A Knowledge Management and Organizational Intelligence Model for Public Administration

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This study explores the development of a KM-OI model and empirically tests, using structure equation modeling (SEM), nine hypotheses related to the following research questions: RQ1: To what extent does organizational culture impact strategy structure learning with environment and information technology?; RQ2: To what extent does information technology impact learning with environment?; RQ3: To what extent does strategy structure, learning with environment impact policies and practices of KM?; RQ4: To what extent do policies and practices of KM impact organizational intelligence? Based on the results of a web survey applied in two of the six largest economies, Germany and Brazil, the article shows the importance of KM and OI for public administration and concludes that the KM-OI model is useful to identify influential factors that must be taken into consideration to improve the processes of creation (KM) and application of knowledge (OI).

Keywords: knowledge management, organizational culture, organizational culture, public administration, structural equation modeling

INTRODUCTION

Information and communication technologies (ICT) have advanced significantly in recent decades, encompassing developments that include Web 1.0 (deployment of the Internet), Web 2.0 (the era of networks), and the future Web 3.0 (the era of semantic and connected intelligence). In parallel with this, concepts of knowledge management (KM) and organizational intelligence (OI) have evolved and advanced a variety of practices and processes aimed at the creation and application of knowledge.

A study of 132 central government organizations across 20 OECD member countries found that improved KM practices came with the added cost of information overload for a majority of the organizations surveyed (OECD, 2003). This points to the fact that large quantities of information are insufficient in guiding such organizations toward desired futures, and that organizational intelligence (as an operative concept) is required in order to make sense and chart a feasible route forward.

This article investigates, besides others, this very proposition: that there is a relationship between KM and OI which should be firmly anchored in theory and practice as regards public administration.

This article explores the development of a KM-OI model that draws on the work of Halal (1998) and tests a number of propositions through web-based survey methodology administered to 101 civil servants of two national public administrations, Brazil’s Planning Ministry and Germany’s Bundesanstalt. The goal of this KM-OI framework is to identify influential environmental factors that can be used to guide a plan of KM-OI in public administrations worldwide.

PERSPECTIVES ON KNOWLEDGE MANAGEMENT AND ORGANIZATIONAL INTELLIGENCE

Cognitive Hierarchies

In 1989 Richard Ackoff established a simple taxonomy of environmental stimuli that has been widely adopted as concerns KM and OI, holding that four classes of inputs exist for any system: data, information, knowledge, and intelligence.
The transformation of knowledge into intelligence is an operation accomplished by the human capacity to interpret, analyze, integrate, predict, and act.

The framework is constructed by the CETISME cooperative (2002) on a practical level, wherein intelligence begins, as shown in Figure 1, with data sourced in the environment. The information is analyzed in the context of the personal standards, criteria, and expectations of the decision-maker to become knowledge. Finally, the decision-maker applies this knowledge to a particular situation to create intelligence.

In general, scholars suggest that governments need to ensure that science is at the forefront of the strategy for economic recovery and economic growth. For them, science produces knowledge and therefore produces innovation, which improves quality of life, democracy, economic growth, and the ability to solve larger problems. However, Rothberg and Erickson (2004) hold that knowledge is static and ultimately, it only has value if people use it.

Knowledge implies that learning and experience have been applied to information, but it does not imply an action. The transformation of knowledge into intelligence can be said to be an operation accomplished by the human capacity to interpret, analyze, integrate, predict, and act.

Definitions of KM

Scholars have been concerned by, and practitioners have struggled with, the lack of clear, comprehensive concepts that define the field of knowledge management (Chauvel & Despres, 1999). Sutton (2007) holds that academics and practitioners have not yet been able to stabilize the phenomenon of KM enough to make sense of what it is. Heisig (2009) concludes that knowledge management (KM) has arrived at a new stage of its life cycle. After the technological euphoria and the KM hype, followed by the disillusion, KM’s success factors are now on the way to being better understood.

Nonaka & Takeuchi (1995) consider KM to be the capability of an organization to create new knowledge, disseminate it throughout the organization, and embody it in products, services, and systems. Bali et al. (2009) define knowledge management as a comprised a set of tools, techniques, tactics, and technologies aimed at maximizing an organization’s intangible assets through the extraction of relevant data, pertinent information, and germane knowledge, to facilitate superior decision-making so that an organization attains and maintains sustainable competitive advantage.

