

INNOVATIVE LEADERSHIP: INTEGRATING MARKETING, MANUFACTURING AND R&D

Léo F. C. Bruno, Ph.D. Department of Leadership
Federal University of Amazonas and Fundação Dom Cabral
Nova Lima, Minas Gerais, Brazil

leobruno@fdc.org.br

ABSTRACT

Organizations are paying much interest to the concept of knowledge management and core capabilities; that is, how organizations define and differentiate themselves. This article attempts to establish the links between strategic competencies, knowledge management, organizational learning and innovation management: particularly, how an organization identifies, assesses and exploits its competencies, and translates these into new process, products and services.

Key-words: value innovation, organizational learning, enablers, customer-oriented processes.

1. Introduction

The focus of our topic will be on the impact of market and consumers/clients on the success or failure of new design, development and commercialization. Why so many expensive product innovations fail to achieve market success? Indeed, on average, only one in ten R&D projects succeed in the market. And, on average, 46 per cent of all resources dedicated to product development and commercialization is spent on products that are cancelled or fail to yield adequate financial returns (Cooper, 2000). Therefore, this topic will focus on how organizations can learn from the market in order to carry out their innovative activities, particularly product-related activities. In other words, the focus will be on how organizations use the market as a source of information in order to meet and also anticipate customers' needs quickly and effectively. Therefore, the topic will help explain **why** and **how** organizations succeed or fail in developing and commercializing their products depending on the way in which they use market – particularly users – as a key source of innovation. There are three ways that the best organizations can win when they develop new products. One is to do *projects right*, appropriate for environments where the competition is stable, and the critical success factor is efficiency, having as a background strategy vertical integrations, owning assets and scale economy. Their competence are prioritized as follows: know-how, know-why and know-what. That is, they have focused on the process of innovation. They have re-engineered their new-products process and, in so doing, have built in the critical success factors that make the difference between winning and losing. Many organizations now use a stage-gate new-product process, to drive their new-product projects to market quickly and successfully.

On the other hand, a second way to win is by **doing the right projects**, appropriate for environments where the competition is dynamic, and the critical success factors are efficiency, variety and uncertainty, having as background strategy limited investments for specific use, modular organization, speed to market, and scattered, simultaneous and autonomous development process. Their competence are prioritized as follows: know-what, know-why and know-how. Here, management focuses on project selection and ultimately implements the portfolio management principle for product innovation. Finally, the third approach is a middle-of-the-road one, and is by **doing the convenient projects**, appropriate for environments where the competition is in evolution, and the critical success factors are efficiency and variety, having as background strategy long-term alliances, group strategy, critical resources accumulation, and time-to-market. Their competence are prioritized as follows: know-why, know-what and know-how. Here, management follows headquarter recommendations for new-products selection.

Anyway, the need for product innovation has never been greater. Product life cycles are shorter than ever new products make your old ones obsolete. Driven by the globalization of markets, technological advances and ever-changing customer needs, product innovation is nowadays the first priority in many organizations' strategies. For example, in the United States, new products account for about 50 percent of organizations' revenues from sales and 40 percent of their profits. The fortune list of the Most Admired Companies presents the most innovative firms in America: Intel, General Electric, Johnson & Johnson, Procter & Gamble, 3M, Pfizer, and others.

Companies that fail to innovate face a dark future. Their product lines fall victim to more aggressive, innovative competitors. Customers switch allegiances and market share stars to suffer, and even stock market share prices weaken.

2. The New Competition

The vision of the future of most best companies is one of increased product complexity, being complexity here understood in terms of more functions in a given physical space. Product complexity has to be increased to hold existing customers and to attract new customers. The managements of the best companies have set their goals as increased flexibility, because with it comes increased capability to meet the demands of the market place. There will probably always be the competitor factory producing a huge amount of a given product per month, but more and more manufacturers are finding ways to produce smaller volumes of more varieties without the increase in costs so often observed in the past and still found nowadays.

Flexible specialization is a strategy of permanent innovation: accommodation to ceaseless change, rather than an effort to control it. This strategy is based on flexible – multi-use-equipment, skilled workers, and the creation, through politics, of an industrial community that restricts the forms of competition to those favoring innovation. For these reasons, the spread of flexible specialization amounts to a revival of craft forms of production. Let's consider the impact of the new competition on some of the major functions. The Manufacturing Function to cope with the new competition must **focus** on total process efficiency, having as positive effects:

- low overhead and bureaucracy;
- greater variety at lower costs;
- optimum quality;
- high production flexibility;
- elimination of waste (all the types);
- low total costs;
- continual process improvement;
- sense of community;
- low inventory carrying costs;
- high utilization of and investment in worker skills;
- high labor productivity, and
- integration of thinking and doing.

A possible detrimental effect may be a demanding, stressful environment.

As an example of demanding external environment Toyota was turning over its work-in-process more than 300 times a year by 1982.

