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Market and technology drivers: shaping an innovation strategy

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Introduction

We know that customers are an important source of a firm's revenues. They buy products that are needed, making their lives easier or simply more enjoyable. We also know that firms cannot satisfy every customer's desire. Firms may not have the technology, the experience or sometimes cannot ensure a price level the customer is willing to accept. While all this seems obvious, innovation may provide a solution to this problem. However, research suggests that only a few organizations use a dual strategy of market and technology drivers when attempting to innovate.

Innovation research argues that organizations adjusting their innovative efforts from a predominant focus on pure research to a predominant focus on product development might be better prepared for the competition when compared with rivals who do not (Pech, 2009). Innovation is generally not a one-off event. Hence, it is not surprising that the likelihood of success depends on a firm's readiness to see innovation less as a lottery than as an inbuilt, ongoing process with continuous improvement in mind. These efforts work best if they incorporate both market *and* technology forces. Yet, how can this be achieved – a strategy to shift from one that is all too often steeped in hope toward one of planned action? Our case example demonstrates that when combining the satisfaction of market and technology forces, a synthesis can be created that will result in the achievement of concrete objectives and deliberate actions, reconciling the two forces and their interests and positions.

Relationships between market insights, technological capacity and performance

The management literature emphasizes the impact of market information processes on innovation performance. However, organizations that consider themselves technology driven often display a tendency to disregard these processes. Such organizations spend less effort on undertaking comprehensive market research than market driven organizations. They may undertake barely adequate efforts to determine customer acceptance but rarely take that next step necessary for neutralizing competitors. These organizations run the risk of developing products at great cost that fail to address actual market needs. As an example, Corning's ex-chairman Roger Ackermann reflected on Corning's innovation activities, claiming they used to be like a game of dice. They first invented something and then rolled the dice, hoping that they might have it right. But ultimately his team realized that if they failed to understand their market dynamics, the product would crash (Miller and Le Breton-Miller, 2005). Conversely, organizations focusing purely on market insights risk hamstringing their R&D departments with demands they can never satisfy.

Recent research in Europe emphasizes the impact that market and technology forces have on innovation and performance. Simon (2009) surveyed innovative mid-sized family firms and a random sample of large multinationals to investigate whether they were predominantly

technology or market driven or whether both drivers were equally important. Almost one-third (31 percent) of the large multinationals considered themselves as technology driven and 50 percent said that their innovative efforts are market driven. Only 19 percent recognized the market and technology as equally strong drivers. In turn, almost two-thirds (65 percent) of the innovative family firms found that markets and technology were equally important, 21 percent indicating that they were market-driven, and only 14 percent considered themselves to be technology driven. The large multinationals' belief that their innovative activities were predominantly driven by market forces does not surprise, considering the commonly held misconception that a firm should focus on the market and customer. However, it seems that innovative organizations established and maintained structures and processes that balance the forces of markets and technology, thereby achieving higher innovation performance.

Two competing schools of thought

The predominant focus on technology or market forces is often attributed to two competing schools of thought, namely, the resource-based and the market-based perspective (Barney, 1991; Morgan *et al.*, 2009; Newbert, 2008). The latter can be described as one with a focus on market opportunities that require a firm's strategy to change in line with market developments. The resource-based view, in turn, proposes that organizations consist of portfolios of specific assets (e.g. resources, technology, skills, and capabilities) and the firm's strategy should be driven by these bases. Although these opposed concepts are frequently discussed in the literature, many organizations focus on an "either/or", strategy rather than a more balanced "as well as" strategy when shaping their *modus operandi*.