Given the ongoing gaggle of approaches within the field, KM can be considered as a set of practices aimed at the interaction between tacit and explicit knowledge to acquire and create new competences (knowledge + skills + attitude), which allow an organization to act intelligently in different environments.

Definitions of Organizational Intelligence

While it is possible to find various concepts of organizational intelligence in scientific literature, all are bounded
by one feature: the organization’s capability to adapt to its environment and apply its knowledge.

Choo (2002) defines OI as a continuous cycle of activities that include sensing the environment, developing perceptions, and generating meaning through interpretation, using memory of past experience to help awareness and taking action based on the developed interpretations. Thus, organizational intelligence refers to a process of turning data into knowledge and knowledge into action for organizational gain (Cronquist, 2010).

For the purposes of this research, OI is defined as the ability of an organization to adapt, learn, and change in response to environmental conditions through the use of relevant knowledge.

Juxtaposition of KM and OI

The concepts of KM and OI are complementary and interdependent. Despite its intuitive appeal, this juxtaposition has received relatively little attention in the literature.

Using the questionnaire proposed by Albrecht (2003), Mooghali & Azizi (2008) present a coefficient correlation of 0.931 between KM and OI and Yaghoubi et al. (2011), more realistic, found that almost 59.2 percent of the existing changes in OI are defined by strategic processes of KM. However, Zarbakhsh et al. (2011) emphasize that although Albrecht organizational intelligence tests have been used frequently in research and diagnostic works, no serious measure has been taken to standardize this test.

Liebowitz (2001) has written that the active management of knowledge is critical to enabling organizational performance enhancement, problem solving, and decision-making. Cruz and Dominguez (2007) have positioned KM as an enabler of OI that serves to obtain external and internal information, and facilitate perception, knowledge creation, and decision-making. Lefter et al. (2008) state that the intelligent organization uses knowledge management as an adaptive tool for coping with the continuously changing environment by identifying opportunities and avoiding risks early.

From these perspectives KM provides methods for identifying, storing, sharing, and creating knowledge, while OI integrates and interprets these inputs to accomplish complex, organizational-level decision making.

Knowledge is socially constructed with collaborative activities (knowledge management Practices), but access to that knowledge does not mean success in decision making (Rothberg & Erickson, 2004). In this regard, Choo (2010) finds that an excess of information can befuddle OI processes. Choo (1998) has developed a model of the Organizational Knowledge Cycle that posits certain relationships between the organizational functions of Sense-making, Knowledge Creating and Decision Making, per the representation in Figure 2.

This model proposes that internal and external knowledge are both developed and held within the organization in Knowledge Creating processes. Environmental signals are perceived and interpreted in Sense-making processes, and both structures serve as foundations for goal-directed organizational action in Decision Making. Noteworthy is that the model places interpretation at the center of organizational intelligence in order to balance conservatism (interpreting inputs according to existing beliefs) with entrepreneurism (interpreting inputs for the exploration of new alternatives) (Choo, 2010).

![Organizational Knowledge Cycle (Choo, 1998).](image-url)
Although the new knowledge gained from the application of KM practices enables the organization to act in new ways, it also produces overload of information (Organization for Economic Cooperation and Development [OECD], 2003) and introduces new forms of uncertainty at a time when there are new alternatives and new results. In those moments of uncertainty, organizations must have high levels of intelligence to interpret, integrate, combine, and filter the relevant knowledge to the police maker.

As shown in Figure 3, organizational intelligence depends on a structured network of “expert analyzers” who offer their technical skill, knowledge, and personal experiences to support the sense-making and decision-making processes. They engage with the intelligent systems by validating information, discovering relationships between pieces of information and conducting analyses, providing the pathways for knowledge to become intelligence that is actionable (answer “so what” questions and are future-focused).

OI tools combine a mix of socio-technical elements such that

a. the subjective evaluations of the online discussion, led by hosts, facilitators, and subject matter experts, with
b. real-time feedback from text mining and semantic analysis of the online discussion.

