MODEL FOR TRUST WITHIN INFORMATION TECHNOLOGY MANAGEMENT

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Abstract: This work presents a model for applying the concept of trust in the management of information technology. It presents relevant aspects on the application of trust within IT Management and focuses on the necessity of aligning a trust model with the organizational strategies and main activities. The impacts of trust in IT management are described and related to recent studies on the reduction of risks in business-oriented IT management. In this context, the model presented in this paper is based on the understanding trust indicators are highly desirable to IT management, as long as they are measured and controlled, and used as a means for IT management to acquire greater effectiveness in its alignment to general organizational and business strategy.

1 INTRODUCTION

The environment in which organizations are inserted is noticed as more and more globalized and competitive. For acting optimally in their business areas, these organisations need trustworthy information and updated knowledge, finding in the Information Technology (IT) a vehicle to add value to products and services.

A business performance factor that is not controlled cannot be managed. In consequence, a premise for IT management is the need for controlling specific factors in order to manage IT efficiently. Management experience positive impacts from a series of factors. The present article focuses in one of them, the concept of trust, trying to better know it, by treating trust related models and mechanisms with the focal point in their use for the evaluation of trust levels in the several areas of IT management.

Although trust has been studied for decades in various domains, one can nowadays consider that a major interest exists in the analysis of its meaning and its application by empirical and theoretical methods. The technological development associated to globalization created the need for interaction among people and organizations geographically apart, which added interest to formal and actual relationships governed at least partially by trust.

2 THE CONCEPT OF TRUST

Many authors consider trust as an essential component of relationships in multiple fields of activities, for the optimization of the real interaction between the entity or the person rendering some service and the beneficiaries or users of this service. Mayer et al consider trust to be important in many areas (Mayer et al, 1995), such as: communications, leadership, objective-targeted administration, negotiation, game theory, performance recognition, work relations and implementation of self-managed working groups. Due to this ample employment, in situations in which it is necessary to establish the understanding and definition of trust, the possibility of appearance of conflicting interpretations is observed, giving way to the absence of clear principles related to trust. Kee et al, 1999, coherent with this finding, affirms that "trust is becoming more and more important, but no one knows yet what really it means".

Sociologist Diego Gambetta establishes that the behavior of being as faithful as possible is a basic principle in a model of human trust, being certain that trust is something extremely subjective and difficult (practically impossible) to get a standard definition (Gambeta, 1988). In a relation between two agents there is no guarantee of reciprocity in the degree of trust between both, since each one may trust the other in a distinct dosage. The decision to start or not some interaction with another agent depends on the level of trust established between the parts, on the context and on the risk involved.

As a result of that difficulty, trust is many times defined in a more specialized manner and is directed toward the area of interest of the researcher. Fukuyama (Fukuyama, 1996), for example, relates trust and contemporary society, trust and social systems (Luftman, 1999). Proceeding on specialization, Pillatt highlights that a definition of trust is used and assumed, within the environment of e-business, turned, in a very specific manner, toward topics such as authentication and ability to the payment of requested products and/or services. However, this type of definition is quite restricted to the measurement of the trust regarding the relationship with the purchaser and does not support the measurement of trust of the other transactional entities involved in the negotiation (Pillat, 2002). Manchala tries to see trust in a more generic way, measuring it based on the transaction as a whole and not in some specific parameters of an entity (Manchala, 1999, 2000). In this in case, information referring to all the entities participating in the transaction and in the product/service negotiated are abstracted, serving as a basis for a more generic measurement of trust.

When searching a wider concept, based in objectives, approaching aspects related to honesty, competence and trustfulness, it exceeds the borders of the term itself and involves parameters that may easily become related to terms such as authorization, authentication, validation and others. It is truth that these terms could be used interchangeably as affirmed by Grandison and Sloman, when considering authorization to be the result of the refinement of a reliable relationship, that is, the delegation of access rights for a transactional entity to play specific actions in a specific target, and authentication as being the verification of the identity of an entity, which can be played by means of a password, trustworthy services of authentication or through certificates (Grandison and Sloman, 2000).

Jones adds that trust is defined by the European Commission Joint Research Centre as being "the property of a business relationship so that credit can be given to the business partners and to the transactions played with them" (Jones, 1999).

Thus, it is possible to verify that the definitions at times tend to interpersonal relationships, at other times to business and service rendering, being capable of quantifying levels of trust, opening a wide range of research areas, approaching a number of nuances of the Human as well as the Exact Sciences.

