

## Innovation Types and Talent Management for Innovation

Juan A. Marin-Garcia<sup>1</sup>, Lourdes Aznar-Mas<sup>2</sup>, Fernando González Ladrón de Guevara<sup>3</sup>

<sup>1</sup> ROGLE-IEMA Dpto. de Organización de Empresas. Universitat Politècnica de València. Camino de Vera S/N 46021 Valencia. jamarin@omp.upv.es

<sup>2</sup> IEMA. Dpto. de Lingüística Aplicada. Universitat Politècnica de València. Camino de Vera S/N 46021 Valencia. laznar@idm.upv.es

<sup>3</sup> IEMA. Dpto. de Organización de Empresas. Universitat Politècnica de València. Camino de Vera S/N 46021 Valencia. fgonzal@omp.upv.es

**Abstract:** Companies need to become innovative and in order to do so, they must learn how to be able to manage the talent of their workforce. In this working paper we have reviewed the literature concerning the concept of innovation as a key for the challenge for change in companies to establish a synthesis and a classification of the types of innovation required. We propose a number of competencies needed by the different staff members (support, technicians, managers, etc) as well, so that they can succeed in being innovative in different ways.

**Keywords:** incremental innovation; radical innovation; process; product.

### 1. Introduction

Innovation is one of the intangible assets of any company and it may be a relevant factor for the achievement of a competitive sustainable advantage of companies in the market (de Benito Valencia, 2000). Being innovative is a process based on the behavioural patterns of persons, which must be acquired and developed through a learning process of certain duration (Delgado-Verde et al., 2011). Thus, the innovative attitude is not easy to copy or even to be adapted by competitors (Bessant et al., 2001; Wu & Chen, 2006), though innovation outcomes are. Broadly speaking, innovation is taken as the main factor to improve productivity or efficiency in companies (de Benito Valencia, 2000; Grütter et al., 2002; Rapp & Eklund, 2002), as well as quality of products (Albors, 2002; Grütter et al., 2002), decrease in the production costs (Bond, 1999; de Benito Valencia, 2000; Modarress et al., 2005; Terziovski & Sohal, 2000) or even manufacturing time (de Benito Valencia, 2000; Grütter et al., 2002). All these items are significant in the present situation where it is more and more frequent to face the challenge to improve efficiency, and it is also important to give a quick response to the changes taking place (Hyland et al., 2007; Middel et al., 2007b).

Innovation and its types have been analyzed in this paper, and the competencies developed, which would give rise to innovative members in companies, have been described, as well. We have found that competencies change depending on the staff status. Nevertheless, competencies do not vary according to situations or different contexts.

### 2. Innovation: Definition and Types

Innovation is a process through which a new product, technique or useful service is obtained from the generation of new ideas and their development (Gee, 1981; Jordá Borrell, 2007), which in time provides new solutions to problems and becomes useful for people, companies or society (Comisión Europea, 1995; Lyons et al., 2007). Therefore, innovation starts with the proposal and generation of new ideas and finishes with the use and commercial exploitation of the outcomes (Tonnessen, 2005).

An innovation process is generally divided into various steps such as: decision making, definition of a problem, data collection, study of current situation, proposal of new ideas; implementation of a test or piloting of the selected proposals; the checking up of expected outcomes and the implementation of outcomes with the required changes (Bond, 1999; de Benito Valencia, 2000; Marín-García et al., 2008a; Terziovski & Sohal, 2000).

The concept of Innovation may include different dimensions as, for example, the introduction of a new product or service, new production processes, launching of new markets, changes in the suppliers or even innovative business models for the company or organizations (Goffin & Mitchell, 2010; González Pernía & Peña-Legazkue, 2007; Marín-García et al., 2008b; Schumpeter, 1934).

Additionally, innovation may be considered as something that involves either an incremental change (improvement of existing products) or a radical change (generation of something new) (Bessant, 2005; Boer & Gertsen, 2003; Goffin & Mitchell, 2010; Lok et al., 2005; Tonnessen, 2005). These two points of view would give rise to a classification depending on the level or degree of innovation achieved. In the lowest band we would have the *no-innovation* dimension, next we would have the *incremental innovation* dimension, up to the highest band where we would have the *radical innovation* dimension (Goffin & Mitchell, 2010).

