American Society for Competitiveness (ASC)
25th Annual Conference—Silver Jubilee Year
October 16- 18, 2014
Washington D.C. Area, USA

How the Innovation Improves the Customer Knowledge Management, in México

Juan Mejía-Trejo, Universidad de Guadalajara
José Sánchez-Gutiérrez, Universidad de Guadalajara
Guillermo Vázquez-Ávila, Universidad de Guadalajara

EXECUTIVE SUMMARY

Innovation can be broken down in stages (INNOVS) to increase the competitive advantage. When the Innovation improves the Knowledge Management in the firms based on the sense of information: for, from and about the customers, is called: Customer Knowledge Management (CKM). The aim of this study is to solve: ¿Which is the conceptual model that relates the variables, dimensions and indicators from INNOVS with CKM? A questionnaire was applied on 200 SME´s from the software developer sector in Guadalajara (SDSG), México involving Multiple Regression Analysis by Stepwise method. The results pointed out in three remarkable variables from INNOVS-CKM model proposal.

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

INTRODUCTION

In nowadays, are considered amongst others important key factor to develop competitiveness: INNOVS (Chesbrough et al. 2006) and the CKM (Garcia-Murillo & Annabi, 2002). Therefore, this study is aimed to identify the INNOVS variables, dimensions and indicators that are predominant on the CKM of the 200 SME´s belonging to the SDSG; 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 INNOVS and CKM, closing with the design of the questionnaire; 3) methodology; 4) analysis of results; 5) Discussion and 6) Conclusions.

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 Guadalajara City (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 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.

The Global Innovation Index Report (INSEAD, 2013) places México on site 63/142 that is reflected in its level competitiveness level, which is located on site 55/144 according to The Global Competitiveness Report 2013-2014 (WEF,

2014). Hence the importance of identifying and promoting in a systematic way, the major factors such as the relation between INNOVS and CKM to get more and new competitive advantages.

PROBLEM, HYPOTHESES AND RATIONALE OF THE STUDY

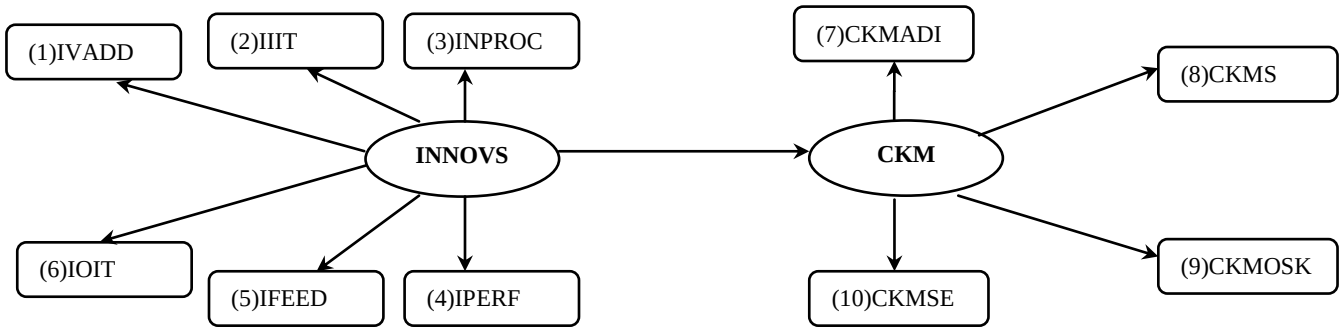
So, our problem is described in a general question as **GQ**: ¿Which is the conceptual model that relates variables, dimensions and indicators from INNOVS to improve CKM? By other hand, the specific questions (as SQ), are **SQ1**: What is the scheme of the model?; **SQ2**: Which are the variables, dimensions and indicators?; **SQ3**: Which are variables and indicators more significant in the model?. The general hypothesis (**GH)** is: from the current knowledge and practice about INNOVS concepts and the importance given by SDSG firms to the CKM, different INNOVS components are present in at least, on 50% of the variability of CKM.

LITERATURE REVIEW

The competitiveness recognizes the potential of the CKM and INNOVS (Hill & Jones, 2011, Loudon & Loudon, 2012). 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 the principal indicators of the CKM (Garcia-Murillo & Annabi, 2002).

