



PRE-PRINT SERIES

DESIGNING ACTION BASED SCENARIOS

« Designing action based scenarios », *Futures*, vol. 40, n°1, p. 25-33.

www.sciencedirect.com/science/journal/00163287

Dr Anne MARCHAIS-ROUBELAT

Associate Professor

Department of Economics and Business Administration, Conservatoire National des
Arts et Métiers, 292 rue Saint-Martin, 75141 Paris Cedex 03, France

marchrou@cnam.fr

Tel : 33 1 40 27 20 99

Dr Fabrice ROUBELAT

Associate Professor

Graduate School of Business, University of Poitiers, Niort SME Management
Institute, place Chanzy, 79000 Niort, France

froubelat@iae.univ-poitiers.fr

Tel : 33 5 49 77 05 91

Fax : 33 5 49 77 05 92

DESIGNING ACTION BASED SCENARIOS

Anne MARCHAIS-ROUBELAT, Fabrice ROUBELAT

Abstract :

Are scenarios carrying actors' projects or on the contrary are they disconnected from action? To answer this question, the paper first outlines how action and actors' projects structure foresight foundations. Such a perspective suggests to design scenarios as action processes to anticipate new rules to be played in prospective futures. In a second part, the results of two action research processes are discussed to analyse the interaction between actors' projects and scenarios. These two case studies exert that actors have to navigate through rule shifts rather than to oppose alternative scenarios. To conclude, further research is discussed to introduce individual actions in scenarios, as well as the design of relations of dominance between actors in the analysis of rule shifts.

Key words: action, foresight, project, rule, scenarios, strategy.

1. Introducing action based scenarios

Since early scenario works [1], scenario planning has become a key methodology of futures studies [2] to help various organizations – private, non-profit, governmental – to learn from the future [3] and to challenge strategic paradigms [4]. To build scenarios, identifying major actors and stakeholders appears as a critical step to study how they influence matters and how they live in scenarios [5]. However, to manage strategies in the scenario process has never really been achieved, as scenarios are often based on major economic and political uncertainties which do not seem to be made by any actor whose strategies are often more based on a reactive anticipation than playing projects.

To explore the relationships between actors' projects and scenarios, this paper will explain in the first part how founding foresight literature considered futures as projects and how both views of forward and backward inductions, i.e. building scenarios from the past to the future or from the future to the past, introduce prospective bridges between projects and scenarios that have to be extended. According to a phenomenological approach of action [6], scenarios will be then characterized depending on the rule they implement to structure action processes. From this point of view, scenarios will be considered as prospective phases of action processes to be played by actors, which may consider them as being able to carry their projects or to serve a context for ones they don't want to be achieved.

In a second part, the place of projects and actors' strategies in scenarios will be discussed from the results of two action researches. From these case studies, it will appear that scenarios should not be considered independently from one another but may be combined to explore different paths to achieve a project. On the opposite, projects underlying some scenarios can correspond not only to alternative modes of

regulation but are also likely to follow one another and to be combined in time, articulating dreams and wills.

Further research will be discussed to conclude the study of the relations of dominance in the analysis of scenario rule shifts.

2. Foresight, projects and action processes: integrating time in scenarios

2.1. Future as a project: the medium of action

In founding foresight literature [7], a process is defined as development of a phenomenon which was not selected like goal by a human will, but which may be viewed as the result of a complex mix of actions. For Jouvenel [8], as for Berger [9], decisions made during this process must be justified in order to be implemented. Thus, a decision is defined as a choice (content), which consequences can have irreversible effects in a future world which will be completely different from the world in which decisions have been made.