The Research & Development Function, in order to cope with the new competition, should focus on a continual incremental innovations, getting as possible effects:

- integration of innovation and production;
- mutually beneficial relationships with other firms;
- frequent process innovations;
- low costs and short cycle times;
- continual improvements, eventual technological superiority, and
- better fulfillment of customer wants and needs.

A possible detrimental effect may be a lack of breakthrough innovations.

Philips/Small Domestic Appliances Division has achieved tremendous improvements in productivity in the electric razor production by making a myriad of small changes on a continuing basis, and as consequence is still today the world's lowest-cost producer in its market segment.

Let's consider now the influence of the new competition on the Marketing Function. Its focus should be gaining market share by fulfilling customer wants and needs, first domestically, then in export markets, having as positive effects:

- ability to respond quickly to changing customer needs;
- technology – intensive products;
- filling the niches;
- high sales domestically and through exports, and
- market takeover.

A possible detrimental effect may be to become too enamored of technology.

As an example of this kind of detrimental effect we may cite the refrigerator door designed to get rid of corrosion problem which was launched with a polyurethane with additives, using the reaction injection moulding process. This process turned to be more expensive than foreseen, and together with the fact that plastics don't have magnetic effect, therefore one cannot hang piece of papers on the door using magnets, lead the product to fail to yield adequate financial returns.

Anyway best companies are characterized by a desire for increased market share, rather than short-term profits. Marketing strategy is based on the concept that a company will be successful only if it can secure a favourable share of the market.

This aggressive approach proved extremely effective when the best companies start to expand into overseas markets: they are able to win a sizable share of those markets in a relatively short period.

Furthermore, best companies work constantly to improve and develop new products that attract consumers. Organizations that ignore this fundamental concept, that fail to develop products that suit consumer's needs, will not survive at all.

The logical principles of this new competition, in full, are as follows:

- Demand for individual has become unstable. What used to be large demand for standard mass-market products has fragmented into demand for different "flavors" of similar products.
- Because demand has fragmented, the large, homogeneous markets have become increasingly heterogeneous. The niches are becoming the market, shifting power to buyers who demand higher-quality goods that more closely match their individual desires.
- Since profits cannot be maintained the old way, it seems preferable to go after some of the niches with the additional variety to go after some of the niches with the additional variety desired, then try to meet the changing needs and wants of these niches. At first this can be done through post production methods of tailoring the product to niches (often through services), but it is an expensive alternative; increased variety must eventually come through production.

- Creating high levels of variety in production cannot be accomplished through the specialized mass production techniques: creating variety requires flexibility in manufacturing processes, the antithesis of mass production.
- The production system must therefore be changed. Now driven by market and customers, it must produce a number of different, high-quality products via short production runs, short changeover times, and low work-in-process. This requires general-purpose machinery and highly skilled workers.
- Because the resulting new products more closely meet customer desires, a premium price can often be charged. This extra profit margin offsets any loss of efficiency due to the lower volumes. And, as experience is gained in mass customization processes, it is often found that products with many variations can be produced at the same or lower costs.
- Because the new niche markets are smaller and constantly shifting, continued success can be achieved only by producing ever greater variety more quickly. The rate of product or product technology change increases dramatically; product development cycles must therefore be reduced just as dramatically.
- Along with shorter development cycles comes shorter product life cycles. Driven by the need to more closely fulfill customers' desires, products and technologies are constantly improved upon and replaced.
- The result is less demand for each individual product – demand fragmentation – but increasingly stable demand for the company and its products relative to the old system and to its competitors. Ever-smaller niches to fill with ever-more variety can be sought.

Figure 1 depicts focus, goal and key features of the old competition contrasted with the new one.

	OLD COMPETITION	NEW COMPETITION
FOCUS	Efficiency through stability and control	Variety and customization through flexibility and quick responsiveness
GOAL	Developing, producing, marketing and delivering goods and services at prices low enough that nearly everyone can afford them	Developing, producing, marketing, and delivering affordable goods and services with enough variety and customization that nearly everyone finds exactly what they want
KEY FEATURES	<ul style="list-style-type: none"> • Stable demand • Large homogeneous markets • Low-cost, consistent quality, standardized goods and services 	<ul style="list-style-type: none"> • Fragmented demand • Heterogeneous niches • Low-cost, high-quality, customized goods and services • Short product development cycles

	<ul style="list-style-type: none"> • Long product development cycles • Long product life cycles 	<ul style="list-style-type: none"> • Short product life cycles
--	---	---

Figure 1 – Old competition vs. New Competition
Source: Adapted from PINE, 1999.

The indication of change from the old competition to the new one comes from the market turbulence, via the following evidences:

- decreases in the levels of input stability that can be maintained;
- changing demographics of customers;
- saturation level of a product within its marketplace;
- economic cycles, shocks, and uncertainties that affect the market;
- technological shocks that overthrow the current dominant design in the marketplace and replace it with another.

Figure 2 presents the market turbulence factors viz.à.viz, the level of turbulence.

