

**Review article**

**Engineering strategic approach as organizational necessary**

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ABSTRACT

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The article supports previous evidence that, even in host environments with high cultural distance and constraining employment frameworks, engineering planning, engineering are able to find room for engineering management maneuver. Specific attention paid to the transfer of the headquarters' flat organizational structure to a body of organizations with a noticeably hierarchical managerial system. This paper explore the ways in which certain characteristics in case of organizations generates a tendency to prepare a formal written engineering plan and focus is primarily on what describe as the environmental characteristics. Engineering excellence for strategic engineering includes also tools for financial, human resource, and risk management, as well as technology management, acquisitions and marketing. In other words, as has been suggested elsewhere, every national organizational system even one as constrained engineering strategic approach as organizational necessary contains some degree of malleability and openness which may be exploited through appropriate organization specific managerial strategies for engineering management.

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## **1. Introduction**

The papers in field of special issue as strategic engineering planning, from different perspectives, follows a number of generic questions about how engineering strategy from different nationalities manage their human resources internationally.

The papers concentrate on the transfer of managerial and engineering strategy practices to and within host countries, with a dominant focus on subsidiaries' dynamics, rather than on the influence of organization of origin.

Special attention is to the frequently neglected perspective of employees; to investigate the transfer of strategic engineering planning practices from organizations. The globalization dynamics promoting convergence and divergence in organizations and managerial practices worldwide have attracted attention from a broad range of social sciences disciplines. Two lines of the debates are currently very well definable: - Engineering management as a common argument is that market, technological and managerial forces to adopt common strategies and practices, fostering economic, organizational and employment homogenization across borders.

Engineering strategy must being carriers of globalization, spreading managerial knowledge and techniques internationally through the dissemination of best practice. This paper explore the review in which certain characteristics of actors that in this case of organizations generates a tendency to prepare a formal written engineering plan and focus is primarily on what describe as the environmental characteristics.

## **2. Strategic engineering**

There are no distinct engineering management systems in use at organizations, and nor should there be anything of the sort, as the aim is that strategic engineering is an integrated part of engineering. The role played by the strategic engineering planning in promoting or resisting divergence or convergence of engineering strategy across national borders deserves particular attention. In recent years, a large number of studies have concentrated on the interplay between strategic engineering planning, home and host countries and engineering strategy practices, producing a distinctive line of inquiry within the international engineering management field. Engineering management system is also in general e.g. in the recognized engineering standards understood as a concept for systematic approach or mental system but not as a distinct, physical system. It is generally arguing that effective strategic engineering planning is one of the important approaches in engineering success (Rue and Ibrahim, 1998, 151; Burns, 2001, 412; Kuratko and Hodgetts, 2004, 25). The most extensive review, although now some years old, is the analysis that there seemed to be a consensus that planning was linked positively to growth undertaken (Schwenk, Shrader, 1993, 251). Nevertheless, the debate is still in the development stage, with major limitations at both methodological and theoretical levels: 1) The debate been unnecessarily polarized the divergence and convergence debate is not or should not be about one or the other, but about the interaction between local, national and international influences. This suggests the need for less emphasis on grand tendencies and greater attention to how complex processes work themselves out in particular situations, often displaying elements of both convergence in some respects and divergence in others.

2) Although organizations share the basic elements of the institutionalize approach of many of the contributions in this field, organizations are also conscious that a more ambitious and integrative perspective, taking into account contributions from different theoretical backgrounds, is required to explain the rich and complex social phenomenon under scrutiny.

3) There are signs that a more integrated, engineering strategy approach is emerging in the literature as researchers strive to weave together elements taken from a variety of theoretical perspectives, including institutional, resource-based, industrial-organization and other approaches. There are some argues that formal written planning may be inappropriate for the organizations but this seems a minority view (Bridge, O'Neill, Cromie, 1998, 32). It can be argued that strategic engineering planning is as important to organizations as to larger organizations and standard textbooks on entrepreneurship offer chapters on engineering plan whilst a range of specialist publications outline the best ways of writing engineering plan (Sahlman, 1997, 467).

In organizations, where a engineering plan exists, the preparation of the strategic engineering planning may driven by external forces. The most obvious of these are the requirements of external agencies providing funding for either start up or expansion. In view of its perceived ongoing value to the small engineering, it might expect that strategic engineering planning would be a feature of many, if not most, organizations (Feghhi farahmand,

2005, 458). On the other hand, by coupling quality with engineering strategy recovering empowerment is as (Figure 1).