By other side, 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, et al. 2006) and the lifecycle product (Gale & Chapman, 1994), the design, prototype and pre-production (Nicolai; Keld & Pedersen, 2011; Chesbrough, et al., 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). 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 et al., 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.**

FIGURE 1
GENERAL CONCEPTUAL MODEL



Source: Own by Authors adaptation

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 involves a relationship between INNOVS and CKM. The subjects of the study were the managers from 200 SME´s SDSG. The results were analyzed through statistical inference tools like: Cronbach's Alpha in pilot test and Multiple Regression Analysis (MRA) with Stepwise method, contained in the SPSS 20 program.

ANALYSIS OF RESULTS

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

SCHEME 1
Final Questionnaire showing INNOVS and CKM

INNOVATION STAGES (INNOVS)				
V	**DIMENSION**	**INDICATOR**	**Q**	**AUTHOR**
(A)	1).-Emotions & Desires of Customer (**VAEDC**)	The innovation actions are aimed to increase the Emotions & Desire of the Customer	1	Chaudhuri (2006)
	2).-Cost & Risk (**VACR**)	The Cost is the main constraint to increase the value (**VACR1**)	2	Bonel (et al.,2003)
		The Risk is the main constraint to increase the value (**VACR2**)	3	
	3).-Customer (**VACUS**)	The innovation actions are aimed to increase the Customer value	4	
	4).-Shareholder (**VASHO**)	The Innovation actions are aimed to increase the Shareholder value	5	
	5).-Firm (**VAFRM**)	The innovation actions are aimed to increase the value of the Firm	6	
	6).-Sector (**VASEC**)	The innovation actions are aimed to increase the value of the Sector	7	
	7).-Society (**VASOC**)	The innovation actions are aimed to increase the value to the Society	8	
	8).-Price Value Relation (**VAPVR**)	The innovation is introduced to the market considering the relation price-value added	9	Gale & Chapman (1994)
(B)	9).-Early Innovation Phase (**EIPH**)	Opportunity Identification (**EIPH1**)	10	Kausch (et al. 2014)
		Opportunity Analysis (**EIPH2**)	11	
		Idea Generation (**EIPH3**)	12	
		Idea Selection (**EIPH4**)	13	
		Concept Definition (**EIPH5**)	14	
	10).-Facilities for Innovation (Tangibles, **FFI**)	Provides the most sophisticated equipment to support innovation (**FFI1**)	15	Shipp (et al. 2008); McKinsey (2008)