The importance of leadership when combining a market and technology strategy

Interactions between innovation variables and leadership have been tested and discussed in several empirical studies (Eisenbeiss *et al.*, 2008; Rank *et al.*, 2009). They indicate that the independent variable of leadership has a high impact on the dependent variable of innovation. Employees' levels of experience with environmental pressures might serve as a mechanism to increase market orientation, create sustainable competitive advantage and therefore long-term profitability (Artz *et al.*, 2010; Laforet, 2008; Morgan *et al.*, 2009; Pech and Stamboulidis, 2010). Cooperation during these experiences is critical as organizational members might face uncertainty and tensions among colleagues and competing departments when engaging in innovation efforts. Leaders are responsible for creating the entrepreneurial environment. Effective leadership also needs to actively support individuals to cope with those challenges and to prepare for unforeseeable events during the innovation process (Lattuch and Young, 2011). Clearly, effective leadership that is positively associated with innovation performance, supports and empowers employees, tackles evolving conflicts and provides followers with mentorship to foster team creativity and collaboration.

The technology innovation survey from KPMG (2012) stated that CEOs are the most critical drivers of innovation efforts. However, the report also indicated that only a minority of informants found the CEO as the key driver in their firm suggesting a lack of top management leadership regarding innovation. Since employees tend to be sensitive to behaviors from those who matter to them, leaders are able to shape their interpretation of what is important. Thus, it is essential that leaders help their followers to come to a common understanding of the meaning of innovation initiatives. According to Rindova and Petkova (2007) even the most technical innovations require experienced leaders in order to create a balance between market insights and full team engagement. The leader's communication skills, impact on followers' interpretation of managerial actions, as well as relationships within the organization, are crucial when innovating.

An example of combining technology and market drive

We examined a high-performing family-controlled organization that is the European market leader in its segment. It was awarded one of Germany's "brands of the century" due to continuous innovation that influenced a whole industry during the last 90 years. We investigated the development of an on-grade shower tray. This radical product innovation process was observed and analyzed from its initial conception through to its successful market introduction. Inspired by the critical incident technique, we observed the process and interviewed key people involved in this recent innovation project.

On observing the innovation process, it became clear that a balanced combination of market attention and technology advancements proved to be critical success factors. We found leadership to be an important element to push existing technologies to their limits while at the same time addressing market insights. Why is it that such an organization achieves excellent innovation performance, while so many other firms struggle to achieve similar success? The CEO and business owner demonstrated leadership in a number of areas to hedge against the inherent risks associated with such a venture. The following examples indicate different strategies he employed to efficiently combine market and technology when innovating.

The situation, the challenge and the need for action

During the last 30 years the bathroom has changed from a functional to a recreation and wellness design. This change in design became an important part in people's bathroom concept and the development towards spacious and open rooms drastically altered bathroom fashion. Tile marketers expanded this concept in the sanitary market and offered new approaches to tiling, from walls and floors through to showers, removing the demand for shower trays. Besides the threat of tiles, one competitor introduced an almost flat shower tray to the market and outclassed the case company's product in this segment.

When sales declined and the case company lost market share in this relevant segment, the sales department argued that the poor range of dimensional diversity was the main reason why a competitor took the lead. However, the CEO argued that the dimension issue was indeed important, but a side issue only. He contended that tiled showers continuously gained market share and were badly underestimated by his engineers as a substitute for their shower trays. Instead of re-launching an existing tray with more dimensions, the firm needed to develop a product that outclassed the direct competitor as well as the competing tiled substitute products. The re-launch efforts were stopped and top-management took the lead and the inherent innovation risk to develop a completely new product that would attack the direct competitor as well as the concept of tiles in general.

Initiating innovation to push the firm ahead of competitors

Together with marketing and R&D, top management jointly developed criteria to make the new product successful. They found factual product development arguments supporting their initiative:

- on-grade trays are plain and do not have joints like tiled showers and are therefore more hygienic;
- trays from the case organization are easier to clean due to the use of steel enamel;
- there is greater preservation of the building fabric due to less moisture penetration damage with trays; and
- there was a 30 year warranty and higher recoverable assets for key clients (e.g. hotel chains) compared to what was being offered by tile installer firms.