These tools contribute to deep structural changes and transformations in the social climate, the collaborative culture, and the role of internal collective intelligence (Chauvel et al., 2011). The idea behind the OI tools is to transform the models of “crowdsourcing” that apply “wisdom of crowds” in the “wisdom of experts” to solve complex problems.

THE MODELS OF GOVERNANCE AND THE IMPORTANCE OF KM FOR PUBLIC ADMINISTRATION

In the 1980s, a new management philosophy to modernize the public sector arose, called the New Public Management–NPM paradigm, which has the main following elements: competition, performance standards, monitoring, measurement, flexibility, emphasis on results, customer focus, and social control. One of the main criticisms on the NPM is that this model ignores the difference between private and public sectors (Boston et al., 1996) such as constitutions, the public interest, the market, and sovereignty (Rosenbloom, 1998). This model of public administration has led to a concentration of power and knowledge within governments, resulting in the exclusion of other stakeholders in the policy formulation process. Critics argue that NPM has led to falling ethical standards in public life with increasing incidences of greed, favoritism, and conflicting interests (Larbi, 1999). In particular, according to Samaratunge et al. (2008), in countries that did not have a bureaucratic model established, privatization (characteristic of NPM) has become a popular source of income for the distribution of corruption and patronage.

The shift from Web 1.0 (the invention of the Internet) to Web 2.0 (the era of networks) has boosted the change from a managerial approach as NPM to participatory-based networks, which are determined by the substitution of technical efficiency and market purposes with the practice of co-production of policies.

Despite the fact that collaboration through networks has raised efficiency in the form of reduced transaction costs and speeding up the process of innovation, it has also produced
A Table 1: Three “Ideal” Models of Applied Administrative Governance (Wart et al., 2012)

<table>
<thead>
<tr>
<th>Hierarchically oriented governance</th>
<th>Market-oriented</th>
<th>Network-oriented</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theoretical basis</td>
<td>Weberian or neo-Weberian model</td>
<td>New public management</td>
</tr>
<tr>
<td>Organizing principle</td>
<td>Laws and rules</td>
<td>Market forces open system</td>
</tr>
<tr>
<td>Guiding purpose</td>
<td>Taylorism</td>
<td>Cost</td>
</tr>
<tr>
<td>Mindset</td>
<td>Compliance</td>
<td>Competitive</td>
</tr>
<tr>
<td>Ethical thrust based on</td>
<td>Regulatory</td>
<td>Providing least-cost and least government alternatives</td>
</tr>
<tr>
<td>Relationship of government to citizens</td>
<td>Following the law and rules</td>
<td></td>
</tr>
<tr>
<td>Subjects of regulation</td>
<td>Customers of services and policies</td>
<td>Stakeholders</td>
</tr>
<tr>
<td>Authorized recipients</td>
<td>Citizens as shareholders</td>
<td>Involved citizens</td>
</tr>
<tr>
<td>Taxpaying citizens</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Related leadership model</td>
<td>Hierarchical leadership</td>
<td>Market leadership</td>
</tr>
<tr>
<td>Common leadership styles</td>
<td>Directive and delegative styles</td>
<td>Strategic and achievement oriented styles</td>
</tr>
<tr>
<td>Some features when working at its best</td>
<td>Technical effectiveness (does exactly what it is supposed to); technical accountability (clear lines of authority); clear and well-defined roles</td>
<td>Efficiency (cost); market accountability; organizational learning from the private sector; focus on creativity and entrepreneurship</td>
</tr>
<tr>
<td>Some features when not working well</td>
<td>Rigidity, rule mongering, impersonalism, lack of commitment; focus on inputs over outputs</td>
<td>Loss of public values, corruption, disenfranchisement of less well-connected groups, focus on outcomes over due process and democratic values</td>
</tr>
</tbody>
</table>

An avalanche of information that brought to the fore new forms of uncertainty and complexity and loss of focus and credibility, as presented in Table 1 (types of governance and their characteristics).

As in NPM, the public sector tries to imitate the private sector in terms of KM. The OECD (2000) raises the question: why should the public sector copy the new knowledge management practices of major private sector companies? Cong and Pandya (2003) suggest that one of appropriate solutions to address this dependency is taking a proactive attitude front KM practices more prevalent in the private sector and adapt them to the setting of public administration.

