A SYSTEMIC GRC MATURITY MODEL

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ABSTRACT

This paper proposes a systemic model that will enable organizations to diagnose the state of maturity of its Governance, Risk and Compliance (GRC), from the perspective of the alignment and integration of processes. For its development it was necessary to conduct a thorough study of the concepts of GRC, identify the common elements that lead to their integration and their measurement, and understand the conceptual framework of Systems Theory and its relationship to the processes of organizational development.

The research to validate the model is based on a constructivist paradigm using a qualitative methodology. The state of maturity of GRC is diagnosed based on the perception of the alignment and integration of processes by different observers. The instrument designed to measure this perception was a survey of a representative number of people belonging to different functional areas within the organization. To determine a single measurement of the perception of the state of maturity of GRC, a triangulation process relied on quantitative methods was performed.

As a result of this research it is presented the conceptual definition of GRC maturity as an emergent property of the organization, which arises as a result of the alignment and integration of GRC processes. This definition is operationalized by defining a function that measures systemic GRC maturity depending on the degree of alignment and integration of processes. This function is implemented on an instrument that allows measurement of GRC maturity.

Keywords: GRC, Maturity Model, Systems Theory, Viable System Model

INTRODUCTION

Governance, risk management, and compliance (GRC) are disciplines that have been handled in isolation within organizations. To Kark, Othersen, & McClean (2007), Governance is the definition of the decision structures, processes, and communication mechanisms that will enable the organization to support the business objectives and make an efficient and consistent monitoring progress in meeting business' obligations. Basically, Governance determines how decisions are made, who makes them, who is accountable for them, and who measure and monitor their results. Enterprise risk management is a process, effected by an entity´s board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives (COSO, September 2004). Compliance is a system of policies and controls that organizations

adopt to prevent violations of the law and to ensure that external authorities are taking measures to stop violations of the law (Baer, September 2009).

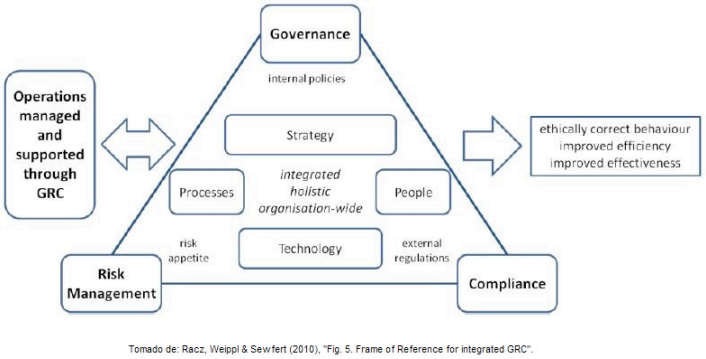
Traditional GRC maturity models focus primarily on process management rating them on one of the following levels within a hierarchy:

- Unconscious or ad-hoc
- Fragmented or isolated
- Integrated or unified
- Lined or automated
- Optimized

These models do not consider among the factors to measure maturity, integration between processes, and their alignment towards achieving the objectives of the organization. In this paper a systemic model of maturity that will enable organizations to diagnose the state of maturity of its GRC, from the perspective of the alignment and integration of processes is proposed.

GRC SCIENTIFIC DEFINITION

Racz, Weippl & Sewfert (2010) define GRC as an integrated and holistic approach to the organization's governance, risk, and compliance, to ensure its ethical behavior, according to its risk appetite, internal policies, and external regulations, by aligning its strategy, process, technology, and people. This definition proposes a high level process model that shows how Governance, Risk and Compliance processes are related and integrated, based on their common elements.