In order to plan the realization of the "flat tray" idea, R&D and top management faced two major technical challenges: the issue of corner radii of the tray and panel thickness for the siphon. Due to existing production technologies, R&D had to develop tooling for stretching trays out of steel sheets with almost 90 degree angles. In other words, the production had to

produce as small edge radii as possible without the need for cost intensive welding. “These 90 degree angles were important to successfully build into the tray without thick silicon spots”, the R&D manager noted. “For this task we had to push existing limitations. Technically, our approach had to hurt (pause) but we had to ensure process stability at the same time. Too many unrectifiable rejects could hamstring the whole production”, a division manager reported. Within this context an R&D team member noted:

The competing company used cost intensive welding techniques to realize 90 degrees, but our task was to get as close to the 90 degree angle as possible with our existing pull technology. We really had to rack our brains to find a technical solution that was feasible. That was a great challenge.

In terms of the panel thickness issue, a small group of R&D engineers had to ignore the company's core business of developing different designs of trays to concentrate on finding a solution below the tray: the siphon. On-grade trays need to be exactly flush to the floor; and floor slabs in houses are mostly not deep enough to completely countersink ordinary siphons. To ensure that the new product would fit in all bathrooms with different kinds of slab thicknesses, a low-rise siphon was critical. Since the market did not offer such a siphon, the firm had to design a solution tailored for their product. Hence, corner radii close to 90 degrees and a low panel thickness of the tray clearly became technical key objectives of the innovation project.

During the development stage small teams with task-specific experience were tasked to complete milestones of the product development. “During this time we pushed constant information flow across teams to ensure that we were not piling up problems, thinking in compartments was strictly forbidden”, an executive reported. A division manager noted:

The overall goal, as usual, was to make the best out of the given technology. Since we are not specialized in cost intensive welding technologies we had to push our existing technology to the limit. We knew beforehand that our pull technology would not be able to realize as small radii as welding could. However, we knew that when we got as close as possible to the welded result, we were prepared for mass production. We knew that this could push us ahead of the competition.

Considering market and technology as equal forces

The CEO was passionate about continuously keeping an eye on the market for insights and opportunities. One needs to be mindful of the firm's objectives, and when product development is initiated, clear technical specifications must be stipulated and adhered to. A combination of insights from competitive products, a clear understanding of current customer demands, and the strategic positioning of a “pioneer and style icon” were all factors that determined his project objectives. According to the CEO, product features are important, but new insights also need to be balanced against technological capabilities, competitors' products, market acceptance, and costs. This understanding is displayed by the pioneering element in the company's strategy. During product development the firm did not focus predominantly on technology or on design, but on a balance between the two. The firm's positioning as a pioneer and style icon helped to shape this understanding throughout the organization thereby emphasizing a culture of innovation. During one focus group session with the project team the CEO noted:

Project management needs understanding of both the technical and commercial departments. Of course, from a market perspective an executive can say “yes, we adapt our product characteristics”, but this may contradict the entire workflow on the shop floor or doesn't suit the assembly layout. Project management needs to consider both sides of the coin. And if you don't have the technical understanding, at least you need to trust that what the technicians tell you, is right. This might sound funny, but this is the topic which is important here. As a project manager and executive I need an accurate and sensitive understanding as to what my research and development departments, and technical facilities, can and cannot reasonably achieve.

The company emphasizes the importance of supporting and promoting technological advancements to provide best-in-class solutions. During the product development phase this involved technicians engaging in theory, simulations, and tool designs prior to the

“The CEO was passionate about continuously keeping an eye on the market for insights and opportunities.”

production processes. This testing especially provided technicians and R&D employees with a certain degree of predictability that the new path to be followed was well conceived. This confidence in being able to manufacture a novel product could be directly attributed to management. Executives, in turn, also predefined ideas from market insights for R&D. These ideas often resulted in challenging tasks. As the CEO noted:

When I receive feedback from R&D that after several test loops they believe that we cannot technically develop this product, I can count on that feedback to be accurate. However, we often give challenging tasks to R&D with the understanding: “Let’s keep them thinking about it. Someday they will hit on something”. Pushing R&D and design beyond their technical limitations was a critical success factor in the development of the new product. However, not expecting unrealistic goals for exceeding these limitations was equally important to ensure production processes were not being asked to exceed actual capabilities.

