The challenge of adaptation through innovation based on the quality of the innovation process

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For most firms competing in the global economy, the urgent message in our time is to innovate and adapt or face the prospect of extinction. To respond to this challenge, their management is called upon to evaluate the quality of each firm’s innovation process. This can be measured by the amount of new revenues and profits it generates, by the speed of introducing new innovations to the marketplace and by well-planned initiatives to reduce their ecological footprint. In recent years we have witnessed a dramatic decline in a business firm’s expected lifetime. A dramatic drop from 40–45 years in 1990 to 18 years in 2008 has been attributed to the continually increasing rate of change in the business environment. More recently, the significant pressures for firms to adapt have been reinforced by the impact of the 2008–2009 global economic crisis causing even role model firms such as General Motors, Sony and Toyota to sustain huge financial losses. In this new setting with ongoing shifts in customer preferences in developed and developing economies, innovation has been replacing quality as the main source of competitive advantage. The needed adaptation to a changing business landscape can occur only through successful innovations for new products or processes, innovations for more effective business models and innovations for new leadership styles and organisational structures. Despite a widespread acceptance of innovation’s importance by the leadership of most companies, as recorded in recent executive surveys, there is a general dissatisfaction with the results realised from their innovation investments. Managing the quality of the innovation process for survival and excellence in adaptation requires a systemic view of the innovation process, using a balanced set of innovation metrics which inform and enable managers to make desirable interventions on the stages of the innovation value-chain.

Keywords: customer preference shifts; adaptation; innovation process; innovation metrics; innovation value-chain balance; innovation leadership tasks

Introduction

In the present environment of a global economy, the strategic objective for most business firms has been that of growth, i.e. the increase in revenues and shareholder profits.

This growth in a stable environment could be generated by improving a firm’s total productivity to reduce costs and improve the quality of its products and services to stimulate greater demand. Achieving these goals has been made much easier since the 1970s by the systematic use of the methods of total quality management (TQM) and lean management.

However, in a continually changing business landscape, especially after the great shock of the 2008–2009 global economic crisis, the approach to achieve the desired revenue growth could no longer be those used in the past. In the post-war period, the pursuit of excellence in the quality of products and processes was responsible for the...
Japanese manufacturing miracle which made Japan the world’s second biggest economy. In our time, product and process quality has become only the admission ticket to an emerging new global competitive arena. Similarly, productivity, which for many nations has been a top priority in the post-war era, is now just a prerequisite to attain acceptable cost levels to compete with differentiation strategies.

In the early part of this decade, the average revenue growth rate expected for companies in the S&P 500, as reflected in their stock prices, was initially set at 12% (Zook, 2004). However, the actual growth rate of the same firms has been much less than the US GNP growth rate. In fact only 13% of companies actually achieve this modest rate. Let us suppose that for a five-year planning horizon, a company sets a target level of revenues that corresponds to the target growth rate, as shown in Figure 1.

The desired target level for revenue growth can be expected to be met from three anticipated revenue streams related to (1) a base revenue from existing products, (2) a revenue related to market expansion, (3) a revenue anticipated from new products already in the pipeline. For most firms the key issue has been how the remainder revenue growth gap will be realised? In the context of a global economy, the answer is through innovation!

Peter Drucker first recognised in 1985 that the world economy had entered an era of discontinuity for which he proposed innovation as the unique approach to survive the ensuing complexities and uncertainties (Drucker, 1985). Gary Hamel more recently also identified innovation as the key core competence for success, stating that without it companies die (Hamel, 2007). Thus, as conditions in the business landscape shift from a state of continuity, typical of the industrial era, to a state of discontinuity, witnessed since the mid-1980s, the focus of quality has also shifted from product and process quality to the quality of innovation as a core competence (Hagel, 2007) and the quality of an organisation’s fitness to its emerging environment (see Figure 2).

For most firms competing in the global economy, innovation, according to several surveys, ranks among the top three priorities in their strategic agenda.

