WILD CARDS, WEAK SIGNALS AND ORGANIZATIONAL IMPROVISATION

Sandro Mendonça[β]
Miguel Pina e Cunha[ψ]
Jari Kaivo-oja[δ]
Frank Ruff[θ]

[β] ISCTE and Dinâmia, Av. das Forças Armadas 1649-026 Lisboa – Portugal, Tel.: 00 351 21 79032 78, Fax: 00 351 21 7903933, Email: sfm@iscte.pt, corresponding author

[ψ] Universidade Nova de Lisboa, Faculdade de Economia, Rua Marquês de Fronteira 20 1099-038 Lisboa – Portugal, Email: mpc@ fe.unl.pt

[δ] Finland Futures Research Centre, Turku School of Economics and Business Administration P.O.Box 110 FIN-20521 Turku – Finland, Email: Jari.Kaivo-oja@tukkk.fi

[θ] Society and Technology Research Group, DaimlerChrysler AG Alt-Moabit 96A 10559 Berlin – Germany Email: frank.ruff@daimlerchrysler.com

WILD CARDS, WEAK SIGNALS AND ORGANIZATIONAL IMPROVISATION

ABSTRACT

This paper addresses the need for reliable action guidelines that can be used by organisations in turbulent environments. Building on current conceptual and empirical research, we suggest an analytical approach for the management of surprising and potentially damaging events. In order to do so we use the wild card management system. Wild cards refer to sudden and unique incidents that can constitute turning points in the evolution of a certain trend or system. As the first of the two components of such a wild card system we advocate a weak signal methodology to take into account those wild cards that can be anticipated by scanning the decision environment. The second component, the nurture of improvisation capabilities, is designed to deal with ongoing crisis. This paper can be seen as part of a broader agenda on how to manage in conditions of continuous but unpredictable change.

Keywords: wild cards, weak signals, improvisation, minimal structures

1. Introduction[*]

Usually the most challenging issue in foresight/futures studies is wild card analysis. A wild card is a description of an occurrence that is assumed to be improbable, but which would have large and immediate consequences for organisational stakeholders if it takes place. Usually such events are serious, destructive, catastrophic or anomalous and essentially not predictable. Furthermore, if such an occurrence takes place so quickly and powerfully that a normal, planned management process cannot make allowance for it, then the organization will be especially vulnerable. To be sure, it is also clear that a wild card, if it does not give the organization any possibility of reaction, is irrelevant in practical terms. Consider for instance the extreme example of a meteor hitting the Earth. This is an occurrence which is not easily introduced as input into a conventional (or unconventional) corporate planning process. The spectre of conceivable wild cards is infinitely wide, containing many events that the organization cannot ignore without cost. Likewise, there is a great need for basic understanding and practical approaches that can be used by organizations in turbulent and unforgiving environments in which unique and sudden events can happen.

The discussion of wild cards seems suited to ignite the "strategic conversation" (Van der Heijeden) exactly where it is mostly needed. Often, hasted actions by senior executives contribute to amplify the seriousness of the problems and heighten the public controversy created around the company. Examples include Royal Dutch/Shell being completely taken by surprise by the Greenpeace

campaign against sinking the Brent Spar oil platform, Daimler and the A Class Series road-test accidents, and, more recently, Ford and the Firestone tyre trouble. Therefore, tactics do matter. Doing too little too late and loosing control of the situation can significantly damage the organisation, especially when information flows rapidly through the media and the Internet. For these reasons, conceptual analysis of discontinuities is important, empirical evidence is fleeting and policy recommendations urgent. Up to now, research into this problem has been ad-hoc.

This paper addresses the need for reliable action guidelines that can be used by organizations in rapidly changing environments. In order to do so we develop a wild card management system, based upon two components: weak signals and organizational improvisation. As the first component we advocate a weak signal methodology in order to take into account those wild cards that can be anticipated by scanning the environment. As the second component, we discuss how improvisation can be used to deal with those events that have not been anticipated and prevented. This foresight practice can create a broadly consistent set of values and orienting principles of (re-)action allowing for a decentralized, coherent approach to technology, marketing and public relations challenges that come unannounced by weak signals.

The paper is organized as follows. We first present a definition and a classification system for wild cards. Next, we describe the role of weak signal detection in the wild card system. The following section discusses the possible contributions of improvisation to organizational foresight and its articulation with the wild card and weak signal topics.

2. Making sense of wild cards

In this section we tackle the basic definitional issues of wild cards and underline their importance for management. We proceed to establish the first component of the wild card system, which is an early warning environmental device based in the imaginability, substance and impact of potential wild cards.

2.1 What are wild cards?

Wild cards refer to incidents with perceived low probability of occurrence but with potentially high impacts for an organization. Events like September 11th are such wild cards. These sudden and unique incidents can constitute turning points in the evolution of a certain trend or system. Wild cards can become plausible at any time and are one of the most unpredictable and potentially damaging triggers of change of four conceivable components of change: trends, cycles, emerging issues, and wild cards. A multiplicity of unconnected contributions to research on this topic has produced a long list of labels such as disruptive events, structural breaks, discontinuities, surprises, bifurcations, unprecedented developments, etc. Here we stick to terminology originally introduced by Rockfellow (1994), so we use the term "wild cards".