LOW MARKET TURBULENCE	HIGH MARKET TURBULENCE
DEMAND FACTORS	
Stable and predictable demand levels	Unstable and unpredictable demand levels
<ul style="list-style-type: none"> • Necessities • Easily defined needs/wants • Homogeneous desires • Slowly changing needs/wants • Low price consciousness • Low quality consciousness • Low fashion/style consciousness • Low levels of pre- and postsale service 	<ul style="list-style-type: none"> • Luxuries • Uncertain needs/wants • Heterogeneous desires • Quickly changing needs/wants • High price consciousness • High quality consciousness • High fashion/style consciousness • High levels of pre- and postsale service
STRUCTURAL FACTORS	
<ul style="list-style-type: none"> • Low buyer power • Independent of economic cycles • Low competitive intensity • High price competition 	<ul style="list-style-type: none"> • High buyer power • Dependent on economic cycles • High Competitive Intensity • High product differentiation

<ul style="list-style-type: none"> • Low to medium levels of saturation • Few substitutes • Long, predictable product life cycles • Low rate of technological change 	<ul style="list-style-type: none"> • High levels of saturation • Many substitutes • Short, unpredictable product life cycles • High rate of technological change
--	--

Figure 2 – Market turbulence factors
Source: Adapted from Pine, 1999.

Recently Philips, the big dutch multinational company, in conducting a process they called “Imaging the Future” reached the conclusion that high market turbulence is nowadays a reality with one additional ingredient namely **speed to market**, in other words, due to the dynamics of the new competition speed (time) has emerged as the strategic weapon that separates the winners from the losers, however one must keep in mind that to **know-what** comes first in such a dynamic market place.

3. Dimensions of Strategy for Profitable Growth

The dimensions of strategy, normally cited on the textbooks, are: industry assumptions, strategic focus, customers, assets and capabilities, and product an services offerings. High profitable growth companies has to do with the way managers thought about strategy, or in other words their strategic moves and the thinking behind them on each of the five textbook dimensions of strategy before cited. The managers of the high-growth companies, irrespective of their industrie, describe what is being called the logic of **value innovation**. The managers of the less successful companies all thought along conventional strategic lines. Therefore, conventional strategic logic and the logic of value innovation differ along the five basic dimensions of strategy. Those differences determine which questions managers ask, what opportunities they see and pursue, and how they understand risk. Figure 3 shows the two strategic logics related with each one of the five dimensions of strategy.

The Five Dimensions of Strategy	Conventional Logic	Value Innovation Logic
Industry Assumptions	Industry's conditions are given.	Industry's conditions can be shaped.
Strategic Focus	A company should build competitive advantages. The aim is to beat the competition.	Competition is not the benchmark. A company should pursue a quantum leap in value to dominate the market.
Customers	A company should retain and expand its customer base through further segmentation and customization. It should focus on the differences in what customers value.	A value innovator targets the mass of buyers and willingly lets some existing customers go. If focuses on the key commonalities in what customers value.
Assets and Capabilities	A company should leverage its existing assets and capabilities.	A company must not be constrained by what it already has. It must ask, What would we do if we were starting anew?

Product and Service Offerings	An industry's traditional boundaries determine the products and services a company offers. The goal is to maximize the value of those offerings.	A value innovator thinks in terms of the total solution customers seek, even if that takes the company beyond its industry's traditional offerings.
--------------------------------------	--	---

Figure 3 – Strategic logics and dimensions of strategy
Source: Adapted from kim and Mauborgne (1997).

In studying the business launches of about 100 companies, kim and Mauborgne (1997) were able to quantify the impact of value innovation on a company's growth in both revenues and profits. Although 86% of the launches were line extensions, that is incremental improvements, they accounted for 62% of total and only 39% of total profit. The remaining 14% of the launches, the true value innovations, generated 38% of total revenues and 61% of total profits.

On the other hand, studies on why new product and service offerings succeed (Cooper, 2000), lead us to analyze carefully the way we handle the so called **critical success factors**. Even more, as you review each one, ask what your company has done to build these factors into their new-product/service plan. The critical success factors are as follows:

- seek differentiated, superior products – the majority of products are tired “me too” whit little to distinguish them from competitors, or are technical solutions in search of a market;
- up-front homework pays off – solid pre-development homework drives up new-product success and is strongly correlated to financial performance, according to real world experience;
- build in the voice of the customer – sadly, a strong market orientation and customer focus is noticeably absent from many businesses' new-product projects;
- demand sharp, stable and early product definition – a failure to define the product before development begins is a major cause of both new-product failure and serious delays in time-to-market;
- plan and resource the market launch early in the process – the need for a quality launch should be obvious, well planned, properly resourced and well executed; but not every project team and business devote the same effort and attention to this;
- build tough go/no go decision points into your process – too many projects move too far into development without serious scrutiny, indeed is strongly correlated to the profitability of new-product efforts;
- organize around true cross-functional project teams – good organizational design means projects that are organized with a cross-functional team, led by a strong project leader, with a proper profile (achievement motivation, team work, problem – solving and communication, skills are some important traits), accountable for the entire project from beginning to end, dedicated and focused;
- attack from a position of strength – the new product creation process is better when it leverages the business's core competencies, meaning a strong fit between the needs of the new-product project and the resources, strengths and experience of the company in terms of marketing, distribution, selling, technology and operations;

- build an international orientation into your new-product process – new products aimed at international markets and with international requirements build in from the very beginning perform better at the market place; and
- the role of top management is central to success – top management proper support is a must role is to set the stage, to be a “behind-the-scenes” facilitator who is much less and actor, this stage-setting is vital for the innovation process.

