

How can anticipation inform creative leadership?

This article approaches a central question, which is spelled out in the title: Why would individuals in a leadership position search for answers in a knowledge domain that, in the first place, has no direct impact on their performance? And why care for more knowledge about anticipation?

This article sets forth:

- what speaks in favor of an anticipatory perspective;
- what the relation between anticipation and intuition is;
- how we translate general knowledge about anticipation and intuition to more specific cases.

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Preliminaries

There is a difference between anticipation and guessing. Even between anticipation and prediction there are distinctions impossible to ignore. We shall examine these differences and distinctions as we try to explain what anticipation is. Let us start with a simple observation: The distinction between good and bad leadership becomes apparent after the fact. Pretty much like cooking. But what distinguishes between bad and good leadership is the anticipation involved in all aspects of a leader's work. The goalkeeper who prevents his team's defeat by catching a penalty kick, or the tennis player who returns a very fast serve, or the skier who makes it down the steep slopes of the devilish slalom is in the same situation. So is the cook – the famous chef as well as the hobbyist kitchen artist. It is anticipation that, after the fact, explains their performance. If their anticipation is right, they will

be successful, and eventually celebrated. Their performance, while not always perfect, will display a pattern of success that cannot be the result of chance or guessing, or even predicting. If they only react, they play a lottery – and sometimes they might get lucky. Sometimes.

This study suggests that anticipation can inform creative leadership in many ways. Jack Welch, GE's famed president; Andy Grove, the genius behind Intel's past fame; Meg Whitman, who turned eBay into the biggest auction house in the world; Henning Kagermann, who established SAP as a brand name in a very competitive field – they all developed an anticipatory style of leadership that gave their respective organization the competitive edge so critical in today's global economy. Remember Jürgen E. Schremp, the president of a Daimler »World, Inc.« (WELT AG), who managed to lower the company's stock price to half and to put a serious dent in the reputation of one of the world's most respected automobile manufacturers? Remember Carleton (Carly) Fiorina of Hewlett Packard, in damage control mode almost from the moment she started? GM's Richard Wagoner, who did not anticipate that the automobile industry would evolve; and even Sun's Scott McNealy (during the last part of his career), who missed the impact of alternatives to proprietary server technology, belong in the same category. Where should Bill Gates be placed? Where Dr. Eric Schmitt, Google's president, along with the two Stanford University alumni Larry Page and Sergey Brin, who started the company? How do we rate the current business leaders in England, France, Germany (Martin Kannegiesser and Klaus Kleinfeld are only two examples), Italy, (remember Parmalat?), Spain, Switzerland? How do we qualify the leadership of Ron Sommer, at the helm of Deutsche Telekom when it went public? And what about business leaders in India (Bharat Wakhlu, president of Tata Inc.; Mahesh B. Lai, Managing Director of Hindustan Petroleum), China, and Russia? Is Khodorkovsky an example of failure or of the reality of a society in which you can get rich, but you cannot challenge the political system?

The answer is never simple: failure can be an opportunity. Success can be a dead end; or it can come before a fall. No surprise that some

of these celebrity leaders are selling their formulas – their stories – for success. What is surprising is that among those wishing to become future leaders are some looking for wisdom and guidance in someone else's past. This article is about opening a different perspective on what it takes to be a successful leader, not just a manager, CEO, or president. Until it is further explained, the label *anticipation* will serve here as a placeholder for acknowledging that not only the past, but especially the future affects, in some very powerful ways, the state of any organization – business, government, education. Concomitant with this thought is the realization that determinism – understood as the simple cause-and-effect sequence – can not by itself effectively support successful leadership. Consequently, we will also examine how intuition informs decision-making, as well as what the requirements are for integrating intuitive and analytical procedures. We will examine a concrete instantiation of these ideas in a leadership model informed by musical experience. No, creative leaders will not have to become orchestra conductors or piano or violin virtuosos; but they should be willing to learn from what it takes to make good music. Isn't the news of profit and growth music to the ears of CEO's, as well as stockholders? Teasing aside, success comes in many embodiments, and the analogy to successful music (composing, improvising, performing) deserves the attention of even those whose ear does not qualify as musical.

From Reaction to Anticipation

The evils that are brewing

One of the most misunderstood books is Machiavelli's *The Prince* [1]. It is about what it takes to succeed as a leader, from a pragmatic viewpoint. It does not assert that everything is permissible if the goal justifies it – what is simplistically defined as »Machiavellian.« But we will not deal with his book here – actually a must read for those willing to assume the responsibilities of leadership. Let us focus on one

critical idea of the book. It is a good entry for anyone who wants to understand how anticipation can inform the creative leadership necessary in our days:

For knowing afar off the evils that are brewing, they are easily cured. But, when for want of such knowledge, they are allowed to grow until everyone can recognize them, there is no longer any remedy to be found.

One hopes that every organization, from the small business to the large governmental bureaucracies will understand Machiavelli's words without any effort. However, when faced with reality, every person in a leadership position will eventually ask: From where should such knowledge about »the evils that are brewing« come? How do we recognize such knowledge? How do we distinguish it from alarmist signals? Few will go beyond the stereotypes: hire consultants, build a powerful information-processing infrastructure, rely on databases and data-mining, etc. And in general, when addressing the many aspects of creative leadership, even fewer will go beyond the generalities of the day: high complexity, fast cycles of change, global competition, and »more of the same.« There are factors that sometimes make leaders react to whatever they encounter, instead of taking a proactive leadership approach. Albeit, we keep producing cures to ailments resulting from a leadership practice informed exclusively by the experience of action-reaction. In reaction to problems, not in anticipation of what might undermine the organization's activity, and even less, focused on creative anticipations – this is leadership under the exclusive guise of determinism.

The rationality of determinism

The rationality underlying Western civilization was pretty much shaped 400 years ago by Descartes [2], whose *Method* became part of our way of thinking and acting. The *Method* states – here I risk sim-

plifying – that we can handle all that we encounter by following two fundamental steps: 1) reduction, 2) identification of the cause-effect sequence. The first step is rather intuitive: what to a person appears very complicated at first sight can be more easily and conveniently understood if we reduce it to its components. Once we understand such simpler constitutive parts, we are guaranteed to understand the whole as well. The second step guides our attention to causal chains. For the level of complexity of the world that Descartes described, reductionism and determinism returned good value. The investment is in the analytical procedure. Once applied, the *Method* allows us to perceive regularities expressed in the laws of physics we all studied in school, as well as deviations calling for a course of action to remedy them. The *Method* extended from a guide to acquiring knowledge and scientific descriptions of the world to a way of living. This is a backbone of our civilization. Leaders of all kind – CEOs, state presidents, company owners, military officers, those in charge of the education establishment and of financial institutions, among others – act according to the reductionist methodology and deterministic perspective. Moreover, as a correlate to the *Method*, we inherited an encompassing model of the world: the machine. Descartes' machine corresponds to what technology afforded over 400 years ago: the hydraulic Archimedean screw; the gravity swing pendulum; the automata, machines with moving elements (dancers, animals, runners, etc.). These are mechanical constructs with wheels, levers, pulleys, escapements, etc. activated by gravity or by waterfall as energy source, or by a person who cranked them. In Descartes' view, all there is – plants and animals included – can be reduced to a machine. From an explanatory model based on analogy, the machine model, embodying reductionism and determinism, becomes an ideal to be achieved – the engines of the past, the machines of the factories of the Industrial Age, the robots of our days. In the architecture of the Industrial Age, a house is not a shelter, but a machine for living, as Corbusier [3] and his collaborators put it, extending the metaphor even to the intimate.

What was a metaphor turned into a *modus operandi* beyond the visionary architecture of the Purists: Machines behave predictably; machines can be fixed; machines are universal; machines can be programmed. And *voilà*, the institution conceived as a machine is thus much easier to handle than the composite of human beings at work. Taylor's and Ford's assembly lines are an embodiment of the machine-metaphor driven model. In *Modern Times*, Charlie Chaplin gave an early warning of what it might entail to make the human being part of the larger machine, or to turn him into one. Our days are far beyond his romantic anti-machine position. (The Luddite movement is known for its attempts to physically destroy machines.)

