
THE INNOVATION GENERATION PROCESS BASED ON THE KNOWLEDGE MANAGEMENT PRACTICES

Juliana Santi Botton, Claudio Mioranza, Edison Luiz Leismann

*Universidade Estadual do Oeste do Paraná**E-mails: julibotton@hotmail.com; cmioranza@terra.com.br; elleisman@gmail.com*

Abstract: The objective of this paper was developing a construct of the Innovation Generation Process – IGP, based on the knowledge management practices applied to any enterprise or market segment. So, based on the Knowledge practices is possible to elaborate an flexible process, indicated for any enterprise or market segment. The process has nine stages and seven levels; each level refers to the enterprise objective. In other words, each level is the enterprise focus, while stages are steps to reach the level. For the IGP is necessary to list Knowledge management practices. There were listed many universal practices indicated for any enterprise. It is necessary that each company choose their own practices according their necessity and reality. After the practices, it is important to apply the specific questionnaire with many enterprise's respondents. For data tab is necessary to calculate the mean and the standard deviation of each variable of each practice (9 variables for each practices) and to calculate the difference between mean and SD. This difference will indicate for which level is relative each practice.

Keywords: Knowledge; Innovation; Innovation Generation Process.

1. INTRODUCTION

For Uriarte Jr. (2008), the knowledge is nowadays used like a new organizational strategy, wherein, possess knowledge is equivalent to possess power. This conception instigates the authors to search more settings about it, without which, the knowledge would be a mere power base. However, it is more than this, it is a support to innovative organizations, as a means of cultural change, and so, an object to obtain power and organizational improvement.

Thus, to understand this relation is important the application of models and fundamentals to the innovation generation. It is so that this study is a theoretical-practical about Knowledge Management (KM) and innovation.

For this, it was observed, the possibility of developing a construct concerning to innovation generation, such, it may be used as holder to the application in generation enterprises of innovation. In addition, it was based on practices that enable KM for the organization, and consequently, innovation.

From the problem: How the practices of knowledge management can be organized, to allow the development of an Innovation Generation Process (IGP)? – it was been possible to prepare the general objective of this study: Developing a construct of the Innovation Generation Process – IGP, based on the knowledge management practices applied to any enterprise or market segment.

Furthermore, it was possible determine, a guiding to the general objective, the specific objectives: a) Formulating, by bibliographic study, possible levels and stages within the Innovation Generation Process; b) Listing, by bibliographic study, – knowledge management practices already validated, that can be applied to an Innovation Generation Process.

With this levy, it is possible understand how happen the relation between knowledge and innovation, observing this occurrence in companies and developing a construct which may be a base to another enterprises those seeking innovation.

Therefore, this study is relevant for organizations, that, grounded on the construct that allows flexibility of practices. They can be applied in other ways and another practices, according the need own company.

2. KNOWLEDGE MANAGEMENT AND ITS PRACTICES

Knowledge is considered the most important asset of this century, whereby, researches perceive it as a competitive advantage in organizations. So, as more it is explored more knowledge there is (DAVENPORT AND PRUSAK, 1999; PROBST, RAUB, ROMHARDT, 2002; DE BRÚM, 2005).

By concept, “ knowledge management involves activities related to capture, using and sharing of knowledge by organization. It is an important part of the innovation process” (OSLO MANUAL, 2005, p. 24).

For Nonaka and Takeuchi (1997); Davenport and Prusak (1999) and; Bergeron (2003), the problem is that, KM is mistakenly seen by organizations that looking for create KM systems as though knowledge could be obtained by artificial intelligence, this is because, it is practically impossible obtain by computers the same human performance, the decision making and the essentially human experiences, and, this knowledge can not be processed by machines.

Thereby, there is not KM without people, the sharing of this knowledge can not be done by machines. Nonaka and Takeuchi (1997); and Santiago Jr. (2005) assert that, KM is a process of obtaining and sharing individuals' experiences, to provide faster access to information and continuous improvement.

Dalkir (2005) believes that the knowledge has become an commodity, implicit in products and services and an market value generator. Beside, Probst, Raub and Romhardt (2002), understand that, to invest in knowledge is more viable for the organizational than large investments in equipment and technology.

For this, a good performance of a company depends on the way that the people of this company to create knowledge and sharing its. So, there is not immediate knowledge, it is developed over the time, as well as skills. It is a process of making of acquired and interpreted information by obtained data.

Knowledge transmission is tacit and explicit, and, not only, one of them, knowledge give-and-take between two axis to enable innovation. In summary, new knowledge creation generates, consequently, new ideas, and, from them, innovation (TAKEUCHI and NONAKA, 2008).

Wherefore, even to create process and system to KM, in practice, it needs a change in the organization. It is a change of culture that depends on the people and it doesn't depend on the machine. The management is a dialectic tool, how had Nonaka and Takeuchi (1997) ever said, it is necessary a change, a thesis, an antithesis and, finally, a synthesis of all the effort.

