The Technology Dimension of Strategic Leadership

The leadership challenge for production economists

Hans H. Hinterhuber*, Stephan A. Friedrich

Department of Management, University of Innsbruck
A-6020 Innsbruck, Austria

Received October 24, 2000; revised January 24, 2001

Abstract

Achieving sustainable competitive advantage and increasing the economic value of a firm in the 21st century's global economy will be a complex, challenging, and knowledge-based task. It can be thought of as revolving around the interplay of three basic forces: a) a dynamic environment, filled with opportunities and threats, b) an innovative and agile organizational system, and c) strategic leadership whose role is to mediate between these two forces, to optimize existing processes and systems and, at the same time, to discover new opportunities and to capitalize on them.

The purpose of this paper is to evidence the technology dimension of strategic leadership and to analyse new perspectives for production economics. We describe first the rules of the game in a dynamic and hypercompetitive environment. By examining the differences between leadership and management, it is possible, first to identify and understand the different roles of production economists and second to analyse the two most critical tasks of production economists: a) as a manager, to optimize existing processes and systems, and b) as a leader, to invent the future and to inspire people to work enthusiastically for achieving challenging goals. The message of the paper is that a comprehensive conceptual framework for integrating technology into strategic leadership increases the probability that a firm can achieve superior long-term performance.

Key words: Leadership; managerial excellence; production economics; production economist.

* Corresponding author. Tel.: ++43/512/507-7181; fax: ++43/512/507-2968; E-mail: Hans.Hinterhuber@uibk.ac.at

1. The rules of the game in a dynamic environment

It is better to do something and to regret it,
than to do nothing, and to regret it too.
Nicolo Machiavelli

The dynamic environment other 21st century's global economy is characterized by a number of factors which are likely to influence more and more the tasks of the production economists [1]. Fig. 1 shows these factors.

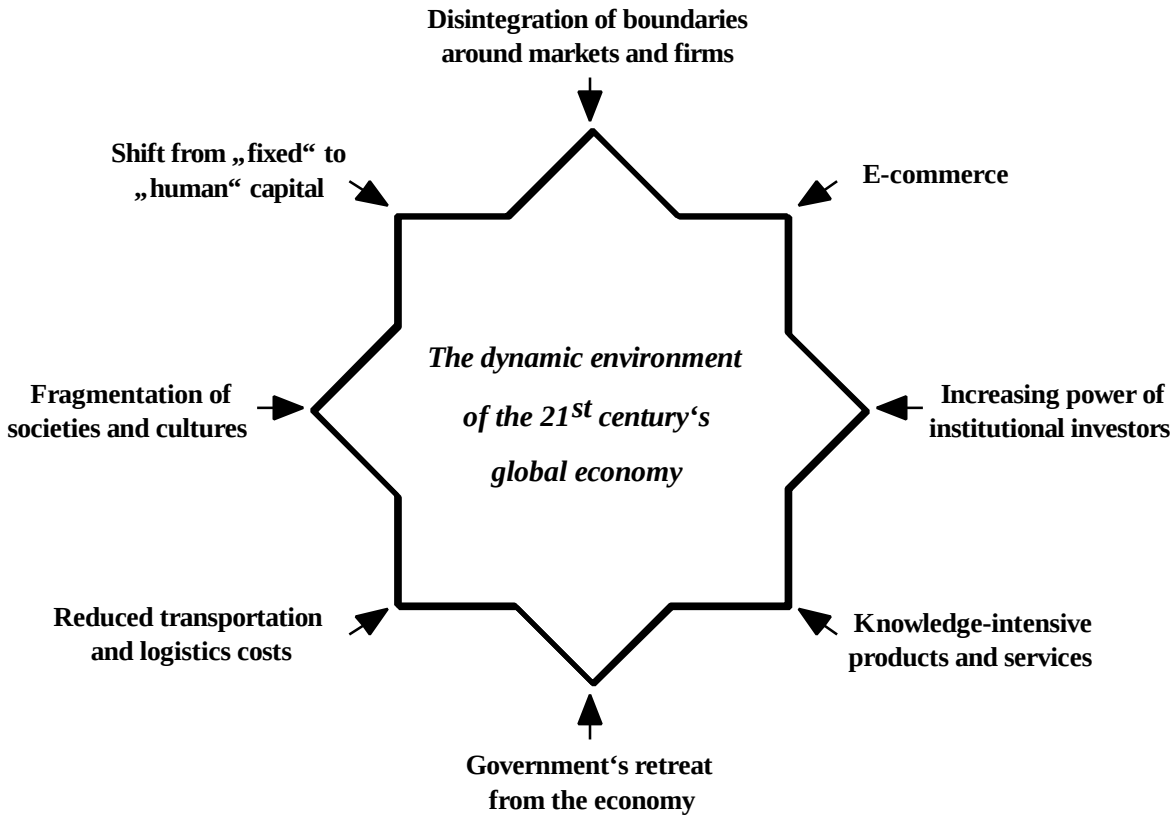

Fig. 1. The forces shaping the dynamic environment an agile firm has to face (Hinterhuber/Pechlaner, 2000)

The traditional boundaries around markets are being redrawn. The disintegration of boundaries is occuring among firms in entertainment, telecommunications, cable television, publishing, and software. This means rethinking value adding activities, deconstructing value chains, and outsourcing many operations. Start-up companies from all over the world change the rules of the game and erode the market positions of leading firms. Firms become more responsive to institutional investors who expect every company or strategic business unit to earn at least its capital costs. Products and services incorporate more knowledge -challenging the creativity and imagination of the production economist. Government's retreat from the economy, reduced

transportation and logistics costs and the fragmentation of societies and cultures open new opportunities for entrepreneurial action. In a knowledge-based economy the emphasis is shifting from "fixed" to "human" capital. Knowledge management is one of the key elements for achieving competitive advantages.