In such a perspective, temporal ruptures question the articulation of the time of decisions with the time of their future consequences, knowing that a present evidence used to justify a choice will be probably null and void when the future consequences of this choice occur. Meanwhile, the time of action such as it is lived by the actors is going by, although each event is lived in present. During the making of the action, the lived time of the project establishes the link between the design of the choices and their future consequences: « the time of action is the time of the project: one establishes what should be done and how it is advisable to do it. (...) The essence of the project is not indeed that it is played "in the future", but that it prepares an implementation, that it requires of application and of work and that it does not let itself confuse with a dream. (...) But a project, because it is an action *in rem*, is always established in the present. » [10]

As an action process runs without goal, decisions are integrated into projects, defined as anticipations on the future which enables actors « to throw ahead » (« *pro-jacio* ») their imaginations. Jouvenel outlines the difference between a *factum* or past fact - which can be controlled and recognized but which cannot be changed -, and a *futurum* or image anticipating a future, - which is neither true nor false but that one can want to make a reality later-: "because this image can be validated, this image is possible, and because this image is attached to a will, this image is a *project* » .

Not only projects belong to action, but they still result from the building of imaginary visions of possible futures, e.g. Jouvenel's *futuribles* or Kahn's scenarios. In order to analyse the role of scenarios between projects and action, the implications of the two usual conceptions of time on the project as well as on the action have to be questioned. On the one hand, the first conception is based on the projection of events and trends by actors of an action towards possible futures. On the other hand, the second conception is based on the building by these actors of imaginary alternative futures to anticipate their consequences on present decisions. This temporal differentiation is comparable with the distinction used in game theory between the principle of « forward induction » where the resolution of the game is achieved while starting with the beginning, and the principle of « backward induction » where the resolution of the game is achieved while starting with the end (one «

goes up » the game) [11]. However, according to whether one chooses one or the other method, one does not solve the game in the same way, so that the same project would create different futures.

2.2. Time in scenarios: projects in action

For Berger as for most futures thinkers, decision makers can no more justify their decisions using forecasts from past trends as they have to manage differential accelerations of time, i.e. our environment is a combination of multiple subsystems which move at different speeds. Consequently, the global system always changes from one shape to another. If all subsystems were moving at the same rhythm, one could create projections from forward induction to simulate how the future might be and to thus justify ones decisions. On the other hand, insofar as the evolution of time is differential, one must expect surprises, but one knows neither when, nor which new rules will emerge. However, the consequences of our current acts will take place in this unknown world. Thus, from a temporal point of view, the articulation between action and project raises the paradox of the deliberate guidance of a future which one can build neither using analogies, nor extrapolations.

Berger explains this paradox: whereas the making of a decision is often justified from forecasts based on past trends, the consequences of this decision relate to structurally different long range futures. For foresight however, long range does not relate to a duration (20 years, 100 years...), but to an "after", i. e. beyond what is known. Thus, action processes have to be divided into several phases, which are durations. During each phase, a rule models the main dynamic of the process. Then, a rule can be considered either as a constraint on actors' behaviour or a relation between variables. During a phase, actors may try to change the rule or to reinforce it, when interactions between actors and variables change the global system. These changes may create new rules and thus make actors enter new phases, even when actors were following the old ones. In this action based approach of the future, long range deals with what will occur beyond the current phase, i.e. when the current rules will no more be valid.

Two proposals result from this action based approach to make decisions within action processes:

- Proposal n° 1: as part of the consequences of the decisions will take place in the long range, they will have to be assessed according to rules which differ from the ones followed in the phase during which the decision was made. Thus, as current and past rules justify current decisions, the decision-making process is disconnected from the consequences occurring in a new phase ;
- Proposal n° 2: as the action results at least partially from a process of organizing [12], current decision-making processes have to include the emergence of the future rules to come.

Actors could only take account of proposal n° 1 and just be short-sighted and reactive, as action process cannot be summed up by a goal. On the other hand, proposal n° 2 shows us that « myopia » is not enough if one wants to manage a project efficiently. In that case, actors have to anticipate the next rules either to facilitate their emergences (or avoid of them), or only to implement them as soon as they occur.

Thus, the problem of the justification of the decision supposes a logic which goes from present towards the future, comparable with that of forward induction. However,

anticipating the world in which the effects of a decision will occur supposes that actors imagine new phases - e.g. new rules - and that they consider the shifts between these future rules and currently known rules that we suggest to explore neither in a backward nor a forward induction but to consider as possible shifts between scenarios.

