Chapter 9

How do we get there -Strategy Action Framework – “Action Engine”

Final draft

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Abstract

The chapter will describe a comprehensive planning framework for developing a company’s knowledge management strategy. The framework includes the goals and game plans of the strategy and the use of three enablers supporting such a strategy: levers, processes and systems. This is complemented by the development of an action plan while considering the resources needed and the constraints present. The framework also includes the discussion of aligning the knowledge management strategy with the company’s business strategy as well as with the organization’s knowledge base and core competencies. The chapter uses two cases to illustrate some of the aspects discussed.

Key words: Knowledge management strategy, business strategy, goals, game plan, levers, processes, systems, action plan, resources, constraints, core competencies, knowledge base, case studies.
Introduction

We described in Chapter 7 the six strategic dilemmas that frame the KM strategic conversation. It is now time to put theory into practice and get right to work. The following pages will describe the KM strategic framework and how to use the specific tools of the detailed KM strategy. This framework will include a number of tools that can be employed independently or as part of a complete package. Strategic thinking is not new to business. In fact, a significant number of frameworks, taxonomies, and typologies are described in the academic and popular literature, and there are plenty of established tools that are used by business practitioners. However, the framework that we are proposing has the added benefits of being user friendly and being supported by successful implementation results. The basic framework includes outcomes (or goals), levers, processes, systems, resources, constraints, game plans, and action plans (see Figure 1). In order to apply the framework, we always start with the goals of the KM strategy. The established goals must align the business strategy and the KM strategy. Once the alignment is identified, then the selected strategy is described using the appropriate levers, processes, and systems needed to support the devised game plan. We also identify the resources needed and constraints identified under which the goals and the game plan were devised and the action plan will be implemented. The implications of the strategies are translated into action plans that will allow you to combine your business strategy with your KM strategy, while putting to work not only your knowledge base, but also your core competencies. Even though the building blocks of the framework seem simple, and putting the framework to work seems straightforward, our experience suggests that implementation is not without some challenges since few companies apply the entire process successfully.

As an example, Dell in 2002 had the largest market share in the PC business. The company had a unique business model that was well protected and was on its way to crushing its competition, especially Hewlett Packard (HP). At the same time, HP was on crutches and barely limping along. HP had lost a charismatic leader, failed in the acquisition of Compaq, and was falling into a decline. So Dell decided to go for the kill and to expand its product offerings to include printers\(^1\), realizing that printers were the cash cows allowing HP to survive. Guess what? Dell was not successful as it was unable to take its current competencies and transfer them to the printer market which was a new marketplace for Dell. This was particularly surprising to Dell as the new market seemed similar, if not the same as the PC market and even the skills and capabilities needed for success seemed the same. However, Dell, the leader in the PC market and a very successful company, was not able to transfer the skills and capabilities. As a result of this change in focus Dell lost a percentage of its market share advantage in the PC market to HP (as of the end of 2007\(^2\)).
Figure 1: KM Strategic Framework
The Complete Planning Framework
Mastering a framework for knowledge management decisions would have given Dell an opportunity to review potential approaches in order to penetrate new markets by utilizing existing competencies or developing new ones when needed. Two frameworks that provide such a resource will be presented in this chapter (see Fig. 9.1 and 9.3). Both are developments and a recombination of our own and others’ academic work and one of the authors, Dr. Russ, used them extensively in his consulting practice in developing strategic plans for KM and other (IS, manufacturing) consulting projects and assignments. A partial illustration of this framework is provided later in the next chapter by two of his students that proposed the implementation of this framework at Aurora Health Care, in Green Bay, WI.

But there is more to it. We are living in economically and socially fascinating and uncertain times. New paradigms are sweeping society and the business environment. Companies are refocusing their attention from their tangible assets to intangible assets based on knowledge and information systems (IS). The experience based economy is increasing in importance. The economy is alternating from boom to bust in a matter of a few short months. The emergence of the global economy on one hand, and the surfacing of new economic powers in transition on the other hand, the need to resolve both the environmental and human poverty crisis simultaneously, and the increased importance of global electronic networks and communications at the same time as face to face contact and regional clustering is gaining importance and creating a new landscape for knowledge management and business strategies. At the same time, knowledge management itself as a managerial practice is transitioning from being IS driven to being driven by the human-IS interaction, and is seen as a socio-technical phenomenon. The shrinking half life of knowledge and product life cycle is adding pressure on business and knowledge management strategists. Some of the questions that top executives and managers are dealing with are: can the same set of tools or strategies serve SMEs and large corporations? Service oriented and manufacturing companies? Companies for profit, not for profit organizations, and/ or governmental agencies? Can they (the tools and strategies) satisfy internal and external users? Are the needs of different generations of users in different economies different? We think that Knowledge Management Strategy in the Age of Paradox and Transition has some new characteristics and requires some new tools. These will be presented later in this chapter.

Following is an introduction to the components of the KM strategy, which include as mentioned above, goals, levers, processes, systems, resources and constrains.

**Goals**

The first thing you must do is decide on the specific goals of your strategy. This is the stage where you align the gap analysis (see chapter 1 in this book) with the business strategy. What is it you want to accomplish in the KM arena that will support/drive your business strategy? Increase the value of your brand? Increase your intellectual capital? Improve your processes or develop new products (or both)? This is also where the six strategic dilemmas described earlier (see Chapter 7), will come to fruition, since the choices you will make regarding which goals to actually use will relate directly to the conclusion of your preferences for the different choice of alternatives you made earlier, or will reflect on these choices.
When determining your goals, be selective and stick initially with a reasonable number. If you identify too many goals up front, you may find that some of them might contradict each other and you do not have all the necessary resources (people, time, money, etc.) to pursue all of them at once. Strategy is about choices, what you decide to do and what you decide not to do. The essence of a successful KM strategy is to focus on the choices and allow those choices to guide you through the process. We found that limiting the goals can be the most difficult aspect of strategy making. Therefore, having some metric or rule of thumb like “we need between 3-5 goals” can be very helpful. Also, what is extremely helpful is the strategic discussion that leads to the choices made, especially the part about those goals that didn’t make the final list.

Figure 2 illustrates some options you might have available to you. For example, we identified increase in intellectual property, sales, earnings, profits, liability or risk reduction, delivery performance improvements, cost reduction, quality improvements, flexibility, agility improvements, innovation, learning, savings, and responsiveness, as some of the most important goals companies tend to focus on. This is by no means a comprehensive list and you would not want to try and create goals for them all, but it will give you a place to start. Once you have developed your goals, it will be necessary to identify measurable Key Success Indicators (KSI) for each one of those goals. You will have to be careful choosing the goals and the indicators, because, assuming you will reward the people the right way to achieve them, you might realize them (or as some say, be careful what you wish for, because you may get it). For example, you may wish to increase sales from new products. You might do so, but at the same time, the increased sales may cause a lowering of your profits, or increase your dependencies on external sources of knowledge that helped you to develop your new products.
Figure 2: KM Strategic Framework – Goals and Enablers

KM Goals/Outputs

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Of course you know that the discussion you will have about which goals to use, how to measure them, and what are specific (measurable Key Success Indicators, KSI) outcomes you want to accomplish is as important as what you will agree upon. Keep in mind that the first discussions will likely just be the beginning of your dialog, since you may have to revisit the list a number of times. You may find that after the planning for implementation phase, the constraints identified will not allow you to achieve all your goals at the same time. Putting aside some of your goals may have beneficial long term effects because organizationally, you will create knowledge that should speed the process when you are able to revisit the goals that were excluded from the first phase. However, remember to keep these goals in a repository that can and will be accessed on a regular basis. If the goals are viable you will want to keep them in the forefront of your future analysis and have them ready for either the next phase of the process or use them to bolster current goals.

For example, acquiring new leading clients might be part of a goal that can drive your KM strategy. How will that be accomplished given the constraints that have been identified? Here is an example. In 1998, one of the authors, Dr. Russ, while consulting with a steel processing company in the Mid-West suggested that the company diversify their client base and try to penetrate the Japanese car companies—specifically, Toyota and Honda. The response was that the company had not had the relationships nor the knowledge of the culture in order to approach such customers and they were more than happy with their current Detroit based customers. Years later, the company was less than happy with its local customer base, but luckily, through acquisition was able to acquire access to an alternative customer base which was local and easier (similar culture) to penetrate. The same difficulties the company had in penetrating the US based Japanese producers seem to haunt the company while trying to penetrate the Asian new markets and the company found itself lagging in such markets.

Once you have the overall goals and KSI, now you have to translate them into divisional, functional, project team, and individual goals. Some examples of goals at the individual or team level might be challenging assignments or at the individual, team (sales) or organizational level might be acquiring leading clients . Individual/team challenging assignments might feed organizational goals of increasing intellectual property or improving competitive positioning, for example, by increasing the number of patents in an area that is critical to the success of the company. The FIAT case (see box below) will illustrate how creating business vision and tying the appropriate business goals to existing design and engineering knowledge allows the company to achieve turn-around in a relatively short time frame.

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**Fiat case**

**KM and business vision**

In 2004 FIAT, with over one hundred years of history in car making, was considered by analysts and the general public to be close to an unavoidable end. During the preceding five years the company had piled up losses of $12 billion and it seemed bound to be moving toward a crushing insolvency. For years the company had been losing market share to European and Japanese
competitors, unable to compete on both pricing and overall quality of its cars. During the late 1980s and early 1990s top management had chosen to diversify its business into non car related investments, mainly banking and insurance, and the lack of a committed focus on research and development in the car business had begun to show its consequences. FIAT Panda, a small sized car kept basically unchanged in its design and key features for over 20 years, from 1985 through 2005, became a symbol of the stalling situation. Year after year it became clear that the money the company was losing on its car business was not balanced by the profits made by its diversified investments.