Fig. 2 shows the rules of the game in a high1y competitive arena. The competitors are lined up on contours of customer indifference, ranging from competitor A, who matches a high perceived value with a high delivered cost, to competitor E who sells cheap products with less perceived value. The competitive situation is in equilibrium until a competitor somewhere offers "more value for less money". In an oligopolistic market situation rivals are forced to adapt, moving to another line of customer indifference. If the game goes on and a competitor reduces the delivered cost and offers more for less, all competitors are forced to move to a new line of customer indifference, even further right of the present equilibrium line. If this escalating competition goes on, some competitors are forced out of the market and even surviving firms face increasing difficulties for adding value for their key stakeholders [2].

In order to increase the long-term economic value of the firm, competitors in a highly competitive arena face three strategic alternatives:

1. lower the delivered cost and increase the perceived value for the customers,
2. create more value for the customers, outperforming the competitors, or
3. discover new opportunities in an economic landscape which is less competitive.

Alternative 1 and 2 mean creative problem solving and optimizing existing processes, systems and, procedures. As will be shown, they require management behavior. Production economists have to lower delivered cost and to create customer value through higher quality, better service, more effective relations with key customers and shorter delivery and cycle times. Alternative 3 means alertness for opportunities and imagination to capitalize on them. Alternative 3 is associated with leadership behavior.

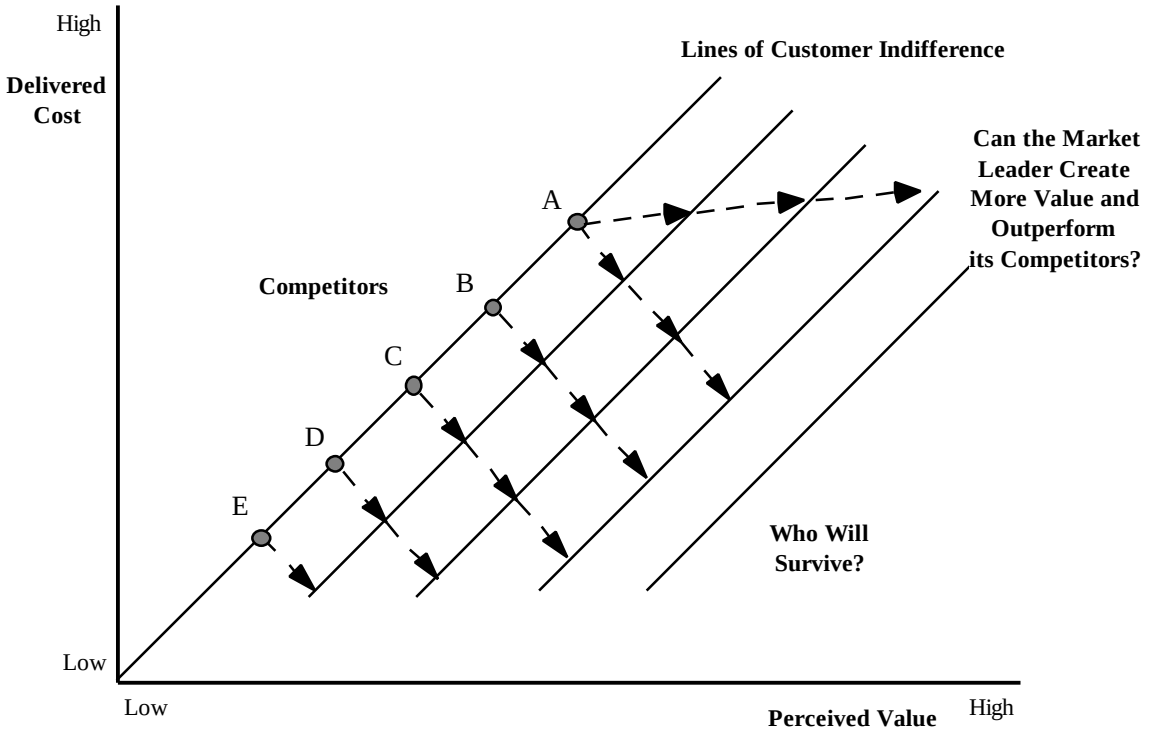

Fig. 2. Creating customer value in a dynamic environment

Alternatives 1 and 2 can be compared to a positional warfare (Fig. 3). A positional warfare, in economic terms, is characterized by optimizing, existing products, services, and systems, cost reductions, in other words, by management behavior. New opportunities, new products, processes, and services lead to a mobile warfare, in which the rules of the game are changed; sooner or later, depending on the entry barriers, however, existing and/or new competitors will imitate the leading firm, thus transforming the mobile warfare into an imitational warfare [3]. The imitational warfare leads back to a positional warfare. Strategic leadership is needed in order to breakout of this hypercompetitive cycle.

We would like to introduce the production economist to the exciting field of strategic leadership, which is enjoying more and more theoretical and empirical research. Strategic management focuses on the strategy, strategic leadership on the individual and on the team in the strategic management process.