4. Value Curve an the Three Platform

Value curve is a graphic depiction of a company’s relative performance across it sector’s key success factors. Figure 4 presents, as an example, the hotel formule 1’s value curve.

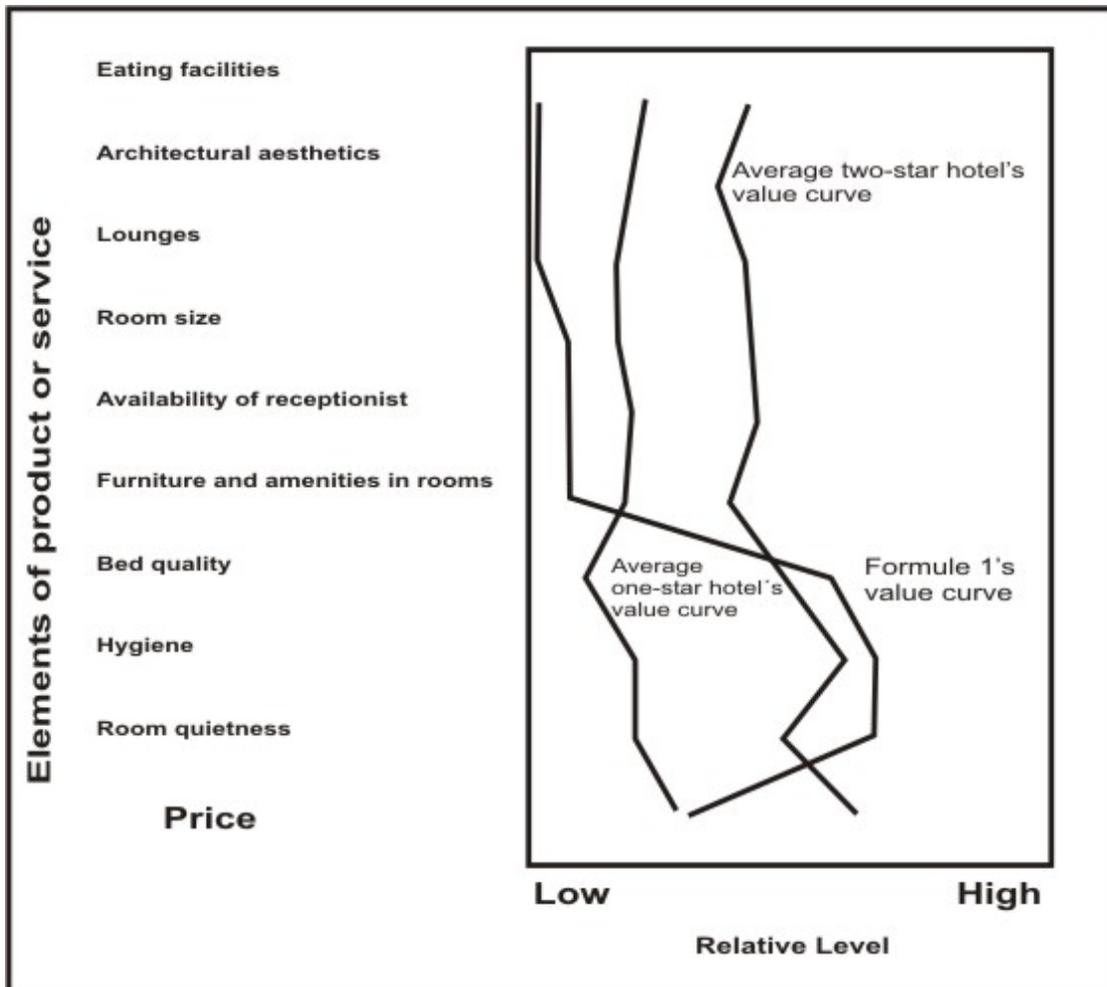


Figure 4 – Formule 1 value curve
Source: Adapted from KIM and MAUBORGNE (1997).

According to the conventional logic of competition, an industry’s value curve follows one basic shape. Competitors try to improve value by offering a little more for a little less, but most don’t challenge the shape of the curve.

Like Accor Group, owner of several brands besides Formule 1, all the high-performing companies create fundamentally new and superior value curves.

They achieve that by a combination of eliminating features, creating features, and reducing and raising others to levels unprecedented in their industries.

Value innovators believe that most people will put their differences aside if they are offered a considerable increase in value. Those organizations shoot for the core of the market, even if it means that they lose some of their customers.