		Invests in R&D+I (**FFI2**)	16	
		Assigns staff to R& D+I (**FFI3**)	17	
	11).-Efforts for Innovation (Intangible assets, **EFFI**)	Makes efforts to use and / or generate Patents (**EFFI1**)	18	Canibano (1999); Shipp (et al. 2008); Lev (2001); Howells (2000)
		Makes efforts to create and / or improve Databases (**EFFI2**)	19	
		Makes efforts to improve the organizational processes (**EFFI3**)	20	
		Makes efforts to use the most of knowledge and skills of staff (**EFFI4**)	21	
		Makes planned decisions to increase its availability to the risk (**EFFI5**)	22	
		Makes efforts to discover New Market Knowledge (**EFFI6**)	23	Popadiuk & Wei-Choo (2006)
		Makes efforts to study the Existing Market Knowledge (**EFFI7**)	24	
(C)	12).-Research & Development + Innovation (**RDI**)	Makes actions to improve existing processes of Research & Development + Innovation (**RDI1**)	25	Shipp (et al.,2008); McKinsey (2008); OECD (2005)
		Makes studies about Product Lifecycle (**RDI2**)	26	Gale & Chapman (1994)
	13).- Design (**DSGN**)	Makes actions to improve the existing design (**DSGN1**)	27	OECD (2005)
		Employees have influence on their job **(DSGN2)**	28	Nicolai (et al., 2011)
		Employees engaged in teams with high degree of autonomy (**DSGN3**)	29	
		The strategy is based on Open Innovation concepts **(DSGN4)**	30	Chesbrough (et. al 2006)
	14).-Prototypes (**IPPFI**)	Makes actions to develop prototypes for improvement	31	Chesbrough (2006); McKinsey (2008)
	15).-Pre-Production (**IPPPIP**)	Makes improvement actions to pre-production	32	
	16).-Market Research (**MR**)	Makes to investigate market needs of obsolete products (**MR1**)	33	Chesbrough (et. al. 2006);Rogers (1984)
		Makes to investigate the needs actions and / or market changes for innovators (**MR2**)	34	
		Makes to investigate needs and / or market changes for early adopters (**MR3**)	35	
		Makes to investigate needs and / or market changes for early majority (**MR4**)	36	
		Makes to investigate needs and / or market changes for late majority (**MR5**)	37	
		Makes to investigate needs and / or market changes for laggards (**MR6**)	38	
		Makes to investigate the onset of a new technology (**MR7**)	39	Afuah (1997)
		Makes to investigate the term of a technology (**MR8**)	40	
	17).-Novelty (**NOVY**)	Decides actions to improve or introduce new forms of marketing (**NOVY1**)	41	Lev (2001)
		Seeks to be new or improved in the World (Radical Innovation) (**NOVY2**)	42	OECD (2005); Afuah (1997)
		Seeks to be new or improved to the Firm (Incremental Innovation) (**NOVY3**)	43	
		Seeks to be new or improved in the region (Incremental Innovation) (**NOVY4**)	44	
		Seeks to be new or improved in the industry (Incremental Innovation) (**NOVY5**)	45	
	18).-Training (**TRAI**)	Makes actions to train the staff continuously (Incremental Innovation)	46	
	19).-Type of Innovation (**TOINN**)	Makes actions to innovate in technology (**TOINN1**)	47	
		Makes actions for innovation in production processes (**TOINN2**)	48	
		Makes actions to improve or introduce new products forms (**TOINN3**)	49	
		Makes actions to improve or introduce new forms of service (**TOINN4**)	50	
		Makes actions to improve or introduce new organizational structures and functions (**TOINN5**)	51	
		Innovation activities tend to be rather radical (**TOINN6**)	52	
		Innovation activities tend to be incremental (**TOINN7**)	53	
(D)	20).-New products/ and/or services (**NPSD**)	Detects the projected level of revenues generated by innovation (**NPSD1**)	54	Shipp (et al. 2008);
		Detects the projected customer satisfaction level generated by innovation (**NPSD2**)	55	McKinsey (2008)
		Detects the projected sales percentages levels generated by innovation (**NPSD3**)	56	Lev (2001)
		Detects the level of the number of launches of new products/services in a period (**NPSD4**)	57	McKinsey (2008)
		Detects the net present value of its portfolio of products / services in the market generated by the innovation (**NPSD5**)	58	
(E)	21).-Cost-Benefit of Innovation (**PCBOI**)	Do you use an indicator like: Innovation income / (Investment in Innovation) ?	59	Bermúdez-García (2010)
	22).-Opportunities Index for Collaborative Innovation (**POIFCI**)	Do you use an indicator like: Innovation Identified Opportunities / (Total Contributors on the Process)?	60	
	23).-Generation Ideas Rate (**PGIR**)	Do you use an indicator like: Generated Ideas / (Market Knowledge Opportunities x Total Contributors on Process)?	61	
	24).-Effectiveness of Idea Generation (**PEOIG**)	Do you use an indicator like: Number of Approved Ideas / (Number of Generated Ideas)?	62	
	25).-Implementing Effective Prototyping (**PIEP**)	Do you use an indicator like:Number of Correct and Timely Prototype Terminated / (Total Prototyping Approved)?	63	
	26).-Innovation Generation Rate (**PIGR**)	Do you use an indicator like: Number of Generated Innovations / (Identified Innovation Opportunities)?	64	
	27).-Index not Successful Innovations (**PINSI**)	Do you use an indicator like: Number of unsuccessful innovations implemented / (Total Innovation)?	65	