From what is understanding by Knowledge Management, the organizational practices of KM–KMP, have as intention “knowledge production, its retention, its dissemination, its sharing and its application into organizations, as well as their relation with outside world” (BATISTA, 2004, p.10). Kuniyoshi (2008, p. 19) define them as “tools, technologies, strategies, policies and techniques that help people (employees) in the company, when is necessary identification, creation, capture, selection, acquisition, dissemination and sharing, use and reuse of corporate knowledge”, or, that facilitate the transfer of information. Individuals can know more than can say, narrate or pass to other, and, practices assist the process to generate and transmit knowledge to other (POLANYI, 2009).

KMP provide value and competitive advantage for the organization. It is important to consider that, so there is KM development, it is necessary a company transformation regarding culture, communication and technologies.

Then, KM is materialized by experiences, courses, books, mentoring, beyond of what is considered informal learning, informal conversations and what is remembered (the memory is a knowledge management practice).

2.1. Organizational Culture for KM and innovation

It is meant by culture, joint of beliefs, standards, values and organization's lasting actions (BESSANT, TIDD, 2009). For Costa (2012), organizational culture is a joint of truths and established practices that nobody disagree. It is the way in which the organization perceives itself and the external environment and how it solves its problems.

Culture guides the behavior of individuals, of a group of them, or, the majority of individuals in an organization. Altogether, to create a focused environment on knowledge it is necessary changing values and changing organizational culture, guiding people's behavior (DE BRÚM, 2005). Cultural aspects related to innovation, including, according Flynn (et al, 2003), sharing, teamwork, motivation and involvement of individuals in organizational knowledge management.

For Dalkir (2005), cultural change allows to reinforce four thoughts relative to organizational knowledge:

- a) Using knowledge is not exhaust it;
- b) Transferring knowledge does not mean losing it;
- c) Knowledge is abundant, but, the ability to use it is scarce;
- d) Most of organizational knowledge (people) will go away in the end of the day

Furthermore, Dalkir (2005), alleges that, human ability is restricted and is not wide as the knowledge; thus, it is necessary that this knowledge is stimulated and generated for the organization, and, that tools of retention are used.

Nonaka and Takeuchi (1997) agree that, as well as knowledge, innovation is generated by people, based on the knowledge they convey. The organization should support learning, growth, and respect. This knowledge can be defined, according the authors, like the company's maturity in relation to knowledge.

The orientation of this knowledge is function of manager, who, based on altruism, mediates the relationship between individuals and culture, knowledge and innovation, the organizational does not create knowledge, but, they induce individuals until knowledge.

The opposite of altruism would lead to monopoly, only the manager or its closer could contain knowledge. These organizations are able to failure or a frustrating climate and they are unfit to KM and to knowledge, because, "the enclosure culture keep it scarce" (DAVENPORT, PRUSAK, 1999, p. 51).

Bessant and Tidd (2009) complete saying that, this innovation is created in a favorable organizational climate; a climate for creativity that promote the generation of innovation concerning new products, services and processes. This climate strengthens new practices in the organization, "new ideas, improvement process, new products or new developments" (BESSANT, TIDD, 2009, p. 75) and, allows innovation to organization.

3. INNOVATION

Schumpeter (1988) defined, in the 1980s, innovation, as one that occurs only when there are financial results, however, it is disagreed about this definition, seeing that, internal innovation, although without financial results, can be important to bring management results and organizational results beyond changes.

As soon, agree up that, innovation generates competitive advantage, it is “the process of transferal of ideas to products, processes or services, useful and usable” (BESSANT, TIDD, 2009, p. 47). Corroborating, Abou-Zeid and Cheng (2004) mentioning several studies wherein there is relationship between KM and Innovation. According them, research indicates that the business knowledge manipulation enable development of radical and incremental innovation in organizations.

Innovation can be defined yet, by a continuous improvement, inserted within company and dependent on people who apply it as knowledge. Consequently, it needs personal training for the continuous improvement (FONTANI, 2005).

Soon, knowledge management, incorporated into organization's Human Resources, should worry about generation of participative innovation, whose ideas belong everybody and not just ideas about management. To everyone is allowed to have ideas. A innovative organization reap what it wait (BARBIERI, 2007, p. 88).

Innovation can be divided, according Bessant and Tidd (2009), into: a) Innovation in products, new products or services are created, innovation is on the things that company offers; b) Innovation in process, changes the way that things are done, new processes in manufacturing products or development services, elaborated to optimize the work and results; c) paradigm innovation; culture changes, new models of job; d) position innovation, context changes.

Furthermore, it can be incremental and radical innovation. First is refers improvements in products, services or processes that already exist. On the other hand, radical innovation is a totally new creation of new product or process. In summary, radical or incremental, innovation management depends on three factors: a) generation of new ideas; b) selection of best ideas; c) implement new selected ideas (BESSANT, TIDD, 2009).

