

**Redefining Organizational Boundaries:  
Building an Aware and Agile Organization by Enabling New Social  
Interactions**

by

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## **Abstract**

Today's world is characterized by great turbulence and uncertainty. Rapid and discontinuous changes in technologies, regulation, competition, and demand are increasingly becoming the rule. Information is rapidly rendered inaccurate or obsolete by new information, and strategic opportunities arise and disappear quickly. The complexity of the external environment, and the associated unpredictability, place a premium on fast decision making and organizational flexibility to adapt quickly.

Policymakers as well as business decision makers are struggling to keep pace with these new challenges. As the scientific and mechanical view of the world is not appropriate for such complex environments, new methods are required. To this end, we explore emerging fields, such as complexity theory and complex adaptive systems, to offer new approaches to address the fundamental dilemma of flexibility versus efficiency. Furthermore, we argue that policymakers can learn from the private sector and leverage new management concepts to become more effective. A key lesson is that organizations need to tap the passion and spirit of their employees.

Clearly, technology will play a central role in redefining decision and policy making. We discuss how new web based social technologies will revolutionize organizations and enable new ways to channel collective intelligence of its employees. Such technologies have virtually eliminated transaction costs and made group forming easy and costless.

We propose a framework to leverage the power of new social technologies. We argue that organizations need to redefine their boundaries and make them more permeable. This will enable more interactions with the external environment which will provide the required background information, especially early warning signs, to let the appropriate changes emerge inside an organization based on loosely connected elements. By sensing external triggers early, organizations can initiate internal changes guided by motivated and passionate employees. We have applied relevant portions of the proposed framework to a Fortune 50 company to test our ideas.

We also highlight the need for adaptive policies to deal with the turbulent environment and outline specific recommendations for policymakers and agencies accordingly. These recommendations offer new ground for building flexible yet efficient organizations.

**Thesis Supervisor:**      **Dr. Mahender Singh**

Research Director, Center for Transportation and Logistics

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# Chapter 1. Introduction

There is at least one consensus about the current environment that policy makers and business decision makers are dealing with: it is turbulent, fast-moving and complex.

We are living in a high-velocity environment characterized by rapid and discontinuous changes in technologies, competition, regulation and demand. Information is rapidly becoming inaccurate or obsolete, and strategic opportunities arise and disappear quickly. As a result, keeping pace with the environment and its turbulence has become a great challenge for organizations, making the speed of decision-making a decisive feature for future success. More importantly, there are no definitive formulation to address the problems involving multiple stakeholders with different values and priorities. This is a new challenge for experts who need to access a multifaceted view of the world to cope with the sudden complexity.

This environment also makes the work of decision makers more difficult because forecasting what will happen in the future has become impossible. Crafting new policies is characterized by the multiplicity of inherent, almost irreducible uncertainties and unknown risks that could arise suddenly. These characteristics of the environment have an important impact on policy making and government action. National security for example is a domain where there is a tremendous need for real time information and the ability to make decisions fast. But the complexity and interdependence of the external environment are complicating the task of policymakers. In fact, every institution needs faster decision making to be able to react in a timely manner to unexpected disruptions. Conceptually speaking, organizations need policies that can adapt to the sudden changes in the external environment.

In the business world, the current environment is one in which competitive advantages are transient at best. Firms are struggling to stay competitive in an environment that requires constant input and actions from them. To excel in such environments, organizations need to be able to react fast and adapt to the continuously changing circumstances. This is a challenge because thus far we have operated in a world in which, most of the time, the changes are triggered by disruptions and crises. Planning to operate assuming a disruption driven model is not sustainable and a poor fit for the future since disruptions will be far more frequent and severe than the past. This could be avoided if we can sense the drivers of potential disruptions at an early stage and initiate the required responses quickly.

For this purpose, a new requirement to operate in the new business environment is for organization to better monitor the changes and build awareness. As issues no longer can be understood and solved through the usual cause-effect framework, decision makers need new methods to address the future challenges.

## 1.1. Problem statement

An increasingly complex and turbulent environment exerts greater pressure on decision makers. They need to find new ways to better grasp this dynamic environment and its different complex components. Old methods based on a linear and mechanistic view of the world fail to perform in such a complex environment. Because rapid step changes can't be addressed through execution alone, the current view of strategy will not work in the fast moving world of hypercompetition. The solution lies in redefining the manner in which organizations frame strategy and execute. Organizations need new methods to address broad changes and emerging trends in the future. This leads to a natural research question:

*How can organizations address the unexpected challenges resulting from a highly turbulent and uncertain environment?*

Lately, the idea of collective intelligence has generated tremendous interest and it is becoming a much sought after capability largely due to the innovations in communication technologies. These technologies are enabling new ways to collaborate, build communities and reach out to customers. Such platforms could also be used internally to promote collective intelligence and foster a sense of shared belonging to an organization culture. Technologies, such as Web 2.0 tools and social media platforms, could also be leveraged by organizations to trigger better decision making and help to build a more agile and aware organization. With this knowledge, we refined our research question as follows:

*How can organizations leverage new communication and social technologies to address these challenges resulting from a highly turbulent and uncertain environment?*

To answer this question, we will review and bring together the learning from a variety of domains. We will discuss how these can help to build a new approach to answer our research question. Specifically,

we will see how technology can be embedded in an organization to drive permanent culture of discussion and diversity by changing its social architecture.

## **1.2. Research approach and methods**

### **1.2.1. Qualitative methodologies**

This research work is exploratory in nature as the problem is still not well structured and the topic is fairly new. Not much academic research has been published on this specific topic. For these reasons, the choice of qualitative methodologies is logical for conducting this research.

According to Ghauri and Gronhaug, “qualitative research is particularly relevant when prior insights about a phenomenon under scrutiny are modest, implying that qualitative research tends to be exploratory and flexible because of 'unstructured' problems (due to modest insights)” (Ghauri and Gronhaug, 2005). We are primarily concerned with interpretation and understanding of an evolving topic, and qualitative research allows us to “understand reality as socially constructed: produced and interpreted through cultural meanings” (Eriksson and Kovalainen, 2008).

While both quantitative and qualitative research methods are useful and needed, quantitative methodologies are not adequate in our context. A quantitative approach would result in loss of texture. As Silverman points out, quantitative research cannot deal with the social and cultural construction of its own variables (Eriksson and Kovalainen, 2008). Since the context, as well as the social and cultural dimensions, is extremely important to us, quantitative research – at least in this first exploratory phase – is not well suited. In fact, the attribute ‘qualitative’ to characterize our approach is more a question of perspective and is independent of a choice of methods.

### **1.2.2. Methods**

First, an extensive literature review was conducted and focused on extant academic and business literature. The main goal of the literature review was to frame and position our approach more precisely. The literature review also helped clarify and sharpen our research question and ideas and considered the following three topics.

The first topic of interest was concerned with understanding the dynamics of decision making in high velocity environments, with issues such as *fast decision making*, and *hypercompetition*. This also had to be compared with more traditional literature on decision making. The second topic was focused on understanding how companies and organizations deal with new communication technologies and what could be done with them. This encompasses topics such as *Web 2.0*, *social networks*, *social software*, *Enterprise 2.0*, as well as the concepts of *collective intelligence* and *groupthink*. Finally, we tried to learn more from new fields: *complexity theory* and especially *complex adaptive systems*. Our objective for this third topic was to understand how such theories could be leveraged to help organizations succeed in a complex environment.

To validate our learning and complement the research, we worked with a Fortune 50 company as a case study. We designed a trend-watching system to help them develop better awareness of their external environment. Comparing the case organization's behavior with what we found in the literature allowed us to design an effective and appropriate trend-watching system.

Finally, the available information was used to carry out a structural analysis of the problem and to focus the learning from this research to offer a detailed qualitative analysis of how organizations should approach the challenges posed by a highly dynamic environment and how they can use new communication technologies for this purpose. These recommendations from the private sector were eventually adapted for policymakers to help them address the challenges of a turbulent and uncertain environment.

## 1.3. Thesis outline

In chapter 2, we present an extensive literature review of the main fields of interest: decision making, collective intelligence, information aggregation methods, Web 2.0 and social media, as well as complexity theory. This will provide the background necessary to understand the current and future approaches that decision makers can use.

Chapter 3 will focus on understanding what has changed in the current environment. We will analyze how the environment is becoming turbulent. We will also examine the impact of technology and especially the speed of its evolution on the environment. We will see the consequences of a turbulent and dynamic environment on business and policy decision making.

In chapter 4, we will study some of the approaches that business organizations have been trying out. We will especially focus on the use of new technologies to foster new strategies. This section will particularly analyze the limitations of these approaches. Learning from new fields to propose new approaches is discussed in chapter 5. We will explore emergent research fields such as new technologies, fast decision making and complex adaptive systems. This will inform us on how management and decision making can benefit from these concepts. The goal is to provide new insights for policymaking based on what businesses are already trying to implement.

Chapter 6 will bring different concepts together. We will focus on the necessity to recalibrate the organization between strategic agility and operational efficiency, to leverage the passion and spirit of employees, and to enable constant monitoring of the external environment in order to build awareness and flexible informal structures. A case study of the design and implementation of a trend-watching system will also be presented. We will analyze the insights from the development of such a monitoring system in a Fortune 50 company. We conclude this chapter by channeling insights from the business world and proposing new approaches for the policymaking realm. We will see how these new fields call for adaptive policies and highlight the role of citizens in the decision making process.

Finally, we will conclude this thesis with some general recommendations for decision makers in business and policy organizations in Chapter 7.

# Chapter 2. Literature review and definitions

## 2.1. Decision making

Here we present the key attributes of a rational decision-making process. This provides the background to better understand how decision makers deal with uncertainty.

### 2.1.1. Rational model

The most common decision making model assumes that human behavior has some purpose, which means that people make decisions rationally. This implies that the different actors involved in the decision making process have objectives which they are aware of before entering the decision situation and which they are trying to pursue. Such models follow a very structured approach with specific steps, which J. Robert Baum and Stefan Wally describe as follows:

*“From the perspective of the strategist, or managerial decision-maker, the deliberate rational decision-making process involves five intertwined cognitive stages: (1) give attention to a problem or opportunity; (2) collect information; (3) develop an array of options; (4) value the options using expected costs and benefits; and finally (5) select the option with the greatest utility.” (Baum and Wally, 2003)*

The last step, which they omit here but which is obvious, is the implementation and evaluation of the selected solution.

### 2.1.2. Difficulties and limitations

Several studies have highlighted the limitations of the different steps of the rational decision-making model. As Baum and Wally further state, referring to their description of the process, the decision-making process is an “incomplete description of real decision processes” (Baum and Wally, 2003).

Aspects such as intuition, emotion, or experienced-based mental routines should also be incorporated in a thorough description of decision-making processes. Similarly Eisenhardt explains:

*“Goals are unclear and shift over time. People often search for information and alternatives haphazardly and opportunistically. Analysis of alternatives may be limited and decisions often reflect the use of standard operating procedures rather than systematic analysis.” (Eisenhardt and Zbaracki, 1992)*

There are several psychological traps that impact the decision-making process. These include the nature of the model presentation, the roles of the analyst and decision maker in the modeling process, and factors external to the modeling process (Kugler et al, 2008). And as expected, decision makers are prone to make mistakes that are not without consequences. Kahneman, Slovic and Tversky, for example, “found decision mistakes that are caused by misunderstood probabilities, personal biases, and failures of memory” (Baum and Wally, 2003).

We will see later when discussing information aggregation methods, several biases also limit decision making and need to be accounted for to better understand and analyze decisions. The rational decision making model suffers from severe limitations especially in its assumptions. At the very least, uncertainty and social aspects need to be included in the new model of decision making.

### **2.1.3. Bounded rational model**

The concept of bounded rationality was developed by Herbert Simon to acknowledge the limitations of the mainstream economic theory and especially the fact that it relied on a description of economic agents as pursuing a full and rational maximization of their utility function (Gigerenzer and Selten, 2001).

*“The term ‘bounded rationality’ is used to designate rational choice that takes into account the cognitive limitations of the decision maker – limitations of both knowledge and computational capacity.” (Simon, 1997)*

Simon argues that economic decision makers use heuristics and rules of thumb rather than strict and rigid optimization rules. The emotions of people need to be incorporated into decision making models. The complexity of the situation and their inability to process and compute the expected utility function of all alternative actions force them to do so. Decision makers are “satisficers” and not optimizers.



## 2.2. Policymaking

A general definition of policy often proposed is that it is “a deliberate plan of action to guide decisions and achieve rational outcomes” (Wikipedia, policy). Policymaking usually applies to government and regulatory agencies as well as to private sector organizations. The purpose of policies is to guide individuals and actions toward a desired outcome. Policymakers are thus interested in designing policies that address and help resolve present or future issues; policies are instituted to avoid some negative effects or to seek some positive benefit.

In particular, public policy is generally described as the course of action or inaction taken by governmental entities with regard to a particular issue (Wolf<sup>1</sup>). Other scholars define it as a “system of courses of action, regulatory measures, laws, and funding priorities concerning a given topic promulgated by a governmental entity or its representatives” (Kilpatrick<sup>2</sup>).

### 2.2.1. Policy cycle

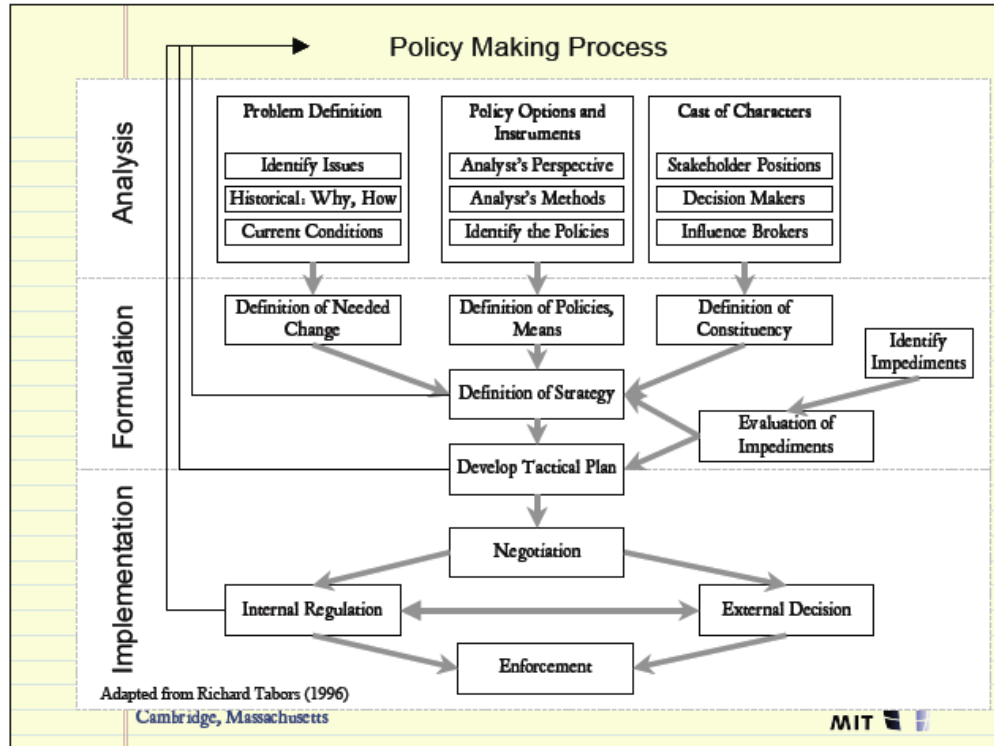
The development of policy usually follows a standard process. The main steps are: problem identification and analysis, policy formulation, and policy implementation. Figure 1 provides an example of different steps involved in the policymaking process. Another way to look at the policy cycle is detailed by Bridgman and Davis, it has the following eight steps (Bridgman and Davis, 2004):

1. Issue identification
2. Policy analysis
3. Policy instrument development
4. Consultation (which permeates the entire process)
5. Coordination
6. Decision
7. Implementation
8. Evaluation

---

<sup>1</sup> <http://qsilver.queensu.ca/~wolfer/General/Definition.html>

<sup>2</sup> <http://www.musc.edu/vawprevention/policy/definition.shtml/>



Source: Class material, ESD.10 – Introduction to Technology and Policy

Figure 1 - Policy cycle

These models are obviously heuristic and iterative. They try to simply capture the underlying dynamics of policymaking. The actual policymaking process is typically characterized by even greater complexity and more interactions between a variety of stakeholders, individuals and organizations.

## 2.2.2. Tensions in policymaking

In *Policy Paradox*, Deborah Stone argues that considering market as the model of society is flawed. She suggests using a model of society as a political community. Because policy and thinking about policy are produced in political communities, society should be considered as such. She emphasizes the limitations of a model of policymaking based on rationality where policy is created in an orderly sequence. This approach is linked to the rational model of decision making which we studied in the previous section. According to Stone, such a model loses the essence of policymaking: “the struggle over ideas” (Stone, 2002).

Stone analyzes how goals shape the policymaking process. Among them, she cites: equity, efficiency, liberty, security, their role in policy can be defined as follows:

*“They are often invoked as justifications for a policy, for a government action, or for the government’s not taking action. They are also used as criteria for evaluating public programs; in this way, they function as standards against which programs are assessed. They are often called values, suggesting a more complex array of considerations rather than a definitive endpoint.”*

Equity is about “treating likes alike;” efficiency is concerned with “getting the most output for a given input;” security strives for the “satisfaction of minimum human needs;” and liberty is the “ability to do as you wish as long as you do not harm others.”

Stone argues that there are several trade-offs between these different goals that policymakers need to overcome, such as between equity and efficiency, security and efficiency, liberty and security, or liberty and equality. These goals and the potential trade-offs between them drive the policy making process. Good policies are thus policies that strive to achieve these goals and solve society’s problems. In a model of society as a political community, these goals are not only wishes but also means of gathering political support.

## 2.3. Collective intelligence

### 2.3.1. Definition

The idea of collective intelligence has generated tremendous interest lately and has become a much sought-after capability, largely due to the innovations in communication technologies. As we will see, these technologies are enabling new ways to collaborate. As defined by the online encyclopedia Wikipedia (itself a symbol of collective intelligence, as we will discuss later), “collective intelligence is a form of intelligence that emerges from the collaboration and competition of many individuals” (Wikipedia, Collective Intelligence). On his blog, George Pór, a collective intelligence pioneer, goes beyond this definition and extends this concept to “the capacity of human communities to evolve towards higher order complexity and harmony, through such innovation mechanisms as differentiation and integration, competition and collaboration” (Pór<sup>3</sup>).

---

<sup>3</sup> <http://www.community-intelligence.com/blogs/public/>

These two definitions share in common the pivotal idea that a collection of minds can produce superior knowledge and achieve a higher state of comprehension or innovation than those same minds by themselves.

### 2.3.2. The power of Internet

Several authors argue that collective intelligence is attracting great attention because of the Internet, which provides people with new tools to access information. New communication tools are enabling people to interact, share and collaborate with ease and speed, fulfilling their interest for sharing information. The Internet can indeed be seen as a meeting of minds and collaboration of knowledge. We will review different examples of Web tools in Section 2.5.3.

### 2.3.3. Collective intelligence utopia

Pierre Levy, a French philosopher, defines collective intelligence as “a form of universally distributed intelligence, constantly enhanced, coordinated in real time, and resulting in the effective mobilization of skills. [...] The basis and goal of collective intelligence is the mutual recognition and enrichment of individuals rather than the cult of fetishized or hypostatized communities” (Levy, 1997). From his point of view, collective intelligence can be seen as a positive ideal: “The ideal of collective intelligence implies the technical, economical, legal, and human enhancement of a universally distributed intelligence that will unleash a positive dynamic of recognition and skills mobilization.” He also emphasizes that collective intelligence is about placing people and human at the center again and leveraging their passion: “The tension toward collective intelligence assumes that we are willing to focus on the human as an end in itself” (Levy, 1997).

### 2.3.4. Avoiding groupthink

It is also common knowledge that group deliberation and crowds can also lead to “collective stupidity” (also called “collective dumbness”). This is the concept of *groupthink* where groups of very bright and smart people can collectively produce stupid outcomes.

Janis explores this phenomenon in *Groupthink* where he argues that “extensive consideration of goals and a wide range of alternatives is a prerequisite to sound decision making” (Bourgeois and Eisenhardt, 1988) and thus to avoid such groupthink. James Surowiecki goes further in his book *The Wisdom of*

*Crowds* where he analyses some of the required condition for many minds to produce actionable and effective intelligence. This tension between two extremes, collective intelligence vs. collective dumbness, suggests that there might be certain conditions under which bringing people together is successful and others under which it might not be the most appropriate and efficient approach. In the following section, we discuss the requirements for collective intelligence.

## 2.3.5. Reaching collective intelligence

### 2.3.5.1. *The wisdom of crowds*

James Surowiecki is a true believer of the power of groups to produce knowledge. In *The Wisdom of Crowds* he argues that, “chasing the expert [the one right person who will have the answer] is a mistake, and a costly one at that. We should stop hunting and ask the crowd instead. Chances are, it knows” (Surowiecki, 2005). His central thesis is that “a diverse collection of independently-deciding individual is likely to make certain types of decisions and predictions better than individuals or even experts on their own” if provided with appropriate tools such as an information aggregation mechanism. Throughout numerous examples and stories, he makes the point that:

*“Under the right circumstances, groups are remarkably intelligent, and are often smarter than the smartest people in them.”*

Surowiecki emphasizes that the ability to tap crowds has the potential to make a profound difference in the way companies do business. As we will see later, new Web 2.0 tools open promising ways to harness collective intelligence.

Current research on collective intelligence suggests that different conditions are required for the group to make decisions and predictions better than individuals. The first is diversity of opinion. This implies that each person involved in the process has some private information. Diversity contributes to collective intelligence by adding different perspectives and by making it easier for individuals to say what they think. This leads to the second requirement: independence, i.e. the fact that people’s opinions should not be determined by other opinions around them. The third requirement is decentralization. Decentralization encourages independence and specialization while still allowing people to coordinate their activities and solve difficult problems. Finally, the fourth requirement is

aggregation. The presence of some mechanism for turning private judgments into a collective decision is indeed critical.

According to Surowiecki, “if a group satisfies these conditions, its judgment is likely to be accurate.” He argues that this is because, under such conditions, errors from different group members will cancel themselves out through randomness. Furthermore, the information part of “information minus error” equation is likely to be good because of the amount of information a group’s collective verdict so often contains. Hence the *wisdom of crowds*. An important conclusion is that crowds can predict the correct answer even if only a small set of people in the crowd knows it. This is due to the fact that “incorrect information can cancel out through randomness” (Page, 2008).

### 2.3.5.2.Diversity

Scott E. Page argues that the main condition for producing better groups is to have diversity. He thus proposes a slightly different approach than James Surowiecki. In his book, *The Difference*, he shows through several theorems how groups that display a range of perspectives outperform groups of like-minded experts. One important theorem is that:

*“Given conditions 1-4 [below], a randomly selected collection of problem solvers outperforms a collection of the best individual problem solvers.” (Page, 2008)*

The conditions are as follow: “1/ The problem is difficult (no individual problem solver always locates the global optimum); 2/ The calculus condition (the local optima of every problem solver can be written down in a list. In other words, all problem solvers are smart); 3/ The diversity condition: any solution other than the global optimum is not a local optimum for some nonzero percentage of problem solvers; 4/ Good-sized collections drawn from lots of potential problem solvers: the initial population of problem solvers must be large and the collections of problem solvers working together must contain more than a handful of problem solvers” (Page, 2008).

This supports and specifies the view of the *Wisdom of crowds*. Crowds can beat averages under the condition of diversity, which is a more precise condition than the ones developed by Surowiecki. The collective prediction of a collection of diverse individuals will be more accurate than the average individual predictions. This implies that a crowd necessarily predicts more accurately than its average member. Furthermore, this also shows that crowds can outperform experts if their coverage is diverse

enough. As Scott E. Page concludes, “for a crowd to be wise, its members must be individually smart or collectively diverse” (Page, 2008).

### **2.3.6. Channeling people**

The issue of collective stupidity has also been called the “joke of crowds” (Purves, 2009). Greenpeace experienced the issue of the joke of crowds when it launched a contest to name a humpback whale as it wanted to leverage the power of collective intelligence and democracy. It set up a place for people to propose names and vote on them. The result was not what Greenpeace expected: 78% of people voted for the name “Mr. Splashypants.” Surowiecki attributes this unexpected result to the fact that for open issues, it is more difficult to enable the wisdom of crowds; groups of individuals are especially good at solving problems which they know have precise answers.

Tom Purves suggests that organizations need to design their initiatives to “funnel people into valuable action rather than allow them unrestricted freedom”. Something that has been used with success to leverage the wisdom of crowds is, for example, to let people vote up or down. By setting some parameters, such actions help to support constructive interactions between different individuals and to limit destructive ones. In the end, organizations need to set some guidelines or policies to lay a solid foundation for the use and development of tools to leverage collective intelligence.

## **2.4. Information aggregation methods**

In this section we will discuss different information aggregation methods in more detail and highlight their respective strengths and weaknesses. An information aggregation method is a service that gathers relevant information from multiple, diversified sources. The objective is to add value in a way that will be useful to decision makers.

