and the seeds of possible ruptures of the general and competitive environment.

Although there is no single approach to developing scenarios, the integrated approach which we have developed is more rigorous than most, and puts an accent on the systematic analysis of possible futures. (see figure 4)

What is a Scenario?

A scenario is an ensemble formed by a description of a future situation and the path of events which would permit one to pass from the baseline situation (most likely the present) to the future situation.

One distinguishes, in fact, two major types of scenarios:

- those constructed from past and present trends which describe likely scenarios (exploratory scenarios) which are objective and value-neutral.

- those constructed from alternative images of the future and may describe futures that are either desirable or undesirable (scenarios of anticipation or normative scenarios) and which are value-laden and conceived in a retrospective and subjective way.

These normative scenarios (often called scenarios of anticipation) may indeed be the most likely or the most contrasted, assuming they take into consideration the most probable or the most extreme among the possible hypotheses.

Instructions

The Elaboration of Scenarios Includes Three Phases

Phase 1: Construct the Base

This phase plays a fundamental role in the construction of the scenario. 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 model of a system whose dynamic

elements are linked to one another, and the system itself is linked to the larger universe beyond.

It's important therefore:

- to define the scope of the system and its 'environment',

- to determine the essential variables,

- and to analyse the strategic actors (players).

To define the scope of the system and its environment, classic structural analysis (see point 2.3) 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 favouring 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/players. These forces, often called feedback in systems terminology, may be either positive (reinforcing) or negative (stabilising). 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 point 2.4).

Phase 2: Scan the Entire Field of Possibilities and Reduce Uncertainty

Having identified the key variables and analysed the interplay of actors, it becomes possible to identify the possible futures using a list of hypotheses such as; status quo, trend reversal, rupture, etc. Morphological analysis (see point 2.5 above) permits the team to deconstruct the system under study into its essential dimensions and study possible recombinations—which may be numerous.

The 'survey of experts' methods such as Delphi, Régnier's Abacus, or Smic-Prob-Expert (see point 2.5 above) allows the team to reduce the above uncertainty by estimating the subjective probabilities of the various recombinations or a particular key events for the future.

Phase 3: Elaborate Scenarios

At this stage, the scenarios are still in an embryonic state since they are only described 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 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 number-crunching. However, data so calculated doesn't have indicative value; they simply illustrate the evolution of the system and allow the team to verify the coherence of their hypotheses.

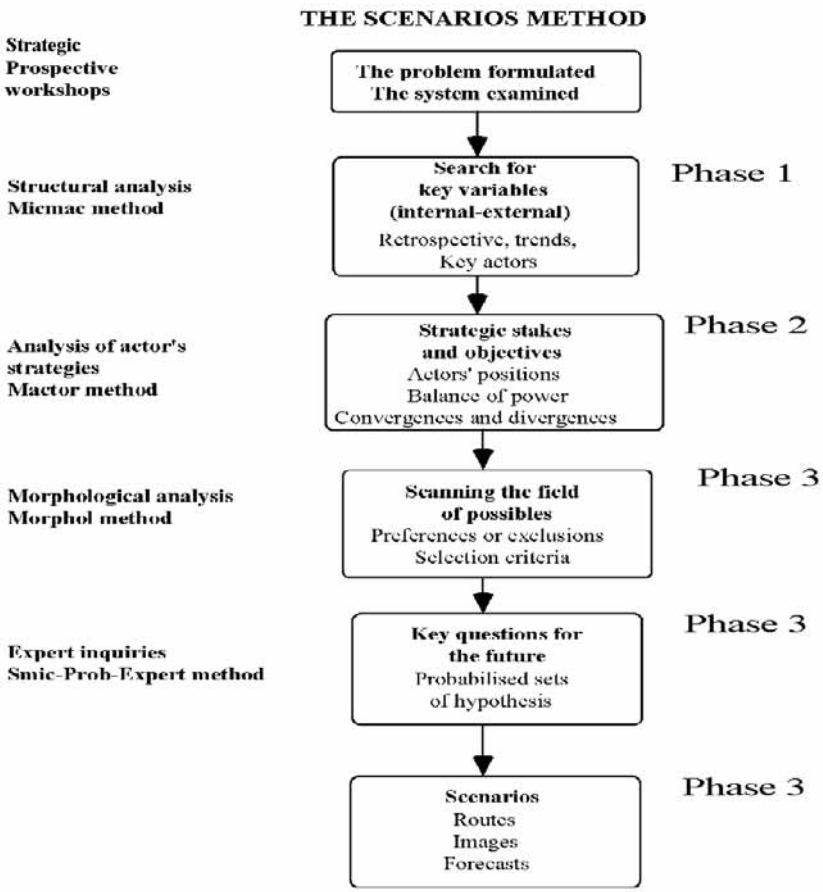


Figure 4 – The Scenarios Method

Utility and Limitations

Scenarios represent an indispensable tool for orienting strategic decision. Scenarios can aid a team making decisions by putting the maximum number of assets in their corner. The logical course of action (defining the system, retrospective analysis, strategies of actors, and the elaboration of scenarios) has been well established over the course of dozens of such studies.

However logical the course of the scenario method may be, you are not required to follow it either sequentially or entirely from A to Z. It all depends on the degree of knowledge of the user and the system under study. The scenario method is a modular approach. It is possible, so long as the need exists, to limit the study to such or such a module(s). For example, a team may employ one or a combination of tools as the need dictates. So, using structural analysis to clarify key variables, or using the interplay of actors to study those actors implicated in the system, or expert analyses to 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 the ability to drill deeper.

One of the principal limits of the scenario method is time. It takes, in general, several months to complete this method in its entirety, of which most of the time boils down to constructing the base. If it's not possible to complete the entire method from A to Z, then it's preferable to concentrate on the modules which seem most important.

Practical Conclusions

The term scenario is often used in an abusive manner to qualify any set of hypotheses about the future. Let's recall that for *la prospective* and strategy, the hypotheses of a scenario must meet five conditions simultaneously; relevance, coherence, likelihood, importance, and transparence.

Even if "scenario" and "*la prospective*" are not synonymous, the construction of scenarios often plays a central role in most of *la 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) contributes to elaborating the principal stakes of the future.

The Strategic Prospective Workshops

The goal of the strategic prospective workshops is to initiate the participants and explain to them the methods that will be used throughout the strategic group process. During this module, the participants familiarize themselves with the methods and tools of *la prospective* and collectively identify and rank the principle stakes for the future. Participants also identify preconceived ideas and possible courses to be taken. At the end of the workshop, the participants are in a good position to define the problem and chose an approach (and associated tools) which will suit their strategic needs.

Instructions

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

Most often, these workshops take place in 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 on the problem and system under study.

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

- anticipation and the mastery of change
- identifying pre-conceived ideas about the enterprise and its activities.
- competency trees, past, present and future (see point 2.2)

After the first two workshops, the principal stakes of the future as well as the preconceived ideas which deserve to be scrutinized more carefully have been identified and ranked. This third workshop is just as important. If thinking about the corporate environment is useful, then it is equally as useful consider the past and the future of that environment. These past, present and futures are represented as competency trees, wherein the team will elaborate (in the roots) the know-how, (in the trunk) the means of production, and finally (in the branches) the enterprise's markets and product lines. One discovers at this stage that memory is often erroneous and that the present is not fixed, but rather fluid. Before knowing where one wants to go, one must know from where one came.

In a second phase, several strategic prospective workshops are organised—also from two to four hours in length. Now it's time to translate the data gleaned from the first phase into objectives and sub-objectives and the means to undertake them. (see point 2.6 above)

So, the participants are not helpless here when faced with the great challenges of the future, since, in a few short hours, they can sketch out several courses of action. They are, at this point, quite close to elaborating preliminary courses of action, and also important stakes for which the need for new actions will emerge.

Regardless of the subjects treated, these workshops are organized around two major principals:

- allow the greatest freedom of expression by those involved (time for individual reflection and moments of silence, recovering all possible ideas including those written down);
- channel the productivity of participants (notably by keeping to time limits and by systematically classifying and ranking ideas).

At the end of the workshops, the various subgroups share their thoughts and compare them. At this point, they will have acquired a good understanding of the tools and the problems under study. In time, they will decide upon a common methodology for the work ahead (calling upon whichever tool(s) in the toolbox which are appropriate) according to the constraints of time, the means available, and the objectives of the study. (The correct approach is usually not apparent until after a few weeks of retrospection.)

Utility and Limitations

The strategic prospective workshops are work-training sessions, which act like training wheels for developing good foresight.

Moreover, the modular character of these workshops (several half-day sessions) allows for flexible scheduling. Furthermore, the materials required to implement the workshops are relatively simple and include; a few notepads both large and small, and some writing instruments. With the simplicity and ease of application, these workshops are not dissimilar to what Burn Nanus (1982) calls a "*quick environmental scanning technique*".

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 multiple personnel. 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.

Practical Conclusions

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.

It is desirable to have at least two subgroups that will anticipate future changes (so that the subgroups can then compare results with one another). At least one subgroup should be allocated to treating preconceived ideas and so at least some of the taboo ideas will be debunked.