2.1 Trust Types

The wide range of trust takes us to dividing, according to the area of application and in accordance with the distinct definitions, the relationships facilitated and taken to relevant levels of interaction based on interpersonal trust, inter-institutional trust and person/institution trust. (Grassi, 2004), configuring an interesting approach to the objectives of this work, specifies that, according to (Lyons and Mehta, 1997), trust is a matter of degree, going from complete trust to its complete absence, where the opportunist behavior will be the rule. These authors analyze the role of trust in facilitating efficient exchange relations, considering the approach of two distinct mechanisms that give support to trust, the socially-oriented trust and the self-interested trust.

The socially-oriented trust considers aspects of the past backward-looking, when analyzing the social mechanisms carried out by the community of individuals who, intentionally or inadvertently, support trust and its consequences. (Dogson, 1993) calls this vision of trust goodwill trust, where the recognition that behavior is located inside a social arena leads to the notion of trust for an orientation based on norms; the social relations are experienced in certain normative ways, or mutually understood.

The self-interested trust is instrumentally understood, applying the theory of games to shape the interaction between agents whose interests partially conflict and partially converge. Trust comes up as consequence of a careful calculation or the intentional creation of incentives in direct reply to the presence of behavioral risk. The relative costs and benefits of being trustful or trustworthy are measurable, and they are evaluated within the limits of the exchange relation. Therefore, the self-interested trust, in contrast with the previous one, is fundamentally based on future "*forward-looking*", with agents being trustful or trustworthy only up to

the point where they expect such behavior to render some direct return.

3 TRUST FOR IT MANAGEMENT

According to Haes and Van Grembergen (Haes and Van Grembergen, 2005), in academic and professional literature, the articles mentioning governance in their titles, started to appear in 1999, with an article Sambamurthy (Sambamurthy and Smud, 1999) named Arrangements for the Information Technology Management: A Theory of Multiple Contingencies, and, in 2000, with the article The Balanced Scorecard and IT Governance de Van Grembergen, (Van Grembergen, 2000). Thus, they concluded that the concept of management emerged in recent years, what does not mean many of the underlying elements of strategic discussion on the alignment did not attract the attention long ago.

Also, these authors emphasize that, even with the advance of knowledge, it is usual to find organizations where IT is inserted as a single activity, implementing its processes and controlling itself, moving in parallel, without converging to the organizational management. Such procedure hardly contributes to the generation of value in the organization and, on the other hand, almost always leads to a lack of tuning and adjustment between the end-activity and the technological platform that has as purpose to provide a solid base for the qualification of strategic performance.

In this context, limited, hardly controlled actions spread, in which tactics overcomes strategy, in environments where processes and responsibilities are not presented with the desirable definition. With the excuse of fluidity of the competitive world and the urgency of the business, unsatisfied customers, products of poor quality, impacts in the organizational image, and the inevitable income losses are harvested.

The same studies, on the other hand, state that organizations with an IT management adjusted to the business, focused on the adequate treatment of information, have their actions facilitated into taking the opportunities and take less chances in face of potential threats.

With this point of view, Weill and Ross emphasize that IT Management "is implemented by means of a set of mechanisms that if well conceived, well understood and transparent promote desirable behaviors in terms of IT. On the other hand, if the mechanisms are poorly implemented, arrangements for the management will not bring the expected results". (Weill and Ross, 2004).

3.1 Model for Trust within IT Management

The study of trust confirms that it is directly related to the levels of development of the societies and that a society is more of evolved according to the trust on the relationships of the individuals between themselves and between them and the organizations. Robinson and Jackson affirm that trust is related to faith in people, that it is probably linked to the fact that someone will keep his/her word, that is, there is a risk involved, since this word may not be kept (Robinson and Jackson, 2001).

Bacharach and Gambetta affirm that signals exist which are used by individuals to interpret the trustworthiness of the others and, moreover, the repetition or the absence of these signals will, in its incidence, provide mathematical answers, i. e., provide measurement. This way, it is verified that the trust involves risk and can be measured (Bacharach and Gambetta, 2000). Couch adds that there are at least two different scales reliable: "trust in the partner" (in a specific person) and "generalized trust" (in the people in general, the nature human being) (Couch et al, 1996).

These two aspects, measurement and risk, in report to the IT management, for management involves measurement and risk is inherent to IT services. Thus in the application of trust to IT management, the level of the trust, one may see, many important points are considered, for the higher the level of relationship is, the higher the level of relationship and the lower the risk of the IT services, guaranteeing adjusted relationships, efficient communication and easiness in the implementation of necessary adjustments to the conduction of IT in the organizations.

The formalization of the application of the trust in the IT management stimulates the conception and implementation of computational model, that could after be conceived elaboration of the evaluation of the IT management.