		Market Managers			
		Menswear	Women's wear	Home furnishings	Industrial markets
Product Managers	Rayon				
	Acetate				
	Nylon				
	Orlon				
	Dacron				

Fig. 1. Strategic engineering planning model.

The form of the plan (Mason and Stark, 2004, 374) may vary between the agencies but the strategic engineering planning is the minimum document required by any financial source (Kuratko, Hodgetts2004, 296). In addition to its role in engineering funding, the engineering plan may serve as a strategic planning document for the entrepreneurs, a plan to guide the engineering and serve as a basis for taking strategic decisions and it may serve as a subsequent monitoring device (Deakins, 2003, 329). Modern organizations can adopt various strategic engineering planning practices to enhance employee satisfaction. The form and structure of an organization's human resources system can affect employee motivation levels in several ways. Continuous training, employment security, performance appraisal and alternative compensation systems can motivate skilled employees to engage in effective discretionary decision-making and behavior in response to a variety of environmental contingencies. Recognizing the importance of strategic engineering planning in achieving flexibility in an international context expands the types of research questions related to the role of strategic engineering planning functions in organizational performance, such as selection of human resources, training, and compensation and performance appraisal. Selection of human resources: As it was, stated organizations today are making abundant changes internally to cope with a highly turbulent external environment. With frequent reorganizing, downsizing, rightsizing, flattening the pyramid, teaming and outsourcing taking place, selection of human resources also shaped by the fact that many people are experiencing major difficulties in their attempts to adapt to the uncertainties of career life. Modern organizations try to adopt a pluralistic approach to career management that embraces different definitions of career success. Recognizing the diverse needs of employees enables the organization to reward and maintain diverse competencies in their workforces. Selecting the right person for the right place becomes a more sophisticated process since internal changes in organizations have a straight impact on traditional methods for selection of human resources. Although many studies have reported a positive association between various human resources practices and objective and perceptual measures of selecting human resources for modern organizations, some authors have expressed concern that results may be biased because of methodological problems. Traditional methods for selection mostly based on statistical techniques involving the analysis of test scores as well as empirical approaches based upon the intuition and experience of experts and their understanding of the job specifications and the capabilities of the candidates. Modern approaches recognize that selection of human resources is a complex process that involves a significant amount of vagueness and subjectivity. Situational and individual-difference variables influence which category will dominate the decision maker's impression of the job candidate and exert the greatest influence on the hiring decision. Innovative selection systems that seek to identify individuals with the ability to learn and adapt to new situations and markets can provide a firm with competitive advantage. International organizations can adopt various practices to enhance employee skills:

- 1) Efforts can focus on improving the quality of the individuals hired, or on raising the skills and abilities of current employees, or on both.

2) Employees can hire via sophisticated selection procedures designed to screen out all but the very best potential employees. Indeed, research indicates that selectivity in staffing positively related to firm performance.

3) Organizations can improve the quality of current employees by providing comprehensive training and development activities after selection.

What is important is the need to continuously review and update plans for career development and to acknowledge that individuals have varied and different perceptions. The more we understand people and their total environment, the more their needs are likely to met.

The traditional psychological contract in which an employee entered a firm, worked hard, performed well, was loyal and committed, and thus received ever-greater rewards has started being replaced by a new contract based on continuous learning and identity change.

Employees are one of the most valuable resources and companies have to remain competitive. Modern organizations might achieve this by using organic human resources systems that promote the development of a human capital pool possessing a broad range of skills and that are able to engage in a wide variety of behavior.

### **3. Approach of strategic engineering**

A few tactical actions for implementation (Mason and Stark, 2004, 205) can make the challenge simpler and provide leadership that is as follows (Feghhi farahmand, 2004, 358):

1) Engineering strategy supporting: Obtain support from the board of directors, because an organization is total quality efforts must begin at the very top and begin with the board of directors. One method of obtaining their support is to conduct a quality survey among them that such questions could include:

a) Has an estimate been made of the cost of poor quality?

b) What measures using to judge quality?

c) What are current performance levels?

d) How does your quality of engineering empowerment compare with your competitors? 2) Engineering strategy preparing: Prepare an action plan and answers to these and other questions will provide valuable insights into the existing corporate culture and indicate the organization's readiness for adopting quality.

An action plan based on the survey feedback should formulate by the top management and communicated at every board meeting.