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

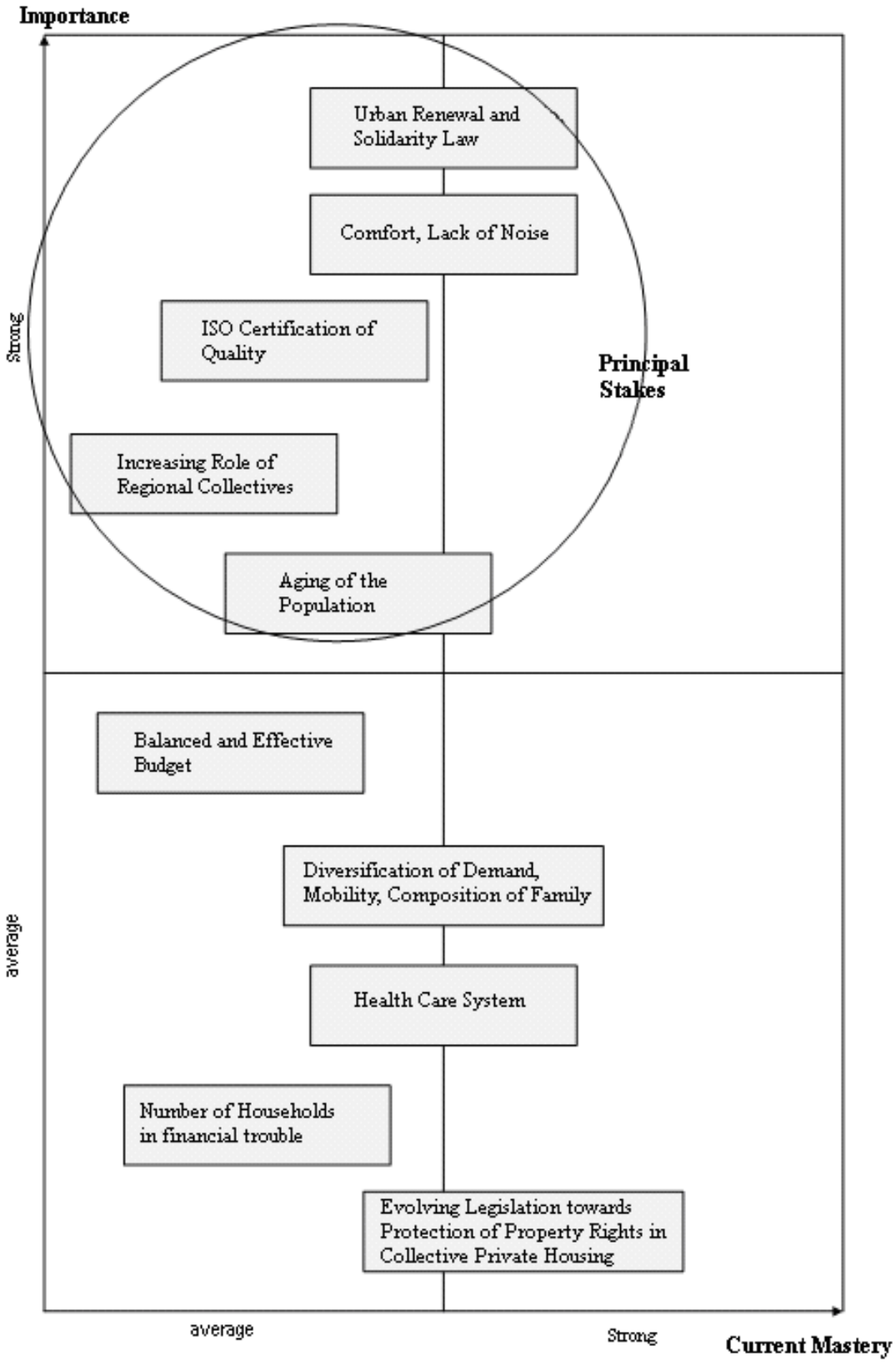

Importance
Urban Renewal and Solidarity Law
Comfort, Lack of Noise
ISO Certification of Quality
Strong
Principal Stakes
Increasing Role of Regional Collectives
Aging of the Population
Balanced and Effective Budget
Diversification of Demand, Mobility, Composition of Family
average
Health Care System
Number of Households in financial trouble
Evolving Legislation towards Protection of Property Rights in Collective Private Housing
average
Strong
Current Mastery

Figure 5 – Example of the Result of a Foresight Workshop "Dynamic and Inertial Factors" (ANAH Stakes Horizon 2010)

Create the 360° X-Ray of the Organization in its Environment

Competency Trees

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 for *la prospective* (strategic foresight), 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 the possible strategic options.

Frame 7 – The Tree of Competencies and its Dynamic

The past is singular. The analysis of the past allows the team to understand those things which do not really change, such as core competencies which have carried it to its present position. The analysis of the past also allows the team to recount the history of the organization and situate the organization within this history.

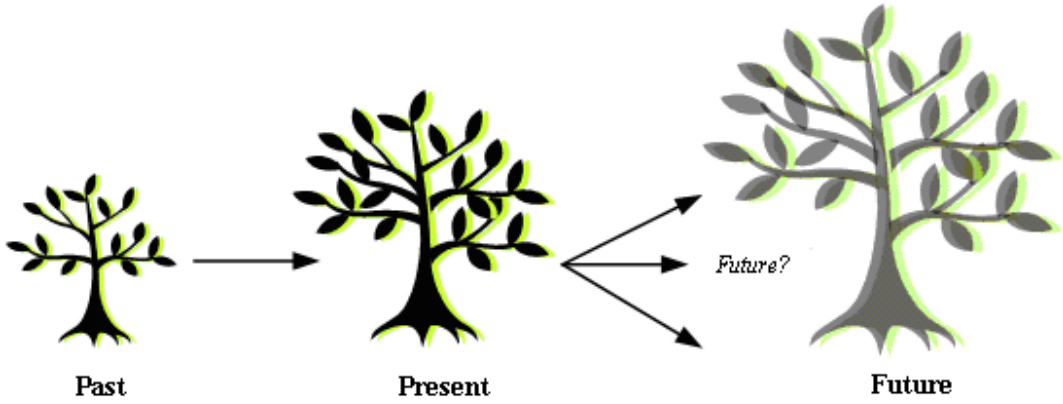


Figure 6 – Roots (competencies and *savoir-faire*), Trunk (means of production), and Branches (product lines and markets) of the Competency Trees.

The future is uncertain and its analysis allows the team to identify the risks and opportunities, and to define the stakes and the challenges. In so doing, the team is able to determine a desirable future and integrate that vision into the mission of the enterprise.

Instructions

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.

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 its competetive environment. This comparative 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.

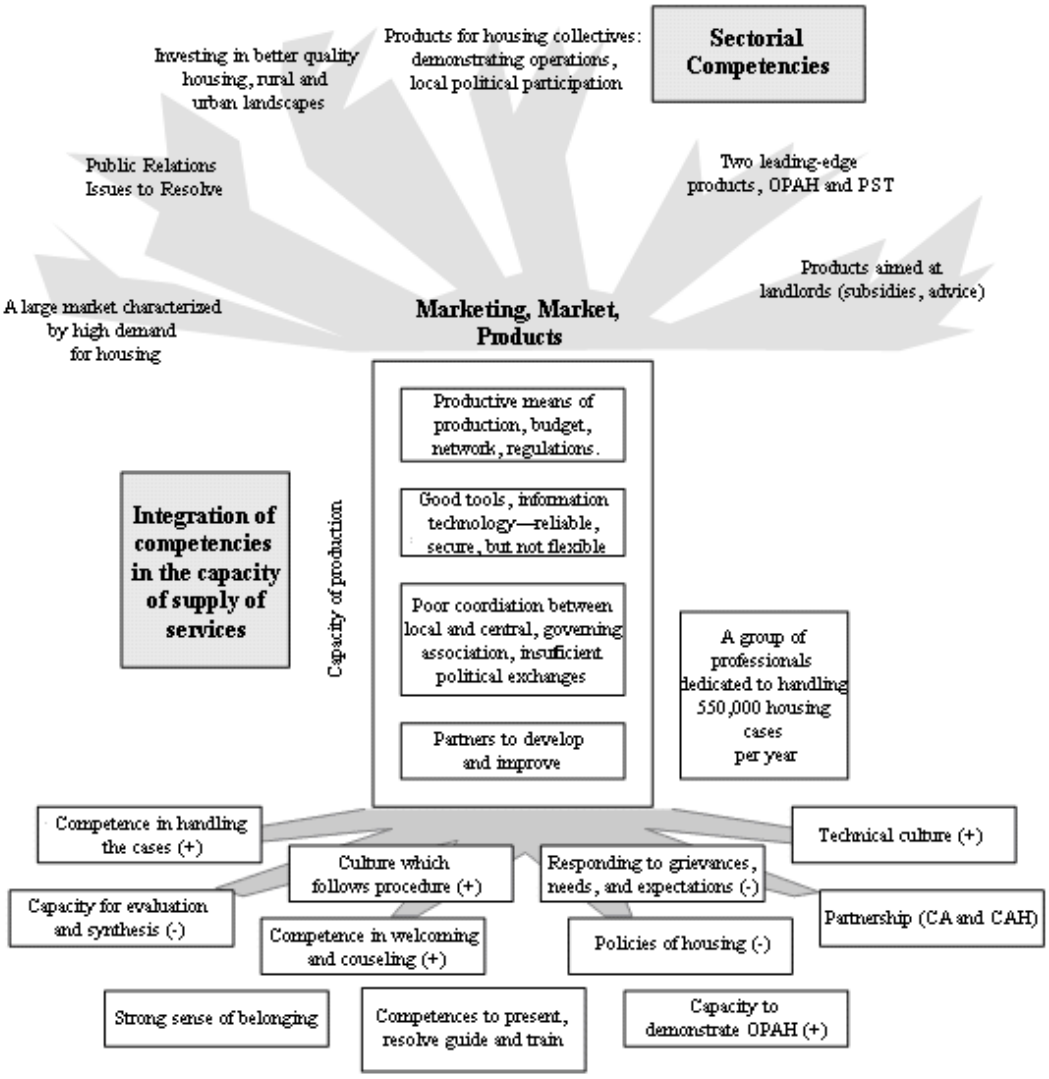


Figure 7 – ANAH's Tree of Current Competencies (Cordobes, Durance, 2004)

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 the public."

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* (The Slide rule in English) the famous store converted to selling calculators and computer products.

The image of the tree also has its limits, and is not a perfect metaphor for an organisation. 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 organisation has a certain disposition that is not unlike the genetic code in biological organisms. A pine tree cannot become an oak, nor can a cherry tree grow pears.

Practical Conclusions

This approach, formalised 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 the strategy.

For the last dozen years or so, the representations of competency trees have been especially useful as tools of collective reflection in foresight workshops (see point 2.1 above). This tool is equally useful in an industrial context as it is in a regional one.

The Methods and the Tools of Strategic Analysis

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

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 developing 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 competence).

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. 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 those studies that 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 used advisedly while keeping in mind their inherent limits.

The Strategic Diagnosis (360° X-Ray)

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 to 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.

Instructions

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 an organisation'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 labour 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 unsaleable 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 organisational 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. Although the external diagnostic is useful, it would be illusive to believe that the future of an enterprise depends only on good external strategic choices, without changing internal structures or behaviours.

Whatever uncertainties loom on the horizon, every organization is confronted with the same trends and must deal with the same ruptures in the future. Thus, as always, it's the behaviour of qualities of people which will make the difference between winners and losers in the future. This is also the reason why there are enterprises which are performing well in a so-called declining industry, and conversely, why there are

organisations 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.

Why and how can we anticipate? What are the strategic consequences and changes in the operating environment? How can we challenge and motivate the workforce? And finally, what is the future of the management? The responses to these questions are not unrelated because internal motivation and external strategy feed upon each other.

