

Making the Impossible Possible: Controlling Innovation

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ABSTRACT

This chapter describes an organizational solution to the special challenges involved in organizing and controlling innovation processes in a company. The specific challenge arises from the fact that innovative practices inherently require various kinds of freedoms for approaching the unknown, whereas any form of organization inherently tries to restrict freedom in order to create control. The chapter suggests that in the management literature there can be found four fundamental principles of how resources of a company can be steered and controlled towards a desired strategic target. A careful consideration and application of a proper mix from among these four principles can help the innovation manager to overcome the paradox of control and freedom, when organizing for innovation. Two case examples are included to illustrate how different mixes have been used to great success in innovation driven companies.

INTRODUCTION

“An excellent research organization is always slightly out of control”

Dr. Fopke Klok, Head of Philips Research, on October 15th 2003 in Amsterdam

In the Oxford Dictionary, technology is defined as *“the application of scientific knowledge for practical purposes”*. Even if not always, still much of that *“application”* requires or leads to making changes in existing products, processes or methods – or in other words technology typically requires or leads to innovation. Several of the major trends in technology discussed in this book so far, such as technology development becoming ever more complicated and expensive, that companies specialize ever further, or that product life cycles become shorter and shorter, are the effects of innovation through technology. Therefore technology management and innovation management are usually tightly linked – and hence technology managers typically inherit a special challenge of innovation management: namely how to control the uncontrollable.

Innovation introduces this challenge, because by definition, innovation is concerned with the new, the changing or the unknown. Since the new is not yet known, it cannot yet be harnessed, it cannot yet be tied down and tamed, and hence the innovative processes used for creating the “new” are therefore inherently uncontrollable (Eisenhardt, 1998). However, to a manager that is not acceptable. Managers are members of an organization, and it is the purpose of the organization to collectively achieve certain targets or perform various functions – otherwise there would not be a point to their existence. Organizations cannot achieve targets, unless they have control over all their resources, including those busy with innovation (Picot, 2003). Organizations and managers must therefore also achieve control over their innovative process by linking the abilities of the whole of the company to the utilization of its innovation processes – even if innovation itself is not controllable – or else they call their role in the innovative process into question (Iansiti, 1998).

Thus presents itself the central dilemma or paradox of this chapter: the challenge of controlling the uncontrollable, or the paradox of freedom vs. control. A paradox is a situation in which two seeming contradictory factors appear to be true or necessary at the same time (Quinn and Cameron, 1988). A problem that is a paradox has no real solution, as there is no way to logically integrate the two opposite sides into an internally consistent understanding of the problem. Dealing with paradoxes has been shown to be at the core of strategy management (De Wit and Meyer, 2004). It also applies to the issue of innovation management. This chapter will not and cannot provide a recipe for how to dissolve the paradox – it does aim however to offer to the manager of technology some of the most prominent armory available in management sciences for how to overcome the paradox of freedom and control inherent to innovation and use it for his competitive advantage. As the quote by the head of Philips R&D, Dr. Klok, illustrates, a technology organization cannot be fully under control, but it cannot be out

of control either – being “slightly out of control” illustrates the necessity to manage a paradox.

In this chapter, conceptually speaking, achieving control is a function of exerting power towards a particular organizational resource, (which are typically people), so that the object experiencing this power accomplishes or reaches a predetermined desired target. Achieving control is not about setting these targets, nor is it about recruiting the resources that are supposed to achieve the target. The designer of the control mechanism takes both the target and the resources for granted. His task is to install organizational mechanisms to guide or control the given resources towards the given targets.

In practical terms of technology management, examples for this necessity to install control mechanisms in an organization could be how to organize a group of engineers who are charged with developing a new product, or a process for how to decide the allocation of resources between competing research projects. All too often, the more innovative a process becomes, the more it is assumed that organizations can actually not provide a controlling guiding function towards the resources employed in this function. The stereotypes of the “techies” in the R&D departments, or its “flippy” scientists come to mind, those people who live in an organizational world on their own, and whose creativity may not be disturbed lest their innovative power would be reduced.

Other stereotypes stemming from the same helplessness of how to control the innovation process, include the “rebel entrepreneur” who by breaking boundaries of convention can create innovations more effectively, or the “mad genius” loner, who in mysterious ways is cooking up the next technological breakthrough. However, organizational management in innovation has come much further than these stereotypes would imply. Two short case studies about successful innovation driven companies illustrate two very different organizational control systems for dealing with the paradox of control vs. freedom in innovation and technology management: first, the actions by Carlos Ghosn in the turnaround story of Nissan, and second the organization created by Ricardo Semler at Semco, generally held to be the prototype company of work place democracy.