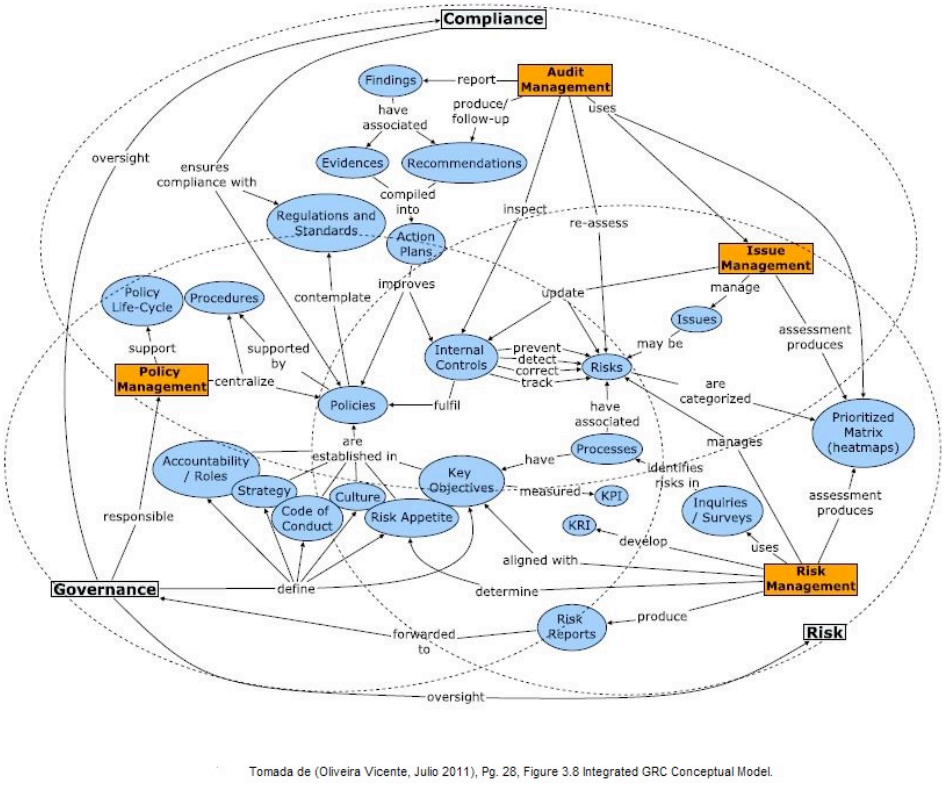


Tomado de: Racz, Weippl & Sewfert (2010), "Fig. 5. Frame of Reference for integrated GRC".

Figure 1. Racz, Weippl & Sewfert's Model

Vicente & Mira da Silva (2011) models GRC as domains whose integration is described around audits, policies, issues and risks, and their integration points: internal controls,

risks, process, key objectives, and policies. The information on the integration points is commonly the one that is managed simultaneously on different organization areas. This is a reference model useful to understand GRC and the integration of its elements.



Tomada de (Oliveira Vicente, Julio 2011), Pg. 28, Figure 3.8 Integrated GRC Conceptual Model.

Figure 2. Vicente & Mira da Silva's Model

Governance, risk management, and compliance (GRC) are disciplines that have been handled in isolation within organizations. To Kark, Othersen, & McClean (2007), Governance is the definition of the decision structures, processes, and communication mechanisms that will enable the organization to support the business objectives and make an efficient and consistent monitoring progress in meeting business' obligations. Basically, Governance determines how decisions are made, who makes them, who is accountable for them, and who measure and monitor their results. Enterprise risk management is a process, effected by an entity´s board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives (COSO, September 2004). Compliance is a system of policies and controls that organizations adopt to prevent violations of the law and to ensure that external authorities are taking measures to stop violations of the law (Baer, September 2009).

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GRC FRAMEWORKS

The systemic GRC maturity model is constructed using two frameworks, the GRC Capability Model, developed by "The Open Compliance and Ethics Group" (OCEG, 2009), and the model developed by Vicente & Mira da Silva (2011). The first model describes the practices to implement and manage GRC activities. The second one is used to reach a common language to understand the integration universe of GRC.
The conceptual GRC integration model defines the area of influence of three domains (Governance, Risk, and Compliance), and the relationships into each one (Vicente & Mira da Silva, 2011). The common elements into each domain are policies, internal controls, processes, risks, and key objectives. The level of integration among those common elements determines the level of maturity of GRC into the organization.