For a number of enterprises in difficulty, the shipwreck can be explained more by management's internal deficiencies than by any 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 exterior front are one in the same. The battle can only be won on both fronts, or on neither. In other words, faced with the changes in ones 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 behaviours 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, an action that does not have a goal, does not have any meaning. It's anticipation which clarifies action and gives it both meaning and direction.

Anticipation is not practiced very often among corporate executives because when everything is going well, one can do without it, and when everything is going poorly, one is preoccupied with reacting. Reactivity is certainly desirable in the short term, but is not an end in itself. Furthermore, reactivity leads nowhere if it is not oriented towards the long term objectives of an enterprise. As Seneca once said, "Not a fair wind blows for him who knows not where he goes." The foresight attitude does not consist of waiting for change to happen and then reacting; rather, it aims at mastering anticipated changes (preactivity) and provoking desirable ones (proactivity).

Environment	**Strategic Consequences**
1: Uncertainties	Flexibility, Preactivity, Proactivity, Actor's Project

2: Interdependence and Complexity	Global Vision and Simple Structures
3: International Imbalances	Regulation concerning Financial and Information Networks
4: Globalization	Internationalization of Activities, Local Roots
5: Weak Growth, Grey Hair	Struggle for Market Share, Productivity, Quality, Differentiation, Innovation
6: Technological Changes	Progress in Processes Better than in Products
7: Deregulation	New Competitors
8: Economic Diversification, Mass Production and Mass Variety	Multi-small Is Profitable, Independent Teams
9: Independence, Differentiation	Entrepreneurs, Intrapraneurs

Figure 8 — Strategic Consequences of Changes in the Environment

Change is not fatal. Everything depends on humans and their capacity to appropriate possible futures in order to act and work together toward a better one. Changes in the environment require that an enterprise respond quickly and flexibly. The structures of an enterprise will largely condition its ability to respond. Henceforth, the structures must not only adapt themselves to changes in the environment, but also anticipate it, because their inertias engender lateness in this adaptation.

The strategic consequences of changes in the environment are multiple. Without pretending to be exhaustive, we have considered nine principal trends which characterize the changes in the general environment of the enterprise and show some of the consequences for an organization and its strategy (see figure 8 below).

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 the1970s and 80s, the parcelling 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 of 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.

Practical Conclusions

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 *la prospective* (strategic foresight).

Identifying the 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.

Instructions

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.

Phase 1: Creating an Inventory of Variables

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 avenue of research.

In addition to the strategic prospective workshop (see 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. It thus recommended that the team establish a precise definition for each variable. The team should also identify and describe important derivative variables which are at the source of the principal variables, and then describe how these derivative variables are trending and how they may be likely to cause a future rupture.

Phase 2: Describing the Relationships amongst the Variables

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 "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. It also allows, in most cases, 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%.

Frame 8 — Example of How to Elaborate Hidden Variables

This example was extracted from a foresight study of nuclear energy in France in 1972. By adopting different points of view (political, economic, technological, etc.) the team created a list of 51 variables which is worth taking into consideration.

The results obtained are presented in the following way:

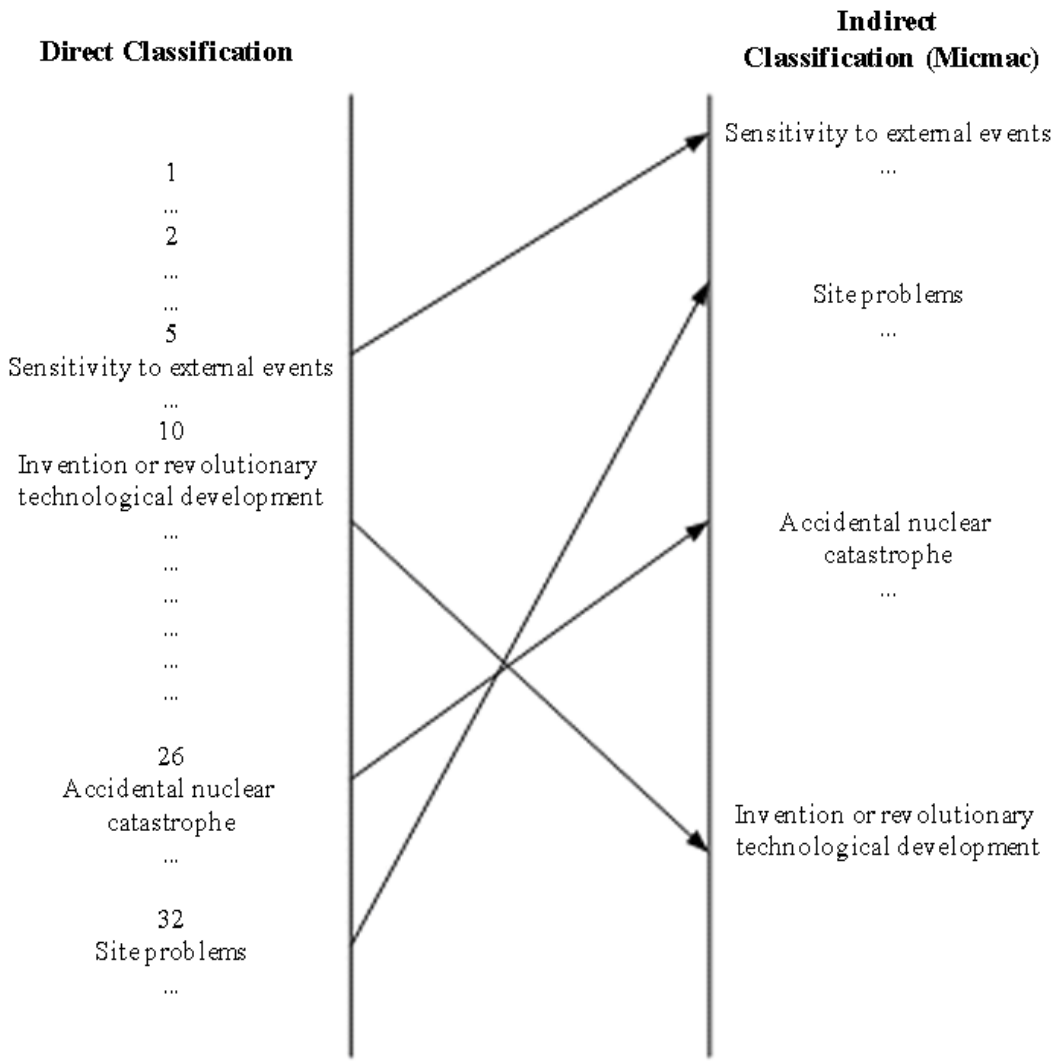


Figure 9 — Indirect Classification (Micmac) of Key Variables May Highlight Important Changes

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 "Sit 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.

Phase 3: Identifying Key Variables

This phase consists of identifying and reranking 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 analysis. 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 with the exclusive use of direct comparison.

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 identifying the most influential variables in the system, to study the different roles played by these variables (see figure 9 below).

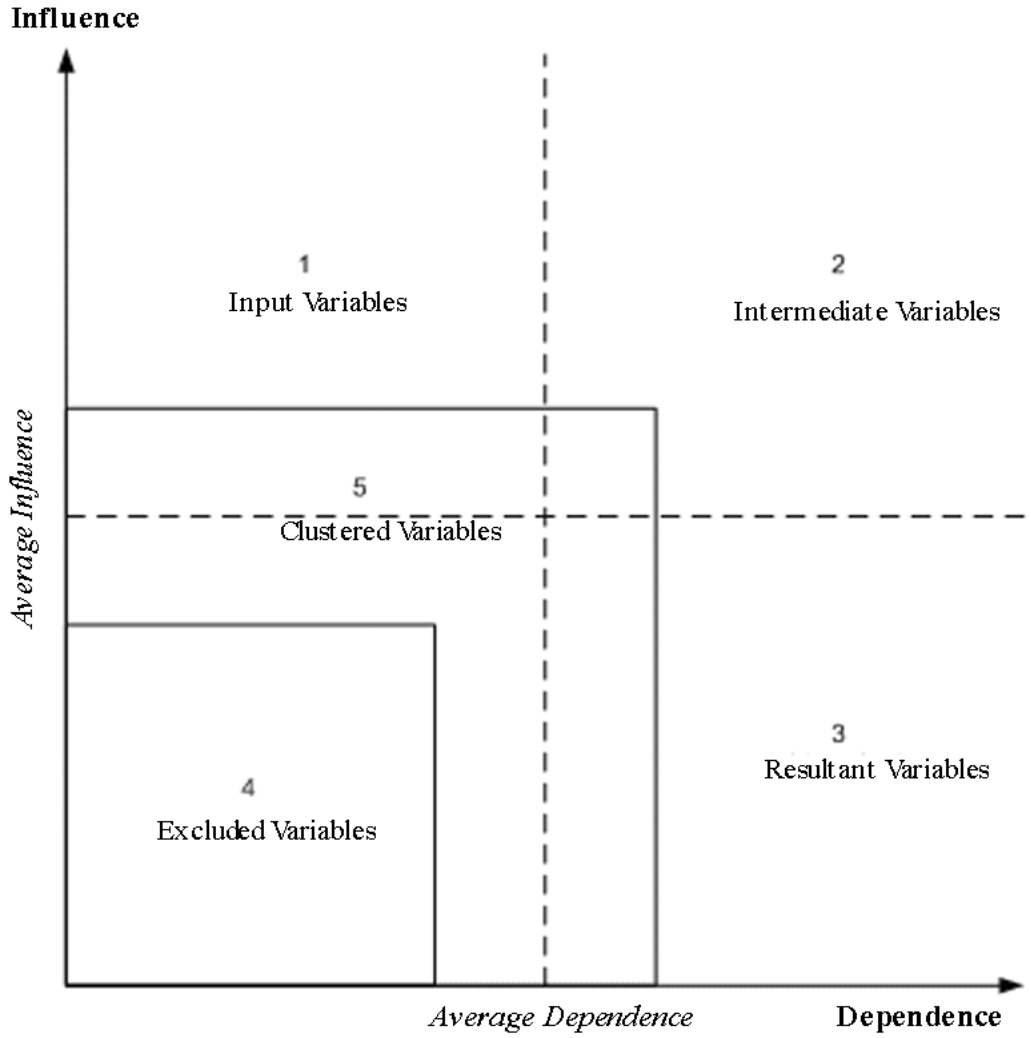


Figure 10 — Graph "Influence / Dependence"

To facilitate structural analysis, and particularly the indirect classification, LIPSOR has developed the MICMAC software (available in several languages, including English), which is available for free (see figure 10, you may download the software here: www.laprospective.fr).