People in R&D described themselves as skeptical about the product idea during the early stages of its conception. However, they managed to address these challenging market demands during the technical product design stage and were provided with a high degree of freedom while doing this. Their efforts were, moreover, commonly recognized by their executives. Simply put, leadership in this organization was established by providing a certain degree of autonomy and trust with regard to its technical and R&D division. Top management thereby nurtured a culture of pioneers that became evident in a motto used by the employees which stated that: “we want to, and we can be better than the competition”.

Focusing on concrete ideas and market insights that are specific

A second example illustrates how the CEO valued specific and concrete ideas rather than vague sentiments. During an interview a senior manager noted that top management had an accurate predictive sense for the success of future product innovations. When this statement was discussed during a focus group session the CEO responded: “The product success had nothing to do with an accurate predictive ability but rather it had more to do with honesty! Would I buy the new product myself?”. The firm encourages innovative activities of employees while stressing the importance of realism. The CEO’s favorite word is “concrete”. Whenever his team offers an idea he enjoys asking: What does this mean in concrete terms? Why exactly would people buy this new product or why specifically should we enter this market? When innovating, the CEO provoked his team to focus on concrete ideas and market insights that were specific, meaningful and thought-out instead of nebulous visions that were hard to grasp.

Surprising competition with unexpected actions

The commercialization of the new product was restricted due to the legal protection of a registered design by a competitor’s product. Therefore the firm planned the market introduction for the month when this protection would expire. In order to advertise the product earlier than this date without breaching issues of legal protection, the firm’s marketing team followed an unorthodox approach: they distributed a pre-product folder to exhibitors and important customers. Within the folder they did not actually display the new shower tray, but drew broad contours with a dashed line and labeled the illustration: “An innovation with much to offer”. Clearly, they did not show nor describe the new product, but immediately achieved over 500 placements, which approximated almost 50 percent of potential placements with exhibitors in Germany. “Considering that none of the exhibitors actually knew what we were coming up with, this was a great achievement and indicates the

“...it is critical to give time and space for R&D to verify developments before they are considered for mass production, something often ignored by organizations.”

level of trust attached to our brand”, the Marketing Director reported. Following on, the Sales Director stated:

[...] by promoting a new product that was illustrated just with dashed lines, exhibitors became curious. With additional incentives we ensured that exhibitors ordered the new product. This approach really turned the potential disadvantage based on legal issues into an advantage. Our new product was available at exhibitions and show rooms right after the competitor's legal protection expired. And even better: Our competitor did not expect us to enter their market segment with a new product so quickly.

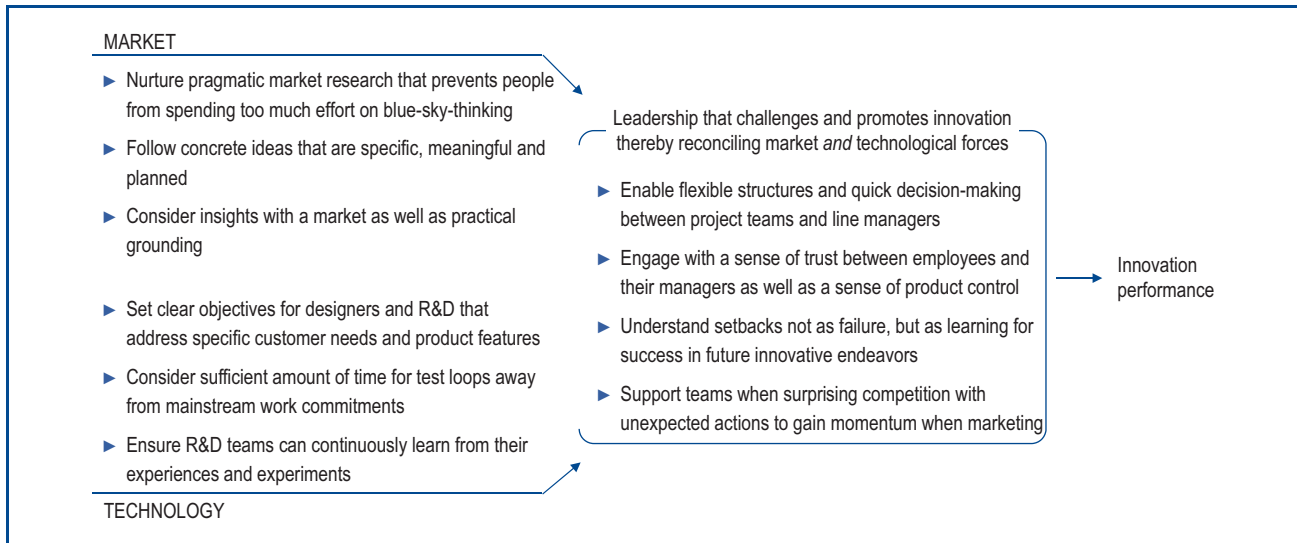
Due to legal protection rights, the competition was surprised by this unexpected action. By also aggressively penetrating the market at the same time, the firm won additional market share within a short-term. These two actions cleared the way for smooth and successful market penetration.

