# Leadership and Value Creation on Innovation: The Case of Software Developer Sector in Guadalajara, México

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## EXECUTIVE SUMMARY

*This document is a descriptive study that aims to discover and analyze the elements that characterize the leadership oriented to value creation and development of innovation in organizations. The methodology is based on the application of Short Multifactor Leadership Questionnaire (MLQ 5X) of Avolio & Bass, (2004), for discovering the predominant type of leadership as; Transformational(LTRF) , Transactional (LTRS), Passive / Avoidant (LPAV), and their results (RLDS) characterized with 45indicators, and their incidence to the Value Creation(VC,8), Innovation Generation (IG,50), add up 103 indicators, describing 36 dimensions and 9 variables. The questionnaire was applied to 200 managers belonging to firms of the Software Developer Sector (SDS), as subject of study in Guadalajara City, Mexico (GCM). The study concluded with the discovery of LTRF as a predominant leadership in SDS, with positive correlation with VC and IG. LPAV, has an opposite correlation, mainly with VC (11%).*



*Keywords: Leadership, Mlq5x, Value Creation, Innovation Generation*


## INTRODUCTION

Leadership has generated excitement and interest from ancient times, because is a complex issue finding out how certain individuals have the power of attraction and persuasion to achieve goals and objectives, with limited resources and how they exceed the expectations. The organizational world requires to identify the main characteristics that drive individuals to discover their skills (Petrick, et al. ,1999) developing certain leadership style: Transformational, Transactional or Passive/Avoidant (Avolio &. Bass, 1995, 2004); Avolio & Gibbons,1988; Bass, 1985; Bass & Avolio, 1990, 1997, 2006) is able to create value (Bonel et al., 2003; Gale & Chapman, 1994) and innovation (Shipp et al.,2008; Chesbrough, 2006; McKinsey, 2008; OCDE 2005; Rogers, 1962) due they are drivers for improving the competitiveness of the organizations. Therefore, the challenge is to identify what kind of leadership and indicators are predominant in the SDS (409 firms) in the GCM, considered as one of the most successful in the creation of value and innovation. This work is divided into: 1) contextual reference, research questions, hypotheses, research questions and rationale for the study; 2) the theoretical framework, which is a collection of concepts of leadership, value creation and innovation and closing with the design of the questionnaire; 3) methodology description; 4) analysis of results; 5) conclusions.

## CONTEXTUAL REFERENCE

One sector, that is considered successful, fast-growing and highly dependent on value creation and innovation generation is the SDS. According To INEGI (2013), in GCM located in Jalisco state, there are around 200 firms that are directly or indirectly related with SDS, which have opportunities to develop them into the Digital Creative City program. The project, was officially announced on January 30, 2012 by President Felipe Calderon, to enable 1000 acres, with an investment close to 1000 million USD looking for create 20,000 jobs in 10 years. Disney, Pixar Studios and Disney already have shown interest in joining to the *Jaliwood* concept of Mexico, hence the importance of identifying and promoting in a systematic way, the major factors such as leadership to facilitate VC and IG in SDS.

## PROBLEM, HYPOTHESES AND RATIONALE OF THE STUDY

The Global Innovation Index Report (INSEAD, 2012; p.xix) places México on site 79/141 with high expectations to be 7th. World Economy in 2020 (Web Portal Millennium, 2012), but still, so far away to get it (eg place 81/125, INSEAD, 2011; place 69/132 INSEAD, 2010; place 62/130, INSEAD, 2009; place 37/107, INSEAD, 2007, p.27), a fact which is reflected in its level competitiveness level, which is located on site 58/142 according to The Global Competitiveness Report 2011-2012 (World Economic Forum web Portal, 2012). Despite all above, there are some firms well known as a successful organizations due to the practice of VC and IG that they have reached to increase their level of competitiveness in recent times. Some of those firms are grouped in the SDS into GCM. So, our problem is described in

a general question as **GQ: What is the conceptual model that complements the MLQ5x able to characterize the leadership for the VC and IG in a firm of SDS?**. So, the specific questions (as **SQ**), are:
**SQ1:** What is the scheme of the model?; **SQ2**: What are the variables, dimensions and indicators that complements the MLQ5x for obtain a final questionnaire that rationale the value creation and innovation generation in a firm?; **SQ3:** What variables, dimensions and indicators, from value creation and innovation generation, are more affected by leadership in the SDS in GCM?. The general hypothesis (as **GH**), is: What is the predominant leadership style in the SDS in GCM?