Utility and Limitations

The principal utilities of structural analysis are to; stimulate collective thought, and allow the team to consider the counter-intuitive behaviour 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.

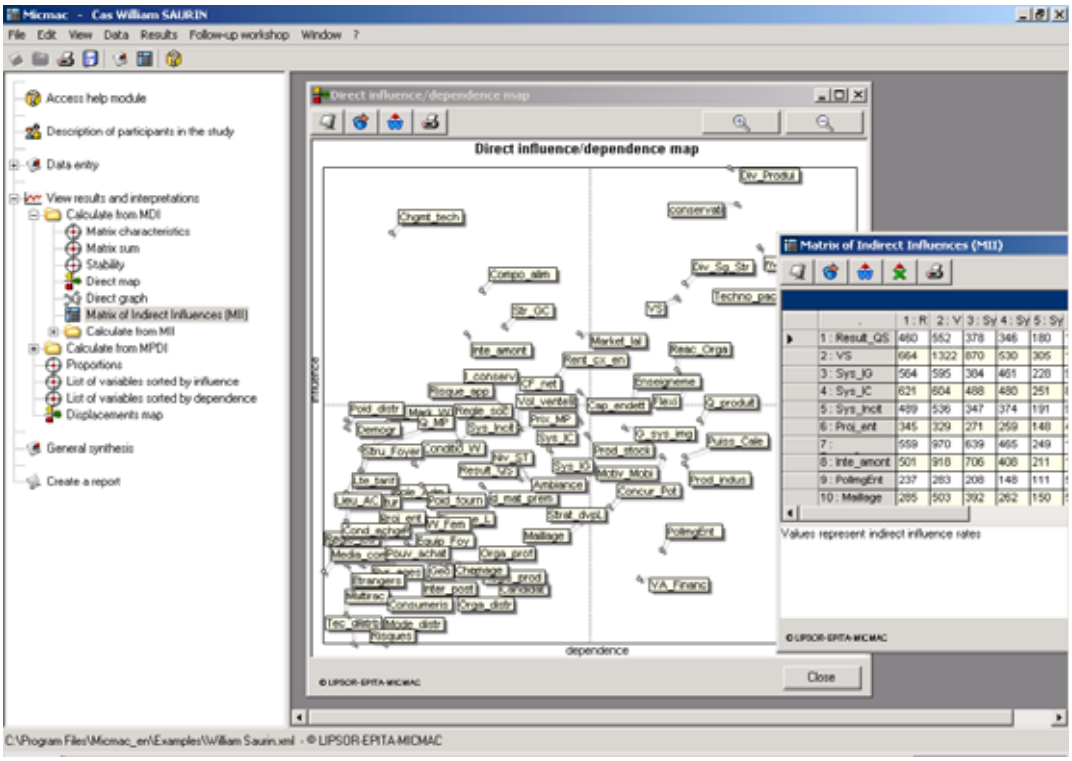


Figure 11 — The MICMAC software, developed by Lipsor, facilitates the analyses of variables.

Practical Conclusions

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.

- parcelling 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 appropriable 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 behaviour 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 judgement of those concerned.

Analyzing the Interplay of Actors

Strategic analysis of the interplay of actors constitutes one of the crucial steps of *la prospective*. It aims as 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 an actor (doesn't matter which one) to forge alliances and manage potential conflicts with other actors.

Instructions:

The method includes seven phases:

Phase 1: construction of a table "Actors' Strategies"

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 ideal number of actors is somewhere between 10 and 20).

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 behaviour (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.

Phase 2: identification of strategic stakes and objectives related to those stakes.

The confrontation of actors according to the interests, their projects and their means of action, allow the team to reveal several strategic stakes on which their objectives either converge or diverge.

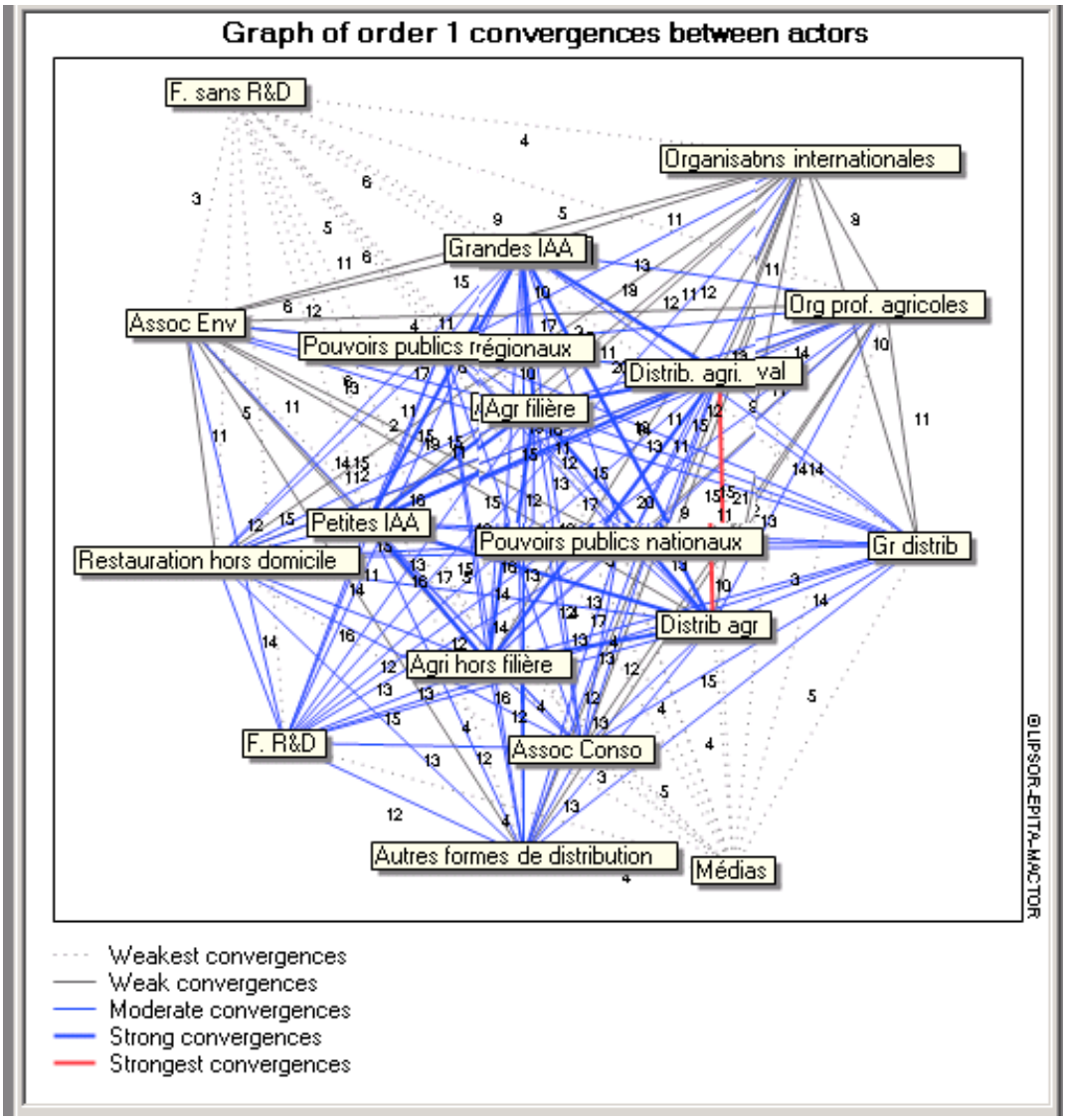


Figure 12 — Graph of Convergences between Actors

Note: this graph illustrates the absence of common objectives between the Aéroport de Paris (AP) and its guardian, the State.

Phase 3: positioning of actors in relation to their objectives and the identification of convergences and divergences.

In this stage, its about describing, at the heart of the matrix (actors x objectives), the current attitude of each actor with respect to each objective indicating; agreement (+1) disagreement (-1) or neutrality (0).

In order to inventory the possible alliances and conflicts, the method specifies the number of the objectives on which the actors, taken two to two, are converging or diverging. Two initial complete graphs of both possible convergences and divergences are then established. They allow the team to; visualize the groups of actors who have convergent interests, evaluate their degree of apparent freedom, identify those actors who are potentially most threatened, and finally analyze the stability of the system.

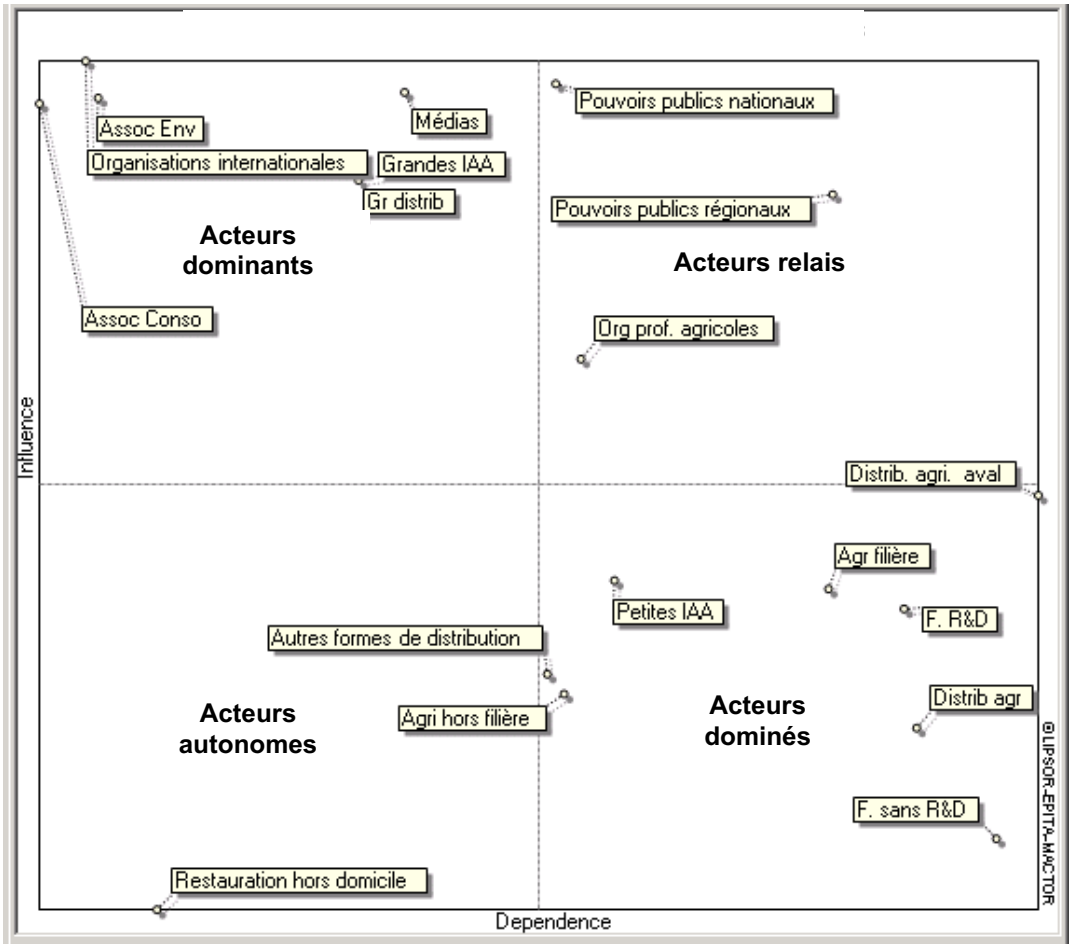


Figure 13 — Actor's Matrix of Influence/Dependence

Phase 4: The ranking of priorities of objectives for each actor.