Incremental innovation is a systematic process which has been well planned and organized and it causes some changes in the production processes and also in work practices, which in turn cause improvements in the development of the indicators of development (Albors, 2002; Bateman & Rich, 2003; Dabhilkar & Bengtsson, 2007; Grütter et al., 2002; Hyland et al., 2007; Lok et al., 2005; Marín-García et al., 2009; Marín-García et al., 2010; Middel et al., 2007b; Miralles Insa & Marín-García, 2010; Prybutok & Ramasesh, 2005; Readman & Bessant, 2007; Wu & Chen, 2006). Incremental innovation needs no large investments and both managers and technicians in the companies are totally involved (García-Sabater et al., 2011; García-Sabater & Marín-García, 2009; Terziovski & Sohal, 2000).

Radical Innovation consists in obtaining something totally new (products, processes, technology or any other element), which means a breakthrough and causes a significant impact in the market and entrepreneurship (Ali, 1994; Ettlie, Bridges & O'Keefe, 1984; Lee & Na, 1994; Henderson, 1993; Stopford & Baden-Fuller, 1994; Leifer, 2000). This type of innovation, which was initially associated with laboratory study is the outcome of a systematic research. Radical innovation produces such drastic changes that either existing markets are transformed or other new ones are generated. This type of innovation plays a very important role in the success of companies in the long run (Freeman, 1987; Leifer, 2000; McDermott & O'Connor, 2002).

### 3. Talent Management for Innovation

According to several authors, Talent Management is a complex pattern of practice in the area of Human Resources, which allows companies to have the most prepared people with them, integrate these people in their corresponding job tasks and make them become a support for the development of the competencies of the rest of the staff members to satisfy both the current and future demands of their companies (Ulrich et al, 1995; Luna-Arocas & Camps, 2008; Hayton & McEvoy, 2006; Luna-Arocas & Morley, 2011). One of the steps to be taken as regards Talent Management is the identification of competencies (Hayton & McEvoy, 2006; Kochanski & Ruse, 1996; Ulrich, 1998; Ulrich et al., 1995).

Professional competency means the efficient performance of the capacities that lead to the development of a particular task, regarding the level required for that job. It is a complex know-how that demands the management of knowledge, skills, attitudes, ethical values and common characteristics of that job, as well as how to make the necessary decisions and perform a particular task (Fernández March, 2010; Lasnier, 2000; Perrenoud, 2005).

We can consider competencies, capacities and skills as the three categories of complexity in a contextualized know-how. A competency is formed by a set of capacities and these are formed by a number of skills, which are required for a more and more complex professional performance. The capacity is a medium complex know-how that integrates skills which require procedural and conditional knowledge. The skills are a simple know-how. (Bessant et al., 2001; Fernández March, 2010; Lasnier, 2000).

Some academic issues and research have analyzed a number of competencies in professionals that allow them to learn, innovate and be up to date regularly. Thanks to them, it is possible to identify the following competencies as priorities for managers and technicians in innovative situations:

#### Managers:

- Talent Management (Corso et al., 2007; Dooley & O'Sullivan, 2001; Goffin & Mitchell, 2010; Jacobsen, 2008; Jorgensen et al., 2003; Lyons et al., 2007; Middel et al., 2007a; Readman & Bessant, 2007; Scott, 2001; Ziaul, 2005)
- Selection, Definition and Estimation of Development Indicators (Bateman y Rich, 2003; Corso et al., 2007; Dooley & O'Sullivan, 2001; Goffin & Mitchell, 2010; Jacobsen, 2008; Kaye & Anderson, 1999; Marín-García, 2010; Marín-García & García-Sabater, 2010)
- Communication (Corso et al., 2007; Jacobsen, 2008; Jorgensen et al., 2003; Lyons et al., 2007; Middel et al., 2007a; Readman & Bessant, 2007; Scott, 2001; Ziaul, 2005)
- Management of Driving for Results and Business Acumen (Goffin & Mitchell, 2010; Jacobsen, 2008)
- Good Leadership and Management of Team Work (Bateman & Rich, 2003; Corso et al., 2007; Dooley & O'Sullivan, 2001; Jacobsen, 2008; Kaye & Anderson, 1999; Marín-García, 2010; Marín-García & García-Sabater, 2010; Scott, 2001)
- Motivating People to Generate Ideas (Dooley & O'Sullivan, 2001; Goffin & Mitchell, 2010)

