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Governance of Information Systems in Congolese Public Entreprises: Case of the Congolese Control Office

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Abstract: ***This case study examines the implementation of Information Systems Governance within public enterprises in the Democratic Republic of Congo, focusing specifically on the Congolese Control Office (OCC). Despite over four decades of IT adoption, OCC has failed to achieve strategic value creation from its information systems. The article identifies shortcomings in infrastructure, project management, and governance structures that hinder performance and alignment with national reform objectives. Using established IT governance frameworks such as COBIT and ITIL, the study proposes actionable strategies to improve oversight, security, and integration of IS functions. This research underscores the need for a systemic governance model supported by strategic alignment, structured audits, and empowered human capital.***

Keywords: information systems governance, strategic alignment, public enterprises, value creation, IT audit.

1. Introduction

A systemic analysis of the company subdivides it into three systems: decision system (or steering system), information system and operating system. The information system (IS) being the channel for the circulation of data between the other two.

However, today the IS has invited itself into the general strategy of organizations and is rightly considered as the "nervous system". It is increasingly at the very heart of strategic market, product and organizational process innovations.

Strategies must be adopted to align IS objectives with the organization's goals. And, it is one of the main current challenges to ensure coherence between the IT policy of an organization and its long-term strategic objectives. The challenge is to transform IT from a cost center into a profitable service center. This is the whole point of IS Governance.

In the context of the reform of public companies in R.D. Congo, it is necessary that the owning state facilitates entry into the digital age. Because they have shown chronic underperformance as a result of bad decisions based on information that did not meet the quality criteria. It is therefore important to ensure the IS truly serves both operational and strategic needs of the company.

The choice of the OCC as a field of research was motivated by our knowledge of the company as well as by its key role both in foreign trade and in local production, since it is responsible for quality and quantity controls.

The purpose of this study is to evaluate the implementation of Information Systems Governance in Congolese public enterprises, using the OCC as a case study, and to propose a structured approach for aligning IS with strategic organizational goals.

This study is significant as it provides a rare, context-specific examination of how IT governance can transform underperforming public enterprises in developing nations, offering a framework that bridges strategy, technology, and operational execution.

2. Literature Review

In everything that man undertakes, he always uses strategy. This may be vague, incoherent, unintelligent eventually, and, in this case often not formalized in a speech or in a structured plan. It nevertheless exists. It manifests itself in the practical decisions that are made, in the policy implemented, in the choice of resources mobilized.

On the other hand, a strategy can also be thought out, deliberate, shared and stated, therefore revisable, based on the most factual assessments possible. In terms of information systems, both approaches exist. The information system strategy is integrated into the company's general strategy. The IS is even a highly strategic area for most of them and it is a key element of the operational performance and efficiency of any company.[1].

Information Systems Governance structures how IT strategy is developed and executed within a company. It consists of defining, describing, implementing, continuously controlling and improving management processes, operational processes and an organization, allowing the information system to

meet the needs of the company and provide value, in a performing and controlled risks manner.

Several authors address IS Governance, developing both theoretical and practical aspects including:

- In their book [2] propose a complete approach to information systems governance, in covering theoretical concepts, implementation methods and good practices. It is useful for professionals seeking to understand the basic principles and implement a effective governance of information systems.
- For [3] the emphasis is on the importance of an integrated approach to systems governance of information in companies. It explores the different aspects of governance, including the strategic, organizational and technological dimensions, while providing advice practical for successful implementation.
- The authors [4] offer a practical perspective on information systems governance, in providing concrete case studies and examples of good practices. It covers the fundamentals theoretical aspects of governance as well as the methods of implementation in various contexts organizational.
- In his study [5] examines the management of information systems in the Democratic Republic of Congo, evaluating the current state and proposing future perspectives. It identifies the challenges and opportunities related to the management of information systems in the Congolese context.
- The book by [6] examines the governance and management of digital transformation, focusing focus on organizational practices. It offers perspectives on how companies manage digital transformation and the challenges associated with this evolution.
- For [7] whose book explores the governance of information systems and ethics in a global perspective. It examines governance and ethical issues related to systems information in different cultural and organizational contexts around the world.
- The authors [8] highlight the information systems governance practices adopted by successful companies. It offers insights into how these companies manage decision-making rights in information technology to achieve superior results.