4. METHODOLOGY

This search is a qualitative approach, based on the development of a construct to the innovation generation process (IGP), and, a quantitative basis, presents in the statistical method of analysis for the proposed construct. Moreover, it is an applied search, because, according Cooper e Schindler (2001), sought up to generate knowledge for the practice application, toward the solution of problem: Developing the IGP.

Relative to the objectives it is an exploratory research, because, sought to deepen knowledge relative to KM and Innovation Generation – IG, developing an overview of the study (GIL, 2006). For technical procedures it was possible consider it as a bibliographic search, “developed based on already elaborated material” (GIL, 2006), furthermore, it is a data collection, in relation to the listed practices.

Search was divided into three big moments: a) bibliographic literature review; b) theoretical construction, survey of knowledge management practices and theoretical development of IGP; c) theoretical-practical comprehension, elaborating of specific questioner for applicability of the construct and directions about it suitability.

These moments have been necessary so that it was possible reach the specific objectives, and, consequently, the general objective of this study: *developing a construct of the Innovation Generation Process – IGP, based on the Knowledge management practices.*

To start this process of research, it was defined as theoretical method, the reflection on the themes that it was intended to study, besides of an initial problem for search, definite as “How to establish an *Innovation Generation Process (IGP)*?”

Several authors as Schumpeter (1988), Bessant e Tidd (2009), etc., apart from theoretical base as the Oslo Manual (2005), emerged as information conductors relative to innovation, affirming that: there is no information without knowledge.

It is believed that at this moment was built the first premise for the theoretical construct: 1) innovation and knowledge are interconnected and dichotomous, in other words, although, they are not equal, they are dependent on each other, one can not exist without the other.

In a second time, it was observed another fundamental idea demonstrated by authors, that, there is no knowledge without people, causing one second premise: 2) innovation based on knowledge need to be generated through the practices that allows to people, innovation. Which justifies the use of PGC as basis for the innovation generation.

Finally, in a third moment, it was observed that, there are no people without culture, as said De Brúm (2005), or yet, Davenport and Prusak (1999) and Flynn (*et al*, 2003). Consequently, as third premise: 3) is necessary implement practices directed to people, focusing knowledge management and innovation generation, establishing a culture oriented to people, determined by company's maturity. So, this is a cyclic process, wherein culture is enhanced by knowledge management practices.

First consideration to IGP, observing Nonaka and Takeuchi's definitions, innovation is a process is cyclic. Several authors were studied, determining firstly, Stages to IGP.

Stages establish an abstract construction of a cyclic process, showing the enterprise maturity degree in relation to knowledge management practices. It was defined nine stages. For each stage, it was established objectives to achieve. So, beyond the stage, based on Nonaka and Takeuchi (1999), Uriate Jr. (2008), Terra (2005), Davenport and Prusak (1999) and De Brúm (2005), it was elaborated seven levels (objectives) for the IGP: Level *Organizational Culture*: Stage A and I; Level *Information in progress*: Stage B and Stage C; Level *Incentive*: Stage D; Level *Knowledge*: Stage E; Level *Process for Innovation*: Stage F; Level *Innovation*: Stage G; Level *Results*: Stage H.

After theoretical elaboration, and after IGP construction, it was used two criteria for group the practices concerning to KM: a) Define only practices, present on the studied bibliography and already validated practices; b) Define, just specific practices for the proposed segment. So, practices must be listed according the enterprise reality or segment.

Finally, after definition and listing of practices, it was necessary consider as step for IGP, the application of specific questionnaire, indicated at the next session. The questionnaire was elaborated based on the theoretical formulation and, by the objective of the search: verify in which stage and level of IGP is each practice.

After the questionnaire application, enterprises may use the proposed model of analysis tools, so, understand which one is the indicated practice for each level of organizational maturity.

5. DEVELOPMENT OF INNOVATION GENERATION PROCESS – IGP

The IGP development was based in several authors, cited here. Uriate Jr. (2008) approaches the KM process facilitators. It establish strategy elementary actions for KM and

consequently, for innovation generation. For this author, the **first step** for an innovation process would be necessary a redefinition of the organizational structure; the manager must develop actions aimed at knowledge. On **second step**, the author quotes the human resources practices as corresponding to KM and IG process, partnership with individuals, and, facility application of KM practices. Finally, he establishes as **third step**, the organizational culture redefinition, proposing a consistent culture and based on KM, focused to innovation.

Based on this author, IGP must have at least, three important **steps**: structural change, people development practices and; as result, a new organizational culture based on innovation.