Our entire universe of existence depends on a large variety of loosely integrated or independent machines. However, an institution reduced to the status of a machine does not need a leader. Its functioning is regulated from within. It needs a self-diagnostic program and good procedures for networking. For all practical purposes, a telephone switch is an example. Some 20 years ago, it was more than obvious that, as a large employer, AT&T could actually carry out its major function without any personnel. In a telephone company, there are activities of extreme repetitive nature and limited processing scope that can be entirely automated. No human being will notice the difference. But as these reductions, predicated by the expectation of higher return on investment, higher efficiency, and lower dependence on the human factor, are practiced – resulting in the automated digital switch – the focus changes to that part of human activity that is not yet subject to rationalization and automation. The research associated with telephony, which in conjunction with the evolution of computer technology eventually led to wireless communication, is not reducible to a machine function. If it is obvious that the »AT&T machine« – without any employees – does not need a leader, it is far from obvious how to define the nature of leadership in a competitive business world focused on service (for instance, servicing the human-free AT&T enterprise) and, even more challenging, focused on creativity.

Every type of organization contains quite a large portion that can function like a machine, or actually functions like one. But it is as well evident that there is a living component in every organization, and that leadership means to successfully integrate the two. The machine component of the business relies on the knowledge embodied in its various parts. But this component is not representative of the complexities implicit in human interaction. Regardless of whether one sells cars, shoes, coffee, services, art, or sex, the defining component is human interaction, no matter how far automation reaches. Accordingly, to lead is not to press the button of a machine that runs by itself, but to anticipate how a certain leading action might influence the ever-growing chain of interactions it might trigger. Or how it might inhibit it.

A definition of anticipation

Machiavelli's focus on knowing ahead of the time when things might affect the organization addresses only one aspect of anticipation. But the breakdown (theorized by Heidegger [4] and the many philosophers of modern technology following in his footsteps) is not the characteristic aspect of any activity. In order to shed light on other aspects that make organizations viable and resilient, we'd better submit an operational definition to the readers in order to help them realize how anticipatory leadership is practiced.

An anticipatory system is a system whose current state is defined not only by its past states, but also by possible future states.

The first part of the definition describes the deterministic component of any form of human activity. The second captures the anticipatory component. Red high-top shoes, 3-wheel cars, and garlic ice cream might be creative or surprising ideas, but the possible future state, represented by possible acceptance of such products, cannot be ignored. Everyone knows that once upon a short time ago, Sony had the better video recording product. The Betamax embodied knowl-

edge and a good understanding of causality in the quality of videotaping. The science was good, the technology even better. The product failed. In our days, the bet is on which kind of DVD format will succeed. In the running are another Sony product (the Blu-Ray) and the competitor's HD-DVD. (Obviously, they are not compatible.) The jury is out on which format (and company) will win. But these are famous examples. Think about the death of the laser videodisk – if you were ever exposed to it as a great promise. And think how technological innovation takes many detours. This is why we still use the CD-ROM – *although not for much longer*. Sometimes, a product conceived for a certain purpose – Internet conceived by DARPA as a digital communication infrastructure for the military – ends up being »reinvented« for other purposes.

IBM failed to recognize the relevance of the operating system for the personal computer. It asked Microsoft to develop such a system. When this happened, the anticipatory component of leadership at IBM was certainly missing. When Microsoft failed to perceive the relevance of the Internet and the world-wide web, the anticipatory component in the scientific-technological part of the company proved to be well inferior to that in marketing. To this day, Microsoft's Explorer™ browser is a mediocre product. But it survives because one of the most powerful companies in the world does not let it die. GM failed at least three times – in the 1970's (1973 and 1979) and now in the 2000's – to anticipate the consequences of sporadic oil crises and the need to rethink the car. Such errors not only cost market share, but also result in the world-wide perception of the company's declining viability. Almost all automobile manufacturers in the world lack the anticipation that they will eventually have to provide mobility, not just cars, to their customers. (See Nadin [5] project proposal for DaimlerChrysler.) Ethanol, bio-fuels, and hybrid and hydrogen-fueled vehicles are not the answer to the many challenges posed to car manufacturers, highway designers, civil engineers, urban planners, etc. Examples – of lack of anticipation, in this case – do not make for improved knowledge. And when it comes to leadership, the past

can guide the present, but in the spirit of the ideas presented so far, anticipation has to inform it. It is almost useless to pinpoint the tragic consequences of failed anticipation in leadership. Politics, driven more and more by circumstances, and by poll numbers, makes it very clear that without authentic strategic considerations, the leaders, stuck in past reductionist-deterministic models, will only usher the organization from crisis to crisis.

The Futures Agenda

The concrete embodiment of a creative leader's vision is what is called the *Futures Agenda* [6]. In this very simple document, one can easily identify not only if anticipation is considered, but more important, if it can be possible. Talking about spectacular failures associated with the company name, E. Neville Isdell, the president of *Coca Cola*, made an important point: »As we take more risks, you will see more failures. This is something we must accept as part of the regeneration process.« In order to explain the relation between the many aspects of anticipation and leadership, let's take a second methodological step – after defining what anticipation is – and examine what makes anticipation possible. Within a physical system, such as a mechanical contraption (engine), there are few, if any, degrees of freedom. Neither the pendulum nor the hydraulic pump allows for deviation from strict rules of functioning. A pendulum does not anticipate, neither does it predict. The same holds true for any tightly controlled system. The living is subject to many control mechanisms. Some are tight, such as the »thermostat« in control of body temperature; some are loose, such as the color of our skin. It is only within an open-ended, adaptive, well-defined, yet not rigid control system that anticipation can emerge.

»...when a man stands motionless upon his feet, if he extends his arm in front of his chest, he must move backwards a natural weight equal to that both natural and accidental which he moves towards the front.«

Leonardo da Vinci [7] made this observation, while studying motoric aspects of human behavior, which he wanted to represent in his paintings. Five hundred years later, biologists and biophysicists addressing postural adjustment [8] proved that the compensation that da Vinci noticed – the muscles from the gluteus to the soleus tighten as a person raises his arm – slightly precede the beginning of the arm's motion. In short, the compensation occurred in anticipation of the action. The same happens when you get out of bed. Blood pressure has to be maintained constant, regardless of whether you are vertical, horizontal, or sitting in a chair. The heartbeat changes before you get up, not in reaction to getting up. In reporting on their investigation of the »proactive nature of the motoric system,« Ishida and Sawada [9] concluded that the hand's motion precedes the target motion. We often catch an object falling from above, or thrown in our direction, before actually seeing it (perception), or at least before we can acknowledge having noticed it.

In view of these fundamental observations, the *Futures Agenda* tells very clearly whether a leader realizes what it takes to integrate deterministic and anticipatory characteristics. Tight control, rigid rules, dogmatic benchmarks – all reflected in the quarterly obsession with satisfying shareholders and the stock exchange – do not allow for anticipation. Leadership becomes management. Companies performing within this model do well until they start fading away. Sun Microsystems is an example; so are the many industries of the past. They are milking another penny in profits from their trusting clients as they are taken over by Chinese or Indian companies. These usually take the factory apart while it is still running and rebuild it where labor is still a fraction of what it costs in Germany, France, and even the USA.

To anticipate in the tightly integrated world of the global economy means to facilitate interactions of a new quality. The leadership of Starbucks not only brought high-quality coffee to Americans – who knew of nothing better than the tasteless Folgers blend. They also brought a sense of engagement in new markets, fair trade, and a series of environmental causes which, when demagogically affirmed, never

attract more than a tired smile. Whole Foods is another example of promoting quality, a sense of responsibility for the community, and ecological understanding. It is the anticipation of new values that has made this chain succeed in the highly competitive market of food retailing. And obviously Aldi (known as Trader Joe's in the USA), which offers good value to a base of customers who otherwise have very little in common. These examples prove that the anticipation at work does not preclude returning value to investors or projecting a sense of shared responsibility. Again, examples – negative or positive – are only examples. We need to return to guiding ideas. From the examples given above, we know what anticipation is; we now know what it takes to facilitate it; and we also realize that it is a characteristic of leadership that addresses the organization's creative potential. The time arrow of reductionist-deterministic action points in the direction in which a cause (past or present) can affect a result; the opposite, *anticipatory* arrow, points from the possible future to the present.