3) Engineering strategy visionary: Vision and mission statement and develop a vision or mission statement if the organization does not have one already. The key to the initial adoption of quality is continuous communication of the vision within a comprehensive communication plan. 4) Engineering strategy participating: Establish a top-level quality committee, because an essential ingredient for success is a senior quality committee, which provides leadership in quality and stimulates cultural change. This should be chaired by the CEO and comprise the entire senior management team and the individual responsible for quality. Depending on the size and structure of the organization, these committees can establish within operating divisions, functional group or by geography. The responsibilities of a senior quality committee can include (Feghhi farahmand, 2004, 398): a) Establishing strategic quality goals,

b) Allocating resources,

c) Sanctioning quality improvement teams,

d) Reviewing key indicators of quality,

e) Estimating the cost of poor quality,

f) Ensuring adequate training of employees, g) Recognizing and rewarding individual and team efforts; 5)

Engineering strategy conducting: Conduct a engineering empowerment survey that it sponsored by the top management to send a clear message throughout the organization that quality linked to engineering empowerment. The senior executives should then present the results to all employees that detailed strategies for improving engineering empowerment can devised and communicated. 7) Engineering strategy goal setting: Set goals for quality and engineering empowerment. The results of the engineering empowerment survey lead the senior management to establishing a set of quality goals. Although the whole organization can provide input to this task, the setting of goals is part of management's leadership responsibility. They should be set out along the following examples:

a) Reduce the cost of quality by 20 percent within two years;

b) Improve employee empowerment by 25 percent within one year. These goals must manage and communicate via the senior quality committee.

#### **4. Strategic engineering planning**

By highlighting the way in which strategic engineering planning extract international competitive advantage from distinctive, company-specific aspects of their engineering management, the resource-based perspective draws attention to organizations motivation for transferring particular engineering strategy practices between national business systems. It also encourages a focus on the role and behavior of subsidiaries in the dissemination of practices. Resources at the affiliate level may provide a source of competitive advantage for the strategic engineering planning at the local, regional, or global levels such competitive advantages in subsidiaries may seen as stemming from the distinctive characteristics of host business systems. Engineering and Industrial information are able to provide organization with access to materials that can tailored to organizational needs; all it takes is a visit in person, a phone call or an email.

Organization may even choose to use web-based engineering plan applications or purchase software to help organization prepare plans and forecasts. The mainly qualitative evidence available to date suggests that strategic engineering planning within organizations is an activity of a minority, as highlighted that few small humanities use strategic planning (Woods and Joyce, 2003, 183). There may be a number of reasons for the lack of strategic engineering planning. Historically the typical strategic engineering planning within organizations has tended not to pursue higher levels of education or to take formal engineering training. When beginning the research phase of organization plan, keep in mind that there is a lot of information out there, especially online, but not all of it is accurate. It is always important to consider the source of any information organization gather; research is only valuable to you if it is factual. Avoid letting unreliable sources tell you what organization want to hear. If organization comes across information that organization, find useful. There are various, excellent organization market research tools that are available online. If organization has, trouble-piecing research together to paint an accurate picture of organizational engineering, try brainstorming with a skilled professional is necessary. Hence, there are two possible reasons why strategic engineering planning within organizations tends not to plan (Chell, 2001, 67) that they are emotionally unsuited to it. They think and act intuitively and they are simply unaware of the various tools, which would enable them to plan systematically. Indeed, the limited awareness amongst strategic engineering planning of the tools associated with the practice of strategic management has been organized (Woods and Joyce, 2003, 284). A further constraint, likely to restrict strategic engineering planning, is that they may not have sufficient financial information to prepare a formal plan. For example, at the lower end of the size range of organization with less than 10 employees, only 33 percent regularly calculate profits to monitor their organization's performance (Nayak and Greenfield, 1994, 227). A lack of formal planning may also relate to the fact that small organizations are just too busy surviving to take time out to plan ahead whilst others might argue the environment in which operate is so turbulent there is little point in planning ahead (Westhead and Storey, 1996, 197). A lack of formal strategic engineering planning among organizations does not necessarily mean that organization badly managed. It does, suggest that many strategic engineering planning within organizations miss the opportunity to consider the overall direction of the engineering and management decisions may made based on poor information. Further, if strategic engineering planning is an important component for engineering success, advice agencies might find it useful to identify the characteristics of those managers who are most receptive to the strategic engineering planning idea. The characteristics of the organization and engineering development strategies hereafter termed engineering strategy, influencing engineering behavior, which might used to inform analysis of the determinants in organizations. Organization characteristics controlled out of analysis in order to focus our attention on engineering strategy variables. Only the environmental characteristics, describe the backgrounds of the managers rather than their personality traits. Of course, the two components on which attention focused related to one another and the individual variables grouped within each category do themselves show a high degree of interdependence (Storey, 1994, 65). Nevertheless, the two components and the individual variables provide a useful conceptual framework within which to interpret the determinants of strategic engineering planning within the organizations.