In 2004 the key shareholders realized that it was time to take control of the situation. They came to this decision after realizing that their latest attempt to sell the car business to General Motors was not going through. GM had bought 10% of FIAT stock in previous years, and also signed a put (buying) option that obliged the American company to buy the remaining 90% if FIAT wanted to sell. Now, GM (itself in serious financial trouble) was no longer in a position to execute its put option and FIAT had to find a way out of its trouble by itself. A new CEO was hired with the clear goal to bring back profitability to the car business in order to outline a path to a lasting financial recovery.

Sergio Marchionne (a Swiss-Italian manager trained in Canada) was the man selected for the task. Marchionne had no experience with the car business but had a successful track record in bringing faltering companies back to profitability. His plan was clear: first find a solution to the pending put option issue with GM and buy time from banking creditors; then focus on a business plan leveraging upon the key assets of design and engineering that had once characterized the winning appeal of FIAT, mainly within the Italian and European market.

The first part of the plan was accomplished in February 2005 when Marchionne convinced GM to clear their contractual put option obligations by paying $2 billion, and showing to banking creditors a business plan in which the car business became once again the main focus (investments in banking and insurance were either considerably reduced or totally dismissed in order to readily increase cash flow for business development). Marchionne clearly stated that FIAT was going to tap back into the roots of its former success: innovative, practical, user-friendly engineering, and most of all unique, distinguished Italian car design. According to Marchionne this was the only way to gain back a “passion for the business” within factories and dealerships; passion that for too long had been faltering. He acknowledged that FIAT had become “old and bureaucratic” and, as a consequence, out of touch with the changing market needs and demands. Most of all, FIAT had become unable to foster and enable a full appreciation for the design and manufacturing engineering talent that had characterized the successes of the brand during its hundred year old history.

Since the mid 1990s FIAT cars began to be considered by the market still mechanically dependable (as it was the tradition for the brand) yet of little appeal due to their outdated design and lack of affordable, driver-friendly features and frills made popular by aggressive European competitors (mainly the French Peugeot and Renault, and the German Volkswagen) and Japanese ones (Toyota and Nissan). All of this had progressively created a low morale within factories and dealerships (no real hope for future improvements since management had shown no commitment for the development of the car business) contributing to the market perception of
FIAT as old, outdated and bound to end as a brand, a brand that for over one hundred years had been the pride and joy of Italian creative, innovative and stylish engineering brought to mass market products.

The fact was that underneath the hoods, such innovative design and manufacturing engineering was still very much present. For example in the mid 1990s FIAT engineering had created the jet-stream turbo-diesel system (JTD) that had made diesel engines ever more efficient in fuel consumption yet ever more powerful and even more fun to drive than a traditional gasoline engine car. Unfortunately, due to dire cash flow needs, the JTD technology was sold to the German car component company, Bosch, and through Bosch, readily utilized by all of FIAT’s main competitors. The majority of car drivers and buyers never realized that the revolutionary JTD system was FIAT’s creation; it was a given that such innovation was born in Germany and mainly developed by Bosch. The whole issue contributed to fuel and deepen the low morale that had spread within FIAT. People and suppliers close to the factory headquarters as well as factory workers and unions had started to comment that many FIAT managers were doing nothing for the future of the company and actually they were undermining the expression of the engineering talents that the company had hired and trained in the past. The feeling was that there was a lot of wasted know-how and talent in FIAT and the dire financial situation was considered proof of it.

Marchionne was determined to end these dynamics making sure that all of the knowledge and talent present within the company was not only fully utilized but also properly developed to better serve the market. A radical change in the mindset of top management was necessary: several top managers within the organization were asked to leave and were replaced by younger, more dynamic and attuned to the market, managers. For the first time in the history of the company people in their late thirties and early forties became part of top management. This was quite a shock within the traditionally seniority based cultural dynamics of Italian companies and under the direct, informal culture, Marchionne has become popular even on the pages of Italian gossip magazines for leading board meetings wearing a shirt and dark blue sweater doing away with the traditional stylish ties and jackets. At the same time, Marchionne set focused, clear goals for growth and profitability and monitored the implementation of this strategy by his top management.

Making design a key feature of FIAT cars’ appeal was one of the goals. In 2005 Marchionne hired from Ferrari (FIAT still owned the majority of the sport car maker’s shares even after having to sell a portion of the shares to a banking consortium for cash flow needs) its top designer: the Norwegian-Spanish Frank Stephenson. The design goals were set, once again, to leverage upon the know-how based on FIAT’s past successes making new models resembling the designs that supported the creation of the FIAT brand during the booming 1950’s and 1960’s as well as tapping into the sporty, dashing style of Ferrari itself. These goals were to be accomplished by making sure to efficiently utilize the mechanical and electronic engineering technology that was already performing and dependable on FIAT cars; in other words making sure to find a way to make the market fully appreciate and value all the best that the company engineering had been able to create in the past and the present: to redirect present technical ideas and talents to market focused solutions.
The strategy was readily put into practice: the new, key, small sized car, Punto, and the mid sized Bravo models were totally new in their design while retaining 60% of the components of previously unsuccessful models that the company already had in place. The new cars were also set to reduce manufacturing costs by sharing structural platforms with several models (belonging to different market segments depending upon size and comfort levels) and sharing components with other car manufactures (for example Ford, Suzuki, Tata) with which Marchionne had set focused partnership manufacturing agreements. For all of this to happen it was essential to accomplish a proper flow of information and knowledge within all of the company’s departments and factories. No longer were seniority-based political games and personal agendas going to rule business decisions; market focus and actual merit and competence were clearly stated and practiced as the cornerstone of FIAT’s revival.

No longer was engineering isolated from marketing; technology topics were put back into marketing campaigns to leverage upon and boost the traditional “Italian passion” for car innovation and style. End users were invited to share ideas, through customized web sites, about ways they would have liked to see new versions of classic FIAT successes (for example the small FIAT 500). Similar internet tools and campaigns were utilized to understand what drivers and passengers actually wanted to experience during their driving. Traditionally, FIAT had been the company “teaching the rules of the business” to the market and competitors. Now the focus was more on “learning the new rules” and putting them readily into practice.

The new mindset was also set to affect the way a key market player did his part of the job: the dealerships. Marchionne and his new top management team realized that the company had to be closer, much closer to its customers, and dealerships were the vital links in the relationship. New dealerships were opened all over Europe and concrete ways to better engage feedback sharing were identified and practiced. Each dealership was financially encouraged to participate in any attention drawing local event. The focus was on making sure that the “bring back the Italian passion” theme was shared not only within the company but also with clients and prospects.

All of these changes also affected the traditionally uneasy relationship between FIAT’s management and its factory workers. Once FIAT workers and relevant unions understood that the company was really getting back to focus on the car business with actual investments (letting go of other activities: banking, insurance) it was possible for Marchionne and his team to get workers to cooperate (more hours worked for the same pay) leveraging upon reestablishing “FIAT passion and pride” also within the workforce. For years workers were pointing out wasted resources on outdated strategies and models (the 1985-2005 Panda previously mentioned was once again a symbol of the situation) and complaining about the poor working conditions of factories that until the early 1990s were considered to be “world class”. Progressively, investments were made to improve the situation and workers were happy to make cars that, once again, anyone could recognize as Italian just by looking due to their unique, appealing style. This was exactly what Marchionne had envisioned within his company recovery strategy. A vision that, not only for management and workers, but also for customers, has become a reality. In 2007 workers were awarded for their renewed commitment to FIAT with a substantial pay increase.

After all of these changes (many of them set to create a powerful link between the glories of the past and the appealing innovations of the present and the future) FIAT once again scored profits.
in 2006 and 2007, with financial results listed among the very best of the more than one hundred year history of the company. Both in Italy and Europe the market share gains were considerable: even a plus 20% over the previous year within a slowing down market. The new FIAT 500 was awarded with the “2008 Car of the Year” Award in Europe and its market demand exceeded FIAT’s expectation at the time of the new car presentation (July 2007) by 70,000 units.

On April 24th, 2008 the reputable financial journal, The Economist, featured a Leader article by the title “The miracle of Turin” subtitle: “the lessons that other car makers can learn from the fixing of FIAT”. Two key suggestions inspired by Marchionne’s work were noted in the articles aimed mostly at the troubled US carmakers: 1) get back to focusing on the primary business, car making, without getting strategically and operationally sidelined by focusing on higher margin smaller markets such as pick up trucks; 2) address directly, rapidly, and with determination the operational and product line problems. As we have described, FIAT leveraged and developed the knowledge and talent present within the organization and largely neglected in the struggling years prior to Marchionne’s arrival.

The global car market remains difficult and it is actually getting worse. During the first half of 2008 its overall demand has been rapidly decreasing due to the oil prices surge and the unfolding global financial crisis. In July 2008 FIAT announced that it had to lay off workers at four of the six Italian plants for three one week periods during the coming fall due to the slowing demand for some popular models in Italy. At the same time, FIAT announced the signing of a Memorandum of Understanding with BMW laying out a strategic and operational cooperation regarding the manufacturing (and sale in the US market) of the Mini (owned by BMW) and Alfa Romeo (owned by FIAT) brands in the profitable market of compact fashionable cars. This was the 35th strategic and operational alliance with other car makers signed by Marchionne since his arrival at FIAT in 2004. The alliance with the prestigious (and always profitable) BMW points out the fact that FIAT has gotten back to inspiring a sense of trust and dependability for its future. Without the new course the company has taken during the last few years, it is quite possible that the current market crisis would have sealed the end of its independence and the end of its ability to show the ‘unique Italian feel’ Marchionne has so determinately sought back. Nowadays FIAT seems to be back on track, taking full advantage of its know-how within a market that is still difficult and challenging for all the car manufacturers. By using the new vision of the future the company can now envision a brighter future.

