# Managing the “Intangibles”: Business and Entrepreneurship Perspectives in a Global Context

***Coordinators***

By

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# Customer Knowledge to improve the Innovation: The Relationship in México

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## Abstract

**The Knowledge Management (KM) improves the innovation in the firms based on information (OECD, 2003). Gebert, Geib, Kolbe, & Riempp, (2013) showed the sense of information: for, from and about the customers, that increase the market opportunities; this is called Customer Knowledge Management (CKM). The different Innovation Stages (INNOVS) increase the competitive advantage (OECD, 2005). Hence: ¿Which is the conceptual model that relates the variables, dimensions and indicators from CKM with INNOVS? A questionnaire was designed using Likert scale and the Cronbach's alpha for confidence measurement, Pearson's Correlation and Multiple Regression Analysis (MRA) with stepwise method, was applied in 200 SME´s belonging to the software developer sector located in Guadalajara City (SDSGC), México. Independent variables are based on CKM to explain the dependent variable INNOVS. CKM as a Driver Innovation (CKMADI) and CKM other sources of Knowledge (CKMOSK) on INNOVS showed correlation.**



***Keywords:*** *Customer Knowledge Management, Innovation Stages, Competitive Advantage*


## Introduction

Today, are considered amongst others important key factor to develop competitiveness: the CKM (Garcia-Murillo & Annabi, 2002) and the INNOVS (Chesbrough, 2006). Therefore, this study is aimed to identify the CKM variables, dimensions and indicators that are predominant on the INNOVS of the 200 SME´s belonging to the SDSGC; they are considered as one of the most successful industrial sectors in the creation of innovation. This work is divided into the explanation of: 1) contextual reference, problem, research questions, hypotheses and rationale for the study; 2) the theoretical framework, which is a collection of concepts about CKM and INNOVS, closing with the design of the questionnaire; 3) methodology; 4) analysis of results; 5) Discussion and 6) Conclusions.

## Contextual Reference

One sector in México that is considered successful, fast-growing and highly dependent of CKM to drive the innovation in different stages is the SDS. According to INEGI (2014), into GC 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 early investment close to 1000 million USD looking for create 20,000 jobs in 10 years. Disney, Pixar Studios and Dreamworks 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 CKM to encourage the INNOVS in SDS.

The Global Innovation Index Report (INSEAD, 2012) places México on site 63/142 that is reflected in its level competitiveness level, which is located on site 53/144 according to The Global Competitiveness Report 2012-2013 (WEF, 2013). Hence, the rationale for the study is to know the principal indicators for, from, about the customer (CKM) as information aimed to increase evenly the competitiveness by means of the innovation stages (INNOVS) in the **SDSGC**.

## Problem, Research Questions, Rationale for the Study and Hypothesis

So, our problem is described in a general question as **GQ: ¿Which is the conceptual model that relates variables, dimensions and indicators from CKM with INNOVS?** By other hand, the specific questions (as **SQ**), are: **SQ1:** What is the scheme of the model?; **SQ2**: Which are the variables, dimensions and indicators?; **SQ3:** Which are variables and indicators more significant in the model?. The general hypothesis (**GH**) is: from the current knowledge

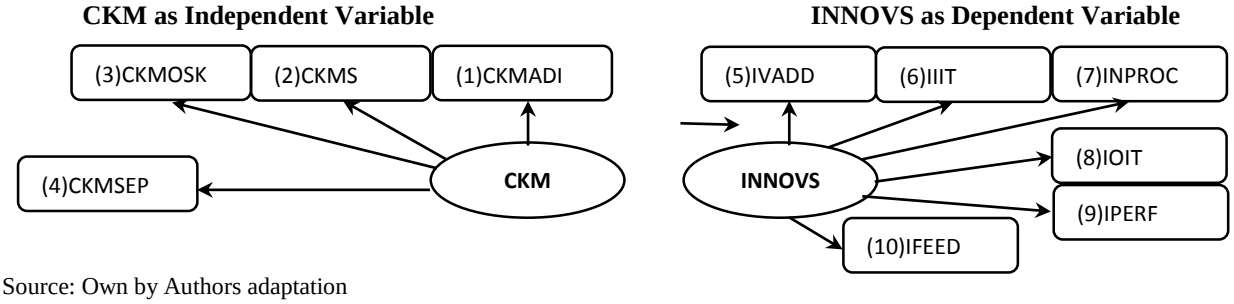
and importance given by SDSGC firms to the CKM, this is present in at least, on 20% of the variability in their innovation stages.