### **2.4.1. Overview of some tools**

There exist a variety of ways to aggregate information. Some are really simple such as having people vote on what they think the outcome or the answer should be, while others are more refined and complex, such as the Delphi method. Other aggregation methods include polls, deliberation groups, auctions and bids, panels (potentially with experts involved), focus groups, etc. We will not present a

comprehensive definition and analysis of these tools as they are well-known and commonly used in organizations. Our emphasis will be on new tools and methods, especially the ones that try to leverage collective intelligence.

In *Infotopia* (2006), Cass Sunstein provides an interesting overview of different information aggregation methods. The book provides an analysis of “how many minds can produce knowledge.” For this purpose, the author describes several information aggregation methods, outlining their advantages and limitations.

One of these traditional methods, which Cass Sunstein focuses on, is group deliberation. He stresses that “under appropriate conditions, groups can do much better than individuals.” The relevant conditions appear to include highly competent group members attempting to solve statistical problems that are known to have demonstrably correct answers. He argues that, “deliberation groups will converge on the truth, and outperforms statistical groups as well if the truth has some initial social support within the group and when the task has a demonstrably correct answer according to a framework that group members share.”

Deliberation groups are also subject to several issues and biases. Especially, they tend to amplify the errors of their members and do not usually elicit information that their members have. In addition to that, they are also subject to cascade effects that can produce situations in which “the blind leads the blind.” Furthermore, they can show a tendency towards group polarization by which groups are carried to extreme positions.

Thus deliberating groups, one of the most usual ways of aggregating information, can be efficient in very specific circumstances. However, when those circumstances are not met, the outcome of the aggregation can be biased and of less value for taking decisions. Cass Sunstein and other authors thus promote the use of other aggregation methods, and especially prediction markets.

## **2.4.2. Prediction markets**

### ***2.4.2.1. Definition and characteristics***

Although prediction markets have been around for quite a while (the first known corporate prediction market was created around 1990), their popularity is quite recent. This is partly due to new studies on the accuracy and advantages of prediction markets to aggregate information and to make decisions



(Google Scholar returns almost 600 articles on prediction markets in April 2009). Another reason is the fact that *Wisdom of Crowds* and *Infotopia* have championed these tools in comparison to more traditional tools.

Prediction markets are a specific type of speculative market that takes advantage of dispersed information by turning publicly dispersed knowledge into a more accurate estimate, using money as a proxy. The core idea is to use market mechanism that has indeed been recognized to aggregate privately held information. It follows from rational expectations theory that, in equilibrium, asset prices will reflect all the information held by market participants. The most common uses of prediction markets are found in sales forecasting, development of product ideas and new features, project management, comparative analysis and assessment of market conditions.

### 2.4.2.2.Examples

Numerous studies and books have discussed the idea of prediction markets. According to Oliver Young “in nearly all tests, prediction markets have shown tremendous efficiency for aggregating knowledge and, as a result, are remarkably accurate.” He also notes that prediction markets may provide a cheap mechanism for aggregating information and offer a greater diversity of opinion. Cass Sunstein in *Infotopia* cites the success of StrategyMarkets.com, which has predicted correctly 90% of the time. Intrade.com is another example of such prediction markets available to the public. Their trading service allows members to transact on political, financial, current and similar event futures. Let us look at two successful examples of prediction markets in more detail.

#### Iowa Electronic Market

The Iowa Electronic Markets, or IEM, are “an on-line futures market where contract payoffs are based on real-world events such as political outcomes, companies' earnings per share (EPS), and stock price returns”<sup>4</sup> operated by the University of Iowa Henry B. Tippie College of Business for educational and research purposes. The IEM focuses on events that are observable to a broad based population at large (elections for example), certain stock prices or the action of the Federal Reserve. These markets have proven to be highly accurate to predict political election outcomes, especially in comparison to traditional polling (Sunstein, 2006).

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<sup>4</sup> The IEM website, [www.biz.uiowa.edu/iem/](http://www.biz.uiowa.edu/iem/)

## HP Information Aggregation Mechanism (IAM)

Hewlett Packard also pioneered applications of prediction markets to printers' sales forecasting (Chen and Plott, 2002). Market predictions based on the IAM outperformed regular and official HP forecasts. Furthermore the outcomes were consistent with the probabilistic prediction of the IAM. They noted several positive aspects of the IAM such as its flexibility and ability "to aggregate any type of information possessed by different people." The methodology is also scalable in terms of the number of participants or their location. Additionally, "incentives to hide information, misrepresent information or simply ignore requests for information are either eliminated or limited."

The study of the HP IAM by Kay-Yut Chen and Charles R. Plott also raises further research questions, such as "can [prediction markets] be designed to attract those with good information and discourage those with bad information?" Interestingly, these questions have received attention from authors such as James Surowiecki, who argue that this is not a relevant question as people with less information have less incentive to participate. Furthermore, people tend to participate in prediction markets not based on what they want the results to be from their perspective (as polls operate), but rather on what they think the overall population think and will do. Cass Sunstein argues that "prediction markets do not require accurate judgments by anything like the majority of participants", suggesting that accurate answers can emerge even if only a small percentage of participants have good information.

Additionally, although many people are biased, the market as a whole may not be. This is the marginal trader hypothesis. Cass Sunstein explains that certain "unbiased" (at least not the relevant ones) traders have a disproportionately large impact on prices. Thus, when those traders are active, they profit from the errors and biases of other traders. Overall, the different errors and biases have no effect on the aggregate market price. Prediction markets are thus very robust prediction mechanisms.

### **2.4.3. Common issues and biases in information aggregation methods**

Human nature and the fact that people have natural biases pose a challenge for information aggregation methods. Individual errors often get amplified during group decision making process when biases are widely shared. For example, groups tend to display overconfidence than group members individually

and they are more likely than individuals to escalate their commitments to a course of action that is failing – and more so if members identify strongly with the groups of which they are a part.

Among other biases that can affect group decision making and information aggregation are:

- Egocentric bias: tendency to think that other people think and act as we do
- Hindsight bias: people's tendency to believe, falsely by with the benefit of hindsight, that they would have accurately predicted the outcome of an event
- Favorite-long shot bias: tendency to under-evaluate near certainties and over-evaluate events associated with low probabilities.
- Confirmation bias: people usually assimilate new information in a way that confirms their view of the world.
- Optimistic bias: tendency to overestimate the likelihood that people think alike.
- Cascades: informational and reputational. Information cascades describe the phenomenon that individuals are following the lead of those who came before. Reputational cascades relates to the behavior of going along with the crowd in order to maintain the good opinions of others.
- Group polarization is the phenomenon by which members of a deliberating group end up in a more extreme position in line with their tendencies before deliberation began. This can be due to informational or social influences but also to a sense of shared identity.
- Hidden profile describes the accurate understandings that groups could obtain but do not. This is a product of the common knowledge effect, which describes that information held by all group members has far more influence on group judgments than information held by only a few members. As Cass Sunstein notes: "the influence of a particular item of information is directly and positively related to the number of group members who have knowledge of that item before the group discussion and judgment."

On top of the common biases and issues, there can also be transmission and communication deformation when information circulates among persons.

## 2.5. Web 2.0 and social media

### 2.5.1. Definition

Web 2.0 is a term that appeared at the first O'Reilly Media *Web 2.0 conference in 2004*. O'Reilly's "compact definition" of this trend is:

*"Web 2.0 is the business revolution in the computer industry caused by the move to the internet as platform, and an attempt to understand the rules for success on that new platform. Chief among those rules is this: Build applications that harness network effects to get better the more people use them. (This is what I've elsewhere called 'harnessing collective intelligence.')*"  
(O'Reilly, 2006)

Web 2.0 is a fast developing trend in the World Wide Web technology that aims at producing second generation web-based communities to unleash creativity, collaboration and relationship among disparate users. It is important to note that this term does not refer to a technology change but rather to a new way of thinking. Especially, the figure "2.0" does not reflect a new version of the web. Web 2.0 has to be understood as a move towards a more social, collaborative, interactive, user-friendly and responsive web.

### 2.5.2. Characteristics

Network effects of user contributions are the key to market dominance in the Web 2.0 era. Web 2.0 is the acknowledgement that users are adding value and thus should be given more power. A large shift of control to the user can thus be seen as its logical consequence. Moreover, Web 2.0 is about a change in the philosophy of web companies and web developers. It is about people connecting with other people, a process of putting "us" into the web.

Some of the characteristics of Web 2.0 are: decentralization, conversation, customization, ease of use and simplicity, rich user experiences, and self organizing structures. Web 2.0 platforms are thus fostering horizontal and open social networks. The following *tag cloud* represents the different terms and keywords generally associated with Web 2.0. This can be seen as a way to characterize what the Web 2.0 philosophy encompasses.



Source: Markus Angermeier, 2005

Figure 2 - Web 2.0 characteristics

### 2.5.3. Examples

There exist several examples of social network channels. We provide the definition of some of the most prominent ones here.

- **Blogs:** A blog (short for web-log) is “a personal or corporate website in the form of an online journal, with new entries appearing in sequence as they are written, especially as dealing with reflections or opinion, and typically incorporating links to other articles” (Wiktionary, Blogs).
- **Wikis:** As defined by the online encyclopedia Wikipedia (itself a wiki), “a wiki is a collection of web pages designed to enable anyone who accesses it to contribute or modify content” (Wikipedia, Wiki). The most prominent feature of wikis is the remarkable ease with which users can edit the content of the pages.
- **Mashups:** Mashups are lightweight web applications created by combining information or capabilities from more than one existing source to deliver new functions and insights. Mashups allow rapid creation of new content integration or information visualization without any

technical skills. Mashups facilitate reuse of existing capabilities and information. For example, they enable mixing internal and external information in a single application.

- **Micro-blogging:** Micro-blogging is a specific type of blogging where messages or posts are limited in numbers of characters. Twitter, one of the major micro-blogging website, limits posts to 140 characters.
- **Social bookmarking:** Social bookmarking facilitates the sharing of web bookmarks (web pages that one likes) among users. This type of applications allows users to store, organize, search, manage and share bookmarks of web pages. Most social bookmark services encourage their users to use *tags* instead of the hierarchical system of folders. Tags are keywords assigned to a piece of information. This kind of metadata helps to describe an item by allowing for more than just one tag and thus facilitates categorization and search.
- **Social network services:** Wikipedia defines social network services as “services that focus on building online communities of people who share interests and activities, or who are interested in exploring the interests and activities of others” (Wikipedia, Social network services). An important aspect of social network services is to provide different ways to users to interact with each other individuals and help develop a sense of community among users.

#### 2.5.4. An example of categorization

We are aware of the complexity and diversity of the new Web 2.0 world and philosophy. A number of new services and websites have emerged that propose to tap into this new way of doing things and especially the collective intelligence and communities aspects.

Figure 3 presents a comprehensive view of the popular Web 2.0 applications. It presents one way to categorize different services that have recently emerged. The different categories are presented on the periphery of the “flower”, and the “petals” show different services and websites that fall in those categories.



Source: *The conversation prism*, <http://www.flickr.com/photos/briansolis/2735401175/>

Figure 3 – *The conversation*, a categorization of social platforms

Interestingly, the authors of this categorization (Brian Solis and JESS3) posted an initial version of this representation on the image hosting website and online community service, FlickrR. It received great attention and a significant number of users pointed out flaws and made suggestions for improvements. The authors incorporated them in a new version of the representation. This process is still going on and the representation in Figure 3 is as of the beginning of May 2009. This is a nice example of the power of collective intelligence and collaboration enabled by online communities and Web 2.0 services.

## 2.5.5. Social media

Social media “is the use of electronic and Internet tools for the purpose of sharing and discussing information and experiences with other human beings in more efficient ways” (Parr, 2008). Social media can also be simply defined as “people having conversations online”.

New technologies, especially Web 2.0 technologies, work as an enabler and accelerator for this new way of communicating. Social media can take a wide variety of forms: internet forums, wikis, podcasts, blogs, etc. Examples of social media applications are Facebook or MySpace (social networking), Wikipedia (reference and knowledge sharing), YouTube (social networking and video sharing), Last.fm (music sharing), Second Life (virtual reality), FlickrR (photo sharing), Twitter (micro-blogging and social networking), and others.

## 2.5.6. Enterprise 2.0

Enterprise 2.0 is a fairly new concept primarily influenced by the Web 2.0 approach. Many are still trying to define it and capture the different ideas it encompasses. Andrew McAfee, the Harvard professor credited with coining the term, defines Enterprise 2.0 as the “use of emergent social software platforms within companies or between companies and their partners or customers.” He also has a short definition that characterizes Enterprise 2.0 as the “adoption of Web 2.0 principles by companies.” Awareness, in its last report about Enterprise 2.0, defines the concept based on the answers to a survey: “A system of Web-based technologies that provide rapid and agile collaboration, information sharing, emergence, and integration capabilities in the extended enterprise.”

Strictly speaking, Enterprise 2.0 represents the evolution and maturation of best practices for collaboration and knowledge management. Its objective is to provide companies with structure that enable more flexible work models, knowledge sharing and community building. Enterprise 2.0 is thus about transforming the way people work with each other and information. Technology is just an enabler for those new collaboration ways. Enterprise 2.0 tools help solve business problems by better incorporating the social context of information.

The Enterprise 2.0 philosophy facilitates a flat organization and a bottom-up distributed management approach. As a result, the boundaries are becoming fuzzier with teams becoming global and cross-



cultural. Furthermore, the informal organization and paths of information sharing are acknowledged, which translates into more flexibility and more transparency in the organization.

## 2.6. Complexity theory

### 2.6.1. Complexity theory: definition and concepts

Complexity science is seriously challenging long held views in the scientific community about how the world works, especially by debunking the linear and mechanistic approaches that sometimes has led to unrealistic models of the world. Elizabeth McMillan explains, “complexity science is concerned with systems that have the capacity to spontaneously self-organize themselves into even greater states of complexity” (McMillan, 2006). Similarly, Jamie Murray also emphasizes the ideas of emergence and non-linearity of the interactions: “Complexity theory studies emergent order through self-organization in complex, far-from-equilibrium, non-linear, dynamic systems” (Murray, 2008).

Furthermore, a complex system has “within itself a capacity to respond to its environment in more than one way. This essentially means that it is not a mechanical system with a single trajectory, but has some internal possibilities of choice or response that it can bring into play” (Allen, 2001). But it is also important to make the distinction between complex and complicated. We are here interested with complex systems. While complex systems are complicated, complicated ones are not necessarily complex. As Allen explains: “Complexity is a deep property of a system, whereas complication is not” (Allen, 2001).

### 2.6.2. What is a system?

Peter Erdi defines a system as follows:

*“A system is a delineated part of the universe which is distinguished from the rest by a real or imaginary boundary.” (Erdi, 2007)*

One of the characteristics of systems is that they can be open or closed. Open systems are the ones that are able to interact with their environment, whereas closed ones are secluded from everything happening outside of their boundaries.

The study of complex systems is deeply linked to systems theory. Kevin Dooley talking about complex systems explains what systems theory is about:

*“One of the key purposes of systems theory is to describe a system in such a manner that automated control mechanisms can maintain the system's behavior at some desired goal. Fluctuations from the outside (environment) force the system to adjust in order to maintain equilibrium, and negative feedback mechanisms dampen the effect of these fluctuations. Likewise, positive feedback mechanisms, which accentuate fluctuations, can be used to enhance and accelerate the effects of positive fluctuations.” (Dooley, 1997)*

Note the importance of interaction with the external environment in the performance of a system.

### 2.6.3. Complex adaptive systems

Complex adaptive systems are a subset of complex systems. They consist of a network of elements interacting nonlinearly with themselves and their environment from which they receive information. One of the key aspects of complex adaptive systems is that they reach a form of order through self-organization in complex and far-from-equilibrium zones. Complex adaptive systems have this very particular capacity to change and learn from experience, which differentiates them from self-organizing systems: “they learn to adapt to changes in circumstances” (McMillan, 2006). This is how they differ from more simple self-organizing systems.

Kevin Dooley explains that some of the “key elements of the complex adaptive systems model of organization change [are that] agents scan the environment and adapt accordingly (organic), using schema to interpret reality and context, and trigger decisions and actions (cognitive), while competing and cooperating with other agents for resources and information (organismic)” (Dooley, 1997). Agents are thus constantly acting and reacting to the actions of the other agents. In so doing, they also gain experience that helps them to reconsider and reorganize themselves. This shows the particular importance of the environment as a source of input for the organizational choices made by agents.

Complex adaptive systems “behave/evolve according to two key principles: order is emergent as opposed to predetermined, and the state of the system is irreversible and often unpredictable” (Dooley, 1997). As Thietart and Forgues argue, “Forecasting is impossible, especially at a global and in the long

term.” The unpredictability of the behavior of complex adaptive systems is such that “similar actions taken by organization in a chaotic space will never lead to the same result” (Thietart and Forgues, 1995).

## 2.6.4. Difference with chaos theory

While complexity theory is deeply rooted in chaos theory, there is an important difference between these two types of systems.

*“Whereas chaos theory relates to a particular behavior of complex systems, complex adaptive systems theory allows one to analyze the organizational system from a more holistic point of view. A complex adaptive system is both self-organizing and learning.” (Dooley, 1997)*

An important point is that, contrary to a popular belief, chaos is deterministic. This means that if the initial conditions and the context are known, the course of the action can be predicted accurately by chaos theory. Complexity, on the other hand, is non-deterministic and forecasting is impossible as their behavior is unpredictable (Prigogine, 1997).

## 2.6.5. Two important characteristics

### 2.6.5.1. Edge of chaos

Edge of chaos is an important concept of complexity theory. As Elizabeth McMillan explains:

*“Complex living systems appear to have the ability to balance order and chaos and this place of balance is known as 'the edge of chaos'. The edge of chaos is a place, or rather a zone, where the parts of a system never quite lock into place, and yet never quite break up either.” (McMillan, 2006)*

The edge of chaos is thus a region “between stability and ambiguity, between centralization and decentralization, between order and chaos” (Wallis, 2008).

What is so unique about the edge of chaos is that it seems to be “the one place where a complex adaptive system can be spontaneous, adaptive, and alive” (Waldrop, 1992). The edge of chaos is the zone where the behavior of complex adaptive systems is “optimal from the viewpoint of adaptation” (Bonabeau, 1997) which is what complex adaptive systems are about. As Eric Bonabeau points out, this flexible feature of the edge of chaos “is particularly advantageous in a changing environment”

(Bonabeau, 1997). It is interesting to note that this edge is not in phase space but in the space of rules. This means that, “if we slightly perturb a rule that generates complexity we will get a rule that either generates chaos or stasis. Therefore, the search for the edge of chaos focuses on how small changes in a rule impact its behavior” (Miller & Page, 2007).

### **2.6.5.2. Emergence**

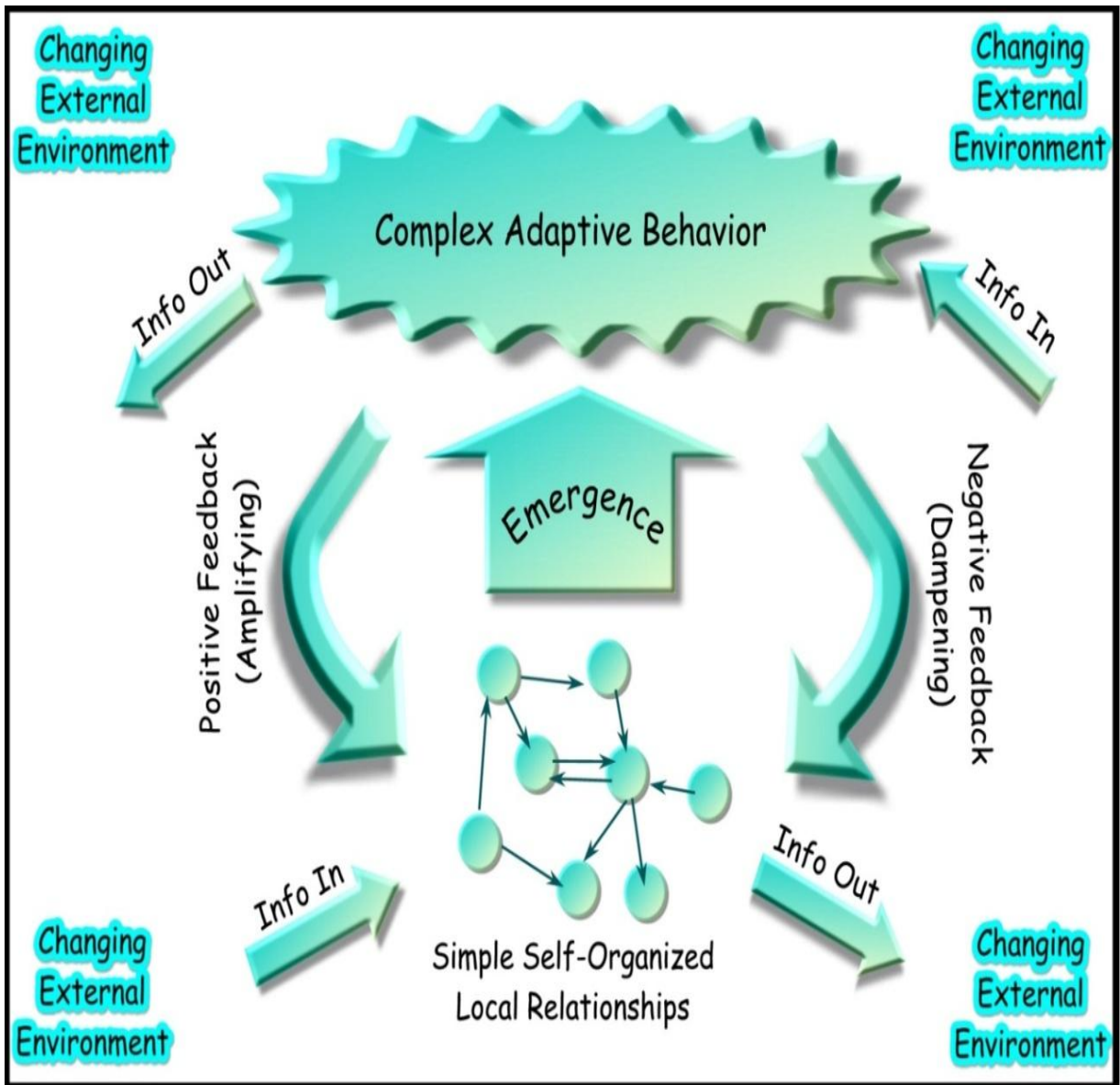
Emergence is this process through which “a global order emerges from the interactions in a local, dynamical system and in so doing a whole new set of [global] properties emerges.” “This global level system then feeds back and interacts with the local interactions, so creating a circular feedback process” (McMillan, 2006). This is based on a system of simple rules shared among agents at the local level. The non-linearity in the interactions between agents is responsible for the creation of a new global order that one cannot forecast just by looking at the simple rules.

Miller and Page further point out that the emergence phenomenon shows a disconnection between local and global behaviors: “Such a disconnection implies that, within limits, the details of the local behavior do not matter to the aggregate outcome” (Miller & Page, 2007).

### **2.6.6. Summary**

The following picture (Figure 4) from Wikipedia Commons summarizes the different aspects of complex adaptive systems.

The brain, whose neurons are connected by synapses to a complex network, is a good example of a complex adaptive system. Other examples include the control network of our immune system, and social or economical networks whose dynamics could be described as an evolutionary game.



Source: <http://en.wikipedia.org/wiki/File:Complex-adaptive-system.jpg>

Figure 4 - Complex Adaptive System

# Chapter 3. Mismatch between current methods and the external environment

In this chapter, we explore the key characteristics of our environment, especially its increasing turbulence and uncertainty. We then analyze what this means for policy making and businesses and argue that high unpredictability calls for new methods for organizations to overcome such challenges.

## 3.1. Key characteristics of the environment and the associated challenges

It is important to review and understand the emerging characteristics of the current environment in which decision makers have to operate. For each of these characteristics, we will provide literature and research background and discuss what each of them implies in practice for decision makers.

### 3.1.1. High velocity environment

One of the most alarming characteristics of the environment is its high velocity. Bourgeois and Eisenhardt describe high velocity environment as one “in which there is rapid and discontinuous changes in demand, competitors, technology and/or regulation, such that information is often inaccurate, unavailable, or obsolete, where strategic windows are opening and shutting quickly, and where the cost of error is involuntary exit” (Bourgeois and Eisenhardt, 1988).

Velocity has been defined as “the pace of opportunity flow into a given environment” (Davis and Eisenhardt, 2007). This velocity of the environment seems to be linked to changes in external forces such as technologies. Furthermore, this characteristic of the environment is now something that is impacting all industries and organizations. And, as Glassman et al. notice:

*“There is near unanimity that the world has entered an era of unparalleled turbulence, reflecting the entwined forces of technological, biotechnological, and communication advances.”*  
(Glassman et al., 2005)

This raises a new challenge for decision makers. Since lacking sufficient information, it is easy to make mistakes if they act too soon, but it is equally ineffective to delay decision making or to copy others. The new objective is to seize opportunities as quickly as they arise while recognizing that any misstep can trigger an avalanche of disaster on an unsuspecting organization without offering a second chance. Keeping pace with the environment has thus become a new requirement.