As we finalize this chapter, a new fascinating chapter in FIAT history is developing, one that provides for an interesting perspective on value of knowledge. FIAT is negotiating the receipt of about 30% of Chrysler stock value in exchange for access to FIAT’s knowledge of the design and manufacturing of small, fuel efficient cars. Not only that, FIAT also will have immediate access to the American market through its alliance with Chrysler, and its network of dealers. If such intent is materialized, it will be a wonderful illustration and example of the value of knowledge and leadership (what we call intellectual, and more specifically human capital).

Once you have chosen the expected outcomes (see also our earlier discussion of goals in chapter 1) your strategic KM plan will focus on, now you have to identify the enablers: the levers, processes, and systems you need to have in place in order to achieve them. For example, you
have identified as an outcome that you want to increase your sales of new products. For that you might need more sales people with the knowledge base to sell the products (lever) or you might need to have a Customer Relationship Management (CRM) system in place that will allow you to support the sales people (see chapters 15 and 16 in this book for discussion) and you will need some product sites to complement the data and knowledge that they might need (systems). You also might need to have a process of hiring and training the sales people (option A) and/or a process of developing and updating the product sites (option B) as you go. The point is that in order to arrive at the outcome you want; you will need some enablers that will allow your people to achieve them.

**Enablers - levers, processes and systems**

We will now describe the enablers, the second part of our framework. We have found that executives and managers like to think in terms of the three categories we have identified, even though they may use different terms for them.

**KM Levers**

Think about the lever as a multiplier of force for whatever strategy or action you put in place in order to arrive at the outcome. Our experience suggests that the following levers should be considered: Human Resources (HR) Policies, Reward (formal & informal) System, Cross Functional Collaboration, Core Competencies, Top Management Support, External Relationships, and Culture/Tolerance of Risk. By no means is this a comprehensive list. Feel free to add, eliminate, or modify the levers that we have proposed. In any case, be sure that you truly have in place the levers you think you have and that they are appropriate for the use you intend. Take for example, internal collaboration. You may take it for granted that the two units you need to collaborate on sharing the knowledge in order to share best practices will do so. But, you may be surprised to learn that: the two units have contradicting reward systems, or, there is no shared policy that allows them to easily exchange the data/information they need to share in order to have effective collaborations. Or, you may learn that the heads of the two units don’t talk, or they talk, but cannot agree on anything because of conflicting agendas and time horizons. Or take for example what some people call “knowledge bridges.” Knowledge bridges can be individuals or units that provide their organizations with knowledge boundary spanning roles, between different, independent organizations or subunits. They go beyond gatekeeping since they connect and share knowledge. This can be done through a formal arrangement, like patent licensing (for codified knowledge) or by intentionally moving the tacit knowledge by moving the person in which the tacit knowledge is embodied.

Next we will discuss the specific levers we suggest you consider.

**HR Policies**

HR policies cover the areas of recruiting, selecting, hiring, training, developing, and rewarding new and current employees at all levels. Here are some illustrations of the ties between HR
policies as levers for KM strategy (rewards will be discussed separately since we believe they deserve special attention).

Hiring, training, retaining, etc. is seen by many as talent management and to be different from knowledge management. We agree that they are different, but we claim that they are intensely/heavily related, and that talent (one result of having the appropriate HR policies) is one of the most important, if not the most important lever needed for your KM strategy.

For example, one of the key positions companies have to develop for successful KM strategies are gatekeepers that have the capacity to bridge across disciplines. This unique set of skills can be either groomed internally or acquired from the outside, but the HR policies must allow for gatekeepers to survive, improve, flourish, and perform their function effectively.

We have also found that diversity is crucial to support creativity. One hiring policy that can increase cross fertilization and creativity is hiring people with different backgrounds, e.g. ethnicity, culture, complementary (but different) technical skills. Having the appropriate policies for that in place might seem natural in the US, but this is not necessarily the case in other countries and societies. As globalization becomes more and more common in business, this strategy may have far reaching consequences. Diversity takes on new meaning when dealing with personnel with inherently different cultures, and goes beyond gender, race, age, etc.

**Reward (formal & informal) System**

Appropriate reward systems are crucial for the success of any strategy and KM is not an exception. The discussion below will illustrate some of the issues and complexities of this lever.

**Pay for performance**

Individual pay for performance might be contradictory to new knowledge creation or to existing knowledge sharing behavior. Take for example a lawyer that is rewarded by billable hours and the profit for her firm resulting from getting new clients. Would she be spending time on developing new services for the firm and sharing them and her knowledge with her colleagues? Probably not. So how about team based rewards based on profits? This might work if the team or organization has a strong culture, but if this is not the case you might be facing free riding (knowingly or unknowingly) by some individuals. If you are dealing with tacit knowledge and the organizational culture is not open, the knowledge that must be shared may not be released to the individuals who need it and it may be hoarded by those who have the tacit knowledge. If the knowledge that needs to be shared is codified it will be easier to detect, even if the company reward system is positioning the different units as competing for the pool of rewards. However, tacit knowledge is much too easy to hide. This might explain why copying best practices within the firm is so difficult. First, the best practice that might work in one place will probably have to be slightly modified because of local conditions, regulations (if it is a different state or country), etc. Second, the knowledge provider might not be aware of some of the tacit knowledge assumptions that are taken for granted at his/her location. And lastly, the reward system based on the profits in the specific business unit will probably not be rewarding him/her if it is based on a profit at the other business unit.
On the other hand, delayed payment, or payment that results from a relatively long period/tenure, may be effective in promoting the appropriate behaviors that support KM strategy implementation.

Promotion

Promotion (or tenure in the academic environment) might be used more effectively to promote new knowledge creation and/or knowledge sharing. For example, McKinsey created a special promotional track for their “knowledge experts”\(^8\). Those experts are promoted based on their ability to develop new knowledge that is then incorporated and judged by other internal users as part of their consulting assignments.

A problem with promotion is that it might be more subjective and as such create/play into internal politics.

Intrinsic rewards

Intrinsic rewards are seen by some as the most appropriate but the most difficult to create and sustain. Some specific examples used to support KM strategies are: increasing the visibility (e.g. “best seller” advice) of an expert\(^9\) or being nominated as a mentor, or being sent to conferences to represent the organization.

This might be even more effective, but requires the right culture (for example a team spirit), and leadership, and it is also easy to ruin.

Issues with reward systems

1. Be careful with putting in place a simplistic system, one that might encourage people stealing others’ ideas to be submitted by a due date to avoid being penalized; see example in Samsung.\(^10\)

2. Ask questions such as: What is the appropriate level of aggregation (unit of analysis) for KM reward systems? Are individual’s goals and rewards the appropriate units or should it start with teams or departments?

Cross Functional Collaboration

Cross functional collaboration is seen as a Key Success Factor (KSF) for successful KM strategy implementation. Here are some issues and illustrations.

Cross functional collaboration is a KSF for new product innovation (new knowledge creation) in large high tech companies. For example, marketing collaborating with other functions might be crucial in some cases more than others. Learning from failures or from successes presents challenges for KM in a fast changing and uncertain environment. So, in this context a strategic question will be how to structure the cross functional team (composition) and how much autonomy and flexibility the team should have in making strategic and tactical/operational
decisions. This also requires coordination with the nature of the knowledge (codified versus explicit) and the systems supporting the team activities.\textsuperscript{11}

Another question will be how to break the barriers between the internal or external silos, when true collaboration between people is needed but language barriers, organizational (intra and inter) authority lines, functional responsibilities, etc. make true dialogue difficult if not impossible. And since the collaboration seems to be dependent on effective dialogue and the majority of the knowledge is tacit\textsuperscript{12}, can IT systems help? What about virtual cross functional teams? How do you develop a dialogue when you also have to cross culture and time zone boundaries? How do you allow gatekeepers to operate effectively?

Some of the most interesting aspects revolve around sales people and their integration into cross functional teams, due to their unique nature, potential for turnover and critical role.

The stickiness of the knowledge in question will be an issue as well. For example, if the knowledge is highly technical, the collaboration might require mechanisms appropriate for sharing tacit knowledge, while if the knowledge is codified (or codifiable) the collaborative mechanisms that will be appropriate will be more IT systems based.

The other issue we identified that is relevant here is that in many cases the function of KM is siloed (under/owned) by either the IT function or by the HR function. If this is the case in your organization then the cross functional collaboration may be tainted by turf wars.

You have to allow redundancies within your organizational design, since assuming that only formalized and planned processes will work is wrong. So for example, some companies have organized idea fairs, some have halls covered with posters that promote ideas (supply) or needs (demands) sharing so people can randomly interact.

How can you determine if you actually do or don’t have cross functional (formal or informal) collaboration? The British Council provides an example of using a relatively simple tool of social network analysis to identify the communication within a globally dispersed organization. For those teams to be effective, they can not operate in a vacuum. The British Council uses this tool as complementary to their use of KM audits. It also has a formal KM strategy and formal KM roles within the organization.\textsuperscript{13}

\textbf{Core Competencies}

We use the following definition of organizational core competencies: the key processes that allow the organization to deliver its product/services to its customers better than any of its competitors, and which result in its sustainable competitive advantage. Those processes are unique, hard to copy\textsuperscript{14}, and cut across multiple units (function, business units, layers/levels, etc.). As such, they depend significantly on company culture and are not based on (but use) information systems. They are the result of a complex process of organizational learning and an accumulation of multiple teams’ learning, and as such are very difficult to manage, codify, or copy.
Core competencies can operate as levers since they are the center of the organization’s business model. As such, they should be the lenses through which the organization concentrates its efforts, and the required knowledge support, updates, reconfiguration of existing knowledge, etc. Being such a magnate for knowledge is a great advantage, but when the environment changes, or when the company may want to change its strategy significantly, this might be a huge burden. It is crucial to understand that managing existing core competencies and developing new competencies requires a different set of organizational skills and leadership to say the least (more on that later in this chapter).