2.3. Foresight as an organizing process: actors playing scenarios

To imagine how to play new rules in new environments, scenarios may help to specify a project (making real a wishful scenario or avoiding of a feared one), and to think about the sequences of possible decisions to manage a project in a moving environment.

As we emphasized it, an action process has no goal but may contains actors' projects, each actor's project being directed by a will. Thus, a project may contain a sequence of decisions for a goal *to come*, therefore necessarily virtual to be played in scenarios.

As much as with an expert knowledge, foresight deals with the implicit and explicit actors' future-oriented beliefs. These beliefs are those of the various actors related either to the issues of the foresight process or to the organization and its environment. That means that foresight often challenges expert knowledge, as individual and collective representations are discussed in an interactive process to make sense from the future and to mobilize actors around a project [13].

Beyond sensemaking, foresight plays many different functions which one may classify [14] according to whether they build a knowledge (scientific function) or whether they seek to influence the construction of the future (ideological function). These two types of functions are not antagonistic, but complementary. It rises from this ambivalence that foresight cannot be considered only as an incremental process linking futures thinking and decision making but also as an interactive process between actors' projects.

In such processes, scenarios challenge strategic paradigms in organizations as in their global and local environments [15] as they play emergent ideologies as dominant new rules. The actors' systems of beliefs can, in the case of trend based scenarios, be compatible with the strategic dominant paradigm that the scenarios then will contribute to reinforce. On the contrary, trend-breaking scenarios will challenge strategic dominant paradigms which cannot solve the anomalies these scenarios contain. Within this framework, a trend based normative scenario carries projects of actors who will strengthen the strategic dominant paradigm. On the contrary, if the projects which make a normative scenario are trend-breaking, actors will use foresight to create new strategic paradigms in order to challenge the dominant one.

The main function of foresight is then to support the project in order to transform it into a desired future image and diffuse it in the environment. The efficiency of this ideological function of foresight depends at this stage on the capacity of scenarios to emphasize the possible shifts between a perceived present and imagined futures. For the actors of such foresight processes, the problem is to make the project believable since the project may be played in only a few if not only one of all possible futures.

3. Action based scenarios: lessons of two action researches

3.1. Methodological framework

To discuss how actors' projects interact with scenarios, we will focus in this second part upon two action-researches [16] dealing first with Euro-Mediterranean relationships [17] and second with local risk management [18]. From a conceptual point of view, these action-researches put the action and actors' strategies in the middle of scenario planning.

Since Jouvenel's works, introducing time in scenarios has been proposed on the one hand by early regional planning works emphasizing political and social changes [19], and on the other hand by operations research based works [20, 21, 22]. To go further and to study the issue of the transformation of scenarios in time, our two researches sought to introduce action processes into scenarios using a phenomenological approach [6]. To design models of action processes, this phenomenological approach is primarily based on the longitudinal study of the social construction of events – i.e. Jouvenel's *facta* – in their inner and outer contexts to induce rules to anticipate possible futures – i.e. Jouvenel's *futura*. Its foresight implementation also extends the methodology to prospective evolutions of *futura*, which may contain actors' projects.

In this approach, scenario design is the result of three steps: sensemaking through an action rule, shaping the context of the action, assessing actors' strategies around the action rule and within the context.

- Step 1. The rule structuring an action process during a scenario is the fundamental element insofar as it creates the context of the environment, as well as it makes sense to the actors' strategies. As this rule changes, the context moves from one shape to another, and actors enter a new scenario in which their former behaviours can no more play efficiently the new game.
- Step 2. In a scenario, the context of the action process is summed up by sub-systems - e.g. political, economic, social...-, also called dimensions of the environment, which are selected through their ways of evolution, described by trends of variables implementing the rule and by speeds of implementation of the rule. The evolutions of these dimensions as their interactions make sense for actors which will evolve in these dimensions and use them to assess their strategies.
- Step 3. Thus, actors' strategies have to be assessed according to the action rule and to their abilities to play a role in the game. That explains that national states have in some scenarios to be split into departments or offices when they do not have the same position towards the scenario rule. The various actors - transnational institutions such as European ones, nongovernmental organizations, corporations,...- act within the dimensions of the context. In some scenarios, actors can emerge or disappear.