The graphs constructed during the third phase remain rather elementary. The don't take into consideration the number of convergences and divergences of objectives amongst actors. To make this model closer to reality, it helps to take into consideration as well the ranking of objectives for each actor. The intensity of the positioning and of each actor as well as evaluating with the aid of specific scale.

Phase 5: The Evaluation of Important Relationships amongst Actors

A matrix of direct influence between actors is constructed from the table "Actors' Strategies" elaborated during Phase 1 by valorising the means of action of each actor.

The important relationships are calculated taking into consideration both the means of actions direct and indirect (an actor being able to act on another though an intermediary).

A chart "influence-dependence" of actors is then constructed. The analysis of important relationships highlights the strengths and weaknesses of each actor, their possibilities of an impasse.

Phase 6: Integration of important relationships in the analysis of convergences and divergences amongst the actors.

If a particular actor has twice as much global influence than another actor then, that means that it will also have twice as much influence on the local objectives in which it's interested. The objective of this stage is to adjust the relationships of each actor with respect to particular objectives.

Phase 7: formulation of strategic recommendations and key questions about the future.

The Mactor method illuminates the interplay of potential alliances and conflicts amongst the actors and therefore 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.

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, the software is available in several languages, including English, and is available free for download at: www.laprospective.fr).

Utility and Limitations

The Mactor method 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.

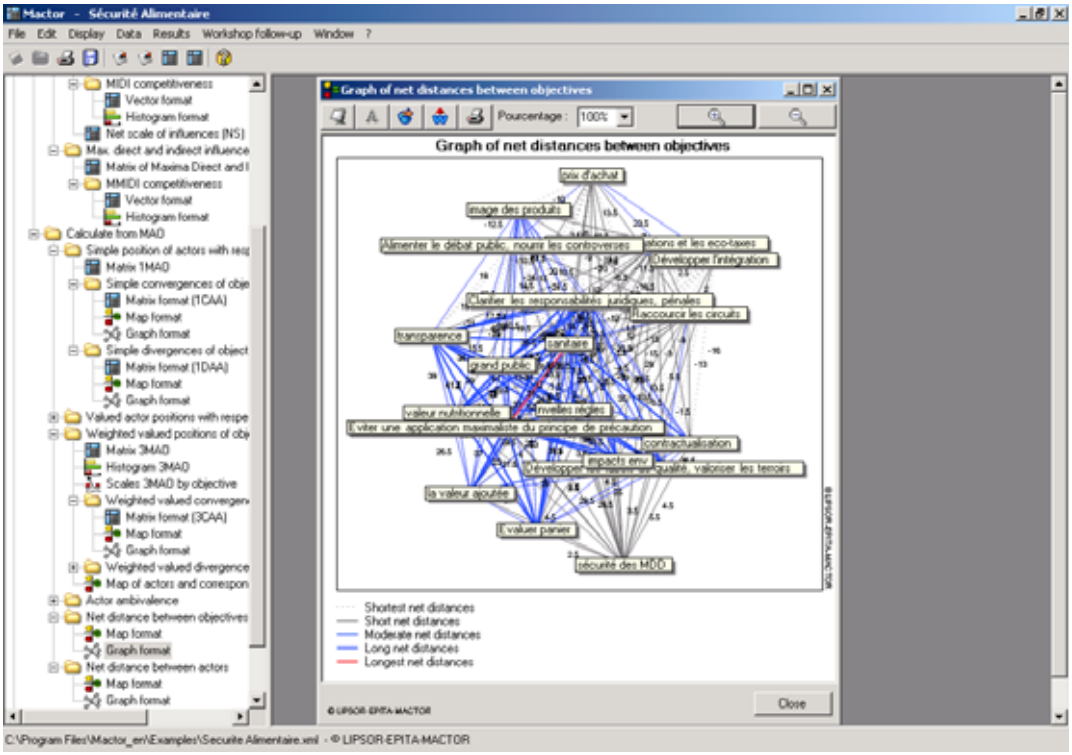


Figure 14 -- The MACTOR software, developed by LIPSOR, facilitates analyses concerning the interplay of actors.

Practical Conclusions

On a practical level, the time necessary to conduct an analysis of the interplay of actors with the aid of the Mactor method is 2 to 5 months, and 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.

Sweep the Entire Field of Possibilities and Reduce Uncertainty

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.

Instructions

Morphological analysis is a technique which was formalized by the American researcher F. Zwicky during WWII (Maurer, 2001). It includes two principal phases:

Phase 1: The Construction of Morphological Space

This first stage is concerned with decomposing the system (or function) into subsystems or components. The decomposition of a system is a delicate operation and requires serious consideration if the method is to be useful. Nevertheless, the data derived from the structural analysis may be a good reference (see point 2.3 below).

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 (see figure 15 above), 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 *x* 3 *x* 3 *x* 3 *x* 3 *x* 3 x 4). The morphological space grows exponentially and therefore there is a risk of drowning in the sheer number of possible combinations.

Each configuration of a given component should have a particular probability associated with its occurrence.

INTERNATIONAL CONTEXT OF THE EUROPEAN COMPUTER INDUSTRY ON THE HORIZON OF THE YEAR 2000 : MORPHOLOGICAL ANALYSIS

Demographic Trends in Western Countries	A1 Aging of populations Migrants control ethnic conflicts	A2 Migrant flows from east and south to western countries Integration problems	A3 New baby-boom in western countries and acceptable migration flows	
Geographical and Geopolitical Context	B1 Tensions and conflicts No regulator of interdependence	B2 Limited conflicts in the south and eastern countries Uncertainties in western countries	B3 New international order of a multipolar, interdependent world	
Role of Eastern Europe	C1 Disintegration regional wars refugees	C2 Unequal development Social and regional tensions	C3 Economic convergence and integration of the countries (east and west)	
European Integration	D1 Failure of the Europe of 12 Come back of smaller Europe	D2 Stable Europe of 12. Integration of markets only	D3 Political integration of Europe of 12 Extension to new members	
Conditions of Trade and Competition	E1 National protectionism (end of GATT)	E2 Regional protectionism (regional barriers and free trade within the block)	E3 GATT extension free trade Strong competition between firms	
Globalisation of Economy	F1 Reduced	F2 Variable according to the regions and sectors	F3 Intensive	
Annual rate of growth of the GNP	G1 Recession Less than 0.5 %	G2 Low with fluctuations 1.5 %	G3 Medium trend based 2.5 %	G4 Strong More than 3 %

Source : Godet M. et al. - "Scenarios globaux à l'horizon 2000", *Travaux et Recherches de Prospective*, n°1, June 1995.

Figure 15 -- An Example of Morphological Space

Phase 2: Reduction of Morphological Space

There remain certain combinations, or even certain families of combinations, which are incompatible. The second phase of the analysis consists of reducing the initial morphological space into a useful sub-space through the introduction of rules of exclusion and selection criteria (economic, technological, etc.). Relevant recombinations may thus be examined from this smaller sub-space.

To facilitate morphological analysis and notably, to facilitate; setting up morphological space (and sub-space), managing the rules of exclusion, and developing

selection criteria, LIPSOR has developed the MORPHOL software (see figure 15 below, the software is available in several languages, including English, and is available free for download at: www.laprospective.fr).

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 MORPHOL software is an indispensable tool in this regard.

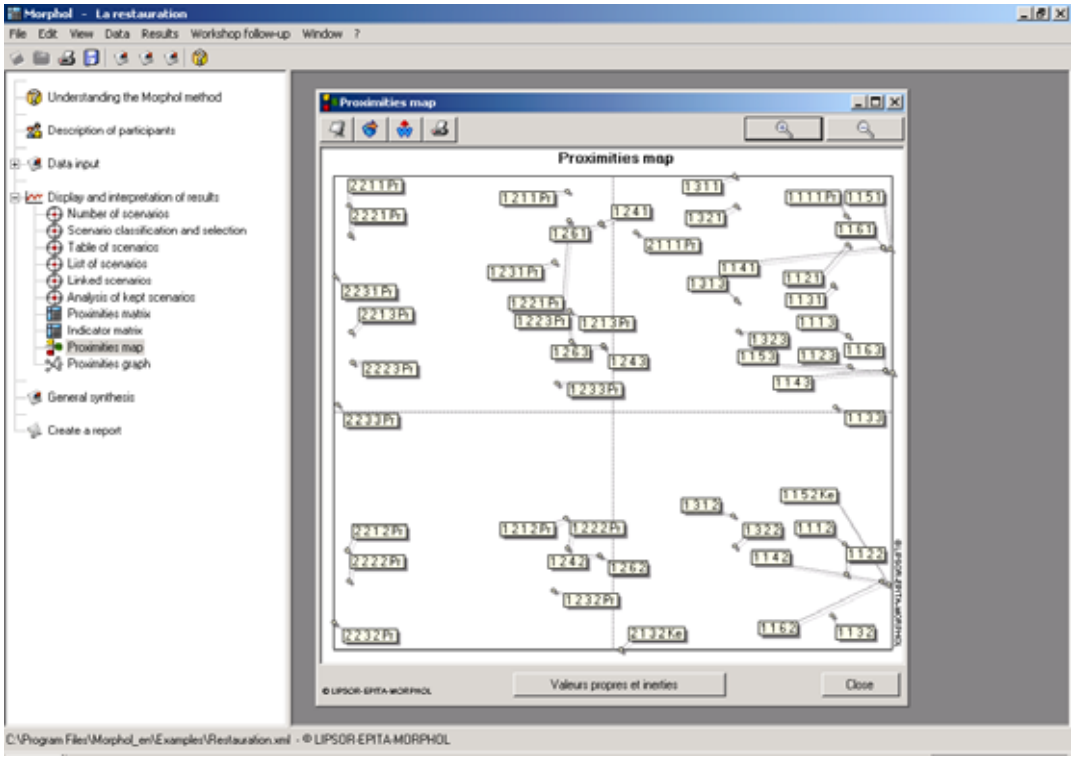


Figure 16--The MORPHOL software, developed by LIPSOR, facilitates the exploration of possible scenarios through the recombination of system components.

