Blázquez-Puerta, C.D. & Bermúdez-González, G. (2019) The Emotional Intelligence of Senior Executives and their Effect on Products Innovation and on Processes Innovation, Journal of Business. Universidad del Pacífico (Lima. Peru) Vol.11(1): 14-26





# The Emotional Intelligence of Senior Executives and their Effect on Products Innovation and on Processes Innovation

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#### **Abstract**

The main aim of this empirical research is to prove that the emotional intelligence of senior executives exerts a direct and positive effect upon innovation across different enterprises. The study uses total sample of 139 senior executives belonging to Spanish companies engaged in a wide range of activities who were required to complete a 22-item survey. In addition to validating the conceptual model, the outcome of the empirical analysis based on application of the structural equation model confirm the –"starting hypothesis"-: -"the emotional intelligence of senior executives exerts a direct and positive effect upon product innovation and process innovation within enterprises"-.

**Keywords:** Emotional intelligence, Product innovation, Process innovation

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https://doi.org/10.21678/jb.2019.980 Paper received 30/02/2019 paper accepted 18/06/2019

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## Introduction

Innovation is regarded as a significant dimension within the process of learning at work, which implies rational, intuitive, emotional and social processes; while emotion plays a very important role in influencing employees and in their willingness to create and innovate (Fenwick, 2003). According to Helfat and Martin (2012), creativeness and innovation within different organizations depend on the capacity of members of management to measure the different possibilities.

Emotions can exert a certain degree of influence upon human thought processes and opinions through the promotion of different information strategies (Forgas, 1995). According to Mayer and Salovey (2007), there are four basic talents inherent to emotional intelligence: 1) "understanding, evaluating and expressing emotions"; 2) "the effect on ideas"; 3) "understanding of the changeable and complex structure of emotions" that affect decision- makings, and 4) "supporting emotional and intellectual expansion" (Charbonneau and Nicol, 2002).

Positive emotions could facilitate the heuristic process as being useful for "creative jobs" (Lyons and Schneider, 2005).

Park (2005) supports the idea that the quality of the emotional environment within different organizations can improve creativeness and productivity.

Employees with a greater emotional intelligence (EI) have a greater command of their capacity for negotiation and problems-solving (Goleman, 1998), which is the basis for "creative ideas" (Scott and Bruce, 1994). The process of creating ideas is the first step in the process of individual innovation.

## Theoretical framework and conceptual model proposed

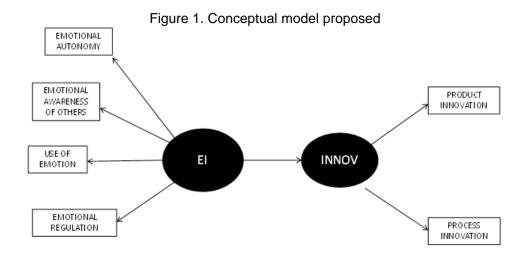
Considering a systemic focus in which; the starting point is the individual joining the organization (Tejada, 2003) our theoretical framework is based upon the dual model of intelligence proposed by Norman and Shallice (1986), and the winner of the 2002 Nobel Prize for Economics, Daniel Kahneman (2012), who explains: "The mind has two systems: System 1 (Fast brain), fast, intuitive and emotional, operates quickly and automatically, with little or no effort and no sense of voluntary control" and System 2 (slow brain), slower, hard and rational, focuses attention on the hard-working mental activities that demand it, Its operations are often associated with the subjective experience of acting, choosing and concentrating."

In the present study, we will concentrate only on System 1 (upon the Affective System at the stage of humanbeing and upon the Emotional Intelligence (EI) at an Organizational level; and inside the System 2 at individual level is identified with the taking of decision related to the innovation (Innov) at the enterprise (see figure 1).

This conceptual model is based upon the theoretical framework shown above and is based on the following principle: for managers to have the capacity to exert some influence upon the outcome of products as much as process innovation within the enterprises they are running, they should develop emotional intelligence, which promotes awareness both of aid having both of oneself and of others: by making use of their emotions according to the different situations they face, as well as their capacity to

regulate emotions (Mayer and Salovey, 2007; Wong and Law, 2002; Jordan and Troth, 2002; Suliman and Al-Shaikh, 2007; Shih and Susanto, 2010).