## Theoretical Framework

The competitiveness recognizes the potential of the CKM and INNOVS (Hill & Jones, 2011). Many authors have tried to identify different senses of CKM information like: for, from, about and to co-create (Nambisan, 2002; Desouza, Awazu, Jha, Dombrowski, Papagari, & Baloh, 2007; Nicolai; Keld & Pedersen, 2011). Even more, there are efforts to determine the Negative side effects of Customer Integration (Gassmanna, Kausch & Enkel,2012). The importance of how the knowledge can be supported by means of the human resources, the exchange amongst them, the rewards (Nicolai; Keld & Pedersen, 2011; OECD, 2003; Gebert, Geib, Kolbe, & Riempp, 2013; Gloet & Samson ,2013) and the influence of the Information and Communication Technologies (ICT) (Laudon & Laudon ,2012) is evident to boost the innovation stages. The firm must keep special care about the internal and external sources of information and how to extract them for CKM process (Baker & Hart, 2007; Garcia-Murillo & Annabi, 2002; Gebert, Geib, Kolbe, & Riempp, 2013). It´s important to remark the results around the terms of satisfaction, experience and performance as principal indicators of the CKM (Garcia-Murillo & Annabi, 2002).

By other hand, we have the INNOVS as a matter of study in several stages that we have proposed like a system, involving: value added to several agents apart the customer (Bonel, J. I., Bonel, F. J., & Fontaneda,; 2003) the relation value-price (Gale & Chapman, 1994), the customer emotions and desires to identify the attributes of products and services (Chaudhuri, 2006). The early phase of innovation that recognize the idea (Gassmanna, Kausch & Enkel,2012), the tangible (Shipp, 2008; McKinsey, 2008) and intangible resources (Afuah, 1997; Canibano, 1999; Shipp, 2008; Lev, 2000; Howells, 2000 Popadiuk & Wei-Choo, 2006) As part of the procces, is impotant to consider the concepts like Research, Deevelopment and Innovation (R&D+i) (Shipp, 2008, McKinsey, 2008; OECD, 2005 Chesbrough, 2006) and the lifecycle product (Gale & Chapman, 1994), the design, prototype and pre-production (Nicolai; Keld & Pedersen, 2011; Chesbrough, 2006; Shipp,2008; McKinsey, 2008). The cycle of customer since the early innovation until the obsolete state of a product, is described by Rogers Model (1983) and Mejía-Trejo & Sánchez-Gutierrez (2013a); the efforts of the technology (Dussauge & Ramantsoa, 1992). The novelty, training and type of innovation is considered as primary prerogatives (OECD, 2005; Afuah, 1997) to determine the attributes and characteristics in the new product and service development (Shipp, 2008; McKinsey, 2008; Lev, 2001; Dussauge & Ramantsoa, 1992). The results must be measured, by means of indicators (Bermúdez-García, 2010) aimed to reinforce the agreements amongst the government, the firm and the universities (Smith & Leydesdorff, 2010).

Finally, like an autocontrolled system there must be an information feedback of innovation, by means of capital investment (Lev, 2001;Shipp (2008); Nicolai; Keld & Pedersen, 2011), the improvement to the firm due the product, service, process, marketing, organizational, technology, infrastructure and other aspects of the innovation (Dussauge, & Ramantsoa , 1992; OECD, 2005; Chesbrough, 2006; White & Bruton, 2011), value added (Bonel, J. I., Bonel, F. J., & Fontaneda, 2003; Gale & Chapman (1994) and the kind of leadership that boost the innovation (Mejía-Trejo, Sánchez-Gutiérrez & Ortiz Barrera, 2013). As a result of the documentary analysis and making several groups of concepts answering **SQ1** we obtained the **Figure 1.**




Source: Own by Authors adaptation

FIG 1: GENERAL CONCEPTUAL MODEL

## Methodology

This is a descriptive and transversal study; it is based on documental research, to design a conceptual model and questionnaire to obtain several groups of variables, dimensions and indicators that are involves between CKM and INNOVS value creation and innovation generation. The subjects of the study were the managers from 200 SME´s SDSGC. The results were analyzed through statistical inference tools like: Cronbach's Alpha in pilot test, Pearson´s Correlation and MRA with stepwise method, contained in the SPSS program.