#### Technicians

- Creativity (Goffin & Mitchell, 2010; Lyons et al., 2007)
- Problem Solving Techniques (Bessant et al., 2001; Jacobsen, 2008; Wu & Chen, 2006; Ziaul, 2005)
- Communication (Goffin & Mitchell, 2010; Delgado-Verde et al., 2011)
- Initiative and Leadership (Goffin & Mitchell, 2010; Navas López & Ortiz de Urbina Criado, 2002)
- Team Work (Corso et al., 2007; Dooley & O'Sullivan, 2001; García-Sabater y Marín-García, 2009; Goffin & Mitchell, 2010; Marín-García, 2010; Marín-García & García-Sabater, 2010; Middel et al., 2007a; Navas López & Ortiz de Urbina Criado, 2002; Tonnessen, 2005; Ziaul, 2005)
- Forward Thinking (Bessant et al., 2001; Goffin & Mitchell, 2010)

Other research papers have remarked on the importance of the specific context in which innovation takes place (Goffin & Mitchell, 2010). Particularly, it has been considered that the needs and outcomes of innovation may be totally different when changing strategies, structure, technology, culture or the area where innovation is carried out (Goffin & Mitchell, 2010; Lok et al., 2005; Middel et al., 2007b). However, we have not found enough research which permits us to determine whether innovation competencies for managers or technicians are similar or different in each of those contexts. Neither have we found references describing the type of innovation (product, process, market) nor the

difference, if any, for the competencies required. Finally, except for the work carried out by Bessant and other authors (Bessant et al., 2001; Marín-García & García-Sabater, 2010), we have not found a clear framework of competencies, capacities and skills required in any of the three categories aforementioned.

#### 4. Conclusions

Innovation is a recent topic in academic literature and research nowadays, and many authors coincide in the stating that innovation is not easy to implement nor to maintain in companies, whether dealing with the incremental or the radical type of innovation (Marín-García et al., 2010). We have focused our attention on the identification of the essential competencies to promote and enhance innovation in companies. We have classified the types of innovation according to three categories which include the levels of innovation achieved in each of them, and we have discovered a serious gap in the literature concerning innovation.

It seems that a detailed description of competencies for each of the dimensions has not been carried out yet. Besides, there is not much written about the crucial difference in meaning of the following concepts: *competence*, *capacity* and *skill* for each type of innovative category or specific context. It can even be noted that it has not been established yet whether those competencies, capacities and skills that make a person innovative are similar for all contexts or if they should be different. If so, those differences should be made more explicit and this has become our main focus for future research.

#### 5. Acknowledgements

This paper has been written with financial support from the Project "Construcción de un cuestionario de factores psicosociales para el diagnóstico de condiciones de trabajo y efectos sobre la salud y la satisfacción laboral. Adaptación a entornos docentes universitarios" (PAID-05-11-2846) of the Universitat Politècnica de València, and also with financial support from the European Union within the Project 518132-LLP-1-2011-1-FI-ERASMUS-FEXI "INCODE-Innovation Competencies Development". We would also like to thank Ms Mercedes Gutiérrez, Service Marketing Coordinator for South Europe and the Mediterranean Area in OTIS, Spain, and Mr. Miguel Aparicio, one of the CTOs (Chief Technology Officer) in INDRA, Spain, for their valuable comments and advice in the area of recruiting graduates and competences required in the professional world of the 21st Century.