Finally, the aim is to prove empirically that the emotional intelligence of seniors executives exerts a direct and positive effect upon innovation within enterprises, especially in terms of product and process innovation.



Source: compiled by authors

# Literature review

# Emotional intelligence

Nowadays, there is evidence that emotional intelligence is a very important predictor for the clear development of human social and personal behavior (Extremera & Fernández Berrocal, 2005a; Schutte et al., 2001) and also has a substantial power as a transmitter of the behaviors developed around the work place across, different departments (Jordan & Troth, 2002).

Emotional intelligence has been found to relate in a positive and important way to a enhancing the behavior one adopts, such as: more adaptable response strategies (Fernández-Berrocal, Alcaide, Extremera& Pizarro, 2006), and a greater capacity to break off negative emotional states and sustain positive ones (Salovey, Stroud, Woolery & Epel, 2002; Williams, Fernández - Berrocal, Extremera, Ramos & Joiner, 2004).

Park (2005) analyzes the connection inside an organization between the emotional environment and its outcomes. Based on the hypothesis: "How far people experience an organization as enabling them to feel capable, listened to, accepted, safe and included affect their creativity and innovation" Suliman & Al-Shaikh (2007), he finds a correlation between degree to which staff experience these five dimensions and the degree to which they observers, resilient, creative, and interdependent, besides some other qualities associated with "learning power". Park concludes that different organizations increase their likelihood of improving productiveness and creativeness by focusing upon the

quality of the emotional background at work, and must establish aims in order to achieve these results.

On the other hand, Brooks and Nafukho (2006) attempt to show the integration between EI, human resources, social capital and organizational productivity, coming to the conclusion that EI at work is clearly related to other factors. Thus, to increase their productiveness that of their different departments, organizations look to employ and develop workers with a higher EI.

### Innovation

Nonaka and Takeuchi (1995) regard innovation as a knowledge-creation process, whose main input is the availability of known knowledge, which needs to be capitalized and transferred to those workers taking part in the process. Nevertheless the mere fact of processing knowledge in itself does not guarantee any strategic advantage (Zack, 2002).

This present study, argues that innovate is to create or acquire an idea or knowledge and introduce it into the organization, making it possible to turn it into a new product – (that is, an object) – or a new process or method.

In several senses, innovation can be described as the implementation of different discoveries and interventions and the process through which new results emerge, they be products, systems or processes (Gloet & Terziovski, 2004).

Innovation can be understood as a broad term that defines the capacity of an enterprise to introduce new products or processes (López-Cabrales, - Pérez-Luño, & Cabrera, 2009). In turn, Wang, et al., (2010) argue that innovation is conceptually a process that starts with a new idea and ends with its introduction into the market.

Innovation, as alluded to, can be broken down into two different areas: products and processes (Gobeli & Brown, 1994; Yamin, Mavondo, Gunasekaran, Sarros, 1997). Product innovation refers to the process of generating new ideas or the creation of something totally new, which is reflected in the changes in the product or in the final result offered by the organization; meanwhile, process innovation represents changes in the way in which enterprises obtain final products or services, through the transmission or adoption of new innovation developed elsewhere (Tidd et al., 1997).

# Effects of emotional intelligence on innovation

In 1990, Mayer and Salovey, defined EI as "the ability to regulate proper feelings and emotions and the belonging to other ones, discriminate between them and use this piece of information to lead the thinking and action of a person". Mayer and Salovey (2007) through their model based on four branches, argue that EI consists on four abilities: 1) perception, valuation and expression of the emotion; 2) emotional use of thinking; 3) understanding and analysis of emotions using emotional knowledge; and 4) reflexive regulation of emotions to promote emotional and intellectual development. This definition of EI is widely accepted given its representativeness across all literature on EI (Wong & Law, 2002; Law et al., 2004; Shih & Susanto, 2010).