## Analysis of Results

To answer **SQ2** we present the **Table 1** with 10 variables, 45 dimensions and 110 indicators.

TABLE 1: FINAL QUESTIONNAIRE THAT RELATION CKM WITH INNOVS

| CUSTOMER KNOWLEDGE MANAGEMENT | | | | |
|---|---|---|---|---|
| **VARIABLE** | **DIMENSION** | **INDICATOR** | **Q** | **AUTHOR** |
| (1) CKM AS A DRIVER OF INNOVATION (**CKMADI**) | 1).-Information from Costumer (**IFMC**) | Customer is a Resource of NPD ideation; Customer Driven-Innovation (Innovation from Customers). Mutual Innovation. | 1 | [25]; [7]; [12]; [13] |
| | 2).-Information about the Customer (**IABC**) | Strategy of close collaboration with customers. Communities of creation. | 2 | [25]; [*13*]; |
| | 3).-Information for Customer (**IFRC**) | Customer as a User collaborates intensively in the product testing and support. Customer Focused Innovation (Innovation for Customers) | 3 | |
| | 4).-Information as a Customer Co-creator (with) (**IWIC**) | Customer as a Co-creator helps over NPD design and development; Customer Centered Innovation (Innovation with Customers); Prosumerism; Team-Based-CoLearning. Joint Intellectual Property | 4 | [26]; [7]; [*13*] |
| | 5).-Negative side effects of Customer Integration (**NSEC**) | The firm is warned about the dependence on customer´s personality (**NSEC1**) | 5 | [11] |
| | | The firm is warned about the dependence on customer´s experience (**NSEC2**) | 6 | |
| | | The firm is warned about the dependence on customer´s point of view (**NSEC3**) | 7 | |
| | | The firm is warned about to choose the wrong customer | 8 | |
| | | The firm is warned about the risk to integrate the customer to the company´s side (**NSEC4**) | 9 | |
| (2) CKM SUPPORT (**CKMS**) | 6).-Knowledge Incentives (**KI**) | Salary associated with the ability and willingness to share knowledge (**KI1**) | 10 | [26]; [27]; [12] |
| | | Salary determined by willingness to improve skills and upgrade knowledge (**KI2**) | 11 | |
| | | Tolerance of Failure (**KI3**) | 12 | [14] |
| | | Rewards and Recognition (**KI4**) | 13 | |
| | 7).-Knowledge Fluence (**KF**) | Exchange the knowledge between employees across departments (**KF1**) | 14 | [26]; [27] |
| | | Communication among employees and management (**KF2**) | 15 | |
| | 8).-Knowledge and ICT (**KICT**) | ICT to support and control the Customer Knowledge Management | 16 | [20] |
| (3) CKM OTHER SOURCES OF KNOWLEDGE (**CKMOSK**) | 9).-Internal Sources of Knowledge (**ISOK**) | Technical Services (**IOSK1**) | 17 | [2]; [10]; [12] |
| | | Engineering Department (**IOSK2**) | 18 | |
| | | Research and Design Development (**IOSK3**) | 19 | |
| | | Production (**IOSK4**) | 20 | |
| | | Marketing and Sales (**IOSK5**) | 21 | |
| | | Purchasing and Supply (**IOSK6**) | 22 | |
| | | Other Employees (**IOSK7**) | 23 | [10] |
| | 10).-External Sources of Knowledge (**ESOK**) | Supplier (**ESOK1**) | 24 | [2]; [10] |
| | | Scientist, Universities, Patents, Exhibitions Technological Consultant (**ESOK2**) | 25 | |
| | | Distributor Agents (**ESOK3**) | 26 | |
| | | Competitor (**ESOK4**) | 27 | |

