

# INNOVATION MANAGEMENT: TOOLS AND TECHNIQUES

## INOVĀCIJU VADĪBA: INSTRUMENTI UN TEHNIKA

**Pankaj**

Rezekne Academy of Technologies, coolpanku@rocketmail.com, Rezekne, Latvia  
*Scientific supervisor: .Lienīte Litavniece Dr.oec. Associate Professor*

**Abstract.** *The overview focuses on the innovation and its strategies, process and implementation activities in a management of an organization. Author introduce the systems based approach to organizational-level innovation management by suggesting that Investments in R&D activity and innovation could help the industry to lower its future capital requirements and operating costs, while also increasing yields and reducing resource and energy use. These investments would ultimately help the industry become more efficient and economically viable. This paper examines technological trends, innovation efforts and outcomes, as well as their implications for productivity in the automobile sector. The analysis shows that investments into R&D were drastically reduced during the run up to the financial crisis but are slowly increasing. Results from an analysis of patent applications suggest that the direction of invention in automobile technologies is turning towards climate change mitigation. However, a recent downward trend could be of concern given the environmental challenges ahead. By providing a first look at innovation and productivity issues in the global automotive industry, this paper also proposes possible avenues for future research.*

**Keywords:** *contingencies; innovation; innovation roles; organizational arrangements; process model.*

### Introduction

Innovation management has become an increased concern in scientific and management literature for the past three decades. The study of innovation management is driven by its practice. It is an applied field. There is no unified theory of innovation management. There are, however, diverse theories that can help explain various aspects of innovation management of social and economic process. Example of psychology, for example, explains the motivations of innovative individuals, while sociology explain the power relationships between and within groups and organizations that affect the innovation as a Endeavour, and political science enlightens us about the influences institutions can exert. Organization theory tells us about how new fields of knowledge and effort are formed and institutionalized, and how practices are negotiated and become embedded. The instrumental activity towards the theories in economics and strategic management, with a common concern to explain how resources and capabilities are deployed and value is created through introduction of new ideas. That is not underestimated the value of other theories and the explanations and insights they offer, but it does reflect the value of three approach evolutionary economics, dynamic capabilities and innovation management that emphasize the connections between context, strategy and practice. It also suggests their value compared to alternative, often deeply embedded, theories in the same field, such as neo-classical economics or strategy based on industrial structure analysis. By identifying the three analytical lenses-evolutionary economics, dynamics capabilities theory and innovation management it is possible to recognize several strands or connections that help frame understanding.

Additionally, since their proposals, the first linear innovation models have evolved to cope with a broader and systemic consideration of innovation. It has also been a matter of debate in this journal. There is a high demand among firms for practical approaches to managing innovation, and hence, numerous management models have been proposed to manage growing uncertainties and increasing global competition. Thus, in fact, both the various innovation management models and innovation management techniques or tools have been proposed to manage innovation more efficiently at the firms level. However, the literature related to the latter, which is the focus of this paper, is scarce and dispersed among various fields (Drucker, 2007).

**Aim of Article:** developed a process-based contingency model of innovation that would allow us to describe, analyse and explain how and why innovations develop and becomes either successes or failures. First, the term innovation is defined. Then, based on a wide range of innovation, organization and decision-making theories, six propositions are formulated. These propositions are the cornerstones of the innovation model described next. Subsequently, the three studies are introduced and their results described and analysed. The article concludes with implications of the research for the theory, management and research of innovation.

### **Innovation Management**

Innovation Management (IM) is not easy concept. It has various theories but there is no specific definition for it. In this perception, there are three simple overlapping phases when we consider innovation management - Innovation Management or, better defined, IM technology management (TM) and management of innovation (MI).