Other found definition about a possible process was showed by Terra (2005), called of seven dimensions for innovation generation in business, it is necessary that:

- I. The hierarchical top management establishes strategy, defined for its employees, focusing on learning.
- II. The organizational culture to be implanted focus on innovation, as well as the commitment with results.
- III. The new culture must structure new work practices and communication, so, create new knowledge;
- IV. The enterprise must stimulate external and internal knowledge;
- V. Personal contact must be strengthened, providing greater communication, transparency and collaboration;
- VI. People in the organization must measure results that are important ;
- VII. Organizational learning of environment be built by alliances with other enterprises, relationship with customer, implying on a new culture.

In a third reflection about IGP, it were observed five principles (I to V), defined by Davenport e Prusak (1999) for KM, that can promote an organizational operating, assisting the culture and innovation.

- I. **knowledge value promotion:** this principle equates to concept of Uriate Jr. (2008) and Terra (2005), who say about important cultural changes for the new knowledge organization.
- II. **Knowledge mediation towards employees;** It equates to the second proposal by Uriate Jr. (2008), who considers human resources as base to the knowledge, and, IV Terra's dimension, that defends employees incentives.
- III. **Appreciation of creative potential:** Equivalent to incentive dimension on human resources;
- IV. **Clarify the intent to generate knowledge and direct it;** It equates to concepts by authors have cited about innovation generation from knowledge and finally,
- V. **Creating parameters to measure success obtained;** it is knowledge and innovation reflection for the organization. Innovation is just valid if it results on benefits to the organization, whether these benefits of any kind (financial, emotional, status).

Finally, a forth and last reflection about IGP comes from De Brúm's (2005) definition, who establishes three indispensable assets for knowledge generation and, consequently, innovation: People; processes and; technology. According to author:

People: if knowledge is the most important asset of the organization, as it has ever seen in the first part of this study, so, people are the asset who supports knowledge. Without people there is not organization, and so, there is no, knowledge. Investment in human development in the company is extremely important and must be considered indispensable, unavailable and irrefutable.

Processes: for knowledge sharing, organization needs structured internal processes, sometimes even in the organizational structure, cultural, in its scope, or in its values.

Technology: technology must go beyond the intranet and e-mail relation. It must be a tool that provides the connection among people, among information and, consequently, among knowledge.

So, from formulations and concepts was possible define the **Innovation Generation Process**. The development of IGP was showed as basis, the formulation established by Uriate Jr. (2008) is a reset of organizational structure, corroborating with Terra (2005), who presents the cultural change in three first dimensions of his concept about innovation generation, added to Davenport and Prusak (1999) definition on their principles about KM, and finally, by the assets showed by De Brúm (2005).

IGP was established from seven possible levels. Each level represents actions relative to Innovation. However, each one of them can have one or two stages; the stage means different actions of one same level, in other words, different actions for the same result. As an example, it is possible adduce the First Level, that is divided into stage A and I. This level refers to **Organizational Culture**, it may be in the stage A (figure 01), that means the first tentative to renewal of organizational culture of the company. On the other hand, stage I refers to organizations that have ever implemented the IGP, and, have ever had results, and that, from the results, they are strengthening the new culture already implemented.



Figure 01 – IGP cycle

So, the first level proposed to the PGI, seen in Figure 04, is the level of **Organizational Culture** (Defined here at stage A and stage I); in stage A, as authors defined, the organization may seek process implementation.

For this, manager's role, according Uriate Jr. (2008), is very important, since he is the management meter. It is at this stage still, that culture begins to shape itself to the knowledge.

a) **STAGE A – LEVEL ORGANIZATIONAL CULTURE:**

On this stage happen the search for the implementation of KM practices. It is the first step of Innovation Generation Process (IGP); it is necessary remember that, on this first stage, the organizational culture is not a new culture, but, a change initiative. "One enterprise can make significant changes, but, it can not become on a totally different enterprise" (DAVENPORT, PRUSAK, 1999).

Consequently, in stage I, level **Organizational Culture** does not match to the initial step of IGP, but, it is a potential “final” moment of process, even if, the process does not have end, it is continuous, it represents the closing of the cycle.

In sequence, the **second level** of IGP is **information in progress** (defined here by stages B and C), where, according to the meanings of Uriate Jr., start up practices aimed at individuals. Thus, on these stages, the process implementation does not depend of manager, but especially, of information sharing among employees (internal and external).

This level/stage may be analogically related to the fourth dimension of Terra (2005), wherein, the enterprise may stimulate knowledge. However, as seen previously, knowledge just can be generated from the information. So, this level is defined as **information in progress**, because, it occurs in a moment that organization’s people pass information each other in order to exchange their knowledge.

This level has division between two moments, stage B and stage C. These stages were also based, and principally on Nonaka and Takeuchi’s (1997) knowledge spiral, because they are relative to **information in progress**.