| | | | | |
|---|---|---|---|---|
| (4) CKM, SATISFACTION, EXPERIENCE AND PERFORMANCE (**CKMSEP**) | 11).-Paradigm (**PAR**) | If Only We Know What We Knew (KM) as a Customer Retention (**PAR1**) | 28 | [10] |
| | | Retention is Cheaper than Acquisition (CRM) as a Customer Satisfaction (**PAR2**) | 29 | |
| | | If We Only Knew What Our Customer (CKM) Know as a Customer Experience and Creativity (**PAR3**) | 30 | |
| | 12).-Performance (**PER**) | Performance against budget; Customer retention rate.(KM) (**PER1**) | 31 | |
| | | Performance in terms of customer satisfaction and Loyalty (**PER2**) | 32 | |
| | | Performance against competitors in innovation and growth; Contribution to customer success. (CKM) (**PER3**) | 33 | |
| **INNOVATION STAGES** | | | | |
| (5) INNOVATION VALUE ADDED (**IVADD**) | 13).-Emotions & Desires of Customer (**VAEDC**) | The innovation actions are aimed to increase the Emotions & Desire of the Customer | 34 | [5] |
| | 14).-Cost & Risk (**VACR**) | The Cost is the main constraint to increase the value (**VACR1**) | 35 | [3] |
| | | The Risk is the main constraint to increase the value (**VACR2**) | 36 | |
| | 15).-Customer (**VACUS**) | The innovation actions are aimed to increase the Customer value | 37 | |
| | 16).-Shareholder (**VASHO**) | The Innovation actions are aimed to increase the Shareholder value | 38 | |
| | 17).-Firm (**VAFRM**) | The innovation actions are aimed to increase the value of the Firm | 39 | |
| | 18).-Sector (**VASEC**) | The innovation actions are aimed to increase the value of the Sector | 40 | |
| | 19).-Society (**VASOC**) | The innovation actions are aimed to increase the value to the Society | 41 | |
| | 20).-Price Value Relation (**VAPVR**) | The innovation is introduced to the market considering the relation price-value added | 42 | [9] |
| (6) INNOVATION INCOMING ITEMS (**IIIT**) | 21).-Early Innovation Phase (**EIPH**) | Opportunity Identification (**EIPH1**) | 43 | [11]; |
| | | Opportunity Analysis (**EIPH2**) | 44 | |
| | | Idea Generation (**EIPH3**) | 45 | |
| | | Idea Selection (**EIPH4**) | 46 | |
| | | Concept Definition (**EIPH5**) | 47 | |
| | 22).-Facilities for Innovation (Tangibles, **FFI**) | Provides the most sophisticated equipment to support innovation (**FFI1**) | 48 | [31]; [22] |
| | | Invests in R&D+I (**FFI2**) | 49 | |
| | | Assigns staff to R& D+I (**FFI3**) | 50 | |
| | 23).-Efforts for Innovation (Intangible assets, **EFFI**) | Makes efforts to use and / or generate Patents (**EFFI1**) | 51 | [1]; [4]; [31]; [21]; [17] |
| | | Makes efforts to create and / or improve Databases (**EFFI2**) | 52 | |
| | | Makes efforts to improve the organizational processes (**EFFI3**) | 53 | |
| | | Makes efforts to use the most of knowledge and skills of staff (**EFFI4**) | 54 | |
| | | Makes planned decisions to increase its availability to the risk (**EFFI5**) | 55 | |
| | | Makes efforts to discover New Market Knowledge (**EFFI6**) | 56 | [29] |
| | | Makes efforts to study the Existing Market Knowledge (**EFFI7**) | 57 | |
| (7) INNOVATION PROCESS (**INPROC**) | 24).-Research & Development + Innovation (**RDI**) | Makes actions to improve existing processes of Research & Development + Innovation (**RDI1**) | 58 | [31]; [22]; [28]; [6] |
| | | Makes studies about Product Lifecycle (**RDI2**) | 59 | [9] |
| | 25).- Design (**DSGN**) | Makes actions to improve the existing design (**DSGN1**) | 60 | [28] |
| | | Employees have influence on their job **(DSGN2)** | 61 | [26] |
| | | Employees engaged in teams with high degree of autonomy (**DSGN3**) | 62 | |
| | | The strategy is based on Open Innovation concepts **(DSGN4)** | 63 | [6] |
| | 26).-Prototypes (**IPPFI**) | Makes actions to develop prototypes for improvement | 64 | [31]; [22] |
| | 27).-Pre-Production (**IPPPIP**) | Makes improvement actions to pre-production | 65 | |
| | | Makes to investigate market needs of obsolete products (**MR1**) | 66 | [30] [23] |