	28).-Triple Helix Politics (**PTHP**)	Does exist any relationship among : university- government- industry, to develop the innovation?	66	Smith & Leydesdorff, (2010)
(F)	29).-Capital (**IFCAP**)	Based on the results identifies intellectual capital dedicated to innovation for its improvement	67	Lev(2001);Shipp (et al. 2008); Nicolai (et al., 2011)
	30).-Product & Process (**IFPP**)	Based on the results identifies the stages of new or improved process for upgrading (**IFPP1**)	68	OECD (2005); Chesbrough (2006)
		Based on the results identifies attributes of new or improved product / service for its improvement (**IFPP2**)	69	
	31).-Innovation (**IFINN**)	Based on the results identifies the stages of new or improved form of marketing for improvement (**IFINN1**)	70	
		Based on the results identifies the stages of new or improved technology for improvement (**IFINN2**)	71	
		Identifies the stages of the new or improved structure and functions of the organization to its improvement (**IFINN3**)	72	
		Identifies the type of innovation (radical or incremental) that has given best results (**IFINN4**)	73	
	32).-Value Aded (**IFV)**	Based on the results identifies the new or improved value proposition (benefits / costs) for its completion; relation value-price	74	Bonel (et al.,2003)
	33).-Leadership and Innovation (**FLINNO**)	The type of leadership that drives innovation is Transactional (**FLINNO1**)	75	Mejía-Trejo (et al., 2013), Gloet & Samson (2013)
		The type of leadership that drives innovation is Transformational (**FLINNO2**)	76	
		The type of leadership that drives innovation is Passive (**FLINNO3**)	77	
CUSTOMER KNOWLEDGE MANAGEMENT (CKM)				
(G)	34).-Information from Costumer (**IFMC**)	Customer is a Resource of NPD ideation; Customer Driven-Innovation (Innovation from Customers). Mutual Innovation.	78	Nambisan (2002); Desouza (et al., 2007); Gibbert (et. al, 2002)
	35).-Information about the Customer (**IABC**)	Strategy of close collaboration with customers. Communities of creation.	79	Nambisan (2002); Gibbert (et. al, 2002)
	36).-Information for Customer (**IFRC**)	Customer as a User collaborates intensively in the product testing and support. Customer Focused Innovation (Innovation for Customers)	80	Nambisan (2002); Desouza (et al., 2007)
	37).-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	81	Nicolai (et al., 2011); Desouza (et al., 2007); Gibbert (et. al, 2002)
	38).-Negative side effects of Customer Integration (**NSEC**)	The firm is warned about the dependence on customer´s personality (**NSEC1**)	82	Kausch (et al. 2014)
		The firm is warned about the dependence on customer´s experience (**NSEC2**)	83	
		The firm is warned about the dependence on customer´s point of view (**NSEC3**)	84	
		The firm is warned about to choose the wrong customer (**NSEC4**)	85	
		The firm is warned about the risk to integrate the customer to the company´s side (**NSEC5**)	86	
(H)	39).-Knowledge Incentives (**KI**)	Salary associated with the ability and willingness to share knowledge (**KI1**)	87	Nicolai (et al., 2011); OECD (2003)
		Salary determined by willingness to improve skills and upgrade knowledge (**KI2**)	88	
		Tolerance of Failure (**KI3**)	89	Gloet & Samson (2013)
		Rewards and Recognition (**KI4**)	90	
	40).-Knowledge Fluence (**KF**)	Exchange the knowledge between employees across departments (**KF1**)	91	Nicolai (et al., 2011); OECD (2003)
		Communication among employees and management (**KF2**)	92	
	41).-Knowledge and ICT (**KICT**)	ICT to support and control the Customer Knowledge Management	93	Laudon & Laudon (2012); Mejía-Trejo & Sánchez-Gutierrez (2013)
(I)	42).-Internal Sources of Knowledge (**ISOK**)	Technical Services (**IOSK1**)	94	Baker & Hart (2007); Garcia-Murillo & Annabi (2002)
		Engineering Department (**IOSK2**)	95	
		Research and Design Development (**IOSK3**)	96	
		Production (**IOSK4**)	97	
		Marketing and Sales (**IOSK5**)	98	
		Purchasing and Supply (**IOSK6**)	99	
		Other Employees (**IOSK7**)	100	Murillo & Annabi (2002)
	43).-External Sources of Knowledge (**ESOK**)	Supplier (**ESOK1**)	1	Baker & Hart (2007); Garcia-Murillo & Annabi (2002)
		Scientist, Universities, Patents, Exhibitions Technological Consultant (**ESOK2**)	2	
		Distributor Agents (**ESOK3**)	3	
		Competitor (**ESOK4**)	4	
(J)	44).-Paradigm (**PAR**)	If Only We Know What We Knew (KM) as a Customer Retention (**PAR1**)	5	Garcia-Murillo & Annabi (2002)
		Retention is Cheaper than Acquisition (CRM) as a Customer Satisfaction (PAR2)	6	
		If We Only Knew What Our Customer (CKM) Know as a Customer Experience and Creativity (**PAR3**)	7	
	45).-Performance (**PER**)	Performance against budget; Customer retention rate.(KM) (**PER1**)	8	
		Performance in terms of customer satisfaction and Loyalty (**PER2**)	9	
		Performance against competitors in innovation and growth; Contribution to customer success. (CKM) (**PER3**)	10	

Notes: Variables (**V**); **(A)**.-Innovation Value Added (**IVADD**); **(B)**.-Innovation Income Items (**IIIT**); **(C)**.- Innovation Process (**INPROC**); **(D)** Innovation Outcome Items; **(E)**.- Innovation Performance (**IPERF**); **(F)**.- Innovation Feedback Items (**IFEED**); **(G)**.- CKM as a Driver of Innovation (**CKMADI**) ; **(H)**.- CKM Support (**CKMS**); **(I)**.- CKM other Sources of Knowledge (**CKMOSK**); **(J)**.- CKM, Satisfaction, Experience And Performance (**CKMSEP**)
Source: Authors by own adaptation