Strategic Areas of Information Technology Governance

This literature identifies strategic areas or pillars taken into consideration in the context of IT Governance. Their number is still debated today and has not been the subject of a consensus. There are three main currents:

a) That defined by ISO under the ISO/IEC 38500:2008 standard which serves as a framework for IT Governance effective and helps business leaders identify and fulfill their legal commitments, regulatory and ethical relating to the use of IT. It includes definitions, of principles and a model. It sets out six pillars for good IT Governance which are:
   - Responsibility;
   - Strategy;
   - Acquisition;
   - Performance;
   - Compliance;
   - Human behavior.

b) That of the IT Governance Institute - ITGI (a subsidiary of ISACA) which in the publication "Board Breifing on IT Governance" (Edition 2) identified five strategic areas that have been taken up and integrated into COBIT from version 4:
   - Strategic alignment;
   - Risk management;
   - Resource management;
   - Performance measurement;
   - Value delivered.

c) That defined by several groups of independent researchers and experts, specializing in governance and strategic management of information technologies, from the AIS[1] which proposes an extended version with eight strategic areas:
   - Strategic alignment;
   - Management;
   - Resource management;
   - Risk management;
   - Performance management;
   - Control and audit;
   - Financial value;
   - Maturity.

The second stream is the most common among various authors.

3. Methodology

In our approach, several methods and techniques have made a significant contribution: the descriptive method for the description of the field of work and our case study, and the analytical method in the last step to dissect our subject into several components to allow us to better analyze them.

In addition, documentary research and interviews were the techniques that allowed us to carry out the literature review and trace the major stages of the computerization of our case study.

We interviewed the IT Director and his key colleagues, as well as three business department heads who have benefited from IT over the past ten years. Regarding documentation, we consulted, among other things, books on IT Governance as well as the archives of the OCC's IT Department, which trace much of the evolution of IT technology.

4. Results

The introduction of IT in companies has been progressive and can be subdivided into three phases.

From 1960 to 1980, a period when the computer sat enthroned in a room, the temperature and humidity of which were controlled, isolated from the other departments of the

[1] The Association for Information Systems (AIS) serves society through promotion of knowledge and the promotion of excellence in the practice and study of information systems. AIS is the leading professional association for people and organizations that lead research, teaching, practice and the study of information systems around the world.

company and accessible only to authorized persons.

From 1980 to 1990: characterized by the appearance of the information system as well as its design methods. It is also the time when the microcomputer and, later, networks made their appearance in the company.

From 1990, the proliferation of computers gave rise to problems of internal consistency of the company's IS. This made the general management feel the need to refocus IT efforts and resources.

Here, computer-assisted work through the computerization of processes rather than functions becomes a reality. From now on, the IS, formerly considered a simple support for the management of companies, has been transformed into an engine, the backbone of the management of organizations.

To date, the use of IT has, through its evolution, become involved in all the activities of the company. They have become the main foundations: an information system is today at the heart of the functioning of any organization, and its effectiveness determines its performance. The constant evolution of trades and techniques has complicated the management of systems. It is therefore vital for the company to manage its IS with rigor and coherence [9].

Therefore, the IS should not only be the responsibility of the IT Department but rather a global approach at the initiative of the highest authorities of the company: this is the principle of Information Systems Governance [10].

4.1 Information systems governance, what is it?

IS Governance is an integral part of Corporate Governance. It consists of defining, describing, implementing, controlling and continuously improving management processes, operational processes and an organization enabling the IS to meet the needs of the company, to bring value to risks. [11]

It is therefore an approach to optimizing IT investments in order to make them contribute to the objectives of value creation, to increase the performance of IT processes and their customer orientation, to guarantee that the risks related to the IS are under control, to control the financial aspects of the IS and to develop the solutions and skills in IT, which the organization will need in the future, while developing transparency of action.

IS Governance includes 8 strategic areas:

1st. Alignment
The concept of alignment consists of making IT conform to the company's strategy. That is, making IT investments consistent with the company's strategic objectives.

2nd. Management
IS Governance, a consequence of corporate governance, imposes a separation between the management of operations and the management of strategy. This evolution redefines the mission of the Information System Departments.

To manage the IS, companies have set up two ITG structures:

- The IT Governance Council: equivalent to the Board of Directors. The administrators appoint an Information Systems Governance Council. This Council is composed of at least
- three members, at least one third of whom must be external to the company's governing structures (based on the recommendations of the Vienot report of [12].
- The IT Governance Committee: equivalent to the Management Committee. It plays an executive role for the implementation
- of governance and the monitoring of its missions. It reports exclusively to the Council of
- IT Governance. It is therefore independent of the operational departments, including the IT Department, which are under the supervision of the Management Committee.

3rd. Resources
IT resource management defines the fundamental principles of management and organization of IT resources within the framework of IT Governance. Its objective is to put in place a set of mechanisms to manage the IT infrastructure so that it supports and develops the company's ability to create value.

4th. Risks
In an IT Governance approach, risk management is considered a strategic area [10]. This status is mainly justified by the fact that the company relies entirely on its technological resources as well as its information assets to achieve its strategic objectives.