* Zook, Chris, Beyond the Core, HBP, 2004

Figure 1. Relentless market pressure for business revenue growth.
However, despite the widespread acceptance of innovation’s importance, the leadership in most firms expresses a general dissatisfaction with the results from innovation investments. A recent Boston Consulting Group annual survey has found that less than half of the executives surveyed are satisfied with the return they realise from innovation investments and this percentage has declined from 52% in 2006 to 46% in 2007 and 43% in 2008 (Boston Consulting Group 2007, 2008).

**Approaches for building the quality of innovation process**

Improving the quality of the innovation process requires that we manage it as a core process, in the same way successful companies manage their finances and the quality in products or services. *In fact, the secret of success with innovation is to institutionalise it, in the same way it was done with quality when implementing TQM.*

In general, organisations can improve the quality of their innovation process by doing one or more of the following:

1. Strengthening innovation capability factors, related to leadership, process and finance,
2. Developing good innovation metrics,
3. Balancing the innovation pipeline flow through needed interventions, and
4. Striving to develop and maintain a healthy innovation culture.

**Strengthening the innovation capability factors**

A firm can be truly effective by addressing simultaneously all the key innovation capability factors. These include leadership, people, culture and its infrastructure systems.
For this we require the careful analysis of all aspects of the innovation system, i.e. the outputs, the inputs and the innovation process itself, as shown in Figure 3. Along with innovations on products and services, it is especially important to explore how to innovate on a firm’s business model, i.e. the way in which a firm chooses to do business. Whereas DELL made a breakthrough by eliminating intermediate delivery channels and addressing customer needs directly, Apple Computers in recent years has developed an effective business model using the ‘iTunes’ platform for the legitimate downloading of digital music and video content, thus becoming a global music and video store, like Amazon.com initially did with books.

Especially critical as an innovation capability factor is a firm’s leadership because it can communicate an organisation’s vision, determine its strategic direction and set goals and priorities for new initiatives, projects and investments (Barsh, Cappozi, & Davidson, 2000). Furthermore, leadership seeks to ensure the balance of long- and short-term activities, and the alignment of different component parts of the organisation (business units, divisions etc.) and seeks the critical alignment of the innovation strategy with a firm’s broad business strategy, such as low-cost or differentiation.

Having leaders take personal responsibility for innovation can have a tremendous impact in signalling how the company will compete. Steve Jobs assuming the leadership for innovation at Apple has played a key role in transforming the firm to the first position of the top global innovators in recent years, accompanied with spectacular financial results, raising its stock value from $20 per share in 1998 to over $160 in 2007, despite the dot.com bubble bust in 2001. A similar impact on performance has been observed with CEOs for Blackberry cell phone manufacturer RIM and with Ford Motor Co.

An equally important innovation capability factor is the people component. This factor determines what is available within an organisation in the form of knowledge, skills and talents of employees. Highly motivated people are essential in creating within a firm valuable informal networks based on their shared values, beliefs and attitudes. During the
industrial era when quality was the responsibility of specialised individuals in a Quality Control Dept., there was a limit to how much quality could be controlled and improved. When quality became every employee’s concern and responsibility in the implementation of a TQM culture, quality took a quantum leap as a performance indicator, reaching the impressive levels we witness today globally in Six Sigma companies.

Less visible but equally powerful and pervasive as an innovation capability factor is a firm’s culture, because culture defines the context in which human relations grow. Among other things, culture plays a critical role in developing the special language within an organisation that clarifies an organisation’s values and strategic goals, and continually shapes how employees think and act (Conti, 2003; Dervitsiotis, 2008).

Companies with a strong innovation culture such as 3M and Apple Computers have a big advantage compared to others in which innovation is less diffused in the corporate psyche. Of all factors trust has become the dominant aspect of a firm’s culture affecting innovation success. In fact, many experts believe that trust has the highest impact of all factors on innovation performance (Dervitsiotis, 2006). Considering that innovation is a cooperative network-based activity, requiring the free flow of information and the exchange of personally possessed tacit knowledge, there is little an organisation can accomplish without the trust that flows out of a powerful shared vision and supporting shared values.