| | | | | |
|---|---|---|---|---|
| | 28).-Market Research (**MR**) | Makes to investigate the needs actions and / or market changes for innovators (**MR2**) | 67 | |
| | | Makes to investigate needs and / or market changes for early adopters (**MR3**) | 68 | |
| | | Makes to investigate needs and / or market changes for early majority (**MR4**) | 69 | |
| | | Makes to investigate needs and / or market changes for late majority (**MR5**) | 70 | |
| | | Makes to investigate needs and / or market changes for laggards (**MR6**) | 71 | |
| | | Makes to investigate the onset of a new technology (**MR7**) | 72 | [8] |
| | | Makes to investigate the term of a technology (**MR8**) | 73 | |
| | 29).-Novelty (**NOVY**) | Decides actions to improve or introduce new forms of marketing (**NOVY1**) | 74 | [21] |
| | | Seeks to be new or improved in the World (Radical Innovation) (**NOVY2**) | 75 | [28]; [1] |
| | | Seeks to be new or improved to the Firm (Incremental Innovation) (**NOVY3**) | 76 | |
| | | Seeks to be new or improved in the region (Incremental Innovation) (**NOVY4**) | 77 | |
| | | Seeks to be new or improved in the industry (Incremental Innovation) (**NOVY5**) | 78 | |
| | 30).-Training (**TRAI**) | Makes actions to train the staff continuously (Incremental Innovation) | 79 | |
| | 31).-Type of Innovation (**TOINN**) | Makes actions to innovate in technology (**TOINN1**) | 80 | |
| | | Makes actions for innovation in production processes (**TOINN2**) | 81 | |
| | | Makes actions to improve or introduce new products forms (**TOINN3**) | 82 | |
| | | Makes actions to improve or introduce new forms of service (**TOINN4**) | 83 | |
| | | Makes actions to improve or introduce new organizational structures and functions (**TOINN5**) | 84 | |
| | | Innovation activities tend to be rather radical (**TOINN6**) | 85 | |
| | | Innovation activities tend to be incremental (**TOINN7**) | 86 | |
| (8) INNOVATION OUTCOMING ITEMS (**IOIT**) | 32).-New products/ and/or services (**NPSD**) | Detects the projected level of revenues generated by innovation (**NPSD1**) | 87 | [31]; |
| | | Detects the projected customer satisfaction level generated by innovation (**NPSD2**) | 88 | [22] |
| | | Detects the projected sales percentages levels generated by innovation (**NPSD3**) | 89 | [21] |
| | | Detects the level of the number of launches of new products/services in a period (**NPSD4**) | 90 | [8]; [22] |
| | | Detects the net present value of its portfolio of products / services in the market generated by the innovation (**NPSD5**) | 91 | |
| (9) INNOVATION PERFORMANCE (**IPERF**) | 33).-Cost-Benefit of Innovation (**PCBOI**) | Do you use an indicator like: Innovation income / (Investment in Innovation) ? | 92 | [2] |
| | 34).-Opportunities Index for Collaborative Innovation (**POIFCI**) | Do you use an indicator like: Innovation Identified Opportunities / (Total Contributors on the Process)? | 93 | |
| | 35).-Generation Ideas Rate (**PGIR**) | Do you use an indicator like: Generated Ideas / (Market Knowledge Opportunities x Total Contributors on Process)? | 94 | |
| | 36).-Effectiveness of Idea Generation (**PEOIG**) | Do you use an indicator like: Number of Approved Ideas / (Number of Generated Ideas)? | 95 | |
| | 37).-Implementing Effective Prototyping (**PIEP**) | Do you use an indicator like:Number of Correct and Timely Prototype Terminated / (Total Prototyping Approved)? | 96 | |
| | 38).-Innovation Generation Rate (**PIGR**) | Do you use an indicator like: Number of Generated Innovations / (Identified Innovation Opportunities)? | 97 | |
| | 39).-Index not Successful Innovations (**PINSI**) | Do you use an indicator like: Number of unsuccessful innovations implemented / (Total Innovation)? | 98 | |
| | 40).-Triple Helix Politics (**PTHP**) | Does exist any relationship among : university- government- industry, to develop the innovation? | 99 | [32] |