Hamel concerning the first IM, defined it as adjustments in what managers do and the way they do it, which could create long-lasting benefits for the firms (Hamel, 2006). Birkinshaw make contributions to defined innovation (revolutionary) management as the invention of a control practice, procedure, shape or method that is new to the nation of the art and is intended to further organizational desires. On this sense, they analyse the institutional context, propagation, cultural repercussions, and position of managers' influencing it. Moreover, a leading author inside the challenge claims that innovative control yields an enduring benefit when one or more of three situations are met: the innovation is based totally on a unique management principle which challenges a few lengthy-standing or thodoxy; the innovation is systemic, encompassing a variety of processes and techniques; and/or the innovation is part of an ongoing application of rapid invention where progress compounds over the years (*Birkinshaw et al., 2008*). Other authors aid this move of idea as nascent literature and propose its taxonomy for innovation control, such as approach, structure, innovation in paperwork and approaches, and the creation of records technologies The inclusion by using this school of thought of strategic and structural modifications in the management of innovation is incredible, further to the combination of motivational and reward guidelines or management. We ought to surmise that the primary focus of IM lies within the control hobby in line with se without focusing necessarily on the innovation outcomes. An instance of this wide and difficult method is the taxonomy proposed by using Skalkos that comprises nine classes for innovation management: from know-how control, business strategy, new product development, change control, and so forth to advertising and business enterprise. This is the whole wide field of control. The second time period, TM, has been defined in a large sense as "a system, which includes planning, directing, manage and coordination of the development and implementation of technological talents to shape and attain the strategic and operational goals of an enterprise. TM has been explained inside the context of the Dynamic abilities theory through how a firm manages its assets for innovation through the years inside the context of changing technology. Consequently, when we talk equipment for TM, they will address choices and sports related to the integration of technology into the enterprise in an progressive context however, it has been outlined that many of the fundamental influencers of technological innovation and especially inside the case of small firm are the managerial attitudes in the direction of innovation (*Kim et al., 1993*) sooner or later, concerning control of Innovation (MI), Van de Ven, early in 1986, pinpointed that it must be focused on 4 center factors: new ideas, people, transactions and institutional contexts however contemplating the innovation outcomes. Adams, in a seminal paper, proposed a framework with seven classes for MI size: inputs, information control, approach, organization and subculture, portfolio management and commercialization. On this respect, it's been emphasized how new dimension of innovation outcomes ratios are presently required. At gift, we consider the management of Innovation from an extra targeted method,

Knowledge management (KM). In line with Dankbaar, the Management of Innovation is ready reutilizing what can simplest be partly reutilized and providing the good enough shape and surroundings for creativity. The core process consists of making use of know-how to the work of knowledge workers, according to Drucker. This information perspective has had numerous supporters in the academic literature. Furthermore, the systemic innovation focus suggests that innovation and understanding generation take area because of a variety of sports, innovation management strategies and tools, a lot of them outside the formal research technique. Hull defined expertise management Practices for Innovation as those observable exercises worried directly in the improvement and application of knowledge. The previous authors have identified that equipment by gazing the practices of numerous R&D firm departments. We should finish then that Management of Innovation has a much broader holistic method to the problem of managing innovation including some gear of TM and IM with the cause of enhancing the innovation method efficiency of the firm.

### **Innovation Management: Tools and Techniques**

In the past setting, TM devices were defined as choices and exercises associated with innovation and coordinating innovation into the business in wording of the key innovation management forms: determination, identification, acquisition, exploitation and security of technology. From an innovation model, in their Pentathlon model, contend that to accomplish fruitful innovation management, administration organizations must first perform in five management zones: innovation procedure, imagination, ideas management, determination, portfolio management, execution management, and human asset management (HHRRM). However, IMTTs have a more extensive and precise thought and have been defined as a scope of instruments, strategies, and philosophies that help organizations to adapt to conditions and address showcase difficulties in an efficient way identified with the limit of firm to apply their insight to improve their businesses inside and their association with outside entertainers. The first audit on Innovation Management Tools was distributed by the European Commission (EC), an association that has paid significant attention to this field. It comprised of an evaluation of instruments and methodologies used by advisors working with little and medium-sized endeavors to support them in overseeing innovation. It was created with regards to the Management of Innovation and New Technologies (MINT) program of the EC. There view classified them with respect to kinds of undertakings they tended to, processes involved and nature of the innovation the firm was creating. The analysis recognized the unexpected idea of IMTS, contingent upon inner issues of the companies and their outside condition. These devices could be viewed as first generation. They concentrated on a top-down methodology and more on investigation than on decision-production or usage. The examination investigated 18 devices created by various European associations. Just a third was unmistakably organized. Be that as it may, the study inferred its effect however did not indicate useful evidences. Shortly a short time later, the propelled a task with the target of sensitizing SMEs, specialists, and business improvement associations to the interest of utilizing IMTS. As indicated by this examination IMTS were defined as strategy logical approaches for improving the aggressive position of firm through innovation. A manual, Advancing IMTS in Europe was distributed where the suppositions of different on-screen characters, advisors, open support organizations were arranged and dissected. This investigation studied 10IMTS, classified into three gatherings: internal looking (Project Management, Value Analysis, Design Techniques, Re-Engineering), outward-looking (Benchmarking, Marketing of Innovation, and Technology Watch), and forward-looking (Creativity Tools, Quality Management). The examination finished up with a greater part of positive comments on the effect of these IMTS on the methodology and the basic pretended by open help. Once more, this investigation found with general comments and recommendations yet bombed in demonstrating clear evidence. In 1999, an examination