Although it is known that changes in management are more difficult to implement in the public sector and the competitive pressure and incentives to reduce costs have traditionally been less important in comparison with the private sector, the lack of studies on KM in the public sector is a paradox, since KM can contribute to the reform of public administration to make governments more efficient, transparent, responsive to citizen needs, and effective in achieving their objectives.

Brun (2005) holds that if we think about the many interactions within and between several stakeholders, and their impact on policy and service provision, then we begin to see the scope for knowledge management in the public sector. KM had the potential to greatly influence and improve public sector renewal processes. KM is especially important in the public sector as staff have long been identified as the key knowledge depository (McAdam & Reid, 2001; cited by Edge, 2005). According to Abdullah and Date (2009) because of this nonpareil strength the public sector has a unique role in promoting the sharing, creating, integrating, and dissemination of knowledge resources available in its context. Denner and Diaz (2011) conclude that KM in the public sector is not only plausible but necessary for the effective functioning of the public sector, in order to achieve sustainable development goals.

Knowledge management has raised expectations. In the OECD survey (2003) the following widely perceived expectations have been cited:

1. releasing information more rapidly and making it available more widely to the public;
2. improving working relations and sharing of knowledge with other ministries;
3. improving work efficiency and/or productivity by producing and sharing knowledge;
4. minimizing or eliminating duplication of efforts between divisions and directorates;
5. making up for loss of knowledge (due to shorter staff turnover, future retirement, departure in the private sector, etc.); and
6. promoting life-long learning.

Despite the fact that KM has been extensively discussed by many theorists and practitioners, there is little literature and/or information on KM (Cong & Pandya, 2003; Syed-Ikhsan & Rowland, 2004; Edge, 2005; Riege & Lindsay, 2006) found in the public sector.
Edge (2005) states that current examples of public sector knowledge management are often narrowly focused and do not provide rich data on the strategies and experiences of those engaged in the process at the organizational level. These research often focuses on the role of technology or e-government services (Ling, 2002; cited by Edge, 2005). In fact, most governments have invested in e-government to improve internal and external communication as well as the quality and speed of service.

In practical terms, the various protests organized through social networking that led to the fall of governments and constitutional changes in the Middle East and North Africa, and the more recent movements such as those occurring in Brazil and Turkey, show that governments have difficulty capturing collective knowledge and turning it into intelligence to solve major problems.

The environment of popular participation “Eu quero participar” (I want to participate), created by the Brazilian government and involving society in the elaboration and improvement of public policies, is a good example of the shift from a “Gov-to-You” mindset to a “Gov-with-You” mindset to incentivize co-creation of knowledge.

However, it is important to emphasize three big challenges:

1. creation of a sharing culture inside and outside of the public administration;
2. facilitate a concise expression by citizens through public websites and portals;
3. the use of intelligent tools/systems and experts to transform the information in knowledge and then in intelligence.

Governments do not have sufficient resources, internal skills, and intelligence to effectively answer the needs of citizens in a rapidly changing environment. Therefore, the public value is not provided only by the government but by collaboration. Sharing power, opening up the decision-making process, forging new relationships, and partnering on service delivery are the foundations of 21st-century government.

This involves dealing with complex issues, many of which, according to Ho (2008; cited by Bourgon, 2009), have the characteristics of “wicked problems” in an unpredictable context of a modern global economy and corporate network, where several players are acting simultaneously. As can be seen in Figure 4, in the “new synthesis of public administration,” intelligence and resilience are the foundation for meeting the challenges of the future.

In a world increasingly unpredictable and complex (risks, breakthroughs, and crises), a profound cultural change in the public sector is necessary—from people-to-documents to person-to-person approach—taking advantage of personal competences. This cultural change is the basis for creating a Strategic KM-OI plan. In line with this, Riege and Lindsay (2006) highlight that the main driver for the adoption of diverse KM initiatives in public services is the change of organizational culture. Nevertheless, changing a culture in a public organization where people are permanent employees, where there is a strict organizational structure, and directives come from numerous sources is a formidable challenge. The biggest challenge to the public administration is to change from a prevailing culture of “Knowledge is power” to “Knowledge sharing is power.”