**Top Management Support**

Top management support (or lack of) is crucial as in any other major organizational change or strategic initiative. It can create a powerful lever by providing the appropriate environment, e.g. budget, people, time, establishing appropriate performance indicators and reward systems, as well as providing the vision and leadership needed, as illustrated by the Fiat case.

In some cases, gaining top management support might not be easy, since KM might have a negative connotation, sound like another buzz word, or is seen as just another way IT is trying to increase their budget, by sneaking in a fancy technology. Since KM requires time, top management might see it as a significant drain on their attention and time, especially if the outcomes are not quantified. On the other hand, the Top Management Team might see KM as a tool for gaining control over labor, as it may allow for a better knowledge of what labor does (CRM allows more transparency of the performance of a sales person than end-of-month sales figures; GPS on a truck not only allows for better management of inventory but also lets you know what the driver does every second) and in this way allows for de-skilling of the human asset as well as lowering cost, etc.

Top management support is not static. The lenses through which the top executives test the value of KM are dynamic, and can be modified. One example of when the lens of KM will change will be due to government regulation, or when a government body like the FDA, introduces new legislation or a new standard. Another way to change the lens of KM and to gain support of top management is by aligning KM vision and mission with organizational vision and mission, which is why the goals are on top of our matrix.

Top management support, is not synonymous with control. Actually in the KM case they contradict. The more control you have, the less support you are showing, since KM requires the soft touch of management.

One word of caution, having strong top management support is crucial, but not sufficient. The role of middle management in KM is one of the least understood and studied aspects, even though it is clear that middle management plays a crucial role in successful implementation of both. For example, Bontis and J. Fitz-enz, (2002) found that middle management’s experience (tenure) had a positive impact on revenue and income growth. In other words, you will need to ensure the support and commitment of your middle management as well.
External Relationships

More and more companies depend on external sources of knowledge. As there is a greater need to react quickly to environmental issues and the ever-changing market, it becomes apparent that knowledge creation not only must be fostered from within, but companies should always be ready to discover additional external sources of knowledge. One variable in the equation is time. Although we have not explicitly quantified time within the knowledge creation process, it is evident that organizations are required to streamline this process. Knowledge creation can be a relatively slow process and one way to accelerate it is to utilize outside knowledge. There will be rare occasions when all the knowledge required by an organization will be available in one or few individuals and even then the cost of such knowledge can be relatively expensive. However, understanding what knowledge is required and how that knowledge can be used for a particular set of circumstances can greatly impact the time needed. For example, it can reduce the time-to-market of a new product or service.

It may seem contradictory to discuss the length of time it takes to create knowledge when discussing external relationships, but time is one of the primary factors that must be considered when analyzing the overall requirements for knowledge creation. Knowledge will be exchanged when external relationships are fostered. It is both an advantage and disadvantage depending on your perspective. However, the ultimate cost of knowledge loss or additional risk acquired, assuming it is a value to the organization, must be weighed against the perceived gain of creating knowledge at a faster pace than creating it from within, which is why more and more companies, even the larger and successful, use external sources of knowledge extensively.

Remember this is not a “cure all” and there are many obstacles that could inhibit the dissemination of knowledge from the resource that “owns” the knowledge. It will not be a one-to-one (knowledge to need) relationship but it can be a significant lever for advantage if managed correctly.

The Toyota-Formula One case provides many examples of external knowledge sources. It also provides examples of how collaboration with suppliers can result in an improved design of a new product as well as lower the cost of supply chain management. As you can see, these items are all inter-related and focusing on one aspect, although important, can take you away from the overall picture.

Some other issues to consider when discussing external relationships include utilizing customer relationships as a trigger for new product/service development. You can never assume that you have a complete understanding of the market and where it may be going. You must recognize that your customers may be telling you there is a need for a new product or service that you can provide. However, that need must be weighed against strategic direction as well as the ability to ramp up and bring the new product or service to market in a timely and cost efficient manner. Inherently, customers with intimate relationships will know if the product or service is something that is within your organization’s scope but decisions of that scope must be made by you, based on the strategic direction in which the organization is planning to move. Customers, like individuals are selfish and are only looking to their own needs and strategic direction. They will endeavor to push their agendas and the coercion of their requests may look like a lucrative niche.
is developing. The reality is that there may be a new market opening and you may have the knowledge to fill that need. However, if the direction is contrary to your organization’s strategic direction, there may be dire consequences when what seems like a good fit runs against the direction the organization is taking.

Acquiring knowledge from external resources may also allow for a recombination with internal knowledge and creating a new knowledge/product/service. Some capabilities are more relevant than others depending on the expected outcomes and strategies. For example, for exploitation purposes, strategic alliances and affiliation with Venture Capital might be more appropriate, while for exploration purposes embracing a broad scope of human capital skills supported by previously engaging in more challenging explorations might be more appropriate.  

Development of alliances and or joint ventures with one or more partners or participation with competitors in the development of industry standards or as part of a consortium is another way to acquire knowledge from external sources. The issue here is the transfer of knowledge to manage the relationships and understand what proprietary knowledge may be shared with others. If that knowledge is part of an organization’s competitive advantage or core competency, steps must be taken to ensure that the newly shared knowledge is leveraged and any strategic decisions made because of that knowledge are reviewed. In this case, a strategic decision may be compromised because proprietary knowledge is no longer contained within the organization’s domain.

All that is required to formalize the process of developing alliances is the capacity to develop and manage external relationships. This is more complex that it sounds, especially in the knowledge intensive context. For example, some of this participation may require signing a contract. In the context of developing new knowledge, writing the contract too early will be impossible; you will not know what knowledge outcome is possible and when. Even when the outcome uncertainty is reduced later on, customer expectations might not be clear enough to estimate value. But even if a signing a contract is not an issue, developing the relationships (taking risks of sharing exposing knowledge and opportunity costs) and managing the relationships have their risks and costs. One of these risks is being ‘locked’ into a “strong tie” relationship with a ‘wrong’ customer or supplier. Meaning, the customer was right at first, but when circumstances changed, they may turn out to be a wrong customer. Or, the supplier was appropriate for the first product line, but ‘wrong’ for a very different product line (see example in the Toyota-Formula One case below). In another words, one aspect of managing relationships, is to know when to disconnect/detached from a wrong partner, customer, or supplier, while one aspect of developing relationships is to write a contract that will allow for such detachment.

**Culture/Tolerance of Risk**

As in all things, there will be failures experienced as organizations work through the knowledge management strategy development and implementation processes. Indeed, many of the organizational failures experienced today could have their roots in KM. It must be remembered that building a culture or enhancing the present culture that will accept failure is of critical importance. As employees and partners see that the organization will accept failure, an implicit trust will be developed that will foster individual efforts to enhance internal knowledge. Much
of this reasoning is implicitly understood, but consider the differences between the quantification of knowledge and the quantification of, for example, a sales quota.

Just as setting sales quotas for individuals and groups is important to help drive business and forecast revenue, similar quotas should be set for knowledge creation. However, guidelines for not meeting the knowledge quota should be defined during the goal setting process. One problem that may be discovered is the quantification of the goal. Although these technical issues must be addressed, one important aspect to remember is that failure in one aspect of KM may not necessarily be a failure in another aspect of KM or business strategy. If a quota was set for a division to acquire a specific domain of knowledge and that goal was not reached, analysis is required to determine if any knowledge was created. Although the specific goal was not attained, different knowledge may have been created that will enhance the organization’s knowledge base, or, the business using external feedback, is communicating the possibility that such knowledge is not needed at this time.

These are not simple concepts to grasp at first but it should be remembered that knowledge creation is an active process and the creation of any knowledge requires active participation by all the parties involved. So as you look at the cultural aspects of accepting failure, you must also look at the willingness the organization has to accept and live with a moderate risk factor of not creating the knowledge it wants to create.

Like failure, risk is another factor that must be addressed. The amount of risk an organization is prepared to accept when dealing with KM should be consistent with the amount of risk the organization can culturally accept. You cannot expect an organization that is culturally risk-averse to be non-risk averse when dealing with knowledge issues. An organization that accepts a high level of risk will usually understand that the risk resulting from the interchange of knowledge with other entities is something they will live with based on the potential benefits that can be achieved later. Indeed, the high-risk taking companies that flourished during the internet boom seemed to thrive, not only on risk, but on sharing as much knowledge as possible in order to gain even the smallest competitive advantage. Of course as the companies matured and their knowledge base became solidified, the amount of knowledge risk they would accept changed because the paradigm governing knowledge of the organization changed from creators of technology (or new knowledge) to keepers of products (sustaining existing knowledge). In any case, as the recent economic crisis illustrated, most companies lack the ability to manage their risks and are not prepared for negative (e.g. black swans) or positive contingencies. From the KM perspective this is extremely risky today because of the shrinking knowledge life cycle, the accelerated pace of new knowledge developed causing both faster knowledge depreciation and a shorter half life of knowledge.

These issues did not emerge in a vacuum. Especially in the knowledge creation process, sharing knowledge must be rewarded and hoarding that knowledge should be penalized. At the macro level, consider the difference between Apple computer and Microsoft. Apple ‘hoarded’ its proprietary operation system while Microsoft “shared” its operating system and allowed it to be used on a variety of hardware platforms. Although both companies navigated the rough waters of the technology boom, from an operating system market share perspective, it is obvious that Microsoft is clearly dominant. If this argument is narrowed to a micro level, it is consistent that
the more knowledge is shared, the greater the possibilities available for benefiting from knowledge exchanged.