## THEORETICAL FRAMEWORK

This section analyze the concepts of leadership, value creation and innovation in order to find similar points to determine and describe the main variables and propose the conceptual model for its interrelationship.

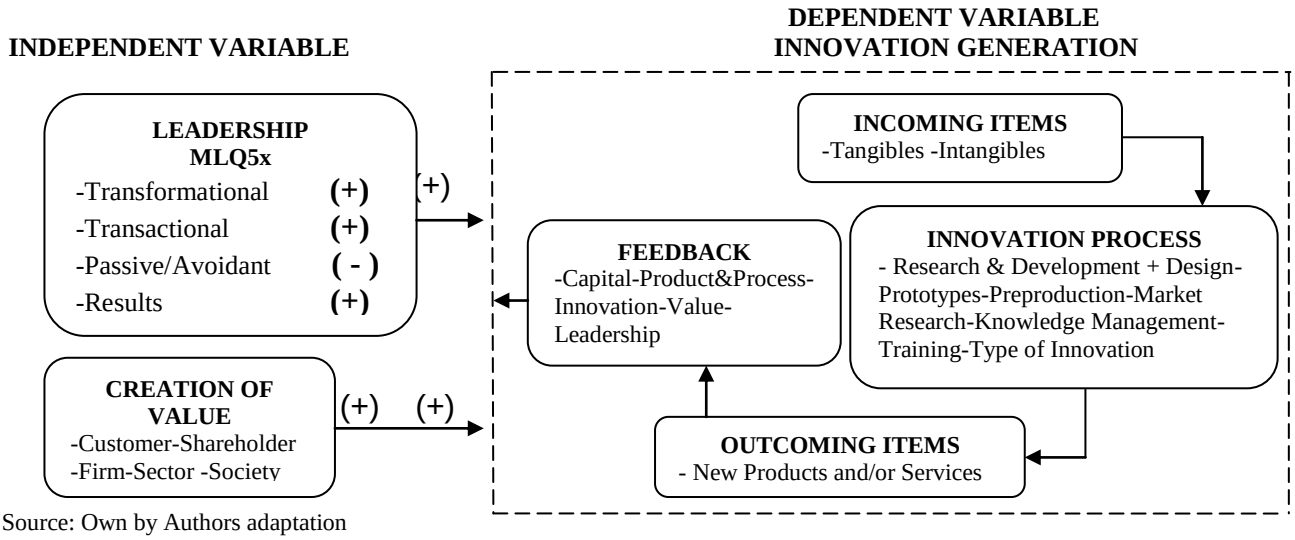
**Leadership.-** According to DRALE (2013), means: 1. m. *lead.* 2. m. *Status of superiority which is a company, a product or an industry, within its scope*. Today, we have recognized the advantage represented transformational leadership in innovation processes, due to the work of Avolio & Bass (2004). Sample's report (2007), for example, has the following profile of transformational leader: *creating greater alignment around strategic visions and missions, their behavioral factors are associated with increased sales, transformational leadership explains between 45% and 60% levels of organizational performance; create greater unit cohesion, commitment and lower turnover, predicted higher levels of innovation in teams of R & D products, transformational leaders create safer working environments* . Hence, is suggested to identify the level of transformation and transactional leadership qualities of the leaders of the organization using the tool known as the Multifactor Leadership Questionnaire (MLQ5x). This questionnaire has 4 variables that identify the type of leadership (Transformational/Transactional/Passive-Avoidant Behavior and Outcomes of Leadership style), 12 dimensions and 45 indicators.

**Value Creation.-** Bonel (et al.,2003); Gale & Chapman (1994) define it as the set of economic goods or any other type of utility (power or prestige) that pursuing the owners and managers of an organization as well as products, and services offered by the organization . The beneficiary has value not only to customers but also shareholders, the organization, the industry and society.It consists in 1 variable, 7 dimensions, 8 indicators.