So, in the level **information in progress** there is attempted to exchange tacit or explicit knowledge to another person. However, in the stage B, the second individual does not interact in the process. So, he receives the information for the possible internalization, but, he does not pass to another person his knowledge.

b) **STAGE B – LEVEL INFORMATION IN PROGRESS:**

At this stage occurs the transference of information, a person passes information for other in order to demonstrate tacit or explicit knowledge. However, the second person does not interact with the first person, so, knowledge is not. There is not knowledge exchanging, just the transfer of each other, this other, just received knowledge.

c) **STAGE C – LEVEL INFORMATION IN PROGRESS:**

At this stage occurs information in traffic, the information exchanging for the knowledge occurs by two or more individuals, each one exchanges with others its own tacit or explicit knowledge, and vice versa – both share ideas.

d) **STAGE D – LEVEL INCENTIVE:**

At this stage occurs incentive for knowledge, the information shared results in a desire of another person for searching more information, a desire of a new knowledge; they are practices that incentive ideas; this moment is associated to III and IV steps of Terra (2005), wherein knowledge is stimulated by the enterprise manager and Human Resources department.

e) **STAGE E – LEVEL KNOWLEDGE:**

At this stage, individual or group reaches knowledge from the incentive generated by the previous stage. Occurs the effective search by new knowledge which enables its practice application. There is ideas developing, application, search about new issues, about new knowledge. The practices of this level are those that create tacit knowledge, and yet, explicit knowledge construction.

f) **STAGE F – LEVEL PROCESS FOR INNOVATION:**

At this stage there is applied search for determinate issue, it is an application of knowledge in search of innovation. Practices are usually relative to inquiry and they are geared towards a specific focus, generating the possibility of joining theory and practice.

It can be defined as the moment in which apply knowledge in innovation search. This level can be aligned to the V step of Terra (2005), who says that, from the IT tools and practices and from the communication is possible achieve innovation.

g) **STAGE G – LEVEL INNOVATION:**

Innovation is generated on the sixth level, stage G, whose the application of KM practices possibility innovation generation. It is the application of theory in practice, which was developed. Created Innovation can be in a product or in a process; it can be yet, radical or incremental.

For Man (2001), ideas there are no sense if they are not implemented. One organization that has ideas is very creative, however, it is innovative just when, it chosen the best ideas, and, implement them in practice. Innovation implementation is so, an indispensable step for generating results in organization.

At this stage occurs practice implementation than has been studied and developed in theory. Practices on this level are responsible by application of studied techniques, developed products, new product or process being created, radically or incrementally.

h) **STAGE H – LEVEL RESULTS**

After innovation implementation is necessary that results are observed, it is not valid if it does not represent positive results for enterprise. Results can be financially measured, as well as, emotionally, culturally, according to five principles defined and showed previously by Davenport and Prusak (1999).

At this stage are collected the expected results by the innovation. Few, but, some practices provide results, as information sharing about determined result, participation of employees in the project.

Finally, in the last stage, level **Organizational Culture** again, relative to VII step of Terra (2005), the new culture will be developed. This stage, although it has specific practices of its development, it is result of implemented practices in the early stages and mainly, of results obtained with IGP.

i) **STAGE I – LEVEL ORGANIZATIONAL CULTURE**

At this stage occurs implementation of a new change in the culture, occasioned by people reaction when they achieve results. A new culture – this new culture can be directed to harmony or conflict, according to what people want with that determined result. Practices can generate new conflicts by power, or, they can improve relationship among people, generating good new results. At this moment happens what is called how upkeep of practices, they can keep on the cycle just if they are continual.

So, IGP proposes to apply of KM practices in each organizational level. They are management facilitators for innovation, because, the enterprise can choose which practices apply, according to the level of culture and innovation in which it is. For example: in case of a beginner enterprise in market and that seeks to develop new products, it can start by the first level, focusing in organizational culture for innovation.

Stages are not mandatorily sequential, however, it is important obtain practices in each stage, in order to the process is not compromised. In summary, each stage is indispensable for Innovation Generation, indicating that KM practices are facilitators on this process. With regard to these practices, it was lifted and grouped for enabling better understanding by the company, what can be seen in the next subsection.

As it can be observed, the levels **Organizational Culture and Information in progress** are organized, both, with two different stages. This definition was deliberate when was understood that, the practices' objective (level) defined in stages A and I, as well as in stages

B and C, were the same each other, however, the practices maturity was different, requiring different stages.

After definition of Levels and Stages for IGP, it was effected the survey of KM practices. It is necessary remember that, knowledge management practices must be listed according to reality of each company, and that this study will list just universal practices, as an example.

5.1. Survey of Innovative knowledge management Practices - IKMP

As it was mentioned and observed, people and knowledge are indispensable base for innovation generation. For Strauhs (*et al*, 2012, p. 11), knowledge is fundamental in any innovation process: “in generating and selecting of ideas, in choice of most appropriated resources, in an implementation project management and, mainly, in organizational learning”. Some practices are possible for the process occurrence. So, for the proposed IGP, it was listed many KM practices, previously appraised, that can be incorporated to innovation generation, establishing a dependent relationship among them.