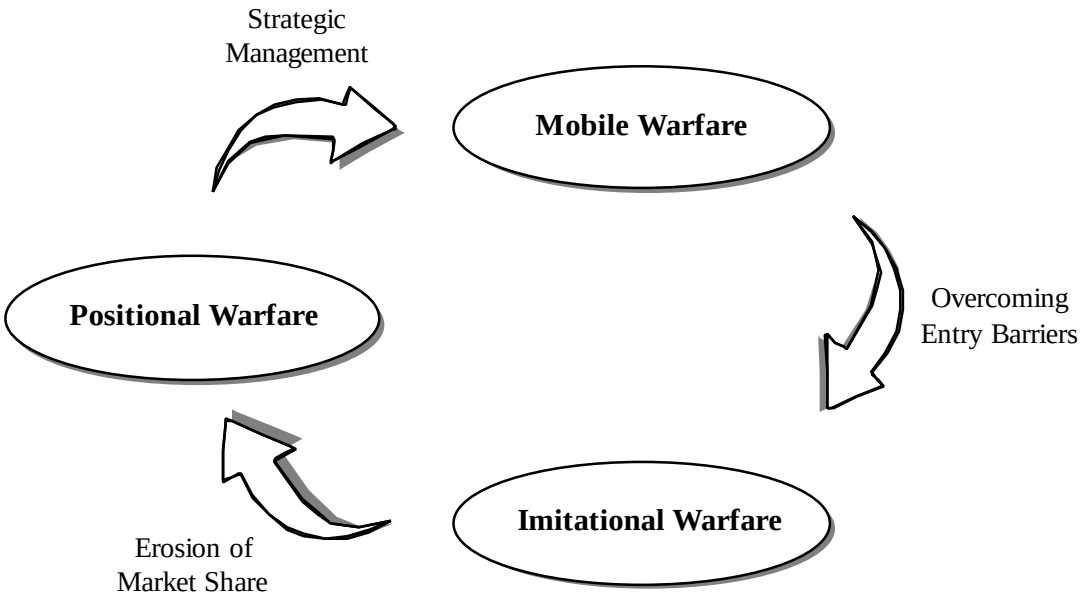

Fig. 3. The competitive arenas in hypercompetition

2. The two basic tasks of the production economist

You manage things, you lead people.
Warren Bennis

Leadership and management are very common topics of research interests. Empirical studies of senior executives tend to draw from either positive agency theory or strategic leadership theory [4]. In agency theory, senior executives are viewed as agents of shareholders, with own interests and agendas, potentially separate from those of the shareholders whom they are employed to represent [5]. Strategic leadership theory argues that companies are reflections of top managers and of the teams they have built around them [6].

The source of *leadership* is alertness to opportunity and the imagination and vision to capitalize on it [7]. Leadership means:

- identifying opportunities that others might not see and exploiting these opportunities rapidly and fully,
- inspiring people to achieve more than they think they can achieve and demonstrating them that they should never be satisfied with where they are now [8].

Leadership is a learned or acquired ability of influencing people to work enthusiastica1ly toward goals identified as being for the common good [9]. Leadership is not based on power - forcing someone to do one's will -, but on *authority,* one's personal influence of getting people to *willingly* contribute to achieve shared goals.

Leadership is a natural, unforced ability to identify and exploit opportunities and to inspire people to create values for all stakeholders - the customers, the employees, the shareholders and the financia1 community, society, suppliers and partners in strategic networks [10]. Leadership cannot be effective without high energy, courage and a fundamental respect as well as genuine interest in people [11]. Leadership creates a new paradigm and works on the system [12]. Leadership means inventing new markets, changing the rules of the game in existing markets or changing the structure of an industry through mergers, acquisitions, joint ventures or strategic networks [13]. Leadership has its true roots in ideals and values as well as in an unselfish service and commitment that go beyond personal interests [14].

Management is creative problem solving. It optimizes existing systems, procedures, processes, products, and services. Management works within a given paradigm or within a given system. Management deploys a great number of decision and action methods as well as attitudes in order to achieve competitive advantages. Reducing the delivered cost, improving the production flow in a plant or increasing the value of existing products and services for the customers are management tasks.

Management is easier to learn than leadership. Production economists need both – leadership and management, if radical changes are to be implemented in order to achieve dramatic improvements in performance [15]. Fig. 4 illustrates the complementarity of management and leadership. Table 1 summarizes the leadership and management tasks of the production economist as thought by European manufacturing company managers.

The study was carried out between 1997 and 1999. In each of the companies at least one manager, representing either the executive team or middle management, was submitted a questionnaire. The objective of the questionnaire was to identify the appropriate level of decision making (executive level/operational management level) for a variety of issues typically encountered by a company. The results are reported in Table 1. Table 2 summarizes our interviews with selected CEO’s of participating companies.

Fig. 4. Management versus leadership

The message is that the production economist needs management and leadership capabilities. As a manager his task is to optimize existing systems, procedures and processes, to control supplier relations and logistics, and to implement efficiently the manufacturing policy by taking advantage from appropriate IT-systems.

In addition, the production economist has a *leadership* responsibility: to discover new opportunities which can be exploited with the existing organizational capabilities of the firm, to develop new core competencies for new products, services, and systems, and to create a culture which fosters innovation.

	Percentage of respondents citing each criterion	
	Leadership Tasks (cannot be delegated by senior executives)	*Management Tasks* (can be delegated by senior executives)
Vision/Mission statement	97	3
Core Competencies/Outsourcing	92	8
Supplier Relations	9	91
Core products/services	90	10
Core differences/product design prior to manufacture: competitive advantages	84	16
Manufacturing policy	12	88
Factory layout and processes	6	94
Logistics	2	98
Corporate Culture/Corporate Identity	72	28
Organization/Management selection	95	5
Strategy/Strategic Issues	99	1
Union relations	43	57
Information systems	23	77
International manufacturing	63	37

Source: Department of Management, University of Innsbruck, survey of 108 European manufacturing companies, 1999

Table 1 Leadership tasks versus management tasks

3. The management tasks of the production economist

Everytime you hold an internal meeting,
you show your ass to the customer.
Jack Welch

Production economics is basically an engineering discipline. This field focuses on topics treating the interface between technology/engineering and economics/management, concerning all aspects in relation to manufacturing and processing industries, as weIl as to production in general. The subject is interdisciplinary in nature. In recent years, mainly due to the globalization of manufacturing, researchers in production economics have also shown an increasing interest in

strategic issues of production, thereby furthering ties between production and strategic-organizational topics [16].