Applying the statistical inference tools from SPSS 20 program, were obtained:
I.- **TABLE 1**, shows the questionnaire confidence to 20 CEOs of SDSG by Cronbach's Alpha test =.947

TABLE 1
Cronbach's Alpha Test

Cronbach's Alpha	Standardized Alpha	N of Cases	N of Variables
.947	.948	20	110

Source: SPSS 20 as a result of the research and adapted by the authors

II.-MRA by Stepwise Method was practiced with the next results:

II.1.- **TABLE 2** shows the Correlations amongst the variables.

TABLE 2
Pearsons Correlation

		CKM	IVA	IIIT	INPROC	IOIT	IPERF	IFEED
Pearson Correlation Coefficient	CKM	1.000	.140	**.533**	**.655**	.519	**.564**	.237
	IVA	.140	1.000	.164	.134	.170	.179	.051
	IIIT	**.533**	.164	1.000	.550	.448	.465	.253
	INPROC	**.655**	.134	.550	1.000	.562	.481	.239
	IOIT	.519	.170	.448	.562	1.000	.625	.314
	IPERF	**.564**	.179	.465	.481	.625	1.000	.448
	IFEED	.237	.051	.253	.239	.314	.448	1.000

Source: SPSS 20 as a result of the research and adapted by the authors.

II.2 **TABLE 3** shows the set of variables entered/removed (a).

TABLE 3
Variables Entered/Removed

Model	Variables Entered	Variables Removed	Method Stepwise
1	INPROC		Criteria: Probability of- F-to-enter<= .050, Probability of- F-to-remove >=.100
2	IPERF		
3	IIIT		

(a) Dependent Variable: CKMS

Source: SPSS 20 as a result of the research and adapted by authors.

II.3.- **TABLE 4** shows the Model Summary

TABLE 4
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error for estimate
1	.655 (a)	**.429**	.426	.463
2	.714 (b)	**.510**	.505	.430
3	.727 (c)	**.528**	.521	.423

(a) Predictors: (Constant), INPROC;
(b) Predictors: (Constant), INPROC, IPERF

(c) Predictors: (Constant), INPROC, IPERF, IIIT
Source: SPSS 20 as a result of the research.

III. Using the Stepwise method SPSS produces an ANOVA for each model

III.1 **TABLE 5** shows the Analysis of Variance (ANOVA).

TABLE 5
ANOVA (a)

Model	Sum of Squares	Df	Mean Square	F	Sig.
1					
Regression	31.891	1	31.891	148.821	.000(b)
Residual	42.429	198	.214		
Total	74.320	199			
2					
Regression	37.884	2	18.942	102.417	.000(c)
Residual	36.436	197	.185		
Total	74.320	199			
3					
Regression	39.232	3	13.077	73.050	.000(d)
Residual	35.088	196	.179		
Total	74.320	199			

(a) Dependent Variable: CKMS
(b) Predictors: (Constant),INPROC
(c) Predictors: (Constant), INPROC, IPERF
(d) Predictors: (Constant), INPROC, IPERF,IIIT
Source: SPSS 20 as a result of the research.

III.2 **TABLE 6** shows the results of Coefficients.

TABLE 6
Coefficients by Stepwise Method (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t.	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.733	.166		10.433	.000
	IP	.509	.042	.655	12.199	.000
2	(Constant)	1.250	.176		7.093	.000
	IP	.388	.044	.499	8.770	.000
	IPERF	.232	.041	.324	5.693	.000
3	(Constant)	1.010	.194		5.204	.000
	IP	.332	.048	428	6.935	.000
	IPERF	.201	.042	.280	4.813	.000
	IIIT	.163	.059	.168	2.744	.007

(a) Dependent Variable: CKM
Source: SPSS 20 as a result of the research.

IV.- **TABLE 7** shows the Excluded Variables.