Within this framework, the scenario building process may vary from one study to another (table 1). Such a process often includes the building of a trend-based scenario which supposes the continuation of the current phase rule. The trend-based scenario follows a forward induction logic where the scenario would be viewed as a project when actors don't want to challenge the dominant paradigm or on the contrary would act as a foil, as in « the scenario of unacceptable » [19] or more

recently in Slaughter's Dystopia [23] when the trends cannot be sustainable. Trend-breaking scenarios however supposes paradigm shifts, e.g. the emergence of new rules, but which can be viewed as preferred - or feared - visions of the future where actors would be able to develop - or not - their projects.

Table 1: Framework and process of the two action-researches

Research context	General issues	Research actors	Process and steps
Joint study between EDF and the Mediterranean Observatory of Energy	Euro-Mediterranean relationships to 2020	Executives of energy companies (EDF, ENI) and of European institutions Researchers in economy and political sciences A former OPEC executive A journalist specialised in Mediterranean issues	• Discussion of forecasts to 2020 • Discussion of brakes upon development of the Mediterranean southern rim • Design of scenarios crossing two dimensions : European integration level, market integration • Design of shifts between scenarios and description of intermediate scenarios
Datar (Regional planning French governmental agency) study upon « local risks and collective action »	Foresight of the local risk management by 2020	A mixed working group of academics from various fields of social sciences (politics, economy, management, law) and French state department representatives	• Design of trends, wildcards and actors' strategies from actors' interviews • Design of a trend-based scenario • Design of four trend-breaking scenarios and design of shifts between scenarios • Story telling of crisis management within the scenarios

II.2. From actors based scenarios to action based scenarios : the case of the Euro-Mediterranean scenarios

In the case of Euro-Mediterranean scenarios, the first methodological problem to solve was that some actors were promoting as a point of departure a trend-breaking preferred scenario, which was integrating countries of the southern Mediterranean rim in a large European Union, to be called Euromed Community. From such a point of departure, all other scenarios were perceived by these actors as a barrier to the realization of the project of euro-Mediterranean single market. For other actors on the contrary, such a scenario was nothing but an Utopia and would disturb the foresight process. We find there the Utopian or Dystopian scenario trap, the working group being confronted with a phenomenon of groupthink [15]. As a consequence of groupthink, the working group focuses upon a preferred or a feared scenario and either does not see other ones, or rejects scenarios considered as not plausible because unacceptable.

To avoid this trap, scenarios were framed crossing two dimensions: a policy dimension (European integration) and an economic one (Market integration) (figure 1). Scenarios were named according to the rules to be played in scenarios (table 2).