**Innovation Generation**.-According to DRALE (2013) and Mejía (2011) and Mejía (2012a,2012b, 2013a) comes from the latin *innovatio,-ōnis* and means: 1. *f. Action and effect to innovate.* and 2. *f. Creating or modifying a product.* For the Oslo Manual (OECD, 2005, p.56) innovation is the introduction of a new or significantly improved product (good / service), process, a new marketing method, or a new organizational method in the internal business practices, the workplace organization or external relations, so it is not just limited to the field of technology, product or services. Also, OECD ( 2005, p.37) and Mejía (2013) recognize the process of creative destruction, enunciated by Schumpeter, which raises two types of innovations: the *radicals* that contribute to major changes in the world and, the *incrementals*, happening on an ongoing change process. The Rogers Innovation Bell (1962), divides the innovation market in : a.-*the innovators* (they are very careful to use the latest in technology, and very important to communicate and spread) ; b.-*early adopters* (people considered as *opinion leaders* and influence their environment but are very careful to suggest and / or use the latest innovations); c.-*early majority* (conservative people, but open to technological change with some level of careful to adopt it); d.-*late majority* (consumers particularly skeptical to the use of innovations until a large number of his acquaintances, has adopted it); 5.-*the laggards* (very traditional people maintaining the old forms; they hardly accept any changes and adapt to them until they become a habit even.). Afuah (1997), describes the importance to define the Lifecycle of Product (the start/end of the technologies).So, are involved 3 variables, 12 dimensions, 41 indicators.

**Measuring the Innovation Generation.-** In this context, it is recognized that it is a complex process and therefore its measurement (OECD, 2005, Shipp et al., 2008; Mejía 2013b). However, the propose is to identify the major elements of the innovation generation in: 1).- *Incoming items* divided in tangibles-intangibles, (since equipment until intellectual capital (Lev, 2001)); 2).-*The process innovation* based on close or open innovation concepts (Chesbrough, 2006);3).- *The outcoming items* characterized by concepts suggested by OCDE (2005) and the McKinsey Report (2008) aimed to measure the new products or services characteristics designed by innovation;3).- *The feedback* line to the leadership, that is described for 1 variables, 5 dimensions, 9 indicators . As a result of the documental analysis, we obtained the **Scheme 1.**

**Scheme 1.-**General Conceptual Model that complements the MLQ5x for VC and IG in a firm.




Source: Own by Authors adaptation

## METHODOLOGY

This is a descriptive and transversal study; it is based on MLQ5x model and documental research, to design a complementary questionnaire to obtain the other variables, dimensions and indicators for value creation and innovation generation. The subject of the study were the 200 firms managers from the SDS placed in GCM. The results were analyzed through statistical inference tools, contained in the SPSS program.

## ANALYSIS OF RESULTS

**Table 1**, shows a table that involve: variables, dimensions and indicators which describes the detailed conceptual model taking as foregoing, the **Scheme 1** with 9 variables, 36 dimensions and 103 indicators.

| VARIABLE | DIMENSION | INDICATOR | ITEM | AUTHOR |
|---|---|---|---|---|
| LTRF STYLE | Idealized Influence-Idealized Attributes (IA) | Instills pride in me for being associated with him/her. | 1 | Avolio & Bass, (2004); Sample, (2007) |
| | | Goes beyond self-interest for the good of the group. | 2 | |
| | | Acts in ways that builds my respect. | 3 | |
| | | Displays a sense of power and confidence. | 4 | |
| | Idealized Influence-Idealized Behaviors (IB) | Talks about their most important values and beliefs regarding education. | 5 | |
| | | Specifies the importance of having a strong sense of purpose. | 6 | |
| | | Considers the moral and ethical consequences of decisions. | 7 | |
| | | Emphasises the importance of having a collective sense of mission. | 8 | |
| | Inspirational Motivation (IM) | Talks optimistically about the future. | 9 | |
| | | Expresses confidence that goals will be achieved. | 10 | |
| | | Talks enthusiastically about what needs to be accomplished. | 11 | |
| | | Articulates a compelling vision for the future. | 12 | |
| | Intellectual Stimulation (IS) | Re-examines critical assumptions to question whether they are appropriate. | 13 | |
| | | Seeks differing perspectives when solving problems. | 14 | |
| | | Suggests new ways of looking at how to complete assigned tasks. | 15 | |
| | | Gets me to look at problems from many different angles | 16 | |
| | Individual Consideration (IC) | Treats me as an individual rather than just a member of the group. | 17 | |
| | | Helps me to develop my strengths | 18 | |
| | | Spends time teaching and coaching. | 19 | |
| | | Considers me as having different needs, abilities and aspirations from others. | 20 | |
| LTRS STYLE | Contingent Reward (CR) | Makes clear what one can expect to receive when performance goals are achieved. | 21 | |
| | | Provides me with assistance in exchange for my efforts. | 22 | |
| | | Discusses in specific terms who is responsible for achieving performance | 23 | |