subsidized by the EC proposed a structure for the management of innovation dependent on five stages or procedures — Scan nature for signals in regards to the requirement for innovation and potential chances, focus attention and endeavors on a specific methodology for innovation, asset that strategy, implement the innovation, and figure out how to all the more likely deal with the procedure or activity. In this unique situation, it dissected 18 devices and its amplexity for every one of those stages. This research depended on past EC studies. During February 2002, the EC again financed a field contemplate in 15 part states of the European Union (EU) among consultancies, business colleges, academic Innovation.

### **Conclusions and suggestions**

1. The literature search indicates that the tools related to TM, knowledge management practices, project management, quality management and human resources are those with a more frequent reference.
2. However, there are very few papers dealing with the IMTs portfolio as such. In general, there is ample consensus on the positive impact of IMTS on innovation.
3. Be that as it may, of 53 papers modified only 11 present specific proof of a constructive outcome on innovation execution and mostly dependent on contextual investigations or a gathering of cases. Only two creators present a definitive examination inside a huge example of firm.
4. The research results allow us to definitively conclude that the role and impact of the utilization of innovation management techniques are quite significant on the performance results of both incremental and radical innovations. The use of IMTs in the firms results in a predictive factor of their innovation performance, especially considering the incremental innovation outcomes.
5. An additional relevant result, not pointed out in the previous literature, indicates that the companies' incremental innovation performance significantly affects the radical innovation performance results. This finding is a noteworthy clue indicating that the companies' performance on simple (incremental) innovations augments the skills of the firms to develop higher level innovations (radical innovation results). Incremental innovation results are a sandbox fields for companies.
6. The PLs results, on the other hand, indicate that companies that perform IM practices tend to reduce their utilization of IMTS. That could be interpreted as a tendency towards restrictive practices.
7. When we compare the performance of firms, considering their sector of activity or their technological level, the research results are impressive. In principle, when considering the companies' technology paths, there are no significant differences between the various groups.
8. The patterns in the model relations are very similar to low- and medium-tech companies. In both cases, the practice of IM has no substantial influence on the innovation performance output
9. However, it must be outlined that incremental innovation results in low-tech companies having a significantly greater impact compared to med-tech companies. This fact, again, supports the idea of a contingent model of innovation management where the management approach seems to be moderated by the sector of the firms.
10. As a "range of tools, techniques, and methodologies directly focused in companies to improving their competitive position through managing innovation to adapt to circumstances and meet market challenges in a systematic way." Thus, the IMTS portfolio would include methods to promote creativity and entrepreneurial attitudes within the company; plans to develop competitive strategies; techniques to improve the firm's efficiency in the design and development of new products; systemic ways to enhance the

businesses cooperative networking with its environment; TM tools and two underlying group of tools to manage the firm's knowledge as well as the human resource competencies required for the whole innovation process.

11. The article has clear management implications. First, it calls for a focused management of innovation, applying sophisticated IMTS techniques. Second, it outlines the contingent aspect of this application when looking for efficiency. Tools must be implemented considering the firm's, its experience, and the sector of activity. Finally, it points out that innovation management competencies require learning and those enterprises may start by aiming at incremental innovation for later launching of radical innovation ventures.