The final item on the subject of culture is the level of trust an organization is willing to put in its knowledge base. It is fair to say that any organization that is risk-averse and culturally “closed” will have a difficult time managing the knowledge creation process. Inherently, knowledge creation thrives on the ability to share, experiment, and fail. Creating knowledge is difficult but managing the creation and exploitation of that knowledge requires managers to grant a level of trust that may go counter to the culture of an organization and its constituent parts. The most impressive example of this is a playground of small children. They freely share knowledge, experiment, fail, and succeed. Rarely, if ever, does the child in the corner grow as much as the ones fully engaged with others.

**KM Processes and Capabilities**

Our experience also suggests that the following KM processes and capabilities (see Figure 2) should be considered: Communities of Practice, Product Domains, Functional Units, Project Teams, and Informal Networks/Clubs. Again, this is not a comprehensive list. Below we elaborate and illustrate some of the important aspects. What makes these processes and capabilities different from the levers (mentioned earlier) is that they are KM specific based and NOT organization wide based.

**Communities of practice**

McKinsey initially used an open market system to clean and validate the knowledge within their data systems within a community of practice; this was followed by creating a position of “practice coordinators”\(^{19}\). Every organization has these types of structures but because they are not formalized they do not get the recognition they deserve. By setting apart specific organizational units, possibly a microcosm of the organization or division, the company is allowing the area in question to focus on a specific domain. We see this all the time in companies that geographically separate divisions and departments into smaller, more manageable units. The difference is that when specialized individuals or groups are allowed to focus on specific responsibilities and work in peer groups, the knowledge sharing possibilities begin to grow internally.

People and teams in similar positions and similar disciplines begin to communicate for the common good and interpersonal relationships begin to emerge for the betterment of the organization as a whole and not for individual advancement. These relationships are less focused on specific goals and more on providing better means of doing business within a domain. As the network of these relationships grows, knowledge is shared on a variety of levels. Out of these “siloed” environments come best practices that are fostered by institutional experience and shared knowledge. Because the competitive nature of division vs. division is not in place, inter-relational knowledge sharing becomes the norm. Once different areas within an organization have more than a financial reason to share resources, the best resources in the organization can be put to work where they can be used to their best advantage. The end result is gaining and maintaining a strategic advantage because there is a common goal rather than
competitive in-fighting. Part of structuring an organization in this manner is the ability to create, maintain, and utilize a common set of tools that can be shared with others in similar situations. These tools may, by design, be position or discipline specific to enable the end users to accomplish their individual goals without changing the status quo of the organization. Similar networking structures, schemas, metadata, etc., all combine to provide an organic resolution to problems that cross functional lines and reduce the need for re-inventing the wheel every time a new project is undertaken.

**Product Domains**

Product domains are another area where knowledge is created, utilized, and maintained for the common good. There is great similarity between communities of practice and product domains. Consider these domains as somewhat smaller communities of practice but instead of encompassing knowledge at the macro level, products put limits on the macro view as they focus more sharply on the functional parts of the practice.

Product domains are still broad in their scope, but they are more narrowly focused than the practice level. Product domains may be comprised of one product or a number of products that work either independently or in concert to provide an output for the end user. They are also knowledge creation tools as individuals and teams develop, maintain, and support existing products.

Of course, how customer feedback is solicited will have a great impact on how new knowledge will be created within the organization. As the support mechanisms for the products are developed, internal structures must be developed to maintain and support the knowledge base that is required to sustain the organizational understanding of the domain. This is a broad concept and the next step down is the understanding of the functional units that are created to maintain the domains.

**Functional Units**

Functional units are created to support the product domains. They may grow organically out of need or they may be intentionally developed by organizations that have a strong strategic plan and direction. As you can imagine, these functional units are a level lower than Product Domains. These units, although not the lowest level we will discuss, can be considered the fundamental baseline for knowledge creation. These are however the lowest level at the formalized organizational structure. We do not discount knowledge creation at lower levels, in fact we have found that lower level knowledge creation can be a more significant factor but organizationally these levels are difficult, if not impossible to manage and informal low-level knowledge creation at the project team level should be brought to the functional level to enable more rapid dissemination throughout the organization.

Functional units are small enough to allow knowledge creation on a one-to-one basis and large enough to ensure diversity within the units to allow for a wide ranging environment for knowledge creation. The assumption regarding these units is that the same or similar work is being performed by groups or teams but within formalized structures, geographical boundaries
for example. Perhaps your organization provides consulting services and within the United States, the functional units are broken down geographically to better serve your customer base. Ideally, these functional units will incorporate best practices and the services provided will be formalized to a point where all the consultants have a standard way to provide the services. However, things happen and the unexpected always occurs.

These types of issues are, or certainly should be, the basis for any organization’s knowledge creation strategy. At the functional level, the knowledge created can easily be quantified and added to the knowledge base.

**Project Teams**

Project teams feed the Functional Units. The reason we exclude these teams from the formalized organizational levels is due to the transient nature of Project Teams. This is not to say that they don’t provide an excellent platform to create knowledge, but the dynamics involved in, do not create the atmosphere for a long term knowledge creation base. It must also be recognized that Project Teams could, and often do, provide a springboard for knowledge creation especially because they are constantly interacting with internal and external stakeholders. They are on the front lines and are doing the day-to-day work that allows knowledge to be shared and disseminated to other areas within the organization.

Because the nature of projects is short-term and finite, organizations cannot look to project teams to provide long-term knowledge creation. Since the knowledge created will be project specific, and knowledge sharing must be formalized within the functional units to analyze the knowledge and determine the most appropriate area for the knowledge to be utilized in. This is not to say that the knowledge created at the project level cannot be used to the advantage of the entire organization but transferring knowledge from a project team to an organization is complex, and as such the majority of the knowledge transferred is in the tacit format, embodied in employees, unless the organization created a specific mechanism for such transfer.

It is suggested that Project Teams be used as inter-disciplinary teams that work together to share the knowledge created and provide the basis for internal knowledge creation and for creating processes, either tacit or explicit, to develop knowledge. This will go a long way to establish a detailed knowledge base as well as to establish best practices that can be used for multiple project teams. We look at this as an informal knowledge creation process that becomes formalized as knowledge is shared and as formalized processes become the norm. It should also be remembered that as multiple project teams are sharing newly created knowledge and formalizing the project approach, the functional units will begin to see cohesive knowledge bases that can be utilized for ensuring consistency among multiple project teams.

**Informal Clubs and Networks**

Informal clubs are similar to project teams but with much less formality. We look at these clubs at the organizational level as similar to sub-conscious knowledge creation at the individual level. It is established that we create knowledge at the conscious and sub-conscious level. We have all had experiences where once we set aside a problem and stop actively trying to solve the problem
an epiphany occurs and suddenly we “know” the answer. Because of the informal nature of these clubs and the lack of formalized organizational structure, these clubs bring knowledge to the organization that is based on individuals who are dedicated to the process and have an intrinsic affinity to the process and to creating knowledge for that process.

The potential problem that may arise from these clubs is the lack of codification of knowledge created at this level. Since there is no formal structure to share knowledge between the clubs and project teams, any knowledge created may not be available to the organization at any level. Although this is an extreme case, we are confident that individuals who are drawn to these clubs will also bring that knowledge to their project teams. Therefore, although difficult to codify and quantify, knowledge created at these levels will eventually become available to the organization although it might take longer to manifest that knowledge.

If one looks at the social networking sites available to anyone with access to the internet, you can see the power of informal networks. However, do not be misled by the seemingly unstructured organization of these types of networks. There is much to be gained by individuals and teams that gather in this type of environment. The knowledge might not be easily codified and it value quantified and it is certainly based on the individual entity but there is a much to be gained from this type of interaction at both the individual and organizational levels.

**Systems**

Finally, you also want to add the systems you need to have in place to make the outcomes happen. Systems in our case are not limited to IS. We are suggesting of course to include KM/IS Architecture, but you also should consider the KM/IS Security Policies. Here is another example where the strategic dilemmas discussion (see chapter 7 in this book) will come back. But you have to be careful here. Just to have the systems in place might not be sufficient. For example, you might have the IS in place, and you also might collect the data that you need, BUT the data might not be valid or reliable. We have found more than once, that companies assume they have the valid and reliable data they need to support their decision makers, but are surprised badly when they put it to test. And even when they have the data, the data may not be available where and when needed because of security policies. Think about a sales person in the field collaborating online with a client at a third location, connecting with a mobile PDA and needing access to a secured data base, and you will begin to see the complexities.

**KM/IS Architecture**

It is fair to say that technology will become even more pervasive than it is today. Organizations must be diligent to understand that without information systems, knowledge management systems are useless. Every day the workforce grows more and more reliant on computers and communication networks to access their workday needs. If the IT infrastructure and systems are not built along with the knowledge base that an organization is looking to expand and foster, the process will be doomed to failure.

What these systems will look like and how they will be accessed in the future is almost anyone’s guess. What is clear is that a knowledge repository is not a collection of documents. It has to be
an easy to use intuitive set of tools that can quickly allow someone to create the knowledge they need to complete the tasks assigned. In addition, it must also allow for the analysis of how something was done and if the results were satisfactory. The fast growing importance of analytics as a business intelligence tool is just one illustration of the trend (see below).

Knowledge Embedded in Systems

So if connecting the dots is difficult, even having events and reward policies (for example) is not enough, since the organization is spread in multiple locations, across time zones, etc. Can KBS systems and policies help? Sometimes it might. For example, a mix of knowledge capturing structured interviews, with a mind mapping technique (and data aggregation and interrogation engine software-Crossbow) to capture the knowledge visually is described by Nousala et al, 2005\(^2\). Such interviews not only capture the knowledge (to a degree of course) but also might precondition the individual to share their knowledge later, at the appropriate time (of course if the right reward system is present).