CONCEPTUAL DEFINITION OF GRC MATURITY

Conceptually, GRC Maturity can be defined as an emergent property of the organization, which arises as a result of the alignment and integration of GRC processes. Norbert Fenzl (2003) defines an emergent property of a system as one which cannot be deduced or previously observed as a functional characteristic of a system. In its conceptual reference model GRC, Pedro Vicente and Miguel Mira da Silva, identified four main features of GRC (Audit Management, Policy, and Risk of Incident). GRC processes are those processes of the organization through which those functions are implemented.

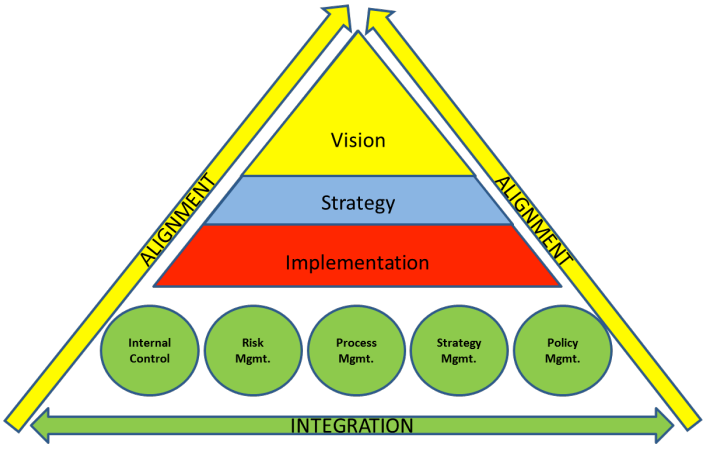

Figure 3. Conceptual Foundations of GRC Maturity Model

The proposed model is based on a systemic conceptualization of organizations. Following systemic organization concept formulated by Fuenmayor (2001), the vision of the organization defines its purpose, around which different activities are orchestrated. A holistic vision, in addition to considering the environment, takes into account the relationships between the elements of the organization that are being analyzed. In a traditional management model of command-and-control, vision of the organization is set to the highest hierarchical levels, and implemented at lower levels. Under the VSM model, derived from biological systems, in which the hierarchy is replaced by structural recursion, the vision of the organization is established from the simplest to the most complex structures, guiding their self-organization and self-regulation.

Figure 4 shows the GRC Maturity Model from the point of view of the VSM. Under the VSM model, the strategic thinking of the organization relates vision information to existing capabilities and operational requirements. This interrelationship tries to identify the strategies that the organization should follow to ensure their survival in the midst of a world of constant change. Survival is achieved by integrating operational elements into a cohesive whole, so that the total system performance is greater than the sum of its parts working independently (Millar, 2009).

The first element in a systemic approach to the development of a strategy is that it has to operate on multiple levels simultaneously. It must be able to reconcile different interests of different parts of the organization. This requires a set of conversations between levels so that each management team can verify the consistency of their proposals with the rest of the organization. Based on those conversations, each management team can modify their own plans, influence others and generate an appropriate strategy for their area of influence into the organization, but that is also consistent with the rest of the organization.

A strategic decision process begins with the assessment of the current state, the decision of the future state, and the planning of how to get to the future state from the current state. Within the VSM model the assessment of the current state is performed within the

System 3 (Cohesion), while the decision of the future is performed within the System 4 (Intelligence). A successful process of strategic decision making requires a debate between those two elements. These debates are monitored and balanced by System 5 (Policy). The process of strategic decision making seeks to identify the "strategic gap" between what is currently done and what has been identified to be done in the future. This process opens and closes the strategic gap to lead the organization in a continuous evolution and adaptation over time. The System 3 (Cohesion) is responsible for closing the gap, while the System 4 (Intelligence) is responsible for opening it (Hoverstadt, 2008).