Facilitate innovation at your organization

The foregoing case has many useful lessons:

- In the current case, engineers managed to meet requirements from top management thereby broadening the firm's horizon significantly, without pushing for impossible technical demands. Clearly, R&D stretched itself to the limit of what they were capable of, but did not feel pressured to proceed beyond that point. Interactions between market need and maximal demand from technology were critical in this case. Although these drivers are derived from two independent sources, innovative firms need to integrate both when defining the direction of activities within their chosen market.
- This case also demonstrates that during innovation initiatives R&D needs a certain degree of autonomy and space to verify product developments using experiments or simulations. Part of this process is to understand potential setbacks not as failures, but as learning for success in future innovative endeavors. Determinants of engagement during the innovation journey were a sense of trust between employees and their managers as well as having a sense of product control. Such experience can lead to innovation capabilities that may result in competitive advantage. In addition, neglectfulness during testing cycles might have negative implications for the firm. Accurate knowledge about a product's characteristics and performance can help organizational members cope with market uncertainty and any potential risks when forging new pathways.
- Based on a flexible structure and quick decision making, the CEO and business owner drove activities cohesively throughout all departments. The combination of his high degree of persuasive control, instead of autocratic demands, combined with the experience and skills of project members, were cornerstones of innovation success. Top management should actively promote innovation projects so that they are fully understood by organizational members and so that they fit the organization portfolio.
- Regardless of the industry, this case illustrates how pragmatic leadership can foster innovation that leads to higher levels of performance and competition. Organizations that spend too much effort on blue-sky-thinking and waiting for a break-through idea might miss opportunities that derive from clear market analysis and technological advancements. Surprising the competition with pragmatic and unexpected actions can especially help firms to gain momentum when commercializing their products.

Figure 1 Ten actions to facilitate innovation at your firm



Conclusion

This case study is one that most leaders should find useful. First, leading with clear, well-defined, and persuasive goals that consider market and technology factors as equal forces is critical in pursuing innovative activities. Second, focusing on concrete ideas and market insights that are specific ensures that the need for improvement do not attempt to push the firm's technology beyond its actual limits. And third, surprising competition with unexpected actions helps to generate an unstoppable momentum after market introduction.

We must accept that there may often be a discrepancy between wishes and technical capabilities. Our research found that technical limitations are not determined by verbal statements, but are tested and proven by experiments. An organization must have the capacity and resources to provide employees with the freedom to undertake experiments outside the daily mainstream of the business. Important decisions rely on the ability to undertake these experiments. Considering the thousands of products the case company produces and sells, any technical risk that can only be partially managed might be destructive to the firm and its reputation.

In terms of leadership it is critical to give time and space for R&D to verify developments before they are considered for mass production, something often ignored by organizations. Figure 1 highlights the key determinants that leaders need to consider when promoting innovation in their firm. Effective leadership at the right project phases particularly helps to reconcile the dual perspective when promoting innovation. Learning from experience with clear objectives for R&D separates a tinker from a technician. However, the exact route to achieving these objectives should never be predetermined. "That's where creativity comes into the game", we were informed by the CEO.

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