Table 1 – Possible Innovative knowledge management practices

INNOVATIVE KNOWLEDGE MANAGEMENT PRACTICES			
PR01	Market analysis and internal analysis	PR14	Developing/application of action plans
PR02	Notes / Tickets	PR15	Corporative e-mails
PR03	Acquisition of new technology	PR16	Physical and creative space and space for rest
PR04	<i>Benchmarking</i>	PR17	scattered ideas: Murals, suggestion box
PR05	<i>Brainstorming</i> or idea generating	PR18	Intranet and Extranet
PR06	Innovation Center/ Search and Development	PR19	Mental maps/ Flowcharts/ Manuals
PR07	<i>Coaching</i>	PR20	<i>Mentor/Tutor</i>
PR08	gatherings	PR21	Incentive policies, financial or otherwise
PR09	Consulting	PR22	Informal net/ radio-employee
PR10	hiring of Employee with experience	PR23	Reports
PR11	hiring of Employee with good resume	PR24	Meetings / conferences
PR12	Developing/application of new project	PR25	Training / Workshops
PR13	Developing/application of new product or service	PR26	Corporative university

Emphasizes up, many KM practices are cited in literature. However, practices can be distributed by their importance, application in each company. They must be organized in alphabetic order, in addition to called in PR plus number 1 to n. For facilitate the preparation of the practices, it was proposed that they are classify at least four categories: Focused in knowledge (specific practices for new ideas generation); Focused in Management (practices that assist in organizational management); Focused in Information Technology (most appropriate practices in segments that use IT tools); Focused for efficiency in process (mainly manufacturing practices). They are listed 26 universal practices.

5.2. Specific Questionnaire Development

After the listing of IKMP, the enterprise must apply a specific questionnaire, applying to the largest number of possible respondents, among managers and employees. The questionnaire was elaborated in order that it is self applicable, with all the possible explanations to fill out. The questionnaire must contain: **Practice number**, **practice name** and its definition, as the figure 01.

Finally, the questionnaire must contain nine possible situations of influence of practice on the management, called of **Situational Variables (SV)**, asking to the respondent that chooses just one answer in a scale interval between 1 to 10, which is the level of the practice influence for each one of the nine Situational Variables.

If observed, it can understand that, each one of the situations above described is based in one of the nine stages of IGP. So, it was from this question that is possible measure data and define, in which level of IGP (table 02) is indicated the practice using.

Table 02 – Specific questionnaire

PRACTICES	Check how much practice cited can help the enterprise to improve each one of the nine situations. Considering: 1- the practice does not help anything... 10- the practice helps so much (totally)										
PR01 Market analysis and internal analysis	a. in good communication among people and in the improvement of the organizational climate;	1	2	3	4	5	6	7	8	9	10
	b. in the information transmission of one person to another person; without exchange.	1	2	3	4	5	6	7	8	9	10
DESCRIPTION The company makes analysis by market research (satisfaction, competition, etc.);	c. in the information exchange between two or more individuals each other;	1	2	3	4	5	6	7	8	9	10
	d. in the incentive of individuals for more information about a topic;	1	2	3	4	5	6	7	8	9	10
	e. in the search , that possibility higher knowledge about a topic;	1	2	3	4	5	6	7	8	9	10
	f. in creativity , the creation, the desire to innovate.	1	2	3	4	5	6	7	8	9	10
	g. in innovation , in practice, new something (process, product or service);	1	2	3	4	5	6	7	8	9	10
	h. in achieving of good results from innovation application;	1	2	3	4	5	6	7	8	9	10
	i. in maintaining of good results, in a new culture based on innovation.	1	2	3	4	5	6	7	8	9	10

The same questionnaire is indicated by any enterprise, sector or segment that wants to use the IGP, it (enterprise) responsible by the listing of practices according to own reality.

6. APPLYING DATA ANALYSIS TO THE IGP

With the listing of practices by the enterprise, and after application of questionnaire, it will be necessary do the tab and data analysis. It proposes that enterprises adjust the questionnaire according to their reality and need. It is possible that they ask to the respondents other information as: the importance and frequency of each practice, or yet, indication by respondents of new practices that are not present in questionnaire, etc.

For analysis, the answers must be grouped, considering a large number of practices, which facilitate the process of results comprehension. The same grouping must be done with each one of the practices listed by company, helping the analysis, and, enabling that they can be observed in a single database. At this moment, the analysis takes over the objectives of this study in order to analyze in which stage of the Innovation Generation Process is each practice.

To achieve these results, firstly it was proposed an application simple model of data analysis and it indicated for any enterprise's manager, so, it will be possible available by enterprises with smaller or larger statistical potential.