The solid arrows are parallel processes in real time; the grey interrupted arrow corresponds to »faster than real time,« e.g., so-to-say thinking about the action. This diagrammatic representation suggests that the future to which the definition refers is a possible future, reached in the mind ahead of the action in which the individual is involved. Strictly speaking, this corresponds to a faster »clock«: the two white arrows from the future to the present. In the human body, various synchronizing mechanisms are at work in every anticipation. People »know« how to fall without harming themselves. When the faster process – e.g., perception (of »the evils that are brewing«) ahead

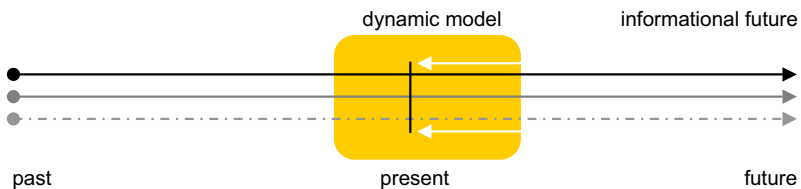


Fig. 1: *The end – informational future – is where we start from. The future appears as embodied in faster than real time models.*

of time as a leader defines a future's agenda – is no longer fast enough, or does not occur at all, a breakdown is possible.

In order to predate a certain outcome – balance, hand motion ahead of target motion, adjustment of heartbeat before changing body position, which are all part of the possibility space (postural changes, gait adaptation, etc.) – anticipatory mechanisms, integrating previous experiences, unfold in faster than real time.

The future as a possibility

To interpret this simple representation is to realize that the future as a possibility is the future that a leader has to envision. There are many opinions regarding this vision aspect: Some have the talent for it; some acquire the knowledge or expertise that it takes in order to »see the future;« some have experience and thus can infer based on skills acquired to what will eventually unfold; some use all possible means and methods to model the future, moreover, to simulate it (more recently through computer-based simulations). We will not try to confirm or reject such opinions. Rather, we will state that the future as a model has to continuously be considered in its relation to the *dynamic* present. This model has a control function. It guides the efforts of all those involved in achieving a goal. Therefore, the leader who acknowledges anticipation needs to practice a policy of transparency. Once upon a time, the »leaders with vision« used to consider the »vision« as their own secret. They were not interested in engaging the organization in finding out how it could affect overall performance. Given the never-ending refinement and fine-tuning of an organization's activity, it follows that anticipation is a quality-driven control mechanism. It helps maintain course, but not at any price, rather against the background of the numerous changes in direction that organizations experience today.

The following diagram simply suggests that the anticipatory model unfolds in faster than real time and checks back, through a variety

of effector mechanisms, on the current state. Leadership means to make such feedback and correction possible, and to engage everyone involved in it.

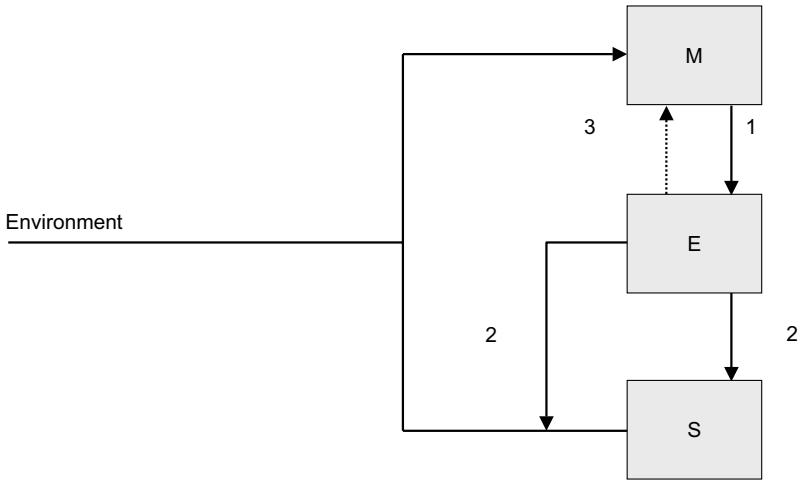


Fig. 2: *This diagram, first proposed by Robert Rosen [10], shows how a model (or simulation) controls the dynamics of the system.*

Let us take this diagram and try to specify its components. The reason for the exercise is simple: Leadership is a concrete activity. Abstractions – such as, in the diagram, M, S, and E – can assist in leadership functions only after they are specified for the particular organization. This function of concretizing cannot be delegated. Creative leaders know that many functions can and should be delegated – especially in the activity’s deterministic component. But others need to reflect the particular way of thinking, the particular creativity, the style of the individual assuming a leadership position. The following considerations are provided only for the sake of example.

Environment

- ⇒ fast-changing scientific and technical knowledge
- ⇒ economic dynamics
- ⇒ social dynamics
- ⇒ global context
- ⇒ political factors at work

Each leader will define the specific environment. Example: In a web-based transaction company, the science is different from a nanotechnology business. The economic dynamics of energy companies (exploring for oil or coal) is different from that of companies operating in the private security business.

The object system S is actually the organization. A description that distinguishes between the deterministic part (everything that is rationalized and automated) and the »living« part can guide the leader in understanding how anticipation is not some extra expectation, but a resource.

Object system

- ⇒ structure
- ⇒ planning
- ⇒ research and development
- ⇒ production
- ⇒ marketing

Example: Product development has a special role in which many factors are involved in maintaining the company's competitive edge. With the participation of all parties involved, procedures should be conceived to reward ideas and individual contributions that help in this respect. In some companies aware of the fact that creativity is supported by the right »chemistry« among team members, teams are formed on an ad hoc basis model of compatibility. Even the most brilliant are not automatically assigned to a creative team if the members do not unanimously feel that they can work well together. A leader

should have an open mind for such and similar procedures that result in augmented anticipation. Obviously, virtual organizations have a different structure than corporations in the classical sense.

The model M, faster than the real system S, is never perfect, but should allow for improvements as fit.

Model

- ⇒ dynamics of structure
- ⇒ creativity
- ⇒ feedback and feed-forward
- ⇒ self-organization

While all the aspects of the object system S are reflected in the model M, this is not a simple mapping from what is to what might be. Rather, in M we have quantified models of change. Examples: how the structure of the organization might have to change as the business becomes global; how the creative edge – resulting from innovation in science and technology – will further increase competitiveness; how information channels (for feedback, but also for feed-forward) support the proactive leadership. Especially relevant are all the factors that stimulate self-organization, i.e., bottom-up processes involving everyone who depends on the success of the operation. The coupling through effectors, such as quality control, market analysis, and the like, only suggests that there will always be a gap between the best laid plans and reality.

Rarely would leaders today have enough competence to cover all these areas. Accordingly, they should be able to connect to data and interpretations that will inform their decision-making. There are some professionals in the field of leadership studies who suggest that a position qualified as anticipatory (management, coordination, or the like) be created. In view of all the arguments discussed so far, it could be agreed that anticipation cannot be delegated, rather encouraged at all levels of activity. As we shall soon see, intuitive aspects critical to leadership will rather suggest delegation of other functions, includ-

ing those related to evaluation of reactive and proactive performance. What can and should be practiced by anticipation-aware leaders is the spreading of the expectation of including anticipation at all pertinent components and activities of the organization. While nobody can teach us how to anticipate, we can learn more about anticipatory processes and bring this awareness to expression in our entire activity. For those intent on further refining their anticipatory skills, the following, rather condensed observation might serve as a guide.

- ⇒ Prediction and anticipation are different. The mechanism behind prediction is the mathematics of probability. Anticipation refers to the mathematical notion of possibility. Nothing can be probable unless it is possible. But being possible does not automatically make an event probable.
- ⇒ Anticipation is not guessing. And it should not become the justification for transforming wishful thinking into a leadership procedure.
- ⇒ Decision support systems, combining analytical tools and heuristics, can, if well designed and well maintained, facilitate access to less obvious aspects of the organization. Good leadership integrates output from decision support systems into anticipatory procedures.

Discovery, awareness of trends, behavior understanding and evaluation can provide the much talked about insight that makes the difference. Anticipation often appears to persons aware of its role at the intersection between data (quantitative approach) and impression (qualitative approach). While many like to bring up left-brain (analytical)/right-brain (intuitive) decision making, the persons actively pursuing anticipatory-based leadership soon realize that these reductions (and localizations) are metaphoric, at best. As an autonomic expression of the living, anticipation stands for the whole person; that is, anticipation is holistic. This will be addressed in the next section, where we focus on intuition.