#### **5. Engineering excellence tools**

The strategic engineering planning is potentially important part of any organization's performance engineering management system. The engineering management might function in several important ways: providing feedback to employees, developing employees and discussing compensation, job status and disciplinary decisions. The engineering management must be aware about sensitivity to employee needs for privacy and confidentiality. It is of utmost importance to provide undivided attention during the engineering and reserve adequate time for a full discussion of the issues. Management's feedback is essential in gaining the maximum benefits from goal setting. Without feedback, employees are unable to make adjustments in job performance or receive positive reinforcement for effective job behavior. Effective performance feedback is timely, specific, behavioral in nature, and presented by a credible source. Performance feedback is effective in changing employee work behavior and enhances employee job satisfaction and performance. Performance engineering management systems depend heavily on subjective ratings of performance provided by supervisors, peers, subordinates and job incumbents. Despite a heavy reliance on performance ratings, it generally acknowledged that they too often contaminated by systematic errors. Rater engineering management programs can have positive effects on the psychometric quality of performance ratings. Methods used to provide training are lectures, group discussion, practice and feedback. In general, the more actively involved raters become in the training process, the greater is the outcome. The above engineering management functions are essential to a human resources manager job. Practical means, tools, methods, etc., especially relevant management methodology, are available to get the approach concrete in practice. For this purpose, a collection of management tools has created at organizations. Some of these tools have created and maintained by engineering experts. Drawing on the varieties of strategic engineering planning analytical framework, tried to extrapolate the findings to subsidiaries in engineering strategy contexts, suggesting that different national skill profiles and institutional processes significantly constrain or stimulate organizational innovation engineering management strategies.

Emphasizes four engineering strategy consequences can findings:

- 1) The engineering management of the personal and communication skills that play a critical role within knowledge networks generally been neglected.
- 2) The role of the subsidiary engineering strategy function in managing international knowledge networks and their career development implications needs to rethink.
- 3) The engineering strategy function could be a mechanism for harnessing the organizational learning deriving from international networks, particularly that relating to the management and accommodation of organizational diversity.
- 4) The engineering strategy function itself challenged by the demands made on its professional skills by the shifting power and micro-political relations arising out of organizational engineering management through international networks.

Focusing on the practices of engineering management in four different sectors with research in organizations, explore whether there has been a move towards a strategic engineering planning or international strategic engineering model for managing personnel, or whether, on the contrary, national differences in strategic engineering planning are still significant. The reviews demonstrate that expectations of an increasing internationalization of recruitment and mobility in strategic engineering planning are not borne out. The recruitment of foreign scientists is neither significant nor generalized, and international mobility is relatively low. While the internationalization of strategic engineering planning clearly affects engineering management, the impact is not as large as might be expected. Engineering management practices in strategic engineering planning still shaped at a national level, displaying major institutional differences. By pointing to different patterns among similar strategic engineering planning, the findings also emphasize the critical role of organizations strategic choices and their relative autonomy with regard to the institutional context. Finally, emphasize is the importance of sub-national strategic engineering planning and the research draws on four case studies of the relationships between strategic engineering planning and its engineering management. Strategic engineering planning steps The basic steps of strategic engineering planning development that they are suitable for all of organizations are as follows:

- 1) Engineering strategy purpose: For develop strategic engineering planning to strengthen the organization's engineering related, operational, and financial performance.
- 2) Engineering strategy scope: The strategic engineering planning should include both short-term and long-term goals and plans and a method to ensure that the plan deployed and adhered to should be part of the

management review procedure throughout the organization. These activities could be a separate procedure or included as part of this procedure (Storey, 1994, 27).

3) Engineering strategy responsibilities: The chief executive usually has control of these developments, deployment, improvement processes and all executive management should be personally involved in these processes.

4) Engineering strategy procedure:

The procedure should include the description of the timetable for strategy and strategic engineering planning development including of how the development considers:

a) Engineering requirements, expectation, expected changes, the competitive environment, financial, market, technological, societal risks, company capabilities, human resource, technology, research, development and supplier an/or partner capabilities.

b) A description of how information and company level data related to quality, engineering, operational performance, and relevant financial data are collected, analyzed, and integrated into the strategy development should be included in this procedure. These should compare with similar measures of competitors and or appropriate benchmarks.

c) A description of how the strategies and plans are translated into actionable key engineering drivers i.e. those things the company must do well for the strategy to succeed, should be included.

d) A description of how the engineering plan, together with the key engineering drivers, deployed throughout the organization should be included. Describe how they translated into actions. This includes reviews to ensure that the engineering processes support the engineering plan.