The implementation is modeled within the System 1 (Implementation) of VSM. The implementation includes the primary activities that the organization forward to deliver value to its external customers, as opposed to support activities that are performed to keep the organization running. Primary activities are broken down into sub-activities according to four concepts of complexity: technology, geography, customers, or time. The activities are structured according to the technology if the organization aims at producing different products. Geography guide the structure of the organization if its production has a geographic differentiation involving the formation of different teams located in different geographical locations. Customers guide the organization structure if its goal is guided by the same individual characteristics such as the size of their accounts. Time guide the structure of the organization if it is oriented to the continuity of production or service provision (Hoverstadt, 2008).

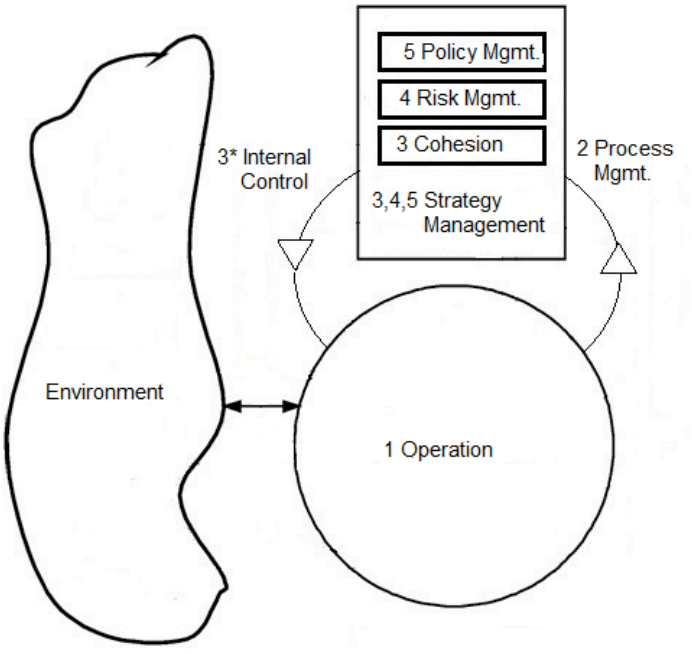

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Figure 4. Viable GRC Maturity Model

Regarding the integration points of Vicente & Miguel da Silva´s model (Internal Controls, Risk, Processes, Key Objectives, and Policies), which form the conceptual basis of this GRC Maturity Model, these are also mapped for the Viable System Model, as can be seen in Figure 4.

OPERATIONAL DEFINITION OF GRC MATURITY

Operationally, the GRC Maturity is measured by the degree of alignment and integration of processes. The degree of alignment measures how much processes are guided by the same vision of GRC, support strategies oriented to the realization of that vision, and operationalize the implementation of these strategies. The degree of integration, in turn, is measured on the relationships between the elements of the organization: people, processes and technologies (people that is running processes which are leveraged on technologies). Given that these three elements guided by a vision are implementing the GRC strategy, the degree of integration between them is measured on three levels, the vision, the strategy and implementation.

Under the VSM model, the elements of the organization (people, processes and technology) are recursively structured, from the simplest to the most complex structures: from people to groups, from task to processes, from components to technological systems. On the same way the vision is established, serving as a guide to self-organization and self-regulation in response to changes in the external environment and internal capabilities (Espejo & Harnden, 1989). The strategy is the result of a decision making process oriented to take the organization from a current state to a desired future state. The strategy comes as a product of different conversations at different levels of the organization.

To the extent that in any process of the organization are carried out in an integrated manner the key activities of GRC (Internal Control, Risk Management, Process Management, Strategic Management, and Policy Management), and that such activities are oriented by the vision of GRC, support the GRC strategy and operationalize it, we can say that there is a certain level of maturity of GRC in the organization. To determine the level of maturity of GRC in the organization, it should then perform two measurements: the alignment and integration of processes.