Throughout this chapter, when the term “resources” is used, then this should mean to include the following four main resources available to innovation (and technology) management:

- people with technology skills (researchers, developers, engineers),
- formalized intellectual properties (patents, copyrights),
- machineries (as an already existing application of a technology)
- financial resources (usually necessary for investment, because innovation tends to be an investment activity)

In the sense that the intellectual properties, the machineries and even the money must be transacted and handled by people, one could say that there is only one resource that needs to be controlled, and that is the people and their actions. Where in the following text this distinction matters, the word “people” is used instead of “resources”.

FOUR SOURCES OF POWER FOR ACHIEVING CONTROL

This chapter argues that there are four principle sources of power for achieving control. The following will outline in detail what these are, how they function, what their main advantage and disadvantage is, and what measures prominent management thought leaders are suggesting on how to implement them in an organization. The four powers are:

1. *The power of rules*: Achieving control with rules is a matter of defining the right set of rules and regulations. If the resources are subjected to the right rules and regulations, along with proper incentives and punishments for following them, then resources will be controlled towards achieving the aspired target.
2. *The power of leadership*: Achieving control with leadership is to make the resources follow a leader or a leading principle. In both cases, either the leader or the leading principle inspires or guides the resources towards achieving the aspired target.
3. *The power of competition*: Achieving control through competition is a function of creating markets where competition allocates resources towards the achievement of the aspired target.
4. *The power of complexity*: Achieving control through complexity is a function of creating a community of self-organization that can self-regulate itself towards achievement of the aspired target.

To state the major conclusion from this chapter upfront: None of these four powers can be, or even should be employed on an exclusive basis. On the contrary, it is probably the carefully selected blend of all of them, which will create the best results of achieving control – in particularly achieving control over innovation processes in organizations. Nonetheless, managers will usually have strongly predisposed preferences to use one source of power over the others. In some cases these predispositions are based on strong belief of superiority in one particular source, in other cases these predispositions rest on more familiarity and practice with one source of power over the other. However, these managerial biases apart, from an empirical point of view it is impossible to ascertain the general superiority of one source of power over the other, or even to correlate the

suitability of one in certain situations over the other. All four sources of power are represented by schools of thought with long and deep histories of scholarship as well as long traditions of successful application in practice.

The Power of Rules

Among the four principle powers for control mechanisms, rules are possibly the most frequently used to achieve control over resources. A hypothetical innovation-oriented company called “Inova” might enact a rule that says: “*work at Inova company starts at 8:30 am.*” Then all the human resources of Inova are due to start work at that time. The employees at Inova have thus lost their freedom to start working whenever they are ready for it in the morning – instead their work starting time has gotten under control.

The key advantage of rules is that within the parameters set by the rule, they have universal and timeless validity. The example “work at Inova company starts at 8:30 am” is true for all Inova employees, for all Inova locations and for all times, until or unless a new rule is made. With relatively small effort, rules can therefore achieve a very high degree of control. The main disadvantage is, that this very same universality of rules can make them very costly or annoying to obey. Imagine the cafeteria worker at Inova Company, who would have to arrive at 8:30 am in the morning, even though his work only really starts at 11:00 am.

The challenge of rule making is to make the rules being obeyed and as useful as possible. Typically rules are therefore accompanied by a regime of rewards and punishments for following them, because that makes rules more useful for the ruled. A prominent field of study has always been in the social sciences, why people follow rules. One of the more recent and most influential explanatory models in practical management application has been developed by Michael C. Jensen from Harvard University. In one of his classic papers “The Nature of Man”, (1994, p.19), Jensen concludes:

“ Whether they are politicians, managers, academics, professionals, philanthropists or factory workers: individuals are resourceful, evaluative maximizers (REMs). They respond creatively to the opportunities the environment presents to them, and they work to loosen the constraints that prevent them from doing what they wish to do. They care about not only money, but almost everything – respect, honor, power, love, and the welfare of others. The challenge for our society, and for all organizations in it, is to establish rules of the game and educational procedures that tap and direct the creative energy of REMs in ways that increase the effective use of our scarce resources.”

For Jensen, controlling resources towards a certain desired outcome is like solving a mathematical equation, even if one of enormous difficulty. The difficulty stems from

the nature of Jensen's "REM" people. According to him, these REMs are far from simple-minded creatures, they are instead "*Resourceful*". They are so resourceful in fact that it is likely to be a continuous struggle to invent and design the right mix of rules, rewards and sanctions for making people do what is expected of them. People will also find ways to game the system towards their increased personal benefit and to the contrary of the intended outcome.

In addition, REM people are "*Evaluative*", in contrast to being for instance merely calculative. They barely ever calculate the net present value of rewards and sanctions, but instead make their judgment based on values. These values could be and often are numerically expressible economic values, (such as comparing gasoline prices), but they will also relate to much fuzzier value sets like religion, morals, recognition, respect or simply the mood of the day. Moreover, people are unpredictable in which value they are going to use when judging a course of action.