### 3.1.2. Increasing uncertainty

Another important aspect is the volatility and high uncertainty of the environment. Literature on how decision and policy makers should cope with uncertainty is truly impressive. A quick search on Google Scholar for example returns more than four millions articles related to uncertainty (April 2009).

Glassman et al. argue that:

*“There are too many variables, too many forces at play, and too many unknowns for either scholars or practitioners to feel sure about what the future may hold. The policy environment is marked by great turbulence, uncertainty, and an accelerated pace of change.” (Glassman et al., 2005)*

Explaining further, Ermoliev and Hordijk note that one of the key challenges is the vast variety of inherent, practically irreducible uncertainties and ‘unknown’ risks which could have an impact on territories and communities and affect them suddenly.

#### 3.1.2.1. Uncertainty and unpredictability

Following Makowski (Makowski, 2006), we can differentiate between two types of uncertainty. The first is called *epistemic uncertainty*. This type of uncertainty is due to incomplete knowledge of the phenomena. The second, *aleatory (variability) uncertainty*, is due to the inherent variability and the natural randomness of the phenomena. Natural processes, human behavior, and discontinuities can for example lead to aleatory uncertainty. Decision makers need to deal with both types of uncertainty to make effective decisions.

Unpredictability refers to our inability to know what the future may hold. More formally, unpredictability can be defined as “the degree to which past opportunities are dissimilar from present ones and so are unforeseeable” (Davis and Eisenhardt, 2007). Baum and Wally on the other hand focus on dynamism. This concept is linked to the predictability of an environment, “dynamism (instability or

turbulence) refers to the level of environmental predictability; it is manifested in the variance in the rate of market and industry change and the level of uncertainty about forces that are beyond the control of individual businesses” (Baum and Wally, 2003).

### 3.1.2.2. *Consequences*

It is more difficult to manage a system successfully in an unpredictable environment. We follow Davis and Eisenhardt conclusion on the impact of unpredictability on organizational structure. Their conclusion is that as unpredictability increases, the range of optimal structures (to achieve performance) narrows and it becomes increasingly difficult to find an appropriate structure. They further develop this idea:

*“When environments have high unpredictability, there is an inverted V-shaped “peak” relationship between structure and performance. This suggests a punishing environment in which it is challenging to find the optimal amount of structure, hard to maintain the optimal structure even in the face of small perturbations of structure and environment” (Davis and Eisenhardt, 2007)*

Exacerbating the situation is the fact that “most individuals underestimate the uncertainty of the world” (Arrow, 1992). The immediate consequence is that people have a natural tendency to believe too easily in the clarity of their own interpretations. As suggested by Arrow, greater humility becomes a new requirement to better approach uncertainty.

### 3.1.3. **Complexity**

Complexity can be defined as “the degree to which environmental opportunities have many features that must be successfully dealt with by the organization” (Davis and Eisenhardt, 2007). A complex system has several components that interact with each other. The difficulty resides in the intrinsic limitation of systems model and understanding which neglect several of these components or connections.

We adhere to Nicolis’ and Prigogine’s opinion that our world is riddled with constant fluctuations that result in a very complex and rich environment, in turn requiring organizations to apprehend,



*“Our physical world is no longer symbolized by the stable and periodic planetary motions that are at the heart of classical mechanics. It is a world of instabilities and fluctuations, which are ultimately responsible for the amazing variety and richness of the forms and structures we see in nature around us. New concepts and new tools are clearly necessary to describe nature, in which evolution and pluralism become the key words.” (Nicolis and Prigogine, 1989)*

Complex environments present several challenges for decision makers since they have to understand the many complex features of potential opportunities. Furthermore, execution has also become a challenge lowering overall performance.

Many authors have dwelled deeper into the challenges of decision making in a complex world and commented that, “decision makers today face problems that are increasingly complex, and interrelated. Many important decisions routinely made are dynamic in nature - a number of decisions are required rather than a single decision, decisions are interdependent, and the environment in which decision is set changes over time” (Karakul and Qudrat-Ullah, 2008).

As the environment becomes increasingly complex, the number of variables and facets required to describe and understand the problem increases dramatically. Such a challenging environment thus results in high ambiguity, which can be defined as “the degree to which the key features of opportunities are difficult to interpret” (Davis and Eisenhardt, 2007). To cope with a high velocity and complex environment, organizations must access and evaluate a constantly evolving, multifaceted view of the world since the timing and knowledge of external events will be critical.

Peter Drucker has also emphasized the challenge of a constantly evolving knowledge as being central to business success. The high velocity of the environment and the speed of communication technologies amplify this phenomenon by making information obsolete faster. He argues that the world economy will continue to be highly turbulent and highly competitive, prone to abrupt shifts as both the nature and the content of relevant knowledge continually change. This will require organizations to constantly access up-to-date information and knowledge. We conclude that organizations need to build great awareness of the internal and external environment.

### 3.1.4. Technology speed

The increasing pace of industry is being driven by a number of forces, technology being key. D'Aveni argues that "rapid technological change" is one of the four drivers for hypercompetition. "Incredible increase in technological speed is matched in business (product life cycles are measured in months not years) and in people's lives (most of us feel we are running as fast we can merely to stay in place)" suggests Toby Tetenbaum. Similarly, Fine explores the role of technology in Clockspeed.

Such rapid changes in technologies, as Eisenhardt argues, place a premium on rapid decision making. Some of these changes can indeed represent significant departures from old ones, thus forcing organizations to adopt them and to do so quickly. In addition to that, seizing the right technological opportunity can result in developing a competitive edge, which might be critical. Furthermore, J. Robert Baum and Stefan Wally explain that this phenomenon is accentuated by the impact of new technologies:

*"For managers, it is apparent that advances in communication and information-processing technologies have produced business environments that appear to be changing at an ever more rapid rate, which makes maintenance of competitive advantage through proprietary assets or knowledge more difficult." (Baum and Wally, 2003)*

As technology becomes more pervasive, impacting all aspects of our society, organizations need to drive this train of constant change as well to capture opportunities. It is difficult for organizations to find an appropriate structure since "dynamic and/or high-velocity environments may enhance the negative relation between formalization and performance" (Brown and Eisenhardt, 1997). Flexibility has become a new requirement for organizations as they need to be able to adjust quickly to environment changes.

*"The underlying logic is that the flexibility enabled by less structure becomes more important than efficiency as markets become more turbulent." (Davis and Eisenhardt, 2007)*

How can this vision be enabled without completely suppressing the advantages of control and efficiency?

## 3.2. Mismatch in policy making

### 3.2.1. “Explosion” of policies

The process of policymaking is a complex one, involving many stakeholders, many positions and points of view, as well as many variables. In addition to that, some other factors can influence the process of making and implementing policies, thus further complicating the process. This is for example the case of market failures and the issues of unintended consequences, which we propose to explore here. This will help us better understand the challenges policymakers are now facing.

#### 3.2.1.1. *Market failures*

In the market model which most policy decision makers and economists rely on, individuals try to maximize their own welfare and self-interest. For this purpose, they exchange goods or ideas with each other whenever these trades are mutually beneficial (Stone, 2002). This model is however prone to failures when implemented. Such market failures can be categorized in two broad categories: economic market failures, and political and institutional market failures.

##### *Economic market failures*

The first category, economic market failures, encompasses issues linked to property rights as well as externalities’ influence on policymaking. Imperfect information and imperfect consent, along with anti-trust issues, are examples of such market failures.

The well-known anti-commons problem is a great example of unstable property rights. It is characterized by the underutilization of a scarce resource, opposite to the commons problem where a resource is overused because too many owners have access to it and no one has a right to exclude others. The important trade-off for policy makers here is between creating incentives to invest while at the same time limiting the diffusion of investment rewards. Such anti-commons problems can, for example, arise when patents are overly broad or make ambiguous claims. This also happens when intellectual property licensing is not affordable or when commercial users need access to a bundle of multiple patents from different owners.

Monopoly and collusion can also trigger market failures. Policymakers need to find a balance between limiting economic rents and political power on one hand, and allowing the capture of scale-based

efficiency and innovation on the other hand. They need to ensure that companies do not collude, while at the same time ensuring that they get the right incentives to produce in large scale.

A great source of market failure is imperfect information. Similarly to imperfect consent, these two similar types of defaults are frequent sources of complication for policymakers. The difference between private and public information can indeed lead to adverse selection. Insurance and the automotive market for lemons are well-known examples of asymmetry of information resulting in the selection of “bad” products or consumers.

Finally, another important factor is externalities. Thomas C. Schelling proposes a simple definition of externalities: “An "externality" occurs if you care about my choice or my choice affects yours” (Shelling, 2006). Network externalities usually lead to a snowball effect: the more people adopt a particular product or process, the more valuable the good becomes to all users. The tradeoff for policymakers is between promoting efficiency by internalizing costs versus providing rents. The presence of externalities is often used as a justification for government intervention in economic affairs. However, cures for market failure often bring on other problems, typically through failures of political processes and institutions.

### Political and institutional market failure

The second type of market failures finds its root in political and institutional defaults.

Capture theory, which was developed by Stigler, explains that interest groups and other political participants will use regulations and coercive powers of government to shape laws and regulations in a way that is beneficial to them. For example, producers will fight for regulations that provide direct monetary subsidies, constraints or subsidies on substitutes or complements of commodities produced, price fixing and control over entry by new rivals. This kind of policy can thus be used to limit competition.

Another potential market failure is described by Olson that concerns collective action dilemmas and free-riding. This happens when there are diffuse and collective regulatory benefits, with concentrated and private regulatory costs. In such cases, a classic collective action problem arises in which long-term diffuse interests are under-represented and short-term concentrated interests are over-represented.

Here is one example of such a market failure. Let's consider small distributional coalitions that tend to form over time in countries. These can be groups such as cotton-farmers, steel-producers, and labor unions, which have the incentives to form political lobbies and influence policies in their favor (cf. Stigler). These policies will tend to be protectionist and anti-technology. As a consequence, these policies are very likely to hurt economic growth. However, since the benefits of these policies are concentrated amongst the few coalition members, while the costs are diffused throughout the whole population, it is logical that there will be little public resistance to them. Hence as time goes on, and these distributional coalitions accumulate in greater and greater numbers, the nation burdened by them will fall into economic decline.

### 3.2.1.2. *Unintended consequences*

A classic example of unintended consequence is the challenge of providing incentives for employees inside an organization. James Surowiecki explains this situation and the resulting consequence:

*“As Harvard Business School professor Michael C. Jensen points out, tell a manager that he or she will get a bonus when targets are realized and two things are sure to happen. First, managers will attempt to set targets that are easily reachable by lowballing their estimates for the year ahead and poor-mouthing their prospects. Second, once the targets are set, they will do everything they can to meet them, including engaging in the kind of accounting gimmickry that boosts this year's results at the expense of the future.” (Surowiecki, 2005)*

According to Russ Abbott, “an unintended consequence occurs when an unexpected and unintended use is made of a mechanism or formalism—such as a law, a rule, a regulation, or even a custom or an accepted ethical or moral precept—that has been established in the world.” This means that a different result than the ones intended by the mechanism or formalism is achieved. In some cases, the result can even be contrary to the one that was intended. These unforeseen effects are not necessarily negative or undesirable, but only something unexpected. The “law” of unintended consequences states that, “any purposeful action will produce some unintended consequences” (Wikipedia, Unintended consequences). For example, Adam's Smith “invisible hand” can be seen as a positive unintended consequence. While each individual only seeks his own self-interest, he is also “led by an invisible hand to promote an end which was no part of his intention” (Smith, 1776) but which promote the good of the community as a whole.

In his famous article *The Unanticipated consequences of purposive social action*, Robert K. Merton identified five limiting factors responsible for unanticipated consequences (Merton, 1936). The major factor is the “existing state of knowledge”, and especially the lack of adequate knowledge. Another class of factors is error by itself. This is, for example, what happens when we apply an action that was successful in the past to a new situation just by habit and without really ensuring that it is appropriate. Another class is what he calls the “imperious immediacy of interest”. This describes situations in which we are more concerned with the immediate foreseen consequences and thus exclude consideration of longer-term consequences. As a result, some actions may be considered rational in terms of immediate results, but deemed irrational when looking at long-term interests or goals. A related factor is “basic values” and how they can influence decision making. Finally, Merton argues that the very prediction of a consequence can have an important impact, and thus becomes a new factor in determining what will ensue as a result of policy action.

Dietrich Dörner proposes a system approach to this issue of unintended, and potentially undesirable, consequences (Dörner 1989). He identifies several features of systems, which make a complete understanding of any real system impossible, namely complexity, dynamics, opacity, and ignorance and mistaken hypotheses. These features are further responsible for triggering unintended consequences. It is interesting to note that we previously examined several of these features as characteristic of the external environment policymakers are dealing with. Because systems are composed of several components interacting with each other, because some systems evolve spontaneously without a centralized control, because some elements of a system cannot be seen, because ignorance and mistaken hypotheses are always something possible, unintended consequences are a reality that policymakers need to incorporate in their view of the world in order to propose policies which will reduce potential negative effects.

### 3.2.2. Implications

Policymakers and the public policy domain are strongly impacted by the challenges posed by high velocity and uncertain environment. Clearly, several forces are constantly challenging governments. These include deregulation, changing public expectations and needs, technological innovation, increased mobility, global competition, etc. The interaction between these forces further accentuates the difficulties of operating in such an environment and affects all aspects of the society. Policymakers need to adapt to such changes in behavior and in the overall environment.

Failing to incorporate new realities would likely lead to shallow and inefficient policies that are not suitable for current level of uncertainty and turbulence in the external environment. We have seen how such characteristics can complicate the tasks of policy makers by making market failures and unintended consequences more frequent.

Ermoliev and Hordijk further argue that one implication of a turbulent and dynamic environment is that our society is becoming increasingly vulnerable (Ermoliev and Hordijk, 2006). This in turn places a higher weight and responsibility on policymakers. Speaking about climate change, they express the idea that policymakers need to incorporate a greater amount of recent information in their evaluations, thus complicating their task of crafting good policies:

*“The exact evaluation of overall global climate changes and vulnerability requires not only a prediction of the climate system, but also an evaluation of endogenous socioeconomic, technological, and environmental processes and risks.” (Ermoliev and Hordijk, 2006)*

In fact, this idea can be generalized to any fast-moving environment. Because they are characterized by increased velocity and uncertainty, gaining what we called a multifaceted view of the world has become a pressing requirement. Policy makers need to incorporate new variables and different estimations and point of views in their evaluation to devise policies.

The uncertainty and unpredictability of the environment also leads to uncertain time-delays between decisions and consequences that are difficult to manage for policy makers. As we saw with examples of unintended consequences, understanding the complex relationships that exist between decisions made and the consequences of their actions is very important to minimize distortions (Ermoliev and Hordijk, 2006). Because decision problems are no longer well-structured issues that can be addressed using straight forward and common problem solving approaches, decision making is becoming increasingly difficult.

The main implication of discussed shifts in the environment, in which policy makers have to operate, is a need for new methods for policymaking that will acknowledge and incorporate these new characteristics of the environment. As Masmanian argues, all forms of policy-making are impacted: policy decision making as well as policy implementation need to be renewed. The goal should be to find new ways to best apply public authority and serve the common interest of citizens.

## 3.3. Mismatch in business

Used to operating in a slow-paced business environment, businesses deploy procedures that are no longer relevant. In this section we will review some of these issues in more detail.

### 3.3.1. Hypercompetition

Our current environment is characterized by high velocity, uncertainty and complexity. Collectively it has been called *hypercompetition* by D'Aveni.

*Hypercompetition is a form of competition “characterized by intense and rapid competitive moves, in which competitors must move quickly to build new advantages and erode the advantages of their rivals.” (D’Aveni, 1994)*

Thomas and D'Aveni discuss how hypercompetition is fast becoming the rule for most companies. While such characteristics were familiar to fast-paced industries like the computer industry a decade ago, they argue that this is now becoming true and relevant for most industries and impacting all companies. In such an environment, most competitive advantages are transient at best.

With these changes comes the need for businesses to work in a different manner to remain competitive. Working harder and smarter will not be enough. The businesses will have to act faster as well. In *Time Based Competition*, Joseph D. Blackburn highlights this fact as well when he explained that “time reduction provides an important leveraging of profits that is not obtained with cost-reduction strategies” (Blackburn, 1990).

To be able to react faster, businesses need to think of new ways to make strategic decisions. Eisenhardt argues that such a change in the environment now require organizations to make decisions fast. Organizations cannot rely anymore on a carefully conducted industry analysis and on broad-ranging strategic plans. While these strategies might have been successful before, they are not synonym of success anymore in fast paced and turbulent environments. If a strategy takes too long to formulate, implement or execute, then it is irrelevant. Fast decision-making has thus become essential to be able to grasp emerging opportunities.

As for policy makers, the traditional approaches cannot be adapted to such extreme conditions. The main issue is that they rely too much on executives' ability to analyze and predict which industries,



competencies, or strategic positions will be viable and will perform. The new challenge is to realize that the high unpredictability of the environment doesn't allow for such approaches: the emphasis should switch to effective and fast strategies.

### 3.3.2. Wicked problems

The economic engine of a business rests on two pillars: Strategy and Execution. Crafting an effective strategy is an imposing challenge that has been termed as a wicked problem by John C. Camillus (Camillus, 2008). He further states that this challenge will become worse due to “increasingly complex environment in which [companies] operate.”

At present, most companies compete by deploying narrowly focused strategies targeted towards a subset of opportunities and focus on operational efficiency. Dealing with expected and unexpected market variability is left for the execution side of the organization. This result in an enhanced focus on operational agility as the company is forced to battle frequent random changes in demand and supply to support an inflexible business strategy.

As a practical matter, the planning system in most organizations is designed to work based on a feedback mechanism: execute strategy, compare results with plans and take corrective actions to remain as close to the plans as possible. Although a powerful source of learning, feedback mechanism fails when problems are not well behaved and outcomes can't be predicted. Since the future challenges addressed by strategy are likely to arise from unanticipated, uncertain, and unclear forces, pursuing revised versions of past and current strategies is not the answer. It would be more effective for organizations to embrace a 'feed-forward' orientation instead and to discontinue their wait-and-watch approach. This further accentuates the need for new ways to make strategic decisions. As the world is becoming increasingly complex and to compete successfully, organizations must discontinue their wait-and-watch approach and acquire a proactive personality.

Because businesses are used to operating in a stable environment with long undisturbed stretches of market calm, they favored inflexible strategies and *operational efficiency*. Ironically, numerous businesses have failed even in this infrequently punctuated business environment falling prey to slow developing step changes. At the same time, companies have also managed to recover from the brink of disaster and reshape their destiny due to the slower pace of change, for example IBM. The future will not be so forgiving. Companies will not enjoy long stretches of calm anymore.

The future high velocity environment will engage businesses in a very different manner. Any misstep can trigger an avalanche of disaster on an unsuspecting company without offering a second chance. Frequent changes in the strategic direction may be required to compete, making this environment truly different from what businesses have encountered thus far.

At the same time, attention must be paid to *operational efficiency* in the near term. This is important since healthy financial performance depends heavily on day-to-day operational success. Maximizing returns during the short periods of competitive stability afforded to the business will be essential for sustainable success. Consequently, execution will remain front and center to the business debate albeit differently. A landscape characterized by disjointed short periods of stability presents a very different challenge in terms of execution. Operating efficiently under a variety of regimes is an uphill task. As a result, strategic agility and operational efficiency are considered antithetical. Competing in the future will mandate companies to break this paradigm and excel on both fronts.

### 3.3.3. Hamel's moon shots

Gary Hamel and a group of scholars and business leaders assembled in May 2008 to “lay out a roadmap for reinventing management” (Hamel, 2009). In their opinion, most of the modern management theories and breakthroughs are from a decade ago and now need to be renewed to better address the new challenges that organizations face.

*“The evolution of management has traced a classic S-curve. After a fast start in the early twentieth century, the pace of innovation gradually decelerated and in recent years has slowed to a crawl. Management, like the combustion engine, is a mature technology that must now be reinvented for a new age.” (Hamel, 2009)*

We support Hamel's opinion that the goals of management have shifted from being efficient and enabling economies of scale, to creating adaptable and resilient organizations. Although the problem of organizing work at scale with ever-increasing productivity is still an important one, new challenges cannot be solved with Industrial Age management practices and structures. “The solution was bureaucracy, with its hierarchical structure, cascading goals, precise role definitions, and elaborate rules and procedures” (Hamel, 2009).

The old concepts of management, which he coins “Management 1.0”, needs to be recognized as having reached their limits. The principles previously developed, such as standardization, specialization, hierarchy, control, and primacy of shareholder interests, are not adapted to current requirements. Some of the new challenges identified by Hamel’s group are:

*2/ Fully embed the ideas of community and citizenship in management systems; 4/ Eliminate the pathologies of formal hierarchy; 8/ Expand and exploit diversity; 9/ Reinvent strategy making as an emergent process; 10/ De-structure and disaggregate the organization; 12/ Share the work of setting direction; 15/ Create a democracy of information; 17/ Expand the scope of employees autonomy; 18/ Create internal markets for ideas, talents and resources; 22/ Enable communities of passion; 25/ Retrain managerial minds*

This list shows how organizations need to tap into their employees as an asset. As hierarchy is not suitable for current challenges, organizations need to find new structures and new ways to share and exchange knowledge and information. Hamel further develops this idea:

*“The need to adapt and innovate will require organizations to better use their human capital. For organizations to succeed in today’s “creative economy,” they need employees who bring more than their diligence and expertise to work: employees must also bring their imagination and passion.” (Hamel, 2009)*

### **3.3.4. Informal and formal structures**

Meeting financial goals in a consistent and efficient manner has driven organizations to favor formal hierarchical organization. A formal organization is described as an environment with fixed set of rules of intra-organization procedures and structures that leaves little discretion for interpretation. These rules and procedures are usually standardized. They are executed through formal position and mechanisms, such as authority or ownership. As a consequence, formal organizations have explicit firm boundaries and contractual terms.

By design, formal structures are programmed to follow a defined course and they are incentivized accordingly. In that sense, a formal organization is aligned with operational efficiency needs but is not well suited for delivering strategic agility. Lower levels of the hierarchy are subservient to the top layer

in spirit and in action. As Scott explains, formal institutions define the “normative system designed by management” or what has often be called “the blueprint of behavior” (Scott, 1981).

Due to embedded incentives, cultural frames make the formal organization structure rigid and incapable of transforming repeatedly to address step changes. Furthermore, the monolithic formal structure interacts with the external environment in a static and biased manner. Although a close watch is kept on external developments, it is done using a highly biased and limited opening. The result is an anemic flow of what the organization wants to see in the external environment. (See Figure 5 below.)

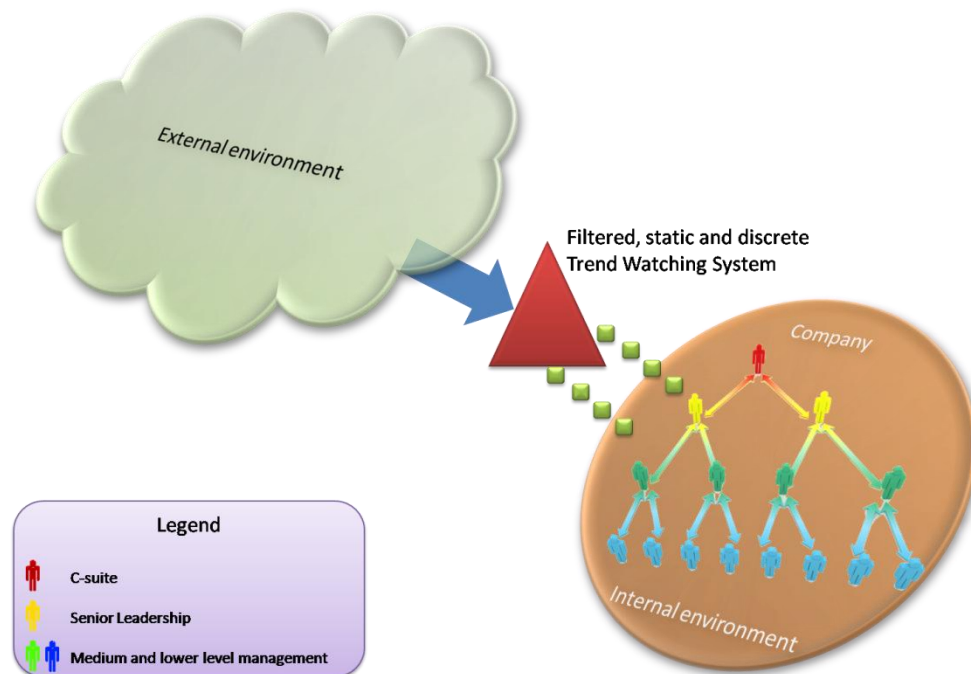


Figure 5 – Model of a formal organization access to the external environment

On the other hand, an informal organization is aligned with the objectives of organizational agility but poorly positioned to operate efficiently. According to one description, “informal organization is the interlocking social structure that governs how people work together in practice. It is the aggregate of behaviors, interactions, norms, personal and professional connections through which work gets done and relationships are built among people who share a common organizational affiliation or cluster of affiliations” (Wikipedia, Informal organization). Informal institutions are rules based on implicit understanding. They include for example routines, political processes and norms.