Wild cards have a direct effect on the human condition, have broad and sometimes fundamental implications, and tend to move too fast for the whole of the system to adjust to the shock (Petersen 1999: 17). These systemic breaks emerge from a variety of interlinked variables, which produce no obvious effect until a threshold of some kind is met. Wild cards can be regarded as single watershed events in history, like the end of an era, or a paradigm shift. The fall of the Berlin Wall is a perfect example of a wild card event. After a wild card watershed, disequilibria reigns

until the affected system reorganizes and establishes a new equilibrium. The two Germanies are still in the process of getting back to a cohesive larger political and economic system. Other examples, imaginable future wild cards, may include a major stock market financial crash (larger than 1987), the implementation of the Tobin-tax, a nuclear disaster in Russia (larger than Chernobyl), the flop of the new European currency, a civil war in the USA, a coup d'Etat in China, or a new disease that kills more than 500,000 people in a country, etc.

The core characteristics of wild cards are low probability (or high uncertainty if probability assessments can not be given) and high impact. However, the effects of a wild card do not have to be abrupt in time. By the last point it is meant that time to impact (and damage) can be long or short. A current example is climate change possibly induced by carbondioxide emissions. This is a wild card which could emerge slowly over time but with irreversible consequences. This justifies a bias for action in dealing with wild cards. Indeed, waiting for more and better information on what is going on might be as costly as making a wrong decision in response to an hazardous event given that, as time passes, exposure to harm increases. As John Maynard Keynes once put it, "we may never know enough to take the chance worth taking".

2.2 Are wild cards important?

In a strategic planning process one can ask three questions with respect to wild cards (Petersen 1999: 16): which are the most important Wild cards for an organization? Can we anticipate their arrival? Is there anything we can do about them? If managers can answer these three questions, wild card analysis increases the possibility that some major future negative events might be averted

or moderated, but also positive actions can be implemented. Since wild cards are, by definition, surprises, it might be assumed that there is nothing we can know or do about them. However, this is not so: not all wild cards are unimaginable. Moreover, if information about likely direct and indirect effects on a company is to be appraised by watching for weak signals that anticipate wild cards, realistic measures can be thought of in order to reduce the drastic consequences of major wild cards. Managers can find help to answer Petersen's three questions if they prepare to make sense of the environment *ex-ante*. Wild card analysis increases the probability that some major future negative events might be averted, but also positive actions can be implemented. If we neither take time to look at them nor consider how they might be anticipated, they are guaranteed to catch us off our guard. The challenge is therefore in designing a special kind of foresight methodology that keeps the wild card debate alive, allowing room for interactive learning and the development of anticipatory attitudes.

A consequence of not accounting for wild cards from the beginning of the management process is to loose time in un-prepared crisis management when they happen (see e.g. Mitroff et al.1996; Mitroff and Pearson 1993; Mitroff and Anagnos 2000; Reid 2000). As shown in figure 1, when a proper wild card system is installed, time used in crisis management decreases with time giving room to other types of managerial tasks such as operational, strategic and visionary management. If the company is not able to promptly neutralize or adapt to wild cards it risks facing an accumulation of problems that demand an increasing commitment of managerial problem-solving capabilities to short-tem crisis situations. This helps to make the point that wild card management is highly complementary with other kinds of managerial styles, potentially increasing the effectiveness of the latter.

(Figure 1 about here)

Related to this time management issues, another consequence of not having a wild card system in place is a higher probability of choosing a wrong action, or complete inaction. When under pressure, the wrong re-action might increase the damages of the original wild cards themselves. If (flexible) contingency plans are formulated and taken seriously, especially those that relate with developing organizational improvisation capabilities, as we shall argue below, there can be a sense of calm and orderliness when dramatic events eventually strike. Managers there, as well as their teams, will go about their jobs as though some civil defence operation for which they had already practiced. This stands in contrast with the sense of shock and panic reaction observed in other organizations where hasty and erroneous decisions will have more probability of being made. That is why in a period of exponential change and tight time budgets, it seems prudent to investigate the concept of wild cards and formulate policies that take them into account. Such an investigation would increase the possibility that some major future negative events might be averted or mitigated.

3 Preparing for wild cards: The weak signal sub-system

This section explores how practical knowledge about wild cards can be developed. It starts by discussing what is meant by weak signal and goes on to put forward a new environmental scanning tool. It then discusses the uses of the tool in the organisation.

3.1 What are weak signals?

The concept of weak signal is used widely in the business literature, but the exact definition of what is actually meant is difficult to find. Usually weak signals are seen as information on potential change of a system to an unknown direction. The crisis management literature has repeatedly noticed the fact that "long before its actual occurrence a crisis sends off a repeated and persistent trail of early warning signals" (Mitroff 1988: 18). According to our view, the concept of weak signal analysis is basically information on the likelihood of events whose probability is estimated to be very low but to which is attached a high uncertainty concerning the impact of those events and the trends that can develop afterwards, if any. Coffman (1997) has defined weak signals in a way that is compatible with our view of weak signals as indicators of wild cards. In summary a wild card is:

1. An idea or a trend that will affect the business or business environment;
2. New and surprising from the signals receiver's vantage point;
3. Sometimes difficult to track down amid other noise and signals;
4. A threat or opportunity to an organization;
5. Often scoffed by other people who "know";
6. Has substantial lag time before maturing and become mainstream; and
7. Represents a chance to learn, grow and evolve.