How first basis, it is indicated to calculate the mean of all scores for each practice in each one of the nine variables (situational). Each practice had nine situational variables, totaling nine means for each practice, so, if they were listed, for example, ten practices for the enterprise, so, there will be nine (9 variables) x 10 (practices), equal to 90 means, each mean relative to one variable.

Considering that this is a study indicated, rather for micro and small enterprises, it is difficult to obtain so many variables, and so, to obtain normality is difficult too. So, it will be acceptable to the lack of data normality.

After means computation, it must obtain the three highest situational variables of each practice, they indicate, which levels of IGP is indicated for each practice, for example, if the **Market Analysis** practice indicated that its highest variables: Communication, transmission and exchange, so, it understands up that, this practice is indicated on the first levels of the Innovation Process, which it is a **primary** practice.

if data show very close means, it is possible calculate Standard Deviation (SD) of each Situational variable. The SD indicates as a measure the dispersion of a data set form its mean. It is the square root of variance.

After the SD, it is possible observe three smaller SD in relation to three highest means, so, the situational variables indicate are that variable with the highest Mean and the smaller SD.

To better observe this relation it is possible make a scatter plot, furthermore, it is possible estimate the difference between Mean and SD. Through the difference between them, it is obtained the **Relative Amplitude**. These three highest **amplitudes** indicate the variables more applied for each practice. So:

$$\text{Mean} - \text{SD} = \text{Amplitude}$$

Calculate 3 highest Means – 3 smaller SD = 3 HIGHEST AMPLITUDES

Amplitude = best variable for each practice

The example can demonstrate the selections of variable by the amplitude calculate:

Table 03 – Amplitude

Variables	PR1	PR2	PR9	PR12
Communication	6.53	6.416	3.564	3.928
Transmission	6.446	6.377	4.372	3.776
Exchange	6.67	6.353	5.282	3.687
Incentive	6.355	4.419	5.823	3.861
Search	6.605	3.43	6.802	3.862
Creativity	6.284	2.754	5.679	3.779
Innovation	5.98	2.937	5.603	4.828
Results	6.607	3.991	5.395	5.658
New Culture	5.406	3.596	4.947	5.199
Highest	6.67	6.416	6.802	5.658
2nd highest	6.607	6.377	5.823	5.199
3rd highest	6.605	6.353	5.679	4.828

From example is possible indicate that each practice would passivity a different analysis, the practice1 (PR01) for example, it would be indicated as a Dispersed practice, because, it does not have a homogeneous distribution. On other hand, the practices 02, 09 and 12 would be **primary practice**, **central practice** and, **superior practice**, respectively.

So, the practice Notes / Tickets (PR02) could be considered a **primary practice**, in other words, it is indicate to the beginning of Innovation process; the practice consulting (09) would be a central practice, indicated for companies that have already started the innovation

process, but they did not have already results. Finally, the practice Developing/application of new project (12) is indicated by enterprises that have maturity in the innovation process, in other words, companies that have experience in the IGP.

So, it is possible indicate four types of practices: **Primary, Central, Superior and Dispersed**. This latter is as a wildcard in the process, it is been for every moment.

So, primary practices are indicated for enterprises in the started of the innovation process; superiors practices are indicated for enterprises that have already had maturity in KM practices and innovation. Finally, dispersed and central practices are generally indicated for enterprises with an intermediated maturity level.

6.1. The abstract of Construct IGP and finals considerations

With the construct, the company must not waste time looking for best ideas for application, but, it must apply the practices that consider the most important and indicated to its own reality. So it may develop other practices add them to IGP.

So, the IGP is not a model, but a fast and flexible practice for the company. For the IGP application it is necessary observe some steps: a) listing of indicated practices for specific company or segment and adequacy to the questionnaire; b) questionnaire application with the largest number of employees, of every hierarchical levels; c) data tabulation; d) analysis and application of the practices by stages of process that it wants to achieve, gradually.

Table 04 – IGP resume

STEPS TO IGP APPLICATION	
Practices listing for the specific segment	As at this study, it is necessary search practices have already validated by authors or even , practices have already used by enterprise.
Questionnaire application	Applying the highest number of respondents, of all possible hierarchical levels, keeping the personal information confidentiality.
Data tabulation	Using of statistic softwares or auxiliary softwares as Microsoft Excel.
Amplitude Analysis	Calculating the difference between mean and SD of each variable of each practice. Observing the three highest results (Amplitude).
Practices classification	Allocating each practice in its respective Stage and Level according to its classification: Primary, Central, Superior or Dispersed.
IGP utilization – Using the practices continually and gradual, incorporating firstly primary practices to enterprise and so successively to the superior practices, according to maturity level obtained..	

Source: Surveyed data, 2014.

IGP is a flexible construct that allows the applicability in other companies or segments. However, it is necessary some requires are observed. The flexibility is in the listing of knowledge management practices, indicated for determined sector. The manager must apply with the highest number of respondents.