KM/IS Security Policies and Reporting Systems

As mentioned in the sections above, the transfer of knowledge could/should be free flowing in the appropriate cultural environment. Organizations must put some security constraints on the transfer and sharing of knowledge but this is a very difficult aspect to manage. If the security restrictions are too stringent and do not allow for the sharing of knowledge both internally and externally then the company creates the possibility of becoming too insular and defeating many of its goals before they can be achieved. The same is true for KM systems within the IS infrastructure. If accessing data is difficult, cumbersome, or restrictive due to security policies, people will not use the systems. The difficulty is managing what is available against what can be disseminated to individuals outside the organization. If the systems are too secretive, individuals will create their own domains and the organization will have created multiple KM domains with no inter-relationships. The knowledge will not be shared because the barriers for sharing are too high.

Reporting is similar but has at least one additional facet, it must be relevant. Of course before that question can be answered, an analysis of what is being reported must be addressed. Just like a financial database, a knowledge database will have a wide variety of data but that data may or may not be useful depending on the structure and audience. If an organization is only interested in the quantification of knowledge then the reporting will go in one direction. If it is interested in providing the reporting as a means to create additional knowledge then reporting will go in another direction. Regardless of the direction, the organization must tie the reporting to the security policies to ensure that the entities that need the data can access it in a useable and secure format.

Business Intelligence and Analytics

Business intelligence in this context deals with the knowledge and data on the interface/boundary of the organization. Focusing on the KM aspect, the knowledge should help the organization to understand and respond better to its customers, end users and suppliers as well as better manage
its competition (current and potential) and its macro-environment. Any system that is the repository of data requires that the data be available in a number of forms to serve multiple heterogeneous users, for applications not always anticipated in advance. Understanding the basics of the business and the data that is housed within its systems is the beginning of understanding what the business needs, as output, in order to prosper.

Business intelligence isn’t a knowledge creation function; on the contrary, it is an output of the knowledge creation process. As long as systems are in place to capture organizational data, there will be a need to formalize that data into specific outputs that enhance the business process. It is critical here to understand the business process and how it has changed in the past along with the expectations of changes in the future. It makes no sense to create output that is mired in historical attitudes and formats. Outputs are essential but they must be designed so all potential users can understand the value of the output as well as have access to it. In today’s decentralized environment, paper reports are quickly becoming obsolete but we really don’t know what form the next generation of output will have. It may be a web site generated knowledge or based on internal algorithms specific to sub-sets of data within a data warehouse. We just don’t know. However we must be aware that output must be channeled to users in a fashion that is realistic, timely, and useable. Some of that is depicted by systems, what some people call Analytics but the most complex and fuzzy aspects of business intelligence are still managed tacitly by organizations, which is why it is critical to allow for flexibility in outputs to accommodate currently unknowable future needs.

*How to use Levers, Processes and Systems (LPS) to achieve the goals*

Now we need to tie the Levers, Processes and Systems to the goals and how to achieve them.

Be sure to consider a number of alternatives, before deciding finally on the goals you like. Remember, the decisions you make here are not set in stone. Once you begin to move forward you must constantly review your decision and determine if what you want to achieve is a valid outcome of what you are doing.

It is a very complex task to reflect on all the Levers, Processes and System that should be part of the design process but such a reflection should be addressed on a regular basis. It is a simple matter to get off track because of a business necessity or market forces that steer you away from the matter at hand. You have to remember that these are long term goals and it may take a very long time for them to be achieved. However, focus must be placed on the process. This will be something that requires constant attention and should have a significant place in the status reporting of the organization. For example, the economic crisis that started to develop in late 2007 with the decline of the housing market would have to be analyzed in conjunction with the other Levers, Processes, and Systems to determine how to proceed based on your original goals. To be specific, let’s assume that your organization made the decision to purchase a new Human Resources system but economic factors delayed or cancelled the project. The conditions surrounding the Process and Systems involved with the delay/cancellation would have to be analyzed based on the goals that were part of the reasons to purchase the new system.
Simply because you have created a set of goals you cannot forget that all the variables that went into the decision making process must be addresses on a continual basis. You have to be in the position to understand the current situation and factor in any changes from when you made the initial decision. Based on that, a re-assessment of all the Levers, Processes, and Systems has to be an on-going process to remain on course and account for any circumstances that will impact the final goals.

There is a holistic element to tying the LPS together as a cohesive unit. The critical aspect is ensuring that the three work in tandem and do not contradict or interfere one with another. This is a highly complex balancing act because these elements are constantly changing and the relationship and balance between them might be shifting. Even a slight, almost non-existent shift may have undue consequences on the other factors. Another aspect to remember is the need to tie the goals and LPS to capabilities and competencies (see Figure 3). Your KM strategy needs to support the short-, mid- and long-term goals of the organization (see Figure 5 in chapter 1).

There is one additional reason for your KM strategy to be cohesive and that is support for the building of internal capabilities and competencies. Although the process may seem overly complicated, if these items are not considered and addressed, your organization will have a very difficult time creating the necessary tools to become a knowledge-based entity. Further, if these items are not addressed and there is a modicum of success from the process, that process will be replicated and the amount of work that is put into creating knowledge will be inconsistent with the relatively meager results.

You also must allow for some ambidexterity here, meaning, create a variety of capabilities, levers, etc. so if the external environment requires resources that are not in your core, you still will be able to acquire them in a timely fashion with minimal effort.

**KM Strategy**

Now you should create your KM strategy and put it in place. This should be done by matching your goals with the levers, processes and systems. Following that, you will develop an action plan and match that to your resources and constraints.

Here are some ideas you may want to think about. The current business environment is extremely volatile and creates paradoxical, contradictory forces on any organization. For one, change is not the only constant; it is the increasing pace of change that is constant. Next, organizations need to be able to respond to conflicting pressures, for example centripetal and centrifugal competing forces, or the need to attract young, Y-generation employees while still being attractive to older and “not retiring any time soon” older employees. So, how can the company have a strategy responding to such environment, or what Stacey (1992) identified as the need for strategic decision making when the future is unknowable. His advice was to use outcomes and feedback to detect the environment, not only to control for the effectiveness of the strategy. He also recommended for the organization to strive for being in the most innovative state, which is bounded instability that should allow the organization to determine its own future, which is what others called the Blue Ocean Strategy. Others suggested that organizations...
should create such an innovative capacity by increasing their action’s requisite variety\textsuperscript{26} and increasing their anticipatory memory\textsuperscript{27}, as well as using indicators for developing anticipatory, positive, non-linear (but within limits) feedback mechanisms. We would strongly recommend also to develop your human capital, even though we don’t know how to measure it, and reward them appropriately and consistently with your goals, all the while being open to good and bad surprises (Black Swans\textsuperscript{28} and others).

There is very little more we can add here. For one, check chapter 7 for strategic choices you can make. Also, since your strategy will be (hopefully) unique to you, you will have to figure out how to match your goals while using the LPS to achieve them. There is no cookie cutter solution for that, sorry ☹️.

Next you have to think about implementation and communication.

The most effective way to address these issues is to be open minded about not only what you are doing but the results you expect to achieve. This is consistent with what we have studied and the outcomes lend themselves to an open discourse about how the implementation should be completed as well as how the communications process should be managed. As with everything, the platform and the content used to disseminate the data should be geared toward the user. How they are going to use the data is the important aspect, not the form the data takes. However, it should be noted that the data should be controlled in some sort of repository, a data warehouse for example, and that might be a determining factor in how the final data is presented and utilized.

**KM Constraints and Resources**

The obvious constraints are the current resources that you have, and/or that are available for any initiative, project, activity, etc. Budget, time, and staff are major among them, and like in any strategic planning or thinking you must take them into consideration in your planning process.

But this will not suffice.

Basically, any existing levers can be a constraint due to limited availability or due to a change in circumstances/conditions. For example, your current culture, norms and leadership (support, commitment) are constraints. Your current IS/KB systems are constraints. Your current policies, procedures, etc. are constraints. Your current capabilities and people skills (or lack of) are constraints. You must take them all into account and consideration in your planning process.

Also, like in any major change initiative, internal politics must be taken into account and addressed. Organizationally, you must take a critical look at where you want to go with the understanding that the journey must be mapped out based on how the organization works. Analysis must be done to evaluate where the roadblocks will come from and how the organization will be able to navigate around any unforeseen problems. Is the commitment from management there? Will funding be cut off in the future? We invite you to review the Toyota-Formula One case and see the issues they faced and what they did to overcome obstacles.
This can be a difficult exercise but it is required preparation to give you an understanding of how you will manage the process going forward. In some areas you will succeed and in others you will fail. However, failure should not be looked at as defeat, it is a learning experience so you can gain the knowledge required to make furthers attempts successful.

Early research in KM suggested that time (and not money) is the major constraint people face in their jobs. So, smart KM companies allow their employees 10-15% of their weekly hours to use for whatever they choose. This may seem counter intuitive, but if you look at the way the workforce has changed in the last 20 years, you can see that managing time efficiently is no longer the driving force behind work. When most jobs were based on an assembly line of some sort, it was relatively easy to understand the relationship between workers (time) and output (product). A factory manager needed only to know how many workers it took doing a week’s work to produce x number of widgets. Based on orders and forecasts, staffing the correct number of workers was a fairly simple process. Of course this did not leave any time for the workers to learn anything more than the job they were assigned. There was no need for a line worker to understand the marketing strategies of the company since there was no correlation between those functions. In today’s environment, it is fair to say that Apple could never have gotten the iPod to market with that type of mindset.