#### 6. References

- Albors, J. (2002). Pautas de innovación tecnológica industrial en un región intermedia. El caso de la Comunidad Valenciana. *Economía Industrial* n°. 346, pp. 135-146.
- Ali, A. (1994). Pioneering versus Incremental Innovation: Review and Research Propositions. *Journal of Product Innovation Management* II 56-61.
- Bateman, N.; Rich, N. (2003). Companies' perceptions of inhibitors and enablers for process improvement activities. *International Journal of Operations & Production Management*, Vol. 23, n°. 2, p. 185.
- Bessant, J. (2005). Enabling continuous and discontinuous innovation: Learning from the private sector. *Public Money & Management*, Vol. 25, n°. 1, pp. 35-42.
- Bessant, J.; Caffyn, S.; Gallagher, M. (2001). An evolutionary model of continuous improvement behaviour. *Technovation*, Vol. 21, n°. 2, pp. 67-77.
- Boer, H.; Gertsen, F. (2003). From continuous improvement to continuous innovation: a (retro)(per)spective. *International Journal of Technology Management*, Vol. 26, n°. 8, pp. 805-827.
- Bond, T. C. (1999). The role of performance measurement in continuous improvement. *International Journal of Operations & Production Management*, Vol. 19, n°. 12, p. 1318.

Comisión Europea (1995). Libro verde de la innovación. Comisión Europea (ES/13/95/55220800.P00).

Corso, M.; Giacobbe, A.; Martini, A.; Pellegrini, L. (2007). Tools and abilities for continuous improvement: what are the drivers of performance? *International Journal of Technology Management*, Vol. 37, nº. 3-4, pp. 348-365.

Dabhilkar, M.; Bengtsson, L. (2007). Continuous improvement capability in the Swedish engineering industry. *International Journal of Technology Management*, Vol. 37, nº. 3-4, pp. 272-289.

de Benito Valencia, C. M. (2000). La mejora continua en la gestión de calidad. Seis sigma, el camino para la excelencia. *Economía Industrial* nº. 331, pp. 59-66.

Delgado-Verde, M.; Martín-de-Castro, G.; Navas-López, J. E.; Cruz-González, J. (2011). Capital social, capital relacional e innovación tecnológica. Una aplicación al sector manufacturero español de alta y media-alta tecnología. *Cuadernos de Economía y Dirección de la Empresa*, Vol. 14, nº. 4, pp. 207-221.

Dooley, L.; O'Sullivan, D. (2001). Structuring Innovation: A Conceptual Model and Implementation Methodology. *Enterprise & Innovation Management Studies*, Vol. 2, nº. 3, pp. 177-194.

Ettlie, J. E.; Bridges, W. P.; O'Keefe, R. D. (1984). Organization strategy and structural differences for radical versus incremental innovation. *Management science*, 30, 6, p. 682-695.

Fernández March, A. (2010). La evaluación orientada al aprendizaje en un modelo de formación por competencias en la educación universitaria. *Revista de Docencia Universitaria*, Vol. 8, nº. 1, pp. 11-34.

Freeman, C. (1987), *Technology Policy and Economic Performance*, Pinter, London.

García-Sabater, J. J.; Marín-García, J. A. (2009). Enablers and inhibitors for sustainability of continuous improvement: A study in the automotive industry suppliers in the Valencia Region. *Intangible Capital*, Vol. 5, nº. 2, pp. 183-209.

García-Sabater, J. J.; Marín-García, J. A.; Perelló-Marín, M. R. (2011). Is implementation of continuous improvement possible? An evolutionary model of enablers and inhibitors. *Human Factors and Ergonomics in Manufacturing*, Vol. In Press.

Gee, S. (1981). *Technology transfer, innovation & international competitiveness*. Wiley & Sons.

Goffin, K.; Mitchell, R. (2010). *Innovation management*. Palgrave-MacMillan.

González Pernía, J. L.; Peña-Legazkue, I. (2007). Determinantes de la capacidad de innovación de los negocios emprendedores en España. *Economía Industrial* nº. 363, pp. 129-147.

Grütter, A. W.; Field, J. M.; Faull, N. H. B. (2002). Work team performance over time: three case studies of South African manufacturers. *Journal of Operations Management*, Vol. 20, nº. 5, pp. 641-657.

Hayton, J.C. ; McEvoy, G.M. (2006). 'Competencies in practice: an interview with Hanneke C. Frese'. *Human Resource Management*, 45, 3, 495-500.