5. CONCLUSIONS

From this theoretical search, it was observed that knowledge is the basis for innovation, and, at this least can not develop without knowledge. The Knowledge management practices are the best statements of the knowledge maintenance, dissemination and application in enterprises.

However, it is necessary observe that, not all practices can be allocated for any segment, but, some practices are for specific segments, while, many of them are universal, as the practice *informal conversations*.

On this way, the practices and the questionnaire development was an example for application in any company. The perception of companies' maturity must be evaluated by companies. It is indicated the practices application according to enterprise necessity. Similar, primary practices must be apply before the superior practices.

These superior practices are indicated when there is a high level of maturity by the enterprise, and, it is important the acceptance by everybody in the company and still a good knowledge about the consequences of each practice.

It remembers yet that, IGP is the incorporation of the practices to the process, in summary, continuously. There are no result in long-term without a cyclic practice application. The primary practices are responsible by immediate results. Superior practices (alone) are also responsible by immediate results. Just in a cycle it is possible obtain results in long-term and with the the commitment of everyone.

REFERENCES

- ABOU-ZEID, El-Sayed; CHENG, Qianzhen. *The effectiveness of innovation*. Vol. 8, N°. 3pages. 261–274, 2004.
- BARBIERI, José. C. **Organizações inovadoras sustentáveis: uma reflexão sobre o futuro das organizações**. São Paulo, Atlas, 2007.
- BATISTA, F. F. **Gestão do Conhecimento na administração pública**. Texto para discussão n°. 1095, 2004.
- BERGERON, Bryan. *Essential of knowledge management*. 2003, Wiley editor, digital edition.
- BESSANT, John; TIDD, Joe. **Inovação e empreendedorismo**. Porto Alegre: Bookman, 2009.
- COSTA, Eliezer A. da. **Gestão estratégica: construindo o futuro de sua empresa**. 1ª ed. São Paulo: Saraiva, 2012.
- COOPER, D.R.; SCHINDLER, P.S. **Métodos de pesquisa em administração**. 7ª ed. São Paulo: Bookman 2001.
- DALKIR, Kimiz. *Knowledge management in theory and practice*. Versão digital, Boston: Elsevier, 2005.
- DAVENPORT, Thomas; PRUSAK, Laurance. **Conhecimento empresarial**. Rio de Janeiro: Campus; São Paulo: Publifolha, 1999.
- DE BRÚM, Caroline (org). *ABC of knowledge management*. NHS National Library for Health, 2005.
- FLYNN, Michael. *Et al. Idea management for organisational innovation*. International Journal of Innovation Management. Vol. 7, N°. 4, pages (417–442), 2003
- FONTANI, J.I.C. **Fatores e mecanismos associados à inovação incremental em processos no ambiente industrial: o caso da café Iguaçu**. 185 f. Thesis of marster's degree Centro Federal de Educação Tecnológica – Ponta Grossa, 2005.
- GIL, Antônio C. **Métodos e técnicas de pesquisa social**. São Paulo: Atlas S.A, 2006.

- KUNIYOSHI, Márcio S. **Institucionalização da Gestão do Conhecimento: um estudo das Práticas gerenciais e suas contribuições para o poder de competição das empresas do setor elétrico-eletrônico.** São Paulo, 2008.
- NONAKA, Ikujiro; TAKEUCHI, Hirotaka. **Criação do conhecimento na empresa.** Rio de Janeiro: Elsevier (Campus), 1997.
- OSLO MANUAL, *Guide lines for collecting and interpreting innovation data.* 3ª ed. 2005.
- POLANYI, Michael. *The tacit dimension.* [Versão digital] London and Chicago: Chicago Press, 2009.
- PROBST, G.; RAUB, S.; ROMHARDT, K. **Gestão do Conhecimento – Os elementos construtivos do sucesso.** Porto Alegre: Bookman, 2002.
- SANTIAGO Jr. José R. S. **Gestão do conhecimento: a chave para o sucesso empresarial.** São Paulo: Novatec, 2004.
- SCHUMPETER, Joseph A.A **teoria do desenvolvimento econômico.** São Paulo: NovaCultural, 1988.
- STRAUHS, Faimara do R.*et al.* **Gestão do conhecimento nas organizações.** Curitiba: Aymarã Educação, 2012.
- TAKEUCHI, Hirotaka; NONAKA, Ikujiro. **Gestão do conhecimento.** Porto Alegre, RS: Bookman, 2008.
- TERRA, José C.C. **Gestão do conhecimento: O grande desafio empresarial.** Rio de Janeiro: Elsevier, 2005.
- URIATE Jr. Filemon A. *Introduction to knowledge management.* Livro digital. ISBN No. 978 - 979 - 19684 - 0 – 9, Indonésia, 2008.