Learning and training (new knowledge development) is one of the first things that companies cut when economic downturn occurs. This is because they do not have a solid, valid set of tools for quantifying the value of ROI on human capital development. Imagine when times are most difficult and companies are trying to get the most out of every dollar, they begin cutting the very essence of their future. However, it is not a difficult call to make for a CEO. They have fiduciary responsibilities to the shareholders and maintaining the status quo will, it is hoped, allow them to maintain pre-defined levels of output and quality. The problem is that once the cycle starts to ramp back up, they are not in a position to learn from the mistakes they might have made. They are in a position where a decision has to be made to either move forward with training and new knowledge development or they can, if their business model allows for it, become a commodity producer in the market. Most companies are somewhere in the middle and are in a constant state of flux with relation to their new knowledge creation. It is very similar to the yo-yo diet effect and like that, without any clear direction, knowledge creation takes a back seat and there is no great material gain or loss. However, in the long term, these companies are doomed to fail because the failure of companies to create critical new knowledge and/or maintain existing knowledge and disseminate it throughout the workforce creates an environment where the status quo is the only goal, at best.

**Action Plans and Planning Constraints and Resources**

Now you are ready for the next step and reality check (see Figure 1). You will now list the specific steps/action plans as well as the all the resources needed for the strategy to happen, and all the constraints you will be facing when implementing it. Again, here, the devil is in the details. The more specific you are and the better and accurate your data and planning is, the higher the probability that you will be able to accomplish your goals. We have found
(unfortunately) that in many cases management is clueless about the details needed for such planning, but at the same time they are not willing to involve the people at the bottom of the ladder that have the knowledge needed for such detailed planning.

That is not to say that this is an exercise that will go unnoticed. At this point it is vital to bring in resources at all levels to ensure that you can actually perform the steps/activities based on the game plan and achieve the goals you have formalized. Management must realize that this cannot be done in an ivory tower and disseminated top-down to the employees like another policy. If you look at the thought process behind the structured process we have provided, it is imperative to ensure all the appropriate people are in place to formalize the process and provide the necessary input that allows management to make the correct decisions.

If you go through this process assuming that the management team has all the knowledge to set the correct goals you may be misguided. No select group of individuals can possess all the knowledge needed to drive this process forward. The premise we use is to bring in as many different opinions as we can to detail the activities, to identify the resources needed, as well as the constraints, and to establish the correct goals. Once this is done, you are well on your way to providing a roadmap that has an excellent chance of success.

An integral part of the process is creating a Risk Analysis that encompasses the resources, constraints, and goals. Specifically, a major risk in this type of environment is to understand that the major players are constituents in the process and losing any of them might adversely affect the KM proposition as a whole. It must be remembered that the people in the forefront have already created a vast amount of knowledge and the management may not understand the level of expertise these people bring to the process. Conversely, losing one or two key players in the process can adversely impact the KM implementation process timeline but if the participants have been utilizing the structured approach we outlined, the amount of organizational knowledge or in this case team knowledge, will more than compensate for the loss of individual participants as long as there is a strategy for transferring the team knowledge to the new participants.

Although at this point there is much to be said for keeping individuals within the process, it is also important to understand the importance of reviewing risks associated with the defined constraints. Since business is a fluid process, constraints will change throughout the KM strategy formulation and implementation lifecycle and these must be addressed on a periodic basis as the process moves forward. Do not discount the possible ramifications of addressing this step. It is of critical importance that the risks be updated so all possible scenarios can be analyzed. Look at the recent financial crisis where real estate values plummeted substantially and an organization was funding a number of initiatives based on the relative values of that real estate, a 20% or 30% devaluation of the company’s assets could have an adverse effect on the funding available for the KM initiative. Although it would be difficult for most organizations to forecast that type of event and add it to their risk scenarios, it is an example where constant re-evaluation of all constraints, not just the ones that have a direct impact, is vital to the long term success of the KM initiative.
Managing core competencies

Now you are ready for the big picture. We will now connect the concept of core competencies and the KM strategy to indicators and to other traditional tools for strategic thinking. There are a couple of reasons for this, but the most important one is that we know from our experience that companies have a very difficult time knowing how to manage their core competencies. They also have no clue how to develop new ones when they are needed (for example Sony\textsuperscript{30}) or when they are restructuring (for example Thomson-France\textsuperscript{31}), or when they have a need to use them in another product/market (Dell). So here is a framework that might just help (see Figure 3).
Figure 3: KM Strategic Framework – the big picture
Core Competencies (CC), is a sound academic construct that makes sense for management intuitively, but we found it extremely difficult to put to use as a rigorous, formalized process that can be used effectively and efficiently by management. We found examples to be helpful in explaining the concepts, but it is almost impossible to get management to truly comprehend it and more than that, to put it to use. Most interestingly, even when a company developed a competency at one point in time, when they need to change it, or when they need to “re-engineer” it, they have no clue how to do that. Which would suggest to us, then, rather than referring to the development of the competency in the first place, we should refer to it as stumbled into it?

The framework described in Figure 3 builds on the original work of Roos and Roos (1997) but adds building blocks as well as identifies which aspects in the environment of the organization have stronger impact on which components of the framework.

First the basic framework; there are couple of reasons for the arrangement (from left to right in Fig. 9.3) KSF-KMS-KSI-CC-KB in this order. From the right, we are consistent with Fig. 1.2 or with the need for the KB to support CC resulting in KSI. From the left we need the external environment to have an effect on the KM strategy, which will also result in KSI, hopefully the same indicators and outcome, as mentioned earlier. Now obviously, there is a KB-KM strategy relationship, but separating them is intentional, since we do not want to limit the KM strategy to our own KB. We want to allow for strategies that utilize external sources of knowledge (see CLEEP, in chapter 7) as from acquisitions or open sources, as mentioned also earlier in this chapter.

We start again with the outcomes. On one hand we identify the KSF that we need to have (resulting from the industry you are in) within our context to get to them, and we identify the business strategy that will provide for them. On the other hand, we identify the core competencies, activities, processes we need to have to arrive to them and we identify the knowledge base and the KM strategy that will get us there. Please note that there are a number of internal forces here you need to take into account, such as, culture and leadership; and external forces, such as industry’s “rules of the game”. By the end of the day, it is the implementation that makes the difference, and that causes the achievement of the expected outcomes. Why is this framework different? First it requires to “spelling out the guts” of the competency. What specific activities, and processes you have (or need to have) in place for this competency to work. Second, it is framed by outcomes and knowledge bases, which will make this connection explicit, and also will allow you to verify that indeed you have the “right” competency in place. And lastly it will connect it both to your strategy and to your industry, again explicitly, so you can verify that the connections, relationships and ties make sense.

You will also notice that the SWOT factors are placed in specific positions to help illustrate where in the process they come into play. Opportunities and Threats directly influence Key Success Factors and KM Strategy. In a similar fashion, Strengths and Weaknesses are directly influence Core Competencies and the company’s Knowledge Base. We attempted to place the analysis factors with the most direct influence on the areas that they are impacting. As you move to the bottom of Fig. 9.3 you see the relationship come full circle as, for example, Strengths and Weaknesses influence Core Competencies and the Knowledge base in a direct relationship and
that directly influences Culture and the corporate KM Strategy. All of these factors have a vertical influence from top to bottom but they also influence the other items in the framework as you move from side to side. There are no stand alone items in the framework. Everything has some influence on other items. The difference is how directly the items are influenced.

**KM Outcomes**

Outcomes should be consistent with goals, so our discussion in chapter 1 and in this chapter (goals) should cover that, but keeping the 80/20 rule in mind as well as surprises, we must allow for new learning to happen, meaning we must be able to account for some unplanned outcomes to create value. Even in continually updated plans, the unexpected can (and will) happen, with both positive and negative results and/or consequences.

This also may encourage your organization to experiment and to be open to the unexpected, or re-invent itself partially, or completely. What we are really saying here is that there will always be new and unexpected events that will require you to re-think, re-do, and even re-invent what has already transpired. Knowledge is vibrant and multifaceted but more importantly, knowledge is dynamic. The factors we have defined as influencing knowledge are a sub-set of all the factors that directly influence the knowledge creation process. This sub-set has specific meaning in the business environment and provides a guide to maneuver through the knowledge creation process.

As we have discussed, the process is complex and there are no simple answers. In fact, you may be surprised by some of the answers you will get throughout the process. It is a simple thing to say that organizationally, you want to make changes and start moving toward a knowledge-based organization, however actually making that change involves considerable work and buy-in at all levels of the organization.

We have said that it is critical to review the process and the specific steps within the process on a continual basis and that is also true of reviewing the outcomes. An interesting exercise to perform is, when the process is complete, look back at the initial drivers that led to the decision to go forward with a KM initiative and look at the differences between what was accomplished and the expectations. You will see that the initial expectations, at a high level, have not changed that much because the vision is supported by the process. However, as you look into the specifics of the process, we are sure that you will find many of your initial assumptions were incorrect and that the process required you to make more changes than you thought you would have to, because of the dynamics of the process.

Don’t be surprised by this. It is not inconsistent with the knowledge creation process. We all make internal assumptions and try to fit our world view into those assumptions. The process simply allows you to take an objective look at the assumptions and fit them into the business process to create value. The journey is long and hard but the benefits speak for themselves.
KM Controls (closing the loops)

Now that the process has come to a close and the KM strategy development initiative is over, you cannot stop. Maintenance is critical to ensure the process continues and provides for learning and knowledge creation on an ongoing basis. To do that, controls have to be established and stakeholders and other interested parties should be brought into discussions regarding the organization’s vision, mission, and goals. Consistent with this, the strategy, levers, and constraints of the KM initiative should be reviewed on a periodic basis to ensure the baseline has not changed. These controls will allow the organization to completely understand the implications of both internal and external factors that impact how business is done and the external environment. This is actually a mini KM initiative with one difference: since most of the hard work has already been done, this simply keeps everything that has been accomplished on track.