TABLE 7
Excluded Variables (a)

Model	Beta in	T	Sig.	Partial Correlation	Collineartity Tolerance
1					
IVA	.054(b)	.993	.322	.071	.982
IIIT	.248(b)	4.004	.000	.274	.697
IOIT	.221(b)	3.502	.001	.242	.684
IPERF	.324(b)	5.693	.000	.376	.768
IFEED	.085(b)	1.545	.124	.109	.943
2					
IVA	.016(c)	.320	.750	.023	.965
IIIT	.168(c)	2.744	.007	.192	.645
IOIT	.070(c)	1.017	.310	.072	.521
IFEED	-.035(c)	-.619	.537	-.044	.799
3					
IVA	.006(d)	.116	.908	.008	.959
IOIT	.056(d)	.813	.417	.058	.518
IFEED	-.042(d)	-.761	.448	-.054	.797

(a) Dependent Variable: CKMS
(b) Predictors: (Constant),INPROC
(c) Predictors: (Constant), INPROC, IPERF
(d) Predictors: (Constant), INPROC, IPERF, IIIT
Source: SPSS 20 as a result of the research.

DISCUSSION

About **TABLE 1** and according by Hinton (et al. 2004), Cronbach's alpha corresponds : • 0.90 and above shows excellent reliability; • 0.70 to 0.90 shows high reliability; • 0.50 to 0.70 shows moderate reliability; • 0.50 and below shows low reliability. **TABLE 2**, as a general rule, predictor variables can be correlated with each other as much as 0.8 before there is cause for concern about multicollinearity (Hinton, et al. 2004; Hair et al., 2010). Respect the **TABLE 3**, the Variables Entered/Removed table shows that the Stepwise method of regression has been used. Notice that SPSS has entered into the regression equation three variables: INPROC, IPERF and IIT that are significantly correlated with CKM. **TABLE 4** shows the Models: 1, 2, and 3 where the independent variables INPROC, IPERF and IIIT accounts for 42.9 %, 51% and 52.8% respectively of the variance in the scores of CKM dependent variable. The R value (0.655) in Model 1 is the multiple correlation coefficient between the predictor variables and the dependent variable. As IP is the only independent variable in this model we can see that the R value is the same value as the Pearson's correlation coefficient in our pairwise correlation matrix. In Model 2 the independent variables INPROC and IPERF are entered, generating a multiple correlation coefficient, R =.714. The Adjusted R Square adjusts for a bias in R square and is usually used. The Std. Error of the Estimate is a measure of the variability of the multiple correlation. **TABLE 5**, indicates Model 1: $F(1,198)= 148.821$, $p<0.01$; Model 2: $F(2,197)= 102.417$, $p<0.01$; Model 3: $F(3,196)=73.050$, $p<0.01$. Dividing the Sums 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. The values for Model 1 have been used as an example: 31.891/74.320= **0.4291.** In **TABLE 6** the Unstandardized Coefficients B column gives us the coefficients of the independent variables in the regression equation for each model. Model 1: CKMS = 1.733 + .509 INPROC; Model 2: CKMS = 1.250+ .388 INPROC+ .232 IPERF; Model 3: 1.01+ .332 INPROCP+ .201 IPERF+ .163 IIIT. The Standardized Beta Coefficient column informs us of the contribution that an individual variable makes to the model. The beta weight 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. 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. By observing the Sig. values in our research we can see that for Model 1 the IP scores

are significant ($p < 0.05$) , and so on with Model 2 and 3. Hence, we suggest to use Model 3 because it accounts for more of the variance. The Unstandardized Coefficients Std. Error column provides an estimate of the variability of the coefficient. **TABLE 7** The Beta In value gives an estimate of the beta weight if it was included in the model at this time. The results of t tests for each independent variable are detailed with their probability values. From Model 1 we can see that the t value for IPERF is significant ($p < 0.05$). However as we have used the Stepwise method this variable has been excluded from the model. As IIIT has been included in Model 2 it has been removed from this table. As the variable IP scores is present in the 3 models it is not mentioned in the Excluded Variables table. The Partial Correlation value indicates the contribution that the excluded predictor would make if we decided to include it in our model. Collinearity Statistics Tolerance 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).

So far, we answered **SQ3** since **TABLE 3** that shows the most significant variables were IP, IPERF and IIIT from INNOVS. Therefore, GH is explained because using **TABLE 4** Model 3, 52.8% produces the variability on the dependent variable CKM. Doing the same MRA for the INPROC, IPERF and IIIT Indicators on CKM, we found **TABLE 8.**

TABLE 8
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error for estimate
1	.672(a)	**.452**	.449	.454
2	.739(b)	**.545**	.541	.414
3	.763(c)	**.582**	.576	.398
4	.779(d)	**.607**	.599	.387
5	.789(f)	**.622**	.612	.381
6	.796(f)	**.634**	.623	.375

(a) Predictors: (Constant), TOINN4
(b) Predictors: (Constant), TOINN4,MR2
(c) Predictors: (Constant), TOINN4,MR2,MR7
(d) Predictors: (Constant), TOINN4,MR2,MR7,PEOIG
(e) Predictors: (Constant), TOINN4,MR2,MR7,PEOIG,NOVY3
(f) Predictors: (Constant), TOINN4,MR2,MR7,PEOIG,NOVY3,TOINN2
Source: SPSS 20 as a result of the research.