Finally, whichever value people use, they will then want to "*Maximize*" its outcome. In contrast to what might often be stated by people, in practice they will want to have not only more love, but as much love as possible, not only more money, but as much money as possible, etc. According to Jensen, in practice people do not draw a line where they realize that enough might be enough – instead, even if they have reached such a line, they will then want to have even more.

In summary, rules are an important design ingredient for the innovation manager trying to achieve control over the innovation process, because rules can create a lot of control with only *small effort*. The key criteria to watch out for when making rules is to respect peoples ability to be resourceful about rules, to be evaluative about them, and to realize that people will usually want to maximize their benefit.

The Power of Leadership

Leadership may well be the oldest control principle employed in human organizations, reaching all the way back to the alpha individual of the horde informing the others on how to behave. Sticking to the hypothetical company of "Inova" and how to control the beginning of its working hours by using the leadership principle: "*people will start working in the morning once the designated and accepted leader tells them to do so.*"

That portrays the principle weakness of using leaders to control the resources: if a leader does not issue a command, then the control is not achieved. Imagine the leader in a company who calls his team every morning and tells them when to come to work. If he does not call, then the workers do not show up. If it turns out that he would have to call them at the same time each morning, then it would be easier to make a rule – and make the people follow the rule, rather than the leader. However, it could also be that the

conditions for the starting time of work change every morning, in which case it would be better not to make a standard rule, but rather employ a personal wake-up call by a leader. If conditions change a lot, then creating standard rules would be less effective than using the flexible control that an experienced leader can achieve. In this way flexibility is the main advantage of the leadership principle.

Using leadership as a mechanism of control is not to be confused with leaders using their authority to be a rule maker, which falls under the power of rules. In the management literature the controlling power of leadership in its own right, independent of rulemaking, is only a relatively recent field of study. One of its protagonists is Jay A. Conger who taught this subject in renowned business schools around the world. In a defining commentary on the research in his field in 1999, he recounts the history of the study of “Charismatic and Transformational Leadership in Organizations.” How the notion of this kind of leadership is supposed to reach far beyond the rules based approach typified by Jensen, is captured well by Bennis and Nanus in 1985:

“Management typically consists of a set of contractual exchanges, ‘you do this job for that reward, ... a bunch of agreements or contracts.’ What gets exchanged is not trivial: jobs, security, and money. The result, at best, is compliance; at worst, you get a spiteful obedience. The end result of leadership we have advanced is completely different: it is empowerment. Not just higher profits and wages... but an organizational culture that helps employees generate a sense of meaning in their work and a desire to challenge themselves to experience success.”

According to the leadership school of thought, charismatic and transformational leadership would to an almost transcendental degree yield results from resources that would otherwise be unimaginable. Hence also the notion, that “exceptional times require exceptional leaders”. Various behavioral models have been developed to ground the nature of charismatic leadership in more measurable terms – or at least in descriptive terms. According to Conger (1999, p.156), all these models include nine converging attributes of leadership, such as:

- vision
- inspiration
- role modeling
- intellectual stimulation
- meaning-making
- appeals to higher-order needs
- empowerment
- setting of high expectations
- fostering collective identity

These attributes need not be exclusively attached to a single person as a leader. They can also be applied to a “leading principle”, a “leadership vision” or even a whole

“leading community” of people. For the designer of a control mechanism, these nine attributes are a helpful checklist if the leadership mechanism is to be employed. The more the individual leader or the leading principle can represent these nine attributes, the more effective will the leadership be.

In summary, the power of leadership is an important mechanism for controlling resources towards a certain target, due to its *flexibility*. However, this power of leadership is not to be confused with rule making, instead it is based on the transformational, charismatic power of individual persons or ideas to make people do certain things, which otherwise they would not do on their own accord. The nine features by which charismatic leadership can be identified are vision, inspiration, role modeling, intellectual stimulation, meaning-making, appeals to higher-order needs, empowerment, setting of high expectations and fostering of collective identity.

The Power of Competition

The principle of competition permeates modern industrial societies so deeply that it seems a most natural phenomenon. Yet, it has become established as a mechanism of control only a lot more recently than the power of rules or the power of leadership – having become mainstream only in the course of industrialization in the western world during the 19th century, and spreading from there to most other societies. With the downfall of Soviet communism and the termination of communism in China in all but name, the principle of competition has become accepted as the major mechanism to allocate (=control) resources in national economies, and by extension also within companies.