The process of culture change encompasses the following requirements:

1. people need to be willing to cooperate (right incentives and rewards need to be in place);
2. basic understanding how KM can improve the government processes, its integration with the broader goals of e-Gov implementation;
3. create of a network of Chief Information Officers to engender cultural change;
4. measurement (achievements of KM and whether productivity and public service delivery have been enhanced);
5. deeper studies on KM initiatives and how policies can impact KM implementations should be carried out;
6. collaboration models among local, regional, and national levels, as well as between public and private organizations;
7. new programs and policies of selection, recruitment, training, learning, promotion (meritocracy), and assessment of the contribution and collaboration of civil servants;
8. transcend specific job training and prepares for long-term career and life success (development of human capital and lifelong learning);
9. develop creative thinking, broad-minded, fair-minded, and open-minded attitude, capacity for conceptual grasp, risk taking;
10. address problems from an integrated, holistic perspective;
11. technical and legislative changes; and
12. transform managers (Transactional leaders) in transformational leaders.

THE KNOWLEDGE MANAGEMENT-ORGANIZATIONAL INTELLIGENCE MODEL

The research reported in this study seeks to assemble concepts developed in previous theoretical treatments of KM and OI, but relies more heavily on that of Halal (1998) due to its currency, grounding in theory, and applicability in practical settings. Halal (1998) holds that OI is a problem-solving capacity which is created by five cognitive subsystems: organizational structure, organizational culture, stakeholder relationships, strategic processes, and knowledge management. The KM-OI model incorporates all dimensions of Halal’s model (1998), except stakeholder relationships, which is replaced by Learning with the Environment. The KM-OI model is shown in Figure 5.

RESEARCH METHODOLOGY

The hypotheses were investigated via a 34-item questionnaire that was addressed to 101 civil servants in two federal administrations, the Brazilian Planning Ministry and Germany’s Bundesanstalt.

Table 2 shows the results of the hypotheses testing.

Data Collection

A pilot version of the questionnaire with 79 questions across 10 dimensions was sent to 53 civil servants in the Brazilian Planning Ministry. Forty-nine were returned with responses. Exploratory Factor Analysis of the results indicated that 34 questions across 7 dimensions explained a majority of the variance. A second version of the questionnaire was subsequently sent to a second population of 126 civil servants in the Brazilian Planning Ministry as well as to 47 civil servants in the German Bundesanstalt. A total of 101 responses were returned, including 63 from the Brazilian Planning Ministry and 38 from the German Bundesanstalt.
TABLE 2
Hypotheses Testing in the KM-OI Model

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Sources</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1: KMCUL influences KMSTY</td>
<td>It should be apparent that different cultures may fit different organizations and their environments, and that the desirability of a strong culture depends on how well it supports the organization’s strategic goals and objectives (Schein, 1985).</td>
<td>supported</td>
</tr>
<tr>
<td>H2: KMCUL influences KMSTR</td>
<td>The values and behavioral standards have been formed through organizational culture, act as filters in processing the information (De Long &amp; Fahey, 2000).</td>
<td>supported</td>
</tr>
<tr>
<td>H3: KMCUL influences KMIT</td>
<td>Sociocultural dynamics thoroughly shaped the information system, the information system recursively shaped its sociocultural milieu, which then shaped the information system anew in a context-warping spiral of events (Despres, 1996)</td>
<td>supported</td>
</tr>
<tr>
<td>H4: KMCUL influences KMLWE</td>
<td>Any learning environment will reflect a set of cultural values about teaching and learning (Warger &amp; Dobbin, 2009).</td>
<td>supported</td>
</tr>
<tr>
<td>H5: KMIT influences KMLWE</td>
<td>What makes a discussion of learning environments particularly important today is the range of opportunities that technology provides for creating new kinds of learning activities and experiences (Warger &amp; Dobbin, 2009).</td>
<td>supported</td>
</tr>
<tr>
<td>H6: KMSTY influences KMPPT</td>
<td>Deductions based on previous research suggest a positive association between organizational strategy and KM Practices (Zheng, Yang, &amp; McLean, 2010).</td>
<td>supported</td>
</tr>
<tr>
<td>H7: KMSTR influences KMPPT</td>
<td>A decentralized structure has often been seen as facilitative to knowledge management success and structures that promote individualistic behavior can inhibit effective knowledge management across the organization (Gold et al., 2001).</td>
<td>supported</td>
</tr>
<tr>
<td>H8: KMLWE influences KMPPT</td>
<td>Knowledge management looks at the external environment as a source of knowledge and as a testing ground for its understanding and interpretation of itself and the outside world (Bennett &amp; Bennett, 2003).</td>
<td>supported</td>
</tr>
<tr>
<td>H9: KMPPT positively influence OI</td>
<td>The active management of knowledge is critical to enabling organizational performance enhancements, problem solving, and decision-making (Liebowitz, 2001)</td>
<td>supported</td>
</tr>
</tbody>
</table>

