

IMPLEMENTATION OF IT GOVERNANCE IN A REGIONAL PUBLIC ORGANIZATION

BY

Aadil BELHAJ

Researcher at Faculty of Law, Economics and Social Sciences, Hassan 1st University in SETTAT-Morocco.

&

Jamal ZAHI

Professor at the Faculty of Law, Economics and Social Sciences, Hassan 1st University in SETTAT-Morocco.

Abstract :

Private sector companies are mobilizing to adopt IT governance frameworks to control their information systems and increase the profitability of their IT investments. Today, public organizations have come to adopt the same approach. The study of IT governance in the public sector has interested several researchers in recent years. However, there is still a lack of literature concerning its implementation in developing countries and especially in a context of regionalization.

The case study in this article shows how a "regional public organization" has implemented its IT governance framework in a regionalization context. The results of this study show that the intentional implementation of the mechanisms, with reference to the governance guidelines of the central top management, was done without major complications. However, the organization should make a lot of efforts to "decentralize" processes at the regional level to better support IT projects with regional specificities, and to improve its structures.

Keywords: IT governance, public organization, regionalization, decentralization, implementation.

Résumé :

Les entreprises du secteur privé se sont mobilisées pour adopter des cadres de gouvernance des TI afin de contrôler leurs systèmes d'information et augmenter la rentabilité de leurs investissements en technologies de l'information. Aujourd'hui, les organisations publiques ont fini par adopter la même approche. L'étude de la gouvernance des TI dans le secteur public a intéressé plusieurs chercheurs ces dernières années. Cependant, il existe encore un manque en littérature concernant son implémentation dans les pays en voie de développement et surtout dans un contexte de régionalisation.

L'étude de cas menée dans cet article, montre comment « une organisation publique régionale » a implémenté son cadre de gouvernance des TI dans un contexte de régionalisation. Les résultats de cette étude montrent que l'implémentation intentionnelle des mécanismes, en se référant aux orientations de gouvernance de la direction centrale, s'est faite sans grandes complications. Or, l'organisation devrait déployer beaucoup d'efforts pour « décentraliser » des processus au niveau régional pour mieux supporter les projets TI aux spécificités régionales, et d'améliorer ses structures.

Mots-clés : Gouvernance des TI, organisation publique, régionalisation, décentralisation, implémentation.

1. INTRODUCTION:

Today, we are witnessing a massive use of information technology (IT) in organizations of different sizes. Given that the estimate of the overall cost of IT resources represents between 10 and 40% of the operating costs of companies depending on the sector of activity (Georgel, 2005).

In response to this, and after the famous financial scandals of the 2000s, private sector companies mobilized to adopt IT governance frameworks to optimize the return on their IT investments.

Public organizations have taken some time to understand the importance of such governance. But they ended up following those in the private sector, realizing the benefits of implementing effective IT governance that could better serve IT projects and IT programs in their organizations (Al Qassimi and Rusu, 2015). In addition, the implementation of effective IT governance would be a device to control IT investments and a tool to mitigate information system deficiencies (Zahi and belhaj, 2018).

In this work, we have observed a lack of literature regarding the study of the implementation of IT governance in public organizations in a context of regionalization adopted by Morocco. In this sense, we ask the following research question: in a context of regionalization, how is IT governance implemented in a regional public organization?

We begin this article with a review of the literature, recalling the concept of IT governance and its mechanisms (following the model of De Haes and Grembergen (2004)), followed by an overview of the research already conducted in public organizations. Afterwards, we mention the levels of IT decision-making. In the 'methodology' section we explain why we based ourselves on the exploratory case study. The results and interpretations will be well detailed to understand analytically how the regional public organization had implemented its IT governance.

2. LITERATURE REVIEW:

2.1. IT governance and its mechanisms:

IT governance is an area that has evolved rapidly in recent years (Vejseli and al., 2019). After the famous financial scandals (Enron, Worldcom ...), the advent of IT governance has proven essential to supervise and control IT investments and improve the performance of any IT service. As a result, it has become an indispensable tool for aligning IT with the activities of the organization, while minimizing IT risks.

In this sense, Grembergen (2002) defined IT governance as « *the organizational capacity exercised by the board, executive management and IT management to control the formulation and implementation of IT strategy and in this way ensure the fusion of business and IT* ».

The Information Technology Governance Institute (ITGI, 2001) defined IT governance as « *the responsibility of the board of directors and executive management. It is an integral part of enterprise governance and consists of the leadership and organizational structures and processes that ensure that the organization's IT sustains and extends the organization's strategy and objectives* ».