Anticipation and Intuition

Fallibility awareness

The hunch, the gut feeling, the insight, the inspiration, emotional thinking, and quite a few other semantic equivalents stand, depending on the context, for what we call intuition. The etymology is far from delivering the magic key to unlocking the various aspects of intuition. Indeed, the late Latin *intuitio* – the act of contemplation – is probably already loaded by the religious practice of divination in the space (templum) dedicated to the reception of enlightenment. But at least 200 years before *intuitio*, there was *intueri*, which is as simple as *to look at*. Yes, intuitions always seem obvious – after the experience. You look at something and suddenly you see the right path. That things are a bit more complicated need not take our time here. In looking at something that is not obvious, we assess the information available – usually very little, or at least not very distinct – and contribute new information that leads to a choice. Intuition guides us in avoiding a dangerous situation for the institution, or in finding the path to some desired result. Many successful leaders, in various organizations, have contributed to the folklore of the subject. After being suspected of not having feelings, or after being expected not to have feelings – like surgeons – they explained some of their decisions as based on feelings. In this case, feeling translates as knowledge associated with the situation, but brought into decision-making, mostly subconsciously, from previous experiences. Intuition guides the initial steps, not the whole process. As is known from psychological and cognitive studies, when we are faced with many choices, the »right feeling,« in the form of information that the person generates, guides, in the shortest time, to the shortest or best path. How and under which circumstances this happens will preoccupy us in this section.

John Dewey [11], the American philosopher, is one among the many who wanted to understand how intuition works. Moreover,

he wanted to know what it means to be qualified as intuitive. In this vein, he wrote quite eloquently:

»These 'feelings' have an efficiency of operation which it is impossible for thought to match. Even our most highly intellectualized operations depend upon them as a 'fringe' by which to guide our inferential movements. They give us our sense of rightness and wrongness, of what to select and emphasize and follow up, and what to drop, slur over and ignore among the multitude of inchoate meanings that are presenting themselves [...] These qualities are the stuff of 'intuitions'.«

For leaders willing to explore the realm of intuition, here are some factual observations. Intuition is pervasive, efficient, implicit, and fast. Pervasive means that intuition extends to the most unexpected aspects of our lives, in particular, in our ability to make convincing decisions in a context of little available information or knowledge. Its effectiveness reflects the fact that leaders able to »listen« to their intuitions can, at times, affect the outcome of their actions by many orders of magnitude higher than the elaborate solutions. Intuitions are, in such cases, what dynamic systems experts call *initial conditions*. Their implicit nature brings up a simple issue: how to convey to the persons involved in executing actions of significance to the institution aspects of one's particular nature, almost at the border between privacy and public domain. Finally, the speed at which intuitive processes unfold is such that no other procedure, including fast computations, can keep up with or replace them. But as much as the tall tales of successful intuitions would make us want to believe that they are infallible, they are not. Creative leadership entails realizing this important limitation.

If the same energy and missionary fervor were invested in debunking intuition as in idealizing it, we would get a balanced view of a form – one among many – of access to a particular kind of knowledge. As often as some intuitions succeed – and keep feeding all kinds of urban mythology production – others fail and go unrecorded. Although we could, after the event, learn as much about intuition processes from failure as we learn from success, failure is not recorded. This important characteristic – the fallibility of intuitions, i.e., they

succeed or fail – suggests we are in the cognitive territory in which deterministic and non-deterministic processes take place together, and they cannot be separated. Although it confirms what we've already discussed, this statement needs further elaboration.

Anticipatory processes are ultimately expressed in action. Intuition informs only the beginning of an anticipatory process. The timescale of anticipatory action depends on the concrete activity. In a small company, delivering goods that are expected in a more complex production line (parts for the automobile industry, or agricultural products for the food industry), the timescale is dictated by a rhythm over which the company cannot exercise much control. In a different organization, such as a museum, school, hospital, bank, or a military unit, timescales are defined differently. But after all is said and done, timescales, affecting the type of anticipation involved in the activity of leaders, are defined by the scale of the action: the return of a very fast tennis serve has a different timescale from the slalom trail; and heartbeat control involves a timescale different from the anticipation expressed in a work of art or architecture. Intuitions correspond to insight, and therefore their timescale is rather couched in the temporal realm of cognitive and neural processes, i.e., 100 milliseconds. They may lead to actions, but not necessarily. To better understand their temporal aspects, as well as their specific expression, let us examine intuition-based procedures, in contrast to deliberate analytical decision-making.

Arousal of the mind

At first look, intuition suggests an automated procedure. As with anticipation, leaders, as well as the rest of us, do not decide to perform an intuition. (»I am going to intuit« would be as stupid as declaring »I am going to anticipate«.) But while anticipation is autonomic – it results from within, triggered through internal stimuli – intuition appears as automatic, spontaneous. Persons in a leadership position

relying on intuition do not weigh alternatives against each other. They are actually either unaware of such alternatives, or they decide to ignore them. And although, after the fact prompted by the intuition (»feeling what is right«), leaders can assess that the outcome is less successful, chances are that what the intuition prompted might turn out to be as good as what their deliberate decision-making might have generated.

To the question of why an organization would pursue a course based on a leader's anticipation, there is only one answer: In hiring someone for a leadership position, the institution/organization makes a decision similar to an act of faith. They trust one person more than the others. Although applicants usually have a track record, most of the time there is no relation between what they did and what they will eventually do. When Steve Jobs recruited John Sculley to become the president of Apple Computer, he asked, »Do you want to continue to sell sugar water, or do you want to change the world?« From Pepsi Cola marketing to Apple, as an innovator in computers, is at least a leap of faith. Under such circumstances, trust is not easy to gain, but it can be lost in as short a time, as can a wrong intuition of consequence to the organization. It took Sculley the wrong intuition to bet on a product called Newton, and the lack of anticipation of demand for such a cumbersome product, and to fight Jobs, and he was out. Apple came close to a crisis. Thus it makes sense to integrate in the hiring procedure of leaders (at various levels) specific benchmarks that pertain to intuition and its many characteristics. In view of this need, but not with the intention of providing some magic formula (which does NOT exist), we shall further examine the cognitive aspects of this characteristic of human choice-making.

Intuition preliminaries

- ⇒ No one's intuition is expressed in a vacuum
- ⇒ Learn to listen
- ⇒ Learn to see
- ⇒ Internalize your priorities
- ⇒ Avoid acting by habit
- ⇒ Take chances if they feel right
- ⇒ Develop associative thinking

Inspiration – i.e., the state of arousal of the mind – as an expression of intuition is documented in a succession of initial ideas (e.g., sketches on successive sheets of transparent paper, variations produced by designers, architects, composers) rarely overridden by more elaborate attempts at a further stage on the project. Leaders with reliable intuition are aware that the people working with them have their own intuitions in turn. The creative aspect of every business is often an expression of successful intuitions, even if sometimes they are conflicting. In view of the performance achieved through intuitive means, and of the cost benefit analysis of fast intuitive choices vs. choices based on time-consuming analytical elaborations, many authors are encouraged to argue in favor of stimulating a more intuitive approach to leadership, even though few have cared to find out what it entails. When one speaks of a scientist's intuition (e.g., Einstein, Feynman), the association is not to the intuitive nature of art – compare the elaborate cubism of Braque to the spontaneous cubist expression in Picasso's work. The association is even less to the intuition at work when we first meet a person, fall in love, or find what's right for us in a given social context (»I don't feel that I really want to work here,« or study at a particular university, or move to a certain neighborhood). The intuition guiding market speculators (the well-known Boesky and Icahns in the USA, and others in European countries) is of a different nature. Neither the intuitive scientist, nor the artist, nor the speculator, nor we, as we fall in love, choose a college, or decide to forego buying a house (»didn't feel right«) juxtapose a decision tree or a matrix with all the appropriate parameters pertinent to what we are

doing to our spontaneous, but not arbitrary, feeling(s). Individuals in a leadership position should be able, even after the fact, to rationalize acceptance or rejection of their intuitions. Not unlike a physician, the leader should be able to pursue an intuition and, afterwards, to seek data to confirm or discard it. This means that the leader should be willing to learn. The analytical path is relatively elaborate. Intuition appears as spontaneous, and if there is something leading to it, we are not fully aware of what that might be. Often, we are inclined to believe that nothing leads to it, that intuition is like spontaneous generation (i.e., from nothingness). However, as we have already suggested, in tracking successful intuitions, we always find out that the situation that prompted them – low level of knowledge, insufficient information – required that associated knowledge be brought into the process. This associated knowledge originates from experience, or, better yet, from learning in its many forms.