The most successful companies at repeating value innovation are those that took advantage of all three platforms on which value innovation can take place:

- product – the physical product;
- service – is support such as maintenance, customer service, warranties, and training for distributors and retailers; and
- delivery – includes logistics and the channel used to deliver the product to customers.

It must be said, any way, that the precise meaning of each one of the three platform may vary across industries and companies.

Too often, managers trying to create a value innovation focus on the product platform and disregard the other two. As time goes by, that approach is not likely to yield many opportunities for repeated value innovation. As customers and technologies change, each platform shows new possibilities to be explored.

5. Leading Organizations for High Growth – The Value Innovation Development Model

Having reframed the company's strategic logic around value innovation, senior executives must ask at least four questions in order to pursue a new value curve: Which of the factors that our industry takes for granted should be eliminated? Which factors should be reduced well below the industry's standard? Which factors should be reduced well below the industry's standard? What factors should be created that the industry has never offered?

To assure profitable growth one needs to answer the full set of questions, rather than one or two.

Value innovation is the simultaneous pursuit of radically superior value for buyers and lower costs for organizations.

How can senior executives promote value innovation?

No single measurement will ever describe a company's stocks and flows of value innovation. Just as financial accounting looks at a number of indexes – return on sales, return on investment, cash value added, to name a few – to paint a picture of financial performance, value innovation accounting needs to look at corporate performance from several points of view. On the other hand, what might be a key indicator for one company could be trivial for another, depending on the industry environment.

Yet the existence of so many possible measurements creates the risk that companies will use too many of them, cluttering their corporate dashboard with instrumentation and, in the end, learning nothing important because they know so much about what is not important. Therefore, three principles should guide a company in choosing what to measure:

- Keep it simple – shoot for no more than a dozen measurements,
- measure what is strategically important – in this domain there are no simple recipes, the capacity to learn from experience and to conduct critical analysis is essential, and
- measure activities that produce value innovation – lots of stuff that companies measure is only sketchily related to value innovation.

In any way, a navigation tool, like a model, may help a lot in driving a company for high growth. Yet, a navigation tool should not only tell you where you are but also show you where you should be going.

In order to perform this, **the Value Innovation Development (VID)** model is suggested (Bruno, 2005).

The VID model is a comprehensive approach to market and value innovation – based corporate management, on two levels, enablers (essential conditions) and processes (customer oriented), aiming at assuring a strategic and articulated logic across the company businesses, designed to increase its market value, achieved through the interaction of technology, market and organization abilities.

The model is based on the evaluation of nine major dimensions divided in two groups:

- essential conditions – encompassing “strategy”, “processes”, “organization”, “linkages” and “learning”; and
- customer – oriented processes – involving the processes of “understand” markets and customers, “create” superior customer offerings, “gain” profitable customers, and “retain” profitable customers.

In the **strategy** dimension there are no simple recipes for success, the important point is the capacity to learn from experience and having critical analysis ability.

In order to succeed companies also need effective implementation mechanisms, also called **processes**, to move innovations from idea or opportunity through reality. These processes involve systematic problem-solving and work best within a clear decision – making framework which should help the company to stop, as well as, to continue development depending on now things are going. Also are required skills in project management, risk management and parallel development of both the market, and technology streams.

In the **organization** dimension there is the fact that innovation depends on having a supporting organizational context in which creative ideas can emerge and be effectively deployed. Organizational conditions are a critical part of innovation management, and involve working with structures, attraction and relation of human capital (reward and recognition systems), and communication patterns.

Within the dimension of **linkages** it is meant the development of close and rich interactions with the external environment – markets, suppliers of technology and other relevant players to the business.

Finally, developing innovation management involves a **learning** process concerned with creating the conditions within which a learning organization can begin to operate, with shared problem identification and solving, and with the ability to capture and accumulate learning about technology and management of the innovation process. These five dimensions together constitute what in the VID model is called **enablers**.

In order to create an overall picture regarding the **enablers** a closed instrument was developed involving the five before mentioned dimensions. For each one of these dimensions some statements were developed in order to enable a judgement using a score varying from “0” (not true at all) to “5” (very true) – see Annex 1.

This instrument will lead us to an average score for the enablers.

The second group of dimensions are related to the customer – oriented processes, which has to do with the value – based orientation. Let’s explore these dimensions a little deeper.

In order to **understand** markets and customers the following investigations should be done:

- data collection and integration,
- customer data analysis, and
- customer segmentation.

Regarding to **create** superior customer offerings the following aspects should be analyzed:

- products/services offers and prices,
- communication and branding,
- multi-client ownership, and
- affinity partnership.

As far as **gain** profitable customers, the following elements must be considered:

- multi-channel management,
- e-commerce, and
- sales force automation

Finally, in order to **retain** profitable customers, the following assessments should be conducted.

- Customer service/customer care,
- Loyalty programs, and
- Customer satisfaction.