The pioneer of weak signal analysis development has been Igor Ansoff (1982), who defined weak signals as external (e.g. quality of the work of suppliers is getting worse) or internal (e.g. increase or decrease of absence of the personnel) warnings that are too incomplete to permit an accurate estimation of their impact, and/or to determine a complete response. Ansoff suggested that every

event goes through a succession of levels of knowledge (from weak signal to strong signal). Usually a sense of environmental turbulence is the earliest identification of the signal. In this condition, the environment is expected to generate novelties but it is impossible to say where the important event will originate. The second phase is that the source of the challenge is known. In third phase shape of the challenge becomes concrete. For instance, in the technological area this kind of phase happens when a first prototype of new technology is constructed. At the stage when a weak signal becomes a strong signal organizations are likely to develop response strategies. In the final phase the outcome of response strategies becomes forecastable. In this phase we can use traditional forecasting methods (see e.g. Makridakis and Wheelwright 1989, Armstrong 2001). We propose that wild card analysis can be introduced in standard foresight exercises through a weak signal scanning device.

3.2 How can weak signals be interpreted?

In the field of business oriented futures studies there is a long tradition of environmental scanning methodologies, which aim to serve the need of weak signal analysis (see e.g. Preble and Reichel 1988; Thomas 1990; Renfro 1993). Following our concern with wild cards we propose a scanning methodology based on the integration of three analytical components: the imaginability, substance and impact classifications. The first is a "surprise metrics" by which we can be used to categorize information leading to potential wild cards. The notion of "surprise" is negatively correlated with the ability of correctly detecting the weak signals.

    i)   as unimaginable surprises (like a journey to the Earth's centre at the time of Jules Verne),

ii) imaginable surprises that are improbable (like a global nuclear war),

iii) imaginable surprises that are probable (like an oil price shock and an invasion of ecological refugees), and

iv) certain surprises (like earthquakes).

The second analytical device is based on the observation that wild cards can be further categorized by substantive themes. Surprises can be distributed in the wild card space according to the PESTE framework, a classic subject checklist for monitoring external trends and shocks: Political-military factors, Economic factors, Social factors, Technological factors, and Environmental factors (see e.g. Meristö 1991).

Thirdly, and finally, we can still classify the nature and magnitude of impact of wild cards, thus completing the ISI matrix shown in table 1. Figure 2 describes a classification of wild cards, which we can expect to happen, when we observe phenomena that can be described by trends. An essential feature of a wild card is that it usually breaks the expected long-run trend. The formulation of a typology of impacts enables an assessment of the stability and sensitivity of scenarios and trends. A break of trend can be the result of:

(1) Dead end type of wild card (DE);
(2) Slow dead end type of wild card (SDE);
(3) Dead end with a recovery to trend line (DERT);
(4) Push up to positive direction type of wild card (PUP); and
(5) Slow push up to positive direction type of wild card (SPUP);

(Figure 2 about here)

This analytical device tackles the type of the impact a wild card could have on an organization. However, this categorisation of impacts should also be interpreted in terms of scope to facilitate the quick understanding of possible consequences if a wild card occurs. Depending on the wild card the type and scope of impact can be very varied. Some wild cards like a financial crash may have an impact on all functional units and locations of an organisation, e.g. on the headquarter, all production facilities and all functional units. At the same time this wild card may entail serious financial losses but not necessarily other types of losses, e.g. an image crisis. Other wild cards, like a local environment hazard, may have a very specific impact on an organization. From a managerial perspective it is vital to perform an "impact mapping", which guides strategic and improvisational action. The categories used for differentiating scope and type of impact depend on the respective context of the organization and one of the first steps in wild card management should be the identification of the relevant categories (e.g. financial losses, human resource impacts, image impacts). This perspective implies the formulation of comments for each impact that deal directly with the field of action and improvisation. What does it mean for managers? In large organizations the locus of improvisation is always "local", meaning in certain parts of the organization. There are only few wild cards in which whole organizations are hit in all dimensions. Mostly the impacts can be specified in terms of organizational type and scope of impact. This is a dimension in which management is mostly interested, because all improvisation has to take scope and type of the internal impacts of the external events into account.

Finally, an integrated approach to potential wild cards can be used as a starting point in the mapping of "weak signals", whose analysis helps the wild card identification process in real time. Table 1 condenses these scanning tools into an integrated scanning system that might be called

Imaginability-Subject-Impact (ISI) matrix. This scanning device can be easily inserted in standard scenario projects as way of taking into account potential wild cards.