Another way to view this is to understand that once a KM initiative has been completed, especially a successful one, it can quickly become a model for other areas within the organization. By maintaining controls, the newer initiatives will have a great advantage over the previous ones as the process becomes defined and the errors made in earlier attempts become laboratories for new learning and knowledge creation.

We need to add here one additional aspect, and this is the question of the self identity of the organization. In our research and consulting we found that in more and more cases, one of the stumbling blocks or barriers for change, or for understanding the environment, is the definition of self identity. Organizations take their old identity for granted so much that they never realize how this is limiting their strategic options and alternative futures. So, to summarize, be sure that you are aware of this issue, and allow yourself to question the need for change as part of your control, closing the loop process.

Finally, below, you find a case describing how a very successful company, despite being a world leader as a learning organization, had difficulty with transferring its core competency to a very different product market, and how its definition of self identity and early successes are limiting its ability to succeed in an environment foreign to them.
Toyota and Formula One

Toyota: celebrated ‘best world manufacturer’, a global model of exemplary efficient and effective management of resources (both material and human). Formula One: the world’s greatest expression of car technology brought to the extreme level of research & development, tested on the most challenging tracks in the world and a powerful global marketing tool. The match between Toyota and Formula One makes a lot of sense on both technological and marketing fronts. This is why Toyota has “spent more than 20 billion yen ($170 million) a year competing in Formula One races since its entry in 2002, for a cumulative total of over $1 billion in 2007.”

Through Formula One the Japanese company competes with many of the key manufacturers it has aggressively and successfully challenged in the global car market: BMW, Ferrari (Fiat), Honda, Mercedes, Renault (Nissan). Unfortunately the successes in the marketplace have not been matched by the results of the Toyota Formula One (www.toyota-f1.com) team to date: no wins, a handful of podium finishes, only one pole position on the starting grid and many frustrating and humiliating experiences (even on the home track in Suzuka, Japan owned by Toyota itself!).

Over six years of trying; over $1 billion spent (Toyota Formula One yearly overall budget equals, some say exceeds, that of the top winning teams Ferrari and McLaren-Mercedes); the top engineering, technical and driving expertise money can buy yet few results to show for it and little progress year after year. The top management of the company in Japan’s headquarters has been increasingly under pressure either to come up with results or quit the Formula One program altogether. Why is this happening? What is Toyota doing wrong?

Many Formula One insiders are very skeptical that Toyota Formula One will be able to succeed any time soon. The key reason for this skepticism is related to the roots of the company’s Formula One program and the way Toyota has been managing and developing knowledge in the unique, fast paced, ever changing Formula One environment. Let’s analyze these issues further.

Formula One historically has been an European centered sport in terms of component manufacturers, team locations (the sport rules require each participating team to design and manufacture its own original chassis, the engine can be manufactured or purchased from a different manufacturer) and tracks. For these reasons Toyota realized that Formula One operations could not be based in Japan, they had to be based in Europe. They decided to utilize the facilities and expertise of the Toyota Team Europe, which was set up and managed by the Swedish former rally driver Ove Andersson. Andersson founded the team (originally named Andersson Motorsport) in Cologne, Germany in the early 1970s and has been very competitive in the World Rally Championship ever since. In 1993 Toyota decided to purchase the team in order to further affirm the racing competitiveness of its cars on a global scale (the Rally World Championship features cars based upon commercial models). Toyota Team Europe was made up of 300 professionals coming from 17 nations. In 1997 it became the first motorsport business to be awarded the ISO 9001 label for the quality of its operations. Thanks to Andersson’s work Toyota won the Rally World Championship as manufacturer in 1990-91-92-93-94-98 and 1999. These successes and the high level of professionalism and determination shown by Andersson
and his people convinced Toyota headquarters to stop the Rally program and utilize the facilities and people in Cologne to enter the Formula One program. In 1999 Toyota headquarters officially presented their plans to begin competing in Formula One at the start of the 2002 racing season as engine and chassis manufacturer, developed and managed by its own team. The proper budget was set in order to involve Formula One experienced engineers and technical personnel, who left their positions at top Formula One teams lured by lavish compensation and the ambitious plans of the Japanese manufacturer famous for the reliability of its cars. They trusted Toyota not to jeopardize the worldwide reputation it had built with Formula One failures.

Since the beginning of the Formula One project in Cologne, Toyota aimed to make the sport headlines for its efficient organization based upon its very own celebrated Toyota Way. It prided itself on the multicultural origins of its people (more than 20 countries represented) managed the “Japanese way” with “German discipline” and aided by sophisticated operations management “American software”. The software helped to gear operations toward a Business Service Model (BSM) allowing for an overall integrated (End-to-End) vision of the manufacturing, testing and racing processes. Within this model all of the processes are integrated upon the improvement and feedback of the end user (for this specific case, the drivers detailed technical feedback from the track which is crucial for effective car development). On paper it is a flow of information and actions that are supposed to, at least, keep the pace (if not lead) in the rapid technological changes in Formula One where a three month old component is often already technologically obsolete.

Theoretically the organizational model should work but the results on the track have been disappointing given the amount of resources and expertise invested in the project. Since 2002 the team has changed many drivers (ruining in the process the career of at least a couple of them who had, until their arrival in Cologne, shown substantial racing and testing skills), it has changed several lead designers (one every year, by average) and it has also changed the top management: Ove Andersson (recently deceased in a vintage rally crash in South Africa) was sidelined from his lead role in 2003 due to the lack of results (officially he retired and remained linked to the team as a consultant). He was replaced by John Howett, former VP of Marketing and Sales for Lexus, who was supported by Japanese executives focusing on day-to-day and strategic operations. Many changes were made, but still no concrete and consistent results were realized.

Formula One insiders link the lack of results to two key aspects: the location of the team operations in Cologne and the lack of a step-by-step technical development continuity. Cologne is an issue because traditionally, Formula One manufacturers of both engines and chassis, have been located in Surrey (South East England) and specifically in areas such as Woking and Guildford (the World Championship started in 1950). Through the decades those areas have hosted small and midsize companies specialized in developing Formula One components and able to keep up with and stimulate the many technological changes (for example the shift from metals to carbon fiber materials). In order to tap into this knowledge base and expertise many Formula One teams have been founded and still are located in this area and even Formula One newcomers have bought-out teams located here (for example the current official Honda Formula One was founded years ago by purchasing the 1970s World Champion Tyrrell team). There are some successful exceptions like Ferrari, located in Maranello, Italy or the former Sauber team
(now BMW-Sauber) located in Hinwill, close to Zurich in Switzerland. It should be noted that through the years both teams have had active technological links with England. For example Ferrari, during the late 1980s and early 1990s, implemented a technological design and aerodynamics center in Guilford, England directed by the then top Formula One designer, John Barnard. Barnard agreed to leave his employer (several times World Champion McLaren team) and work for Ferrari only if the Italian company was willing to finance the center. This was certainly a radical change for the Italian manufacturer always proud to point out that everything in a Ferrari Formula One car was ‘Made in Maranello’ (Ferrari’s historical headquarters are close to Modena). According to Barnard, it was not going to be possible to design and manufacture a winning Formula One chassis without tapping into the know-how and skills present in England. Ferrari Formula One wins in 1990 and 1991 (after almost a decade of struggling performances) proved him right even if political tensions within Ferrari eventually lead Barnard to leave the company and the Guilford center to be closed. The Toyota Formula One team has missed out on this knowledge base. They felt empowered by the Rally World Championship successes and by the far reaching knowledge base of Toyota. Knowledge and work methodology that have been proven over and over to be effective in making commercial cars yet the results at hand were not fully suitable for the nimble (compared to the global Toyota operations) but constantly changing Formula One world.

The location has not been the only contributing factor to the lack of success. The other key contributing factor has been the talent base on which the team was founded and the way that such talent has been managed ever since. During the last 25 years Toyota has been the only manufacturer to begin Formula One operations starting from zero, in other words without buying-out existing Formula One teams (Mercedes, Honda, BMW have all done that). The purchased teams were on a competitive downslide caused by lack of funds or by the fading inspiration and determination of aging visionary founders. Still, all of them had a knowledge base (in terms of people, infrastructure, tools and experiences) upon which to build renewed, better funded and better focused operations. For example the current successes of Mercedes (purchasing the historic McLaren team) and BMW (purchasing the small but experienced Sauber team) were dependent upon these factors.

Toyota Formula One has tried to compensate for this initial lack of specific technological know-how (involving design and engineering for both chassis and engines) and organizational know-how (involving the most efficient and effective way to obtain the best performance on track) by hiring experienced professionals. Yet the lack of results has caused the Japanese top management to keep changing the lead chassis engineers hoping to find better results. This has caused a lack of continuity in development of the knowledge base. Every new lead chassis engineer has chosen to start the overall design project almost anew, often taking into little consideration the expertise developed by the team until then. It is to note that instead on the engine side (lead since 1999 by the Italian engineer Luca Marmorini, a former Ferrari Formula One team professional) the step-by-step continuity has built upon technical advances over the years and the Toyota Formula One engine has been rated one of the most dependable and powerful ones over the last few years, an engine so effective as to place the Williams chassis manufacturer and team, that has been utilizing the Japanese engine during the last two seasons, quite often ahead of the official all Toyota team.
These days, more than ever, winning in Formula One is a matter of technological effectiveness matched by organizational efficiency. Formula One has become one of the most challenging technological and organizational arenas not only in competitive motor sports but also in terms of the overall competitive global industry. Present and future successes in the sport depend upon specific expertise that cannot be improvised nor artificially acquired. Real experience with all its successes and failures is needed.

Only time will tell if Toyota will have the patience, bureaucratic and political inner dynamics, and resources to fill the knowledge base gap it has started its Formula One operations with and to implement a real overall step-by-step incremental approach, season after season, to making a more consistently performing and dependable car. To many Formula One fans its global image depends upon this.

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