Nonetheless, as is true for each of the four control mechanisms, competition is rarely used exclusively even in national economies, let alone within companies. That has mainly to do with its main disadvantage, which is that competition creates a lot of losers. The essence of competition is for one resource to be “superior” over the other. But that implies that the other will be “inferior”. Again taking the hypothetical case of the Inova Company trying to control the starting working time of its employees each morning by using the principle of competition: “*Work starts as soon as a qualifying majority of the people have shown up*”. In this case, the starting work time would be like a bid: whoever comes first, or arrives early enough to be within the first group, has won, and all the others come late and have lost. One of the reasons why organizations will typically restrain the power of competition with various kinds of rules and regulations, is in order to soften the impact on the losers and reduce the potentially disproportionate costs that such losses might inflict on people.

The unbeatable advantage of competition is that it is the most efficient of the four control mechanisms. It matches any given need with the most superior resources

available to it. The inferior resources will then need to look for other places of employment. In the case of Inova company, the starting work time at the company is optimally matched with the earliest time when the resources are willing to start, and will thus require the least remuneration for their services. No other control mechanism allocates resources with this degree of precision and efficiency.

But it took a long time until the social sciences discovered and understood the intrinsic efficiency of the principle of competition. Adam Smith's introduction of *Invisible Hand Theory* in his classic "The Wealth of Nations" in 1776, is considered to be the founding moment of any sort of economics, macro or micro. Smith illustrated the "invisible" efficiency maximization power of competitive markets, or stated differently, the optimization of resource distribution in markets. A more recent path breaking protagonist of this thinking was the Nobel Prize winner Friedrich von Hayek whose insights explained the functioning of competitive markets in more detail (translated from 1996, p. 11, and 1976, p. 115):

"Markets are institutions of information collection. They enable us to utilize widely dispersed information for developing extra individual patterns, ... which make it possible to use widely dispersed know how and capabilities for various purposes without further intervention. " And "The pricing system is a mechanism for transmitting information. Its highest importance is its efficiency in utilizing knowledge, i.e. how little the individual participants need to know, in order to do the right thing. "

These insights are not only true for national market economies, they are also seen by many managers to be a relevant principle for controlling an organization. A very prevalent use of competition logic in innovation management is the use of return of investment (ROI) calculations for judging whether to go ahead with a project or not.

In summary, the principle of using competition for controlling resources towards a certain target is important due to its *efficiency* in doing so. When installing competition systems in an organization, the designer of this control system need to understand that it functions by being a pricing system that discovers information. Therefore, central to the functioning of competition is, that there is a stable currency available in which the prices can function (either financial or artificial currencies such as point systems), and that sufficient transparency is provided – otherwise there is no information that can be discovered. Competition cannot work without transparency and a common currency between the competing resources.

The Power of Complexity

The most recent, youngest understanding of how to achieve control in organizations can be achieved, has been advanced from system theory in the form of *Complex Adaptive*

Systems. It proposes that organizations, whether they are companies or national economies, are not just rule- or market-based exchanges of goods – but instead they are self-organizing, emergent communities (also called chaotic systems). Where competition-oriented economic thinking emphasizes the need for equilibrium, for instance by finding prices which bring demand into line with supply, complex adaptive systems stresses being in constant and dynamic flux.

The reason why complexity is increasingly realized as a source of power in its own right, is that many organizations have become so enormously complex, that achieving control through the other three mechanisms yields less and less results (Gratton, 2004). However, instead of this leading to an absence of control, it turns out that complexity also possesses the power to allocate and control resources, if it is understood and installed appropriately. Applying for a final time the hypothetical “Inova” case and using the power of complexity to control the working starting time there might mean the following: *“work starts as soon as the relevant group of individuals self-organizes towards doing so.”*

To be calling this principle at the Inova Company as a way to achieve control may appear strange at first sight. Yet, this is exactly how companies like Semco, one of the two cases described later, have organized their working time hours. There is a very important distinction between saying: “work starts as soon as the **relevant individuals in a group** decide to do so”, which would be inviting non-controlled anarchy, and saying: “work starts as soon as the **relevant group** of individuals self-organizes to do so”, which would be utilizing the dynamics of complexity.

Complexity works through group dynamics to achieve self-organization, and by that explicitly discouraging individual dynamics of self-determination. Nonetheless, the main disadvantage of complexity as a source of power is obvious: it remains rather fuzzy. Also, it is sometimes difficult to tell whether something is chaotic (that is self-organized) or anarchic (that is uncontrolled). On the plus side, complexity if made to work correctly, is probably the most forceful power of the four. Complexity can still achieve control even where all other control mechanisms have long gone out of steam.

Eric Beinhocker, a former partner at McKinsey&Co, venture capitalist, entrepreneur and recognized thought leader in the field of strategy and complexity, explained complex adaptive systems like this (1997, p. 30):

“Examples of complex adaptive systems include ant hills, forest ecosystems, the immune system and the internet. All are open systems comprising a number of agents whose dynamic interactions self-organize to create a larger structure. Over the past twenty years, aided by advances in mathematics, physics, chemistry and biology, and by the wide ability of cheap computing power, scientists have begun to find that complex adaptive systems are governed by deep common laws.”