In the same way, the EI has become crucial to achieving effective outcomes and staying at the top at times of organizational change (Diggins, 2004); the best executives should possess EI so that their conclusions are based on a combination of self-management, relationship skills and self-awareness about how their behavior can affect other elements within an organization.

Although many studies have found that EI has a positive effect on aptitudes and independent behaviors, labor development, and performance of team (Wong & Law, 2002; Jordan & Troth, 2002; Shih & Susanto, 2010), little is known about the mechanisms in-volved between EI and product and process innovation, or between EI and innovation in worker outcomes.

However, Suliman and Al-Shaikh (2007), observe that workers with higher levels of El tend to report lower levels of conflict and a greater disposition to create and innovate. Employees with higher El have more power over their negotiating and problem-solving skills (Goleman, 1998), which represents the basis for creative ideas (Scott & Bruce, 1994) and therefore, the basis of the individual innovation process.

Moreover, employees with a higher level of EI have a better understanding of others' emotions, better control over their own emotions, and rarely express negative emotions at work (Davies et al., 1998).

In response to a conflict between different roles at the same workplace, emotionally intelligent individuals have the ability to lead and control their thinking and actions towards better resolution in the face of environmental demands and pressures (Van Rooy & Viswescaran, 2004), handing the conflict in a more constructive way and achieving better results (Schlaerth et al., 2013).

Along the same lines, appropriate and efficient behavior during the management of conflicts can improve the income from individual innovation (Chen et al., 2012). In addition, employees with high EI tend to share their ideas with their workmates, invite suggestions and help from their them and know how maintain lasting cooperative relations with their workmates, whereby all of them have to be creative and innovative (Su-liman & Al-Shaikh, 2007).

On the basis of abovementioned literature, we proceed to formulate the following hypothesis:

- 1) The emotional intelligence of senior executives exerts a positive and direct effect upon product innovation at enterprises.
- 2) The emotional intelligence of senior executives exerts a positive and direct effect upon process innovation at enterprises.

# Methodology of analysis

The method used to gather information is a questionnaire, which was tested on ten senior executives and five expert researches, and then adapted to the real situation of Spanish enterprises (See Table 1).

Table 1. Questionnaire

Construct	and areas evaluated	Type of scale	Source
EMOTIONAL INTELLIGENCE		7 point Likert scale	Wong and Law, (2002)
EA1	Most of the time I have good sensation about	1 < <totally disagree="">&gt;</totally>	
	my own feelings.	7 < <totally agree="">&gt;</totally>	
EA2	I have a good understanding about my own emotions		
EA3	I really understand what I feel		
EA4	I always know if I am happy or not.		
EAO5	I always perceive my friends' emotions		
	through their behavior.		
EAO6	I am a good observer of other's emotions.		
EAO7	I am empathetic to the feelings and emotions of other people.		
EAO8	I have a good understanding of the emotions of people aroun	d me.	
UE9	Whenever I set a goal, I always try to give the best of myself	to achieve it	
UE10	I am a self -motivated person.		
UE11	I always encourage myself to get out the best of myself.		
ER12	I am able to control my temperament and manage difficulties	rationally.	
ER13	I am quite capable of controlling my own emotions.		
ER14	When I am very annoyed, I can always calm down quickly.		
ER15	I have good control of my own emotions.		
INNOV	ATION	7 point Likert scale	Prajogo and Sohal
(2006)		•	
PROD1	The degree of newness of our firm's products/services	1<< much less in relation to	
		its main competitors>>	
PROD2	The use of the latest technological innovations in our new	7 << much more in relation to	
	products and services.	its main competitors>>	
PROD3	The speed of new products or service development		
PROD4	The number of new products/services that our firm has introdu on the market.	iced	
PROC5	Our firm's technological competitiveness.		
PROC6	The speed with which we adopt the latest technological innova-	ations	
	in our processes.		
PROC7	The newness of the technology used in our processes		

Source: compiled by authors

A random test was applied to a long list of senior executives, identified via LinkedIn, belonging to enterprises engaging in a range of activities. They were sent the questionnaire by e-mail, along with a letter of introduction about the study and a link providing direct access to the survey.