5) Engineering strategy improvement: Continuous Improvement by:

a) Describe the main types of data and information needed to support operations and decision- making, and to drive improvement of this engineering process.

b) The management and use of these key performance measures should include periodic review for continued validity and need, as well as the analysis and use in process improvement. Approach in the evaluation might include completeness, timeliness, effectiveness, and reliability.

c) Whenever possible, opportunities for improvement should implemented by the engineering process or cross-functional team. If this is not feasible, the identified opportunities should forward to the management review process or Quality Operating System (QOS) process where applicable for review, prioritization, and/or integration into the system and cross-functional improvement activities (Storey, 1994, 198).

6) Engineering strategy job instructions: Within an organization, there must be a constancy of purpose, an alignment or unification of goals, and consistency of processes, actions, information and decisions among organization units in support of these goals. Since the strategic engineering planning is one of the primary documents describing these goals, it influences all engineering processes in the organization. It directly has relation with management review, engineering empowerment measurement and lists all job instruction related to this procedure.

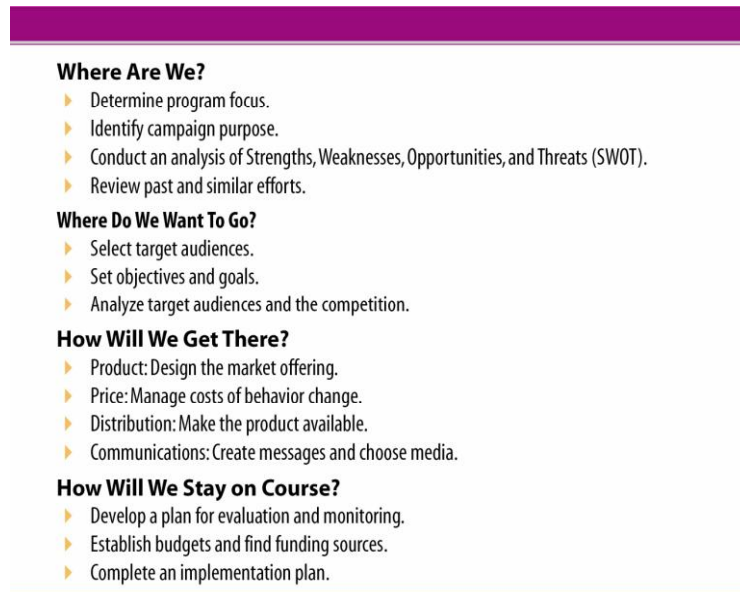
7) Engineering strategy documentation: List of all documentation of strategic engineering planning programs procedure as including:

a) The method and location of storage must define so that quality records are readily retrievable and protected from damage, deterioration, and loss. This may covered by a separate procedure.

b) The strategic engineering planning is a controlled document and should retain at least for the length of the long-term strategy focus.

c) Minutes of development meeting, including the documentation of engineering expectations, financial, and marketing assumptions in filed and retained for the length of the long-term strategy focus.

9) Engineering strategy quality system: Management responsibility, document and data control, corrective and preventive action, handling, storage, packaging, preservation and delivery, control of quality records, internal quality audits, training, statistical techniques, continuous Improvement, manufacturing capabilities. On the other hand, by coupling quality with engineering strategy recovering empowerment is as (Figure 2).



**Fig. 2.** strategic engineering planning process

## 6. Conclusion

The goal of strategic engineering, i.e. engineering excellence reached through innovative management and leadership practices. Managerial strategic engineering planning differs significantly across organizations, particular with regard to variable pay. In order to realize strategic engineering objectives in all parts of the company and at all levels of engineering and engineering management, an organization-wide management structure, a leadership infrastructure framework has defined. Organizations tend to make different decisions about pay contingency, or variability, rather than about base pay, since contingent pay is more associated with financial performance. In general, organizations implement strategic engineering planning or incentive compensation systems that provide engineering strategy to employees for meeting specific goals. Fewer employees work under individual incentive plans while greater numbers of individuals work under some type of group incentive system. A substantial body of evidence has focused on the impact of incentive compensation and performance management systems on group performance. Development of compensation systems other than wages on monthly basis, benefits required by law, and bonuses is necessary. Engineering strategy in modern organizations should pay more attention to alternative and more sophisticated compensation systems, such as performance related pay systems, profit sharing systems, share ownership systems and stock options, non-financial motives and benefits not required by law.

In this way, compensation as a major engineering strategy practice increases level of satisfaction and enhances fairness perception of employees working at various functional units and different hierarchical levels.