The first limitation of morphological analysis issues from choice of components. By omitting a component, or simply an essential configuration for the future, one runs the risk of ignoring an important set of possibilities (which are not static, but rather evolve over time).

The second limitation of morphological analysis comes from the sheer number of possible combinations, which can very quickly overwhelm a user. Experience has shown that the prudent use of both rules of exclusion and selection criteria will result in a manageable sub-space.

Practical Conclusions

Morphological analysis is a method that is rather simple to apply, but has some risks related the overwhelming exponential nature of combinations. It's important that the team not lose sight of the fact that the construction of scenarios is a simply a means to an end. The end, of course, is a strategic plan which will lead to action.

The Delphi Method

Developed by Olaf Helmer[15] 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.

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 has been modified numerous times. Nevertheless, we will present the original, unaltered method here.

Phase 1: The Formulation of the Problem

This is a fundamental step is 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).

Phase 2: Choosing the Experts

This 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.

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[15] Former RAND analysts, inventor of the Delphi method along with Norman Dalkey. Olaf Helmer is also the inventor of the cross-impact method (in 1966 along with Theodore J. Gordon) in which he conceptualized a set of forecasts. Theodore J. Gordon et Olaf Helmer are also the authors of the famous Research Report on a Long-Range Forecasting Study (RAND Corporation, 1964). Olaf Helmer is also the author of Looking Forward (1983) and the co-founder of the Institute of 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 fashion. Doing so, also avoids distorting the expert opinions by a leading opinion.

Phase 3: Distributing the Survey and Collecting the Results

The questionnaire is sent to the experts (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, 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

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 methods (see example above).

Practical Conclusions

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 without a doubt the technique which for 40 years, has been the subject of a number of important applications throughout the world. 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.

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 coloured voting ballot. "A new approach to interactive communication, Régnier's Abacus, uses a coloured 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 colours 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 coloured scale.

Phase 1: The Gathering of Expert Opinions

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). These items then, will be posed as affirmations. Each expert will respond individually to the questions posed in the affirmative using Régnier's coloured scale.

Phase 2: The Treatment of Data

This phase consists of treating the coloured 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. (see figure 17 above).

Phase 3: Discussing the Results

Using this coloured matrix, the experts debate the problem(s) under study. An expert may, at any moment, change the colour 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.

Practical Conclusions

Régnier's abacus is a registered trademark whose products are distributed by the E-motive company under the name ColorVote©. After having existed in a manual form (with the aid of a coloured, magnetic matrix), the abacus is now completely automated, accessible online, or through the use of software which allows for wonderful coloured 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).

Smic-Prob-Expert: (Systémes Méthode d'Impacts Croisés PROBabilistes)

The Smic-Prob-Expert method aims to determine simple and conditional probabilities of hypotheses and/or events, as well as the probability of specific combinations of hypotheses and/or events. Smic-Prob-Expert 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.

We're referring here to one of these methods, Smic-Prob-Expert. Practically, if one considers a system with n hypotheses, the Smic-Prob-Expert permits one to choose, from the information supplied by the experts, among the 2n possible images, those which

should (taking account their probability of occurring) all be studied. Smic-Prob-Expert therefore consists of delimiting the most probable futures which will serve as the basis for the construction of scenarios.

Phase 1: Posing Hypotheses and Selecting Experts

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 point 2.3 below) or the interplay of actors (see point 2.4 below) 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 below).

The survey asks the experts to:

- determine the simple probability of the occurrence of a particular hypothesis with the aid of a scale between 1 (very unlikely) to 5 (very likely);

- determine the conditional probability, the occurrence of a hypothesis according to the occurrence or non-occurrence of other hypothesis.

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

Phase 2: Assigning Probabilities to Scenarios

This phase consists of analyzing the raw data:

- correcting the opinions of experts in such as way as to obtain the coherent, net results (i.e. satisfying classic rules of probability);

- affecting a probability of each of 2^n possible combinations given n hypotheses.

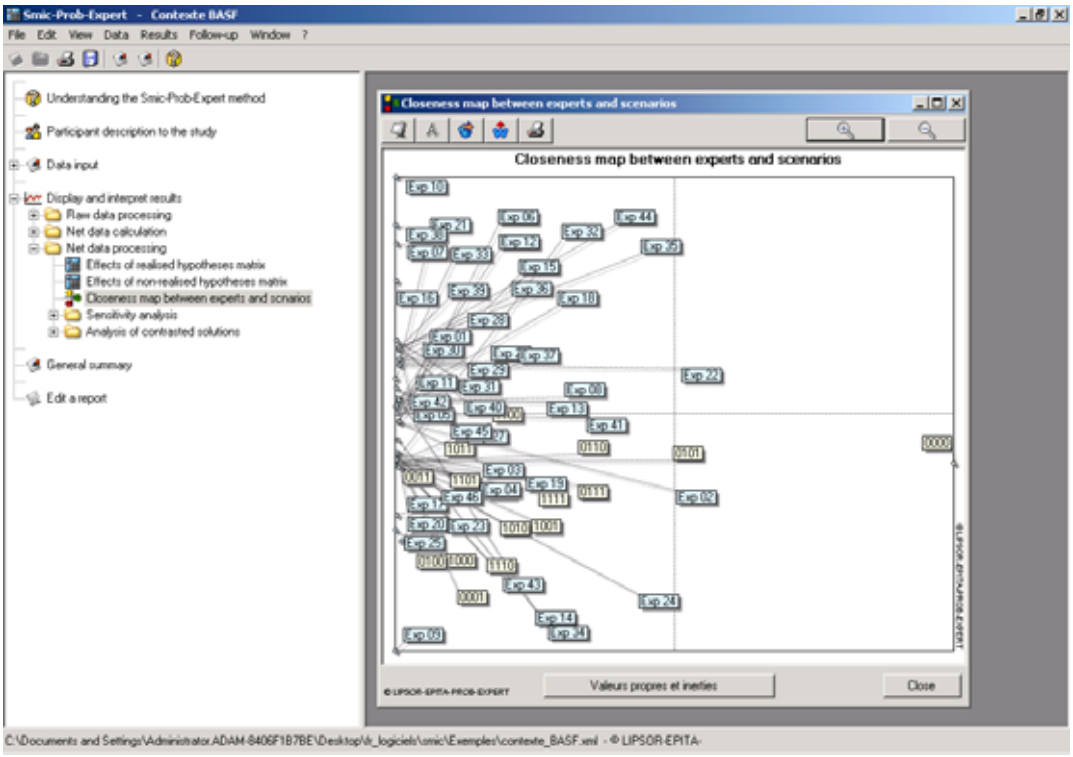


Figure 17 – The SMIC-PROB-EXPERT software, developed by LIPSOR, shows which scenario is associated with which expert.

Taking the average of the probabilities assigned to the 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 behaviour of actors. It concerns the scenario method (see point 2.1)

To facilitate the probabilisation of scenarios, Lipsor has developed the SMIC-PROB-EXPERT software, which is available for download free-of-charge. (see figure 18 above and www.laprospective.fr).

Utility and Limitations

The so-called "probabalised 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.

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.

Practical Conclusions

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.

Evaluate the Choices of Strategic Options

Trees of Relevance

Within the scope of the integrated approach, 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.

Phase 1: The Construction of the Tree of Relevance

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.

- The construction of this tree, which may appear deceptively simple, must respect certain criteria;

- There are no relationships between the nodes belonging to the same level (independence of nodes).

- There are no direct relationships between nodes belonging to non-adjacent levels.

- The levels must be filled-in equally from top to bottom in order to stabilize the model—what one looses 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).

Phase 2: Noting the Graph and the Aggregation of Data

The object of this 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 (i-1) conveys its contribution to the realisation of actions in the level directly above it (i).

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

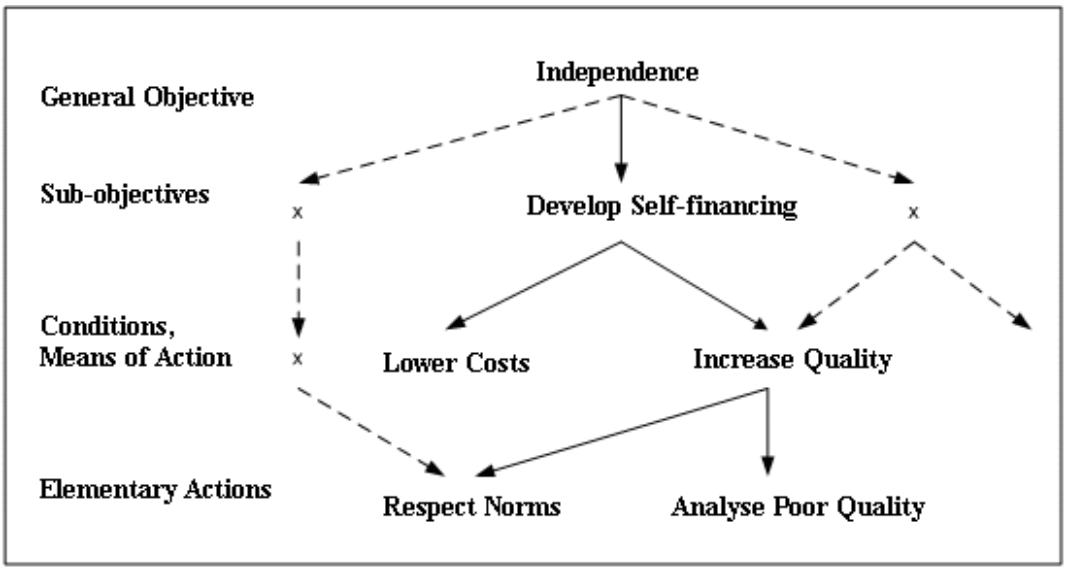


Figure 18 — Example of a *Tree of Relevance* responding to the general objective of greater independence of an organization

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

Practical Conclusions

In practice, this use of a large pad of paper which may either be mounted on a wall or set on an easel, as well as Post-It® notes allow the team to work in a fluid way.