Finally, we must consider a firm’s infrastructure as a key innovation capability factor. This infrastructure consists of all the hard and soft business processes which continually translate plans at all levels into actions in implementing a firm’s innovation strategy.

Developing sound innovation performance metrics

The successful introduction of innovations to the market, for the purpose of increasing performance and/or adapting to emerging conditions, requires that organisations manage the innovation process with the right innovation metrics. It is only when specific aspects of the innovation process can be measured in a systematic and reliable manner that performance can be evaluated and improved. The metrics needed must be related to the key components of the innovation process, addressing the innovation outputs, inputs and process, as shown in Figure 3.

In a 2007 senior executive survey by Boston Consulting Group (BCG), only 35% of executives were satisfied with their company’s innovation measurement practices, even though they believed innovation should be measured rigorously, in the same way as other core processes like quality or financial performance. Only less than half admit that their companies do so (Boston Consulting Group, 2008).

Today most companies (79%) focus on measuring innovation outputs, while fewer (61%), especially high-performers, address the innovation process itself. This fact helps explain the poor performance of innovation execution about which business executives often complain. In the same survey, most companies (60%) rely on five or fewer innovation metrics to measure innovation performance, preferring to track those that relate closely to profitability, time to market and idea generation and selection. Nearly one half of the companies surveyed bother to examine the over-all ‘health’ and proper balance of their innovation portfolio, in terms of the risks undertaken and proper mix of incremental and radical innovation projects (see Figure 3). Most executives in the above BCG survey regard the revenue from new products/services as the most indispensable innovation metric.

It is noteworthy that the companies most satisfied with the use of their innovation metrics are those that assess the performance of the whole innovation process (McKinsey
Quarterly, 2008). A firm’s preference for the selection and use of suitable innovation metrics usually evolves as it acquires more relevant experience. Those firms new in innovation activities prefer metrics more closely related to the operating aspects for innovation, whereas the more experienced ones prefer to focus on the more strategic aspects of innovation. Regardless of the specific metrics used, the overall indicator for innovation effectiveness must be one of the economic value added by the stream of innovations generated in the innovation pipeline.

Several examples suggest that many significant innovations in the past, both incremental but especially radical ones, have not had much impact in creating value for the company that introduced them. A typical example is the copying machines manufacturer Xerox, which in the 1970s and 1980s operated one of the best research laboratories in Palo Alto, California (PARC). This lab introduced innovations that have had a great impact on the computer industry, such as the graphical user interface (GUI), the ethernet, the adobe format and others. However, Xerox’s preoccupation of with its core business of printing did not allow it to assess the potential impact of such innovations. These were later exploited successfully by at the time smaller firms, such as Apple. The same happened with Napster for downloading music free over the internet. Its great success – albeit with no financial benefits – was profitably exploited several years later by the development of Apple’s highly successful and profitable platform of ‘iTunes’, as a legitimate means for downloading music, video, movies, etc. with its iPad, iPhone, iPod and other products. The potential of this was later recognised by other electronics giants such as Sony and Samsung, which established similar platforms for their own products.

Building the innovation portfolio

In developing their innovation projects portfolio, reflecting their innovation strategy, successful firms manage to achieve a sustained overall balance of their initiatives to compete in the marketplace. This desired condition includes:

1. A balance between incremental and radical innovation projects,
2. A balance between the supply and demand of new ideas, after the commercialisation stage, and
3. A balance between internally (R&D initiated) and externally or market-driven projects.

In regard to innovation, an important leadership responsibility is the continual balance between a firm’s demand for innovation in implementing its broad strategy and the innovation supply available through its own innovation strategy and incentives. For a firm pursuing a strategy to lead in its industry through differentiation of its products and services, like Apple Computers, the organisation must implement policies that maintain a stream of innovations in its pipeline, covering both short-term needs for incremental innovations, like improving the firmware for its computers or iPhone and other products, battery lifetime or their over all reliability, while introducing periodically radical innovations like the iPhone or the Mac Air laptop. All these initiatives require an innovative culture with talented creative individuals properly interacting in all four stages of the innovation value-chain. Such cooperation must encompass all activities of idea generation, project evaluation, product development and the effective commercialisation of new products, which is the litmus test of a successful innovation.