Informal organizations evolve on their own and find ways to keep pace with values, people and external environment. This is a place of constant motion and interaction that remains largely un-tampered by the formal organizational caveats. The forces of change are identified and acted upon by participants to best meet the external challenges in a transparent manner that are difficult to choreograph.

Despite its potential advantages, informal organization structures are mostly discouraged and remain unrecognized by organization. Hardly any effort is made to deliberately tap into these capabilities of the organization. Especially as the companies become big, it is only the formal organization that is considered necessary and cultivated to run the organization. Case in point is the torturous process undertaken by a successful entrepreneurial venture that attempts to enter mainstream as it matures. The struggle to move from a highly effective informal and loosely organized structure to a more formal organizational vividly illustrates the divide between these two forms of organizations. And in many cases, this journey results in destroying the true spirit of the entrepreneurial company.

### **3.3.5. Need for new methods**

We have argued that current methods for designing and implementing strategy are not suited to deal with a hypercompetitive environment. It is obvious that businesses are struggling to deal with this shift and must find new way to operate, as they will encounter even faster pace in the future.

Operational efficiency is indeed not sufficient by itself anymore. Business managers need new methods to succeed in these fast-moving environments. Organizations also might need to think about new ways to leverage the passion of their employees and the informal structures. We believe that changing culture ought to be the first step in making businesses more effective in the future. So, how should companies prepare as they move into a fast-moving uncharted territory in the future?

Formal approaches such as strategic planning are appropriate for slower paced and less aggressive environments. Because of these long periods of stability between disruptions, the emphasis was on carefully considering alternatives, taking the time to gather information to think thoroughly about the course of action. However, turbulent and hypercompetitive environments need better reflexes and flexibility in order to adapt quickly to changes in the external environment.

As Glassman et al. explain, a paradigmatic change is required as organizations

*“need to (1) accept the increasing pace of change and the accompanying impact on organizational effectiveness, (2) redesign organizations to welcome complexity and turbulence as the new, conventional normalcy, (3) recognize that an organization's external environment can have a differential effect on individuals within the organization, and (4) assess the appropriateness of current step-by-step, structured approaches to strategy formulation and to consider a more amorphous, spontaneous set of actions and decisions under the rubric of strategic thinking.” (Glassman et al., 2005)*

Part of the answer lies in elevating agility to a higher level and developing *strategic agility*. Strategic agility will allow an organization to reposition its resources effectively at a short notice when faced with frequent unexpected step changes.

To be sure, the challenge of straddling the duality of strategic agility and operational efficiency is not a new one. It has always existed in the business domain but thus far, the need for operational efficiency has outweighed the gains arising from strategic agility. No wonder that organizational philosophy at majority of the companies is aligned with this view. A formal structure based on strict hierarchy and professional skills is capable of ruthlessly driving towards well defined results. But a straitjacket environment, that supports efficiency and does not allow for flexibility and adaptability will not survive much less succeed in a fast moving business environment. So, how can organizations enable such strategic agility while not compromising their operational efficiency?

### **3.4. Conclusion**

In this chapter, we discussed how the environment is changing. It is now characterized by high velocity, uncertainty, unpredictability, volatility, and complexity. This poses new challenges for decision makers whether they are in the policy domain or in business organizations. For both worlds, traditional methods and tools are not suitable to deal with these new difficulties. There is thus a pressing need to come up with new methods for both types of organizations to survive and succeed in these environments.

In the next chapters, we will seek new ideas and insights derived from businesses that are experimenting with new approaches. We will discuss what can we learn from them to better inform policy makers on new methods to address the new challenges of the environment.

# Chapter 4. First approaches and their limitations

In this chapter, we present some of the methods decision makers are currently pursuing to deal with the challenges of an uncertain and turbulent environment. We discuss quantitative and qualitative methods used to deal with uncertainty and then focus on new technologies to create new approaches and why so many of them are failing to do so.

## 4.1. Tools and techniques to deal with uncertainty

There are many quantitative methods that deal with uncertainty. These cover a broad range of tools and techniques, including Markov Chains, Monte-Carlo Simulation, Decision Trees, Dynamic Programming, etc. Expectedly, each tool and method has its own advantages and disadvantages.

One of the main difficulty regarding policymaking is the uncertainty associated with the science and the knowledge which is used as the basis for the decision making process. Van der Sluijs et al. explain that there are three interrelated factors which need to be considered, and which complicates the policymaking process: “uncertainty in the knowledge base, difference in framing of the problem, and the inadequacy of the institutional arrangement at the science-policy interface” (Van der Sluijs et al., 2005). One of the most crucial issues is then framing of the problem, which can have important consequences on decisions.

Most quantitative methods, such as Monte Carlo analysis, are not suitable for problems that involve important societal context, the reason being the fact that quantifiable uncertainties are often dominated by unquantifiable ones. Problem framing, model structure, assumptions, system boundaries, etc. are unquantifiable uncertainties that should be accounted for in the global policymaking process. As a consequence, quantitative methods (although essential in the analysis) cannot be sufficient because

they can only provide a partial insight in a complex articulation of uncertainties. As Van der Sluijs et al. concluded:

*“Key dimensions of uncertainty in the knowledge base of complex environmental problems that need to be addressed are technical (inexactness), methodological (unreliability), epistemological (ignorance), and societal (social robustness). Quantitative methods address the technical dimension only. They can, however, be complemented with new qualitative approaches addressing aspects of uncertainty that are hard to quantify and were therefore largely underdressed in the past.” (Van der Sluijs et al., 2005)*

## 4.2. Scenario planning

Scenario planning is an effective method to deal with uncertain future. Scenario planning is a great way to open one’s mind to the range and unpredictability of possibilities that the future may bring. For more than fifty years, many public and for-profit corporations have deployed scenario-based planning to deal with the challenges of long-term decision-making for an uncertain and unpredictable future. The scenario planning method allows the users to create several plausible visions of the future environments in which their decisions will be played out, and evaluating the robustness of those decisions. The use of scenario planning is recommended to “unfreeze intellect, allowing intelligent people a framework within which it is [...] mandatory to admit that they do not know what the future will bring” (Glassman, 2005).

## 4.3. Technology and processes

As organizations try new approaches to address the new challenges of the environment, they focus heavily on new technologies. In this section, we study how organizations integrate new technologies, how they manage them and how these technologies fit into their processes. We will use Web 2.0 technologies as an example.

Web 2.0, as well as the technologies and the mindset associated with it, has indeed generated a tremendous amount of discussion and interest recently. Multiple organizations are trying to leverage these new ideas internally and externally, to build new communities and reach out. While doing so, organizations are faced with several questions: How should they approach social media platforms?



What can be learned from the first movers? Can patterns be identified from successful or failed cases? What approach should be favored to avoid common pitfalls and mistakes? For those organizations that will manage to master them, Web 2.0 platforms will unleash its great potential in terms of collective intelligence, internal collaboration and reaching out to customers to name a few capabilities.

Summer 2008 has seen the publication of a great number of surveys on the topics of deployment and implementation of Web 2.0 technologies in organizations. Very interestingly, they show great consistency in their results. We will share key insights from these studies and make recommendations for decision makers.

### 4.3.1. What are businesses trying to achieve?

Organizations are starting to recognize the potential of platforms based on new web technologies. The idea of collective intelligence has now been around for quite a while and the *Wisdom of Crowds* is a familiar theme in the industry. The new web technologies and especially the social networks offer promising ways to tap into the collective intelligence of not only organization's employees but also the outside world.

When asked what business objectives organizations are trying to achieve through communities, the most common answers include "generate word of mouth", "increase product/brand awareness", "bring outside ideas into organizations", "increase customer loyalty" (cf. Figure 7). These concepts are focused on outward-facing communities where the main objectives are to relate with the external environment. Marketing departments are trying to take advantage of this new way to reach out to customers and increase customer satisfaction and retention. Organizations also want to leverage new platforms to create and develop new products (or improve current ones) based on customers' insights.

Internal-facing platforms are dedicated to employees within the organization, with the objective of managing teams and sharing content, leveraging the internal knowledge, locating expertise, setting cultural norms and fostering a sense of community, etc. We will see later which tools can be used to meet these objectives. The overall goal is to give employees a platform to share knowledge and communicate with each other. This fosters collaboration in an *ad hoc* manner. The McKinsey survey has categorized different uses into three main themes (cf. Figure 6): managing collaboration internally, interfacing with customers, and interfacing with suppliers and partners. The reported uses for new Web 2.0 platforms and tools are similar among different surveys and show this internal/external dichotomy.

## How companies use Web 2.0 tools

Uses in 2008 by level of satisfaction, % of respondents who report using Web 2.0 technologies,<sup>1</sup> n = 1,446

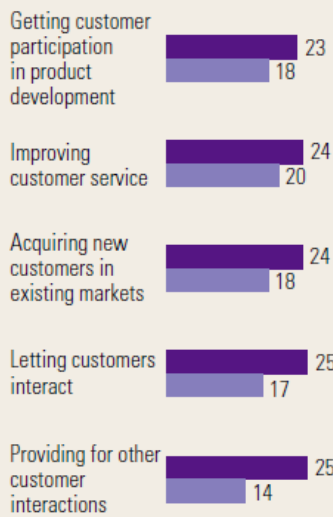
■ Respondents who report highest satisfaction  
 ■ Respondents who report lowest satisfaction

Respondents report using some combination of Web 2.0 technologies to...

### ... manage collaboration internally



### ... interface with customers



### ... interface with suppliers/partners

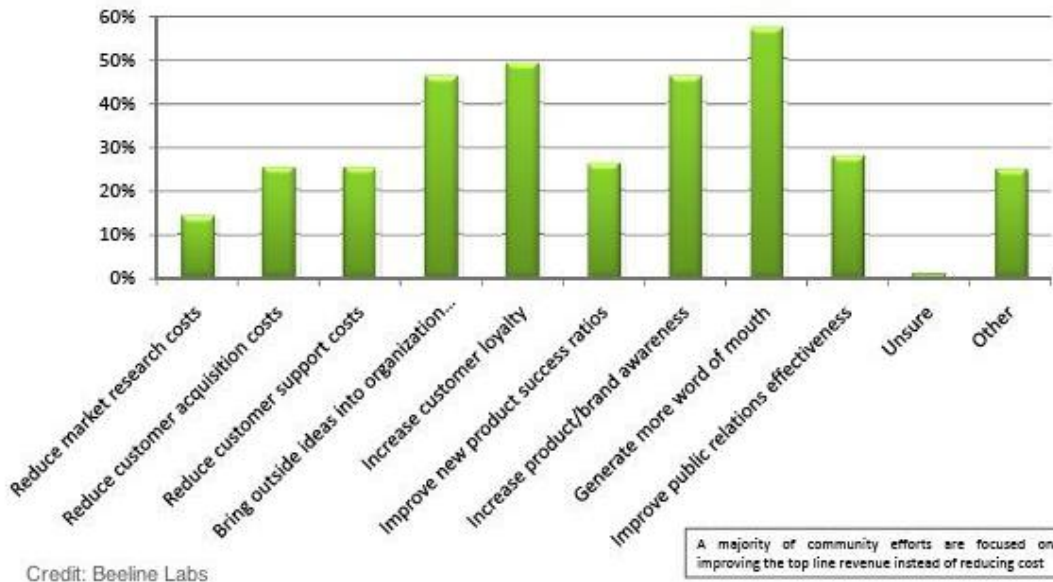


<sup>1</sup>Based on respondents' combined answers to questions about how they use Web 2.0 tools for internal and external purposes.

Source: McKinsey, *Building the Web 2.0 Enterprise* survey

Figure 6 – Survey of how companies use Web 2.0 tools

### What are your business objectives for this community?



Source: *The Tribalization of Business Study 2008*

Figure 7 – Survey of the business objectives of communities

### 4.3.2. Learning from first movers – What fails and what works?

The first and most pressing question is to understand how organizations have implemented new technologies and how they are aligned with their business strategies and objectives. Interestingly, the literature shows that most organizations adopting new approaches mostly end up in failures. The most common reason for failure of technology initiatives or implementation of new Web 2.0 tools is that organizations focus first on technologies. Businesses get enticed by promised capabilities of fancy technologies and do not take the time to tailor these technologies to their specific needs.

For some companies, this can result in spending their entire budget on technology. New technologies and especially all the initial excitement around the new Web 2.0 tools may make them sound more promising than they will eventually prove to be. This is not that this excitement is not justified, but rather that if these new technologies are not implemented in a thoughtful manner, it will usually not succeed. This common mistake is particularly emphasized in the 2008 Tribalization study where the authors explain that people sometimes “get drunk with Web 2.0 tool excitement and then try to push

their business and customer goals into the wrong tool.” The conclusion is to avoid starting with technologies. Another perspective is offered by a Forrester research study. A key statistic from the study is that “one in five firms has not measured the value of its web 2.0 deployments.” This proves that organizations are still confused about what they can do with these new technologies and how they should approach them. Finally, a McKinsey survey also studied how companies are implementing web 2.0 technologies and which ones are successful. One of their main conclusions is that “companies, in which it is the business units, rather than IT, leading the initiative have more success.”

Focusing on technology first leads to the design and implementation of a communication and collaboration platform that may not be adequate for the needs of the organization. Therefore, it is important to first identify the problems before choosing the technologies to tackle them. As an Aberdeen group research concludes: “technology adoption needs to be combined with specific processes designed to maximize its potential.”

Another related issue is the “build it and they will come” fallacy, which presupposes that making the technology available to employees, will translate automatically into having it adopted effectively. Organizations need to become aware of this obvious pitfall in order to avoid it. This further shows the importance of incorporating technology into business processes in order for them to be used and their potential to be leveraged.

### **4.3.3. Some frameworks to better understand these aspects**

In this section, we will propose several frameworks to better understand the dynamics in action. The goal is to help organizations better understand the structure of new technologies and opportunities they may be looking at.

#### ***4.3.3.1. Internal vs. External***

The aforementioned studies usually differentiate new Web 2.0 technologies, and especially social networks and communities, into internal vs. external platforms. Emphasis is put on the four walls of the organization, and thus two distinct worlds naturally appear: internal and external facing applications.

Internal facing applications are restricted to employees (or a specific sub-group of employees) inside an organization. Some examples of internal facing applications could be: managing teams and sharing content, leveraging internal knowledge and locating expertise, etc. External facing applications are open

to the outside world. The most common use is probably in the area of marketing and public relations related applications because new Web 2.0 technologies facilitate reaching and engaging with customers.

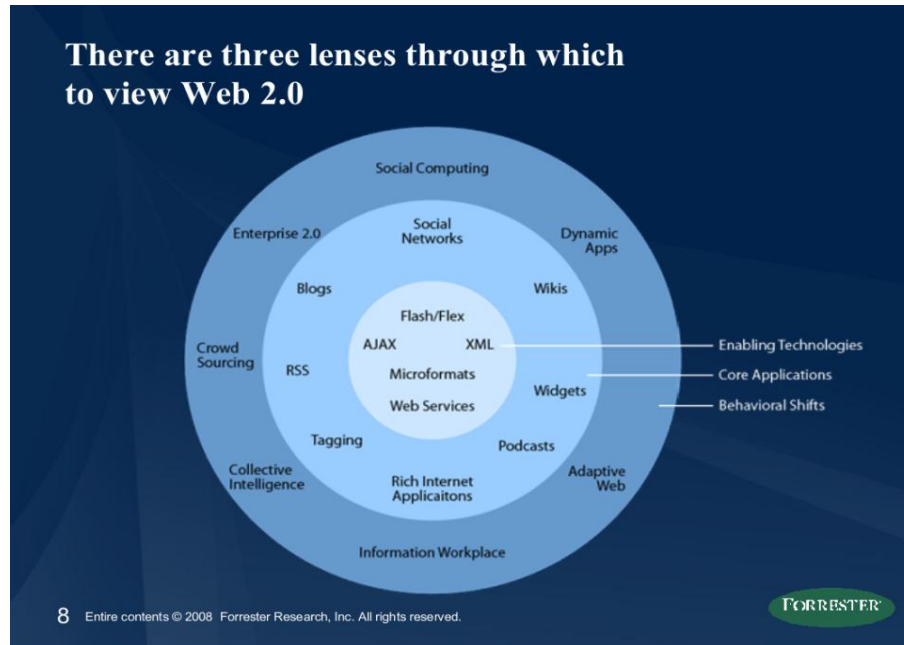
Going beyond this simple dichotomy, let us see how we create a new category of applications that bridges the internal and the external world by constantly bringing information and content from the outside world inside the organization to enrich and foster discussion.

#### *4.3.3.2. Three lenses*

Oliver Young of Forrester Research argues that there are three lenses through which one can view and approach Web 2.0 technologies. This framework provides a way to understand the different sub-characteristics of Web 2.0 and how they should be approached.

- The innermost circle is what he calls “enabling technologies”. They form the core of Web 2.0, with core programming languages for example such as AJAX or XML.
- In the middle, the level that users are facing, are the “core applications”. This encompasses different kinds of applications that are based on the set of enabling technologies that lie under them. For example, wikis, blogs or social networks are core applications.
- Finally, there are core applications that facilitate “behavioral shifts”. Business objectives are to build upon the core applications to enable a learning organization.

Each layer has its own specific characteristics and layers cannot be mixed. Trying to speak about multiple layers at the same time or forgetting one layer would compromise the success of a Web 2.0 platform. Moreover, it is important to realize that an objective (from the outer layer) can be achieved through the use of different sets of applications, and thus even more different sets of enabling technologies. This framework effectively shows why it is important not to start with the technology first (the inner circles) but rather with business objectives. A better approach to Web 2.0 platforms is thus to start from the outer circle, by defining business objectives, and then dig down into the different technological layers. This will help unleash the full potential of such platforms.



Source: Forrester Research presentation

Figure 8 – The three lenses model developed by Forrester Research

## 4.3.4. Understanding the reasons for slow adoption

### 4.3.4.1. *Specific reasons*

The first reason for slow adoption is an unresponsive corporate culture. Leadership is not always enthusiastic about changing the ways things are done. We will indeed see that going further on with such new technologies requires a reengineering of business processes. Furthermore, communities and social networks promote the informal organization inside a company, bypassing the management hierarchy. One can easily understand why that might not be well received by certain people.

Another hurdle is created by the fact that management may not be immediately able to grasp the potential financial returns and understand the full potential of those new platforms. This can be due to the unfamiliarity with such tools and a certain form of anxiety towards their learning curve.

Furthermore, the fear evoked by memories of the firm's most recent enterprise-wide, multi-year, multi-million dollar deployment can endanger the development of new web technologies and social media platforms. This is why it is important to build a proper argument and explain the benefits of new platforms as well as their potential. Showing examples from other successful companies or collecting

anecdotes and strategic wins from a pilot version can help to gain senior management attention and participation.

The McKinsey survey details the barriers to development of Web 2.0 technologies inside the organization. According to the survey, “35% of the respondents at companies that are satisfied with Web 2.0 see no organizational barriers to its greater deployment inside or outside the company.” However, dissatisfied respondents note barriers such as “the inability of management to grasp the potential financial returns from Web 2.0”, “unresponsive corporate cultures”, “less than enthusiastic leaders” and a lack of proper incentives and skills. The details of the survey regarding this question are provided in Figure 9.

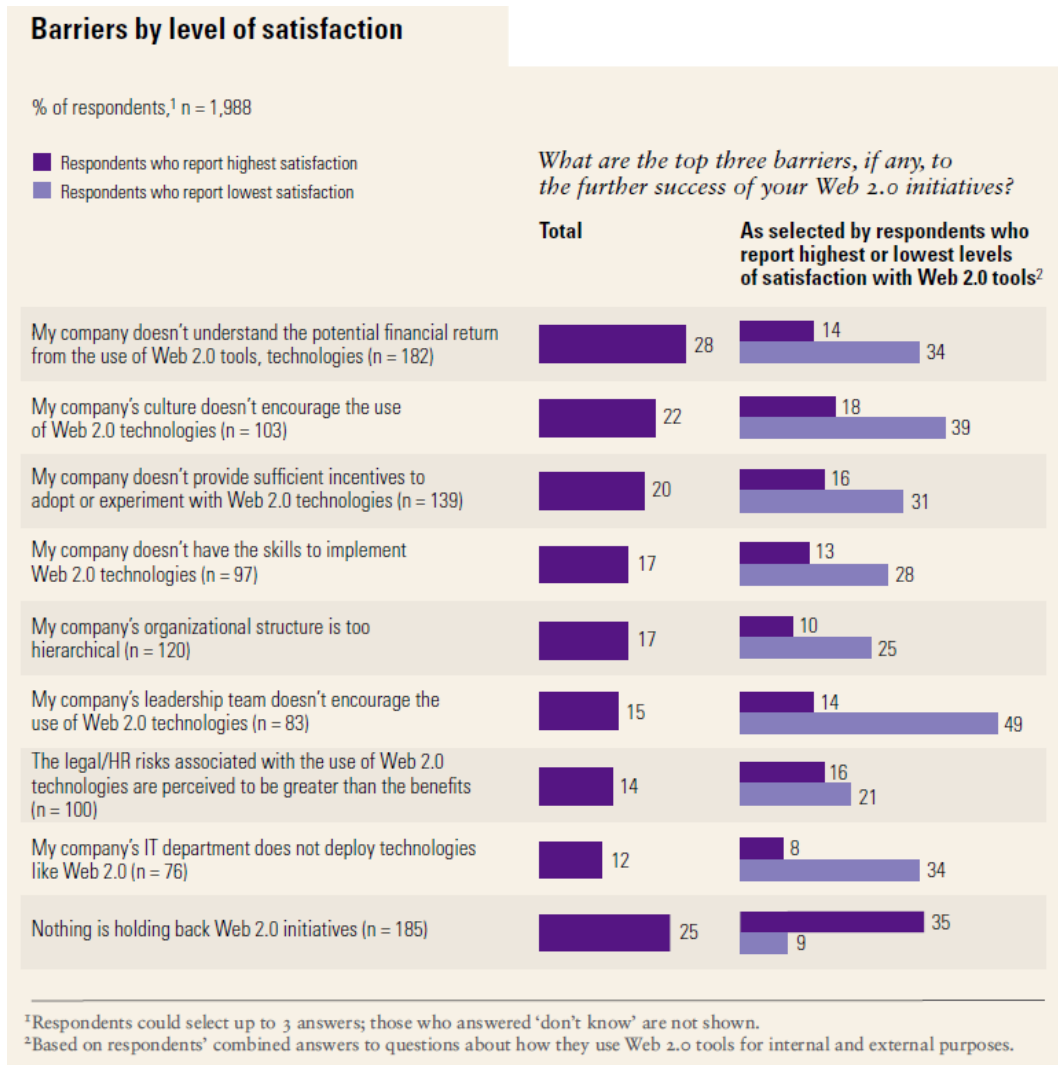
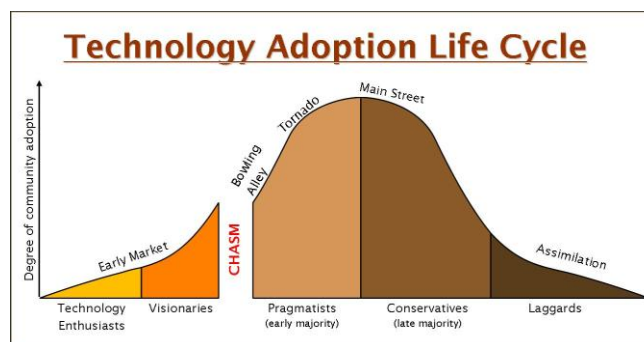


Figure 9 – Survey of the barriers to community development

#### 4.3.4.2. *The technology adoption life cycle*

To better understand the acceptance of new technologies, it is helpful to keep in mind the *Technology Adoption Life Cycle*, as proposed by Geoffrey A. Moore (Moore, 1999). Following his framework, which differentiates between continuous and discontinuous innovations, Web 2.0-based platforms can be seen as discontinuous innovations as it requires a new way of thinking and a change in behavior. However, it can also be seen as a form of continuous innovation, as there is no real change in technology and because the new kind of products and tools now available are still compatible with the current infrastructures. Thus we can make the distinction that, although Web 2.0-based tools do not represent a discontinuous form of innovation in terms of technology and infrastructure, they are a discontinuous innovation in terms of philosophy and way of thinking, and necessitate a new management mind-set.

The *Technology Adoption Life Cycle* model describes “the market penetration of any new technology product in terms of progression in the types of consumers it attracts throughout its useful life” (Moore, 1999). First are technology enthusiasts, people that pursue new technology products. Early adopters or visionaries are the second population type, who quickly appreciates the benefits of a new technology and to relate these potentials benefits to their other concerns. They can match an emerging technology to a strategic opportunity. Then come pragmatists or the early majority which shares some of the early adopters’ ability to relate to technology, but ultimately they are driven by a strong sense of practicality: they are willing to become technologically competent but they want a productivity improvement for existing operations. Later comes the late majority composed of people not comfortable with their ability to handle technology, thus they will wait until a new established standard is developed. At the end of the adoption life cycle are the laggards who avoid new technology.