5th. Performance
Although the information system has invaded the entire company, the impact of its performance on that of the company has long remained a rather vague notion.

This is how Robert Solow, Nobel Prize in Economics in 1987, stated: "we see computers everywhere except in production statistics".

The performance management of an information system must be carried out within the governance framework so that management is able to control the phenomena of reciprocal impact. Two active principles apply to IT performance: monitoring and supervision.

6th. Audit and control
Audit and control have always accompanied IT activities within organizations; but they have taken on great importance for two reasons: the volume of information assets continues to grow and real- time processing is increasing more and more. This requires reliable, consistent and secure IT tools. [13].

7th. Value
Rather than evaluating the intrinsic value of infrastructures and information assets, the goal is to determine how IT resources participate in value creation, therefore in the overall performance of the company.

8th Maturity
A mature company is one that is able to offer products or services that are constantly adapted to the evolution of its environment. This reflects its ability to adapt, which conditions its longevity in performance. For this, the company must meet clearly identified maturity criteria. The IS is therefore called upon to allow this adaptation by continuing to ensure coherence.

4.2 Best practice frameworks

IT governance is no exception to the general principles of governance. This is how it is also associated with the notion of best practices in ethical, managerial, financial, societal and environmental terms

Dozens of IT management frameworks have been developed by various European and North American working groups (companies, universities, associations, institutes). Their scope is the element that differentiates them according to two fundamental orientations: the design or operations domain and the strategic management domain used at the IT Governance level.

To be effective, an IT Governance approach must rely on a set of complementary frameworks. It is common to see IT departments use several frameworks in a coordinated manner. This is the case with COBIT, Val IT, Risk IT (complementary and of the same origin), and ITIL.

- COBIT offers tools for producing IT control and audit processes;
- Val IT concerns the contribution of IT investments to value creation;
- Risk IT defines the rules for managing risks related to the use of IT;
- ITIL very effectively addresses issues related to IT management.

The adoption of these standards involves high-level requirements. From the selection of best practice standards to the certification of processes and stakeholders, rigor must be observed. Failure to implement these standards can jeopardize the entire IT Governance strategy.

5. Discussions

5.1 The OCC'S Information System

Given its status, purpose, and responsibilities, the OCC plays a key role in the economy of the Democratic Republic of Congo. Indeed, in several countries, the various missions entrusted to the OCC are carried out by various independent specialized organizations.

Thus, its position as an interface in foreign trade and its membership in regional and international organizations require the OCC to achieve a high level of performance that it cannot achieve without a reliable, integrated, and coherent IT system. The latter, as stated [1], is a key element in the operational performance and efficiency of any company. However, following our study, it is clear that the OCC's information system falls far short of meeting these requirements. This applies to infrastructure, software, information assets, human resources, management, controls, project management, and so on.

The successive failures of the OCC's information system are attributable to the same causes observed in most cases worldwide:

- Lack of strategic alignment: when an IT project serves a cause that is not that of the company, but rather that of a certain leader, a trend, or a cause unrelated to the company's future.
- Inadequate project management in supporting business developments. A symptom whose underlying problem is the underestimation of changes in company processes and what must accompany them: changes in skills, organization, and business lines. - Underestimation of the resources required. A process is a clever mix of methods, skills, tools, and motivation. Changing the tool isn't enough to make the rest work.
- Lack of reliable performance indicators. Projects are built on "better," "faster," "more efficient," but since pre-project indicators aren't defined, those measured after the project are meaningless. And, the benefits of a project aren't measured in IT terms, since IT costs money by design and it's the optimization of business processes that pays off.

5.1.1. The IT platform
The configuration of the OCC's IT platform (hardware and network) is not under control. Its status and evolution are almost completely beyond the control of the IT Department (ID). As with applications and information assets, the OCC's networks are not documented.

5.1.2. Information system security.
The minimalist security that the IT department is content with is far from the ISO/IEC 27001 standard, which it is responsible for implementing within the OCC. The IT department has therefore not put in place any internal control system for the IS that would allow it to constantly measure the security system.

5.1.3. Software and information assets
The coverage of software and databases is too weak, if not insignificant. In more than 40 years of activity, it is estimated at 35% by the IT department managers.
Since the IS is not integrated, several signage systems coexist within it, repeating the same information, sometimes contradictory.

5.1.4. IT project management
The IT department has not been able to reduce the wall of separation between IT specialists and users as would have been done by a project integrating all IS actors. Hence a climate of almost permanent mistrust has been established between the IT department and its internal partners.

5.1.5. Responsibilities of the IT Department
The official mission assigned to the IT department leaves it entirely responsible for the information system, from design to development. This translates on the ground into the isolation of this program factory which speaks an incomprehensible language and produces ineffective services.