IT governance for Weill and Ross (2004) is « *the decision rights and accountability framework for encouraging desirable behaviors in the use of IT* ». These authors have

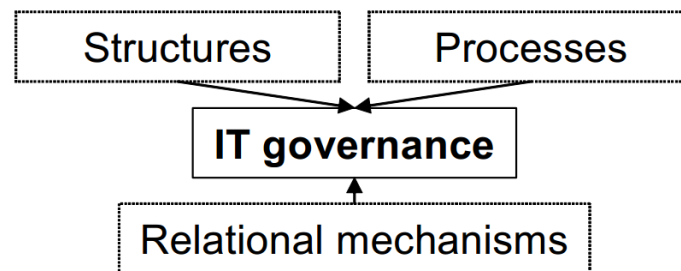
demonstrated the importance of IT governance for organizations. Indeed, and according to these authors, companies with effective IT governance were 25% more profitable than those with poor IT governance, with similar strategic goals. In the same perspective, Wu and al. (2005) believe that IT governance, if properly implemented, can improve the alignment of IT with business in a significant way.

Several studies have been carried out to answer the question of establishing a good IT governance framework in both the private and public sectors, in different contexts and with different contingency factors.

These researches also attempt to identify the mechanisms that significantly impact the effectiveness of IT governance within organizations to achieve the expected benefits.

De Haes and Grembergen (2004) state that to pragmatically implement effective IT governance, one must choose a better combination of structures, processes and relational mechanisms.

Figure 1 : Elements of IT governance framework



Source: according to De Haes and Grembergen (2005)

Structures are mechanisms that explain how the IT function is organized, and the entities responsible for IT decision-making in the organization.

Processes are formal mechanisms used to ensure that daily behaviour is consistent with IT strategy. They also provide feedback for decision-making

Relational mechanisms are also important in IT governance. According to De haes and Grembergen (2004), it is possible for an organization to have all the structures and processes to implement good IT governance, but it will not work. Because, in their opinion, the business world and the IT world do not understand and/or do not work together.

Determining the right mechanisms remains a complex task (Bianchi and Soussa, 2016). In this sense, each organization must be fully aware of the mechanisms that will be suitable for it. because what can work for one organization does not necessarily mean that it will work for another (De haes and Grembergen, 2004).

2.2. IT governance in public organizations:

Nowadays, IT has become not only a set of tools to support business activity, but also an engine of organizational efficiency, growth and viability (Jonathan and Rusu, 2018).

IT investments have become increasingly important in both the private and public sectors. In this perspective, public sector organizations have reported on the importance of governance. Indeed, research has shown the important issue that IT governance has imposed on leaders of public organizations who want to maximize the value of their IT investment (Rusu and Viscusin, 2017).

Ambiguity of IT governance in the public sector has prompted a significant number of researchers to conduct studies to understand and demystify this concept.

The following table presents some IT governance studies in public organizations in different contexts, with different objectives¹.

Table 1 : IT governance studies in public organizations

Purpose of the study	Organization(s)	Author(s)
Evaluate the maturity of IT governance in public organizations by doing benchmarking with international references	Australian public organizations	Liu and Ridley (2005)
Examine how IT governance has been implemented through mechanisms in an Australian context	Australian higher education institutions	Bhattacharjya and Chang (2006)
Explore the appropriate IT governance practices for public organizations	Malaysian government public organizations	Jaafar and Jordan (2009)
Describe and analyze the implementation of IT governance and its benefits for health care organizations	Public health institutions	Currie and Guah (2007) Wilkin and Riddet (2009) Kobler and al. (2010)
Analyze the effects of Critical Success Factors (CSFs) on IT governance performance	Public sector organizations in Tanzania	Nfuka and Rusu (2011)
Evaluate the maturity of IT governance in public organizations by doing benchmarking with international references	Public organizations (Norway and Netherlands)	Aagesen (2011)
Analysis of IT governance practices	Governmental organization in a developing country	Al qassimi and Rusu (2015)
Specific studies on IT governance in public organizations	Australia	Martin and Gregor (2006)
	Croatia	Fabac and al. (2015)
	Indonesia	Erlangga and al. (2016)
	South Africa and Malaysia	Ngoma and Erasmus (2016)
Studying how IT governance practices contribute to inter-municipal IT cooperation	Finnish municipalities	Dahlberg and Helin (2017)
Determine the basic mechanisms for IT governance	Public universities	Ismail and al. (2007) Bianchi, Sousa, Pereira

¹ The list of studies in this table is not intended to be exhaustive

		and hillegersberg (2017) Bianchi, sousa, pereira and luciano (2017)
--	--	---

Source: developed as part of this study

Implementing effective IT governance seems difficult in the public sector compared to the private sector. This complexity is due to the multiplicity of objectives in the public sector, most often intangible or contradictory, with programs involving many stakeholders whose interests may also be in competition (Dawes and al, 2004).