Some of these laws are thought to be that complex adaptive systems are driven by cognitive behavior of people. People only rarely base their decisions on cold-blooded deductive reasoning assumed by traditional economists. However, people are highly skilled at recognizing patterns and developing instincts. This allows them to make decisions in the face of incomplete information, where computer models would spin error messages instead.

Another law is that webs of relationships are more than a merely intensively connected network. These relationships are characterized by multiple dimensions of interaction and feedback dynamics, which makes them impossible to predict in detail, but reasonably predictable overall. This is also called the soccer game effect: if a premier league team meets an amateur village side, it can be certain that it will win the game. However, even then it is impossible to predict, which players will score in what minute and in what combination.

A third component of complex adaptive systems are waves, or recurring rhythms of activity patterns. Economic systems have an eerie quality to be ebbing up and down in regular wave patterns, and virtually never to progress in a linear fashion. These wave dynamics follow their own sets of rules, which can be exploited for benefit.

In summary, the principle of using complexity for controlling resources towards a certain target is important due to the *enormous momentum and force* it can create. Utilizing the power of complexity does not mean anarchy, instead it means arranging the conditions in such a way that self-organization will spontaneously erupt and generate momentum for change. The main characteristics of these conditions are to make use of the complex cognitive and instinctive behavior of agents (people), to utilize the dynamics of webs, and to recognize the dynamics of wave rhythms.

The Organizational Control Matrix

The four powers for achieving control explained so far in this chapter, the powers of rules, leadership, competition and complexity, represent fundamental control principles. By that is meant, that their sources of power are independent of each other: the power of rules can exist independent of the power of leadership and vice versa, and the power of competition can exist independent of the power of complexity, etc.. But these four powers share common features, by which they can be sorted along two dimensions into a matrix. The two dimensions are:

- where the control derives from (source of control)
- where the control is directed to (direction of control)

In addition, power of control can be exerted either relative to and bound by the contextual environment, or it can be independent of it. Likewise, the experience of control can be either relative to and bound by the contextual environment or it can be independent of it. This creates then the following matrix of achieving organizational control:

Exhibit 1: Overview of the Control Design Mechanisms Matrix

		Source of Control	
		Personal Independent of Context	Institutional Bound by Context
Direction of Control	Top Down Independent of Context	Leadership based designs	Rules based designs
	Bottom Up Bound by Context	Complexity based designs	Competition based designs

The power of rules:

Rules *source* their power by being bound to a contextual authority or various parameters of time, place or target group validity. Often rules are also bonded to each other, creating systems and structures of rules. By contrast, on the *directing* side, being controlled by a rule is not bound to something or somebody else. A rule is a rule, unrelated and independent of other circumstances. Thus, rules are bound to context as a control subject, and unbound as a control object.

The power of competition:

The *source* of competition is bound to the context. It can only be exerted, if it defines the playing field where it is active, which resources are inside and which are outside of the bid. But in difference to rules, competition can also be *directed* only relative to other objects of this control mechanism. It is the essence of competition to be compared, to be relative to the others, and thus to be either superior or inferior to them. Thus competition is bound in both instances, as subject and as an object.

The power of complexity

Complexity requires no boundary for its *source*. On the contrary, its very openness, randomness and chaos, is in fact what creates the conditions of complexity to begin with, and is the fountain of its power. But that is not true for the objects of complexity where the power is *directed* – they on the other hand are by definition connected and intertwined, bound to each other in many undifferentiated ways. Thus complexity is unbound as a control subject, and bound as a control object.

The power of leadership

The principle of leadership is unbound on both sides, on the sourcing and on the directing side. Even if there is only one object of leadership power, which is unrelated and unbound by anything, except by being led by a leading power, then this power is being felt and fully effective. Likewise, the source of leadership requires no external authority such as the rules-power, and requires no boundaries drawing like the competition-power – all it requires is the quality of internal charisma to be effective and exertive. Thus leadership is unbound in both instances, both as a subject or as an object.

The non-overlapping dimensions of the organizational control matrix prove the argument that these four sources of powers are functioning as principles, independent of each other. What matters for the practitioner is that each of these four principles has important and valid instruments and applications in the field of innovation management. Each of these four has decisive advantages and disadvantages, which are summarized in the chart below. The most important learning from this table of advantage and disadvantages is, that this suggests to always be using a combination of these

instruments when trying to achieve control over an innovation organization. Smart and deliberate combinations of different powers for control can level or reduce their respective disadvantages against each other and make the advantages reinforce each other. How this has been achieved in two very different companies will be demonstrated with the following two case studies.