| | | | | |
|---|---|---|---|---|
| | | targets. | | |
| | | Expresses satisfaction when I meet expectations. | 24 | |
| | Management by Exception: Active (Mbe-A) | Focuses attention on irregularities, mistakes, exceptions, and deviations from standards. | 25 | |
| | | Concentrates his/her full attention on dealing with mistakes, complaints and failures. | 26 | |
| | | Keeps track of all mistakes. | 27 | |
| | | Directs my attention toward failures to meet standards. | 28 | |
| LPAV STYLE | Management by Exception: Passive (MBE-P) | Fails to interfere until problems become serious. | 29 | |
| | | Waits for things to go wrong before taking action. | 30 | |
| | | Demonstrates his firm belief that "what is not broke do not fix". | 31 | |
| | | Demonstrates that problems must become chronic before taking action. | 32 | |
| | Laissez-Faire (LF) | Avoids getting involved when important issues arise. | 33 | |
| | | Is absent when needed. | 34 | |
| | | Avoids making decisions. | 35 | |
| | | Delays responding to urgent questions. | 36 | |
| OUTCOMES OF LEADERSHIP STYLE | Extra Effort (EE) | Get others to do more than they expected to do | 37 | |
| | | Heighten others' desire to succeed | 38 | |
| | | Increase others' willingness to try harder | 39 | |
| | Effectiveness (EFF) | Are effective in meeting others' job-related needs? | 40 | |
| | | Are effective in representing others to higher authority? | 41 | |
| | | Are effective in meeting organizational requirements? | 42 | |
| | | Leads a group that is effective | 43 | |
| | Satisfaction (SAT) | Uses methods of leadership that are satisfying | 44 | |
| | | Work with others in a satisfactory way | 45 | |
| VC | Emotions & Desires of the Customer | The innovation actions are aimed to increase the Emotions & Desire of the Customer | 46 | Bonel (et al.,2003); Gale, B.T.; Chapman W.R. (1994) |
| | Cost & Risk | The Cost is the main constraint to implement actions to increase the value | 47 | |
| | | The Risk is the main constraint to implement actions to increase the value | 48 | |
| | Customer | The innovation actions are aimed to increase the Customer value. | 49 | |
| | Shareholder | The Innovation actions are aimed to increase the Shareholder value | 50 | |
| | Firm | The innovation actions are aimed to increase the value of the Firm | 51 | |
| | Sector | The innovation actions are aimed to increase the value of the Sector | 52 | |
| | Society | The innovation actions are aimed to increase the value to the Society | 53 | |
| INCOMING ITEMS | Tangibles | Provides the most sophisticated equipment to support innovation time creating value | 54 | Shipp (et al. 2008); McKinsey (2008) |
| | | Invests in Research, Development and Innovation creating value | 55 | |
| | | Assigns staff to Research & Development and Innovation creating value | 56 | |
| | Intangibles | Makes efforts to use and / or generate Patents creating value | 57 | |
| | | Makes efforts to create and / or improve Databases creating value | 58 | |
| | | Makes efforts to create and / or improve organizational processes, creating value | 59 | |
| | | Makes efforts to use the most of the knowledge and skills of staff, creating value | 60 | |
| | | Makes planned decisions to increase its availability to the risk, creating value | 61 | |
| INNOVATION PROCESS | Research & Development + Innovation | Makes actions to improve existing processes of Research & Development + Innovation, creating value | 62 | Shipp (et al.,2008); Chesbrough (2006); McKinsey (2008); OCDE (2005); Rogers (1962) |
| | Design | Makes actions to improve the existing design | 63 | |
| | Prototypes | Makes actions to develop prototypes for improvement, creating value | 64 | |
| | Pre-Production | Makes improvement actions to pre-production, creating value | 65 | |
| | Market Research | Makes to investigate market needs of obsolete products, creating value | 66 | |
| | | Makes to investigate the needs actions and / or market changes for innovators, creating value | 67 | Rogers (1962) |
| | | Makes to investigate needs and / or market changes for early adopters, creating value | 68 | |