In order to create an overall picture regarding these **processes** a closed instrument was developed involving the before mentioned four dimensions. For each one of these dimension

some statements were developed in order to enable a judgement using, again, a score varying from “0” (none) to “5” (ideal) – see Annex 2.

This instrument will enable us to have an average score for **processes**.

The advantage of the model is that it will lead us to compute what is called the value innovation index (VII) by multiplying the final scores for enablers and process. This index maximum score will be “1”, once the enablers and process values are taken as relative figures. This maximum score means that the organization (imaginary company) reached perfection, as far as managing innovation is concerned, it covers the total area.

Figure 5 presents the conceptual framework of the model.

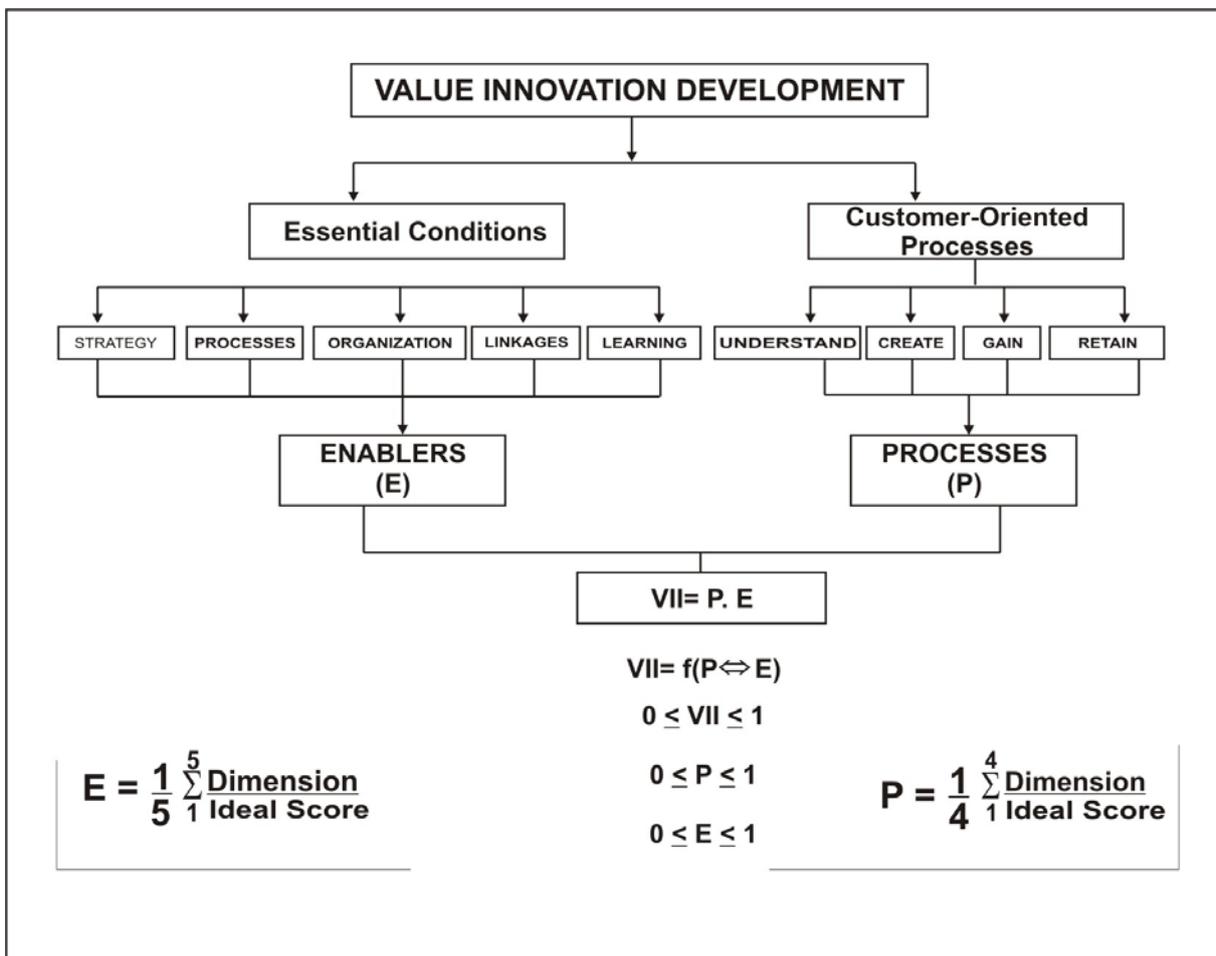


Figure 5 – Value Innovation Development Model Framework
Source: Bruno (2005).

The value innovators scored high in the value innovation index, not necessarily developing new technologies but in pushing the value they offer customers to new frontiers. They are **pioneers** in their industries.

At the other extreme are the **settlers**, business with value curves that conform to the basic shape of the industry. The settlers VII score is generally low.

The **migrators** lies somewhere in between. Such businesses extend the industry's value curve by giving customers more for less, but they don't alter its basic shape. They have moderate VII scores.