(Table 1 about here)

3.3 Debating wild cards inside the organisation

It is now important to make a clear difference between the concept of "weak signal" and the concept of "wild card". Theoretically speaking, weak signals are scattered data that point to the eminence of potential wild card events to the decision-makers. Usually there is an abundance of weak signals "in the air" before a wild card event happens. Weak signals cannot be easily connected to current trends and well-defined risk analysis. It is also possible that a weak signal remains a weak signal, not all weak signals are going to become strong signals. However, weak signals are perceived symptoms of changes in the environment. Tracking weak signals can be a task of an external and internal scanning procedure carried out typically by the strategic planning or marketing departments of an organization. When it is understood that not all weak signals are going to be strong signals the essentially subjective nature of what are the potential wild cards that weak signals may be denouncing becomes explicit. The concept of "wild card" is a culturally embedded one in the sense that we can always note that some things are real surprises to some certain groups and some individuals. Some people are not surprised if they have observed weak signals and have drawn some conclusions concerning weak signals. That means that agents are usually too pessimistic or too optimistic in relation to real wild cards. That is why it is rational to make foresight exercises to debate wild cards when agents are rationally bounded. The objective of

foresight methodologies is to allow a convergence of the belief in subjective probabilities held by different individuals by criss-crossing the variety of their personal views. The end result of this conversation is that overall subjective probability should get closer and closer with the real probabilities of the external world, i.e. a learning process.

Conceptually speaking, foresight systems (trend analysis, scenario analysis, weak signal analysis) can be seen as a part of organizational intelligence, which serves knowledge creation in an organization. Typical aspects, which are relevant for the futures oriented decision-making, are probability, feasibility, desirability and validity (see e.g. Amara 1981; Rubin and Kaivo-oja 1999). And this is the link between positive knowledge and normative intent. Knowledge increases the capability to mobilize attention and effort within the organization and, in the end, the ability to undertake correct actions.

In our case, and specifically building on the weak signal approach, a list of proposals can be derived to answer questions about what policies could be put in place in order to manage the unforeseen events, the desirability of these measures and the degree of belief in their effectiveness. Deriving concrete policy measures from wild cards and their possible meanings in terms of type and scope of impact is key to link the wild card system to concrete action. When a list of wild cards is identified and interpreted they serve as a basis on which conscious decision of action (or inaction) be made. The probability that a true wild card appearing in the ISI matrix can approach zero, however, the process of building such a list of wild cards is not neutral for the future. Listed wild cards, inferred from weak signal monitoring, can provide the basic notes and chords for real-

time decisional innovation, i.e., improvisation. When a decision is to be made, the practice of improvisation, which relies on a bias for action, can be helpful.

To summarize, wild cards can be categorised even though they cannot be known. Once wild card categories are fixed as in the ISI classification system, weak signals can be monitored and prepared against. To be sure, not all of them turn out to be wild cards. However, it is because some wild cards can be mediated by weak signals that this early warning framework should be the first component of wild card management system. It is also true that there are wild cards that are unannounced by weak signals and that our wild card management system would be necessarily incomplete if one stopped here. Organizations need some kind of structure that allows them to manage wild cards in real time. In the next section, we present an illustration of why futures research supplies a structure for social interaction that is both creative and flexible enough to generate a diversified set of ideas that lead to the analysis of wild cards. This section will provide a vivid context after which we will discuss the potential of foresight, not only in the analysis of wild cards, but also in providing the basis for the real-time management of wild cards when they happen.

4. Socio-technology for improvisation: Conditions for real time foresight

This section argues that the practice of scenario planning not only is most suited for carrying out a strategic debate around potential wild cards, but also constitutes a key ingredient for managing wild cards when they really happen. Foresight activities may be combined with organisational structures intended to build and spread improvisational capabilities throughout the organisation.

The practice of foresight provides the infrastructure for improvisation, which will help to create the elements for the second component of the wild card management system.

4.1 The role of organizational improvisation

This section introduces the notion of organizational improvisation and its role in helping the organization in the task of creating the resilience necessary to deal with unexpected events, like those considered by wild cards. Improvisational capabilities, as growing research evidence suggests (Kamoche et al. 2002), can be introduced in the field of organizational foresight in order to complement attempts of anticipation. If the monitoring of weak signals, discussed in the previous section, does not prove to be enough to prevent a crisis from happening, improvisational capabilities may be necessary for dealing with an ongoing crisis. Below we discuss the concept of organizational improvisation and its potential contribution to the field of crisis management.

Organizational improvisation refers to the convergence of conception and execution (Cunha et al. 1999; Miner et al. 2001). In practice, improvisation is said to exist when deliberate but unplanned actions are executed, aiming to help the organization in its effort of responding to unforeseen opportunities or threats in an environment under perpetual change. We argue that improvisation may also be a relevant concept for the field of futures studies due to the following reasons: (1) it is not possible for all crises to be averted; (2) crisis management systems teach the organization, in advance and in a general way, how to combat a potential crisis; (3) however, every crisis develops in a unique way and thus needs to be dealt with accordingly; (4) the lack of detail of crisis management plans needs to be complemented with action based on local knowledge, acquired and processed on the spot – in other words, via improvisational abilities.