Figure 1
Bridging Euro-Mediterranean scenarios

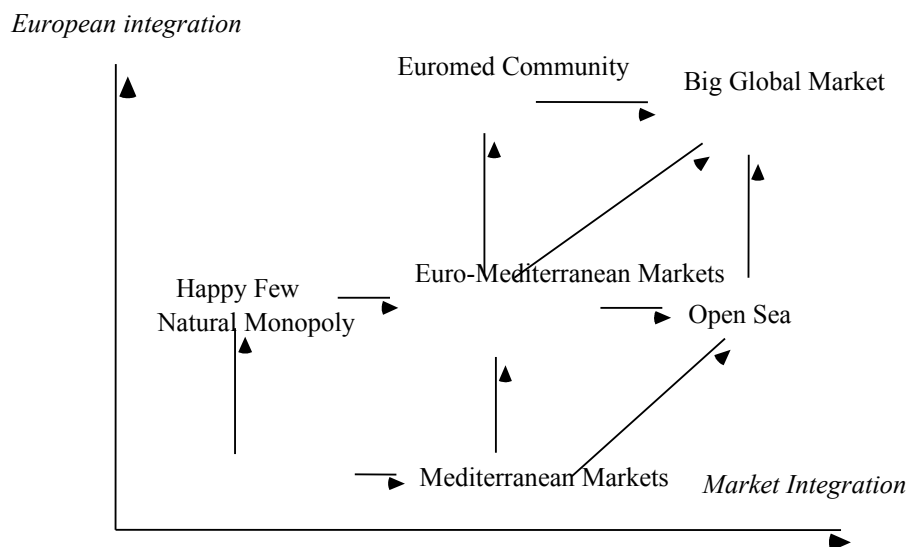


Table 2
Ruling Euro-Mediterranean Scenarios

<i>Scenario</i>	<i>Rule structuring the scenario</i>
Natural monopoly	Mediterranean countries protect their national markets
Happy few	Mediterranean countries prefer one-to-one relationships with the European Union to get integrated
Mediterranean markets	Mediterranean countries build together regional markets to promote their mutual developments
Euro-mediterranean markets	Mediterranean countries develop markets with the European Union
Open sea	Mediterranean countries build their developments through close partnerships with non-EU countries such as the United States, Russia or Far-east countries
Euromed community	Mediterranean countries and the EU build a Euro-Mediterranean Community
Big Global Market	All countries play a free-trade game in a global market

The main result of this first research was to illustrate the time gap between the horizons of the different scenarios which were not all 2020 based. The preferred Euromed Community scenario seemed very distant because having to overcome many political and economic problems. For instance, many members of the working group considered that investments in the southern rim of the Mediterranean ran up not only against political instability but also against both hidden taxes and hidden costs in many countries. This result reinforces the idea that some scenarios are not alternative but might be considered as different phases of an action process. The interest of such an articulation was first to emphasize that the preferred scenario required previous phases and then that different shifts and scenarios could lead to the preferred one but also to challenging others (Open Sea, Big Global Market).

From a methodological point of view, the succession of scenarios in time enlightened the alternatives to the preferred scenario. In fact, as opposed to what the promoters of the Euromed Community scenario suggested, all actors did not have necessarily interest with this project and could regard themselves as a Happy Few or prefer the Open Sea. Thus, the various scenarios suited to different projects of actors, sometimes challenging one another, which could explain the difficulty to set up Mediterranean markets insofar as it could seem for some countries worthwhile to become a « happy few » and thus enter alone the European Union. On the contrary, some would prefer an integration in a global economy by tying close relations with the United States or Asia, rather than developing free trade areas with their neighbours. So, the various shifts between the scenarios do not constitute necessarily a normative signed digraph, as figure 1 would suggest it, nor the Natural Monopoly scenario a starting point. Moreover, it appeared that some scenarios were likely to coexist, as their rules could be used to serve the projects of different actors, that would play these rules in a fragmented southern Mediterranean rim.

As a result, the Euro-Mediterranean scenarios research confirms that the introduction of action into scenarios is less based on searching to reach a goal implementing a forward or a backward induction logic than on designing the conditions of rule shifts,

in which the projects of the various actors may be articulated or may come into conflict.

II.3. Breaking the trend based scenario: the example of local risk management by 2020

In the case of the « local risk management scenarios » study, the starting point was not a preferred scenario like the Euromed Community scenario but a trend based scenario named the Old Maid, by analogy with the card game. The members of the working group did not seem to prefer such a scenario that much, even if the Old Maid could seem a rather convenient way to manage local risks (e.g. industrial accidents, waste management, social protests) as responsibility is never definitively assumed by any actor, but as the old maid card is transmitted from an actor to another one.