Figure 6 shows the graphic interpretation of the model, where the scores of nine imaginary companies (A to I) were plotted.

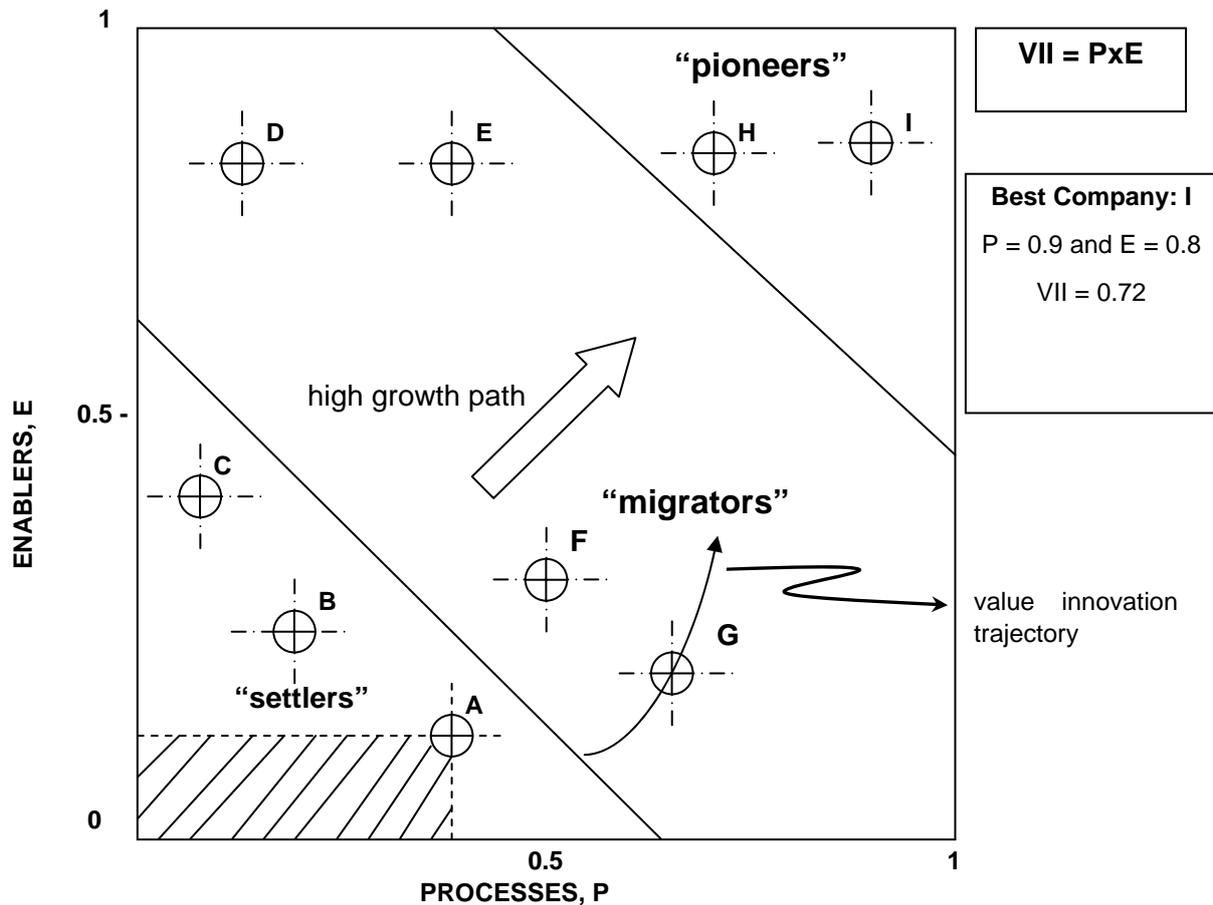


Figure 6 – Value Innovation Development Model
Source: Bruno (2005).

Analyzing the chart, company (or business unit) “A” is the worst case, typically a settler, while “I” is a winner company (or business unit), typically a pioneer.

Another advantage of using such a model, is the fact that the responses to the closed instruments' specific dimensions may reveal significant room for improvements in enablers and processes, as is depicted in Figure 7, which shows a gap per considered dimension.