Performance appraisal as perhaps the most central engineering strategy function is required to justify a wide range of decisions such as selection, compensation, promotions and training. Performance appraisal is defined as the process of identifying, evaluating and developing the work performance of the employee in the organization so that organizational goals and objectives are effectively achieved while, at the same time, benefiting employees in terms of recognition, receiving feedback, and offering career guidance. The terms performance assessment, performance evaluation and performance management are also used to describe the process. Performance appraisal characteristics include target individual, team, type as outcome, behavioral or competency based and data source as manager. Especially in team-based organizations, there is a critical need for effective leadership in designing and implementing performance appraisal systems. Ineffective appraisal system can bring many problems including low morale, decreased employee productivity, a lessening of an employee's commitment and support for the organization. If employees are confident in the fairness of the appraisal process, they are more likely to accept performance ratings, even adverse ones, if they perceive fair decision-making process.



On the other hand, if the employees perceive the process as unfair and not systematic, it is unlikely that they will accept the outcome of the appraisal process. Participation in today's corporation gives an opportunity to the employees to raise their voice into the appraisal process. Greater employee participation as goal-setting process, performance standards, qualitative and quantitative evaluation criteria, and self-evaluation generates an atmosphere of cooperation and support reducing conflicts especially during performance appraisal interview. Strategic engineering planning practices in general and compensations systems in particular have been shown to be highly related to organizational performance. Compensation is the linkage between reward and employee satisfaction. Strategic engineering planning systems are concerned with two major issues: performance and rewards. Performance includes defining and evaluating performance and providing employees with feedback. Rewards include bonus, salary increases, promotions, stock awards, and perquisites. International organizations have considerable discretion in the design of pay policies and the choices made have consequences for organizational performance. Organizations that are similar in terms of types of employees and jobs, product market, size, and so on may choose compensation system designs that differ in their effectiveness for attaining similar goals. In addition, large corporations with several different businesses may have multiple strategic engineering planning systems. While they may share some fundamental philosophies and values, they may differ according to particular business setting, competitive situation, and product life cycle. Thus, multiple reward systems can support multiple cultures or subcultures within one organization. The framework originally created covers all organization functions in a natural and flexible manner and covers the following four levels of the organization:

1) The engineering management cultural level: Where the general principles the common insight, goals, shared tools, and practices concerning quality are created, including how these principles are to be applied in practice on the basis of the organizational engineering requirements. At this level, the organization superior insight of engineering standards and their application with other beneficial tools is established and articulated. Responsible person is always the CEO. This responsibility cannot delegate.

2) The engineering management strategic level: Where decisions made by the general manager of the engineering unit and the other top engineering leaders, and measures undertaken concerning the entire particular engineering and especially the future competitiveness of the engineering and management of the whole engineering system are addressed. The engineering system is composed of the interrelated operational engineering processes. Very often in corporations, there are different engineering areas that may be at different development stages. All these need different strategic engineering approaches but they may operate within one corporate culture.

3) The engineering management operational level: Where decisions and measures daily management made and undertake products and services realized in real time for engineering needs, just now and here. Responsible person is the process owner. Over the years, the model has also been able to accommodate efficiently various organizational changes as well as various new emphases in the engineering and in quality thinking. This has made it possible to develop Engineering Strategy (BS) in a more sustained manner than based on the formal organizational structure and continually depending on numerous organizational changes.

This framework utilizes the most exemplary international ideals and is based on what has been learnt over decades e.g. with engineering partners. There are no distinct engineering management systems in use at organizations, and nor should there be anything of the sort, as the aim is that engineering management is an integrated part of engineering. Indeed, engineering management system is also in general e.g. in the recognized engineering standards understood as a concept for systematic approach or mental system but not as a distinct, physical system. Similarly, the engineering strategy approach, often drawn from its application in the field of organizational relations strategy could usefully provide insights into how different outcomes emerge within strategic engineering planning having similar characteristics. One of the key tasks of analysis of the interaction between globalizing forces and national business systems is, precisely, to delineate the variable scope that strategic engineering planning have to exert strategic choice over the transfer of particular engineering management practices within different institutional settings. These perspectives thus point in the direction of a more contingent perspective on globalization, which explores the transfer of engineering management practices internationally as the complex outcome of the interaction between, on the one hand, strategic engineering planning motivation and choice and, on the other hand, institutional constraints and opportunities of home and host business systems. Institutional and strategic engineering is resource-based views are complementary in

another sense. Engineering excellence for strategic engineering includes also tools for financial, human resource, and risk management, as well as technology management, acquisitions and marketing.