Source: [http://www.theprojectarchitects.be/images/uploads/The\\_Project\\_Graphix\\_-\\_TALC\\_\(Full\).jpg](http://www.theprojectarchitects.be/images/uploads/The_Project_Graphix_-_TALC_(Full).jpg)

Figure 10 – The technology adoption life cycle and the chasm



Slow adoption results from the gaps between different groups of users. The gaps are due to the dissociation between each group and especially to the difficulty any group will have in accepting a new product if presented in the same way as it was to the group to its immediate left. The most radical discontinuity is between the early adopters and the early majority. This is what Moore calls the *chasm*. He explains that when early adopters “expect a radical discontinuity between the old ways and the new,” the early majority wants a productivity improvement and is looking to minimize the discontinuity with the old ways. This is where the chasm is: the early majority wants evolution, not revolution in contrast to the early adopters. This is why early adopters do not make good references for the early majority. And because of the early majority’s concern not to disrupt their organizations, good references are critical to their business decisions. This leads to a difficult situation to handle.

Web 2.0-based platforms can be seen as a technology that has already convinced technology enthusiasts. Early adopters have also already started to implement these tools inside their organizations. This explains the growing interest towards such platforms. One study reports that more than half of the online communities have been implemented in the last year, with 37% developed in the last six months. Thus we can see that this phenomenon is at an early state of introduction in organizations. Other organizations, from the early majority group, are now looking at implementing such tools. However, before really developing them, they need more proof of the business value. Web 2.0 technologies are now experiencing this *chasm*.

Moore advises to be patient in order to gain the pragmatists to invest in new technologies. Objective studies proving the business value will help convince them. Furthermore, building examples and anecdotes of success stories will help the early majority better relate to the new technologies and its promises.

#### 4.3.4.3. *The “fear factor”*

Another reason for slow adoption is what Fraser and Dutta call the “fear factor”. In *Throwing sheep in the boardroom*, these two authors recognize the deeply-embedded reluctance of some organizations to embrace Web 2.0. Many corporate managers fear that these same tools, which can boost productivity by harnessing collective intelligence and fostering innovation, will actually undermine productivity at the office. Because tools such as wikis, blogs or online social networks are based on horizontal and open networks, they are regarded as threatening inside corporate hierarchies whose architecture is vertical and closed.

Many managers also regard Web 2.0 and social networks as a distraction, almost a waste of time that refrain employees from focusing on their work and being productive. Interestingly, a recent study by the University of Melbourne looked at this aspect. Dr Brent Coker, from the Department of Management and Marketing, says that workers who engage in ‘Workplace Internet Leisure Browsing’ (WILB) are more productive than those who don’t. One of the conclusions of the study should be very surprising to these skeptical managers:

*“People who do surf the Internet for fun at work - within a reasonable limit of less than 20% of their total time in the office - are more productive by about 9% than those who don’t.”*

He explains that such small breaks allow the mind to rest itself, leading to a higher overall concentration and thus an increased productivity.

The cautionary approach adopted by several managers needs to be tackled head-on in order to fully harness the benefits of collaborative environments encompassing information-sharing and problem-solving. Organizations need to recognize the positive potential of embracing collective intelligence and collaboration with their employees, customers, clients, and business partners. Legitimate issues such as security risks, legal liabilities, and privacy invasion must be addressed by organizations beforehand.

*“Social interactions, like financial transactions, must be founded on some basic notion of mutual recognition and trust.” (Fraser and Dutta, 2009)*

### **4.3.5. Difficulties**

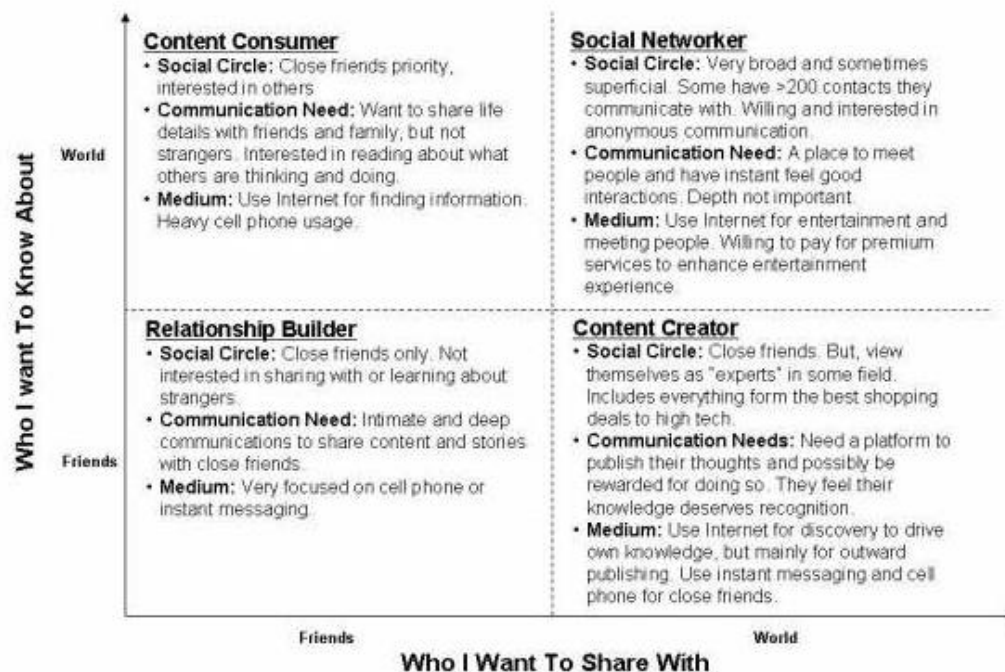
When asked what the biggest obstacles to make communities and Web 2.0 platforms work, organizations responded in very similar fashion. Most note the difficulty to get people to engage. This can become a major issue as it could lead to premature shutdown of a platform.

#### ***4.3.5.1. Attracting people and getting them engaged***

An interesting way to understand this difficulty is to segment the social media users’ base. The model below distinguishes four categories of profiles: content consumer, social networker, content creator, and relationship builder. These four types of users have different approaches to social media and Web 2.0 platforms, namely:

- Content consumers are users that want to know about the world and share what they know with their friends. They do listen more than they talk. They focus on content are able to filter content well.
- Relationship builders want to know more about the people in their lives and want to share what they know with them. They are power networkers that focus on relationships and people. They keep a small group close and know each of them well.
- Social networkers understand the value of being tapped into a network of connections. They thus connect openly and with enthusiasm.
- Content creators like the ability to publish their ideas easily. They could also be called thought leaders. They want their findings to be heard beyond their own group.

## Social Networking User Segmentation Model

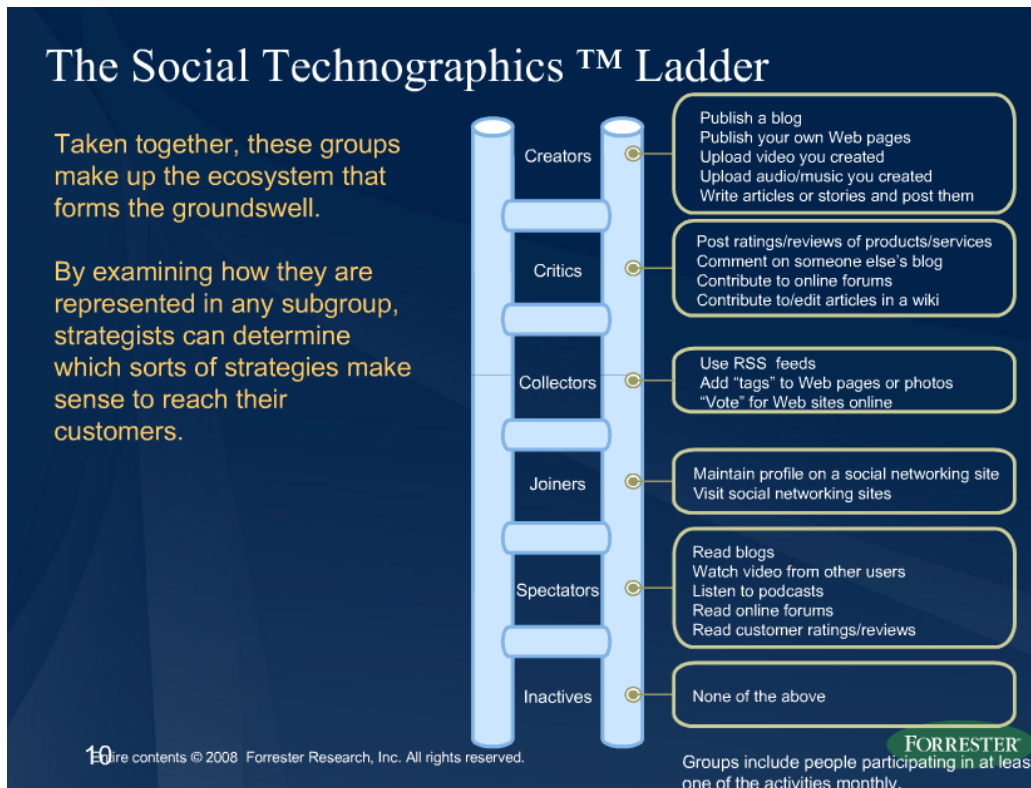


Source: Forrester Research presentation

Figure 11 – Social networking user segmentation model

Forrester goes further in its segmentation of social media profiles (Groundswell, 2008). They differentiate six types of users. First are creators, people that publish or maintain a blog or a website for example and that represent 13% of the users. Critics, people that comment on blog and post ratings and

reviews, represent 19% of the population. Collectors are 15%, they use RSS to collect content and information and tag web pages. Joiners, also 19% of the population, are people using social network sites. Spectators read blogs, listen to podcasts; they represent 33% of the population. Finally, inactive people, i.e. people that do not participate in any of these previous activities, represent about 50% of the population.



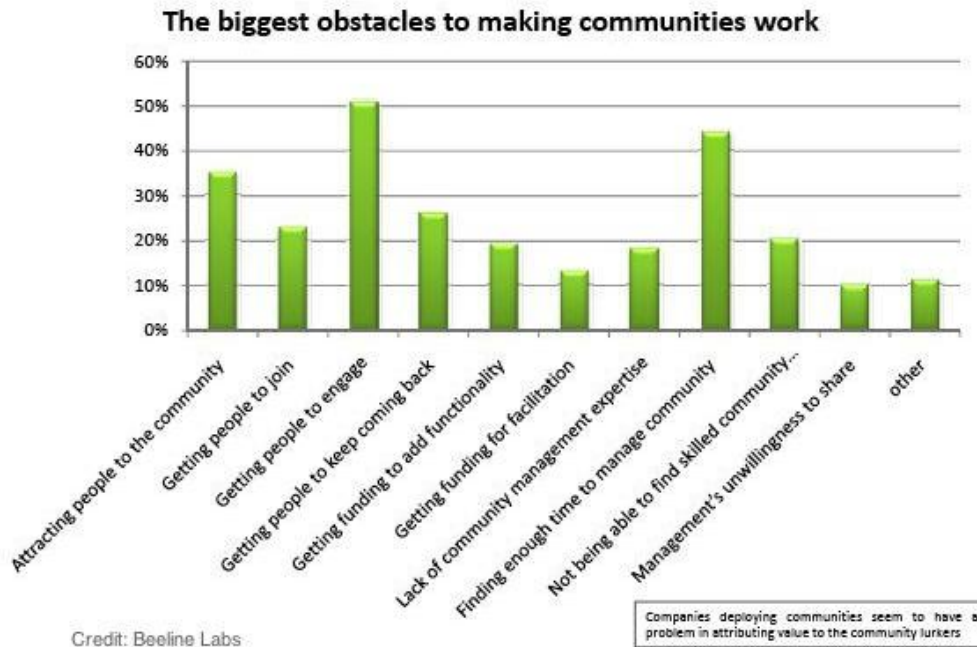
Source: Forrester Research presentation

Figure 12 – The social technographics ladder developed by Forrester Research

These two segmentations help better understand why the fact that people do not participate in a community does not necessarily mean that it is not successful. Some people indeed are more at ease with watching conversations and need more time before being fully convinced with the advantages of proactive participation. To help ensure that people participate, organizations need to put the proper incentives in place, right from the beginning. Furthermore, building on examples and anecdotes of successes thanks to the new platform will help convince people to bridge the gap towards the *creators* and *critics* categories in opposition to the *inactive* and *spectators*. Such an approach will also help to address another major obstacle: “attracting people to the community.”

### 4.3.5.2. Other obstacles

Another important obstacle signaled by organizations is the difficulty to find enough time to manage the community. This point goes back to the problem of misalignment between business objectives and the means put in place. This is required to give the responsibility of the community to competent management. The complete list of obstacles is provided in Figure 13.



Source: *The Tribalization of Business Study*. 2008

Figure 13 – Survey of the biggest obstacles to making communities work

### 4.3.6. Approach suggested in surveys

The surveys and research studies show that a disconnection between technology and processes is responsible for most of the failure of newly created communities. Going to the next step, they propose to revise how processes and technologies fit together. The natural recommendation that follows is that organizations need to first think about the objectives they are trying to achieve. Only when objectives are clear, should they invest in technology to meet their specific needs. A process where technology comes second would avoid the previously cited issue where inappropriate or untailored technologies drove the implementation to failure.

### 4.3.7. Limitations from this suggested approach

However, the proposed approach raises two new issues. First, when companies are looking for the appropriate technology to fulfill their objectives, there might be no technology that fit the requirements that they identified. If the required technology doesn't exist, should the company invest in creating it? This might present a high risk that many organizations will not want to bear. In addition to that, this might mean too much delay in the fulfillment of the objectives, allowing competitors to outpace the organization in a high velocity environment.

Second, the company might have thought of solutions that do not leverage available innovative technologies. Unaware of current possibilities, the company might stick to an old model of thinking and miss out on newly developed technologies that could have helped it succeed. If we take the example of web 2.0, it enables new ways of thinking through organizational structure as well as group creation, which were not even thinkable a few years ago. Furthermore, with the pace of current technologies, companies might learn too late which technologies are out there for them to use and thus become increasingly disconnected with their external technological environment.

This shows that a disconnection between technologies and processes can be fatal in the implementation. Organizations need to integrate the two dimensions to be successful. For this, a new mindset is required as previous attempts have are not been successful enough.

## 4.4. Conclusion

In this chapter, we saw how decision makers have chosen to address uncertainty in the decision making process. Even if some of these methods can be very efficient, they do not solve the problems linked to formal and inflexible organizations. This is why, although required, they are not sufficient to overcome the new challenges pose by a turbulent and uncertain environment.

As we saw, new technologies are opening the doors to potential new approaches, which are based on collective intelligence and social networks. However, a surprisingly large number of organizations are failing in their implementation of these technologies. We need to rethink our approach to find new ways to leverage new technologies while still keeping organizations efficient.

# Chapter 5. Learning from new fields

In this chapter, we explore new fields and leverage that knowledge to come up with new solutions to the problems we have seen before. First, we explore why new communication and social technologies represent such a powerful revolution. We discuss how can we leverage these new technologies to form new groups inside organizations and enable collective intelligence. We also explore fast decision making which is a new field deeply connected to complexity theory and complex adaptive systems. We also argue about the necessity for organizations to build greater awareness of their external environment. Finally, we discuss the impacts that complexity theory is having on decision making and strategy.

## 5.1. Leveraging new technologies – The fall of transaction costs

### 5.1.1. Coase theorem

Coase, in his paper “The Nature of the Firm” explains the rationale for the existence of companies and hierarchical organizations. He argues that the reason for the existence of firms (in a broader sense, including companies, partnerships, etc.) is the presence of transaction costs. Rational individuals trade through bilateral contracts on open markets until the costs of transactions mean that using corporations to produce things is more cost-effective. The size of a firm is thus a balance between transaction costs, which include search and information costs, bargaining costs, keeping trade secrets, policing and enforcement costs, etc., and the decreasing returns to the entrepreneur function, including increasing overhead costs and management mistakes costs (like in resource allocation for example).

In the absence of transaction costs, workers are able to “simply contract with one another, selling their labor, and buying the labor of others in turn” as Clay Shirky explains. If we lived in a world without transaction costs, people would indeed bargain with one another to allocate resources. This is why we have hierarchical organizations and not just markets. The question then arises why we don’t just have central control instead of markets in the first place. But there is another cost which is the cost of

management itself. This cost is thus an important limiting factor. Furthermore, not only do managing resources and people take resources, this cost grows faster than organization size.

### **5.1.2. Group forming and communities**

Interestingly transaction costs are now collapsing and it is revolutionizing the way people form groups. Forming all sorts of new groups is possible and easy using new communication technologies, especially Web 2.0 tools. Creating a blog, a wiki or even an online community is now something that requires only a few minutes. Computing skills are not necessary anymore, making it possible for everybody with an Internet connection to join in. This makes it easier for groups to self-assemble and for individuals to contribute to collective effort without formal management.

According to Clay Shirky, this is the manifestation of a more fundamental shift. New communication tools are flexible enough to match society's social capabilities. Because of this, new ways of coordinating action are now possible which were not even thinkable a decade ago. These tools have been given many names such as "social software," "social media," "social computing," and others. The common idea among all these different terms is that "we are living in the middle of a remarkable increase in our ability to share, to cooperate with one another, and to take collective action, all outside the framework of traditional institutions and organizations" (Shirky, 2008).

Internet communities are easy to create and grow fast. Most of these communities as we will see are based on passion. Amitai Etzioni defines communities as "social entities that have two elements: one, a web of affect-laden relationships among a group of individuals, relationships that often criss-cross and reinforce one another (rather than merely one-on-one or chainlike individual relationships); the other, a measure of commitment to a set of shared values, norms, and meanings, and a shared history and identity -- in short, to a particular culture" (Etzioni, 2004). Because of this, virtual communities represent networks that are more resilient to disruptions.

### **5.1.3. The implications for management**

With the collapse of transaction costs and mushrooming of new group, management practice needs to adapt. Interestingly, new groups do not require as much formal management as before. But it is also safe to say that management is still required since complexity has not disappeared from the system, it



has only changed its form. We need new tools that will enable new and alternate strategies to control complexity. Such new communication and social tools are likely to revolutionize management.

A formal hierarchy was the solution to manage group forming because of high transaction and coordination costs. The difficulty of coordinating everyone in a group was addressed through slotting individuals into that organization by roles. Therefore, an organization would grow up to the size where the advantages acquired by the work of additional employees were offset by the transaction costs of managing them. As Clay Shirky puts it: “The most common organizational structures we have today are simply the least bad fit for group action in an environment of high transaction costs” (Shirky, 2008).

Because of these high transaction costs, some tasks were never performed because too much effort would have been required to form the required groups. As a result, we witness lots of latent groups, i.e. groups that existed only *in potential* but were never formed because of high coordination costs. People have always desired to share and create social groups and communities. But because of high transaction costs, certain activities did not have enough value to make it worth pursuing them in an organized way.

Having overcome the obstacles that prevent sharing and creation of communities, it is possible to achieve large-scale coordination at low cost. In other words, management is not required anymore to achieve serious and complex work. Loosely coordinated groups can do things that were previously out of reach for any organizational structure. New social tools are responsible for this paradigmatic change by enabling people to get together, collaborate, and share easily.

This will have far reaching consequences for management as the previous power of the management hierarchy, which lay in interpreting, filtering and controlling information is now vanishing. Individuals can now collaborate and cooperate successfully without the need of formal management.

## 5.2. New way of implementing technologies

### 5.2.1. Why can it work?

The Tribalization of Business study outlines basic rules to explain why platforms which try to harness the power of communities and collective intelligence work. It is important to understand the central role of people in such platforms. At the heart of these reasons is the fact that human beings are social in nature

i.e., people want to connect with people, people want to help and be helped, and people operate either in a social framework or a market framework. They propose four rules to explain the basic behavior of Web 2.0 platforms and communities:

- The more content there is, the more members there will be.
- The more members there are, the more content there will be.
- The better content and members are matched to members' profile, the more members and content there will be.
- The easier it is to do transactions, the more members will be attracted.

This can be summarized in the following simple *system dynamics* model. The link between two variables can either be positive (+), when more of the cause leads to more of the consequence; or negative (-), when more of the cause leads to less of the consequence. Outlining these relationships results in loops. These loops can be reinforcing or balancing depending on whether an increase in one variable eventually leads to a greater increase or a decrease of that variable respectively.

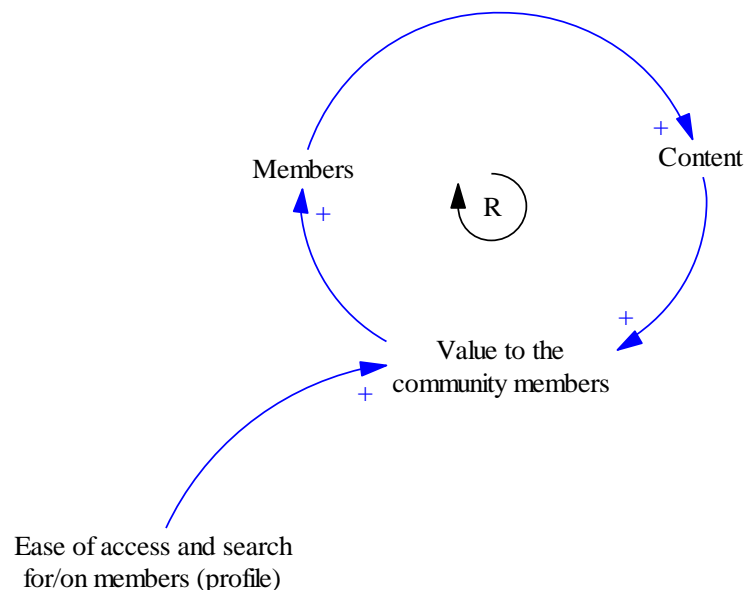


Figure 14 – The dynamics behind social communities

This reinforcing loop (denoted with an R in Figure 14) captures the idea of a virtuous circle in our case. By following the loop, we see that the right environment enables communities to attract even more members. This produces an exponential growth and explains part of the success of social media platforms. There are of course other loops and variables that influence and rebalance the previous basic

graph (since no growth is unlimited). The purpose of our simplified diagram, however, is just to capture the central drivers of growth.

## 5.2.2. Not using new media like the old media

As several authors have pointed out, one of the main challenges of having new forms of communication is not to use them like the old ones. The issue that most companies are now facing is that they are trying to use social media tools in the same way they were using old communication tools, especially sending out mass communications to everyone. For example, we saw earlier that there is still a mismatch between what companies are measuring and their stated goals. This further proves that companies are still struggling to understand what can be achieved with these new tools, and are thus using them as a replacement for older tools.

This relationship between technologies and culture is also visible through the interactions with and the evolution of society. Raymond Williams studied the impact the introduction of a new medium can have on society. He argues against notions of technological determinism (the idea that new technologies have in them the power to transform society in an autonomous way). He suggests that, “we must understand the emergence of new technologies, and in particular new communications systems, as a result of complex interactions among technological, social, cultural, political, legal, and economic forces” (Jenkins and Thorburn, 2004). New media generates debate about political culture but it is not sufficient to significantly alter society by itself. In this model, the impact of new media is evolutionary and not revolutionary.

There are important interactions between societies and technologies. As Marx pointed out in *Capital*: “in changing the technical world, Man changes his own nature.” As Lloyd Morrisett also argues, “if human nature is partially the result of a society's technologies, it becomes crucial to examine technology, both to ascertain the effects of technological history and to attempt to infer the consequences of technological decisions on the future development of society” (Morrisett, 2004).

## 5.2.3. The business value of web 2.0

Some companies have already invested in new web technologies and social media platforms, and are starting to see the positive returns on investments. The major benefits of using Web 2.0 technologies in

organizations are in terms of collaboration and productivity. The surveyed organizations report the following:

- more efficient collaboration between employees; capturing internal knowledge, expertise, experience and making it available to others within the organization becomes easier
- increased transparency of the decision-making processes
- better access to unstructured and structured information; more efficient access to information as more business information becomes available internally and externally via syndication, for example
- decreased email overload
- increased knowledge retention and process documentation
- collective intelligence gathering; faster innovation

Even though most companies lack proper metrics to quantify it, they report increased engagement of employees and an enhanced sense of culture in the company. Employees can communicate better and collaborate more easily in more *ad hoc* situations. Such communication tools also help bridge the distances in time and space between teams or simply within global organizations. Internal branding with employees has also improved, as they become better brand ambassadors.

## 5.2.4. Concrete examples

In this section, we present three examples how social and communication technologies were implemented in organizations. These examples show specific value propositions of new social communication technologies.

### 5.2.4.1. *Dell*

Dell uses a great number of tools to relate and communicate with customers. They also have internal communities to tap into the collective intelligence inside the organization.

In 2006, Dell was facing difficulties in terms of customer relationships. Many customers were complaining about the quality of customer-service. Dell acknowledged these issues, especially with regards to call-transfers and long wait-times. To overcome these difficulties, Dell decided to build a platform that will facilitate communication and help build a community of supporters. With this idea in mind, Dell launched the blog Direct2Dell and stated that:

*“We’re spending more than a \$100 million — and a lot of blood, sweat and tears of talented people — to fix this. In the past months we have taken a more holistic look at our business. We are radically restructuring our contact centers — the intent is to redesign the whole process and put customers and service agents at the center of it. The service agent is our bridge to you and they need to have tools and help available at the tip of their fingers to support you.”*

The project ran into difficulties as can be expected when experimenting with new ways of doing things. Moderation of comments, for example, proved to be a sensible issue that needed to be addressed very carefully. Furthermore, as with most things on the Internet, it is almost impossible to control your brand image and how people will appreciate various initiatives. For example, when the blog was started, more than 50% of the comments were negative.