Exhibit 2: Summary of Advantages and Disadvantages of each Control Power

		Source of Control	
		Personal Independent of Context	Institutional Bound by Context
Direction of Control	Top Down Independent of Context	Leadership based designs + : flexible - : limited reach	Rules based designs + : simple - : costly
	Bottom Up Bound by Context	Complexity based designs + : forceful - : fuzzyness	Competition based designs + : efficient - : harsh on losers

TWO CASES: CONTROLLING INNOVATION IN PRACTICE

The following two cases, Carlos Ghosn at Nissan, and Ricardo Semler at Semco illustrate how these two executives have used a variety of different control mechanisms in their company in order to get the companies that they were in charge of under control. In both cases, gaining control over technology driven innovation played a particular role to achieve a superior performance. Shorter versions of these two cases have been written by the same author and published in the Strategy textbook “Strategy – Process, Content, Context (De Wit and Meyer, 2004, pp. 487 and 490, quotes in the two cases were among others from Magee and Semler, see also references for this chapter).

Carlos Ghosn at Nissan in Japan: Benevolent Autocracy

In 1998 the Japanese carmaker Nissan was flirting with bankruptcy. Its market share in Japan had been sliding for 26 years straight, and while its key domestic rivals Honda and Toyota were reporting record profits, Nissan had not been able to make a profit for seven of the eight previous years. Daimler Chrysler had declined to buy Nissan, even for the symbolic amount of one dollar, while Ford, too, had lost interest. At the urging of Carlos Ghosn, then a senior manager at Renault, it was this unlikely French carmaker who gained a controlling stake in March 1999. Just three years later, Nissan was one of the most profitable automobile manufacturers in the world, even surpassing Toyota, and was set to recapture the no. 2 market share position in Japan. What happened?

Between 1992 and 1998, three different presidents had been behind the wheel at Nissan, but none were able to get the skidding company under control. No fewer than four restructuring plans were announced, but each ran into the sand and gained nothing for the company. So when Renault eventually stepped in and sent the 45 year old, non-Japanese speaking, Brazil-born French/Lebanese Carlos Ghosn, to take control of Nissan in summer 1999, his task was widely hailed as “Mission Impossible”. Later in that year, this assessment was toned down to “Mission Improbable”, and in 2002, Fortune Magazine named Carlos Ghosn “Asia’s businessman of the Year”. In 2003 and 2004, Nissan unveiled cars which received accolades around the world for their innovative features (for instance the new March, or the new Z cars), and for 2005, Nissan was well within reach to sell 40% more cars than it did before, mostly on the strength of its renewed high quality engineering and innovative design. What had changed since Carlos Ghosn arrived?

According to one senior executive at Nissan, “Ghosn stresses action, speed and results. He follows up closely. If there are any deviations he goes after them immediately. He is relentless in following up.” In his own words at the time: “I have one goal, that Nissan will be profitable in 2001... This is not like buying a Persian rug: The guy says he wants 100, but if he gets 50 he will be happy. We want 100, and we are going to get 100. If we do not get it in 2001, that’s it, we will resign...From now on, financial objectives will entail accountability”

Accountability is Ghosn credo. He sees no value in business relationships that are not characterized by clear and controllable targets. Starting at the top, the number of directors on the board was reduced from 43 to 9. The traditional lifetime employment and seniority-based reward system was completely revamped. Several hundred key managers received stock options instead. Promotion and rewards were linked to performance against an annual set of objectives. Ghosn created six program directors with worldwide profit responsibility for a range of cars under their management, who were in charge of designing, making and selling the cars. In this way, the program directors could harness the innovations found by the engineers for features that the customers actually wanted.

Externally, by the end of 2002, Nissan's 67 equity investments in Keiretsu (group) companies were reduced to 25, while all 1400 cross shareholdings with other Japanese companies were undone. The 300 global banking relationships were centralized into a single treasury function. The number of suppliers was reduced by half to 600, with each remaining supplier committing to at least 20% cost reduction over three years. The way the supplier reduction was achieved was typical of the overall approach: on a first come, first served basis any supplier who stepped up to the new deal at Nissan was awarded the contract. The new deal promised doubled volumes at lower prices, to be jointly achieved by intensive engineering cooperation between Nissan and the supplier..

The pressure was equally fierce inside the company, both in terms of cost reduction as well as growth promotion. Headcount was reduced by almost 20%, dropping from 148,000 to 127,000 employees, and five manufacturing plants were closed. All the while, Ghosn planned to introduce 28 new car models within three years. Ghosn's advent to Nissan was not all slash and burn. Off-site R&D centers were immediately granted funds to refurbish their facilities and a completely new automotive plant was launched and commissioned in Mississippi in the record time of only 6 months. Ghosn: "I only take extremely well considered decisions – and I usually decide fast." For Ghosn as an accomplished Bridge player, and committed family father of three children, this is not a contradiction.