A firm’s innovation strategy as reflected in its innovation project portfolio is shown in Figure 4. Such a portfolio reflects the level of risk involved in each project and the
expected timing of rewards. In the portfolio matrix in Figure 4 we have three levels of risk and three time horizons for the realisation of innovation rewards, as cash flows.

1. When the existing in-house distinctive knowledge is superior to that of our competitors, the risk level is low and the best action is to make investments in ongoing or new initiatives.

2. When our competitors’ distinctive knowledge is superior to our own, the risk level is medium, so the best action to gain familiarity is to initiate small- to medium-size investments, following a strategy of experimenting with new products, processes or business models on the margin of mainstream activities.

3. When the risk level is high, the probability of success is difficult to estimate and the best action is to initiate small investments to gain familiarity.

There are three types of innovation strategies that management must adapt to support its business strategy for differentiation or low-cost leadership (Jaruzelski & Dehoff, 2007; Porter, 1985):

1. A need seekers strategy, or a strategy of playing to win. Companies in the ‘need seekers’ category identified their innovation priorities as being first to market and basing R&D efforts on getting direct, proactive input from customers. Typical examples of this type include Black and Decker Tools, General Electric and Apple Computers.

2. Market readers strategy, or a strategy of playing not to loose. Companies employing a ‘market readers’ innovation strategy distinguish themselves through their preferences for incremental change and being fast followers into markets. Typical examples of this type include Hewlett-Packard in computers or Huyndai in the auto industry.
(3) *Technology drivers.* Companies employing a ‘technology driver’ innovation strategy state that they take a technology forward approach to innovation, while remaining less concerned with direct customer input into the process. Typical examples of this category include Sony and certain pharmaceuticals firms.

Firms that compete with a business strategy based on differentiation, like BMW, rely either on a needs seeker (Type 1) or a technology driver (Type 3) innovation strategy. Companies that compete with a low-cost business strategy, like Huyndai, must rely on a ‘market reader’ innovation strategy. When some firms depart significantly from these norms, they tend to experience a fundamental operational incompatibility between their strategic goals and the methods used to achieve them. This can be often disastrous.

As noted previously, the specific innovation strategy pursued by a firm is clearly reflected in its innovation project portfolio. *Management must aim at all times to maintain a balance of incremental versus radical new ideas and a balance of risks undertaken for the expected rewards in market share, revenue and profitability.* Several once successful companies, like RCA in electronics or US Steel, failed because they kept applying for too long project selection criteria that favoured doing more of the same (Christensen, 1998). It is therefore *essential that the criteria used for evaluating new ideas in no way favour only incremental innovations*, due to a culture of risk-aversion or for the sake of higher short-term profits. This practice leads eventually to the erosion of the existing competitive advantage in the market place and is followed by a shrinking market share that eventually may lead to failure or even extinction.

Most large firms with successful products or services already established in the market engage in the development of incremental innovations because these are easy, pose no risk and usually have immediate payoffs. At the other end of the spectrum we have small start-ups willing to take high risks with new radical innovations and a high failure rate for the innovations and the firms themselves for lack of financial and other resources to continue to be exposed to high risks.

However, a continued emphasis exclusively on incremental innovations poses a longer term strategic risk in that a new or existing competitor may introduce a radical innovation that will render a firm’s competitive advantage obsolete. Clayton Christensen’s seminal work *The Innovator’s Dilemma* (1998) made it clear that there is no way for the incumbent large successful firm to protect itself against a small successful disruptive innovator. The demise of large steel makers with the arrival of mini-mills and of mainframe and mini-computer manufacturers, such as IBM and DEC, with the arrival and widespread use of modern PCs represent just two examples of this phenomenon. The economics of large successful firms with high fixed costs from large-scale capacity installations favour high-margin products in order to generate profits. There is not such a constraint for small and flexible competitors that can absorb low-margin products.