Moreover, unlike private enterprises, public organizations have a complex organizational structure, with both administrative and political leadership (Wilkin and Riddett, 2009 ; Winkler, 2013). This is why IT governance in public organizations needs to be studied with participatory management practices, as well as strategic IT management concepts to provide added value to citizens (Ismail, 2008).

2.3. IT decision-making:

As mentioned earlier in Weill and Ross's (2004) definition, IT governance is based on the formalization of IT decision-making. This is done by specifying the policy followed in two important dimensions. First, the areas of decision-making, to clarify who makes the decision and how that decision is made. And second, modes of governance.

Two approaches have been developed by the researchers. One is by Sambamurthy and Zmud (1999) and the second is by Weill and Ross (2004). The following table illustrates two approaches:

Table 2 : Areas and modes of IT decision-making

Sambamurthy and Zmud (1999)		Weill and Ross (2004)	
Areas of decision-making	Modes of governance	Areas of decision-making	Modes of governance
-IT Infrastructure -IT use -IT Project	- Centralized -Decentralized -Federal	-IT principles -IT architecture -IT infrastructure -Business Application Needs -IT investment	-Business Monarchy -IT Monarchy -Federal -IT Duopoly -Feudal -Anarchy

Source : according to Sambamurthy and Zmud (1999) and Weill and Ross (2004)

Weill and Ross's approach is more detailed and decisive. In addition, it can be adopted in the context of decentralized governance. For these authors, the organization can use for each IT decision one of the following six governance archetypes:

- Business monarchy : when centralized decisions are made by senior business executives (at the senior management level);
- IT monarchy : centralized decision-making by individuals or a group of IT executives;
- federal system : it is a decision-making process in consultation between two parties involving the representatives of the different management units and the IT department.
- IT duopoly : decision-making by two parties, IT managers and a group of managers;

- Feudal system : heads of business units make separate decisions based on the needs of each business unit;
- anarchy system : it is the most decentralized mode where each small group or user determines their own IT decision.

3. METHODOLOGY :

The literature shows that the problem of measuring and evaluating IT governance was the most dominant, and ironically, most neglected area in the implementation of IT governance frameworks (Nicho and Khan, 2017).

In this article, we seek to evaluate the mechanisms put in place as part of an intentional and formal implementation in a Moroccan regional public organization (RPO). To do this, we used the exploratory case study as a research methodology. The advantage of the latter is that it is able to capture emerging and rapidly evolving phenomena such as IT governance in dynamic organizations (Baharein, 2008) cited by Hick and al. (2012). Moreover, and according to Yin (2014), the case study is a relevant step for the construction of theory, but also to test, refine or extend theories whether it is a single or multiple case.

Based on a study by Jonathan and Rusu (2018) on previous research addressing the issue of IT governance in public organizations, they concluded that the majority of research is exploratory research aimed at justifying the difference between the private and public sectors (Sethibe and al, 2007; Winkler and al., 2011), as well as to understand how IT governance should be designed and implemented in the public sector (example study: Ismail, 2008; Wilkin and Campbell, 2010; Kaur and al., 2014; Al qassimi and Rusu, 2015).

The case study allowed us to use a variety of sources, and data:

Table 3 : sources and data collection tools

Sources	data collection tools
Regional IS Manager	Semi-directive interview (duration: 2 hours)
Regional IS Manager	Evaluation grid
Reports and documents	Examining documents to understand the context and intentions of the implementation

Source: developed as part of this study

The first source of information in our case is the regional IS manager. It is the first instance and the person in charge delegated by the regional board of directors and the central general management to ensure the implementation of IT projects at the regional level and their follow-up.

We also used documents and reports (secondary data), provided by the regional IS manager, containing guidelines for the implementation of IT governance, and all IT solutions developed by central and regional management.

4. RESULTS AND INTERPRETATIONS:

4.1. Context of the case study:

Morocco has embarked on a flagship project of advanced regionalization, giving the region (regional organization, regional administration) autonomy in the management of its financial, human and technological resources.

Concerned by economic, social and environmental development, Morocco wanted to adopt a strategy of openness and territorial intelligence aimed at enhancing the potential and capacity of each region.

In this sense, the Moroccan government adopted an administrative decentralization charter in 2018 giving more power to regional public administrations, thus aiming to bring the citizen closer to the administration (and thus to satisfy him).