Trust and intuition

There are circumstances when someone's intuition collides with what seems the reasonable course of action. Political correctness speaks in favor of some decisions: Who should be hired? Who should get a sub-contract? How should a product look? Intuition might override the »reasonable« answer, i.e., the politically correct decision. This means that, although it looks good to choose a woman or a member of a minority group, a handicapped person, a senior employee or a younger one, the additional information brought into the process suggests a decision that might cause conflict. A leader, from whom we expect sensitivity to what is socially and politically adequate beyond correctness, in addition to intuition – e.g., taking risks as circumstances require – experiences the conflict. At such a juncture, the anticipation of the outcome for everyone involved should outweigh all factors. Making the politically correct choice might affect not only the organization, but even those favored by the choice. A senior or a handi-

capped person, as much as a woman or a young person, might find out that the task overwhelms them. To think about all the parameters – to satisfy some social or political requirements, to consider the outcome for everyone else, etc. – is not easy. If the leader has gained the trust of everyone to whom he/she must answer, the conflict is usually mitigated beyond opportunistic decision-making.

To be aware of one's own limitations, especially when in a leadership position, is an obligation, since decisions regard so many other people. In general, we cannot account for the choice based on intuition, even though such choices express our own identity. We do not know explicitly how the choice was made. Neither can we really pinpoint the aspects of our interaction with the world surrounding us that prompt or inhibit intuitions. A person in a leadership position should make every effort to retrace the steps leading to the intuition. Even if leaders at times pursue a less than optimal intuition, they can identify the factors affecting the decision-making process through »reverse computing« the intuition. Nobody is really in control of one's intuition, although one still has the power to reject or act upon it before following it. However, we can affect the context in which intuitions emerge and avoid the presence, or absence, of those parameters that in retrospect seem to affect the short intuitive process. Many authors (such as Jerome Bruner [12], Mario Bunge [13], David Myers [14]) observed that, usually, intuition is associated with a sense of familiarity with the specific domain in which it is expressed, associated with internalized knowledge. However, there are documented intuitions in a knowledge domain for which there was no previous experience (cf. Robin Hogarth [15] or Malcolm Gladwell [16]). Let's recall that Lou Gerstner came to IBM from Nabisco and saved the company. He brought experience with him, and one of the defining aspects of his experience was the learning curve in which he engaged. But, successful or not, there are no traces left after the intuition, nothing comparable to the succession of steps followed in deliberate acts of knowledge acquisition. Therefore, intuition cannot be shared as one shares trade secrets or skill-based observations. Intuition cannot

be taught beyond defining it as a different way of engaging oneself in what we do. As opposed to the analytic approach, performed in full awareness of the information processed and of the methods applied, intuition is a-methodical. Methods can be explicitly described and duplicated as a proof of the adequacy of the effort, or as a step towards improving it. The amethodical is circumstantial, non-repetitive.

As an act of completing missing information, intuition is consumed in the act; what counts is the result, not how it was obtained. Intuitions are not subject to repetition. Analysis, of course, is not only a tool passively deployed in a situation, but part of the knowledge we derive from pursuing the analytical path. This alone is of extreme significance. Intuitions seem to originate in the situation, and are part of it, consumed in the situation. Analysis always changes the situation, as it subjects it to the viewpoint driving it. In some other elaborations (cf. Gilovich and Madley [17]), the suggestion made is that, for the observer outside the situation in which intuitive and analytical decisions are made, it seems that we have not one mind, but two. One pulls the intuitive lever, rooted in personal experience, affected by emotion and captive to the circumstance. The other activates our logical, deductive skills. But these minds should not be contrasted, rather understood as interdependent. The creative leader is, after all, interested in cultivating forms of interaction within the organization that engage the two minds we all have.

Intuitive pattern recognition

Rationality expressed in the path of analytical deliberations evaluates good and less good intuitions. Practical experiences defined through intuitions are accessible to rationality only after they took place. Intuitive inclinations are expressed in the ability that leaders acquire in detecting and reflecting regularities characteristic of experiences, even if they are totally unrelated to the new experience within which intuitions are present. Such regularities can be correlations and associa-

tions, more often than not related to deeper levels of consciousness. That intuition is not part of a person's awareness in the same manner as the deliberative approach should not surprise us. On the surface, we continuously perform pattern recognition-based operations when we meet someone, look around, when we identify regularities (or irregularities). It might well be that intuition makes possible pattern recognition, as it triggers cognitive and neural processes that »are us« – we are in the process – but which we do not literally control. In other words, intuition could be the result of a particular form of learning, which is usually defined as implicit learning. The leader who understands this is not a control freak. As was already pointed out, tight controls, rigidity, an authoritarian style, make anticipation impossible.

The attitude towards others – a typical example throughout the rich literature on leadership and intuition – is not an anticipation – of what or how they might do – but rather a scanning, or reading, a surmise of the feelings they might trigger, an intuitive act. Leaders who care for others have good reasons for following their »instincts« (always complemented by factual data) in hiring, promoting, or parting ways with others. Nalini Ambady [18] videotaped thirteen teachers. She showed 30-second-long silent clips of each teacher performing to students who did not know the teachers. The students rated each teacher according to variables such as »accepting,« »active,« »competent,« »confident.« Ambady combined the individual scores into a global rating for each teacher. Furthermore, she correlated that rating with the teacher's end-of-semester evaluations by actual students. The correlation was very strong (0.76). That is, based on a 30-second videoclip, people who never before experienced the teachers were able to rate almost as well as students who worked with them for a whole semester. Ambady cut the length of the silent clips to fifteen seconds. The results were almost the same. Finally, she cut the clips to as little as six seconds. Today, the tight six-second videoclip format used to glean information about a stranger's personality is rather well known. They are used on various occasions and reflect what can be called

intuitive judgment. Such experiments proved that in the shortest time, outside or parallel to conscious awareness, we are involved in a rapid process that will result in accepting or rejecting a person. The science behind intuition, not unlike the science behind anticipation, is supposed to tell us how we get to know something without knowing how. That there are new ways to check out our intuitions means that leaders have no excuse in giving in to instinct without checking against it.

Here we have to address a first major problem: Is it possible to investigate rationally (in a deliberate, analytical manner) a type of cognition that, at least in appearance, is void of what we associate with the characteristics of rationality? Obviously, in doing so, we always automatically follow the path of reductionism – take what you cannot handle in its existential form and reduce it to its components. In this case, some of the components are non-verbal communication, timing, emotion (and its physical substratum), memory, etc. Creative leaders need to understand images (to see where others do not), to have a musical culture, to be sensitive to rhythm, and to know what emotions are – their own and those of the people they interact with. And how to express their feelings. Moreover, such leaders should be able to answer questions such as: Which processes can we associate with intuition? What is the neuro-anatomical base of intuition? Where is it located? The reason for understanding intuition is related to the instances when critical intuitive moments might take place. Instead of fighting one's own intuition, or mistrusting the intuition of others, a good leader should achieve understanding of situations when the alternative to intuition simply does not exist.

Important institutions of higher learning (Harvard University, for instance) developed a variety of programs open to leaders (in government, education, business, etc.). The military trains its own type of leaders in various institutions. Quite a number of businesses do the same. They rely on the competence of cognitive scientists; they even invite artists to create moments of intuitive significance. And as the study of anticipation makes progress, experts in the field (›futurists,«

such as the ones at EDS in Dallas, Texas) will play an increasing role in the definition of strategic goals. Unfortunately, experience shows that most of the institutions referred to above almost never find the time and the format for raising the awareness of leaders to anticipation, or for explaining intuition-based decision-making. Instead, they disseminate the newest and the best in the deterministic aspect of leadership. In providing advice to a world-leading consultancy (*Identität, Antizipation und dynamische Medien*, Nadin, assisted by Maas, 2002), among whose clients are governments and powerful corporations, I experienced the focus on the deterministic How? question, to the detriment of the no less significant Why? question. The directors of this consultancy (I will say no more than that it is located in Düsseldorf) wanted to promote intuition to their clients, not noticing that they themselves operated according to a mechanistic paradigm. They wanted to define the changing role of banks, but had a fundamental problem: They could not understand that to anticipate is to realize that the space of possibilities (including a world no longer captive to the money model) is open ended. Their instinct was to create a better bank machine instead of seeing how the bank as we know it might eventually disappear. Intuition will never compensate for lack of competence, lack of vision, lack of initiative. But given two leaders with qualities as similar as possible, the one able and willing to acknowledge and accept intuitive steps will outperform the other who discards intuition in favor of exclusively analytical procedures.