However, thanks to its consistency, responsiveness and regularity, the blog eventually proved to be successful. The number of negative comments dropped below 25%. Dell showed that it was aware of the importance of customers’ feedbacks and comments. Acknowledging tough issues on the blog and being transparent with customers also proved to be very effective in relating to customers, although it was somewhat criticized inside the company.

The blog now generates 3.5 million pages views/month. The blog is also available in different languages. There are new posts almost every day, with some gaps once in a while. The blog provides “a good mix of discussion about Dell’s products, the technology behind them and the industry in general.”<sup>5</sup> The content resonates with the blog’s readers that seem to come back and comment on the different topics, thus initiating discussions and feedback loops on Dell’s products and strategy.

Realizing the power of users’ feedbacks, Dell created a new website<sup>6</sup> to invite ideas and suggestions. After being registered, users can post new ideas and participate in discussions about which ideas they would like to see implemented. Users can also vote on ideas. The idea of providing laptops with Linux operating systems gained momentum on this website. Dell participates in the discussions and provides feedback to ideas. Users can see the status of implementation of different ideas. Examples of status are: reviewed, in progress, partially implemented, and implemented. Seeing ideas getting implemented is probably the best incentive for users to submit their requests and suggestions.

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<sup>5</sup> <http://moblogsmoproblems.blogspot.com/2007/06/company-blog-checkup-dell.html>

<sup>6</sup> [www.ideastorm.com](http://www.ideastorm.com)

The crowdsourcing site, IdeaStorm, was launched in February 2007. So far it has generated more than 10,000 ideas, almost 80,000 comments and about 684,000 votes. Following this success, Dell also developed a similar platform internally: Employee storm, which has generated more than 2,700 ideas.

Dell is also investing in new social media forms like microblogging with services such as Twitter. Dell has 22 corporate accounts on Twitter that can speak for the company. Microblogs provide a mix of personal and corporate information as well as related information about the industry or about technology. This facilitates collaboration between people with common interests, and especially let these discussions be followed by Dell professionals. In addition to that, more than 17 individuals have personal Twitter accounts which use “[Name]AtDell” handles.

Enabling discussions and feedback loops in several places seem to be one of Dell’s objectives. As Michael Dell puts it:

*“If we don’t do that at Dell.com, it’s going to be on CNET or somewhere. (...) I’d rather have that conversation in my living room than in somebody else’s” - Michael Dell*

Building on this idea, Dell also created a virtual island in Second Life, the internet-based virtual world video game. Dell also implemented a community portal, named Dell community<sup>7</sup>. On this portal, users have an easy way to access a variety of different Web 2.0 tools. On top of the ones that were already mentioned, Dell also provides forums<sup>8</sup>; syndicated feeds<sup>9</sup> to keep tracks of the updates on the different platforms; a technology center based on a wiki platform where “users and staff [can] share knowledge about Dell technology”. A new service is *Dell Community pulse*, a website that allows users “to share comments, compliments and complaints” and track them “as they happen”<sup>10</sup>.

As one can see, Dell is trying to innovate and test new ideas to reach out to customers, build and enhance relationships and discussions with them, and even let them submit improvement suggestions. This enables better feedback loops and improvements in customer service. Dell is in the process of building a sense of community around Dell products and technologies.

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<sup>7</sup> [www.dell.com/community/](http://www.dell.com/community/)

<sup>8</sup> [www.dellcommunity.com/supportforums/](http://www.dellcommunity.com/supportforums/)

<sup>9</sup> [www.dell.com/content/topics/global.aspx/rss/en/rss\\_main?c=us&l=en&s=corp&~section=002#1](http://www.dell.com/content/topics/global.aspx/rss/en/rss_main?c=us&l=en&s=corp&~section=002#1)

<sup>10</sup> <http://communitypulse.direct2dell.com/>

### 5.2.4.2.Comcast

Comcast also faced difficulties with customer satisfaction and experienced the downside of the easiness with which information can be shared and transmitted on the Internet. A famous example is the video clip of a Comcast repairman falling asleep at a customer's house while waiting over an hour on hold with Comcast's service line. The customer took a video of that incident and posted it on the Internet where it caught attention very fast with more than 200,000 people seeing the video in a few days (the video has now reached about 1.3 million views on YouTube). As the New York Times reported, "the video is one of several examples of angered customers taping their interactions with customer service, then putting the experience online."<sup>11</sup> The impact on public relations and on the image of the company is obvious.

Comcast also experienced the difficulty of controlling what people can say about its brand on the Internet. In October 2007, Bob Garfield, a former columnist and a critic for *Advertising Age*, launched the blog ComcastMustDie<sup>12</sup> in order to protest Comcast's poor customer service. The blog was launched to give Comcast's clients a place to "vent their grievances and for Comcast to pay close attention" as he described it. As the disappointment spread quickly via the medium of the internet, Comcast had to react. Comcast used the website ComcastMustDie to help address and solve "many hundreds of customer complaints."

Testing new and innovative ways, Comcast is also using Twitter to relate to customer and hear their complaints. Comcast is indeed monitoring Twitter, blogs and other social media tools. When clients complain about service or raise issues with their Internet connection, Comcast contacts them directly and provides appropriate support. This is part of a larger effort by Comcast to revamp its customer service and it has worked very well. This indeed makes really good word of mouth for Comcast as people are usually very surprised by such direct actions. Although some people are complaining that Comcast is "somehow watching them", they are happily surprised by the incredibly efficient customer service. Responsible for this monitoring action and Internet presence is Frank Eliason<sup>13</sup>. Building on this success, his team is growing up rapidly and soon ten people would be put in charge of monitoring what is being said about Comcast and helping customers.<sup>14</sup>

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<sup>11</sup> [www.nytimes.com/2006/06/26/technology/26comcast.html](http://www.nytimes.com/2006/06/26/technology/26comcast.html)

<sup>12</sup> [www.ComcastMustDie.com](http://www.ComcastMustDie.com)

<sup>13</sup> [www.twitter.com/ComcastCares](http://www.twitter.com/ComcastCares)

<sup>14</sup> [www.nytimes.com/2008/07/25/technology/25comcast.html](http://www.nytimes.com/2008/07/25/technology/25comcast.html)

Furthermore, Eliason's Twitter is now being followed by more than 3,400 people. These actions have acted as a catalyst to form a community around Comcast related interests and go beyond the basic customer approach. This approach helps diffuse bad publicity before it really starts and, at the same time, improves the overall customer satisfaction.

#### *5.2.4.3.Dow*

Dow was facing several challenges with 40% of its workforce eligible for retirement through 2013 and about 40,000 retirees in the US alone. Dow needed a new way to address the issue of capturing and retaining knowledge inside the organization. On a similar topic, Dow wanted to remain connected to employees that were temporarily not working, for example maternity leaves. A close scrutiny of the challenges led Dow to the fundamental objective of "staying in touch with current employees, retirees and workers on leave, helping Dow cope with staff shortages and keeping its workforce more engaged".

Dow decided to develop and deploy a social networking website to better connect with its employees. The project was led by the VP of public affairs and HR. The IT department helped a little in the deployment of the platform, but the whole project was outsourced to an external company, SelectMinds, to limit IT involvement. The project took about one year from conception to its final launch in December 2007.

Dow was well prepared to measure the success of this new platform from the start. Based on external benchmarks, it was expecting 10% active participation rate within a year of the launch. But employees related to the platform very well and this target was exceeded within just two months after the launch. The platform was an impressive success with about 4,500 members in 3 months and with 95% of users returning. The platform also enabled employees to refer potential candidates for job opportunities. Rehiring was also simplified through the platform. About 25,000 referrals were posted and 130,000 connections were created, thus showing an immense success for the job center platform.

Before the start of the project, Dow estimated that it would make savings in the area of recruitment costs and that the cost of the project "could be justified on the basis of rehiring alone, which is more cost-effective than hiring new employees". This simple assessment motivated them from the start.

Lessons can be learned from this platform deployment at Dow. Dow identified critical success factors, such as usability and the "keep it simple" imperative right at the start of the project. Other important points as noted by Dow were the necessity of strong governance with an active moderation and mindful



politics. Dow also successfully experimented with the “communications first and then word-of-mouth” approach. This proved to be very successful and resulted in viral spreading of information. Dow also emphasized the importance of looking at metrics from the beginning. As a result, they are more linked to the business objectives and less enticed by other fancy metrics that might not be so relevant. Having executive implication and senior management support throughout the whole deployment was also a strong reason of success.

Dow’s example shows the importance of “actively measuring and managing the success once the website is live”. Another lesson from the Dow experience is that one shouldn’t make assumptions about what people will want to do or are capable of doing on the platform. In this case, Dow was fearing that retirees would not get much involved in such a community. This assumption proved out to be false. Finally, it is important to understand that this is a change-management project, not a technology deployment project. Technology is the enabler that facilitates the creation and success of such platforms. However, technology should not become the starting point. Having business units take complete charge of the project and define business objectives was key to Dow’s success.

### **5.2.5. Publish, then filter**

Before the development of the new communication technologies, the costs of publishing were high. As a consequence, the usual process was to filter what should be communicated before broadcasting it. The dramatic fall in transaction costs is revolutionizing this process however. Therefore, the need for professional filtering of the good from the mediocre is not an absolute requirement. Now such filtering is becoming a social phenomenon and it happens after the fact.

Personal communication and publishing have merged into one another and are no longer two separate functions. Everybody can publish easily on the Internet and build a community. User-generated content is an amateur and group phenomenon. There is no professional involved in this process. The filtering happens afterwards through the choice of other people who decide or not to broadcast and refer to the published information. By making publishing fast, costless and easy, new communication technologies also facilitate the process of criticizing and responding to the publications.

This example also shows the importance of amateur work in a costless communication environment. People can freely and easily express their ideas and form communities of interests around similar topics, passions and other individuals. As a consequence, amateurism is becoming increasingly predominant,

making the old rules related to information and publication obsolete. Web 2.0 platforms are facilitating a bottom-up culture of rating, ranking and reviewing that is challenging vertical professions and institutions whose authority is based on credentials and “expertise”.

### **5.2.6. Fail fast and cheap**

It is important to note that an astonishing number of Web 2.0 and online social communities fail. This is due to the major challenges that accompany the development of a social community. There is nevertheless something to learn from these failures, and that is the power of failing fast and cheap.

Failing fast and cheap is a departure from the traditional “go / no go” way of making decisions. Instead of getting one’s idea 95% right first internally, this new paradigm call for proceeding with getting it 50% right and then listening to the customers to improve it. This idea is at the source of the numerous “beta” versions of software and social platforms that can be so abundantly found on the Internet. By lowering the costs of experiments, failing fast and cheap allows for more innovation and more discoveries. It becomes a way to accelerate learning. Experiments should be kept as small as possible to extract the most learning with the least amount of risk.

Social communities play a key role in this source of innovation. As it is very difficult to find out beforehand what will seduce a great amount of people, it is important to propose room for feedbacks, learn from them and improve. Some of the social platforms surveyed previously failed due to the difficulty in engaging people in conversation that mattered to them. If they had chosen to listen more to their members, such an issue could probably have been avoided.

### **5.2.7. Power law and network effects**

It is interesting to try to understand why some social platforms seem to get all the attention while others struggle to gather even a few users. Shirky argues that in systems where people have the freedom to choose between many options, the result will always be such an unequal distribution (Shirky, 2008). This phenomenon can be attributed to the forces of network effects.

People’s choices do indeed affect each other. The more people participate in a social platform, the more value it has for other people, thus creating positive and reinforcing feedback loops. Over time, positive network effects can create a bandwagon effect attracting more people. This results in power law distributions (cf. Figure 15).



Figure 15 - Power law distribution or the 80/20 rule

A power law distribution can effectively describe the relationship between the number of web 2.0 projects and the number of individuals they attract. This idea needs to be linked to the concept of long tail popularized by Chris Anderson to describe the niche strategy of businesses like Netflix. Anderson discusses cases where companies have created a market for low-demand products by having large distribution channels. The argument was based on research done by Brynjolfsson et al. who showed that an important part of Amazon's sale resulted from obscure books not available at other common bookstores.

One of the important consequences of power law distributions is that there is no "average user" which would be representative of the behavior of most users. In such distributions, mean, mode and median are very different. As a consequence, most participants are below average. Another consequence is that as such systems become bigger, the imbalance between the few and the many also increases. This is why there is no representative user on Wikipedia. What matters here is the behavior of the collective rather than individual users.

### 5.2.8. Leveraging these new web technologies

Web 2.0 is revolutionizing the ways status is attributed. In the corporate world, status is conferred by institutionalized position. It is a vertically structured world of formal organizational hierarchies. On the other hand, in the online social world, status is earned (and not assigned) on the basis of performance. This in turn is a horizontally networked world of spontaneous social interactions. Online social

networking is revolutionizing how we see ourselves and how we interact with others. Soon, it will also revolutionize how we work and how we participate in society.

*“Society is in the early phases of what appears to be a media revolution on the scale of that launched by Gutenberg in 1448.” (The Economist, 2004)*

Thanks to the fall of transaction costs, group forming is now something easy, fast and almost free. As a consequence, the old paradigm of management as a way to control people and administrate groups is being challenged. Individuals can now collaborate successfully without the need of hierarchies and management. Organizations need to overcome their fear of these new communication technologies and find new ways to leverage them. Web 2.0 technologies can indeed help eliminating the rigidities of formal hierarchies. As put by Matthew Fraser:

*“The great promise of Web 2.0 for corporations is that it fosters horizontal cooperation and thus brings an organization’s best talents to problem-solving and decision-making. Collaborative efforts not only break down organizational silos, but distribute rewards according to demonstrated talents and merit. They can also extend collaboration to a company’s customers who are encouraged to join the conversation.” (Fraser<sup>15</sup>)*

## 5.3. Fast decision making – Competing at the edge of chaos

High-velocity and unpredictable environments call for new ways to make decisions. A fair hypothesis seems to be that organizations need to speed up their decision making processes. This would help them to better react to changes in the external environment, which are likely to occur spontaneously. Eisenhardt argues that organizations need to implement a new form of decision making based on speed to succeed in high-velocity environments, which she coins *fast decision-making* (Eisenhardt, 1989).

The rationale behind fast decision making is multifold. First, making decisions fast enables the early adoption of products and of new business models that are successful and promising. Technologies and processes can for example be adopted early on before other competitors do, thus giving the company a

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<sup>15</sup> [www.throwingsheep.com/throwingsheep/index.php/Professional\\_Crowdsourcing:\\_Harnessing\\_Collective\\_Smart\\_S](http://www.throwingsheep.com/throwingsheep/index.php/Professional_Crowdsourcing:_Harnessing_Collective_Smart_S)

competitive advantage. Similarly, speed can also lead to preemptive actions to enable economies of scale and synergies. Thus, as J. Robert Baum and Stefan Wally put it:

*“In short, decision speed may enable firms in dynamic and not-dynamic environments to exploit opportunities before they disappear.” (Baum and Wally, 2003)*

### 5.3.1. Requirements

Bourgeois lists four specific characteristics of organizational behavior that are key to fast decision making:

- The extensive use of real-time information
- The consideration of multiple simultaneous alternatives
- The use of two-tier advice process, with the use of experienced counselors
- The use of active conflict resolution
- The integration of decisions among themselves

It is interesting to note that fast decision makers rely heavily on real-time information focused especially on operational indicators and on the organization’s competitive environment. As a consequence, the requirements seem to point to a series of apparent paradoxes: the need to plan carefully but to move quickly and boldly when needed. CEOs also need to choose and articulate their strategy quickly while still leaving room for applying it only when necessary (Bourgeois and Eisenhardt, 1988).

### 5.3.2. Effectiveness of fast decision making

According to Eisenhardt, fast decision making leads to superior performance in high velocity environments. This is partly due to the fact that making decisions fast allow them to keep pace with their external environment and its constant changes. Several authors have tried to better understand the relationship between the speed of decision making and performance. William Q. Judge and Alex Miller did a thorough study of the outcomes of decision speed in different environmental contexts. One important finding is that fast decision making only leads to superior performance in high velocity environments, and not in more regular ones:

*“Fast strategic decision making is not associated with profitability and sales growth across all environments.” (Judge and Miller, 1991)*

The link between fast decision making and firm performance is however strongly confirmed in high velocity environments where they show that “decision speed matters for firm growth” (Judge and Miller, 1991). This is why it is important to study the strategic decision-making process on an industry-by-industry basis. The context is indeed important to make sure that these new methods are not applied in the wrong context. Our literature review and analysis of the external environment however suggests that the environment in general is becoming turbulent, volatile and uncertain for most industries if not all. This tends to show that ideas such as fast decision making could now be applied to most industries and organizations.

## 5.4. The relationship between structure and performance

With environments increasing in complexity and in unpredictability, the tension between too little and too much structure seems to be important. Whereas more structure is associated with more control and thus efficiency, less structure is linked to flexibility and innovation. According to Davis and Eisenhardt, organizational structure and performance are indeed linked. They show that there is an inverted U-shape relationship between these two characteristics. The surprising fact is that this relation is asymmetric, which implies that it is better to err on the side of too much than too little structure (Davis and Eisenhardt, 2007). There is a significant drop in performance when there is too little structure, which may lead to chaotic behavior and a lack of control necessary to reach efficiency.

### 5.4.1. Unpredictability as the key variable

In the above mentioned study, the authors also explored different variables such as velocity, ambiguity, complexity, and unpredictability. They specifically focused on understanding which one of these variables was moderating the previously mentioned relationship between structure and performance. They found that:

*“Unpredictability is the key dimension of market dynamism underlying the tension between too much and too little structure.” (Davis and Eisenhardt, 2007)*

In highly unpredictable environments, they show that the relationship between structure and performance takes the shape of an inverted V, compared to an inverted U shape with a plateau when environments have low unpredictability. This highlights a contrast between a *forgiving environment* when unpredictability is low with a broad range of structures are optimal in terms of performance, and a *punishing environment* when unpredictability is high with only a narrow range of optimal structures. This explains why it is so challenging to perform in highly unpredictable environments: there are only a few viable structures and it is difficult to maintain an optimal structure in an environment constantly fluctuating.

## 5.4.2. Simple rules and semi-structures

*“An emerging perspective on strategy in dynamic markets suggests that, as market dynamism increases, success stems from loose capabilities that are purposefully simple.” (Davis and Eisenhardt, 2007)*

### 5.4.2.1. Semi-structures

The previous sections pointed to the importance of finding the appropriate organizational structure to reach desired performance levels. The question of how to find it still remains. Numerous authors have studied these aspects and have proposed different approaches.

One very interesting concept is loosely coupled structures or “semi-structures” suggested by Eisenhardt. The idea is to have only a small amount of structure based on a few simple rules that guide the organization as the environment evolves. This kind of organization is linked to high performance in dynamic industries as many authors point out (Burgelman, 1996; Galunic and Eisenhardt, 1996; Galunic and Eisenhardt, 2001; Katila and Ahuja, 2002; Williams and Mitchell, 2004; Gilbert, 2005). In line with this idea, increasingly dynamic environment is best tackled by increasingly simple strategies.

By using a few simple rules, organizations can more easily capture fleeting opportunities as they appear. Managers using this strategy should pick a small number of strategically significant processes and craft a few simple rules to guide them. The key strategic processes should position the company where the flow of opportunities is swiftest and deepest (Eisenhardt and Sull, 2001).

These rules can then be used inside *loosely coupled structures* where some features are determined and some others are not. On one hand, roles, rules and priorities are explicitly stated to create efficiency and

control necessary to coordinate change. On the other hand, these structures are not so rigid as to preclude flexibility and adaptability. Thus, these structures have only a partial order and some of it is left to employees. By using this strategy, organizations balance very rigid structure aimed at control and efficiency, with chaos that brings flexibility and speed. In order for these two aspects to successfully cohabit and lead to performance, several authors and especially Eisenhardt argue that improvisation should be leveraged. Improvisation can indeed be used to help structure behavior in real-time and take the appropriate decisions based on simple rules:

*“True improvisation relies on two key properties [...] It involves (1) performers intensively communicating in real time with one another, yet (2) doing so within a structure of a few, very specific rules. The limited structure provides the overarching framework without which there are too many degrees of freedom. The communication allows the players to coordinate and mutually adjust within that framework. Together, people can adaptively accomplish tasks even as the context is changing.” (Brown and Eisenhardt, 1997)*

As a conclusion, we note that, in turbulent environments, it is effective to increase the amount of structure the amount of the amount of structure when there is little or even none to engender efficiency and to decrease the amount of structure when it is extensive to engender flexibility.

#### **5.4.2.2. The value of experimenting**

Fast moving environments characterized by high complexity and high uncertainty. These are best dealt through experimentation that probes the future. As it is very challenging to predict what will happen in the future, probing gives decision makers the ability to lower the probability of being surprised by an unanticipated future. Low-cost probes are suggested because decision makers can pursue several of them while minimizing investments and risks at the same time and increasing the probability to find new opportunities. By probing, decision makers can learn and get better prepared for the unexpected (Brown and Eisenhardt, 1997).

#### **5.4.2.3. Building collective intuition**

Another seemingly useful approach to develop optimal organizational structure is to build collective intuition inside the organization. This idea is linked to improvisation. Collective intuition is a way for decision makers to “feel” what the future might reserve:



*“Effective decision makers create strategy by building collective intuition that enhances the ability of a top-management team to see threats and opportunities sooner and more accurately.” (Eisenhardt, 1999)*

For this purpose, it is important that decision makers rely on extensive and real-time information. It provides a background that can be shared among employees and decision makers. The result is the development of deep intuition, otherwise known as “gut feeling”.

## **5.5. Building awareness**

Several authors point to the importance of building awareness to become more resilient and flexible in highly turbulent environments. Being able to see changes in the external environment enables aware organizations to react faster and seize opportunities before they vanish. An important aspect is that building awareness is not about trying to predict the future. We saw that the unpredictability and turbulence of the environment we now live in, makes this impossible and futile. Rather, building awareness is about anticipation and alertness.

Peter Drucker argues that “the productivity of knowledge and knowledge workers” will become the decisive competitive factor in the world economy. In a similar vein, Peter Senge asserts that to succeed in the future, organizations must learn with “head, heart, and hand” and harness the collective intelligence and spirit of their employees at all levels.

Organizations need to design monitoring and early warning systems that will provide them with some forewarning of impending threats and opportunities. This poses a great challenge for them.

Furthermore, it needs to be adapted to the specific dynamics of the industry and the volatility of the external environment. The relationship should be, as we have seen, that increased complexity and speed in the environment be associated with greater monitoring of the external environment.

### **5.5.1. Peripheral vision**

George S. Day and Paul J. H. Schoemaker surveyed 140 corporate strategists about their awareness of the external environment. The results of this survey are almost shocking. They found that 2/3 of respondents admitted that their organizations had been surprised by as many as three high-impact

competitive events in the past five years. Furthermore, an astonishing 97% of people surveyed recognized that “their companies lacked any early warning system to prevent such surprises in the future” (Day and Schoemaker, 2006). This shows the mismatch between what organizations need in order to thrive in an always changing world and what they are actually doing every day.

Similarly, Peter Drucker argues for designing strategies to gather information not only about the internal organization but also about the external environment since they are constantly interacting with it. As a consequence, the external environment should also be monitored and analyzed.

So far, organizations have mainly focused on providing information about the inside of an organization. According to Drucker, approximately 90% or more of the information collected by organizations is focused solely on inside events. But as the external environment is evolving with a greater velocity and uncertainty, it becomes important to monitor what is happening outside the organization. The greatest source of surprise and uncertainty can indeed be found in the events and conditions beyond corporate walls. Because surprise acts as a risk-multiplier, organizations need to find ways to reduce the likelihood of being surprised.

*“Increasingly, a winning strategy will require information about events and conditions outside the institution: noncustomers, technologies other than those currently used by the company and its present competitors, markets not currently served, and so on.” (Drucker, 1996)*

The goal is thus to build *knowledge-creating organizations* which pays great attention to gathering and analyzing outside information. It is only with such information that an organization can decide how to allocate its resources effectively. Monitoring the external environment will also prepare the organization for new changes and challenges arising from sudden shifts in the world economy and in the nature of knowledge itself.

## 5.5.2. Identifying important signals

One of the major challenges of monitoring the external environment and building awareness is to expand the scope just enough to include all the relevant parts of the external environment, but without going any further. By having too narrow a scope, organizations will be surprised by their external environment enough and will let opportunities pass without being able to react fast enough. On the

other hand, a broad scope means that the organization would likely exhaust its resources and lose its focus.

By the same token, knowledge sharing needs to focus on gathering and tracking. The weak signals could lead be precursors of bigger trends in the future and which need to be recognized early on. This in turn raises a new challenge for organizations: how can they identify important signals, the ones that will matter to them and make a difference? Several approaches can be successful. We highlight a few of them here.

The first approach is scenario planning. Scenarios help to interpret the future and make sense out of it by organizing seemingly random signals into a more coherent trend. Scenarios can provide a context for learning. By selecting signals and fast-forwarding their development in the future using scenarios help to stimulate managerial thinking. Furthermore, by considering several scenarios at the same time, scenario planning lays out competing and potentially conflicting assumptions about how the world is evolving. This can keep the organization from being locked into one view of the world, and thus make it more resilient to a wider variety of futures.