Fig. 5 illustrates a model of strategic management [17] that provides the organizing framework for analyzing the management role of the production economist. The model is a systemic, emergent and dynamic framework, which covers a) the value creation process or what the firm does, and b) the results or what the firm achieves with respect to all key stakeholders. The value creation process is connected with the results through leadership and trough the mental models prevailing in the firm.

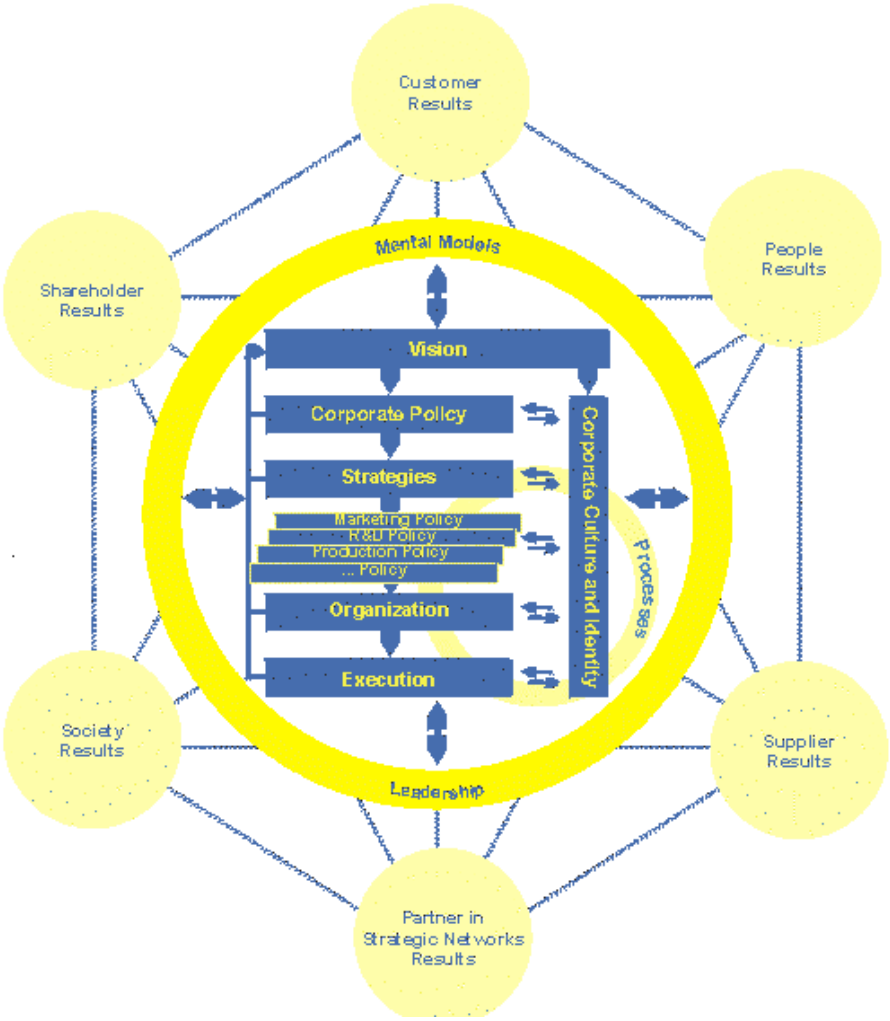

Fig. 5. A strategic management model (Hinterhuber, 2001)

The *value creation process* is about installing and coordinating value adding activities and relationships for achieving sustainable competitive advantages. A firm has to have a clear purpose. The *vision* has to answer the question: "What needs of society does the organization want to fulfill?" It is what a company exists to achieve and what it is willing and not willing to do to achieve it [18]. The vision of BH Marine, a leading European engineering form is: "BMH Marine shall contribute to hand over a cleaner environment to the next generation".

The production economist has to be involved in formulating the company's vision. "If the purpose is not crystal clear, people in the business will not understand what kind of knowledge is critical and w hat they have to learn in order to improve performance. A clear purpose allows a company to focus is learning efforts in order to increase its competitive advantage [19].

The *corporate policy* illustrates in more detail what the company is, what makes it distinctive and what it wishes to achieve with respect to the key-stakeholders. The corporate policy, which finds its formal expression in the mission statement, indicates the markets, in which the firm competes or wishes to compete, the ways - internal and/or external growth - for achieving leading market positions, the return it will offer its shareholders, the shared values for releasing the full potential of the employees, the firm's behavior as a "good corporate citizen" and so on. The mission statement of ILF, a leading Austrian-German engineering consultant firm specifies among other topics the scope of its activities: "Engineering services for the creation, the operation, and the maintenance of infrastructure objects". The production economist's task is to share his or her knowledge for incouraging the involvement of everyone in the organization in defining a concrete mission.

"Strategy is the evolvement of the originally guiding idea according to continuously changing circumstances" [20]. The guiding idea is an innovative business idea or a core competency which has to be evolved in order to match the ever-changing needs of customers better than competitors can do. The core competency of Swarovski, the Austrian world leader in crystal products, is a combination of abrasive technologies, design, marketing, and delighting customers in a collectors club and a unique "crystal world". The core competency of ILF-Consultant Engineers is engineering and technological know-how. The challenging task for the production economist is to analyze relevant trends and major changes in technology, to identify where and how operations contribute to core competencies, and to implement value-adding activities in the operations value chain in order to achieve sustainable competitive advantages.