Nevertheless, there are also large successful firms that have an impressive record for radical innovations in a portfolio of projects that is balanced in terms of risks and rewards. General Electric, IBM, Apple Computers, BMW, Proctor & Gamble and others have, for years, developed a culture of innovation enabling them to maintain a healthy flow of both incremental and radical innovations, not only in products and services but what is even more important, in business models. For example, General Electric, which under Jack Welsch prospered with a distinctive approach for strategy execution based on Six Sigma, under the leadership of his successor Jack Immelt changed its strategy to one of the innovations that took the company even more successfully to new geographic market domains in SE Asia in health services, environmental protection services and others.
To achieve increasing levels of revenue and profit growth, management must continually introduce in the market a sufficient number of new products and services from the commercialisation of new ideas that can keep competitors behind.

**Interventions on innovation process to improve quality and balance**

For a firm competing in today’s global environment, its innovation process must support the kind of innovation strategy best suited for its business strategy of differentiation or low-cost (Porter, 1985). If a firm seeks a competitive advantage based on the effective differentiation of its products and services like Apple, Sony or BMW, then its innovation strategy must encourage the development of a stream of incremental and periodically a few radical innovations that preserve its distinctive image. However, even low-cost competitors must follow the leading innovator with sufficiently similar products, so as to remain a viable alternative in the same markets. The success of Apple’s iPhone can be gauged not only by the impressive sales of millions of devices in a few years, but also by the number of its competitors that in short order introduced iPhone look-alike devices. A similar trend is in the offing after the successful introduction of Apple’s iPad in April 2010, which for the first time helped Apple surpass Microsoft in market capitalisation.

Historically, the introduction of most successful innovations, such as the radio, the telephone or others, was ‘technology-pushed’ from independent inventors or R&D departments. Innovations such as the PC or the cell phone created significant value for customers by making it less costly, faster and easier to do a needed job, while increasing the revenues and profits for their producers. More recently, however, as new lifestyles and new conditions in the global economy create unmet customer needs, there is a significant increase in the number of ‘market-pull’ innovations (Hagel & Brown, 2005).

As a rule, the best place to start checking what kind of new innovations are being made and at what rate these are needed is the marketplace. Whereas in the past the fashion and auto industry were the main industries most expected to introduce new products every year, in our time most industries engage in introducing new offerings all the time along with new ways of producing and delivering familiar ones. Thus, the first principle for designing an effective innovation system is to gear its output for alignment with the market place demands.

Having determined the kinds and likely frequency of innovations needed from the commercialisation stage, management must then look backwards to the previous three stages of the innovation value-chain. The essential need for balance dictates that the idea generation stage, the project selection stage and the development stage must be properly synchronised to achieve the best over-all effectiveness.

In the industrial era those companies that were successful in selling products with long lifecycles felt no pressing need to innovate on a company-wide basis, as their R&D departments was responsible for this task. In our time, the global economy has accelerated the pace of change in the business environment. With a need for a continual stream of new products, traditional companies depending exclusively on internal resources can no longer match the demand for new products emerging in the global marketplace.

Empirical studies and surveys reveal that the problems in generating and introducing new value-adding innovations are to be found in different stages. For some companies the major source of problems is the lack of sufficient new ideas for innovation initiatives. As a rule this idea generation stage is where most value is created and where most things are likely to go wrong. However, in many large companies that are capable of generating many good ideas, their executives complain that there are not as capable in the execution stage to bring these promising ideas to market (Boston Consulting Group, 2007). In the
following we examine some of the ways that problems at successive stages of the innovation value-chain can be diagnosed and addressed.

It is important to state that no innovation can be regarded as successful until it has reached the market and earned cash from customers willing to pay for the benefits to be realised from that innovation.

**Improving the performance of the idea-generation stage**

This is the stage where creativity plays a dominant role and cannot be managed like the other three well-defined stages in the innovation value-chain that may be studied and improved extensively with TQM and Six Sigma. Most value-generating potential in new innovations is created in the idea-generation stage, i.e. ‘doing the right thing’. This potential value, however, cannot be harnessed unless the remaining stages of innovation are executed swiftly and efficiently, i.e. ‘doing the right thing right’.