## References

- Barney, J.B., Zajac, E.J., 1994. "Competitive Organizational Behaviour: Toward an Organizationally-Based Theory of Competitive Advantage", *Strategic Management Journal*,
- Bartlett, C.A., Ghoshal, S., 1993. "Beyond the M-Form: Toward a Managerial Theory of the Firm", *Strategic Management Journal*, 14(1), 23-46.
- Bolton, B., Thompson, J., 2000. *Entrepreneurs, Talent, Temperament and Technique*. London: Butterworth Heinemann
- Boyer, R., Charron, E., Jürgens, U., Tolliday, S., 1998. *Between Imitation and Innovation: The Transfer and Hybridization of Productive Models in the International Automobile Industry*. Oxford: Oxford University Press.
- Bridge, S., O'Neill, K., Cromie, S., 1998. *Understanding Enterprise, Entrepreneurship and small Engineering*. London: Macmillan Engineering.
- Burns, P., 2001. *Entrepreneurship and small Engineering*. Basingstoke: Palgrave.
- Chell, E., 1985. *The Entrepreneurial Personality: A Few Ghosts Laid To Rest*, *International small Engineering Journal*, 3
- Chell, E., 2001. *Entrepreneurship: Globalization, Innovation and Development*. London: Thomson Learning.
- Chell, E., Haworth, J., Brearley, S.A., 1991. *The Entrepreneurial Personality*. London: Rutledge.
- Colling, T., Clark, I., 2002. "Looking for —Americanness": Home-Country, Sector and Firm Effects on Employment Systems in an Engineering Services Company", *European Industrial Relations Journal*, 3(November).
- Curran, J., Blackburn, R., 1994. *Engineering planning and Local Economic Networks*: London: Paul Chapman.
- Deakin, D., Freel, M., 2003. *Entrepreneurship and Engineering planning*. London: McGraw Hill.
- Feghhi Farahmand, N., 2001. *Executive Management Process*, Islamic Azad University, Tabriz Branch, Iran, pp 99-113.
- Feghhi Farahmand, N., 2003. *Permanent Management of Organization*, First edition, Frouzesh Publication, Tabriz, Iran, pp 60-183.
- Feghhi Farahmand, N., 2003. *Strategic Structure of Organization Management Process*, Forth edition, Islamic Azad University, Tabriz Branch, Iran, pp 11-145.
- Feghhi Farahmand, N., 2005. *Strategic Management of Organization*, First edition, Frouzesh Publication, Tabriz, Iran, pp 35-198.
- Feghhi Farahmand, N., 2009. *Organization Strategic Plan compilation*, First edition, Frouzesh Publication, Tabriz, Iran, pp 14-389.
- Feghhi farahmand, N., 2011. *Active and Dynamic Management of Organization*, Second edition, Frouzesh Publication, Tabriz, Iran, pp 27-190.
- Feghhi Farahmand, N., 2011a. *Technology Management of Organization*, Second edition, Frouzesh Publication, Tabriz, Iran, pp 11-118.
- Ferner, A., 1997. "Country of Origin Effects and HRM in Multinational Companies", *Human Resource Management Journal*, 7(1), 19-37.
- Ferner, A., Quintanilla, J., Varul, M.Z., 2001. "Country of Origin Effects, Host Country Effects, and the Management of HR in Multinationals: German Companies in Britain and Spain", *Journal of World Business*, 36(2), 107-127.
- Guillén, M., 2001. "Is Globalization Civilizing, Destructive or Feeble? A Critique of Five Key Debates in the Social Science Literature", *Annual Review of Sociology*, 27; 235-260.
- Hall, P.A., Soskice, D., (eds) 2001. *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*. Oxford: Oxford University Press.
- Hollingsworth, J.R., Boyer, R., eds., 1997. *Contemporary Capitalism: The Embeddedness of Institutions*. Cambridge: Cambridge University Press.
- Jain, H., Lawler, J., Morishima, M., eds., 1998. "Multinational Corporations, Human Resource Management and Host-country Nationals", *The International Journal of Human Resource Management*, 9(4), 553-666.
- Quintanilla, J., Ferner, A., 2007. *Multinationals and human resource management between global convergence and national identity*, *The International Journal of Human Resource Management*, [http://www.tandf.co.uk/journalsDOI: 10.1080/0958519022000031799](http://www.tandf.co.uk/journalsDOI:10.1080/0958519022000031799)