Henderson, R. (1993). Underinvestment and incompetence as responses to radical innovation: Evidence from the photolithographic alignment equipment industry. *The RAND Journal of Economics*, 248-270.

Huiban, J.; Bouhsina, Z. (1998). Innovation and the quality of labour factor. *Small Business Economics* 10, 389-400.

Hyland, P. W.; Mellor, R.; Sloan, T. (2007). Performance measurement and continuous improvement: are they linked to manufacturing strategy? *International Journal of Technology Management*, Vol. 37, nº. 3-4, pp. 237-246.

- Jacobsen, J. (2008). Avoiding the Mistakes of the Past. *Journal for Quality & Participation*, Vol. 31, nº. 2, pp. 4-8.
- Jordá Borrell, R. (2007). Comportamientos innovadores de las empresas de servicios avanzados (SA). *Aprendizaje y entorno en Andalucía. Economía Industrial* nº. 363, pp. 205-221.
- Jorgensen, F.; Boer, H.; Gertsen, F. (2003). Jump-starting continuous improvement through self-assessment. *International Journal of Operations & Production Management*, Vol. 23, nº. 10, pp. 1260-1278.
- Kaye, M.; Anderson, R. (1999). Continuous improvement: the ten essential criteria. *International Journal of Quality & Reliability Management*, Vol. 16, nº. 5, pp. 485-509.
- Kochanski, J.; Ruse, D. (1996). Designing a competence-based human resources organization. *Human Resource Management*, 35, 19-34.
- Lasnier, F. (2000). Réussir la formation par compétences. Guérin.
- Lee, M. ; Na, D. (1994). Determinants of Technical Success in Product Development when Innovation Radicalness Is Considered. *Journal of Product Innovation Management* II 62-68
- Leifer, R. (2000). *Radical innovation: how mature companies can outsmart upstarts*. Harvard Business Press.
- Lok, P.; Hung, R. Y.; Walsh, P.; Wang, P.; Crawford, J. (2005). An integrative framework for measuring the extent to which organizational variables influence the success of process improvement programmes. *Journal of Management Studies*, Vol. 42, nº. 7, pp. 1357-1381.
- Luna-Arocas, R.; Morley, M. (2011). Talent mindset and perceived performance. Paper presented at the Conference International Human Resource Management. Birmingham.
- Luna-Arocas, R.; Camps, J. (2008). A model of high performance work practices and turnover intentions. *Personnel Review*, 37, 1, 26-46.
- Lyons, R. K.; Chatman, J. A.; Joyce, C. K. (2007). Innovation in services: Corporate culture and investment banking. *California Management Review*, Vol. 50, nº. 1, pp. 174-191.
- Marín-García, J. A. (2010). Identificación de los facilitadores clave de la mejora continua y su relación con las conductas. *Working Papers on Operations Management*, Vol. 1, nº. 1, pp. 6-11.
- Marín-García, J. A.; Bautista Poveda, Y.; García-Sabater, J. J.; Vidal Carreas, P. I. (2010). Implantación de la innovación continua en la gestión de operaciones: una revisión de la literatura. *Innovar*, Vol. 20, nº. 38, pp. 77-95.
- Marín-García, J. A.; García-Sabater, J. J. (2010). Traducción al castellano de un cuestionario para identificar conductas de la mejora continua y etapas en el modelo de evolución. *Working Papers on Operations Management*, Vol. 1, nº. 1, pp. 18-26.
- Marín-García, J. A.; Garcia-Sabater, J. J.; Bonavia, T. (2009). The impact of Kaizen Events on improving the performance of automotive components' first-tier suppliers. *International Journal of Automotive Technology and Management*, Vol. 9, nº. 4, pp. 362-376.
- Marin-Garcia, J. A.; Pardo del Val, M.; Bonavia, T. (2008a). La mejora continua como innovación incremental. El caso de una empresa industrial española. *Economía Industrial* nº. 368, pp. 155-169.
- Marín-García, J. A.; Pardo del Val, M.; Bonavia, T. (2008b). Longitudinal study of the results of continuous improvement in an industrial company. *Team Performance Management*, Vol. 14, nº. 1/2, pp. 56-69.
- McDermott, C. M.; O'Connor, G. C. (2002). Managing radical innovation: an overview of emergent strategy issues. *Journal of Product Innovation Management*, 19(6), 424-438. doi:10.1111/1540-5885.1960424