Two conditions enable an organisation to secure a good number of promising good ideas in the idea-generation stage. First, management must be able to deploy the needed creative human talent, properly engaged in the different stages of the innovation value-chain. Second, it must make sufficient investments in infrastructure, especially in information technology, so as to make the available talent productive. The main reasons many companies are weak in generating new ideas for innovations, in order to create new value for their customers, can be traced to one or more of the following causes:

1. Low employee motivation (the ‘nobody cares’ syndrome)
2. Lack of trust among employees and managers that inhibits any idea exchange
3. Lack of customer feedback on company’s products and services
4. Absence of infrastructure needed for people to work together on new ideas jointly and creatively
5. Lack of developing desirable partnerships which facilitate and improve the introduction of new ideas in the innovation pipeline (Dervitsiotis, 2010a, 2010b).

All of the above reasons point to a critical absence of an innovative culture. To overcome this serious organisational deficiency, a firm must first focus on developing a climate of trust in which the skills, education, knowledge, background and attitudes of all employees are important and deserve to be taken seriously. Once this climate of human relationships improves and trust builds up sufficiently, based on a sound vision and shared values, management can proceed to develop the right infrastructure. The latter, which often requires an adequate IT system support, will enable employees to maintain good participation, communication and coordination on pilot projects that will be the testing ground for exploring new ways of doing things with employees and external parties, such as customers and suppliers.

If the above conditions are met internally and yet there is still a shortfall of good new ideas as an input to the innovation process, a company can open up or outsource part of the idea-generation stage to include capable research centres, universities or even freelance independent researchers. This is a practice used even by large successful firms, as Proctor and Gamble, to maintain the edge on new developments (Chessbrough, 2006a, 2006b; Langley & Charan, 2008).

**Improving the performance of the project-selection stage**

To maintain the needed flow of new ideas from the previous idea-generation stage, management must next apply a set of sound selection criteria for the second stage of
new project selection. This critical task, unlike those in the other three stages, determines a firm’s strategy and cannot be assigned to third parties. At the innovation project-selection stage, a company makes the most critical choices for its future and its survival. These are choices which require a well-articulated business strategy on how to address emerging opportunities and threats (Prahalad & Krishnan, 2008).

The right type of criteria needed for new idea selection and project funding must lead to a well-balanced innovation portfolio that is most likely to meet the expected demands of the marketplace. Such a portfolio avoids the excessive reliance on a single ‘bet-the-company’ breakthrough project for a new radical innovation idea, a practice often encountered with new start-ups, relying on both radical innovations that are ‘marathon runners’, along with incremental innovations, as ‘sprinters’ in the innovation race.

**Improving the performance of the idea-development stage**

Once a new innovation project is selected, joining the flow in the innovation pipeline, its execution becomes a matter for developing and testing the appropriate prototypes. Incremental innovation projects usually proceed without serious obstacles, due to the know-how familiarity present in the firm and the low risk involved. As a rule, this is not the case with projects for radical innovations which often engage several other parties more familiar with new technologies, the preparation of prototypes for testing and the collaboration of potential customers and suppliers for a more reliable and comprehensive evaluation. Such projects which are more complex and uncertain often follow a recursive progression path, returning to earlier steps and resume again before reaching a successful completion (Van de Ven, Polley, Garud, & Venkataraman, 2008).

The intervention points for building quality in the multi-stage innovation process, for each of the four stages of the innovation value-chain, are summarised in Figure 5.

![Figure 5. Intervention points in the four stages of the innovation value-chain.](image-url)
To maintain the desired flow of the innovation process at the commercialisation stage, it is essential to have a streamlined flow beginning with the generation of promising new ideas in the idea-generation stage, at the start of the innovation pipeline.

Creating the necessary conditions for a new innovative culture

For best results in creating and nurturing an innovation culture, it is necessary to ensure that the organisation develops the following conditions:

1. Begin with a big leadership jolt from the top in order to
   - Make innovation a top priority
   - Provide innovation training for all, in a way similar to TQM training
   - Transform innovation to a core business competence like quality management
   - Establish the innovation organisational infrastructure by having an innovation top officer, innovation board, innovation advisors, etc.