It is also important to use the collective intelligence of employees. Their spirit and passion can be leveraged to provide new insights inside the organization. Their different points of view can improve sense-making by encouraging constructive conflict and tapping into localized intelligence. Similarly, they can help to formulate multiple hypotheses and to confront the information with realism. Engaged employees foster an aware organization by getting rid of its individual biases. Organizational biases can indeed be overcome by promoting diversity in the organization.

Finally, organizations should rely extensively on experimentation. One of the best ways to better understand the periphery of the external environment is to design experiments to test it. This will help to reduce the uncertainty where it is truly needed. Because of the velocity of the environment, new futures arrive and go quickly. Options thus give managers more possible responses by making it easier for them to adjust. Low-cost probes, as we discussed earlier, accelerate learning and help build competitive advantage.

Overall, a combination of the three approaches presented above can result in high performance for organizations in highly turbulent environments and give them a competitive edge for the future, making them more resilient and more flexible.

## 5.6. The impact of complexity theory on organizations and decision making

### 5.6.1. Issues with current approaches

Complexity theory is gaining popularity in organizational studies thanks to the efforts of many authors, especially Axelrod & Cohen, Brown & Eisenhardt, Dooley or Stacey. Elizabeth McMillan further argues that the mechanistic and linear view of the world provides a reductionist cause and effect approach. Traditional notions of organizational structures and management are indeed not adapted to a causal model of the world. Such a model may have suited more stable times. However, it does not offer effective solutions to cope with the fast-flowing uncertainties of the current turbulent environment. Furthermore, the traditional scientific tools of reducing a system to its atomical elements to understand its behavior, does not work to gain insight about complex systems. Complexity theory indeed shows that it is impossible to reduce the system without killing it. Such approaches are thus bound to fail.

### 5.6.2. Building a complexity theory of strategy

Because companies' competitive environment is now so turbulent and unpredictable, complexity theory can be leveraged to propose new strategic approaches. We saw the important tradeoff between flexibility and control is in dynamic environments. Complexity theory concepts are particularly relevant to explain adaptation in such a context.

This approach has been coined "emergent approach to strategy making", or more generally "complexity theory of strategy." For example, we can apply the concept of the edge of chaos to organizations. It is a zone where organizations can have both the stimulation and freedom to experiment and to adapt to the appropriate framework and structure to avoid disintegration. This gives them a competitive advantage: systems that are driven to the edge of chaos out-compete those that are not (Kautz and Zumpe, 2008).

Complexity theory shows that systems composed of simple structures can give rise to complicated behavior and perform particularly well in turbulent environments. Complex adaptive systems are able to balance order and chaos, and to enable efficiency and flexibility. This is possible through moderately structure organizations. According to complexity theory, adaptation is indeed most effective in systems that are only partially connected. The idea is that too much structure leads to bureaucracy and

immobilization, while too little structure creates chaos and the absence of coordination. Thus complexity theory can be leveraged to focus management on the interactions between different parts of an organization (Brown and Eisenhardt, 1997). Such a loosely connected structure will let flexibility emerge while still having a form of efficiency and control.

Glassman et al. explain that organizations need to realize that “the agility to lead an emergent strategy-making process is created not through the use of standardized procedures or recipes, but through carefully facilitated and purposeful social interactions that accelerate the creation and diffusion of strategic idea making (c.f., Meyer, 2001; Faulkner and Campbell, 2002; Sullivan, 1998; Eisenhardt, 1990)” (Glassman et al., 2005).

A new organizational theory, based on complexity science and the importance of the emergence of new properties resulting from the non-linear interactions of multiple agents which adapt to their environment, is now required. Kevin Dooley suggests a way to leverage several aspects of complexity theory. He describes two main steps: the first one is to develop a shared vision; the second one is to alter employees’ perspective on the current organizational state. To achieve this, “management needs to implement means by which vision can emerge from the group, and management’s vision can gain acceptance among organizational members.” Furthermore, the amount and type of feedbacks available from the environment need to increase. Combined with enhanced communication and exchange of information, organizations can manage to become better connected to their external environment. Communication technologies can help by facilitating the communication among employees and towards the external environment. Such an approach will “bring the system far-from-equilibrium and thus to a potential bifurcation” (Dooley, 1997).

Dooley further proposes guidelines in order to fully leverage the learning of complexity theory and complex adaptive systems:

*“(a) create a shared purpose, (b) cultivate inquiry, learning, experimentation, and divergent thinking, (c) enhance external and internal interconnections via communication and technology, (d) instill rapid feedback loops for self-reference and self-control, (e) cultivate diversity, specialization, differentiation, and integration, (f) create shared values and principles of action, and (g) make explicit a few but essential structural and behavioral boundaries.” (Dooley, 1997)*

## 5.7. Conclusion

This chapter discussed how the fall of transaction costs is making the creation of new groups an easy and costless task. This is revolutionizing the rationale for organizational management, calling for even more new approaches to overcome the difficulties of a turbulent and complex world. Furthermore, these new technologies can and should be leveraged by organizations to foster collective intelligence, and build a knowledge-creating organization where employees can express their passion.

We also presented some insights from emerging fields. Complexity theory and complex adaptive systems offer a new and challenging way to look at a complex environment and organizations should learn from this field to make better decisions. Fast decision making and the new domain of complexity theory of strategy are full of insights for decision makers. Loosely connected structures can provide the much needed flexibility in an organization. This mindset also corresponds to the one which new communication and social technologies are facilitating. These should thus be intertwined to provide new approaches.

# Chapter 6. New approach for decision making and organizational structure

In this chapter, we propose to bring together the insights from different fields to propose a new framework for organizations to deal with the uncertainty and the turbulence of the external environment. We highlight the necessity of operating in the zone of excellence, where flexibility and efficiency coexist, and where the passion of employees can be triggered by interactions with the external environment and then channeled to make better decisions. We also explore how new technologies can facilitate this culture change. We then move on to the study of the implementation of a specific subset of our framework, a trend-watching system for the case company. Finally, we discuss the policy implications of our approach and propose several recommendations for the public sector.

## 6.1. Bringing these concepts together

The mind-map in Figure 16 presents a summary of the different insights received by reviewing literature in different fields.

### 6.1.1. Reconfiguring corporate social architecture

Although suggestions to improve corporate performance by building flexibility and leveraging employees abound, we rarely see a dramatically different business management practice that merits attention. In most cases, it is an aspect of the business operation that has been transformed but the essence of the system remains ossified in age old business wisdom and principles driving efficiency. The key reason being the inertia of the prevailing social architecture that has evolved in a control dominated organizational paradigm. As a result, it is impossible to lead a change effort targeting strategic agility and employee involvement without re-architecting the social interactions. It only makes sense that to define a new social order that moves toward a culture of openness and involvement should not be driven by senior management diktats. Instead it should be a bottom up realization that leads to ideas and suggestions for future organizational and strategic changes.

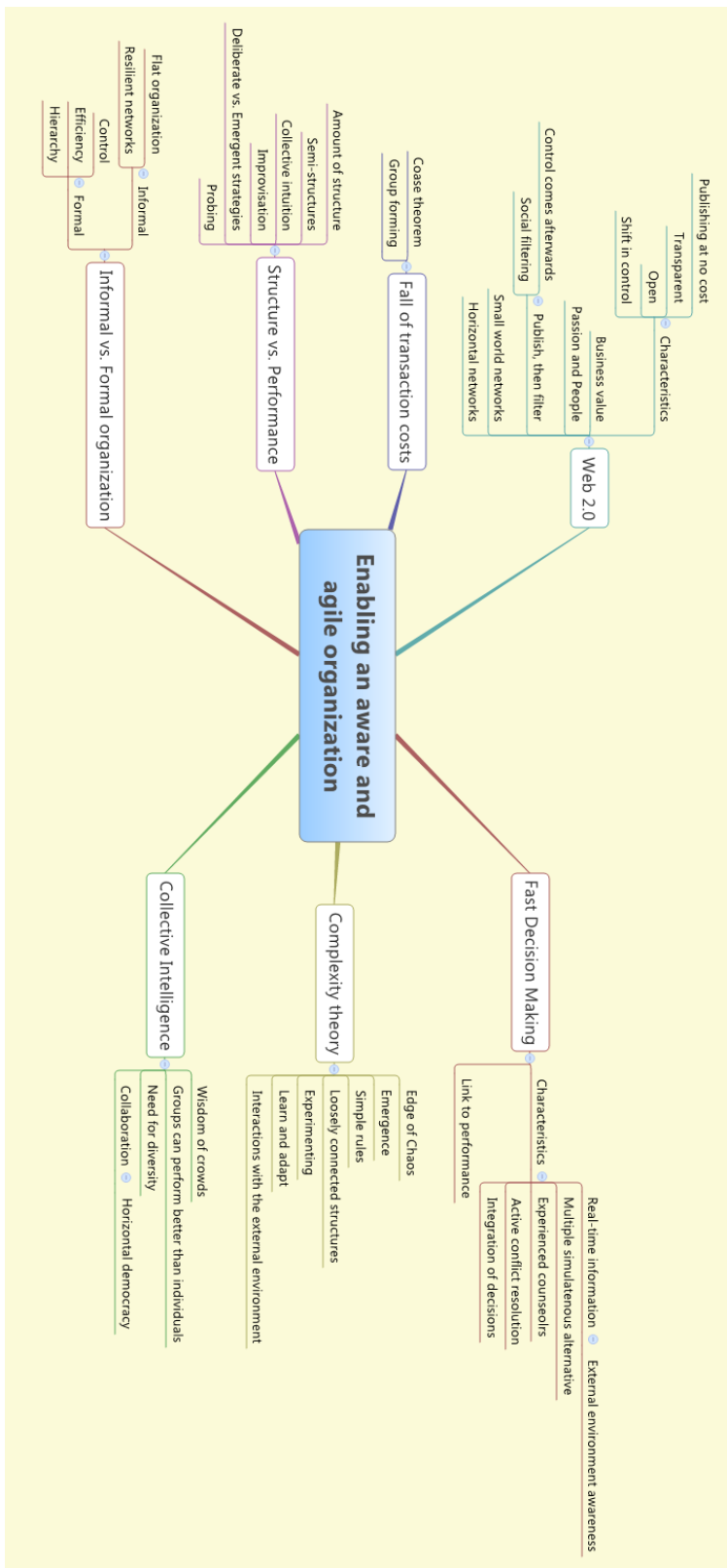


Figure 16 - Mindmap of topics



Arguably, changing social architecture of an organization is one of the most difficult challenges facing any company. This is where latest developments in information technology can play a vital role.

Technology led solutions can help pierce the thick shell of prevailing ethos and foster an environment that encourages the much desired 'knowledge-creating organization.' With the fall of communications and transactions costs, new technologies indeed now make it possible for many more people, even in large organizations, to have access to the information they need to make decisions.

Furthermore, to be able to make a permanent change, we need to be able to persist and reinforce the need to think differently and question existing beliefs and assumptions. Fortunately, with the arrival of the Internet, all this can be accomplished consistently and at a very low cost. We will discuss one way organizations can address broad changes and emerging trends in the future. Especially, we will develop how technology can be embedded in an organization to drive permanent culture of discussion and diversity by changing the social architecture.

Unfortunately, entrenched mental frames prevent businesses from moving in new directions by distorting reality and taking a *convenient* view of problems and opportunities. This is the underlying obstacle preventing companies from successfully redefining their organizational and leveraging informal networks. Also, fully leveraging the informal organization was not possible till recently as we lacked tools to enable such structures. This time, however, organizations must make a concerted effort to find the right balance between formal and informal organizations to match the new needs, and quickly. A step change in management must take into consideration the challenges posed by dynamic market rules, greater complexity, enhanced scope, short reaction time, and unforgiving competition. Organizations must expand their mental frames and limit the impact of biases through the sharing of diverse points of view in a non-threatening way, and by opening up.

The challenge for companies in the future will thus be to find creative ways to free the entrepreneurial hostages within themselves. They will have to seamlessly integrate two divergent organizational structures to create a 'big company' with a 'small company soul'. As Tom Malone says:

*"As a result, we can now have the economic benefits of very large-scale organizations without giving up the human benefits of small ones—freedom, flexibility, motivation, and creativity. These human benefits often provide decisive competitive advantages in knowledge-based and innovation-driven work." (Malone, 2004)*

## 6.1.2. People: The solution within

Unfortunately, organizations have proven to be ineffective in fully tapping its human assets. Typically, employees are assigned to business needs based on their formally declared professional skills alone. These skills are reflected in employees' educational qualifications and/or professional work experience; precisely the information considered when organizations hire new employees. As complexity theory shows, this mechanistic, linear view of the world is driven by a failing cause and effect logic.

What companies have foregone so far is the huge advantage that employees bring via their *passion*. Peter Senge refers to this as capturing the spirit of employees. Organizations can raise their level of performance by unleashing this unexploited innate value of their people that we call the *shadow expertise*. Combining "who you are" with the "why you are hired" is at the heart of what will give organizations the competitive edge in the future. Businesses that have focused on channeling professional skills alone should also focus on releasing the passion of company employees. So, the question is how can organizations foster new hybrid structures? How can organizations keep the structure vibrant and healthy?

Clearly, deploying formal rigid organizational structures to channel passion will not be appropriate. A more suitable approach is to utilize a flexible informal organizational structure to tap employee's diversity and passion. An effective informal organization can be established by encouraging extensive informal interactions among employees that will activate powerful personal networks that tend to be very resilient. Furthermore, companies that operate based on shared beliefs and common values as foundation instead of corporate diktats are better suited to succeed.

## 6.1.3. Zone of excellence

Imagine an organization competing in a business environment that requires it to swing like a pendulum between the structural extremes of an informal organizational (feeding on passion and creativity enabled by less control and more flexibility), and a formal organizational (seeking professional qualities of hierarchical structure, significant control and efficiency). Maintaining a vibrant structure to allow an organization to switch its character so dramatically poses a great challenge for any organization. This is very similar to the concepts of operating at the edge of chaos and emergence we discussed about. In that sense, the answer lies in focusing on the local entities, i.e. people and managing the interactions between them to drive desired change. This will require organizations to permanently embed

capabilities by tapping people in a creative fashion. We suggest that organizations create a *zone of excellence*. This zone highlights the importance of constant effort by the organization to stimulate and channel people's professional and deepest personal aspirations to build broad knowledge base and capabilities.

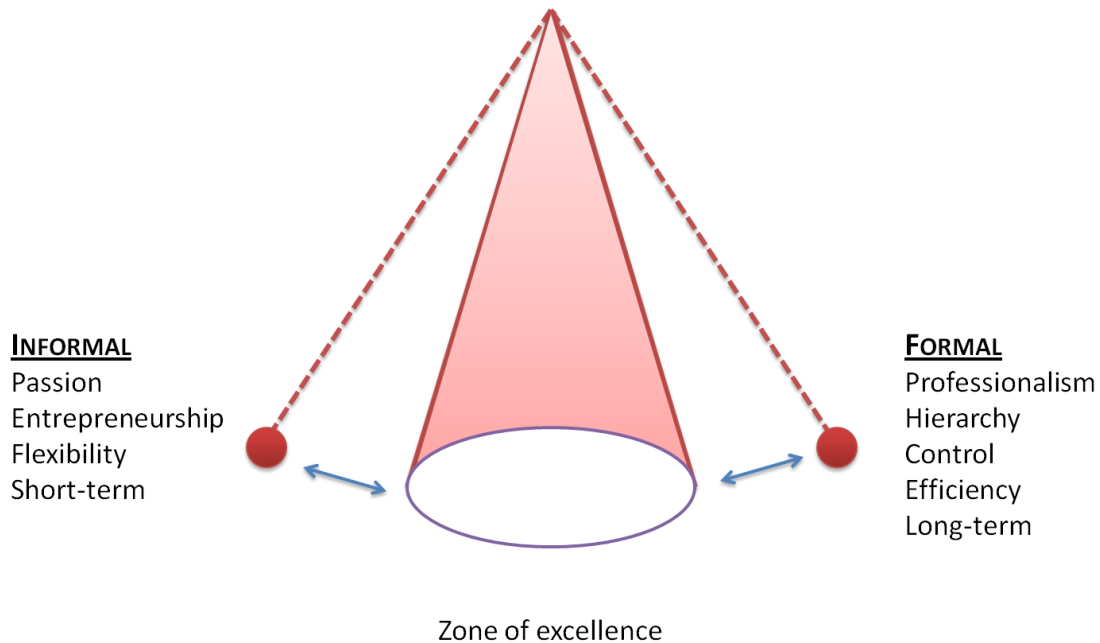


Figure 17 - Balancing informal and formal structures

#### 6.1.4. Embedding technology and processes

When developing communities, the most common pitfall that organizations must avoid is focusing solely on technologies and forgetting about the business objectives. However, to take full advantage of these new philosophies, organizations need to rethink their business processes: a new way of thinking is required. A disconnection between technology and process can indeed be fatal to the implementation of new communication platforms inside an organization. We believe that organizations need to consider technologies and processes simultaneously to enable interactions between them enable the organization to build successful and flexible strategies. Our framework below proposes a new approach that makes processes and technologies evolve at the same time.

## 6.2. Framework proposal

We propose a framework that will cultivate and leverage both informal and formal structures inside the organization. The framework is motivated by complexity science philosophy in that it focuses on interactions between different constituents of the organizations. At the same time, an undue emphasis on informal networks could lead to chaos and confusion and prove to be counterproductive. Consequently, formal hierarchy is also an integral part of the proposed framework. The informal structure is expected to serve as the foundation for the organization. This is important since a foundation built on values and principles will create an informal network that is robust due to its flexibility. The key challenge is to find an effective way to integrate the formal structure into this foundation.

Implementing such a framework is impossible without leveraging the recent developments in information technology. New tools and technologies offer us new ways to manage collaboration internally, interfacing with customers, and interfacing with suppliers and partners. They also help make the decision making process more transparent and give better access to unstructured and structured information from disparate sources. Web 2.0 and new social technologies are capable of helping companies tap into the passion of their employees by giving them the means to interact with each other and easily create groups. Table 1 summarizes how new social applications can help different corporate functions to better achieve their objectives and how both of them can proceed at the same time.

### 6.2.1. Dynamic informal networks

The first step towards fostering a rich organizational fabric is to establish a strong informal network where employees are free to communicate with each other as they deem fit. Private social networks and communities as well as temporary groups according to specific needs should be encouraged to channel the passion of employees. These network structures are founded on participating member's competencies and passion to create adaptive, flexible but yet powerful teams.

Corporate function	Typical groundswell objective	Appropriate social applications	Success metrics
Research	<b>Listening</b> — gaining insights from listening to customers	<ul style="list-style-type: none"> <li>• Private communities</li> <li>• Brand monitoring</li> </ul>	<ul style="list-style-type: none"> <li>• Insights gained</li> <li>• Comparable cost of surveys or focus groups</li> </ul>
Marketing	<b>Talking</b> — using conversations with customers to promote products or services	<ul style="list-style-type: none"> <li>• Blogs</li> <li>• Communities</li> <li>• Social networking sites</li> <li>• Video or user-generated sites</li> </ul>	<ul style="list-style-type: none"> <li>• Awareness</li> <li>• Online “buzz”</li> <li>• Time spent on sites</li> <li>• Sales</li> </ul>
Sales	<b>Energizing</b> — identifying enthusiastic customers and using them to persuade others	<ul style="list-style-type: none"> <li>• Brand ambassador programs</li> <li>• Communities</li> <li>• Embeddable “widgets”</li> </ul>	<ul style="list-style-type: none"> <li>• Community membership</li> <li>• Online “buzz”</li> <li>• Sales</li> </ul>
Support	<b>Supporting</b> — making it possible for customers to help each other	<ul style="list-style-type: none"> <li>• Support forums</li> <li>• Wikis</li> </ul>	<ul style="list-style-type: none"> <li>• Members participating</li> <li>• Questions answered online</li> <li>• Avoided support calls</li> </ul>
Development	<b>Embracing</b> — turning customers into a resource for innovation	<ul style="list-style-type: none"> <li>• Innovation communities</li> <li>• “Suggestion boxes”</li> </ul>	<ul style="list-style-type: none"> <li>• Usable product ideas</li> <li>• Speed of development</li> </ul>

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Source: Forrester Research, Inc. \* 16

Table 1 - Matching corporate functions with new social technologies

## 6.2.2. Channeling external triggers to initiate changes

To promote diversity in discussions and enrich the internal communication, it is also important to create appropriate connections with the external environment to enable continuous flow of new information from the outside. Organizations need to constantly scan the outside world to better estimate the business and technological landscape and what could impact them in the future. Ability to interact with the external environment will help to initiate new interactions among employees who will contact each other in order to better understand specific aspects of the environment. This in turn will refashion the interaction between employees by leveraging informal structures and connections.

<sup>16</sup> Source: Forrester Research presentation

For this purpose, organizations need to implement a system which will continuously feed discussions inside the organization and thus help remove the blinders that could hurt it in a narrow world.

### 6.2.3. Benefitting from synergies

The monitoring of the external environment helps build foundational flexibility into the organization by creating a proactive and dynamic culture among all employees. A key aspect of this approach is that it provides a platform for all employees to interact with each other as a flat organization. Each employee has equal opportunity to sense and respond to all external information in an independent manner. As employees become more aware of the constant turbulence in the environment, due internal changes will take place to make the organization ready as needed. Once changes are triggered in the informal network, incentives and the like should also be adjusted in order to accommodate the formal structure.

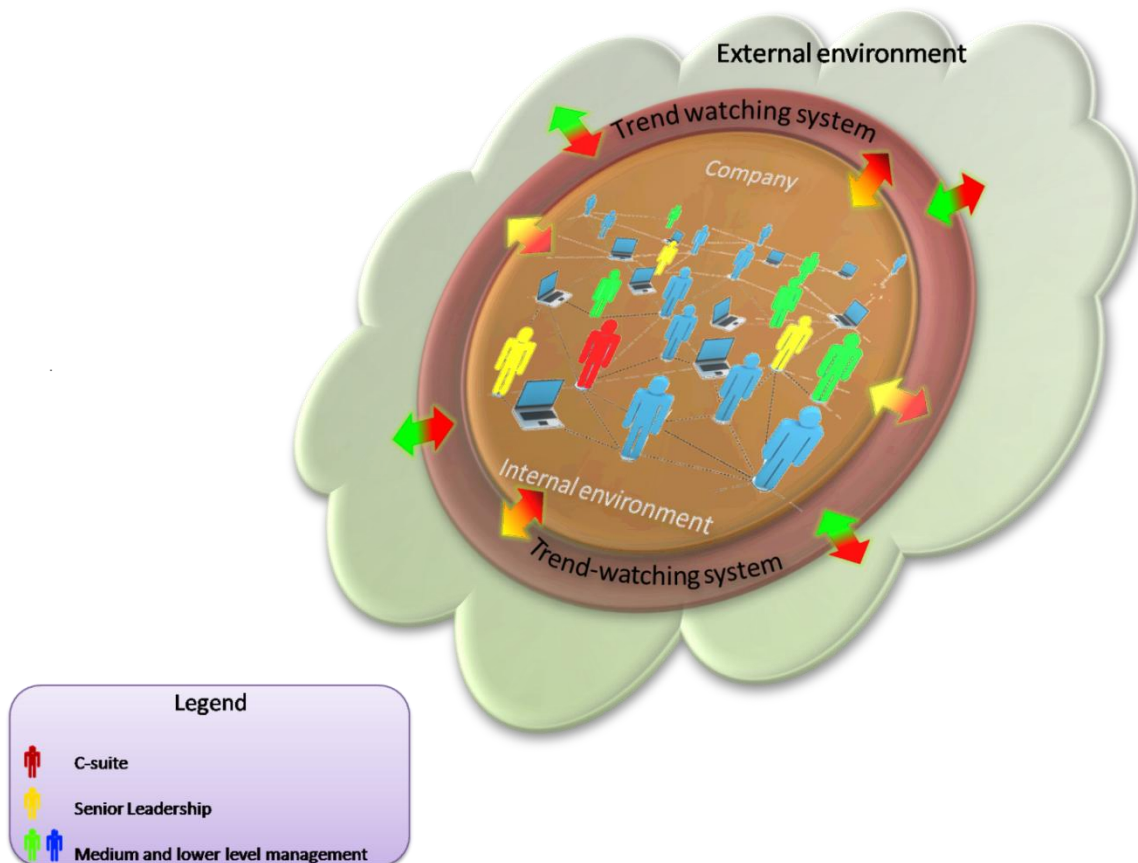


Figure 18 – A dynamic and connected business environment

This new framework will enable organizations to redefine their boundaries with the external environment. By following our guidelines, they will enable new interactions with this turbulent and high velocity environment. Building an early warning detection system (or a trend watching system) will help organizations to have a better awareness of the external environment, thus making them more capable of adaptation. This, combined with loosely internal structures empowering the passion of employees, will result in greater flexibility while still enabling efficiency for superior performance in face of turbulent and uncertain environments. The different ideas of the framework are captured in Figure 18 and should be compared to a more traditional organizational structured as depicted in Figure 5 (page 52).

## 6.3. Case study of a trend-watching system

In this section we present a case study of the design and implementation of a trend-watching system for the technology monitoring needs for a Fortune 50 company. For this purpose, we used the ideas and technologies described in our framework. The trend watching system provides a structure and tools to promote internal informal interactions with the aim of discovering new trends and creating awareness of external environment.