| | | | | |
|---|---|---|---|---|
| | | Makes to investigate needs and / or market changes for early majority, creating value | 69 | |
| | | Makes to investigate needs and / or market changes for late majority, creating value | 70 | |
| | | Makes to investigate needs and / or market changes for laggards, creating value | 71 | |
| | | Makes to investigate the onset of a new technology, creating value | 72 | Afuah (1997) |
| | | Makes to investigate the term of a technology, creating value | 73 | |
| | Knowledge Management | Documents market knowledge, creating value | 74 | OCDE (2005) |
| | | Documents the knowledge of their employees to apply in their processes, creating value | 75 | |
| | | Encourages the exchange of information within your company, creating value | 76- | |
| | Marketing | Decides actions to improve or introduce new forms of marketing, creating value | 77 | Lev (2001) |
| | | Seeks to be new or improved in the World (Radical Innovation), creating value | 78 | OCDE (2005) |
| | | Seeks to be new or improved to the Firm (Incremental Innovation), creating value | 79 | |
| | | Seeks to be new or improved in the region (Incremental Innovation), creating value | 80 | |
| | | Seeks to be new or improved in the industry (Incremental Innovation), creating value | 81 | |
| | Training | Makes actions to train the staff continuously (Incremental Innovation), creating value | 82 | |
| | Type of Innovation | Makes actions to innovate in technology | 83 | |
| | | Makes actions for innovation in production processes, creating value | 84 | |
| | | Makes actions to improve or introduce new products forms, creating value | 85 | |
| | | Makes actions to improve or introduce new forms of service, creating value | 86 | |
| | | Makes actions to improve or introduce new organizational structures and functions, creating value | 87 | |
| | | Innovation activities tend to be rather radical, creating value | 88 | |
| | | Innovation activities tend to be incremental, creating value | 89 | |
| OUTCOMING ITEMS | New products/ and/or services | Detects the projected level of revenues generated by innovation, creating value | 90 | Shipp (et al. 2008); Reporte McKinsey (2008);Lev (2001) |
| | | Detects the projected customer satisfaction level generated by innovation, creating value | 91 | |
| | | Detects the projected sales percentages levels generated by innovation, creating value | 92 | |
| | | Detects the level of the number of launches of new products/services in a period ended generated innovation, creating value | 93 | |
| | | Detects the net present value of its portfolio of products / services in the market generated by the innovation, creating value | 94 | |
| FEEDBACK ITEMS | Capital | Based on the results identifies intellectual capital dedicated to innovation for its improvement, creating value | 95 | Lev(2001) ; Shipp (et al. 2008); OCDE (2005); Bonel (et al.,2003), Mejía (2012a, 2012b) |
| | Product & Process | Based on the results identifies the stages of new or improved process for upgrading, creating value | 96 | |
| | | Based on the results identifies attributes of new or improved product / service for its improvement, creating value | 97 | |
| | Innovation | Based on the results identifies the stages of new or improved form of marketing for improvement, creating value | 98 | |
| | | Based on the results identifies the stages of new or improved technology for improvement, creating value | 99 | |
| | | Based on the results identifies the stages of the new or improved structure and functions of the organization to its improvement, creating value | 100 | |
| | | Based on the results identifies the type of innovation (radical or incremental) that has given best results, creating value | 101 | |
| | Value | Based on the results identifies the new or improved value proposition (benefits / costs) for its completion, creating value | 102 | |
| | Leadership | Based on the results identifies the leadership style practiced by their commanders for their improvement, creating value | 103 | |

Source: Authors by own adaptation

About the statistical inference tools from, SPSS program, were obtained: Alpha Cronbach's test around 0.664 and 0.73 if LPAV is excluded; Kolmogorov-Smirnov as a distribution normality test with more than p>005: LTRF (0.318), LTRS (0.223); LPAV (0.242); VC (0.106); IG(0.076). Pearson Correlation is presented in **Table 2;** MLR Summary is presented in **Table: 3**; MLR ANOVA in **Table 4** and finally, MLR Coefficients is shown in **Table 5.**

**Table 2.-**Pearsons Correlation

| | | IG | LTRF | LTRS | LPAV | RLDS | VC |
|---|---|---|---|---|---|---|---|
| Pearson Correlation Coefficient | IG | 1.000 | 0.760 | 0.628 | **-0.021** | 0.189 | 0.175 |
| | LTRF | 0.760 | 1.000 | 0.709 | **-0.005** | 0.286 | 0.098 |
| | LTRS | 0.628 | 0.709 | 1.000 | **-0.014** | 0.156 | 0.143 |
| | LPAV | **-0.021** | **-0.005** | **-0.014** | 1.000 | **-0.034** | **-0.112** |
| | RLDS | 0.189 | 0.286 | 0.156 | **-0.034** | 1.000 | 0.121 |
| | VC | 0.175 | 0.098 | 0.143 | **-0.112** | 0.121 | 1.000 |