This trend based scenario is not linked to any project and actors can just be short-sighted and interactive: as soon as a crisis or a difficulty appears, actors have just to find another actor to whom they transfer the problem to solve. In the case of polluting industries for example, three solutions can be imagined. Initially, the increasing constraints are assumed by consumers since they are willing to pay the corresponding price. Innovation policy makes possible to transfer the problem to unknown future actors, since risk assessment is not completed. The third solution is offshoring their activities and consists in moving the problem in space to find new actors who are willing to reduce constraints.

Table 3
Ruling risk management scenarios

Scenario	Rule structuring the scenario
The Old Maid	Public authorities make safe the society but return the risks to other actors whenever political consequences may create a danger for themselves
Happy families	Local authorities specialize their areas in the management of risks for which they developed core competences
Monopoly	Risk management is purely individual without any social repartition
Meccano	The National state manages the risks by making decisions with a very reduced participatory process
Tarot	Local authorities develop participative democracy systems to manage risks with all stakeholders

Trying to find new rules for the game, the working group designed new scenarios, corresponding to other modes of risk management (table 3). These scenarios can be connected to some actors' projects such as the Happy Families in which local authorities specialize their areas in the management of risky businesses, such as managing polluting industries, research and industry in highly contagious diseases, for which they developed core competences. In the Tarot scenario, local authorities create participative democracy systems to manage new projects with all stakeholders. Nevertheless, the analysis of the various trends, events and strategies likely to start, accelerate or slow down the implementation of the rules which underlie scenarios (table 4), emphasized that actors' strategies can break some of the rules. As long as actors follow the rule of a scenario, dimensions and actors' strategies

of this scenario remain the same, or at least can be described by a continuous evolution. On the other hand, since these dimensions and strategies dramatically change, the rule can hardly be played any more. In that case, such changes create a shift from a scenario to another. For example, when local authorities fail to coordinate stakeholders, local management based scenarios shift to the Meccano one, in which the National state manages risks by making decisions in a just educative low participatory process. As during a shift actors often do not play the same rule, dysfunctions and misunderstandings increase. Thus, according to the different ways actors assess the risks, scenario design may oscillate between the Old Maid and the Meccano. For example, the National state may play with the Old Maid or the Meccano scenarios. On the one hand, the National state may choose to transmit the Old Maid thanks to long legal procedures. On the other hand, it can keep the Old Maid card and thus enter the Meccano scenario when the urgency and/or the impact of a risk needs a strong dominating actor. Besides, the projects which might underlie scenarios like the Happy Families or the Tarot are dependant on the conditions of emergence of a rule and of shift from a rule to another. The shifts may create huge complexity, as several different rules can simultaneously emerge on different areas and as an actor may play the old rule when another one plays a challenging new one.

Table 4: Roads to and from the four competing scenarios to break or come back the Old Maid scenario

Scenario	Roads to the scenario	Roads from the scenario
Monopoly	The <i>Old Maid</i> card is kept by private companies which sell risk management by marketing innovating products and services to answer and to create consumer demands	<i>Monopoly</i> scenario is flexible but it needs strong and independant regulation authorities which may be just a part of a <i>Meccano</i> built by National public authorities in case of large scale and/or high intensity crisis - Consumers may loose confidence in the market when private companies fail in managing the risks they marketed or are not able to propose new products for emerging risks which may help a mutualist <i>Tarot</i> type scenario
Happy families	the scenario may be helped by the increasing power of local authorities and lobbies both from the <i>Old Maid</i> and <i>Tarot</i> scenarios	- a catastrophe concerning core competence based activities may change risk acceptance, as well as changes in cost/benefit analysis or in managing irreversibilities, and then shift to <i>Tarot</i> or <i>Meccano</i> scenarios - a more citizen based local power shifts to the <i>Tarot</i> scenario, while an increased role of the National state shifts to the <i>Meccano</i> scenario
Meccano	this scenario may emerge when the National state keeps the <i>Old maid</i> card or when local authorities (<i>Happy families</i>) or private actors (<i>Monopoly</i>) fail to manage a crisis or an irreversible risk	problems of distribution of competences among the National state, local authorities and European institutions may create permanent bids as technocratic procedures can block the scenario in an <i>Old Maid</i> game
Tarot	the multiplication of local referendums and the organization by local authorities of local democracy systems may help this scenario from the <i>Old maid</i> or the <i>Monopoly</i>	- the scenario suits to anticipate a crisis rather than to manage it and thus could shift to the <i>Meccano</i> scenario - citizens may become bored by the excessive number of debates or by the difficulties to find consensus to make decisions, as by the cost of the system and thus choose <i>Monopoly</i> or <i>Meccano</i> scenarios - professional lobbyists may block it because of the abusive defense of local interests, shifting to the <i>Happy families</i> scenario