Improvisation *per se* is also not enough to deal with wild card situations: planning is obviously necessary. Thus we agree with Mitroff (1988: 15) when saying that "clearly, it would be the height of folly not to plan for the occurrence of at least one major disaster." In fact, that is what the first component of our wild card system is all about: identifying weak signals and preparing preliminary action guidelines. However, even wild-card scenario planning, will not prevent every crisis from happening. Improvisational capabilities may be especially necessary when confronting issues such as the public failure of a new technology or the notorious defect of a highly visible new product, an environmental crisis, and so forth.

Authors on the crisis management field have aptly noted that it is nearly impossible to invent crisis management mechanisms on the spot, while the crisis is taking place (Mitroff 1988). This indicated that improvisation can not be thought of as *the* way of managing a crisis. They also noted, however, that remaining loyal to planned actions that have become inadequate in face of local circumstances, may be dangerous. Weick's (1993) analysis of the Mann Gulch fire showed that fire-fighters that "followed the plan" were killed, while those that have dropped their tools- something against the plan – have survived. Putting these arguments together it is possible to suggest that organizations need plans but must be aware that these plans should be confronted with and accommodated to local circumstances.

Improvisation has been shown to be helpful in times of crisis, by allowing people to complement general plans with locally sensitive practices. An illustration of how structure and improvisation can be coupled to deal more effectively with crisis situations is provided by Roberts and her colleagues

(Bigley and Roberts 2001; Grabowski and Roberts 1999). These authors report how the incident command system ripes the benefits of bureaucracy (e.g. control and efficiency), while avoiding this format's tendency toward inertia. The incident command system (ICS) is an approach used by USA public safety organizations (e.g. police, firefighters) that assembles and controls the temporary systems needed to manage people and equipment at a wide range of emergencies. It is a highly structured and formalized system, characterized by extensive rules, procedures, policies and instructions. Jobs are specialized and based upon standard routines. Positions are hierarchically related. Plans are established at the top of the hierarchy. Yet the system is highly flexible: rules are needed to create a reliable organization, which must be ready to act expeditiously and according to the crisis requirements. For example, the incident commander comes from the first unit to arrive at the scene, regardless of who arrives first. The system is also prepared to shift roles, as for example when a more experienced person arrives, and to migrate authority to where expertise resides. In sum, the ICS is a highly flexible social system where the organisation's profile alters rapidly (e.g. role switching, authority migration) and the violation of standard operating procedures is acceptable if procedures do not fit the characteristics of the situation. Here Bigley and Roberts (2001) make a distinction between legitimate improvisation (that they define as the application of novel tactics to unexpected problems in order to support ICS objectives) and illegitimate improvisation, or "freelancing" (that they define as behavior not directed towards the goals of the ICS). Freelancing is highly discouraged because it is potentially dangerous both for the freelancer and for the other members of the system: it is not predicted nor expected by anyone in the ICS. Coordination in the system is possible because highly sophisticated cognition management systems are constantly activated. Operational representations of the incident are developed on an ongoing basis. These representations are then intensely communicated throughout the system and

18

shared among its members. Representational responsibility guarantees that each member possesses the knowledge necessary to do his/her job in a proper manner. The incident commander is the person who attempts to maintain the "big picture" of the whole operation in order to ensure that updated mental models of the incident are distributed throughout the system as necessary.

Interestingly, most of the features of the ICS have been reported in other organizational contexts and processes. To illustrate the point with a few cases, it can be noted that Brown and Eisenhardt (1997) have shown, in a study with computer firms, that the same combination of structure and freedom is a major feature of the most adaptive firms. Adler, Goldoftas and Levine (1999) identified the coexistence of bureaucracy and flexibility in the NUMMI automobile assembly plant. Brown and Eisenhardt (1997) identified intensive communication as fundamental for making sense of the software development process. Lanzara (2001) presented action and communication as critical coordinating mechanisms in temporary organizations (in the case the organization of a fashion show). This and other evidence suggests that improvisational capabilities may be a relevant component of flexible systems.

When facing these unexpected events, companies should be able to develop expedite, vigorous and effective responses. However, due to organizational inertia (Hannan and Freeman 1977), defensive cultures (Argyris 1990), or some other source of passivity, they may not be able to deal with the situation in a quickly and effective manner. How to create an organisational basis for improvisation represents the core of the second component of wild card system that we present next.

4.2 The infrastructure for improvisation

We are now to discuss the way in which improvisation can be used as a real-time response to unplanned-for events while they are unfolding. Improvisation rests on a couple of minimal structuring elements (Cunha et al.2001), of two types: organizational and process types. Minimal organizational structures refer to the context of improvisational action. Organizational elements include facilitation of emergent change, a "safe" climate for improvisation, diversity of skills and perspectives, bcality, and a bias for action. The minimal process structure aims to reach the alignment of the means necessary for improvisation to take place. It includes storytelling, a perception of urgency, relevance, non-conformity, possibilities of rehearsal and the capability of rapidly re-combing previous knowledge and structure. These elements, which together enable the possibility of improvisation, make up the second component of the wild card managing system.