The next important consideration is the process that managers use to go from business-unit strategy to strategic action. Business-unit strategy is only an expression of intentions, until people in the operating departments of the company carry it out. Department participation in business- unit strategy formulation and initiative in execution for excellence are expected. *Policies* or guidelines are the bridges between business-unit strategy and department operations. The *R&D policy* and *production policy* are guidelines which allow the R&D and production manager to identify and elaborate those action plans which are in line with the strategy and secure differential advantages to the firm.

The operations department has freedom to design its action programs within the limits set by the production policy, the external opportunities, its history and commitment, and the internal fit (Fig. 6) [21].

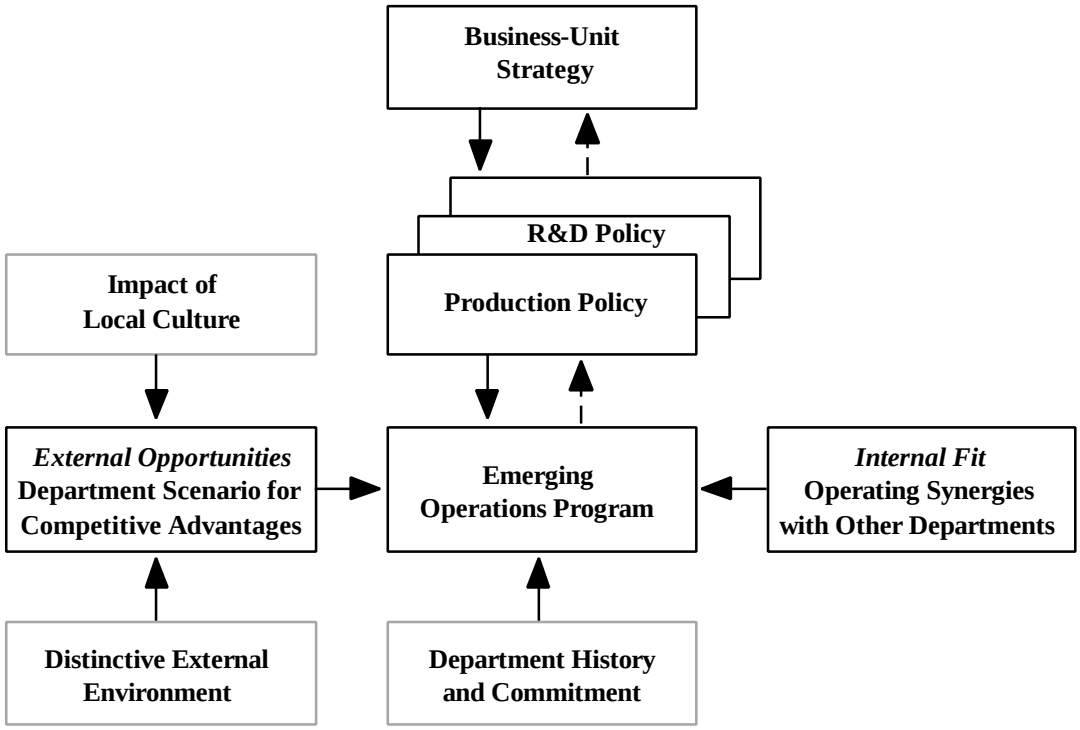

Fig. 6. The critical linkages of the operations department (Adapted from: Newman/Logan/ Hegarty, 1989)

The production economist has to recognize and reconcile the three linkages: with the business-units strategy, the distinctive external environment of the department, and the other departments. Not considering one of them, will undermine the contributions of the operations department to competitive advantages.

Strategy and *organization* are closely interlinked. The existing organizational structure is determined by the strategies and at the same time, influences the strategic options of a company and may even make certain business-unit strategies highly unlikely. Outsourcing value adding activities and/or deconstructing the value chain emphasize the need to consider organization while strategy is still being developed [22].

The managerial aspect of organization design is to achieve maximum efficiency in current activities; the leadership aspect is to facilitate strategic change and flexibility in order to discover new opportunities and to capitalize on them. The production economist has to master both aspects of organization design: maximizing efficiency of current operations and aiding integrated strategic action for exploiting new opportunities. Obviously, the emphasis on efficiency versus strategic change is determined by the business-unit strategy.

A large part of the time of production economists is devoted *to execution*, that is short-range programming, motivating, coordinating, and controlling.

Process management is intended to eliminate the barriers between individuals, departments, hierarchies, business and regional units in order to add value for the customers. The core competencies of a firm are embedded in the processes. Designing and implementing business processes, involving suppliers and partners in strategic networks, and solving the customers productivity equation more effectively than the competitors, is one of the most challenging roles of production economics.

Production economists should behave in a way that creates a *corporate culture and identity* favorable not only to the execution of the strategies and action plans, but also to the previously discussed components of strategic management. They strongly influence the whole process of strategic management by the examples they set and by the values they live.

The strategic management process is not linear. Strategies can emerge from a situation rather than being prescribed in advance from an entrepreneurial vision. Organizational development, corrective actions, coalitions of people forming power blocks may initiate a new strategy formulation process, which requires a new vision and changes the corporate culture.

The *mental models* of senior executives summarize their ideas, about industry evolution, short- or long-termism, the appropriate size and diversity of the company, how to compete and to organize. They determine which issues are viewed as key in the strategic management process, which strategies are being chosen or changed and so on [23].

The long-term performance of the firm depends upon balancing and satisfying the needs and expectations of a1l key stakeholders. The results achieved in satisfying customers, employees, shareholders and the financial community, society, suppliers, and partners in strategic networks have to be measured. The production economist is committed to searching for appropriate measuring criteria.