CONCLUSIONS

We discovered a complete Innovation Stages (INNOVS) described with 6 variables (IVAAD, IIIT,INPROC,IOIT,IPERF, IFEED) with 33 dimensions and 77 indicators; our independent variable was IOIT; at the same time too, 4 variables (CKMADI, CKMS, CKMOSK, CKMSEP) with 12 dimensions and 33 indicators that are trying to explain CKM. The **GQ** is solved involving the relationship between INNOVS with CKM for 200 SMEs at SDCGC when is answered the **SQ1**: obtaining the **FIGURE 1** with 10 variables; **SQ2** is answered by mean the description of variables in the **Literature Review** and the questionnaire design showed in **SCHEME 1** with 45 dimensions and 110 indicators associated to the variables; **SQ3** is answered by means the variable correlations (**TABLE 2**) and the MRA by Stepwise Method (**TABLES: 3 , 4, 5,6 & 7**) showing as the most significant variables: **IPROC, IPERF, IIIT**; in fact, **GH** is answered in a positive way because we found 52.3% (more than 50% proposed) of our model produces the variability on the dependent variable CKMS. Doing MLR again, **IPROC, IPERF, IIIT** we obtained **TABLE 8** that shows the most significant indicators: TOINN4,MR2,MR7,PEOIG,NOVY3,TOINN2 to improve CKM.
Future studies are proposed to determine the impact of these INNOVS indicators to relate them with each one of the CKM indicators mentioned above. As we see finally, there are great opportunities to use not only the 6 indicators mentioned above, but the rest of the **71/77 INNOVS** indicators to improve CKM and get new and pretty important competitive advantages.

REFERENCES

Afuah, A. (1997). *La Dinámica de la Innovación Organizacional. El Nuevo Concepto para Lograr Ventajas Competitivas y Rentabilidad.* México: Oxford University Press.

Baker, M., & Hart, S. (2007). *Product Strategy and Management.* USA: Pearson.

Bermúdez-García, J. (OCT de 2010). Cómo Medir la Innovación en las Organizaciones. *Escuela de Postgrado de la UPC; Cuadernos de Investigación EPG*(11).

Bonel, J. I., Bonel, F. J., & Fontaneda, I. (2003). Aplicación del nuevo modelo estratégico de Creación de valor al análisis del éxito Empresarial del e-business. . *V Congreso de Ingeniería de Organización*, (pág. 11).

Canibano, L., García-Ayuso, L., Sánchez, P., & Olea, M. (9-11, June.1999). Measuring Intangibles to Undersatand and Improve Innovation Management.Preliminary Results. *Paper presented at the OECD International Symposium. Measuring and Reporting Intellectual Capital: Experience, Issues, and Prospects. Amsterdam. 9-11 June, 1999.* Amsterdam: OECD.

Chaudhuri, A. (2006). *Emotion and Reason in Consumer Behavior.* Burlington, MA. USA: Butterworth-Heinemann (is an imprint of Elsevier).

Chesbrough, H. W., Vanhaverbeke, W., & West, J. (2006). *Open Innovation. Researching a New Paradigm.* Oxford: Oxford University Press.

Desouza, K., Awazu, Y., Jha, S., Dombrowski, C., Papagari, S., Baloh, P.(03 de Mar de 2007). *Custome-Driven Innovation.* Retrieved 03 March 2014, from http://faculty.mu.edu.sa/public/uploads/1357394142.956332024697.pdf

Dussauge, P. H., & Ramantsoa, B. (1992). Strategíc Technology Management. Chichester: John Wiley.

Gale, B., & Wood, C. R. (1994). *Managing Customer Value.Creating Quality and Service That Customer can see.* New York: Free Press.

Garcia-Murillo, M., & Annabi, H. (2002). Customer Knowledge Management. *Journal of the Operational Research Society, 53*(8), 875-884.