- Middel, R.; Fisscher, O.; Groen, A. (2007a). Managing and organising collaborative improvement: a system integrator perspective. *International Journal of Technology Management*, Vol. 37, n° 3-4, pp. 221-236.
- Middel, R.; op de Weegh, S.; Gieskes, J. (2007b). Continuous improvement in The Netherlands: a survey-based study into current practices. *International Journal of Technology Management*, Vol. 37, n° 3-4, pp. 259-271.
- Miralles Insa, C.; Marín-García, J. A. (2010). Estudio sobre la implantación de herramientas de ingeniería de organización en Centros Especiales de Empleo españoles, en J. P. García-Sabater, A. Calpe Lizondo, J. F. Dols Ruiz, M. Poyuelo Cazorla, y J. J. García-Sabater (dir), *Accesibilidad al medio físico e ingeniería industrial*, pp. 103-111. Ediciones VJ.
- Modarress, B.; Ansari, A.; Lockwood, D. L. (2005). Kaizen costing for lean manufacturing: a case study. *International Journal of Production Research*, Vol. 43, n° 9, pp. 1751-1760.
- Navas López, J. E.; Ortiz de Urbina Criado, M. (2002). El capital intelectual en la empresa. Análisis de criterios y clasificación multidimensional. *Economía Industrial* n° 346, pp. 163-171.
- Perrenoud, P. (2005). La universitat entre la transmissió de coneixements i el desenvolupament de competències. El debat sobre les competències a l'ensenyament universitari , ICE UB. Documents de Docència Universitària, núm. 5., pp. 8-25.
- Prybutok, V. R.; Ramasesh, R. (2005). An action-research based instrument for monitoring continuous quality improvement. *European Journal of Operational Research*, Vol. 166, n° 2, pp. 293-309.
- Rapp, C.; Eklund, J. (2002). Sustainable development of improvement activities: The long-term operation of a suggestion scheme in a Swedish company. *Total Quality Management*, Vol. 13, n° 7, pp. 945-969.
- Readman, J.; Bessant, J. (2007). What challenges lie ahead for improvement programmes in the UK? Lessons from the CINet Continuous Improvement Survey 2003. *International Journal of Technology Management*, Vol. 37, n° 3-4, pp. 290-305.
- Schumpeter, J. (1934). *The Theory of Economic Development*. Harvard University Press.
- Scott, G. (2001). Customer Satisfaction: Six Strategies for Continuous Improvement. *Journal of Healthcare Management*, Vol. 46, n° 2, p. 82.
- Stopford, J; Baden-Fuller, C.W.F. (1994). Creating Corporate Entrepreneurship. *Strategic Management Journal* 15, 521-536
- Terziovski, M.; Sohal, A. S. (2000). The adoption of continuous improvement and innovation strategies in Australian manufacturing firms. *Technovation*, Vol. 20, n° 10, pp. 539-550.
- Tonnessen, T. (2005). Continuous innovation through company wide employee participation. *TQM Magazine*, Vol. 17, n° 2, pp. 195-207.
- Ulrich, D. (1998). 'Intellectual capital = Competence x Commitment'. *Sloan Management Review*, 39, 2, 15-26.
- Ulrich, D.; Brockbank, W. (2005). *The HR value proposition*. Boston: Harvard University Business School Press.
- Ulrich, D; Brockbank, W.; Yeung, A. ; Lake, D.G. (1995). Human resource competencies: an empirical assessment. *Human Resource Management*, 34, 4, 473-495.
- Wu, C. W.; Chen, C. L. (2006). An integrated structural model toward successful continuous improvement activity. *Technovation*, Vol. 26, n° 5-6, pp. 697-707.
- Ziaul, H. (2005). Managing change: a barrier to TQM implementation in service industries. *Managing Service Quality*, Vol. 15, n° 5, pp. 452-469.