4. Conclusion and further research

In an action based perspective, scenarios provide a framework to challenge actors' projects. Viewed as action processes, scenarios can hardly be regarded as alternative futures but have on the contrary to be explored through shifts which may lead from one to another. Such shifts, which can be designed from the rules structuring scenarios, introduce a temporal dynamics to articulate actors' projects as in the case of local risk management scenarios or on the contrary to draw prospective phases to complete to make a project possible, as in the case of Euro-Mediterranean scenarios.

Since scenarios may be designed as phases of action processes, actors can no more just project themselves in a scenario which would be a required final state. Indeed, a scenario can hardly be viewed as a project, whether individual or collective. Thus, if scenarios may contain actors' wills, they also highlight prospective rule shifts which provide a framework of longitudinal analysis to challenge actors' strategies. In action based scenarios, strategies are challenged from any phase shift, and cannot consequently be seen as resulting from a required final state that might never become actual. In such an approach, anticipating risks seems only a particular case of actors' projection in strategic situations likely to lead to rule shifts or on the contrary to be solved within the current rule.

To extend this methodological framework, further research first deals with in-depth modeling rule shifts, which seem to be the key issue of the analysis of actors' strategies and choices in scenario design. More particularly, the analysis of the relations of dominance [6] within a network of actors could be useful to understand the shift from a scenario to another, as that has been suggested in an action research conducted within the French army staff [24].

As well in this decision making in defense issues action research as in the risk management scenarios one, it came out that the role of individuals can hardly be bypassed in crisis and risk management [25]. However, if the role of individuals is often highlighted in the study of strategic change processes [26], individuals are often replaced by organizations and institutions in scenario planning literature. While writing local risk management scenarios, individuals have been introduced as a first step into scenarios to test how scenarios may be played and then managed. Accordingly, respective roles of individuals and organizations could be further analysed. Lastly, when scenarios are told as stories [27], the ideological functions of scenarios could be stressed by describing how metaphors and myths may be used in the design and diffusion process of scenarios, as the influence of these myths in paradigm shifts. Thus, this research program does not only design scenarios to anticipate rule shifts which can be used as self-fulfilling as well as self-destructing prophecies, but also provide a framework to discuss decision-making issues in strategic action processes.

References

- [1] H. Kahn, A. Wiener, *The year 2000*, Macmillan, New York, 1967.
- [2] M. Mannermaa, « In search of an evolutionary paradigm for futures research », *Futures*, Vol. 23, n° 4, p. 349-372, May, 1991.