### Bibliography

1. Albors-Garrigos, J, Ramos, J.C., Mas-Machuca, M. (2010). Actional Intelligence, a Critical Competence for Innovation Performance. A Research Multi-Case Analysis. *International Journal of Technology Intelligence and Planning*, 6(3), pp.210–225.
2. Birkinshaw, J., Hamel, G., Mol, M.J. (2008). Management Innovation. *Academy of Management Review*, 33(4), pp.825–845.
3. Blindenbach-Driessen, F., Van Dalen, J., Van Den Ende, J. (2010). Subjective Performance Assessment of Innovation Projects. *Journal of Product Innovation Management*, 27(4), pp.572–592.
4. Buyukozkan, G., Dereli, T., Baykasoglu, A. (2004). A Survey on the Methods and Tools of Concurrent New Product Development and Agile Manufacturing. *Journal of Intelligent Manufacturing*, 15(6), pp.731–751.
5. Darroch, J., McNaughton, R. (2002). Examining the Link Between Knowledge Management Practices and Types of Innovation. *Journal of Intellectual Capital*, 3(3), pp.210–222.
6. De Waal, G.A., Knott, P. (2013). Innovation Tool Adoption and Adaptation in Small Technology-Based firms. *International Journal of Innovation Management*, 17(3), 1340012/1–19.
7. Drucker, P.F. (2007). *Innovation and Entrepreneurship: Practice and Principles*. Abingdon: Routledge. 253 p.
8. Du Plessis, M. (2007). The Role of Knowledge Management in Innovation. *Journal of Knowledge Management*, 11(4), pp. 20–29.
9. Fornell, C., Larcker, D.F. (1981). Structural Equation Models with Unobservable Variables and Measurement Error: Algebra and Statistics. *Journal of Marketing Research*, 18(3), pp. 382–388.
10. Hamel, G. (2006). The Why, What, and How of Management Innovation. *Harvard Business Review*, 84(2), pp. 72–84.
11. Hull, R., Coombs, R., Peltu, M. (2000). Knowledge Management Practices for Innovation: an Audit Tool for Improvement. *International Journal of Technology Management*, 20(5–8), pp. 633–656.
12. Kim, Y., Song, K., Lee, J. (1993). Determinants of Technological Innovation in the Small Firms of Korea. *R&D Management*, 23(3), pp.215–226.
13. Liyanage, S., Poon, P.S. (2002). Technology and Innovation Management Learning in the Knowledge Economy. *The Journal of Management Development*, 22(7/8), pp.579–602.
14. Oke, A. (2002). Making It Happen: How to Improve Innovative Capability in a Service Company. *Journal of Change Management*, 2(3), pp.272–281.
15. Phaal, R., Farrukh, C., Probert, D. (2006). Technology Management Tools: Generalization, Integration and Configuration. *International Journal of Innovation and Technology Management*, 3(3), pp.321–339.
16. Prajogo, D.I., Sohal, A.S. (2004). Transitioning from Total Quality Management to Total Innovation Management: An Australian Case. *International Journal of Quality & Reliability Management*, 21(8), pp. 861–875.
17. Skalkos, D., Bakouros, I. (2011). Innovation Management Technique (IMT) for Very Small-Enterprises: Concept, Development and Application. *International Journal of Innovation and Regional Development*, 3(6), pp. 573–601.

### Kopsavilkums

Raksts koncentrējas uz inovāciju un tās stratēģijām, procesu un īstenošanas darbībām organizācijas vadībā. Autors iepazīstina ar sistēmām balstītu pieeju organizācijas līmeņa inovāciju vadībai, ierosinot, ka ieguldījumi pētniecībā un izstrādē un inovācijā varētu palīdzēt nozarei samazināt nākotnes kapitāla prasības un darbības izmaksas, vienlaikus palielinot ražīgumu un samazinot resursu un enerģijas patēriņu. Šie ieguldījumi galu galā palīdzētu

nozarei kļūt efektīvākai un ekonomiski dzīvotspējīgākai. Šajā rakstā aplūkotas tehnoloģiskās tendences, inovācijas centieni un rezultāti, kā arī to ietekme uz produktivitāti automobiļu nozarē. Analīze liecina, ka finanšu krīzes laikā ieguldījumi pētniecībā un attīstībā krasi samazinājās, bet pēc krīzes lēnām pieaug. Patentu pieteikumu analīzes rezultāti liecina, ka izgudrojuma virziens automobiļu tehnoloģijās virzās uz klimata pārmaiņu mazināšanu. Tomēr nesenā lejupslīde varētu radīt bažas, ņemot vērā turpmākās vides problēmas. Sniedzot pirmo skatījumu uz inovāciju un produktivitātes problēmām pasaules automobiļu rūpniecībā, šajā dokumentā ir ierosināti arī turpmākie pētījumi.