With all this in mind, and because we think that leaders need support in this direction, let us revisit the results adopted so far by the scientific community. Matthew Lieberman [19] defines intuitions: »They are fast, and take into account nonconsciously (sic!) generated information, gathered from experience, about the probabilistic structure of the cues and variable relevant to one's judgments, decisions, and behavior.« Please take note of the fact that identifying only the probabilistic, but not also the possibilistic, Lieberman remains in the deterministic domain. He distinguishes between intuition and insight – »becoming suddenly aware of the logical relations between a prob-

lem and the answer« – claiming that intuitions, as a subjective experience, are »an impetus, judgment, hunch, or behavioral response.« Timing is a particular form of intuition, sometimes difficult to define through an analytic procedure. However, in social interactions or in management, it plays a role that no leader can ignore.

Leadership and mindsight

Intuitive cognition and intuitive action have less in common than what the names suggest. This brings up the experiments carried out by Ronald Rensink [20] (University of British Columbia, Canada). He activated a very fast-acting mode of visual perception. In trying to address how come, in the presence of some perturbations, we don't identify even obvious changes – dog in front of a bench, dog without the bench, the distracter being a brief gray screen – he discovered that the viewer acquired a sense for the change. That is, viewers could sense the change (from the image of the dog in front of a bench to the image of the dog alone) before they saw it. Was it guessing? Rensink called this *mindsight*; we call it intuition leading to anticipation – and we introduce it here to make clear what distinguishes anticipation, which guides actions, from intuition, which guides choices (which we might or might not pursue) that might lead to actions. A choice pursued in connection to a possible action is anticipation prepared by intuition. This distinction will become even more apparent as we examine the way in which knowledge acquired through implicit learning becomes one of the sources of intuitions.

Reber [21] defined implicit learning as »the acquisition of knowledge that takes place independently of conscious attempts to learn, and largely in the absence of explicit knowledge about what was acquired.« It seems that implicit learning underlies the adaptive behavior of complex organisms. Ever walked someplace and had the abrupt feeling of danger? The information that contributes to such intuitions often comes from our observation of similarities, from associations.

Covariation detection (i.e., noticing similarities) and frequency detection (i.e., how often a similar situation leads to some unexpected result) are part and parcel of this kind of learning. Judgment, as in the analytical procedure, is supported by a type of implicit learning different from motor response. This should come as no surprise after we stated how intuitions are different from anticipations. Intuitions do not necessarily translate into immediate actions (such as returning the fast tennis serve or escaping a dangerous situation). But they always mean that the answer comes inexplicably. After the fact, we can come up with explanations. But if such explanations were good causal descriptions in the classical sense of the word, we could model intuitions on a computer. No matter how strong this sentence might sound, computers do not have intuitions, as they do not have emotions. Those who know how to fly an airplane are aware that many difficult situations (e.g., abrupt storms, mechanical or electrical failure) are handled based on intuitions. The source of such intuitions are those many hours of instrument-guided flight, with the reality »shut« out by blinders. The model can be used by leaders in order to train their instincts and prepare for extreme situations in which emotion, rationality, feelings, and experience coalesce in intuitive decisions.

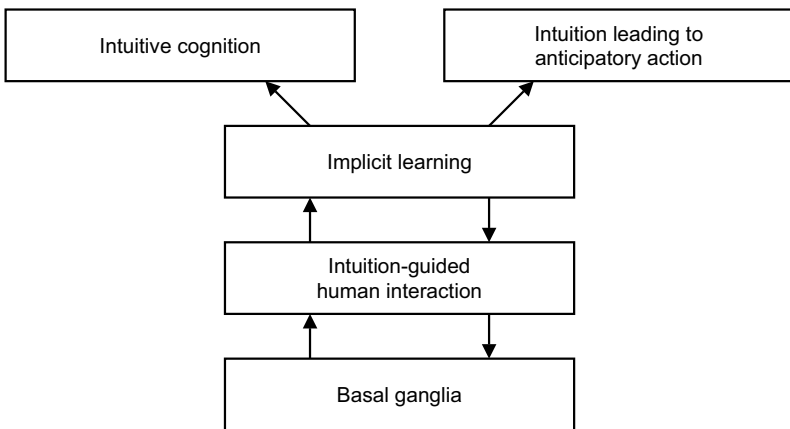


Fig. 3: *Cognitive processes leading to implicit learning (the role of basal ganglia).*

The evidence linking the basal ganglia (consisting of the *striatum*, *substantia nigra*, and *globus pallidus*) to implicit learning is straightforward: Temporal patterns predictive of significant events take place by repeated exposure. After such repetitions, the basal ganglia associate the predictor to the reward implicit in the process (dopamine release) and is capable of what is called temporal pattern prediction. Since the characteristics of the process are close to the adopted description, the basal ganglia are usually seen as a correlate of implicit learning. The intuition mechanism brings up the reward (as dopamine release) and the role of emotions. Often, intuitive thinking is equated with emotional thinking. That other parts of the brain, such as the amygdala, are involved only makes the deterministic localization even more questionable.

On this note, let us point out that anticipatory mechanisms are reward-driven. Leadership that is aware of how intuitive processes are triggered, and how anticipation is expressed, can use reward procedures, in their rich variety, for making possible a climate conducive to proactive attitudes. Not unlike the orchestra conductor, the creative leader knows that musicians do not wait for a cue to enter their sound into the rich musical texture, but rather become engaged in the many anticipations that lead to the amazing musical fluency of a successful concert.

Music as a Metaphor for Leadership

The conducting experience

Routinely introduced to business executives, the orchestra model is quite telling. It claims that leaders ought not only to see what others might miss, but also to hear what others might be deaf to. Some prominent company leaders adopted the conducting experience, obviously in the hope that it can help them deal with the many aspects of integration and differentiation that they encounter in their work. Most famous among them is Norio Ohga, chairman of Sony, as well

as an orchestra director who can handle even difficult world first-class ensembles. What informs the conductor metaphor is the focus on talents and energies of the orchestra members. They are, usually, highly motivated professionals, passionate about their work, very competitive, and still very aware of the fact that their egos, as well as the conductor's, had better not stand in front of the music during the performance. Everyone knows his or her part, but still, the leadership role embodied by the conductor makes possible the fusion, the integration, and the realization that success means both individual contribution and collective unity. Guidance, provided by the conductor, is such that enough room is left for each member's creativity, but never to the detriment of the holistic expression of a creative interpretation. There is, of course, enough room left for intuition, both in preparation for the concert and in the public performance. But as the conductor beats the time, timing itself becomes critical for the outcome. Yes, this is an exercise in synchronization. In advancing an anticipation-based model, and suggesting music as an effective guide, we do not intend to regurgitate what everyone can find in various articles and books on the metaphor of conducting. After all, there will be leaders with less than a musical ear, but with many other qualities that allow them to make it to the top of the organization.

Ever heard of the Suzuki method? Even for those less interested in music, you probably know that it is a very precise set of exercises meant to help the young student of music to learn all the movements a violin player should command. It is a training method based on the premise that once someone knows how to execute the right gestures, each note produced will be as close as possible to the standard expectation. In some ways, such methods are akin to military and sports training. They are focused on the syntax – precise description of what it takes to accomplish a given task. Rote training is applied not only in music or in sports. To memorize and rehash results yield very superficial knowledge; and the skills developed by such training are of limited use. Not being part of the adaptive component of activity, rigidly imposed rules make self-organization almost impossible. Coming

from an anticipatory perspective, some creative musicians advanced a model of music learning based on listening and reproducing what is heard. Indeed, if someone is interested in playing an instrument, it is the tone he/she wants to hear that drives learning, not the finger position or the posture of the future violin player. It is already clear that in trying to »make« or »generate« the same tones, the future musician ends up with the appropriate motoric characteristics. So many virtuosi who never studied music or an instrument are able to convincingly perform a piece they memorized as they heard it. The focus is on the music, not on the mechanism for generating it. Think about this in terms of what you expect from a computer – the meaningful processing of data, not the record of every operation, not the map of how electrons move in the machine. Sure, when playing an instrument, one can dream of the virtuoso performance. But to make it possible, we start with the musical vocabulary. Therefore, the anticipation-driven performance is guided by comparing the sound as one produces it to how one really wants to hear it. It is not the hand and arm that make the music, not even the instrument, but the ability to translate what is heard and the sound anticipated in the movements that make the sound possible. Anticipation drives the music to the extent that there is an ideal sound and tone that the musician wants to achieve.