For this, parameters will have to be established under which the trust could be evaluated and quantified, being then adjusted the use of topics already consecrated and gifts in mechanisms of support to management and auditing, existing in the market and sought according to main decisions and a prospection carried through in more than two hundred companies, as in the case of the research of Weill and Ross (Weill and Ross, 2004).

For the development of such model, as shown in figure 1, aspects relevant to IT management were used and confirmed on a further check (diagnose), which, together with pertaining trust factors, support the definition of trust management: "It is the activity that designs, evaluates, monitors implants and the appropriate mechanisms to establish decisions structures, processes, alignment of business with IT and media for obtaining the desired behavior, or that can be evaluated as reliable in order to allow the focus of technology in business objectives."
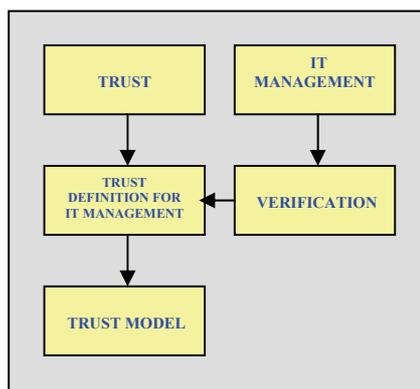
Figure 1: Trust Model Components.

Thus, in the implementation of the model for trust management, the following steps have been established, corresponding to reliable actions:

1. Selecting the parameters or aspects of trust, for the evaluation of trust.

2. Checking the result of the metrics applied IT management, aiming the checking of values obtained and allocated to each aspect of trust.

3. Assessing risk by estimating the risk involved in a particular case based on the information collected and the verification of process through the metrics allocated.

4. Keeping a knowledge base, listing the processes that are in the zone of risk, establishing where they are vulnerable and reporting, in the case of high risk.

3.1.1 Categories and Metrics

As the above aspects are established for the trust evaluation, and to quantify it in the processes of IT management metrics will be used to be able to measure the concept of trust. These metrics focus on each item related to the trust factors, enabling the evaluation by their importance and relevance.

The design of trust in the IT management, notes the importance of the model adoption that will allocate these parameters, which is establish a framework, which allows the analysis and evaluation of the IT processes, listing the points to a vulnerable and inadequate management appropriate and effective.

Amongst the mechanisms related to the management, for what it is considered, they present high relevance to those related to the form as the decisions of IT the adopted methodology are taken to guarantee the alignment IT with the formulated politics, as well as the normative aspects and of communication in the enterprise scope are established.

In that if it relates to the decision taking, verifies that the organizations in formal way or not, they establish a structure to place power to decide responsibilities. In this task the evolvements of business-oriented leaders of IT and as well as the job of types that combine structures of decision taking appears as relevant factors for an efficient management. Amongst the structures the ones exist that proved they generate performance better and others that, for diverse reasons, do not contribute for the efficiency of the activity, fitting to prospectors them for generation of a pertinent and adjusted evaluation to the quantification of the property of its use as facilitators of the management.

For the alignment one is necessary accented adequacy of the administration and the adjustment of IT, of form the one that if constitutes in facilities of the achievement of the enterprise objectives. The alignment is materialized by the adoption of processes that bring in its conception the necessity of compromisers all the involved ones in business and IT. These processes could be evaluated according to its property and, in accordance with the result, to be classified according to its trustworthiness.

Considering a necessary communication for diffusion of the decisions efficiency according to desired, it is verified that despite the simplicity of the understanding of that what it is not communicated, or it is communicated of deficient form, it will not be able to contribute for executions adjusted and focused in the desire of the managers, the adoption of diffusion mechanisms nor always is efficient. To develop adequate strategies of communication becomes a true differential in the cases of success in the enterprise area. These situations, of adequate medias or not, will take the situations of evaluation for referring diagnostic establishment to the trustworthiness of its job and the consequent readjustment, in the case of little

trust, aspect that accented cause impact in the management.

The metric cited ones will be based on band of values instead of an absolute value, providing a bigger flexibility for the implantation of the same ones in some differentiated scenes (small, average and great companies). Being thus, values classified could be used in: (1) low, (2) medium, (3) high, and (4) very high.