2. Create the time and space for people to reflect, generate new ideas and experiment
   - 3M encourages employees to devote 15–20% of their work time on pet projects
   - Google encourages employees to devote 10% of their work time on pet projects
   - Xerox encourages workers to have coffee breaks to be used for problem solving

3. Create an internal market for talent in order to engage the most competent people in each new innovation project. New ideas for important innovations are listed on a special board that informs employees about initiatives they can join.

4. Provide the maximum possible diversity of thinking needed for innovation with people that have different skills, different education, different cultural background and different perspectives. This is facilitated by changing hiring practices to encourage diversity and by bringing people from the outside rather than relying on inbreeding.

5. Enable informal and formal networks that have greater connectivity and facilitate conversations which increase exposure to different views and mindsets, allowing for the sharing of tacit knowledge and the cross-fertilisation of ideas which enhances the power to arrive at novel solutions to human needs.

Maintaining a healthy innovation culture

Developing and maintaining a culture that generates promising new ideas which create value for customers and lead to increases in revenues depends on both the leadership and the people in the organisation. This task involves creating a new mindset which challenges existing practices. It is usually accomplished in one or more of several ways.

1. Harnessing discontinuities by identifying the convergence of ongoing different trends and looking where others are not. This requires a clear understanding of the context of specific changes and the ability to amplify weak signals and see relevant interactions. The recent development of business analytics provides helpful techniques for this purpose and has been helping in recent years successful firms like Amazon.com, Google and others (Davenport & Harris, 2007).

2. Challenging established practices and beliefs by relying on a contrary mindset, avoiding adopting blindly existing best practices and being willing not to follow
a leader competitor when there is strong evidence that there is a better way to implement a strategy.

3. **Leveraging competencies** which refer to unique employee skills, knowledge and experiences that can be used to deliver customer benefits and strategy differentiation.

4. **Leveraging strategic assets** which refer to a firm’s assets that are difficult to acquire, imitate or develop. These can be a source of competitive advantage associated with inputs assets (natural resources, capital, suppliers loyalty etc.), process assets (proprietary technologies, standards, expertise, infrastructure etc.), customer-related assets, i.e. a firm’s customer database, brand recognition or assets related to distribution channels and networks.

5. **Understanding unarticulated customer needs** by bypassing traditional market research and engaging in direct observation, such as looking at what jobs the user needs to get done with a product or service for outcome-driven innovations. This kind of information cannot be captured by listening to the voice of the customer! (see Ulwick, 2005). Equally useful in surfacing unarticulated customer needs are other techniques such as customer experience mapping, by observing and documenting how customers behave in a shopping mall, in a tourist resort, or in a hospital.

**Concluding remarks**

As organisations all around the globe search for ways to overcome the current economic crisis and strive to prosper in a post-toxic-assets and sovereign-debt ridden environment, the need for innovations that meet the requirements for greater transparency, increased concern for the natural environment, a greater government sector presence and reduced levels of finance leverage, become overwhelming. In the ensuing struggle for survival, only organisations that can compete on the basis of successful innovations beyond the need for quality and efficiency will stay standing.

To develop an innovation process of high quality with the maximum beneficial impact on performance, it is necessary to institutionalise innovation within a firm in a way similar to that of quality under TQM. This means making innovation a core process by engaging both internal and external talent.

To be successful in the pursuit of effective innovations a firm must develop and maintain an innovation portfolio which continually aims to balance innovation demand for outputs (new products/services, or new business models) with innovation supply for inputs (creative talent available, investments and infrastructure to manage projects). In addition, there is a need to balance the risks associated with expected rewards, based on a proper mix of the easy and less risky ideas for incremental innovations with the low success probability and long-term germination times of radical innovations having the potential to bring the highest rewards.

Creating an innovation culture demands competent leadership, diversity in knowledge and skills and education of employees, supported by the creativity to explore new ideas without the limitations imposed by an existing mindset, and a willingness to take reasonable risks.

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