The music metaphor submitted in these introductory lines is focused on the distinctions suggested in the first two sections of this article. It maintains that

- ⇒ exogenous factors, such as rules and regulations pursued for their own sake, lead to mediocre performance at best;
- ⇒ endogenous factors, such as self-organizing nuclei, emerging in relation to the goals of the entire organization, lead to higher performance;
- ⇒ leaders ought to recognize that there is a balance to be achieved, and that this balance itself is dynamic.

Each of these distinctions deserves comment.

- ⇒ Moshe Feldenkrais [22], reputed for his deep understanding of how we externalize our deepest uncertainties and conflicts in the manner in which we move, wrote about situations in which »A feeling of senselessness, of tiredness and the desire to give up can be the result of excessive motoric control.« Violin players educated in the spirit of the Suzuki method often end up with physical impairment (the rotator cuff, wrist, and neck are frequently affected). Under the leadership of extreme disciplinarians, organizations rarely reach levels of unity and cohesion. Under the circumstances of post-industrial activity, the need to overcome centralism, hierarchy, and tight rules of functioning resulted in ever more distributed models. The leaders involved in this new dynamics are supposed to earn the respect of their teams by engaging them in the activity. Each leader who breaks down – and so many do – is an example of the consequences of excessive control to the detriment of self-organization.
- ⇒ Only when respected can the creative leader guide in an engaging manner. When the expectation of high performance from everyone involved does not translate into individual automatic response in disregard of all others involved do we have integration of effort. Self-organization as a principle of dynamic systems means, concretely, that even in the absence of the leader, the functioning of the whole remains viable.
- ⇒ As a creative synthesis, the music resulting in a performance is not the mechanical addition of correct finger positions on string instruments or lip tightness on woodwinds. Musicians focus on their piece of music with the full understanding that music does not result from all the vibrations generated, but rather takes the form of a sound tapestry, of interwoven tones, of highly correlated contributions. The dynamics of the activity is itself subject to change. Therefore, a leader ought to make it clear that the organization pursues not mechanical perfection, but rather increasing adaptivity.

The living and the machine

The analogy to music does not imply that we can simply transfer knowledge from successful orchestra conducting to leading a business, a government agency, a school, or a not-for-profit initiative. It suggests the need to understand the difference between a machine model idea of functioning and a living system. Superficially seen, the machine is in many ways better suited for repetitive tasks and for processing (data, materials, etc.). But the machine is not suited to meet the organization's human expectations and the need to adapt to change in the world. The machine does not realize how meaningful, or meaningless, its results are and how these impact others; it cannot anticipate what people would like. To quote Feldenkrais again: »Among all instincts, there is one that blocks our movements: Fear!«

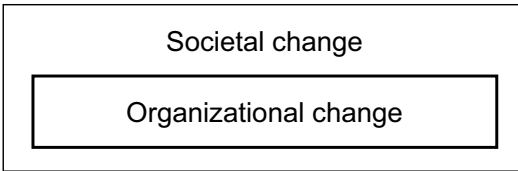


Abb. 4: *Societal and organizational change*

Organizations are subject to the expectation of improved performance. Societal change, affected in part by organizational change, is the result of human interactions in politics, ethics, ecological awareness, economics, and many other manifestations of practical experience.

Machines have no fear, and no sense of future. They do not age. Human beings, whether talented, hardworking, lazy, or corny, are subject to the variability of their anticipation. Experience feeds intuitive processes. But after a certain level, experience can as well hinder. It can lead to stereotype and dogma. To maintain the living character of the institution means to stimulate anticipation, as well as to identify the dangers associated with entering a stage – the aging of the institution – when anticipation decreases.

We know from studies in anticipation [Nadin, 23, 24, 25] that anticipation is acquired, expressed, and eventually lost (when living characteristics decline). In the romantic stage called start-up, a company's major asset is its anticipation. This is embodied in innovative products intended for adoption, in new services, in new ways of conducting a business, in a new model of leadership. Rarely do the inventors and technology wiz-kids make for good leaders. Their creativity is focused on an anticipation different from that of leadership. Their ear – to remain with the analogy to music – hears a »melody« different from what the CEO or president of the enterprise built around their ideas. The choice of a leader is, however, as important as the inventions that underlie the company. It is a matter of compatibility. Not every great conductor is compatible with all great orchestras, not to say with all music composed. There are definite irreducible characteristics that prevent a good performance, even if the musical composition is exceptional, the orchestra great, and the conductor even greater. The nature and quality of interaction remain critical aspects. In the culture of Hewlett Packard, the very reputable Carleton (Carly) Fiorina was able only to sow discord instead of successfully communicating how she would take the company to a higher level. The slogan »Invent the future!« referred more to toner cartridges than to innovation in computation. After she was fired, HP's performance started to improve. But those who know how to read the significance of the numbers change on the balance sheet eventually realized that the improvement was due to the fact that Fiorina's initiatives were finally showing results. (She initiated the merger with Compaq and implemented unpopular expense cuts, including reduction in the workforce.) It is not enough to have patience as a leader (or conductor). The team must also be taught the virtues of patience, even when the pressures of quarterly reporting make this difficult.

There are, of course, many stories of failures that eventually led to successes: the infamous Ford Edsel (1957) was a miserable failure; the Ford Mustang (1964) made up for the fiasco. The memory of Apple's very expensive Lisa (1983) was eventually forgotten as the Macintosh

(1985) became the new name in user-friendly interface. What a leader can learn from failure, which is unavoidable if one is prepared to take risks, is the need to:

- ⇒ establish a framework for innovation characterized by flexibility;
- ⇒ establish a framework for interaction characterized by openness;
- ⇒ establish a framework for supportive interactions;
- ⇒ make failure a learning experience.

Anticipation and integration – anticipation as a synchronizing mechanism

We introduced the musical metaphor because, as anyone who has practiced music knows, when playing together, we do not play in reaction to others, but in anticipation. The music played in reaction would sound terrible, an interrupted stream, a never harmonized effort. Music played with a good anticipatory attitude integrates everyone's part. Synchronized, the effort of all players fuses into the musical performance. This brings up the role of a creative leader in an organization that does not start from scratch. After a certain period of time, the two – leader and team – will function in tandem. Just as no new conductor has the luxury of assembling a whole new orchestra for each new occasion, no new leader forms his/her own team from scratch, as though there was nothing there before he/she arrived. In approaching the team, a leader aware of anticipation pays attention to the compatibility profile. Therefore, the multitude of aspects related to compatibility need to be on a leader's future agenda:

- ⇒ ability and willingness to learn
- ⇒ context propitious to self-organizing nuclei
- ⇒ openness to innovation
- ⇒ drive to overcome limitations
- ⇒ mutual respect.

In a very exciting dialog between the famous conductor Leonard Bernstein and the rock musician Frank Zappa, the latter brought up the fact that many classical musicians treated their profession according to the »German sausage principle« (*Das Mettwurst Prinzip*). Zappa was referring to the extreme attention to musical details (nuances, in particular), and to the solid technical foundation of music interpretation typical of the German School. He, as well as Bernstein, missed the error that gives the musical event much more life than technical perfection does. Precision is not a sin, but when practiced in excess, as a value in itself, the music sounds artificial, forced. Leaders need to be precise, no way around that, especially in an ethical context marred by abuses that have gravely affected their reputation as a group. But the precision required in practicing an engaging form of leadership is different from that maintained by computer systems integrated in the organization's activity. The need for expressive forms of leadership, i.e., for engaging procedures, results from the simple fact that, not unlike a good musician in an orchestra, a good co-worker is more important than the technological infrastructure.

Intentionality is encapsulated in every anticipatory function, and reached through synchronized effort. To make their intentionality known, conductors do not hesitate to use a wide variety of means of expression. Leaders can learn a lot from this. Leaders known only through the many layers between them and the others who make up the organization would be like a remote conductor on a monitor. The music model speaks in favor of a leadership engaged in every aspect of the performance, but still not choking in the details of micromanagement.