Gassmanna, O., Kausch, C., & Enkel, E. (2012). *Integrating Customer Knowledge in the Early Innovation Phase.* Retrieved 03 March 2014, from Integrating Customer Knowledge in the Early Innovation Phase: http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.380.2564&rep=rep1&type=pdf

Gebert, H., Geib, M., Kolbe, L., & Riempp, G. (2013). *Towards Customer Knowledge Management: Integrating Customer Relationship Management and Knowledge Management Concepts.* Retrieved 03 March 2014, from Institute of Information Management. University of St. Gallen.St. Gallen, Switzerland: file:///C:/Users/jmt/Desktop/Towards_customer_knowledge_management.pdf

Gibbert, M. L., & Probst, G. (2002). Five Styles of Customer Knowledge Management, and How Smart Companies Use Them To Create Value. *European Management Journal, 20*(5), 459 - 469.

Gloet, M., & Samson, D. (2013). Knowledge Management to Support Systematic Innovation Capability. *46th Hawaii International Conference on System Sciences* (pp. 3685-3694). Hawaii: Hawaii International Conference on System Sciences.

Hill, C. W., & Jones, G. R. (2011). *Administración Estratégica un Enfoque Integral.* (9a. ed.). México: : CENGAGE Learning.

Hinton, P., Brownlow, C., McMurray, I., & Cozens, B. (2004). *SPSS Explained.* New,Tork, USA: Routledge Taylor & Francis Group.

Howells, J. (2000). *The Nature of Innovation in Services.* Australia: OCDE Innovation and productivity in Services Workshop, October.

INEGI. (2014). *Portal Web INEGI.* Retrieved 6 Jnauary 2014, de Subportal Ciencia y Tecnología;Innovación, Investigación y uso de TICs (Sector Privado); Establecimientos Grandes: http://www.inegi.org.mx/Sistemas/temasV2/Default.aspx?s=est&c=190

INSEAD . (2013). *The Global Innovation Index 2013.The Local Dynamics of Innovation.* Geneve: INSEAD.

Laudon, K., & Laudon, J. (2012). *Management Information Systems. Managing the Digital Firm.* USA: Prentice Hall.

Lev, B. (2001). *Intangibles: Management, Measurments and Reports.* Washington,D.C.: Brookings Institution Press.

McKinsey Global Survey Results: Assessing Innovation Metrics. (2008). *McKinsey Global Survey Results: Assessing Innovation Metrics*. Retrieved 12 December 2013, from McKinsey Global Survey Results: Assessing Innovation Metrics: http://innovbfa.viabloga.com/files/McKinseyQuaterly___assessing_innovation_metrics___oct_2088.pdf.

Mejía-Trejo, J., & Sánchez-Gutiérrez, J. (2013a). *Patente nº MX/a/2013/011807.* México.

Mejía-Trejo, J., Sánchez-Gutiérrez, J.& Ortiz-Barrera, M. (2013b). *Leadership and Value Creation on Innovation: The*

Case of Software Developer Sector in Guadalajara. Retrieved 12 Apr 2014 from portal web *: Social Sciences Research Network ubicado en: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2390787*

Nambisan, S. (2002). Designing Virtual Customer Environments for New Product Development: Toward a Theory. *Academy of Management Review, 27*(3), 392-413.

Nicolai, J., Keld, L., & Pedersen, T. (2011). Linking Customer Interaction and Innovation:The Mediating Role of New Organizational Practices. *OrganizationScience, 22*(4), 980-999.

OECD (2003). *Knowlegde Management. Measuring Knowledge Management in the Business Sector.* Paris,France: Organisation for Economic Co-operation and Development. (OECD).

OECD (2005). *Guidelines for Collecting and Interpreting Innovation Data.* París, France: Organisation for Economic Co operation and Development. (OECD).

Popadiuk, S., & Wei-Choo, C. (2006). Innovation and knowledge creation:How are these concepts related? *International Journal of Information Management*(26), 302-312.

Rogers, E. (1983). *Diffusion of Innovations.* Retrieved 20 January 2014,from http://www.valuebasedmanagement.net/methods_rogers_innovation_adoption_curve.html

Shipp, S. S. (2008). *Measuring Innovation and Intangibles: A Business Perspective. IDA Document D-3704.* USA: Institute for Defense Analyses Science & Technology Policy Institute.

Smith, L., & Leydesdorff, L. (20 de FEB de 2010). *The Triple Helix in the context of global change: dynamics and challenges.* Retrieved 20 February 2014, from The Triple Helix in the context of global change: dynamics and challenges: http://www.leydesdorff.net/th11/th11.pdf

White, M., & Bruton, G. (2011). *The Management of Technology and Innovation.* Mason,OH: OUTH-WESTERN CENGAGE Learning.

World Economic Forum. (2014). *The Global Competitiveness Report 2013-2014.* Geneve: World Economic Forum.