- [3] K. Van der Heijden, « Can internally generated futures accelerate organizational learning? », *Futures*, vol. 36, n° 2, p. 145-159, March 2004.
- [4] F. Roubelat, « Scenarios to challenge strategic paradigms: lessons from 2025 », *Futures*, vol. 38, n°5, p. 519-527, June, 2006.
- [5] Schoemaker P., « Multiple scenario development: its conceptual and behavioral foundation », *Strategic Management Journal*, vol.14, p. 193-213, 1993.
- [6] A. Marchais-Roubelat, « Theory of action. How to describe decision making processes », Cecaia IV Conference, Cachan, 6-8 September, 1995 and for French readers in-depth described in *De la décision à l'action. Essai de stratégie et de tactique*, Economica, Paris, 2000.
- [7] The context of this founding foresight literature is described in E. Masini, « Rethinking futures studies », *Futures*, vol. 38, n° 10, p. 1158-1168 and in F. Roubelat, « The prospective approach: contingent and necessary evolutions », in R. Slaughter (ed.), *The knowledge base of futures studies*, DDM, Melbourne, p.106-119, 1996.
- [8] B. de Jouvenel, *The art of conjecture*, Basic books, New York, 1967. All Jouvenel's quotations will refer to that translation of the original *L'art de la conjecture*, Editions du Rocher, Monaco, 1964.
- [9] G. Berger, « Sciences humaines et prévision », *Revue des deux mondes*, 1957, published in *Phénoménologie du temps et prospective*, PUF, Paris, p. 218-226, 1964. Excepted when mentioned, all Berger's quotations will refer to this founding paper of the prospective approach.
- [10] Translated from G. Berger, « L'homme et l'histoire », Paris, PUF, p. 67-71, VIe congrès des Sociétés de Langue française, Strasbourg, 10-14 sept., 1952, published in *Phénoménologie du temps et prospective*, PUF, Paris, p. 170-174, 1964.
- [11] H. Jungermann, « Inferential processes in the construction of scenarios », *Journal of Forecasting*, Vol. 4, n°4, pp. 321-327, 1985.
- [12] K.E. Weick, *The Social Psychology of Organizing* Reading, MA : Addison Wesley, 2nd ed., 1979.
- [13] J. Lesourne, « Vers un retour en grâce de la prévision et de la prospective », *Revue Française de Gestion*, n°54, p. 17-21, septembre-décembre 1985.
- [14] Y. Barel, « Prospective et analyse de systèmes », *Travaux et recherches de prospective*, n°14, La documentation française, Paris. From Barel, also read « The idea of reproduction », *Futures*, vol. 6, n° 2, p. 93-102, April, 1974.
- [15] See [4] and F. Roubelat, « Scenario planning as a networking process », *Technological Forecasting and Social Change*, vol. 65, n°1, p. 99-112, October, 2000.
- [16] Methodological background of action research applied to futures studies will be found in J. Ramos, « Action research as foresight methodology », *Journal of Futures Studies*, vol. 7, n°1, p. 1-24, August, 2002.
- [17] H. Elandaloussi, M. Grenon, F. Roubelat, A. Saab, « Perspectives énergétiques en Méditerranée », Conférence sur la production d'électricité dans la région méditerranéenne : perspectives et choix technologiques, Beyrouth, February, 1998.
- [18] F. Roubelat, « Présentation des scénarios », « Méthode d'élaboration des scénarios », in Pivot C., Rychen F. (dir.), *La gestion des risques locaux à l'horizon 2020*, Datar-Editions de l'Aube, La Tour d'Aigues, p. 9-10, 177-187, 2004.
- [19] J. Durand, « A new method for constructing scenarios », *Futures*, vol. 4, n° 4, December, p. 325-330, 1972.
- [20] J. Eymard, « A Markovian cross-impact model », *Futures*, vol. 9, n° 3, June, pp. 216-228, 1977.

- [21] S. Enzer, « Interax : an interactive model for studying future business environment », *Technological Forecasting and Social Change*, vol. 17, n°2, p. 141-153, n°3, p. 211-242, 1980.
- [22] P. Canarelli, « Analysing the past and managing the future using neural networks », *Futures*, vol. 27, n° 3, pp. 325-338, 1995.
- [23] R. Slaughter, *Futures beyond dystopia*, RoutledgeFalmer, London, 2004.
- [24] Unpublished report on military strategic decision processes, 2001.
- [25] F. Roubelat, « Prospective, risques et crises », Cadmos Conference on Risk management and European Union Policies, Ecole militaire, Paris, May, 2001.
- [26] A. Pettigrew, « Examining change in the long-term context of culture and politics », in Hinings et al., *Strategic and organizational change*, Academic press, p. 269-318, 1985.
- [27] J. Ogilvy, *Creating better futures*, Oxford University Press, New York, 2002.