When Ghosn arrived, he came with a clean slate of paper. In the first few weeks he interviewed the entire company; all functions, all levels. Within five days of his arrival he already instituted his trademark turnaround strategy: installing 9 cross-functional teams with up to 10 middle managers and hundreds of sub-team members, to work out the entire "Nissan Revival Plan" (the now famous NRP) within only three months. The NRP would become the blue print of action for the next three years. Team members were not responsible for implementation, but their recommendations had to be aggressive, specific, backed up by numbers, and not be respectful towards current practices. In particular, the actions were supposed to emphasize innovative solutions, preferably technological, instead of just numb cost-cutting or investment delays. Any team that did not live up to these targets was sent straight back to redo the numbers. Moreover, Ghosn arrived only with a handful of senior managers from outside Nissan –

almost the entire previous top management remained in place throughout the restructuring and even later. Also, no consulting company was involved in the drafting of the NRP – so virtually all the difference to the conditions before was made by Ghosn and his actions himself.

Besides the application of his organizational and strategic skills, communication enjoys highest priority for Ghosn. Much to the anger of the business and financial community, virtually nothing emerged from Nissan during the first months of Ghosn's reign. Only once the NRP was finished, he announced it personally at the Tokyo Motor Show. All major decisions at Nissan since then have been taken, announced and defended in the public by Ghosn himself. So far he was never forced to take back any of his announcements.

For Ghosn, the Nissan assignment was his fifth radical restructuring of a business he was made in charge of – and not the last. In May 2002, the NRP targets were achieved one year ahead of schedule. Ghosn then unveiled the new Nissan 180 plan – by 2005, Nissan would increase car sales almost 40%, from 2.6 to 3.6 million vehicles, reach 8% operating profit on sales (top of the industry), and have reduced net automotive debt to zero. To industry insiders, this sounded like “mission impossible” all over again...but sure enough, by the end of 2004 the Nissan 180 plan was about to be achieved ahead of schedule. For Ghosn this was no surprise: “Nissan 180 is an ambitious plan, but we have very detailed analysis backing up its feasibility.” Ghosn's next challenge is already outlined: from 2005 he will assume the post of CEO in Renault and Nissan at the same time – a novelty in the modern corporate world – but for Ghosn, only another challenge of innovation.

Ricardo Semler at Semco in Brazil: Democracy at Work

Ricardo Semler took over his father's pump making business in 1980, when Semco was a US\$ 4 million company, focused on the domestic Brazilian market, and heading for bankruptcy in a severe recession, that was to last for most of the decade. By 2003, Semco had expanded beyond pumps to dishwashers, digital scanners, cooling units, mixers, real estate services, environmental consulting or high technology software development, operating as a federation of ten businesses, with revenues totaling US\$ 160 million and about 3 000 employees.

Semco has no traditional organizational hierarchy for decision-making and control. Major decisions affecting the entire organization, such as the purchase of a new plant site or an acquisition, are put to a democratic vote, while other decisions are taken consensually by all employees involved. There are no internal audit groups, no controls on travel expenses, and inventory and storage rooms remain unlocked – but all information is made available to everyone, encouraging self-control. Already in 1992

the central headquarter building was replaced by a network of office spaces dotted throughout the city of Sao Paolo. Any employee was free to walk into any office in the morning, occupy space there and make it his place of work for the day. According to Semler: “Freedom is no easy thing. It does not make life carefree – because it introduces difficult choices.”

Communication is seen as the life blood of the company. To stimulate information exchange, the offices have no walls and all memos must be kept to one page, without exception. Furthermore, everyone is trained to read financial statements, and everybody is expected to know the profit and loss statements of the company and their business unit. In order to avoid any possible suspicion towards the formal reporting, the financial literacy training is conducted by one of Brazil’s most aggressive unions – incidentally, union membership not being discouraged at all. In fact, Semco has experienced strikes, walk-outs and lawsuits by its employees.

The alternative organizational configuration of Semco is made up of four concentric circles. The innermost circle consists of six Counselors, who serve as the executive team and take turns as chairperson every six months. Despite being the majority owner of the company, Semler is not even one of these six – he calls himself “gainfully unemployed”. Around the Counselors is a circle of Partners, who act as business unit managers. Around them is a circle of Coordinators, who function as first-line supervisors. Everybody else is in the fourth circle, and is called Associate. Very critically, there are Nucleuses of Technology Innovation, which are “no-boss” temporary project teams who are freed from their day-to-day work, in order to focus on some kind of business improvement project, a new product, a cost reduction program, a new business plan, or the like. Additional emphasis is placed on keeping small cell structures. No business unit is allowed to grow to more than 200 members or so, or to extend its reach beyond a limited number of core customers or core technologies. If a cell becomes too large, it is expected to split.