Source: Results in SPSS program

**Table 3.-**MLR Model Summary (b)

| Model | R | R Square | Adjusted R Square | Std. Error for estimate | Durbin-Watson |
|---|---|---|---|---|---|
| 1 | .776 (a) | .602 | .592 | .44927 | 2.048 |

(a) Predictors: (Constants), VC, LTRF, LPAV, RLDS, LTRS; (b) Dependent Variable: IG
Source: Results in SPSS program

**Table 4.-**MLR ANOVA (a)

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 59.320 | 5 | 11.864 | 58.777 | 0.001(b) |
| | Residual | 39.158 | 194 | 0.202 | | |
| | Total | 98.478 | 199 | | | |

(a) Dependent Variable: IG ; (b) Predictors: (Constants), VC, LTRF, LPAV, RLDS, LTRS;
Source: Results in SPSS program

**Table 5.-** MLR Coefficients by Enter Method (a)

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t. | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | Constant | -0.647 | 0.432 | | -1.499 | 0.135 |
| | LTRF | 0.813 | 0.084 | 0.645 | 9.713 | 0.001 |
| | LTRS | 0.190 | 0.076 | 0.162 | 2.502 | 0.013 |
| | LPAV | -0.010 | 0.081 | -0.006 | -0.129 | 0.898 |
| | RLDS | -0.041 | 0.062 | -0.032 | -0.670 | 0.503 |
| | VC | 0.154 | 0.077 | 0.092 | 1.992 | 0.048 |

(a) Dependent Variable: IG; Source: Results in SPSS program

## CONCLUSIONS

The **GQ**, involving the relationship about MLQ5x with VC and IG for the SDS in GCM is reached at 100% when is responded, the **SQ1**: obtaining the **Scheme1** with 9 variables, 36 dimensions and 103 indicators; **SQ2**: with the description of variables in **Table 1**; **SQ3:** from **Table 2,** LPAV has negative correlation among the rest of variables and it affects around de 11% , negatively in the VC for the SDS in GCM; **GH:** from values of **Table 2**, the leadership style predominant in the SDS is LTRF (IG-LTRF=0.760). The R square value in **Table 3** shows the amount of variance in the dependent variable that can be explained by the independent variables, in this case: 0.602; The R value (0.776) indicates the multiple correlation coefficient between all the entered independent variables and the dependent variable.

The Adjusted R Square adjusts for a bias in R2 as the number of variables increases. With only a few predictor variables, the adjusted R2 should be similar to the R2 value. It is recommended to take the adjusted R2 value when we have a lot of variables. The Std. Error of the Estimate is a measure of the variability of the multiple correlation. **Table 4**, The regression line predicted by the independent variables, explains a significant amount of the variance in the dependent variable. It would normally be reported in a similar fashion to other ANOVAs: $F(5,194)=58.777$; $p<0.05$. Dividing the Sum of squares by the degrees of freedom (df) gives us the Mean Square or variance. We can see that the Regression explains significantly more variance than the error or Residual. We calculate R2 by dividing the Regression Sum of Squares by the Total Sum of Squares (59.320/98.478=0.602). **Table 5**, explains from Unstandardized Coefficients the equation: IG= -0.647+0.813LTRF+0.190LTRS-0.01LPAV-0.041RLDS+0.154VC. The Standardized Beta Coefficient column shows the contribution that an individual variable makes to the model. The beta column is the average amount the dependent variable increases when the independent variable increases by one standard deviation (all other independent variables are held constant). As these are standardized we can compare them. Note the largest influence on

the IG is from LTRF (0.645). t tests are performed to test the two-tailed hypothesis that the beta value is significantly higher or lower than zero. This also enables us to see which predictors are significant. We can see that LTRF score is the most significant predictor ($p < 0.05$). The next largest t value is for LTRS with sig. 0.013 ($p > 0.05$.).

Given the results, it is recommend checking out others types of leadership not included in MLQ5x model, and updating it, because the need to provide additional features like creating playful environments or different levels of empowerment and commitment to workers, well known in sectors just like SDS in USA for the VC and IG.

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