This method is used notably during the strategic prospective 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.

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 judgement brought 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.

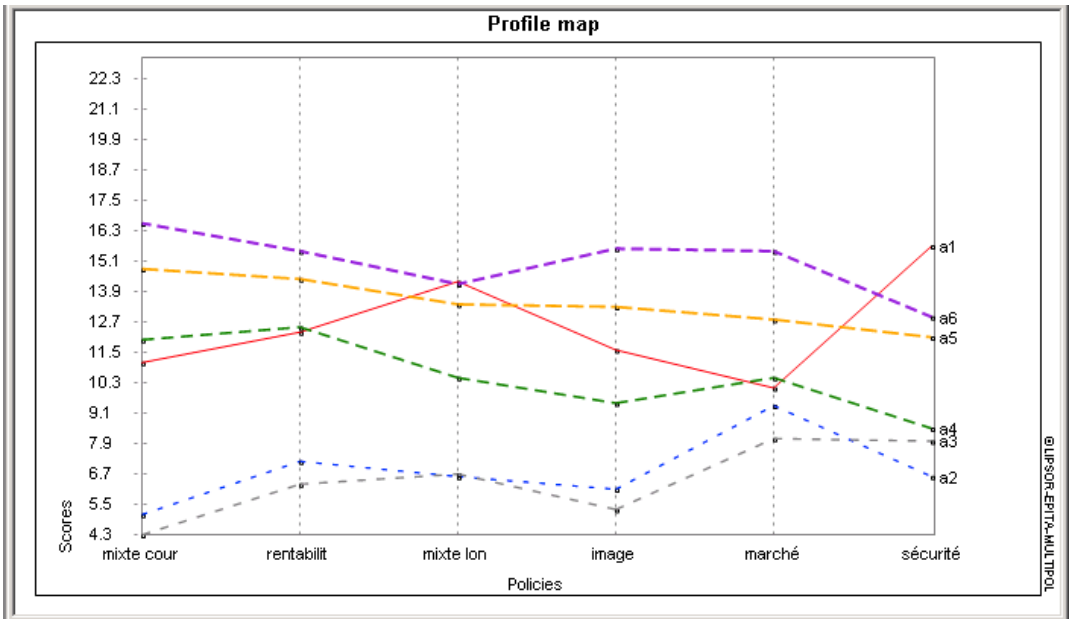


Figure 19 — Line graph of profiles of rankings of actions according to policies

Note: The action A1 has a maximum score of in the political realm "Security", but has a minimum score in the realm of policies "Market".

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. (see figure 20)

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.

To facilitate the mulicriteria 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.laprospective.fr).

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.

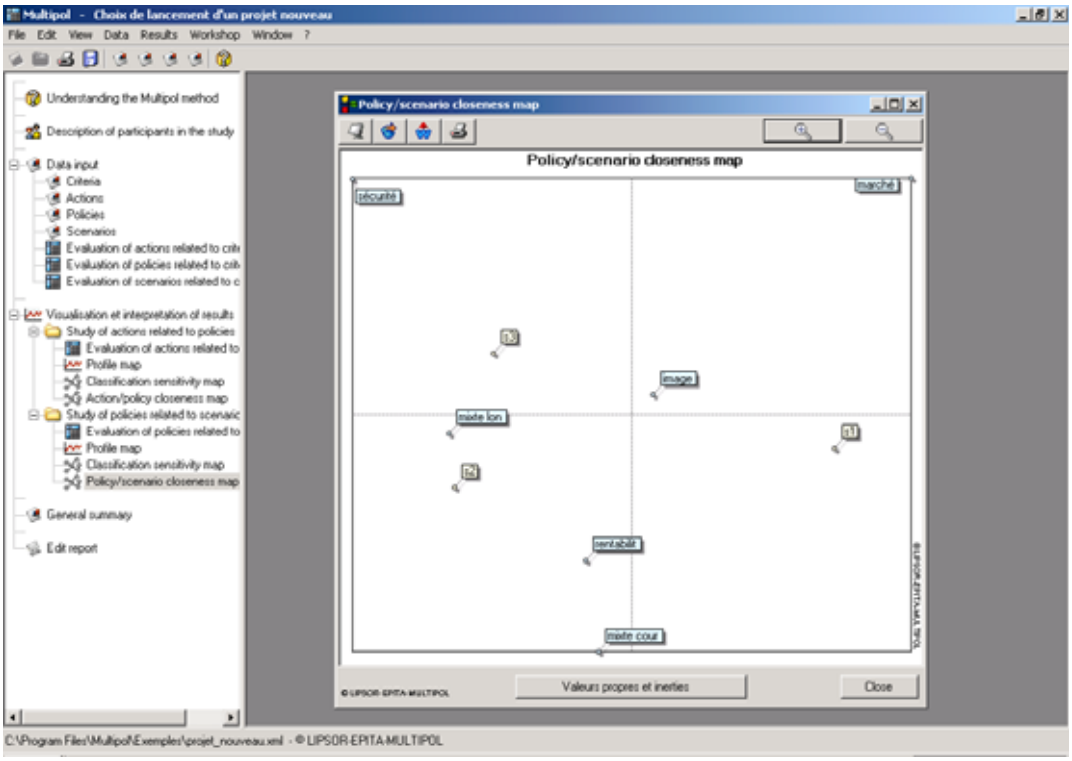


Figure 20 - The MULTIPOL software, developed by LIPSOR, facilitates the work of analyzing actions according to multiple criteria.

Practical Conclusions

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.

The GBN Approach to Scenario Planning

The last section of this Lipsor working paper will summarize the GBN approach to scenario planning, which has enjoyed much popularity in the Anglo-Saxon world. While many of the phases of this approach to scenario planning are similar to those which we advocate, there are some fundamental differences beyond the vocabulary. While both approaches take into account the role of human agency in provoking change, *prospective* is particularly concerned with endogenous factors (i.e. internal strengths and weaknesses) in provoking desired change.

Summary of the Method

Peter Schwartz started his career as a high school teacher in Philadelphia and eventually moved on to Stanford Research Institute in 1975. There he began developing scenarios using the classic approach developed by Herman Kahn and was also introduced to Pierre Wack. In 1982, Schwartz replaced Wack at Royal Dutch/Shell's Group Planning in London where he continued to ply his craft as a futurist. Schwartz moved backed to the United States in 1987 and founded Global Business Network, which is a strategy consulting firm located in San Francisco and currently operating as a subsidiary of the Monitor Group. According to Schwartz, "In 1987, when I left Royal Dutch/Shell, I sought out Jay Ogilvy, who was then the Director of Research of the SRI Values and Lifestyles Program. Essentially, we wanted to create a new type of company which would do for many clients what Pierre Wack had done for Shell: to plug them into a network of remarkable people, to include them in a highly focused and filtered information flow, and to reorganize their perceptions about alternative futures through the scenario method." (Schwartz, 1991) GBN is modelled less on a traditional consulting firm and more on a network or club of individuals. In addition to providing traditional consulting services, GBN sells subscriptions to members who may participate in their book club and attend "learning" conferences and other events. Many of GBNs collaborators were/are active in the Whole Earth Catalogue, the WELL (Whole Earth 'Lectronic Link), and Wired magazine.

The Schwartz/GNB method starts with a problem or issue which needs to be resolved. According to Schwartz, "…begin with a specific decision or issue, then build out toward the environment." (Schwartz, 1991) According to Schwartz, it's important to understand the "myths" that an organization uses to describe itself. Scenarios which implicated a particular player must take these cultural myths into consideration. For Schwartz, a good scenario is one that requires the reader to suspend his/her disbelief and allows the reader to see beyond previously held taboo beliefs. According to Schwartz' mentor, Pierre Wack, "Scenarios deal with two worlds […] the world of facts and the world of perceptions. They explore the facts, but they aim at perceptions inside the heads of decision makers. Their purpose is to gather and transform information of strategic significance into fresh perceptions." (Schwartz, 1991)

The Stages of the Method

1.) Identify Focal Issue or Decision

The process begins with a focal issue or decision. For an energy company, that might mean whether or not to explore a suspected oil field; or for a paper company, whether or not to expand operations. The process begins by articulating mind-sets around the focal issue. According to Schwartz, "Mind-sets tend to keep us from seeing the appropriate questions to ask about a decision." (Schwartz, 1991) Mind-sets relate to attitudes about the future and more specifically to; optimistic, pessimistic and neutral outlooks. So, participants articulate their mind-sets and challenge the underlying assumptions inherent in those mind-sets. Then, they come to a consensus concerning

what the focal issue should be. Mind-sets are the rough equivalent to what *la prospective* calls "*idées reçues*" or preconceived ideas.

2.) Key Forces in the Local Environment

At this stage, the scenario team proceeds to list the key factors that will likely influence the success or failure of the decision identified in stage one. This forces are local, insofar as they affect the industrial sector, but not necessarily internal to the organization itself. In the case of the Shell Oil, the political stability the Russian Federation, or the likelihood of a viable alternative fuel like hydrogen are both examples of key forces in the local environment.