The managers of Semco decide amongst themselves what their pay will be, and the target is to extend this practice to all employees. The amount is made transparent to all others by regular participation in salary surveys, thus everybody knows what the pay is of everyone else. The top managers will be selected by their future subordinates, not by their future superiors, and all managers must participate in quarterly 360 degree manager ratings. Furthermore, every member is part of the company-wide profit sharing program that pays out 23% of a business unit’s profits per quarter as a bonus to the employees. The members of a business unit decide among themselves how the bonus is distributed – in fact, the payout ratio of 23% has also been decided by the employees. Members of a Nucleus of Technology Innovation receive royalties on the achievements of their projects.

At any given moment, who belongs to the Semco company and who doesn’t, can be rather fuzzy. Semler explains: “When we walk through our plants, we rarely even know

who works for us. Some of the people in the factory are full-time employees; some work for us part-time; some work for themselves and supply Semco with components or services; some work under contract to outside companies (even competitors); and some of them work for each other. We could decide to find out which is which and who is who, but ... we think it is all useless information.”

This does not mean that Semco is soft on financial performance targets. If a business unit does not perform, it risks being dissolved quite soon. Nor is Semco a big family. Semler explicitly states that Semco is a business, and that it will not mix up personal concerns of its employees with the company interest. Only under extraordinary circumstances will the company extend loans to its employees for instance, and as a general principle, family circumstances or even education are not taken into account when hiring or promoting employees.

As for strategy, Semco has no grand design. Semler readily admits that he has no idea what the company will be making in 10 years time: “I think that strategic planning and vision are often barriers to success.” Semco’s approach is largely to let strategy emerge on the basis of opportunities identified by employees close to the market. Where new initiatives can muster enough support among colleagues, they are awarded more time and money to bring them to fruition. In this way, Semco can make the best possible use of the engagement and entrepreneurship of its employees. Nonetheless, Semco has strategic principles. It for instance will not enter a business if it is not a highly complex operation. Semco believes that under very complex environments, its organizational competences to foster innovative solutions allow it to gain a particularly strong competitive advantage.

Summing up the Semco philosophy, Semler told the Financial Times: “At Semco, the basic question we work on is: how do you get people to come to work on a gray Monday morning? This is the only parameter we really care about, which is a 100% motivation issue. Everything else – quality, profits, growth – will fall into place, if enough people are interested in coming to work on Monday morning.”

CONCLUSION AND SUMMARY

Carlos Ghosn at Nissan in Japan and Ricardo Semler at Semco in Brazil are both employing a wide range of control tools in the respective organizations that they are in charge of. At first sight, Carlos Ghosn managerial style seems to be entirely top down driven – but a closer look in the case reveals that he uses all four powers of control, and possibly the power of leadership least of them, to achieve control over Nissan. The Nissan case is so striking, because it defies most of the standard management paradigms. Essentially everybody in the industry had written Nissan off, but given an effective cocktail of control, even a company so down on its luck as Nissan could be

revitalized in a short time. Nor was Nissan just a matter of rigorous cost cutting, the second restructuring wave, the Nissan 180 plan, showed that Ghosn's control mix was as effective in creating innovation driven growth, as it was in reducing costs.

The same could be said for Ricardo Semler. At first sight, Semco looks like a chaotic community of no planning and control. But closer inspection shows that there are many elements of competition, leadership and rules mechanisms that create control in the company – and make it flourish greatly even throughout most strenuous business environment.

When studying these two executives one will notice how undogmatic both of them go about their management methods. It is not that they use control mechanisms arbitrarily, but neither are they blinded by singular approaches or cookie cutter recipes. Instead, both executives display a deep understanding of the mechanics of each of the four control mechanisms, and apply them pragmatically, especially concerning the fostering of innovation. With this flexibility to mix and match control mechanisms, they can maximize the advantages of each of the powers, and try to avoid their disadvantages.

Just as Ghosn and Semler did in their technology-driven companies, managers of technology will invariably encounter the need to manage innovation to keep on growing and finding new stimulus for value creation. In doing so, managers of technology will need to overcome the fundamental paradox of control and freedom: because the innovative process requires freedom, while the organization requires control. If one creates a well designed control system around and with the innovation system in the company, this can be achieved, and even used for the company's competitive advantage. The four sources of power that can be used for these control systems are first the power of rules, second the power of leadership, third the power of competition and fourth the power of complexity.

Each of these four powers has distinctive advantages, which makes each of them attractive to be an important element in a total organizational control design system. By the same token, each of them also carries distinctive disadvantages. Thus, it cannot be expected that any one of the four sources of power for organizational control is inherently superior to the others – instead the designer of control system is challenged to find the right mixing and matching of all four sources of power for his particular organization. The chapter provides check lists of the critical elements which recognized thought leaders in the managerial sciences have found to be important attributes when using each of these four powers. But the chapter cannot provide the best recipe on which mix is most suitable for which circumstances – this will remain up to the skills and aptitude of the manager in face of the conditions at hand.

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