Reliability and Validity of the Study

For determining the validity of the survey, a content and construct validity has been used. The content validity was obtained from the relationship of the theoretical framework with the items of the survey and subsequent discussion with two professors, one from Minho University, Portugal, and another from Catholic University of Brasilia, Brazil. Construct validity has been determined through the use of Confirmatory Factor Analysis to estimate convergent and discriminate validities. The use of CFA becomes necessary when we know how to measure each construct, but are still not sure about who influences whom. In such cases, the confirmatory factor analysis (CFA) is the most appropriate method (Henseler et al., 2009).

To verify the relationships among all constructs, the structural equation modeling (SEM) has been used. SEM is a technique combining elements of multiple regression and factor analysis that enables the researcher not only to assess quite complex interrelated dependence relationships but also to incorporate the effects of measurement error on the structural coefficients at the same time.

There are two approaches to estimate the parameters of a SEM (types of SEM techniques): Covariance-based approach—CEB-SEM (e.g., LISREL) and variance-based approach (eg. Partial least square path modeling (PLS-PM)). Because of its prediction orientation, PLS-SEM is the preferred method when the research objective is theory development and prediction (Hair et al., 2011). Furthermore, Henseler et al. (2009) hold that the sample required (to reach the same statistical power) for the CFA-PLS is lower than for CB-SEM and in the PLS-PM there is no assumption of normality of the variables. PLS is a family of alternating least squares algorithms, which extend principal component and canonical correlation analysis (Henseler & Sarstedt, 2013).

According to Schreiber et al. (2006) SEM, in comparison with CFA, extends the possibility of relationships among the latent variables and encompasses two components:

a. a measurement model (essentially the CFA) and,
b. a structural model.

**Measurement model analysis**

Reflective measurement models should be assessed with regard to their reliability and validity.

Reflective measurement models’ validity assessment focuses on convergent validity (Average Variance Extracted—AVE > 0.5, i.e, the latent variable explains more than half the variance of its indicators) and discriminant validity (an indicator’s loading with its associated latent construct should be higher than its loadings with all the remaining constructs (i.e., the cross loadings). The convergent and discriminant validities are shown in Tables 3 and 4, respectively.

All VLs (first and second orders) showed AVE greater than 50 percent, which meets the criteria Chin (1998) and Hair Jr. et al. (2005) for the indication of convergent validity. The fact of the most indicators having higher loads in
management practices. Similarly, items of organizational culture and knowledge management had high correlation with the organizational structure. Thus, being the KMOI model built from a deductive logic, i.e., from the conceptual definition of Culture, Structure, Strategy, Learning with Environment, and Information Technologies as enablers of KM (reflective indicators), it was already expected correlation between them and this correlation is indicative of the reliability of these measures (Nunnally & Bernstein, 1994).

The obtained values of Composite Reliability and Cronbach’s Alpha to all dimensions were adequate, i.e., higher than 0.8 and 0.7, respectively. The Variance Inflation Factor (VIF) has been used to measure multicollinearity in the KM-OI model. Henseler et al. (2009) hold that variance inflation factor-VIF substantially greater than 1 indicates multicollinearity. The highest VIF found was 2.11, which indicates a low multicollinearity. However, it has not affected the result, given that the coefficients are all significant.