The questionnaire included a total of 22 items, and each respondent was required to express their level of agreement or disagreement through a 7 point Likert scale based on the proposal of (Thwaites, 1999; Byrne, 2012 and Bentler & Chou, 1987), with the following categories of answers: 1<<totally disagree>>, 5 <<neutral>>, 7<< totally agree>>. In turn, these are used to measure four constructors:

- Emotional intelligence by Wong and Law (2002), based on 15 items which make up four dimensions: emotional autonomy (EA); emotional awareness of others (EAO); use of emotions (UE) and emotional regulation (ER).
- Innovation outcome, based on seven items, which define two dimensions: a) product innovation (IPROD); b) Process innovation (IPROC). The scale used for measuring the results of innovation in this study was developed by Prajogo and Sohal (2006), taking into account four categories: 1) level of originality; 2) use of the latest technological developments; 3) number of innovations; and 4) speed of innovation. These classifications have been used in empirical studies previous to the innovation (Deshpande et al., 1993; Hollenstein, 1996; Miller & Friesen, 1982; Subramanian & Nilakanta, 1996).

In order to calculate the descriptive statistics for each concept and to validate the different scales of the constructors, an exploratory factor analysis (EFA) with maximum likelihood is conducted using SPSS software. The EFA, as its name implies, is a technique that is mainly based on data, and attempts to discover their underlying structure (Bollen, 1989). To measure data reliability, Cronbach's alpha (1955) is used within SPSS.

## Results

As noted, the aim of this study is to determine whether the emotional intelligence of senior executives exerts a direct and positive influence on product and process innovation within enterprises, based on its four dimensions: a) emotional autonomy; b) emotional awareness; c) use of emotions, and d) emotional regulation.

Table 2 shows the main characteristics of the 139 senior executives who completed the online survey, and their enterprises.

Table 2. Sample characteristics (N=139)					
	n	%			
1. Job category at the enterprise					
Manager (President or Vice-president)	38	27. 34%			
Department Manager	81	54.67%			
Technician	20	17.99%			
2. Age					
Under 25 years old	1	0.72%			
From 26 to 30 years old	13	9.35%			
From 31 to 35 years old	16	11.51%			
From 36 to 40 years old	28	20.14%			
From 41 to 45 years old	32	23.02%			
From 46 to 55 years old	39	28.06%			
From 56 to 65 years old	10	7.19%			
	10	7.17/0			
3. Gender Female	47	33.81%			
Male	92	66.19%			
	92	00.19%			
4. Sector to which enterprise belongs:					
Industry	14	10.07%			
Financial Services/Banking	5	3.60%			
Gestion Services	6	4.32%			
Technology	11	7.91%			
Health Services and Social Services	25	17.99%			
Scientists, Techniques and Professional Activities	29	20.86%			
Energy	4	2.88%			
Construction	4	2.88%			
Public Sector	22	15.83%			
Tourism and Hotel	5	3.60%			
Publicity and Mass Media	4	2.88%			
Other sectors	10	7.18%			
5. Type of Enterprise					
Public	45	32.37%			
Private	87	62.59%			
Others	7	5.04%			
6. Autonomous Community in which the enterpris	se is located				
Andalucía	37	26.61%			
Aragón	6	4.32%			
Principado de Asturias	3	2.16%			
Islas Baleares	4	2.88%			
Canarias	5	3.60%			
Cantabria	5	3.60%			
Castilla - La Mancha	3	2.16%			
Castilla y León	9	6.47%			
Cataluña	11	7.91%			
Comunidad Valenciana	11	7.91%			
Extremadura	4	2.88%			
Galicia	6	4.32%			
La Rioja	3	2.16%			
Comunidad de Madrid	13	9.35%			

Comunidad Foral de Navarra	2	1.44%
País Vasco	9	6.47%
Región de Murcia	4	2.88%
Melilla	2	1.44%
Ceuta	2.	1 44%

Source: compiled by authors

For the estimation and representation of the model, the statistical package AMOS version 24 is used. The focus for this estimation is based upon for parameters related to the structures of Covariance or SEM (Structural Equation Models). Figure 2 shows the outcomes of the proposed Structural Equation Model.