4. The leadership tasks of the production economist

Lead others as you would like to be led.
The Golden Rule

Strategic leadership is defined as a *person's* ability to create a vision, to be an example, and to add value to the firm [24]. Strategic leadership is the art and science of combining results and hearts. Fig. 7 shows the strategic leadership tasks of production economists [25]. The metapher of the house indicates that the customers form the basis of strategic leadership and that production economists have to do justice to all three requirements – envisioning (giving a direction and a meaning to the activities of all people involved in the firm), being an example (the ethical aspect of leadership combining wisdom and *courage,* the willingness to risk) and

creating values for all key stakeholders. In addressing the personal side of strategic leadership the production economist, however, has to add technology for achieving a superior performance of the firm (Fig. 8) [26].

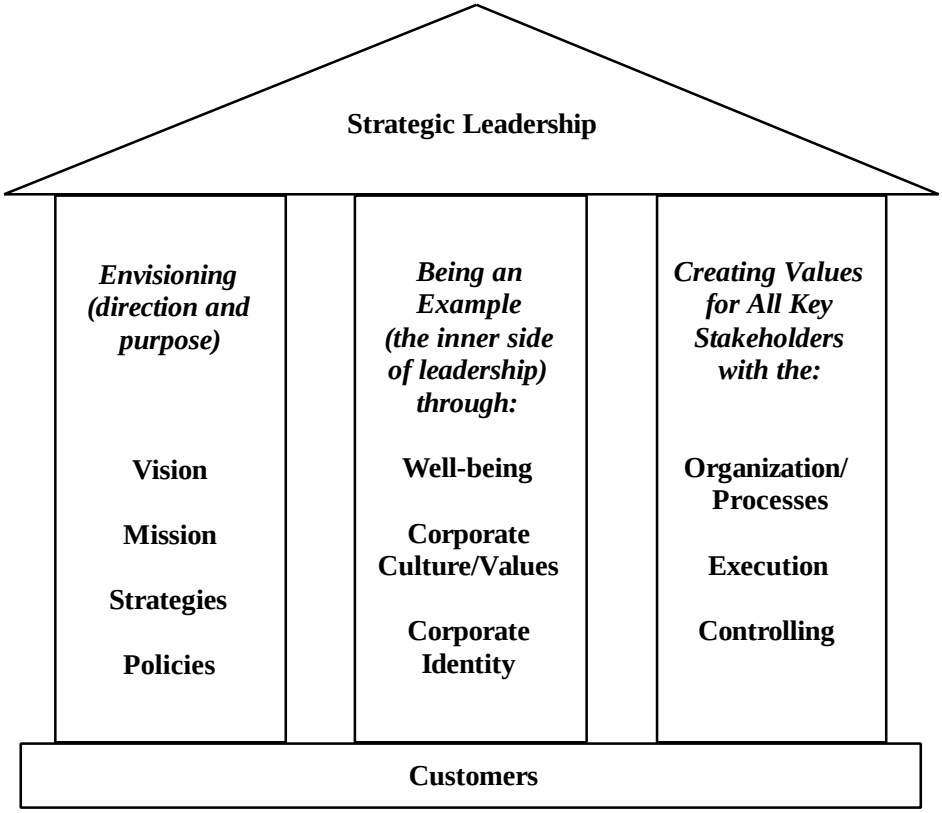

Fig. 7. *The strategic leadership tasks of production economists (Hinterhuber/Krauthammer,* 1998)

The production economist as a leader is someone who identifies and meets the legitimate needs of people involved in the management of technology, removes barriers, so they can serve the customers; in order to lead, one must serve [27].

The personal side of strategic leadership requires credibility, resourcefulness, courage, trust, confidence, sense-giving and contribution to society. These examples show the role of the qualitative aspects in strategic leadership; they must make us modest when we try to explain the performance of a firm or to prepare the managers who will lead them in the future.

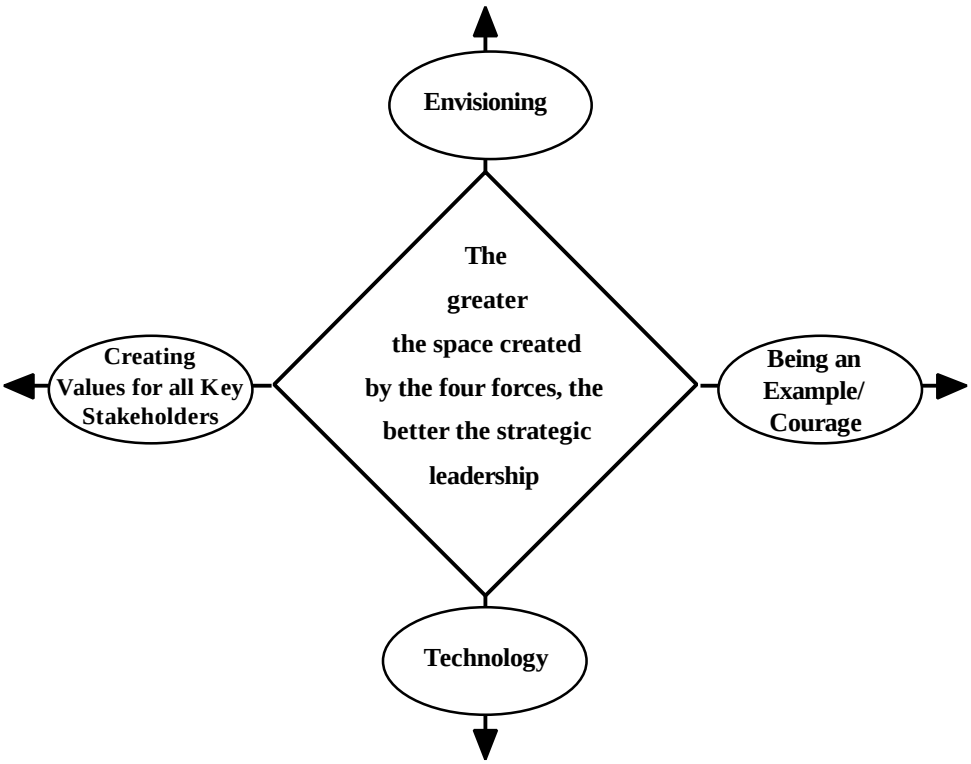

Fig. 8. The four dimensions of strategic leadership (*adapted from P. Koestenbaum,* 1991)

The more the production economist moves up the organization, the more important will be his or her leadership responsibility (Fig. 9). It is important to note, however, that every production economist has a management *and* a leadership responsibility. Depending on the task and the situation, he or she must be able to deploy the right mix of managerial and leadership effectiveness [28].