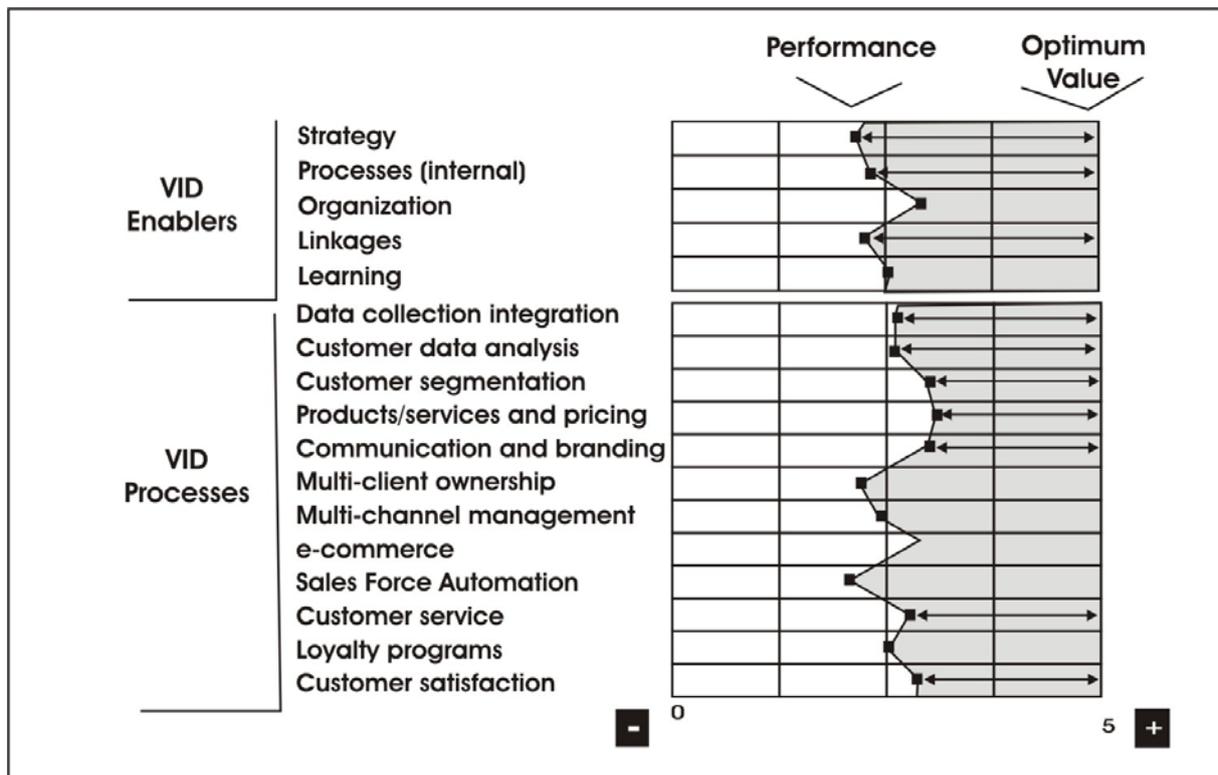


Figure 7 – Gap analysis by dimension

Source: Bruno (2005).

The self-assessment of own performance in each dimension of the Value Innovation Development model will show the company's current profile a useful exercise for a management team pursuing growth is to plot aside the current profile. A useful exercise for a management team pursuing growth is to plot aside the current profile a planned one following the logic of a new positioning of the company (or business unit) at the pioneer – migrator – settler map, defining, therefore, a possible value innovation trajectory, aiming at the "pioneer" area of the model.

References:

BRUNO, L.F. C, **Value innovation development model**. Fundação Dom Cabral Internal Document, 2005

COOPER, R. G. Winning with new products – doing it right. **Ivey Business Journal**, Jul./Aug. 2000. p. 54-60.

KIM, W. C and MAUBORGNE, R. Value Innovation: The strategic logic of high growth". **Harvard Business Review**, Jan./Feb., p.100-109.

PINE, B. J. Mass customization: the new frontier in business competition. **Harvard Business School Press**, Boston, MA, 1999.

Recommended Supplementary Readings

BIERLY III, Paul E. and CHAKRABARTI, Alok K. Technological learning, strategic flexibility, and new product development in the pharmaceutical industry. **IEEE Transactions on Engineering Management**, V. 43, N. 4, Nov. 1996, p. 368-380.

BURGELMAN et al. Management of technology and innovation. MacGraw Hill Fourth Edition, Part 4, 2004.

CLAYTON, T. and TURNER G. Brands, innovation and growth. *in*: TIDD, J. (Ed.). **From knowledge management to strategic competence: measuring technological, market and organizational innovation**. Imperial College Press, 2000.

COOPER, Robert G. **Winning at new products**. Cambridge. Perseus Books, 2001.

FREEMAN, C. **The economics of industrial innovation**. Harmondsworth: Penguin Books, 1974. p. 161-197.

LEONARD-BARTON, Dororothy. 1995, **Wellsprings of knowledge building and sustaning the sources of innovation**, Boston (MA): Havard Business School Press 1995. Chapter 7.

MOWERY, D. and **Rosenberg**, N. The influence of market demand ipon innovation: a critical review of some recent empirical studies. **Research Policy** 8, p. 101-153, 1979.

TIDD, J.; BESSANT J., and PAVIT K. Managing innovation. Integrating technological, market and organizational change. 2 Ed., John Wiley. [s.n], 2001 Chapter 7.

Von Hippel. Users as innovator's, **Technology Review**, 5, p. 212-239, 1976.

WANG Q. The exploitation of a multi-disciplinary approach in studying the R&D/marketing interface with some empirical evidence. **International Journal of Technology Management**, V. 11, p. 369-379, 1996.