### 6.3.1. Overall process

The proposed trend watching system (cf. Figure 19 for the overall process) is driven primarily by user input, specifically suggestions for topics, search locations, and discussions. As described earlier, the computing and technical infrastructure is not an end in itself, but rather a tool successfully leveraged through appropriate processes. In the proposed system, users are provided with a constant feed of information and news articles from the Internet. These feeds are selected to ensure relevance around topics of importance to the users. This constant communication help the users stay up to date on their external environment. In addition, these articles provide a background to engage in informed discussions through the message boards.

The core of the process is the informal yet structured dynamic interaction with several feedback loops among different users. The system provides an integrated *search mode*, providing new information about preselected topics, and a *discovery mode* where users are confronted with relevant but unexpected information. This combination lets users become more aware of the external environment

and discover new trends. Furthermore, by monitoring various discussions and tracking emerging topics of interest over time, new trends are discovered and shared with all users constantly.

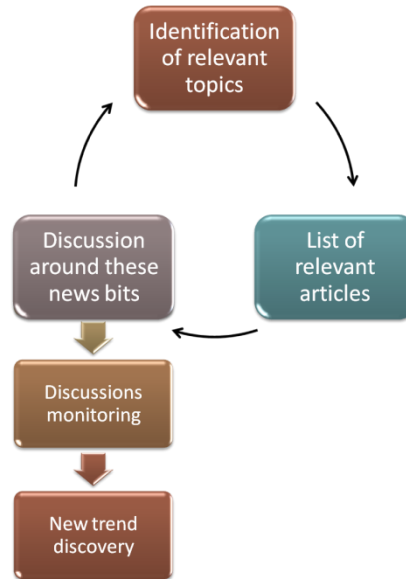


Figure 19 - General philosophy of our Trend Watching System

The following figure (Figure 20) shows a more detailed version of the process we proposed. The different steps in Figure 20 correspond to the following:

1. Based on user input, through brainstorming sessions, polls, discussions or suggestions, relevant topics are identified and selected to be included in the system.
2. The system then runs in the background to provide related and relevant news articles based on the topics specified above. News articles are fetched from several websites, blogs and directories. RSS feeds are used because they enable an easy access to new information and a constant update that is key to the trend watching system.
3. These news articles are then displayed on a webpage. Each article is presented with a relevancy ranking which takes the form of a score, A, B or C, depending on the relevancy of the article to the company and the users. Only the most relevant articles are displayed. Each article is also associated to a category so that users can easily browse through them.
4. Users read the articles and can also go to the original web pages. Thus they are kept up to date on their external environment and on topics that matter to them.



5. Users then engage in informed dialogue in a discussion forum. The different articles provide a background to facilitate these discussions.
6. Monitoring these discussions enables system administrators to discover new topics, which are gaining momentum and interest among users. They can then insert these new topics back in the search mode to provide more background for the users. This is thus a reinforcing loop.
7. The monitoring of the discussions also enables system administrators to discover new trends. They then report these trends to all users.

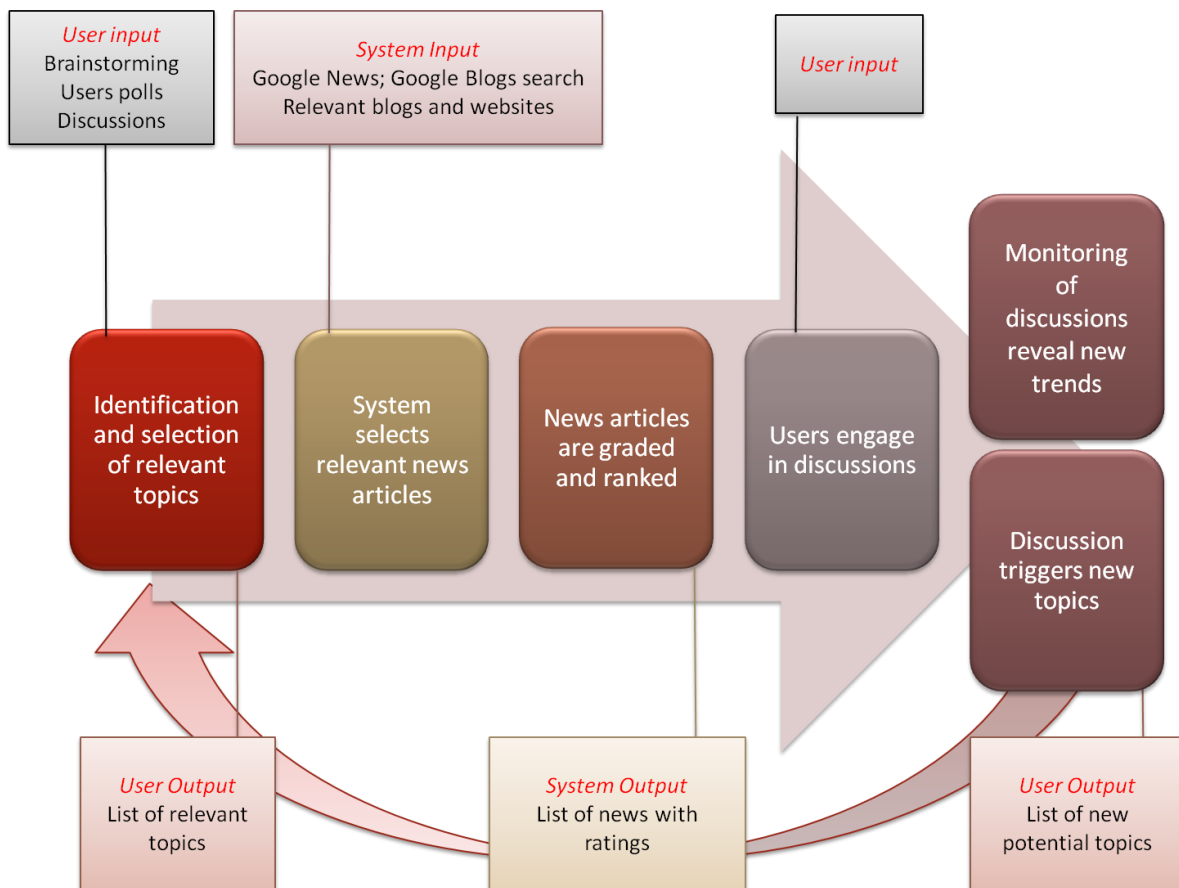


Figure 20 – Trend-watching system process flow

### 6.3.2. Insights

Going beyond simply allowing for more awareness of the external environment, the proposed trend watching system leverages several of the ideas suggested by complexity theory and social media.

The first important aspect is to leverage the passion and spirit of employees. The trend watching system provides all employees with background information that matter to them as employees and as passionate people. A trend watching system is an example of how organizations can empower people and fuel their passion, and simultaneously capture it for competitive advantage. As news bits are presented to all employees, people can react to the ones that trigger their thoughts. These thoughts could be due to their personal interest or professional responsibilities and not particularly related to their day-to-day functions. The trend watching system thus allows for a structured conversation nourished by the passion of the company's human asset. All the information – in its chaotic and unstructured form – is indeed channeled through a structure that gives it more value. By doing this, such a trend-watching system proposes to leverage the informal organization. It facilitates the process of making the internal organization more vibrant by providing it with constant feeds of information.

Furthermore, a trend watching system provides a link to the external environment, a critical element for continued success of an organization in a turbulent environment. It facilitates the recognition of early warnings by a larger number of individuals. Everybody in the organization has indeed access to the trend-watching system and can propose his/her point of view to the issues being presented. The early recognition of trends further allows the organization to experiment early on when costs are still low. Probing thus becomes easier and cheaper, allowing the organization to test different opportunities early to develop a competitive edge.

In conclusion, such a trend-watching system allows everybody inside the organization to be involved as desired – the people decide. It makes the response time to environmental changes shorter, thus reducing the likelihood of being surprised by new developments of the external environment. It also enables organizations to capitalize early on opportunities and warns them of impending threats.

### **6.3.3. Implementation**

The case company implemented the proposed processes and infrastructure. After running through the common implementation issues that accompany any new framework and processes, the company was able to fully implement and leverage this system. They focused the system to monitor new technological and scientific trends that could have an impact on their business. The system provided them with easy access to new pieces of information relevant to what was important to them. It is too early for us to comment on the success of the system but the initial signs are very encouraging.

## 6.3.4. Conclusions

In this section, we presented a case study of the implementation of a trend-watching system in a Fortune 50 company. The set of processes along with the software enabled the organization to develop a better awareness of the external environment through constant interactions with it. Such a system will indeed provide the background to initiate discussions between passionate people inside the organization. It will further enable the discovery of early warning signals and trends in order to develop greater flexibility. The shortening of the response time to environmental changes indeed lets organizations react earlier on to new developments in the external environment, thus limiting the negative impact of surprises.

The trend-watching system is the first milestone in helping companies better envision the future and better manage the uncertainties. Scenario planning, for example, is a great tool to develop *peripheral vision*. Scenario planning helps organization to envision different futures and to craft strategies which are tested for resilience under a variety of future conditions. Finally, the whole early warning system also needs to be aligned with the company's business strategy in order to be fully leveraged. This forward-looking approach will then become part of the company's culture.

## 6.4. Policy implications and recommendations

In this section, we will discuss the implications of our proposed approach for policymakers.

### 6.4.1. The need for adaptive policies

One of the most pressing needs is for policies to allow revision and adaptation. This can be set to happen at specified time intervals or based on specific events.

#### 6.4.1.1. *The rationale for more adaptation in policymaking*

Adaptation and self-correction in science and technology policy is a necessity as it is hard to get things right at the outset. Even if policy makers should work on getting things right in the first place, there are always unknown collateral costs and benefits. Interaction effects are also especially difficult to predict, especially with large scale policies. Policies also generate public reaction that can modify their impact.

Policies can also elicit technological change by promoting a technology that appears more promising or more secure over other potential ones. Furthermore, we saw the new challenges raised by a highly unpredictable and turbulent environment. The complexity of the environment is making these issues even more challenging for policymakers. They cannot incorporate all aspects and variables in their models and analysis, thus leaving policies to remain always imperfect.

Adaptation, as the use of information revealed after the fact, is thus required. We argue that policies should incorporate such new or revised information and leave room for policies to be revised. Our previous analysis indeed showed the importance of building flexible and adaptable structures and organizations. One of the consequences for the policymaking world is to design policies that are adaptive to better respond to the evolutions of a complex, uncertain and dynamic environment.

As a consequence, it is important to include adaptation in the policy process: evaluation, anticipation, adaptation and selection. Both planned and unplanned potential revisions of policies indeed need to be incorporated for this process to be efficient. There should thus be an explicit framing of certain policies as experimental, with attention to provision for monitoring in order to increase the likelihood of adaptation and revision in the future.

#### *6.4.1.2. Conditions for proper adaptation*

Two conditions are necessary for a good adaptation: sensing, the post-hoc assessment of new information including effects; and controlling, the process of responding (or not) to the new information available. Provisional policies incorporating these two aspects should be favored. Our previous analysis specifically emphasized the needs to create awareness to the external environment. We saw how it is becoming an important requirement for organizations in a highly turbulent environment. Therefore, we argue that institutions need to be equipped to assess early warnings enabled through constant monitoring.

#### *6.4.1.3. Adaptive policy disincentives*

However, there are also difficulties in the process of implementing adaptive policies. One of them is that it can be difficult to reconstruct the rationality for the policy choice after the fact, thus complicating the work of future policymakers. As Sheila Jasanoff explains, “science is subjected to extreme deconstruction in the US regulatory process [...] the legitimacy of regulatory decisions ultimately rests on persuasive reconstruction of justifications in scientific, economic and legal terms.” This complicates

the task for policymakers who might be trying to understand the rationale of a policy after new information is revealed. The actions taken to legitimize prior policy choices may indeed impede updating.

Another difficulty is associated with lock-ins once a policy choice is made. Interests (bureaucratic and business) tend to limit self-correction. This tendency towards lock-ins into existing policies may thus limit the adaptive use of information harvested through updating strategies. Next, we propose to consider examples of disincentives.

### Disincentives for sensing

There are specific disincentives for sensing, one of the two requirements for adaptive policymaking. For example, pride of authorship can be an important motivation to limit policy adaptation. Agencies or institutions that crafted the policy in the first place might resist to delegate the sensing and controlling to other parties. This can lead to litigation issues with some parties invoking secrecy to avoid settlements.

Actions taken to legitimize prior knowledge claims may impede updating by denying the need for monitoring the environment and the need for potential changes in the future. Including adaptation as part of certain policies imply the tacit acknowledgement that these policies are not perfect and could be improved. Institutions nonetheless do not want to give the impression that their policy proposals are unfinished work in progress. This leads to resistance to sensing.

### Disincentives for responding

Both public and private sectors may have interests that prevent them from responding, the second requirements for proper adaptive policies. For governments and institutions, accepting that policies need to be adapted also imply a certain form of delegitimation of their work. This can lead to strong resistance from the institutions that participated in the design of the policies in the first place, thus pushing them to deny early warnings. They might also try to argue in favor of the previously crafted policy and invoke common reasons such as the cost of modifying indicators, rules or standards. This results in resistance to revise existing operating procedures and policies.

The private sector may have similar interests to resist responding to policy adaptation. For companies, it is for example easier to recognize and act on existing interests in current regulations, technologies and product, than on prospective interests in potential regulations, new technologies, and innovative

products. Acting this way indeed confers businesses more stability. Furthermore, firms are impacted by changes in regulations that tend to create elements of the business environment. This newly created environment can be very selective, favoring some companies or products, and killing others. Some firms may thus be very reluctant to engage in the revision of policies.

### Recommendations

To overcome these disincentives, we propose a few recommendations. The first one is to sharpen the incentives to reveal and recognize new information and knowledge. This includes the disclosure of existing knowledge as well as the search for new knowledge. For this purpose, systematic attention should be given to the elimination of the disincentives we covered earlier. Funding information acquisition should also be fostered. This would lead to a better aware and adaptive policymaking process.

The second recommendation is to reduce lock-in in existing policies. The problem that we identified earlier is that organized and concentrated interests groups tend to foster lock-ins in current policies, thus making the constituencies for stasis stronger than the ones for change. To overcome this, it is important to realign the incentives of public and private sectors.

Lastly, we recommend a higher level of indicators of performance. It is now commonplace to observe that specialized regulations may not be readily revised as learning is taking place. It thus becomes critical to design operational goals in terms of ultimate indicators of performance and to facilitate the adaptation to information on interaction effects.

The combination of these three recommendations would limit the power of the previously mentioned disincentives and push policymakers towards the design of more adaptive policies.

#### ***6.4.1.4. Finding the right balance between overly sensitive and stagnant policy***

As it is hard to get things right at the outset in a complex world, adaptation is a new requirement of the policymaking process. New information that may trigger changes in policy is indeed required. However, too much adaptation can also become an issue. This is why it is important to find the appropriate balance between overly sensitive and stagnant policies.

There are several difficulties with adaptation that must be balanced however. First, the review and adaptation of policies require funds and can be very costly for large-scale policies. Investment criteria also prefer stability, thus going against the policy revision's rationale. Furthermore and as we saw through the lock-in issue, canceling policies could severely hurt the credibility of agencies and legislative organs. This aspect also needs to be incorporated to provide a suitable balance.

The solution is in finding the adequate time scale. In a system dynamics view, it is important to recognize the delays inherent to a system. There is always some time required for a policy to be implemented, or some time to respond to policy and some more to perceive these changes. If corrective actions are taken faster than one can perceive the effects of policy changes, it will lead to instability and oscillations and create problems for a stable legislative body.

Climate policies are a good example of this difficulty. On one hand, a lot of adaptation is required to incorporate the latest aspects of scientific research. But on the other hand, too much adaptation and revision of policies would send the wrong signals to citizens. As some still need to be convinced with the necessity of having climate policies in the first place, and as others are just starting with the implementation of the first policies, revising them too often would have a very negative effect.

#### **6.4.1.5. Conclusion**

We saw how adaptation is required in order to incorporate new information as it becomes available. To do so, policy makers need to ensure that both aspects of adaptation are present and ensured: sensing and controlling. For this purpose, they need to ensure proper incentives to reveal information and also to change policy based on new information. Parallel efforts to limit the incentives to hide information and to maintain policy are also needed. Both the public and the private sectors still have too much incentive not to naturally adapt. This will help to improve the capacity for adaptive policies.

The policy making approach should be designed to get it right the first time, while also enabling adaptation in the future as more information demands. Attention must be paid to promote strategies that generate this information. As they do so, new issues especially regarding the appropriate timeframe and resources will arise that policymakers will need to consider and solve.

## 6.4.2. Recommendations from the private sector

### 6.4.2.1. *General recommendations*

Several aspects of our learning can be applied to the policymaking realm. Based on the previous insights, we can make the following recommendations for the private sector:

- ***Leveraging people's passion:*** The passion and spirit of people represent a great, untapped source of dynamism and knowledge creation. Policymakers need to find new ways to unleash this power and use citizens' insights for making better policies. This will help to foster collective intelligence inside these organizations.
- ***Incorporating divergent views in the policymaking process:*** In the previous chapters, we saw the importance of diversity to enable the wisdom of crowds. Such diversity prevents group thinking and the pitfalls of organizational biases.
- ***Building awareness of the external environment:*** Developing awareness of the external environment is critical for building aware and agile organizations. This could be applied to the policymaking world where awareness of the external world is critical for governments. Awareness promotes an early discovery of signs that new policies are needed or that old policies should be revised.
- ***Enabling loosely connected structures:*** Such structures enable flexible organizations to leverage the power of people's passion and build on collective intuition and knowledge.
- ***Probing frequently and at low costs:*** This strategy enables organizations and decision makers to experiment more and thus innovate more easily. The lowering of experimentation costs can result in an increase in the frequency of experiments. It is also a great way to accelerate learning.
- ***Leveraging new social technologies:*** Social technologies can help to build communities which foster collective intelligence and the sharing of knowledge. Such technologies should be implemented inside policy and regulatory organizations to foster increased transparency and more efficient collaboration.



### *6.4.2.2.Examples of implementation*

Making adaptive policies is a new requirement. To facilitate this, we propose to leverage the organizational structures and the trend-watching system we proposed earlier.

The implementation of the framework would help to reveal new knowledge that emerges after initial decisions, as well as to limit the disincentives for hiding it. It would make the policy revision process more transparent by providing institutions and policymakers with a tool for credible discovery of new knowledge and the need for the revision of policy.

Because agencies and regulating bodies can be considered as a certain form of business organizations where citizens are regarded as customers, the previous framework and recommendations for the private sector directly apply to them. The ideas and insights from complex adaptive systems and fast decision-making can thus be helpful to policymakers. As corporations, they need access to up-to-date information and knowledge. They are also required to react to new policy needs fast and seize opportunities as they arise.

This is why our framework fully applies to policymakers and various law making agencies. Enabling loosely connected structures inside these agencies and governmental organizations faced with turbulent and uncertain environments would enable them to respond faster and in a more appropriate manner. They should also incorporate trend-watching systems to help them to build better awareness of their external environment. By doing so, they will be able to react faster to new opportunities and threats. As an overall consequence, this will create more flexible and adaptive agencies and regulating bodies.

At a larger scale, one could also see a version of such trend-watching systems being incorporated in an attempt to leverage citizens' knowledge and passion. Citizens and the informal bounds between them can be seen as the equivalent of the informal organization inside a company. Leveraging people's passion and spirit would enable the early recognition of more diverse set of warnings. To do so, several equivalents of trend-watching systems could be implemented at different levels. The major challenge in such a case would be to find the appropriate aggregation mechanisms to select the most relevant knowledge without incorporating biases. Enabling a discussion forum would probably require different levels of aggregation to accommodate a large audience. Voting systems at different layers for example could be a method to elicit the most relevant pieces of knowledge.

### ***6.4.2.3. Conclusion***

Similarly to the private sector, public decision makers and policymakers can learn and gain a lot from the proposed framework and recommendations. Implementing loose structures inside agencies and having trend-watching and monitoring systems would allow these agencies to be more flexible and react faster to opportunities and threats, fulfilling the requirement for adaptive policies.

# Chapter 7. Conclusions and future research

As organizations are faced with increasingly turbulent and uncertain environments, the need for new management methods becomes a pressing requirement. Our research drew from new and emerging fields outside the normal realm of organizational management theories and concepts. The objective is to promote agility and flexibility in organizations both in the private and in the public domains.

We studied how the uncertainty of the environment is resulting in new challenges for decision makers. As the emerging field of complexity theory and especially complex adaptive systems show, the linear and mechanistic approach cannot be successful in assessing and understanding these systems. New approaches are required to understand the emerging trends. Organizations need to find a way to evolve at the edge of chaos, the place where they can be flexible and efficient.

We also saw some specific consequences for the corporate world. Significant changes are in store for the business in the future. Businesses will be forced to switch between strategic agility and operational efficiency on a short notice to remain competitive. Rapid changes in the manner in which businesses respond will exert enormous pressure in the way they are organized. On the one hand the traditional formal hierarchical structure to best utilize professional skills of the employees will make sense; on the other hand, an informal structure to channel passion will be optimal. Architecting such an ambidextrous organization will not be easy to say the least. But highly competitive, turbulent and uncertain environments make such a shift a requirement for creating winning strategies.

Fortunately, recent technological advances are available to redefine the manner in which organizations operate and unleash hitherto untapped capabilities in a cost effective manner. New communication and social technologies can indeed help organizations to channel the power of their informal structure, tapping into the passion and spirit of their employees.

But implementing technology driven solutions is not a straightforward problem. The most common reason for failure of initiatives involving Web 2.0 tools is that organizations tend to focus on technology first. Businesses indeed get enticed by fancy technologies and do not take the time to tailor these technologies to their specific needs. As an Aberdeen group research concludes, “technology adoption

needs to be combined with specific processes designed to maximize its potential.” At the same time, paying attention to objectives and processes first and not knowing what technology solutions exist will also make it difficult for organization to fully leverage the capabilities of what is out there and be competitive. This is why organizations need to find ways to develop both at the same time.

We presented a framework to overcome these challenges. Organizations need to implement loosely connected structures and trend-watching systems to enable a greater awareness of the external environment. By following our recommendations, organizations can become more flexible, and learn and adapt to changes faster. We further applied part of our proposed framework to a case company to see how such a trend-watching system can be practically implemented in a large organization.

In addition to that, we studied the consequences for the policymaking realm that is also experimenting with the challenges of a globalized world where uncertainty and volatility are frequent. Externalities, market failures and unintended consequences, for example, are complicating the task of making good policies. New methods and approaches are also required in the public domain. We argue that public decision makers can learn from the private sector. Agencies and regulating bodies also need to become more flexible organizations able to create adaptive policies. For this purpose, our framework fully applies to them. They should also implement trend-watching systems and structures to let them become more efficient and flexible.

We conclude that, to overcome the new challenges of turbulent and uncertain environments, organizations need to redefine their boundaries and enable more interactions with the external environment. These interactions will provide the required background material, especially early warning signals, to let the appropriate changes emerge inside an organization based on loosely connected elements. As a consequence, organizations will become more flexible while still remaining efficient.

Future research is necessary to promote the need for a change in the way decision makers approach these new challenges. Complexity science is an emerging field and as such, there is still a lot that decision makers can learn from. Furthermore, technology is evolving at a break-neck speed. New communication and social technologies, as well as their adoption in the business world, are also a critical part of new answers to a challenging environment. It is impossible to predict what the future will be but we need to pay attention to early warnings of new emerging fields to improve decision making.

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- *The 2008 Tribalization of Business study*. This study was conducted by Deloitte, Beeline Labs and the Society of New Communication Research (SNCR) in 2008. They did a survey and interviewed 140 organizations which ranged from under 100 employees to more than 10,000 employees.

- *Customer 2.0*. This study was conducted by the Aberdeen Group from March to May 2008. They surveyed 360 companies. The main focus was on customer facing Web 2.0 applications.
- *Workforce collaboration and Web 2.0* is another study conducted by the Aberdeen Group. They surveyed and interviewed more than 270 companies.
- Select Minds, a provider of Corporate Social Networking solutions, has several white papers on social media and the use of Web 2.0 tools in organizations. They surveyed their customers and presented some of the insights.
- McKinsey released a study, *Building the Web 2.0 enterprise*, in August 2008. The survey was conducted in June 2008 and received responses from 1,988 executives worldwide.
- ZDNet conducted an informal study among its readers.
- AIIM did a survey on *Enterprise 2.0, Agile, Emergent & Integrated*. The survey was taken by 411 individuals in January 2008.
- The Gilbane Group released a study in June 2008, *Collaboration and Social Media 2008*. They conducted interviews with 286 respondents randomly selected from a database of 2,893 public and private companies.
- Avanade surveyed 500 companies. It released a report "*Most companies avoid integrating social media despite evidence of benefits*" September 8<sup>th</sup>, 2008.
- Awareness surveyed about 160 professionals. The report is entitled "*Trends and best practices in adopting Web 2.0 in 2008*".

In addition to the different references above, several blog authors and comments need to be acknowledged here. They provided great insights and comments on how to and not approach social media platforms, and thus were a great resource.

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