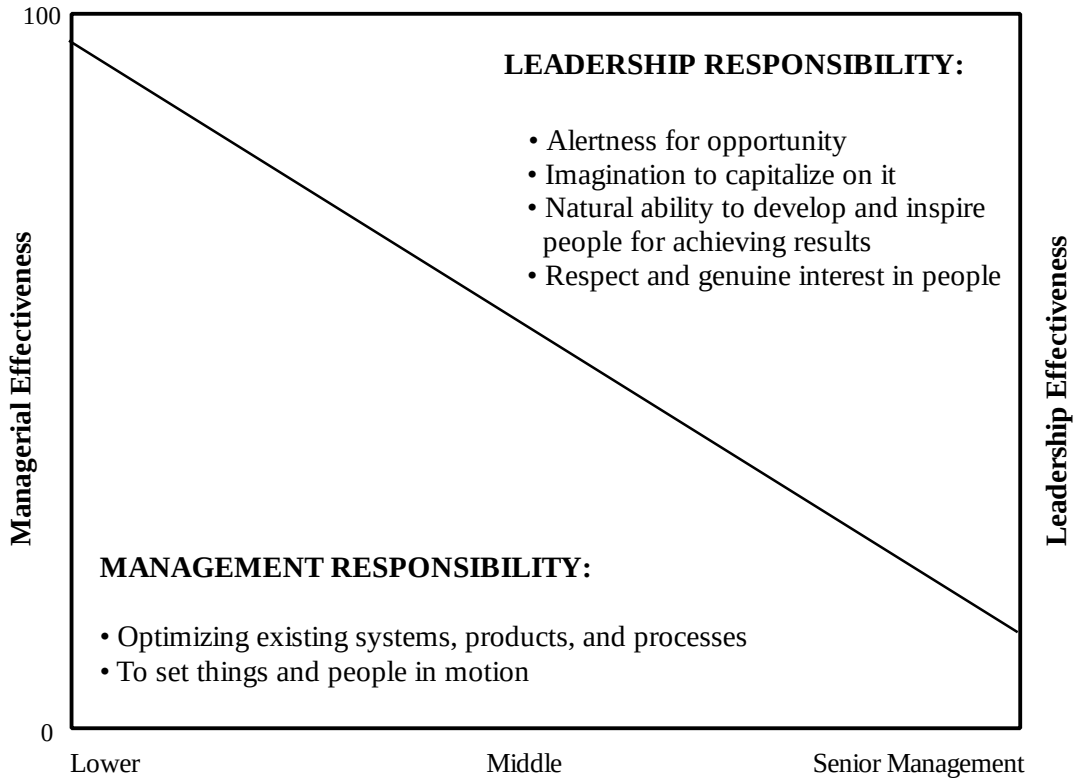

Fig. 9. Management versus leadership responsibility

Critical contributions of the production economist to strategic leadership we found in our survey of European manufacturing companies are summarized in Table 2. These are results we expected and we think they are valid not only for Europe. The production economist can help in many ways to optimize the present and to discover long-run opportunities for increasing the value of the firm and developing the plan for achieving the objectives.

	(A) Envisioning
1. Vision:	• Discovering new technological opportunities that fulfill basic needs of Society
2. Mission:	• Embodying technological values in the mission statement • Contributing to the orientation, legitimation, and motivation function of the mission statement
3. Strategy:	• Discovering new opportunities and optimizing existing systems • Identifying strategic issues in streams of ambiguous data and emerging technologies • Defining core competencies or business ideas for business strategy development • Identifying and implementing synergies for corporate strategies • Assessing and controlling risks and economic viability of strategies
4. R&D and production policy:	• Creating bundles of activities/resources that are valuable for customers, rare, difficult to imitate, and without substitutes • Supplying coordinated support for core competencies in order to

	outperform competitors • Creating product/service attributes that delight customers • Building distinctive capabilities through continuous investments over year • Interconnecting capabilities • Building on past success • Embedding competitive advantages in "causal ambiguity" • Outsourcing non value-adding activities
	(B) Being an Example
1. Well-being:	• Introducing new procedures for working that improve well-being of employees • Improved internal communications • Shared responsibility and commitment
2. Corporate Culture:	• Integrating newly acquired firms with existing businesses • Living corporate values like innovation and customer orientation, entrepreneurial drive, ...
3. Corporate Identity:	• Supporting the technological reputation of the company
	(C) Adding Value for Key Stakeholders
1. Organization/ Processes:	• Maintaining existing and developing new core competencies • Adding value through stock reduction, optimal utilization of assets, more efficient transport and logistic operations, better planning, processes and procedures • Improving routines and standard operating procedures, information flows and systems • Developing competitive advantages out of technological components of structure
2. Execution:	• Analyzing the value chain and processes for improving organizational effectiveness • Improving manufacturing efficiency • Reengineering and outsourcing • Quality improvement • Increasing the sales of service activities
3. Controlling:	• Automating or improving the efficiency of services • Installing an operational and strategic controlling system for the management of technology • Calculating NPV or economic value added • Assessing the risks of major strategic decisions involving new and complex technologies • Finding projects with a positive NPV

Source: Department of Management, University of Innsbruck, survey of 108 European manufacturing companies, 1999

Table 2 Contributions of production economists to strategic leadership

5. Summary and conclusions

Always and in everything strive to attain
at the same time what is useful for others
and what is pleasant for oneself.
Nasreddin

The ultimate objective of production economics is to develop knowledge a) for improving existing products, services, and systems – a management task, and b) for discovering new opportunities and capita1izing on them – a leadership task. Production economics provides the technological basis for supporting management and leadership behavior.