The GRC maturity level can be measured in any process of the organization. If this measurement can be made from the simplest to the most complex processes, you can start building a measure of GRC maturity across the organization recursively. It is important to add that the measurement of maturity made of any process or set of processes in the organization is a current view of the same, which may improve or not depending on the process itself throughout its existence. It is not a static measure, but a view in a moment of time, which requires a statement of the organization's sustainability if you want the results improve.

METHOD OF MEASURING GRC MATURITY

GRC Maturity is defined as an emergent property of the organization, which arises as a result of the alignment and integration of GRC processes. The operational definition states that GRC Maturity is measured by the degree of alignment and integration of processes. The proposed method should consider the systemic connotation of the concept to be measured, and also the relationship between GRC Maturity and the alignment and integration of GRC processes. GRC Maturity (MGRC) can be formulated as a systemic function in terms of the levels of alignment (AL) and integration (IN) of the process.

$$mGRC = m_s\ (AL, IN).$$

The level of alignment shows if processes are guided by the same vision of GRC, support strategies oriented to the realization of that vision, and operationalizes the implementation of these strategies. These three characteristics are presented to the extent that a process including activities of the Internal Control, Risk Management, Process Management, Strategic Management, and Policy Management, which are guided by the vision of GRC, support strategies to realize this vision and operationalize the implementation of these strategies.

Measuring the alignment level (AL) is done by evaluating the existence of activities of Internal Control (CIN), Risk Management (ERM), Business Process Management (GPR), Strategic Management (GES), and Policy Management (GPL), in the organization processes.

$$AL = f\ (CIN, GRI, GPR, GES, GPL)$$

- CIN: Organization processes include internal control activities.
- GRI: Organization processes include Risk Management activities.
- GPR: Organization processes include Process Management activities.
- GES: Organization processes include Strategic Management activities.
- GPL: Organization processes include activities Policy Management.

Given that there are several elements that define the alignment of GRC organization processes, its measurement is proposed to use a method to integrate the perception of compliance with each of the conditions for alignment.

Likert scale (1932), can investigate how much people are or are not in accordance with a concept. The measurement is performed on each item on a range of ordinal values generally ranging from 1 to 5 (1 - Strongly Disagree, 2 - Disagree, 3 - Neutral, 4 - Agree 5 - Strongly Agree). This scale allows the measurement of various items, which provide a higher level of reliability that a measurement is made on a single item. When measurement is performed on several items, the final value is the sum or the average of the measurements of the individual items. This setting switches the ordinal scale for each

item, to an interval scale of final value, on which you can apply descriptive statistics and correlation analysis, factor, or variance (Brown, March 2011 15 (1)).

With a range of 1 to 5 on the Likert scale, a measurement for each of the items is generated.

- LCIN [1,5]: Level of perceived inclusion of internal control activities within the processes of the organization.
- LGRI [1,5]: Level of perceived inclusion of risk management activities within the processes of the organization.
- LGPR [1,5]: Level of perceived inclusion of process management activities within the processes of the organization.
- LGES [1,5]: Level of perception of activities including strategic management processes within the organization.
- LGPL [1,5]: Level of perception of activities including policy management processes within the organization.

Alignment level is then defined as the sum of the measurements of the Liket´s items Internal Control, Risk Management, Process Management, Strategic Management and Policy Management. The range of values that can take the AL function is [5.25], taking into account that the minimum value of each of the 5-item Likert LXXX is 1 and the maximum is 5.

$$AL\ [5,25] = f\ (CIN, GRI, GPR, GES, GPL) = LCIN + LGRI + LGPR + LGES + LGPL$$

The level of integration (IN), meanwhile, is measured in terms of the levels of simplification (S) and connectivity (C) of the external and internal processes (SPI, CPI) and (SPE, CPE).