5.1.6. Structure of the IT Department

The successive structures of the IT department have not allowed it to play its role effectively. While certain components of the information system (hardware, networks, Internet) gradually penetrated the business departments, the applications and information assets were lagging behind. Several services have never played their role.

5.1.7. IT Department facilities

Although the situation of the IT department is not exceptional, it must be recognized that it is badly off and very poorly equipped. Indeed, in terms of equipment, the IT department only has the workstations of the IT specialists. It has no equipment (server) for developments. Several operating servers are installed at the users' premises and the networks are not supervised centrally.

5.1.8. Human resources

The management of human resources within the IT department has been, like the entire company, inefficient. The lack of training policies and programs has led to a very significant decrease in the competence of the IT staff. For more than 20 years, it lacked network specialists while these were spreading throughout the company.

5.1.9. Consideration of IT Governance in the OCC's IS

The analysis of the OCC's IS in relation to the strategic areas of IT Governance gives us the following result: in the area of IS Management, partial consideration through the establishment of some IT Committees and Computerization Commissions. The rest of the ITG areas have never been taken into account.

5.2 Implementation of an IT Governance Approach at the OCC.

Due to scope limitations, this study focuses only on selected areas of IT Governance, we have limited ourselves to the following: Strategic Alignment, IS Management and IS Audit.

5.2.1 Strategic alignment of the information system

Strategic alignment implies that a company has a strategy to which the IS must align.

The official w²ebsite of the OCC presents its main strategic axes1 : quality management, regional and international recognition, the diversification of services to businesses, the development of skills.

This strategy is then translated into sector and operational objectives in the action plans contained in the provisional budgets drawn up every year.

The IT Department, from the perspective of IT Governance, must learn and take on the role of IT service provider that it must now play.

As part of an IS aligned with the company's strategy, IT must become omnipresent. This implies internally:

- Maintaining an exhaustive and up-to-date inventory of the entire IT platform;
- Setting up a system for monitoring infrastructure maintenance;
- Setting up an IS security management system;
- Maintaining complete documentation of the entire information system;
- Mastering networks through the training and assignment of administrators;
- Setting up a user support service.

The deployment of frameworks such as ITIL and COBIT that we suggest will help guarantee this alignment.

5.2.2. OCC information system management.

Based on the experience feedback from certain organizations that have already implemented IT Governance, we propose the solution below:

- **The IS Steering Committee (CPSI):**

It will be composed of the CEO, the Deputy CEO, the "IT Advisor" and a person external to the OCC. This one must come from the ministry responsible for foreign trade and be appointed by the minister.

- The Strategic IS Committee (CSSI)

This committee is made up of representatives from all departments of the company at the highest level, IT experts from each of them and the IT Advisor to the CEO who coordinates it. It guarantees the coherence of the IS and manages cross-functional projects.

- Organize the project management (Project Owner) of the OCC's IS.

An IT project is an engineering project like any other. It involves two actors who share responsibilities between "design" and "implementation", i.e. between "project management" and "project ownership".

The IS Project Owner is made up of all the other departments to whom the IT Department, project owner, must provide IS products.

- Organize Project Ownership (Project Manager)

The IT Department is the project owner of the company's IS. It assists the project management during the evaluation of the cost of a project, because this evaluation assumes that one has at least a sketch of a technical solution. It establishes the detailed specifications that the project management validates, it finally establishes the technical specifications, the last step before implementation. The project ownership develops the project or draws up the specifications and interfaces with the subcontracting.

- The management structures of an IS project

For any project, a structure comprising operational teams and decision-making bodies will be set up. This will evolve throughout the different phases of the project: from the expression of needs to exploitation.

5.2.3. Information system audit

Implementing and succeeding in the innovation that we advocate must be guaranteed by a system of surveillance of the IS both inside and outside the IT Department. Among the benchmarks we propose to implement at the COBIT OCC is a process for IS monitoring and evaluation.

6. Conclusion

The implementation of an IT Governance plan in a company can be summarized as the implementation of professional and qualified project management. But the process is long and requires the involvement of the entire company: the General Management, supreme strategist and the business lines, consumers of the IT product.

Consumers but also partners because as Project Owner they are associated with the project from the specification of needs to maintenance. This approach requires the use of references of good complementary practices intelligently selected from the dozens existing. It is at this price that the alignment of an IS is found, therefore its real contribution to the creation of value for the company's business processes.[9]

Implementing such an approach within the OCC is a decision that must be taken by the highest authorities of the company in agreement with the supervisory authorities. We propose a process that starts with a decision by the General Management of the company to organize a general IT audit which will be able to detect all the flaws in the current system and whose proposals will guide the actions to be taken.

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