### Structural model analysis

Before moving on to the hypothesis testing, we conducted an examination of potential common method bias—CMB. The technique most used to detect CMB is called Harman’s one-factor (or single-factor), and it evaluates the percentage of variance extracted (Harman, 1967).

Despite the fact that there is no a threshold value that is considered problematic, the percentage obtained of 41 percent of variance extracted in the first factor, can suggest a possible CMB. This can inflate correlations, such as the correlations of KM Practices with all other constructs.

Partial least square (PLS) structural equations modeling with Smart PLS software (Ringle et al., 2005) allows the study the role of the factors of KM on OI. Smart PLS works with Path coefficients and Bootstrap.

Figure 6 provides Path coefficients for each factor. Analyzing Figure 6, it is possible to conclude that:

- **KMUC1** has a big and positive influence on **KMIT** ($\rho = 0.51$, $p < 0.01$), **KMSTR** ($\rho = 0.59$, $p < 0.01$), **KMLWE** ($\rho = 0.38$, $p < 0.01$) while **KMIT** has a positive influence on **KMLWE** ($\rho = 0.43$, $p < 0.01$).
- **KMSTR** ($\rho = 0.24$, $p < 0.01$), **KMLWE** ($\rho = 0.39$, $p < 0.01$) and **KMLWE** ($\rho = 0.35$, $p < 0.01$) has a positive influence on **KMPPT** while **KMPPT** has a big and positive influence on **OI** ($\rho = 0.80$, $p < 0.01$).
- A bootstrap (100 sub-samples) allows the verification of the stability of scores and tests the significant character of each coefficient (t-values).

Figure 7 shows that all correlations are high significant with P-value equal to 0.01. Analyzing Figures 6 and 7 it is possible to conclude that the nine hypotheses are supported through the following conclusions:
1. Culture is fundamental to explain changes in Strategy (R2: 0.35; t: 10.35), Structure (R2: 0.51; t: 13.22), learning with environment (R2: 0.50; t: 4.20), and information technology (R2: 0.26; t: 8.07).

2. Culture and Information technologies together explain 50 percent of changes in Learning with Environment.

3. Strategy, Structure, and Learning with Environment explain 74.9 percent of the changes in Policies and Practices of KM (KMPPT) and all correlations are significant (t: 2.52; t: 4.90, and t: 5.22, respectively).

4. Policies and Practices of KM explain 64.8 percent of the changes in OI with high significance (t: 20.05) (the main hypothesis).

DISCUSSION

The aim of the first research question is to understand to what extent organizational culture impacts strategy, structure, learning with environment, and the information technologies. How things are done and how people behave and act (culture) directly influences the goals, mission, vision, processes, responsibilities, design, communication, learning, technology, and so on. The statement “culture eats strategy for breakfast” attributed to Peter Ducker, highlights the importance of culture in providing the context for the formulation and implementation of strategies (Ireland & Hitt, 1999; Farjoun, 2002).

Organizational Culture impacts the organizational structure to implement KM Practices as well. In the public administration, most of the KM projects and programs actually fail miserably just because organizational culture not only does not support the process but, even worse, contributes to produce strong resistance to its successful implementation.

The organizational culture has an important role in creating conditions for learning with internal and external environments, as well as the use and development of information technologies (IT). Culture influences the learning environment while demonstrating openness to the ideas of civil servants, citizens, and other organizations, identifying partners and improving the services according to the demands of the environment. Culture impacts IT when it enables the discipline necessary to organize contents, when it improves the use of technologies, and when it recognizes that information systems support the wide availability and free flow of useful, reliable, and timely operational information.

Regarding the research question 2 (To what extent does Information Technology impact learning with environment?) the investigation was based primarily on the study done by Warger and Dobbin (2009), that highlights the opportunities that technology provides for creating new kinds of learning activities and experiences.