$$IN = g\ (SPI, CPI, SPE, CPE)$$

Compliance with the constructs used by Chen, Daugherty and Roath (2009) to define the simplification and connectivity is then evaluated in the areas of the organization.
Internal Processes Connectivity (CPI):

- CPI1: Appointment of persons with special skills to coordinate internal processes.
- CPI2: Developing a common goal to align the efforts of all the processes, and to establish specific objectives for each process.
- CPI3: Ensuring compatibility between all relevant internal processes.
- CPI4: Use common rules for all internal processes so that they can be linked without problems.
- CPI5: Timely communication of information on specific internal processes to facilitate related processes.

Internal Processes Simplification (SPI):

- SPI1: Simplifying the operation of its internal processes.
- SPI2: Simplifying the design of products and services as a means to reduce the complexity of the processes, but without sacrificing the functionality of products and services.
- SPI3: Periodic evaluation of activities in the internal processes running redundantly in different areas.
- SPI4: Reducing unnecessary steps in the internal processes.
- SPI5: Reducing the number of employees performing the same tasks in different areas.

External Process Connectivity (CPE):

- CPE1: The organization with its major customers and suppliers discuss the processes that frame their business operations when carrying out strategic planning.
- CPE2: The organization with its major customers and suppliers define common goals to align the efforts of the processes that frame their business operations.
- CPE3: The organization with its major customers and suppliers ensure compatibility between the processes that frame their business operations.
- CPE4: The organization with its major customers and suppliers use common standards to link (join, connect) smooth processes that frame their business operations.
- CPE5: The organization with its major customers and suppliers share information in a timely manner to facilitate the development of processes that frame their business operations.

External Process Simplification (SPE):

- SPE1: The organization with its major customers and suppliers work together to redesign work processes and routines that frame their business operations, in order to simplify them.
- SPE2: The organization with its major customers and suppliers work together to reduce the complexity of their business operations.
- SPE3: The organization with its major customers and suppliers work together to reduce the complexity of their distribution channels.

- SPE4: The organization with its major customers and suppliers periodically evaluate whether they have redundant activities within the processes that frame their business operations.
- SPE5: The organization with its major customers and suppliers use a supplier certification program with the aim to reduce and if possible eliminate own inspection processes , counting and verification in the release and receipt of the goods or services delivered or received.

Given that there are several elements that define the integration of GRC processes of the organization, for its measurement it is proposed to use a method to integrate the perception of compliance with each of the conditions for alignment. As with the measurement of the alignment of organizational processes, the suggested method is the Likert Scale. The range of values that can take the IN function is [20,100], considering that the minimum value of each of the 20 items Likert Lyyyy is 1 and the maximum is 5.5.

$$IN\ [20,100] = g\ (SPI, CPI, SPE, CPE) =$$
$$LSPI1 + LSPI2 + LSPI3 + LSPI4 + LSPI5 + LCPI1 + LCPI2 + LCPI3 + LCPI4 + LCPI5 + LSPE1 + LSPE2 + LSPE3 + LSPE4 + LSPE5 + LCPE1 + LCPE2 + LCPE3 + LCPE4 + LCPE5$$

The initial formulation of GRC Maturity (MGRC) as a systemic function in terms of the levels of alignment (AL) and integration (IN) of the process can be rewritten:

$$mGRC = ms\ (AL, IN)$$
$$mGRC = ms\ (f\ (CIN, GRI, GPR, GES, GPL), g\ (SPI, CPI, SPE, CPE))$$

The proposed theoretical model suggests that the level of maturity of GRC is given in terms of the level of alignment and integration of processes. There are many factors that determine these levels, some of which have been considered in the formulation of the functions that measure them. It is proposed to consider a function that measures the correlation between the alignment level and the integration level as a means to measure the GRC maturity level.