The music model has one characteristic that very few leaders seriously consider: the rehearsal. Obviously, the organization can rehearse in a very limited manner. Virtual models (of new products, new chains, delivery, marketing, etc.) can be of help; so can simulations. But a rehearsal in a concert hall is by far different from a virtual model. It is the opportunity to stimulate everyone's creativity, to generate alternative ideas and test them. It is also the occasion to

understand together what each one involved knows, and what the limits of their creative competence are. It is a time to indulge intuitions. Technology can help make the rehearsal even more productive. Everyone involved can listen to how the music sounds, how well the timing, corresponding to the various groups in the orchestra, works; and to what extent the shared conception of the music performed is clearly conveyed. In other words, how synchronization is achieved through everyone's effort, not just as the result of being controlled by a metronome.

It would be at least impractical to invent company rehearsals. But it is not impossible to create, according to the particular context, a model for achieving the same functions as those of a rehearsal. Here are, again, the goals to be pursued:

- ⇒ to stimulate individual creativity
- ⇒ to generate and test alternative ideas
- ⇒ to create a context for increased interaction.

Rehearsed meetings should not be the goal, rather rehearsed instances of interaction, especially when companies get involved in world-wide broadcasted events (such as the launching of a product demonstrated in real time). While launching the Wii™ platform, Nintendo recently showed how such events, in which leaders play a crucial role, can become much more than a marketing gig. Satoru Iwata, Nintendo's president, made the point himself: This console is for everyone (himself included). He also directed the virtual orchestra that performs under the baton of future players. Leaders with an authentic innovative élan should try to come up with ways to make the achievement of such goals possible. After all, no creative leader follows in the footsteps of others. Each tries to define his/her own ways. Each is an inventor in a human domain of knowledge critical to society.

Concluding remarks

Shaped by reductionism and determinism, our current understanding of leadership engendered the expectation of machines replacing not

only assembly line workers, but leaders, as well. Fiction is ahead of reality, and in the world of fiction, an artificial intelligence program can quite effectively guide the activity of an organization that performs the same function over and over. Such an advanced machine costs less than the stars of business, with their high salaries and bonuses, not to say retirement benefits or buyout in case of conflict. It is less difficult to work with an artificial intelligence (AI) procedure than with those ego-driven performers who think themselves infallible. And it entails fewer legal aspects (abusive behavior, unethical decisions, sexual misconduct, etc.). But can a machine replace a good leader? If the answer to the question of the nature of leadership is that it is a deterministic activity, exclusively analytical in nature, we could, in principle, construct such a machine. But, as the arguments in this paper have shown, this is not the case. In a deterministic universe, successful activity would be reducible to the action-reaction sequence. Given that organizations are above all entities composed of human beings, and that their existence is expressed through interactions (inside and outside the organization), we can infer that what defines the living is also definitory of their organizations. In particular, anticipation is such a characteristic. In view of this, the role of anticipation in leadership functions becomes even more important. Within the reactive mode, the past entirely determines the present and the future; in a proactive, anticipatory mode, the possible future, together with the past, is of extreme relevance.

The study provides methodological considerations based on which creative leadership can and should integrate anticipation as a practical requirement. So far, the following were presented in detail:

- ⇒ how to combine a reactive and an anticipatory style;
- ⇒ how to organize an institution as the unity between its deterministic and non-deterministic dimensions;
- ⇒ how to explore the space of probabilities, as well as the space of possibilities.

Since intuition, as yet another non-deterministic trait of the human being, is a preliminary step to any anticipatory action, the study focuses on particular aspects of leadership informed by intuitive acts. The following were detailed:

- ⇒ the characteristics of intuition;
- ⇒ the neurocognitive basis of intuitive acts;
- ⇒ the relation between intuition and anticipation.

A particular expressive form that integrates anticipation and intuition, musical performance, as a synchronized endeavor, can inform the activity of creative leaders. As a result, the concluding arguments of this study focus on music and musical performance. Concretely, the following were addressed:

- ⇒ leadership and coordination of creative contributions
- ⇒ leadership and self-organization
- ⇒ risk and opportunity
- ⇒ synchronization as a concrete form of anticipation.

As a result of the detailed examination pursued so far, we can submit to the reader an overview of the basic leadership perspective that makes the integration of anticipation possible.

This study intends to promote awareness of an anticipatory style of leadership that integrates intuition-based moments. In the context of extremely fast dynamics, the price that organizations pay for not significantly increasing their anticipation-based activity is such that their viability is often at stake. If, alternatively, leaders are capable of integrating anticipation-based procedures and stimulating intuition-based activities, the creative potential of their organizations will increase. The competitive edge thus gained allows for more than maintaining the status quo through new avenues opened that reflect the organization's creative potential and society's expectations of betterment.

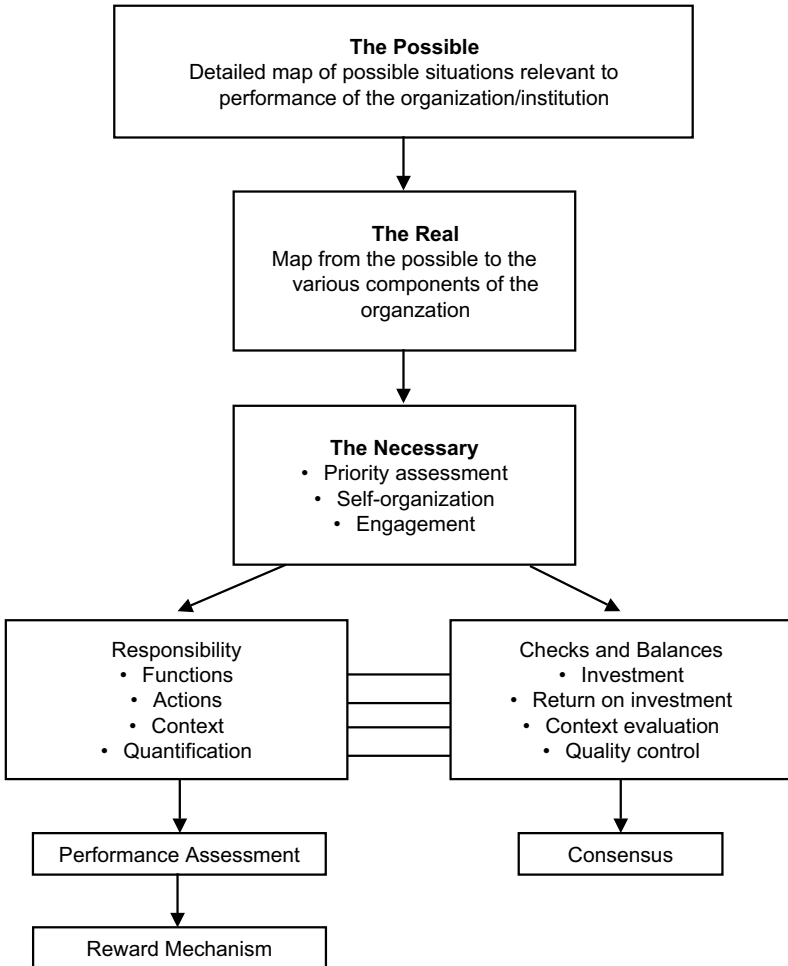


Fig. 5: *Mapping of the anticipatory leadership perspective.*

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Summary

Leadership informed by anticipation reflects a fundamentally new understanding of what organizations are and how their performance can improve. In the current competitive context, anticipation-informed leadership is not an option, but a necessity. Since we all, as products of a culture defined by the Cartesian rationality of reductionism and determinism, are inclined to proceed in the spirit of this rationality, the question is whether we can overcome its intrinsic limitations. Given the human being's learning capabilities, we can only be optimistic about the possibility to transcend the action-reaction modus operandi and progressively acquire an awareness of the possibilities opened by anticipatory thinking and action. The first objective of both the leaders and the members of organizations willing to overcome the limitations of a perspective that in effect eliminates anticipation should be a shared understanding of why it is counter-productive to expect that everything function like a machine. Every deterministic model entails an intrinsic limitation: Once the machine reaches peak performance, nothing more can be expected from it. In an anticipation-driven organization, such a limitation does not exist. Leaders and the people they work with become part of an adaptive process. The result of the activity is not only the performance (production, services, etc.), but also their own change, as their anticipatory characteristics are augmented through the experience they are involved in. Anticipation-inspired leadership engages everyone involved in the experience so that everything of a repetitive nature is eventually automated. Anticipatory leadership stimulates creativity.