The first element of the minimal organizational structure refers to emergence. Contrary to traditional planning practices, that ignored it, emergence is viewed in this case as an inevitable property of complex systems. This is in stark contrast with traditional management practices, which favoured predictability and top-driven change processes. In face of unpredictable events, however, following the rules may not be enough to solve problems. On the contrary, as demonstrated by Weick, following general and abstract rules, i.e. rules that are not adequate to local circumstances, may be a route to disaster (Weick 1993). Improvised behaviours, being locally sensitive, emerge according to the circumstances, and not independently of the circumstances. The role of weak signal analysis in our framework role is to appreciate the meaning of wild cards for the company's

strategic trajectory and instil an awareness of a list of possibly appropriate policy responses. This strategic knowledge supplies a basis from which local interpretation and prompt re-action to of potential wild cards can emerge.

A second crucial element for improvisation to occur is the existence of a "safe" environment. A "safe" environment here refers to the inevitability of errors as "failures of reach" and potential sources of learning (McGrath et al.1995). While planning in real-time, in order to deal with unexpected and novel events, individuals may feel confident enough to try out new solutions and untested ways of problem solving. Safe organizational environments are those that, to use the words of Weick (1999), appreciate the aesthetics of imperfection or, in other words, that understand that to learn is to err (Sitkin 1992). The third organizational element favouring improvisation is functional diversity as represented in cross-functional teams. Cross-functional teams help improvisation to flourish to the extent they facilitate constructive confrontation, deviate the group from routine behaviours, and invite their members to develop non-conventional problem-solving. They should also have a bias for action, which is the fourth and final element in our action structure. As demonstrated by several authors (Weick 1995), action may be helpful while dealing with unexpected contingencies because it is instrumental for sense making and coordination. These, in turn, may lead to discovery and to real-time learning, which are relevant outcomes when facing unexpected events of the wild card genre.

Elements in the process structure include the means needed to assure that the organization has the capacity to put improvisational scenario planning into practice. We suggest that an important process is the storytelling element that is practiced with scenario methodologies. Stories may be

instrumental for improvisation if they show individuals that analytical, fact-based thinking is not the only legitimate form of thinking in the organization. Stories of successful improvisations may diffuse the perception that effortful, intentional responses to events are not only legitimate but also valuable. The potential of storytelling as a means of cultural transmission has been made clear in previous research (e.g. Martin and Powers 1981), and should be considered while preparing an organization to "fight fires". A second element in the process structure is urgency. Without urgency, people will probably revert to planned solutions. One important function of leadership in face of wild cards is precisely to transmit a sense of urgency. Cunha, Cunha and Kamoche (in press) have empirically found that, without a perception of urgency, the probability of improvised behaviours diminishes. The perception of urgency naturally arises when improvisational scenarios are built around key uncertainties. Therefore, improvisation will appear as a response to important and pressing events. When these two conditions are met, people can be expected to plan in real time or, to recur to the definition of Moorman et al. (2001), to make conception and execution converge in time. This convergence is of central importance for preparing an organizational to deal with wild card type events. Another element of the process structure is non-conformity. Considering the disruptive nature of wild card events, people should be prepared to challenge conventional views and/or practices. As such, some organizational culture types, especially the hierarchical type (Deshpandé et al.1993), with its typical emphasis on obedience and conformity, may run against improvisation, and therefore against expedite action intended to deal with events of the wild card type. That is why the quest for flexibility requires the capability to integrate seemingly opposite approaches such as the capacity to protect stable structural elements (the bureaucratic infrastructure) while introducing behavioural variation (Volberda 1996; Kamoche & Cunha 2001).

4.3 Implications for management

The explicit treatment of wild cards in foresight projects is critical for they pose radically engaging questions to the organisation as a whole. Remember that the first component of our wild card system advocates the analysis of weak signals and identifications of minimal action plans. Now, under the direct impact of a real wild card the previously stored information can be stored to supply an inspirational source for innovative reactions to the events. Now, it might be that wild cards, as suggested by weak signal perceptions, were frighteningly accurate or completely wrong in terms of what could happen. However, the anticipated wild cards, and the strategic meanings they immediately evoke, will give precious clues for making sense of what actually happened. For instance, if September 11th was not actually imagined then perhaps it could be though of being somewhere between a war in the Middle East and an earthquake in an important financial capital like Tokyo, two previously imagined wild cards that had been classified in the ISI matrix. Here one can go back to the stored wild card policy options depicted in table 2 and synthesize a mix of new policy implications that will constitute a first basis for decision.

We submit that foresight is the appropriate socio-technology from which improvisation can emerge since it provides a minimal structure for coordination and real-time action. Elsewhere, (Mendonça 2001), we defined socio-technology as a conception of an organisational structure that shapes interactive learning and sharing of understanding among the members of a collective body and, therefore, the learning and innovation capabilities of organisations. At the micro level it can refer to patterns of division of operational and cognitive labour in company whereas, at the macro level, it

can refer to societal institutions (Nelson and Sampat 2001). Socio-technologies define a framework for sense making and behaviour and, so as to be applicable in a range of specific situations and to meet a variety of specific needs Our suggestion to associate the term "socio-technology" with "organisational foresight" has the objective of emphasizing that the structure in which people act and interact have a decisive connection with the performance of that social group.