| | | | | |
|---|---|---|---|---|
| (10) INNOVATION FEEDBACK ITEMS (**IFEED**) | 41).-Capital (**IFCAP**) | Based on the results identifies intellectual capital dedicated to innovation for its improvement | 100 | [21]; [31]; [26]. |
| | 42).-Product & Process (**IFPP**) | Based on the results identifies the stages of new or improved process for upgrading (**IFPP1**) | 101 | [8]; [28]; [6]; [33]. |
| | | Based on the results identifies attributes of new or improved product / service for its improvement (**IFPP2**) | 102 | |
| | 43).-Innovation (**IFINN**) | Based on the results identifies the stages of new or improved form of marketing for improvement (**IFINN1**) | 103 | |
| | | Based on the results identifies the stages of new or improved technology for improvement (**IFINN2**) | 104 | |
| | | Identifies the stages of the new or improved structure and functions of the organization to its improvement (**IFINN3**) | 105 | |
| | | Identifies the type of innovation (radical or incremental) that has given best results (**IFINN4**) | 106 | |
| | 44).-Value Aded (**IFV)** | Based on the results identifies the new or improved value proposition (benefits / costs) for its completion; relation value-price | 107 | [3]; [9] |
| | 45).-Leadership and Innovation (**FLINNO**) | The type of leadership that drives innovation is Transactional (**FLINNO1**) | 108 | [24] |
| | | The type of leadership that drives innovation is Transformational (**FLINNO2**) | 109 | |
| | | The type of leadership that drives innovation is Passive (**FLINNO3**) | 110 | |

Source: Authors by own adaptation

About the statistical inference tools from SPSS program, were obtained: Cronbach's Alpha test =0.793; Table 2, shows the Pearson's Correlations.

TABLE 2: PEARSONS CORRELATION

| | | INNOVS | CKMADI | CKMS | CKMOSK | CKMSEP |
|---|---|---|---|---|---|---|
| | INNOVS | 1.000 | **.575**** | .563** | **.581**** | .108 |
| Pearson Correlation Coefficient | CKMADI | **.575**** | 1.000 | .679** | .628** | .073 |
| | CKMS | .563** | .679** | 1.000 | .718** | .091 |
| | CKMOSK | **.581**** | .628** | .718** | 1.000 | .194** |
| | CKMSEP | .108 | .073 | .091 | 0.194** | 1.000 |

**.Correlation is significant at the 0.01 level (2.talied)

Source: Results in SPSS program

**Table 3** shows the MRA Model Summary where we can see Model 1 the independent variable CKMOSK accounts for 33.7 % of the variance and Model 2 with the independent variable CKMADI accounts for 41 % of the variance in the scores of INNOVS dependent variable respectively.

TABLE 3: MRA MODEL SUMMARY (b)

| Model | R | R Square | Adjusted R Square | Std. Error for estimate |
|---|---|---|---|---|
| 1 | .581[a] | **.337** | .334 | .397 |
| 2 | .641b | **.410** | .404 | .376 |

(a) Predictors: (Constant),CKMOSK ; (b) Predictors: (Constant), CKMOSK, CKMADI

Source: Results in SPSS program

**Table 4** confirms Model 1: F (1,198)= 100.789; p<0.01 and Model 2: F (2,197)= 68.522; p<0.01

TABLE 4: ANOVA (a)

| Model | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| 1 Regression | 15.915 | 1 | 15.915 | 100.789 | .000(b) |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Residual | 31.265 | 198 | .158 | | |
| | Total | 47.180 | 199 | | | |
| 2 | Regression | 19.356 | 2 | 9.678 | 68.522 | .000(c) |
| | Residual | 27.824 | 197 | .141 | | |
| | Total | 47.180 | 199 | | | |

(a) Dependent Variable: INNOVS; (b) Predictors: (Constant),CKMOSK ; (c) Predictors: (Constant), CKMOSK, CKMADI

Source: Results in SPSS program

**Table 5** determines the regression equations about Model 1: INNOVS= 2.147 + .389 CKMOSK and Model 2: INNOVS= 1.854 + .243 CKMOSK + .216 CKMADI.