3.) Driving Forces

Driving forces are the elements that drive the narratives of the scenarios. Identifying driving forces is most effectively done as a participatory process. According to Schwartz, "Driving forces often seem obvious to one person and hidden to another. That is why I almost always compose scenarios in teams." (Schwartz, 1991) Driving forces are derived from two sources; 1.) macro-environmental trends that affect the local forces identified in stage two, and 2.) macro-environmental trends that are likely to affect everyone. As a rule of thumb, the following five domains are considered; social, technological, economic, political, and environmental. Schwartz makes a further distinction between "predetermined elements" and "critical uncertainties". The former is roughly equivalent to what *prospective* calls *tendences lourdes* or prevailing trends. These are trends which have tremendous inertia and are not likely to change their trajectory. Certain demographic trends, like an aging population, may be considered predetermined elements. Critical uncertainties are those elements which are dynamic, highly uncertain, and may indeed change course quickly. Public opinion concerning a particular issue is an example of a critical uncertainty. "Critical Uncertainties are intimately related to predetermined elements. You find them by questioning your assumptions about predetermined elements: what might cause the price of oil to rise again?" (Schwartz, 1991)

This stage is the most research intensive in the scenario-building process. Researching is both an ongoing responsibility of the futurist and a stage specific activity for the project. According to Schwartz, scenarios need to be grounded in reality. Like good science fiction, the scenario must borrow from reality before spinning the tale. Schwartz says, "Why do scenarios work? Because people recognize the truth in a description of future events. The story resonates the truth in a description of future events. The story resonates in some ways with what they already know, and then leads them from that resonance to re-perceive the world." (Schwartz, 1991) Schwartz does not have a formalized scanning methodology; however he does recommend the following techniques.

A.) Keep track of developments in **science and technology,** as they are some of the most important drivers of future events. Once unleashed onto the world, technology has a lasting and often inextricable impact. Human life-extension may be considered such an important technology.

B.) Identify **perception-shaping events,** which are those which profoundly change the public's perception of the world. September 11th may be considered such an event.

C.) **Listening to music** and its lyrics is an interesting way to conduct research according to Schwartz. Musicians often have the finger on the pulse of culture. "Anyone who had listened to Bob Dylan's music in 1964 could have seen the early signs of the political events in 1968 coming."

D.) Interesting data is not likely to come from the establishment. So when conducting research, it's a good idea to **look at the fringes**. This is similar to Kevin Kelly's idea that change tends to come from the periphery.

E.) Seek out **remarkable people**. These include accomplished scientists, artists, philosophers, and countercultural thinkers.

F.) Cultivate the habit of **reading outside your immediate specialty**. Doing so will increase your sources of surprise.

G.) Identify important **information filters**. A magazine editor is an example of an information filter. He or she wades through the information and presents the reader with a coherent view of the world. According to Schwartz the quality of a magazine rises and falls with the quality of the editor. Schwartz suggests going to the public library and wading through dozens of magazines. Here are some of the magazines he suggests reading on a regular basis: Discover, The Economist, Foreign Affairs, Future Survey, Harpers, The Manchester Guardian Weekly, The New Yorker, New Scientist, New York Times (particularly the Tuesday science section), Omni, Scientific American, Science, MIT Technology Review, Utne Reader, and the Whole Earth Magazine.[16]

H.) Immerse yourself in **challenging environments**. Travel is one way to immerse yourself in unfamiliarity according to Schwartz. It forces you to adopt an alien point of view, albeit temporarily. (Art 92) "It forces you to ask questions about why people live the way they do. What created their relationships, goals and values? What are they trying to accomplish?"

I.) **Networked sensibilities**. Using groupware and the Internet is a good way harness the power of collective intelligence.[17]

4.) Rank by Importance and Uncertainty

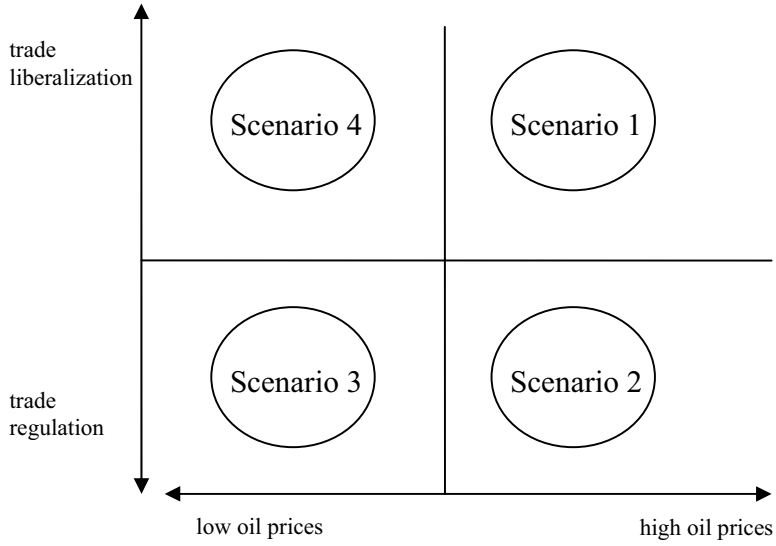
Once the research has been done, the team ranks the Key Forces in the Local Environment and the Driving Forces (the elements collected in stages two and three). The ranking is based on the following criteria: (1) the degree of importance relative to the focal issue or decision identified in stage one, and (2) their degree of uncertainty. The objective of this stage is to identify two or three factors or trends that are both important and uncertain.

5.) Selecting Scenario Logics

Determining the logics is probably the most important step of the scenario-building process as they will condition everything which follows. The number of scenarios that may be elaborated is $f(n) = n^2$,where n is the number of logics (axes). The number of logics rarely exceeds three and the scenarios are typically plotted on either a two-dimensional grid (four possible scenarios), or a three-dimensional block (nine possible scenarios). Increasing the logics to 4 increases exponentially the number of

[16] "The Art of the Long View" was published in 1991 and so some of the journals which are recommended are out of publication. To our knowledge, all of the journals listed here are still in publication.
[17] "The Art of the Long View" was published in 1991, well before the democratization of the Internet generally attributed to around 1995.

scenarios to 16, and so on. "Why two or three plots of logics? Because people's minds can cope with only two or three possibilities. Two many not capture reality, so you often use three. On rare occasions you might consider four. Any more choices will produce a hopeless muddle. Scenario-planners did not always know this. At SRI, in the early 1970s, we generated thousands of possible futures. We hand to use a computer to sort through them. It was silly. In 1974, our seminal scenario project for the EPA offered a mere ten scenarios. Jay Ogilvy, Paul Hawken and I narrowed those further into a book called *Seven Tomorrows*. Upon reflection, those seven were still too many; in essence, we had three possible futures in mind, with a lot of sub-variations. The EPA would have learned more if we had just given them three." (Schwartz, 1991) The following diagram illustrates a two-dimensional chart on which the scenario logics of *trade politics* and *oil price* are considered. Four possible scenarios may be created.



6.) Fleshing Out the Scenarios

In addition to taking into consideration its own logics, each scenario should also incorporate some of the elements identified earlier in stages two and three, that were not chosen to be logics. The narrative of each scenario is developed around a coherent story which explains how the world got from the present to some future situation. The most common plots are; Winners and Losers, Challenge and Response, and Evolution. Other plots include; Revolution, Cycles, Infinite Possibility, The Lone Ranger, and "My Generation". These plots are described in detail in "The Art of The Long View" pages 144-164. According to Schwartz, it's important to pay a great deal of attention to naming the scenarios.

7.) Implications

Once the scenarios have been written, the team returns to the focal issue or decision. Is the decision robust across all scenarios? What strengths and vulnerabilities have been revealed? According to Schwartz, "How could that strategy be adapted to make it more robust if the desired scenario shows signs of not happening?" (Schwartz, 1991)

8.) Selection of Leading Indicators and Signposts

The last step in the process is to identify leading indicators and signposts. These are events which might indicate that the world is evolving towards a particular scenario as time unfolds towards the scenario horizon. Identifying such events will likely lead to a competitive advantage. According to Schwartz, "If those indicators are selected carefully and imaginatively, then company will gain a jump on its competition in knowing what the future holds for a given industry and how that future is likely to affect strategies and decisions in the industry." (Schwartz, 1991)

Utility and Limitations

The use of a limited number of scenario logics laid out on a two or three dimensional matrix, and supported by less important trends and drivers is a fast and easy way to create scenarios, and the method has already enjoyed much success throughout the world. However, the lack of formal procedure makes reproducing such a process difficult, especially for the uninitiated. GBN and its scenario planning methodology, continue to have a lasting and important impact on futures studies.

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Useful Links

- French General Office of Planning http://www.plan.gouv.fr; this site includes archived plans, and became the Counsel for Strategic Analysis in February 2006. In includes a very rich historical section. A group of projects entitled Aleph will give you access to certain key texts.
- DIACT (Délégation Interministérielle à l'Aménagement et à la Compétitivité des Territoires) Interministerial Delegation of Management and Competitiveness of Regions (formerly DATAR) http://www.diact.gouv.fr. The tab *Prospective* on the site includes a link to *Mémoire de la Prospective* which is equally useful for finding key texts as well as historical texts of the delegation.
- *Hudson Institute*: http://www.hudson.org/
- *Institute for the Future:* http://www.iftf.org
- Futuribles: http://www.futuribles.com
- FuturRIS http://www.operation-futuris.org/dyn_menu.asp and http://www.futuris-village.org/ are two important sites of the French school of foresight, *la prospective* as it relates to research and development. They include numerous examples of the methods of foresight.
- *Global Business Network* http://www.gbn.org/
- *Institute for Prospective Technological Studies (IPTS)* at Séville: http://www.jrc.es/home/index.html
- Laboratoire d'Investigation en Prospective, Stratégie et Organisation (Lispor): www.laprospective.fr; the tab *Mémoire de la Prospective* will give you access to several out-of-print or difficult-to-find texts of foresight.
- *RAND Corporation*: http://www.rand.org
- Shell: www.shell.com/scenarios ; le groupe Royal Dutch Shell développe depuis près de 30 ans des scénarios d'environnement
- Shell: www.shell.com/scenarios, the Royal Dutch Shell group has developed scenarios for close to 30 years.
- *World Future Society:* http://www.wfs.org
- *World Future Studies Federation:* http://www.wfsf.org

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MICHEL GODET

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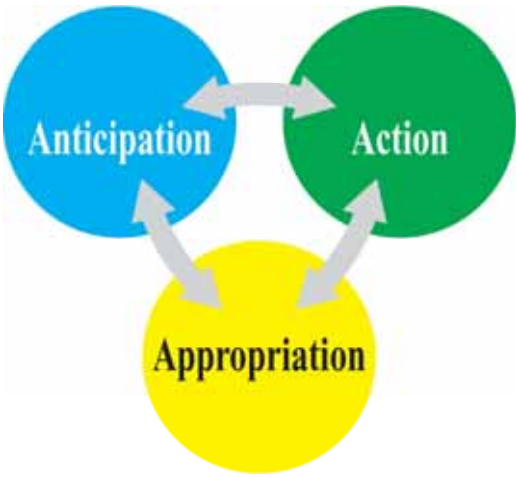
Scenario Planning as a Strategic Management Tool



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