The research question 3 (To what extent does strategy, structure, and learning with environment impact Policies and Practices of KM?) leads to the construction of hypotheses 6, 7, and 8. The first two hypotheses support several studies that have investigated the positive impact of strategy and structure on KM practices. The only exception was the comparison with previous research by Zheng, Yang, and McLean (2010). They found that culture and strategy may have fully accounted for structure’s negative influence on KM. Nevertheless, according to Chang and Chuang (2010) and Allameh et al. (2011), for example, the organizational structure impacts KM positively.
The findings show the importance of a structure, which allows information to flow effectively, supports programs of competences development, and that defines the roles and responsibilities in constructing and applying KM programs and so on.

Regarding hypothesis 8 (Learning with environment influences KM practices positively), this study is consistent with what was found by Bennett and Bennett (2003): “knowledge management looks at the external environment as a source of knowledge and as a testing ground for its understanding and interpretation of itself and the outside world.”

To sum up, before impacting the application of practices of KM and the OI, the organizational culture impacts the strategy and the structure of KM, as well as the learning with environment and information technologies (means).

This study concludes that the analysis phase (OI) should be distinct from the information gathering phase (KM). In view of this, this study answers the main research question: “To what extent do Policies and Practices of KM impact organizational intelligence?.” The result shows that almost 65 percent of changes in OI result from KM Practices. It means that the availability of the collective knowledge corresponds to almost 2/3 of the decision-making process; the rest is the capacity to analyze the knowledge before applying it.

KM can play a key role in supporting the policy-making process. Being KM an attempt by organizations to capture, codify, organize, and redistribute the organization’s tacit forms of knowing and make them explicit (Rothberg & Erickson, 2004), their policies and practices are very useful to create knowledge. However, the practices of KM also produce too much information. In fact, the volume of information available to decision-makers has increased greatly. The challenge is now to analyze, interpret, and integrate the key information needed for decision-making and solving problems. For example, the ability to analyze the knowledge of particular Communities of Practice—COPs, one of the most important KM practices—is at the core of OI.

LIMITATIONS AND FUTURE RESEARCH

It would be interesting to apply the survey in a wider context, involving other countries.

Furthermore, as in this research, the data are obtained from a common form of data collection for all indicators and the Method biases are likely to be particularly powerful. It would be interesting to apply this study in a different way. For example, researchers can use different response formats (e.g., semantic differential, Likert scales, faces scales, open-ended questions), media (computer-based vs. paper and pencil vs. face-to-face interviews), and/or locations (e.g., different rooms or sites) for the measurement of the predictor and criteria variables (Podsakoff et al., 2003).

CONCLUSION

This article has presented a new paradigm for existing theory and identifies theoretical and practical implications. The most important implication for existing theory is the development of the KMOI model, which shows how organizational culture impacts strategy, structure, learning, and technology along with KM and OI. The major practical implication is that leaders need to see the cultural change as a first step before creating a KM-OI plan.

In this regard, the World Economic Forum (2011) affirms that professional schools and public management and administration programs should be updated to educate and train civil servants for 21st century government by emphasizing the skills and knowledge required for public management in an interdependent, technologically sophisticated world. The challenge is not to learn some techniques in short training programs and courses, but regularly develop and integrate different competences.

The leaders must develop and integrate different competences: Intellectual Competence (IC)—Critical Judgment and Strategic Perspective; Managerial Competence (MC)—Engaging Communication, Managing Resources and Empowering; Emotional Competence (EC)—Self-awareness, Emotional Resilience, Influence and Motivation; and Spiritual Competence (SC)—Intuitiveness, Egolessness, Trans-rational, and higher modes of knowing.

This study has emphasized the importance of the passage from a management model (NPM), that concentrates knowledge in the higher levels of the organization, to a networking model, that transfers and creates “knowledge” without limits, but mainly without a perspective of KM and OI.

Because the passage from NPM to Network governance was based mainly on technology, the KM with focus on people (underestimating the “human factor”) and OI were left in the background, creating an overload of information.

This signals the importance for governments of analyzing the advantages and disadvantages of Gov 2.0 (open government + social media + open data) and change to Gov 3.0 (Collaborative Innovation + Public Engagement + Customized intelligent service).

The Web Semantic or Web 3.0, a mix between semantics and intelligence, creates knowledge (contextual information) and transforms it into intelligence (relevant knowledge after the analytical process) to facilitate the policy formulation and decision-making processes.

REFERENCES