TABLE 5: MRA COEFFICIENTS BY STEPWISE METHOD (a)

| | Unstandardized Coefficients | | Standardized Coefficients | t. | Sig. | Collinearity Statistics |
|---|---|---|---|---|---|---|
| Model | B | Std. Error | Beta | | | Tolerance |
| 1 (Constant) | 2.147 | .158 | | 13.564 | .000 | |
| CKMOSK | .389 | .039 | .581 | 10.039 | .000 | 1.000 |
| 2 (Constant) | 1.854 | .161 | | 11.520 | .000 | |
| CKMOSK | .243 | .047 | .363 | 5.165 | .000 | 0.606 |
| CKMADI | .216 | .044 | .347 | 4.936 | .000 | 0.606 |

(a) Dependent Variable: INNOVS; Note: values check for any collinearity in our data. As a general rule, a tolerance value below 0.1 indicates a serious problem (Hinton *et al.*, 2004)

Source: Results in SPSS program.

So, we answered **SQ3** since Table 3 that shows the most significant variables were CKMOSK and CKMADI. Since same Table 3, **GH** is explained because of 33.7% of our model produces the variability on the dependent variable INNOVS**.** Doing the same MRA for the CKMOSK Indicators: ISOK1 until ISOK7 and ESOK1 until ESOK4 and CKMADI Indicators: IFMC, IABC and IFRC we found like the most significant indicators were: NSEC4, ISOK6, ISOK4, ISOK7, NSEC3, as see in Table 6.

TABLE 6: MRA MODEL SUMMARY (a)

| Model | R | R Square | Adjusted R Square | Std. Error for estimate |
|---|---|---|---|---|
| 1 | .529b | .279 | .276 | .414 |
| 2 | .632c | .399 | .393 | .379 |
| 3 | .665d | .442 | .433 | .367 |
| 4 | .681e | .463 | .452 | .360 |
| 5 | .693f | .480 | .467 | .356 |
| 6 | .704g | .495 | .480 | .351 |
| 7 | .699h | .489 | .476 | .353 |

(a) Dependent Variable: INNOVS. (b) Predictors: (Constant), NSEC4; (c) Predictors: (Constant), NSEC4, IOSK2; (d) Predictors: (Constant), NSEC4, IOSK2, IOSK6; (e) Predictors: (Constant), NSEC4, IOSK2, IOSK6, IOSK4; (f)Predictors: (Constant), NSEC4, IOSK2, IOSK6, IOSK4, IOSK7; (g) Predictors: (Constant), NSEC4, IOSK2, IOSK6, IOSK4, IOSK7, NSEC3; (h) Predictors: (Constant), NSEC4, IOSK6, IOSK4, IOSK7, NSEC3

Source: Results in SPSS program

## Discussion

There are great opportunities to develop CKM concepts and their applications in SDS/GC, México because the model discovers only 5 of 33 indicators with 41% of the variability on INNOVS. The Descriptive Statistics results, show in average, there are around a 20% of the indicators that are considered in 3 or less than, situation that does not encourage the development for more innovation, specially on some indicators or variables like: CKMSEP, IVADD, IIIT and IFEED. Future studies are suggested around this issues and how affects the different innovation stages.

## Conclusions

We discover 4 variables (CKMADI, CKMS, CKMOSK, CKMSEP) with 12 dimensions and 33 indicators that are trying to explain CKM; at the same time too, INNOVS is described with 6 variables (IVAAD, IIIT,INPROC,IOIT,IPERF, IFEED) with 33 dimensions and 77 indicators. The **GQ** is solved involving the relationship between CKM with INNOVS for 200 SMEs SDCGC when is answered the **SQ1**: obtaining the **Figure 1** with 10 variables; **SQ2** is answered by mean the description of variables in the theoretical framework and the questionnaire design showed in **Table 1** with 45 dimensions and 110 indicators associated to the variables; **SQ3** is answered by means the variable correlations (**Table 2**) and **Table 3,** showing as the most significant variables with CKMOSK and CKMADI; in fact, **GH** is answered in a positive way because at least 33.7% (more than 20% proposed) of our model produces the variability on the dependent variable INNOVS by CKMOSK (Model 1) and CKMADI (Model 2) action. **Table 4** confirms the Model 1 and Model 2 and **Table 5** the regression equations of each Models. **Table 6** shows: NSEC4, ISOK6, ISOK4, ISOK7, NSEC3 as the most significant indicators of the model.

## References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