This paper has discussed and illustrated the need for both management and leadership tasks in order to create value for all key stakeholders in a dynamic environment. Models have been proposed for identifying the key role of the production economist in strategic management and in strategic leadership.

We would also welcome the development of the next generation of production economists with an even better management training than today's. In these sense, we hope that young production economists take the opportunity to pursue an MBA programme at an outstanding US or European business school before starting their professional career.

The results presented in this paper show that production economists must participate persona1ly and actively in strategy formulation and implementation. Their leadership role consists in identifying and meeting new and legitimate needs of the customers and inspiring people to work enthusiastically toward the achievement of stretching goals. They have knowledge, understanding, and insights that add value to the content and process of strategy; their commitment to the agreed-upon strategy is decisive for influencing people to efficiently execute it.

We wish to thank the anonymous referees for their valid comments and suggestions.

References

[1] L.J. Bourgeois III, I.M. Duhaime, J.L. Stimpert, Strategic Management. A Managerial Perspective, second edition, The Dryden Press, Forth Worth, 1999
[2] R. d' Aveni, Hypercompetition, Free Press, New York, 1994
[3] H.H. Hinterhuber, G. Handlbauer, K. Matzler, E. Valdani, The New Rules of Competition. From Evolution to Co-Evolution, CEMS Business Review 2 (3) (1998) 167-175

[4] A.A. Cannella, M.J. Monroe, Contrasting perspectives on strategic leaders: Toward a more realistic view of top managers, Journal of Management 23 (3) (1997) Special Issue 213-237
[5] E.F. Fama, M.C. Jensen, Separation of ownership and control, Journal of Law and Economics 26 (1983) 301-325
[6] D.C. Hambrick, P. Mason, Upper echelons: The organization as a reflection of its top managers, Academy of Management Review 9 (1984) 193-206
[7] J.M. Kirzner, The primacy of entrepreneurial discovery, in: A. SeIdon (Ed.), The prime mover of progress, IEA, Westminster, 1980,3-30
[8] St.E. Prokesch, Unleashing the power of learning: An interview with British Petroleum ' s John Browne, Harvard Business Review 75 (5) (1997) 132-145
[9] J.C. Hunter, The Servant. A Simple Story about the True Essence of Leadership, Rima Publishing, Rocklin, CA, 1998
[10] W.E. Halal, The New Management. Democracy and Enterprise are Transforming Organizations, Benett-Koehler Publishers, San Francisco, 1996
[11] Ph. De Woot, Towards a european model of management, in: R. Calori, Ph. De Woot (Eds.), A European management model. Beyond diversity, Prentice Hall, New York, 1994, 261-277
[12] St.A. Covey, R.A. Mervil, First Things First, Sirnon & Schuster, New York, 1994
[13] H.H. Hinterhuber, B. Levin, Strategic Networks -The Organization of the Future, Long Range Planning 27 (3) (1994) 43-53
[14] L.R. Donnithorne, The Westpoint Way of Leadership, Doubleday, New York, 1994; R.K. Greanleaf, Servant Leadership, Paulist Press, New York, 1991
[15] B. Taylor, The new strategic leadership -Driving change, getting results, Long Range Planning 28 (5) (1995) 71-81
[16] R.W. Grubbström, The Subject Area of Production Economics, Department of Production Economics, Linköping Institute of Technology, December 1998
[17] H.H. Hinterhuber, Strategische Unternehmungsführung, seventh edition, W. de Gruyter, Berlin-New York, 2001
[18] St.E. Prokesch, op.cit., p. 135
[19] St.E. Prokesch, op.cit, p. 137
[20] H.H. Hinterhuber, St.A. Friedrich, E. Krauthammer, K. Matzler, Leadership for Worldwide Competition: A European Perspective, Productivity 39 (2) (1998) 259-270
[21] W.H. Newman, J.P. Logan, W.H. Hegarty, Strategy. A Multi-Level, Integrative Approach, South Western Publishing Company, Cincinnati, 1989
[22] R. Lynch, op.cit., p. 625
[23] E. Segelod, A comparison of manager's perceptions of short-termism in Sweden and the U.S., International Journal of Production Economics 63 (3) (2000) 243-254
[24] R.D. Ireland, M.A. Hitt, Achieving and maintaining strategic competitiveness in the 21st century: The role of strategic leadership, Academy of Management Executive 13 (1) (1999) 43-57

[25] H.H. Hinterhuber, E. Krauthammer, The leadership wheel: The tasks entrepreneurs and senior executives cannot delegate, Strategic Change 7 (3) (1998) 149-162
[26] P. Koestenbaum, Leadership. The inner side of greatness, Jossey-Bass Publishers, San Francisco, 1991
[27] J.C. Hunter, op.cit., p. 64
[28] E. Krauthammer, H.H. Hinterhuber, Wie werden (und bleiben) ich und mein Unternehmen die Nr. 1? Second edition, Hanser, München, 2001
[29] H.H. Hinterhuber, H. Pechlaner, Winning the Competitive Battles in the 21st Century: Strategic Management and Strategic Leadership – A European Perspective. Paper presented at the 2000 International Conference in Management Science, Tamkang University, Taipeh, June 10, 2000.