- Juhani Anttila, M., Sc. 2009.. Engineering-Integrated Quality Approach In Sonera Corporation The Third International Conference on Quality Management, , Academician IAQ, Integration, Sonera Corporation, Finland
- Katz, H., Darbishire, O., 2000. *Converging Divergences: Worldwide Changes in Employment Systems*, Ithaca: Cornell University Press. Kochan, T., Katz, H., McKersie, R., 1994 [1986]. *The Transformation of American Industrial Relations*. Ithaca, NY: ILR/Cornell University Press.
- Kirby, D.A., 2003. *Entrepreneurship* McGraw Hill Educational, Maidenhead
- Kostova, T., Roth, K., 2002. "Adoption of an Organizational Practice by Subsidiaries of Multinational Corporations: Institutional and Relational Effects", *Academy of Management Journal*, 45(61), 215-233.
- Kuratko, D.F., Hodgetts, R.M., 2004. *Entrepreneurship: Theory, Process, Practice* Mason, Ohio: Thomson South Western.
- MacDufe, J.P., 1995. "International Trends in Work Organisation in the Auto Industry: National-level vs. Company-level Perspectives", in K. wever and L. Turner (eds), *The Comparative Political Economy of Industrial Relations*, Madison: IRRRA, 1-113.
- Malnight, T.W., 2001. "Emerging Structural Patterns within Multinational Corporations: Toward Process-Based Structures", *Academy of Management Journal*, 44(6), 1187-1210.
- Martin, G., Beaumont, P., 1998. "Diffusing —Best Practices" in Multinational Firms: Prospects, Practice and Contestation", *International Journal of Human Resource Management*, 9(4), 671-695.
- Mason, C., Stark, M., 2004. What Do Investors Look For In A Engineering Plan, *International small Engineering Journal*, 22.
- Mauri, A.J., Michaels, M.P., 1998. "Firm and Industry Effects within Strategic Management: An Empirical Examination", *Strategic Management Journal*, 19, 211-219.
- Maurice, M., Sellier, F., Silvestre, J.J., 1986. *The Social Foundations of Industrial Power: A Comparison of France and Germany*. Cambridge, MA: MIT Press.
- Muller, M., 1999. "HRM under Institutional Constraints: The Case of Germany", *British Journal of Management*, 10(September), 31-44.
- Naffziger, D., Kuratko, D., 1991. An Investigation Into The Planning In small Engineering', *Journal of Engineering and Entrepreneurship*, Fall.
- Nayak, A., Greenfield, S., 1994. The Use Of Management Accounting Information, Finance and the organizations, pp. 182-231, London: Rutledge.
- North, J., Blackburn, R., Curran, J., 1997. *Reaching small Engineering: and Enterprising Futures*, pp. 121-135, London: Paul Chapman.
- Oliver, C., 1997. "Strategic Responses to Institutional Processes", *Academy of Management Review*, 16, 145-179.
- Polychroniou Panagiotis, 2009. What about HRM? *Advanced in management Journal*, Department of Business Administration, University of Patras, University Campus, 26500, Patras, GREECE
- Rue, L., Ibrahim, N., 1998. Planning Sophistication and Performance in small Engineeringes, *Journal of small Engineering Management*, 36 .
- Sahlman, W.A., 1997. "How To Write A Great Engineering Plan", *Harvard Engineering Review*, July-August, 98.
- Schwenk, C. R. and Shrader, C.B., 1993. Effects Of Formal Strategic Planning, *Entrepreneurship: Theory and Practice*, 17.
- Sisson, K., 2001. "Reflections on the Papers", presented to the DMU-IESE conference on Multinational Companies and HRM: Between Globalisation and National Business Systems, Leicester Business School, De Montfort University, 12-14 July.
- Smith, N.R., 1967. *The Entrepreneur and His Organization*. University of Michigan: Bureau of Engineering and Economic Research.
- Storey, D.J., 1994. *Understanding the small Engineering Sector*, London: Rutledge.
- Stutely, R., 2002. *The Definitive Engineering Plan*, London: Financial Times Prentice Hall.
- Taylor, S., Beechler, S., Napier, N., 1996. "Toward an Integrative Model of Strategic International Human Resource Management", *Academy of Management Review*, 21(4), 959-985.
- Watts, H.D., Wood, A.M., Wardle. P., 2003. Making Friends Or Making Things?, *Urban Studies*,
- Westhead, P., Birley, S., 1993. Employment in New Independent Owner Managed Organization, *International small Engineering Journal*, 13.

- Westhead, P., Wright, M., 1999. Contributions of Novice, Portfolio, Founders Located In Rural and Urban Areas, *Regional Studies*, 33.
- Woods, A., Joyce, P., 2003."Owner-Managers and the Practice of Strategic Management', *International small Engineering Journal*, 21.