An important point for management is how to achieve the right balance between wild card analysis and organisational improvisation. We submit that the habit of managerial "assumption smashing" (Davis-Floyd 1997) instilled by foresight methodologies, such as scenarios or Delphi projects, is an important factor that facilitates the creation of organisational improvisational capabilities that allow the organisation to defuse or adapt to wild cards. Foresight forums provide a self-contained sphere where people from different backgrounds and organisational departments can pursue critical issues in a psychologically safe manner. By capturing the tacit knowledge embodied in diverse people inside the organization and by facilitating a rich process of debate, foresight techniques contribute to a creative atmosphere nurturing insights from where better-informed and innovative decisions can be drawn upon. The role of foresight in organisations can be seen as the activity of *creative destruction*, to use Schumpeter's celebrated phrase, of habits of thought and decision-making routines within the organisation (Mendonça 2001). To summarise, implementing the two self-reinforcing wild card subsystems we propose in this paper might tune the organisation to the right music enabling a rapid and innovative response to the wild card challenge.

5. Conclusions

Contemporary organizational environments have been often described as turbulent and unforgiving (Harvey and Novicevic 2002). The uncertainty permeating them requires surprise-accommodating structures. This paper discussed the potential advantages resulting from the combination of two such approaches: wild cards analysis and organizational improvisation. This combination results from the assumption that companies should try to anticipate risky events, but need to do more: they have to prepare themselves to deal with these high risk/low probability events before and during their occurrence. With the idea of a wild card managing system, embedded in a foresight context, this paper suggested how to breed across an organization the skill to deal with events as they unfold. This capability of improvisation, or real-time planning is, we believe, a useful but neglected topic in the organizational foresight literature.

We suggest a wild card system as a permanent process taking place in standard foresight exercises. It has a weak signal analysis component that aims to generate basic knowledge on potential crises. This knowledge on the strategic meaning of wild cards will provide the raw material for informed improvisation. It is the link between analysis and the improvisation infrastructure provided by the practice of foresight that enables the organisation to react influence the changes triggered by wild cards. This dynamic and ongoing view of foresight as something embedded in the organization's daily life is, we believe, potentially useful in the articulation between foresight and organizational "firefighting" (Weick 1996). Empowering organizational members with the responsibility to detect and deal with weak signals through legitimate improvisation in their area of expertise, may contribute to avoid the kind of culture that might precipitate the deliberate ignorance of warning signals. To accept that surprises should be accommodated throughout the organization and managed, to a certain degree, in an emergent rather than centralized fashion,

means that change and adaptivity should be regarded not as an exceptional state driven from the top, but as the normal state of socio-economic systems, which results from multiple interactions that cross the several layers of the organization (Tsoukas and Chia 2002).

In this article we have argued that it is not enough to detect weak signals leading to potential wild cards: it is also necessary to act upon them. Improvisation, through the application of locally-sensitive adaptations of recommended tactics, may play a role in the process. This paper aimed to make such role more explicit.

References

Adler, P.S., Goldoftas, B. and Levine, D.I. (1999). Flexibility versus efficiency? A case study of model changeovers in the Toyota production system. *Organization Science*, 10, 43-68.

Amara, R. (1981). The futures field. *Futurist*, 15, 25-29.

Ansoff, I. (1982). *Strategic response to turbulent environments.* Working Paper No. 82-35. Brussels: European Institute for Advanced Studies in Management.

Argyris, C. (1990). *Overcoming organizational defenses*. Boston: Allyn and Bacon.

Armstrong, J.S. (2001). *Principles of forecasting. A Handbook for Researchers and Practioners*. Boston: Kluwer.

Bigley, G.A. and Roberts, K.H. (2001). The incident command system: High-reliability organizing for complex and volatile task environments. *Academy of Management Journal, 44*, 1281-1299.

Coffman, B.S. (1997) *Weak signal research, part III: Sampling, uncertainty and phase shifts in weak signal evolution.* January 15, 1997, MG Taylor Corporation. Read from http://www.mgtaylor.com/mgtaylor/jotm/winter97/wsrsampl.htm.

Cunha, J.V., Cunha, M.P. and Faia-Correia, M. (2001). Scenarios for improvisation: Long range planning redeemed. *Journal of General Management, 27*(2), 67-80.

Cunha, M.P., Cunha, J.V. and Kamoche, K. (1999). Organizational improvisation: What, when, how and why. *International Journal of Management Reviews, 1*, 299-341.

Cunha, M.P., Cunha, J.V., Kamoche, K. and Cunha, R.C. (2002). Organizational improvisation and leadership: A field study. *International Studies of Management and Organization,* in press.

Davis-Floyd, R. (1997). Storying corporate futures: The Shell scenarios. *Journal of Future Studies*, Vol. 1.

Deshpandé, R., Farley, J.U. and Webster, F.E. (1993). Corporate culture, customer orientation, and innovativeness in Japanese firms: A quadrad analysis. *Journal of Marketing, 57*, January, 23-37.