In correlation studies, researchers obtain measurements of two variables and using these measurements to calculate a correlation coefficient. The variables are usually selected based on theory, research, or any experience that suggests a relationship between them. It should be noted that the correlation does not infer causality. It can be concluded that a relationship between two variables X and Y may be high, but there is no way to determine whether X causes Y, or if Y causes X, since there are many other variables that may be affecting the relationship between X and Y (McMillan & Schumacher, 1997). This is the case presented in this research, which does not seek to determine a causal link between the level of alignment and the level of integration processes, but to measure GRC maturity as the degree to which these two variables correlate.

As the correlation coefficient (r) is expressed in decimal numbers between -1 and 1, it is easy to confuse a value with decimal percentages. The coefficient is a mathematical way of expressing the degree to which there is a covariance between any two variables, not so much the degree to which the variables share properties or characteristics. To obtain an estimate of the proportion of variance that two measures share or have in common, the coefficient must be squared. For example, a correlation of 0.4 indicates that the variables are a 16% variance in common, leaving 84% unexplained or without prediction. A high correlation value of 0.80 shows only 64% variance in common, being 100% the perfect variance value. The index calculated by squaring the correlation coefficient is called determination coefficient (McMillan & Schumacher, 1997). As the coefficient of determination (r^2) is a more accurate measure of the relationship between the variances of two variables, it is considered more appropriate to use this ratio as systemic function intended to measure the degree of maturity of GRC in the organization.

$$mGRC = r^2 (AL, IN)$$

MODEL APPLICATION AND VALIDATION

The organization selected to implement and validate the GRC systemic maturity model and perform the measurement of the level of maturity of GRC requested to comply with a confidentiality agreement that restricts the publication of its identity. This organization has a unique nature in Colombia. Its highest governing body is a board of directors, responsible for the management and execution of the functions of the organization. The unique nature of this organization, its commitment to excellence, transparency and sustainability, the particular characteristics of its corporate governance, aimed at strengthening their risk management and process management initiatives, and its demanding control framework and accountability, it does an enabling institution to implement and validate the GRC systemic maturity model and to perform the measurement of the level of maturity of GRC.

The instrument designed for validation of the model was a survey which aims to identify, based on the perception of the organization, the degree of alignment of processes with the Vision of the GRC. The degree of alignment is determined by the evidence of the existence in the process of organizing activities that identify integration points GRC model Pedro Vicente and Miguel Look da Silva (Internal Controls, Risk Processes, Key Objectives, Policies). However, the only evidence of the existence of these activities within the processes of the organization is not a determining factor in establishing the degree of maturity of GRC element. These activities should be part of the articulation of a strategy implemented properly in the processes of the organization, according to the conceptual proposal of the three levels of integration of processes and information model Ralf Klischewki (2004), vision, strategy and implementation.

The instrument further seeks to demonstrate the integration of the process by measuring the perception of connectivity and simplicity. With these measurements, the instrument complements the model with elements that show not only the cohesion of the processes

of the organization, but also the consistency between vision, strategy and implementation of GRC management in the organization.

ANALYSIS OF RESULTS

A sample size of 244 people was calculated among the 2,399 employees of the organization throughout the country, based on the statistics made by Bonilla (1988) for the particular case when the population size is known:

$$n = Z2PQN/ ((N-1)E2 + Z2PQ))$$

Z = 1,65	Critical value corresponding to a degree of confidence (90%)
P = 0.5	Population proportion of occurrence of the phenomenon
Q = 0.5	Population proportion of non-occurrence of the phenomenon
N = 2.399	Population size
E = 5%	Maximum allowable sampling error
n = 244	Sample Size

From 377 surveys distributed, 300 responses (80% of the 377 surveys sent, 123% of required sample size of 244) were received. Of the 63 areas of the organization to which surveys were sent, 62 responses (98% of the expected coverage, 91% of the total areas of the organization [68]) were received. In this study, 300 measurements of two variables, alignment and process integration based on the hypothesis that a relationship exists between them were obtained clearly having a relationship to exist it is not necessarily causal. The found values of correlation coefficient (r) and coefficient of determination (r2) were:

$$r = 0,5009$$
$$r2 = 25\%$$

The obtained value of the coefficient of determination r2 indicates that the level of maturity of the organization under study is 25%.