3.1.2 Verification of the Result

During model validation, organizations with widely known distinct stages of IT management have been used, so as to provide the design of diagrams with clarifying shapes and indicators of their real stages. For such analysis, six aspects of IT management have been considered, which were represented on figures 2, 3 and 4: I – Planning; II – Organization; III – Implementation; IV – Availability; V – Support; and VI – Control. Each aspect has been subdivided according to their domains, being evaluated by their own metrics.
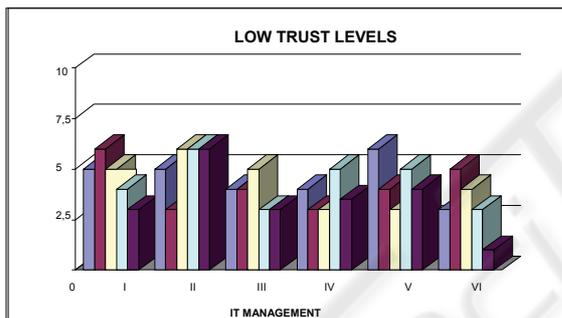
Figure 2: Low Trust Level.

The organizations with low levels of trust, as to figure 2, present the results of the metrics in their totality or, most of those below level five.
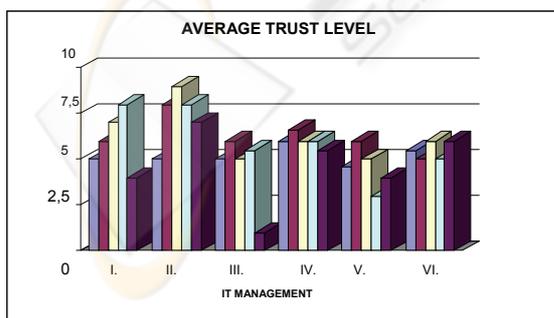
Figure 3: Average Trust Level.

Figure 3 represents the results of metrics in their totality or, most of those between level five and level

seven, which corresponds to organizations with an average trust level.

The third representation, figure 4, refers to the organizations with a high level of trust, for the results of the metrics, in their totality or in its most, is above level seven.
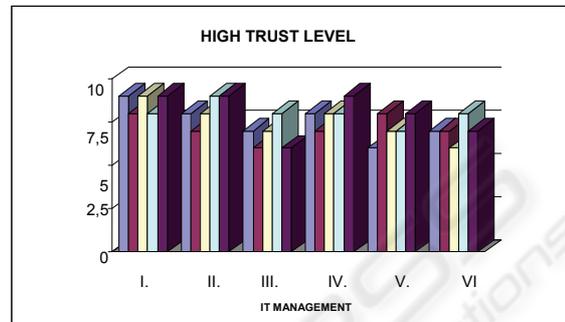
Figure 4: High Trust Level.

All aspects of trust that, after assessment, were found in the risk zone – trust level below level five – have been reported for corrective measures.

The parameters, the actions, the backgrounds will be maintained in a database as useful knowledge for future solutions.

4 CONCLUSIONS

The organizations of all domains, given their needs regarding information treatment, invest in information technology. To attain the objective of using resources to serve the improvement of the operational performance, it becomes necessary to promote integrated actions, in all levels, to respond the necessities of business with the technological support base.

The alignment of the IT Management with the strategy of the organization is of prime importance, for the tactical actions, with limited vision and as solution of immediate or shortly-ranged problems, do not add value and, for being in a less strategic level, do not take us anywhere.

The market already presents quality tools that aim to providing technological solutions, so that information is spread and treatment adjusted in the scope of the organization. The correct agreement of the premises of management and the application of the techniques of alignment and harmonization available will bring as consequence an adjusted and ready organization to take advantage of the opportunities, as well as defend itself of the constant threats that proliferate in the modern environment.

Moreover, a tenacious management supported in pertinent control instruments and a modern organizational culture that the sectorial authoritarianism hinders is necessary, as well as a perfect agreement of the objective traced on the company strategy. The promptness and minor necessities lead to accost demanding management and to unnecessary efforts. The control and accompaniment, implemented in indicators and metrics, bring the guarantee of a safe route and the opportunity of preventive and premature corrections, providing agility, fluidity and trustworthiness.

The trust to be focused in the study of Information Technology Management, moves away from the concepts related to interpersonal relationships, and towards those business-oriented and to the rendering of services, that is, searches rationality leaving aside emotional aspects. Rationality brings implicit the possibility of measurement, of quantification, the possibility of being expressed in numbers.

Thus, in this context, one can infer that the safe route is tied to trust, which shall provide highly desirable results for management, as far as it is controlled and measured. Then, it stops the IT organizations, the creation of an evaluation model for the reliable level in IT management, will make greater effectiveness possible in its alignment with the organizational strategy, and the deepening of research and establishment of new questions in the areas of governance related knowledge, trust and intelligent systems, will be relevant for the scientific community, for stimulating the search of new borders of knowledge.

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