Grabowski, M. and Roberts, K.H. (1999). Risk mitigation in virtual organizations. *Organization Science, 10*, 704-721.

Hannan, M.T. and Freeman, J. (1977). The population ecology of organizations. *American Journal of Sociology, 82*, 924-964

Harvey, M. and Novicevic, M.M. (2002). The hypercompetitive global marketplace : The importance of intuition and creativity in expatriate managers. *Journal of World Business, 37*, 127-138.

Kamoche, K. and Cunha, M.P. (2001). Minimal structures: From jazz to product innovation. *Organization Studies*, 22, 5, 733-764.

Kamoche, K., Cunha, M.P. and Cunha, J.V. (Eds.) (2002). *Organizational improvisation*. London: Routledge.

Lanzara, G.F. (2001). *Organizing a fashion show*. Presented at the 1st International Symposium on Organizational Improvisation, Lisbon, June.

Makridakis, S. and Wheelwright, S.C. (1989). *Forecasting methods for management*. Fifth Edition. New York: John Wiley and Sons.

Martin, J. and Powers, M.E. (1981). Organizational stories: More vivid and persuasive than quantitative data. Reprinted in B.M. Staw (Ed.)(1991), *Psychological dimensions of organizational behavior* (2nd ed.; pp.190-198). Englewood-Cliffs, NJ: Prentice-Hall.

McGrath, R.G. MacMillan, I.C. and Venkataraman, S. (1995). Defining and developing competence: A strategic process paradigm. *Strategic Management Journal, 16*, 251-275.

Mendonça, S. (2001). Scenarios as a social science-based technology: Evidence from Royal Dutch/Shell. In T. Stevenson, E. Massini, A. Rubin and M. Lehmann-Chadha (eds), *The Quest for the Futures: A Methodology Seminar in Futures Studies*, Turku, Finland, 94-112.

Meristö, T. (1991). Scenario building in the management of companies. (In Finnish). Finnish Society for Future Studies. *Acta Futura Fennica* No. 3. VAPK-Kustannus. Valtion painatuskeskus, Helsinki.

Miner, A.S., Bassoff, P. and Moorman, C. (2001). Organizational improvisation and learning: A field study. *Administrative Science Quarterly, 46*, 304-337.

Mitroff I. I (1988). Crisis management: Cutting through the confusion. Sloan Mnagement Review, Winter, 15-20.

Mitroff I.I. and Anagnos, G. (2000). *Managing Crises Before They Happen: What Every Executive Needs to Know About Crisis Management.* New York, NY: Amacom.

Mitroff, I.I. Pearson, C. and Harrington, K. (1996). *The Essential Guide to Managing Corporate Crises.* Oxford*:* Oxford University Press.

Mitroff, I.I. and Pearson, C. M. (1993). *Crisis Management: A Diagnostic Guide for Improving Your Organization's Crisis-preparedness.* San Francisco, CA: Jossey-Bass.

Nelson, R.R and B. Sampat (2001), Making sense of institutions as a factor shaping economic performance. *Journal of Economic Behaviour & Organization*, *44*, 31-54.

Petersen, J.L. (1999). *Out of the blue. How to anticipate big future surprises?* Lanham: Madison.

Preble J, R. P. and Reichel A. (1988) The environmental scanning practices of U.S. multinationals in the late 1980's. *Management International Review,* Vol. 28, No. 4, 4-14.

Reid, J. L. (2000). *Crisis management: Planning and media relations for the design and construction industry.* New York, NY: John Wiley and Sons.

Renfro W. (1993) *Issues management in strategic planning*. Westport, Connecticut: Quorum Books.

Rubin, A. and Kaivo-oja, J. (1999). Towards a futures-oriented sociology. *International Review of Sociology. Revue Internationale de Sociologie*, Vol. 9, No. 3, 349-371.

Sitkin, S.B. (1992). Learning through failure: The strategy of small losses. In B.M. Staw, L.L. Cummings (eds), *Research in Organizational Behavior* (Vol.14, pp. 231-266). Greenwich, CT: JAI Press.

van der Heijden, K. (1996). *Scenarios, The Art of Conversation*. Chichester: John Willey & Sons.

Thomas P. (1980). Environmental scanning: The state of the art. *Long Range Planning* Vol 13, No 1, 20-25.

Tsoukas, H. and Chia, R. (2002). On organizational becoming: Rethinking organizational change. *Organization Science, 13*, 567-582.

van der Heijden, K. (1996). Scenarios, The Art of Conversation. Chichester: John Willey & Sons.

Volberda, H. (1996). Toward the flexible form: How to remain vital in hypercompetitive environments. *Organization Science, 7*, 359-374.

Weick, K.E. (1993). The collapse of sensemaking in organizations: The Mann Gulch disaster. *Administrative Science Quarterly, 38*, 628-652.

Weick, K.E. (1995). *Sensemaking in organizations*. Thousand Oaks, CA: Sage.

Weick, KE (1996). Prepare your organization to fight fires. *Harvard Business Review,* May-June, 143-148.

Weick, K.E. (1999). The aesthetic of imperfection in orchestras and organizations. *Comportamento Organizacional e Gestão, 5*, 5-22.