In order to ensure the predictive validity, the results of the instrument must be submitted to the chi-square (x2) test. This test is used to determine whether there is association between two variables in the data from a probability sample, eliminating the possibility that it occurs due to chance. If there is perfect agreement between observed and expected frequencies the statistic will take a value of 0, on the contrary, if there is a large discrepancy between these frequencies the statistic takes a large value and, consequently, reject the null hypothesis (Briones, 2011). The result of applying the chi-square test to 300 measurements of variables alignment and integration of processes was:

$$x2 = 0$$

This confirms that the association between variables of alignment and integration of processes exists. This association is to measure the level of maturity of GRC as a systemic function of these two variables.

CONCLUSIONS

This research was based on systems theory as an epistemological foundation to acquire knowledge of organizational reality as is his level of maturity in the field of Governance, Risk and Compliance (GRC). The Viable System Model (VSM), built based on systems based on cybernetics and systemic thought, has been used as a tool to understand the organization by modeling their reality. The use of VSM led to the development of the concept of GRC Maturity as an emergent property of the organization, which arises as a result of the alignment and integration of GRC processes.

Beyond modeling GRC Maturity, this research raised the need to define a "systemic function" to measure it. Based on the conceptual definition of Maturity of GRC as an emergent property of the organization which arises as a result of the alignment and integration of GRC processes, the determination coefficient (r^2) was introduced as the "systemic function" appropriate to measure it. This coefficient shows the proportion of variance shared by the alignment and the integration, i.e., as the strength of the relationship between the processes of the organization measured in terms of alignment and integration.
Until the development of this research, all maturity models used to diagnose and prescribe the organizations were based on reductionist approaches, focused on the study of the functioning of the parties. The systemic approach undertaken in this research is based on the system and relations between the parties, and how they function as a whole. This approach recognizes the complex, embedded and dynamic modern organizations, nature that is not covered by reductionist approaches.

Traditional measures of maturity are based on the application of questionnaires to a group of experts of the organization. The opinion of this panel is taken for diagnosis and the prescription. With the systems approach, diagnosis is a collective product, which takes into account the perception of the different areas and at different levels of the organization. The diagnostic tool is a perception survey which evaluates the degree of maturity of the organization. Systemic and cybernetic nature of the model on which the instrument is based allows the same can be applied recursively, and is useful for diagnosis at different hierarchical, functional, or even on certain processes of the organization levels.

Maturity is measured as a "systemic function" showing the degree of determination between two variables (the proportion of variance shared by the alignment and integration of process), but not as a causal link, preventing the mistake of trying improve the level of maturity of GRC through actions on "independent variables". The diagnostic model leads the analyst to observe the results of the organization as a whole, and generate recommendations to advance on several coordinated fronts that generate the effect of improvement in the maturity of GRC activities.

Table 1 summarizes the emergent result of this research, contrasting the essence of traditional maturity models grounded in reductionist approach and the essence of the proposed maturity model grounded in the systems approach. The answers to questions such as "What the maturity model focuses?", "What is maturity?", "What measures the maturity model?", "How is maturity measured?", and some assumptions of measurement, generate a corollary of this research, which provides organizations a complementary approach that will allow a more precise targeting toward reaching their goals and achieving their objectives.

Table 1. Emerging Outcome Research

	MATURITY	
	Reductionist approach	Systems approach
What is the focus of the maturity model?	Process performance	Process relationships
What is maturity?	An State	An emergent property
What measures the maturity model?	Process capacity and performance	Strength of process relations
How is maturity measured?	Level	Tendency
Some assumptions of the measurement	There is a causal relationship between variables	There is a corelation between variables

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