



**Strategic Leadership  
and Innovation in  
High Technology  
Firms**

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# Strategic Leadership and Innovation in High Technology Firms

Did you ever wonder what the organizations that produce some of the high tech gadgets we marvel at such as the iPhone and the Blu-ray player are like? How do their leaders create and maintain a spirit of innovation that produces these hit products? High technology firms face unique challenges because of the fast paced and ever-changing landscape of their industry. Intellectual capital and innovation have become the key sources of competitive advantage in a wide range of industries and many have argued that the key to the future competitiveness of organizations in the U.S and abroad is the ability to innovate and bring new products to market swiftly. But what is the role of top executive leadership in the strategic management of innovation?

The link between leadership and strategy is clear. CEOs can sometimes hinder and sometimes promote the development of dynamic capabilities in organizations. CEOs' contributions in high-technology firms is a matter of how well they can create something brand new, but most importantly, how well they can protect, build on, and improve what was in place before, perhaps prior to their arrival. However, traditional approaches to the study of leadership have not specifically addressed the requisite characteristics for executive leadership in such firms. In high-technology firms, CEOs play an important role in creating a corporate environment that fosters or inhibits innovation and firms reliant on innovation require the effective utilization of people as well as the ability to create and disseminate innovation. The CEO can either encourage basic research by creating well paid research fellow positions (IBM and DuPont adopted this) and by encouraging collaborations with universities or she can implement strategies that weaken the productivity of scientists (for example by linking salary increases to the assumption of managerial responsibilities). Simply put, effective innovation requires that resources are routed to basic research and CEOs have great power to influence innovation decisions since they are the central strategic decision maker. An effective leader in a high technology environment must simultaneously influence the invention, development, and commercialization of new products and services. High technology firms, therefore, have unique requirements for effective leadership.

University of Miami professors, Marianna Makri and Terri A. Scandura, studied the effects of CEO leadership on innovation, and identified new concepts in strategic leadership specifically related to high technology leadership, operational and creative leadership. Their results are detailed in an article entitled, "Exploring the Effects of Creative Leadership on Innovation in High-Technology Firms."

Operational leadership focuses on the development of new products and commercializing these innovations. An effective operational leader must be able to sell those inventions and

communicate effectively with the external market. According to the study, “a CEO exhibiting characteristics of operational leadership would put an emphasis on playing a boundary spanning role by communicating with the external environment, identifying opportunities externally, and creating new knowledge contexts by extending existing product/market domains via mergers and acquisitions, alliances, or joint ventures.” A high technology firm may produce a large number of inventions, but these may be of little value unless the CEO is able to push them through the pipeline, commercialize them and derive a profit from them. As projects move from the invention phase to development and commercialization, an effective operational leader would be skilled in securing resources, and communicating with external constituencies (e.g. FDA). In other words, a successful operational leader must continually monitor and evaluate opportunities in the external environment in order to broaden the firm’s knowledge-creation opportunities by external knowledge acquisition.

While operational leaders focus on the external environment, creative leaders develop human capital, the people side of the business, and strive to create and maintain an environment favorable for new idea creation within the organization. The first step in the innovation value chain, idea generation, is distinct from the other two in that it is the most people-centered and internally-focused. As such, the ability to create a corporate environment that fosters innovation is crucial. According to Maki and Scandura, creative leaders “tend to focus on expanding the firm’s existing knowledge stocks internally and they are skilled at stimulating creative staff intellectually, trusting and supporting them, and providing them latitude.” They promote individual initiative while promoting integration of group activities and teamwork. In sum, exploring new ideas, taking risks, and leveraging human and social capital are dimensions of creative leadership that enhance a firm’s competence in pursuing scientific discovery which in turn can lead to more influential innovations that ultimately have market value.

CEOs constantly assess the gap between their existing capabilities and the targeted capabilities to decide whether to seek new capabilities from outside the firm or to develop them internally. This selection capability is crucial for long-term performance and strategic renewal. As such, ambidexterity in leadership is important. While CEOs who exhibit operational leadership characteristics would try to seek new capabilities from outside the firm, CEOs with creative leadership characteristics would look internally for such capabilities. Obviously this search process would be optimal when the leader is able to select the appropriate mode of strategic renewal.

To this point, Makri’s and Scandura’s study argues, “that CEOs of high technology firms who are able to simultaneously focus on the external and internal environment, and on developing new knowledge as well as commercializing it, would be more effective leaders.” An ambidextrous firm able to simultaneously explore and exploit, able to simultaneously invent and innovate, will outperform firms that emphasize one at the expense of the other. Simply put, CEOs who are able to simultaneously focus on the external and internal environment, will be more effective leaders. While these two leadership styles are important for leaders in all firms,

for firms in the high-technology environment which relies on streams of innovation for long-term success, they are critical. The study suggested that in high technology firms, creative and operational leadership will be positively related to the quantity and quality of innovations.

The study's findings are important for firms as they consider both dimensions of creative and operational leadership in the emergence of leadership of high technology firms and evaluate their performance. These dimensions may be relevant to the question of CEO compensation in high technology firms. According to Makri and Scandura's findings, "operational and creative leadership characteristics are effective predictors of innovation productivity and quality. As such, it is important that boards of directors consider these behavioral characteristics when setting CEO pay in addition to considering financial outcomes." More specifically, high-technology firms can be more effective if they base CEO incentives on a combination of short-term financial results (ROE) and indicators of long-term innovation quality (investment in basic research). Such a compensation system encourages a CEO to commercialize innovations but also reinforces behaviors that enhance the firm's ability to innovate in the long run.

But what is an indicator of innovation quality? The innovation management literature suggests that investments in basic research (science) are associated with higher quality innovations. For example, the number of papers a firm's scientists publish and their external reputation are positively related to the rate of new product development in the pharmaceutical and chemical industries. As such, CEOs of high-technology firms should be evaluated based on invention quality and rewarded for investing in basic research in addition to being rewarded for the number of new patents or products brought to market.

The findings of this study have implications for the selection of leaders in high-technology firms. Creative and operational leadership are both important and relevant for different phases of the innovation process, and clearly, being able to simultaneously pursue both is a desirable trait in a leader. However, because ambidexterity in leadership is a rare trait, selecting executive officers with complementary leadership skills is key. For instance, who the CEO appoints as a Chief Technology Officer is important because a CTO who exhibits creative leadership characteristics can complement a CEO who is more operational. In sum, the top management team can complement the CEOs' leadership tendencies firms that have a cadre of top management talent which have both operational and creative leadership capabilities may be more effective in terms of developing streams of innovation.

Makri's and Scandura's research provides a springboard for further studies into high technology leadership. The study demonstrated a relationship between these two types of leadership and innovation, so further exploration into the process how they are implemented in organizations is necessary. Further, other managers are involved in facilitating innovation. As such, these two types of leadership could be explored in the context of divisional and R&D managers. Most likely there is a cascading effect from the CEO down to lower levels within the high technology-intensive firm.

The next steps are to study the specific best practices that leaders and their top management teams engage in, in order to create, develop and market new innovations. Cleary, “Exploring the Effects of Creative Leadership on Innovation in High-Technology Firms” will be published in an upcoming issue of *The Leadership Quarterly*.