Figure 2. **SEM** 

Source: Source: compiled by authors

According to the results obtained, "the starting hypothesis (see Figure 2) is fulfilled, since emotional intelligence (EI) exerts a positive and direct effect upon innovation (INNOV), exerting a much greater influence on the "product innovation" than on the "process innovation".

With respect to product innovation, EI exerts a direct and positive influence in the following order of intensity: a) speed of development of new products; b) use of the latest technological innovations in products and services; c) number of products and services that the enterprise has introduced into the market; and d) degree of novelty of the enterprise's new products and services.

In relation to the process innovation, EI exerts a the direct and positive influence in the following order of intensity: a) technological competitiveness of the enterprise; b) speed with which the latest technological innovations are adopted by the enterprise; and c) newness of the technology used in the processes. After estimating the model, goodness of fit statistics were used to evaluate its quality (Schreider et al, 2006).

Table 3. Goodness of fit statistics

Statistic		Abbreviation	Estimated model
Absolute fi	it		
Chi-square	d	χ2	429,650
Chi – squared/degrees of freedom		$\chi 2/df$	2.15
Increment	al fit		
Normed Fit Index		NFI	.848
Tucker-Lewis Index		TLI	.886
Parsimony	fit		
Parsimony normed fit index		PNFI	.667
Akaike	Information Criterion	AIC	581,650
Other			
Root mean square error of approximation		RMSEA	.089

The abovementioned measures are within ranges considered acceptable by the Social Sciences.

## **Discussion**

As regards the emotional intelligence of senior executives, it is important to point out that it exerts a positive and direct influence upon innovation within the enterprise (0.14), which is consistent with the findings of Fenwick (2003) and Park (2005). It is also notable that emotional autonomy of senior executives, and these managers` use of their emotions, have considerable weight in El. However, emotional awareness of others and emotional regulation have a lower weight.

That senior executives have emotional autonomy and make use of their emotions implies that they are truly capable of understanding – "what they feel", they have a firm grasp of their own emotions, and they are sufficiently self- motivated to get the best out of themselves. These results support the work of Davies et al., (1998).

Senior executives' emotional awareness of others also has a high weight in EI, whereby it is of particular importance that these managers will be "good observers" of others' emotions, besides that he is capable of perceiving his friends emotions through their behaviours. In turn, the emotional regulation of senior executives has a lower weight, but this does not mean that it is any less important, as managers' ability to control their own emotions and to calm down quickly when they become annoyed also has some influence upon innovation. This supports the arguments by Van Rooy and Viswescaran, (2004); Chen et al., (2012); and Suliman and Al-Shaikh, (2007), who argue that "employees with higher standards of EI tend to report lower levels of conflict and higher standards of learning to create and innovate."

Therefore, the results of this study support the proposal of Mayer and Salovey (2007), for whom "emotional intelligence is the ability to unify emotions and reasoning, using our emotions to make it easier to reason and think about our emotional life a more intelligent way". The four dimensions of emotional intelligence: "Perceive, and Express,

Understand, Make easier and Evaluate Emotions" affect decision making and support emotional and intellectual expansion (Charbonneau and Nicol, 2002).

## **Possible limitations**

The first limitation of this present study is the small number of empirical studies in the management field that analyze the construct of EI and its affects upon innovation within different enterprises. Most studies on EI are related to the field of education.

But the main limitation of this study is the size of the sample and its heterogeneity.

#### Conclusion and future lines of research

Companies should understand that the emotional intelligence is an ability that necessarily has to be trained and developed among senior executives in order to reduce the number of problems, increase creativity, improve product and process innovation, and consequently, obtain better results.

Future lines of research could increase the number of enterprises selected and target their surveys only to the senior executives directly involved in product and process innovation in order to obtain a much more homogeneous sample.

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