IS and IT are in the center of this transformation. Indeed, to sustain the achievements of IS and improve their performance, It is necessary to update their governance model, supporting all the changes brought about by advanced regionalization.

4.2. Results:

The following table summarizes the results that were collected through the two-hour interview. Indeed, we have completed a likert scale grid (0 to 5) measuring the effective implementation of the mechanism (**EIM**), the efficiency of the mechanism from the point of view of the respondent (**EM**) and the simplicity of the implementation of the mechanism (**SIM**).

Table 4 : degree of implementation of IT governance mechanisms

MECANISMS	EIM						EM						SIM					
Structures	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
S1 Roles and responsibilities						×					×							×
S2 IT organization structure				×							×					×		
S3 IT Strategy Committee						×						×						×
S4 IT Steering Committee						×						×						×
Process	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
P1 Strategic IS Planning					×						×						×	
P2 IT balanced scorecards	×						×								×			
P3 Governance Methodologies / Project Management	×						×						×					
P4 Service Level Agreements (SLA)		×						×						×				
P5 ITG frameworks (COBIT & ITIL)	×						×							×				
P6 IT Alignment/Governance Maturity Model	×						×							×				
Relational Mechanisms	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
RM1 Active participation by principal stakeholder						×					×						×	
RM2 Collaboration between principal stakeholders						×					×						×	
RM3 Partnership rewards and incentives	×						×						×					

RM4 Business/IT colocation						×						×				×	
RM5 Shared understanding of business/IT objectives					×						×					×	
RM6 Active conflict resolution (nonavoidance)						×						×					×
RM7 Crossfunctional business / IT training						×						×				×	
RM8 Crossfunctional business/IT job rotation	×						×								×		

Source: developed as part of this study

4.3. Interpretations :

The objective of this article is, on the one hand, to evaluate the IT governance mechanisms implemented by the regional public organization (RPO). And on the other hand, to understand how this organization has implemented them in a context of regionalization (decentralization).

By analysing the documents, we understand the orientations of the top management (central management). Indeed, implementing an IT governance framework was a strategic choice to strengthen integration and mitigate the negative effects of regionalization (including regional differentiation). Other objectives have also been identified, such as mastering the technological systems deployed and optimizing the IT investments made by central management.

4.3.1. Structures :

The new regional division has created new regional organizations. This is the case with our organization, which is the subject of our research. The latter has successfully implemented all IT governance structures. This is due to the (temporal) coincidence of these orientations with the creation of the RPO.

S1 : « ... The governance guidelines have detailed all the roles and responsibilities of all IT sectors, whether central or regional. As well as the main attributions ... Like that, everyone knows from the beginning its scope of intervention ... »

According to the regional IS manager of the RPO, the implementation of this mechanism was carried out without any remarkable complications. Indeed, a detailed description of the directions clarified the roles and responsibilities of all IT governance bodies (central, regional and provincial).

S2 : The RPO's IT structure is divided into four main functions:

- The "IT study and systems integration" function: this function's missions include contributing to the implementation of IT projects led by the "central" IT department relating to the development, integration and testing of IT solutions. When a solution is acquired or implemented at the central level, it ensures that this solution is adapted to the specificities of the RPO. In addition, this function is also responsible for exploiting the data by using it in the development of RPO's decision reports and dashboards.

- The "IT asset administration" function: the IT asset includes IT resources (infrastructures, applications, etc.). It is therefore the role of this function to administer them in order to ensure a high availability of IS and networks for OPR IS users.
- The "OPR user assistance and support" function: any IT solution is exposed to risks and incidents. To deal with this, the RPO has set up a "SPOC: Single point of contact" to provide the necessary support to IS users. Indeed, once an incident is recorded, the assistant classifies it, and requests the "human" resources capable of providing a solution.
- The "change management" function: to succeed in the strategy set by the RPO, it is necessary to define the training required for IS projects.

It is important to note that it is the regional IS manager who occupies 'alone' all these functions. The RPO insists on recruiting qualified employees who meet the profiles recommended by the governance guidelines

« ... our organization has a very recent application park ... claims on the IS are very limited at the moment ... so we do not rush to recruit unsuitable profiles for the four vacant positions... »

S3 and S4 : IT projects that are national in scope and involve standardized processes must be carried out in collaboration with all stakeholders.

«...the declaration and expression of needs are made by the RPOs... We participate in all IT projects, from the expression of needs to the deployment and exploitation of solutions in RPOs... »

This explains the centralization of these two committees at the level of the central management (top management). Indeed, the role of the IT Strategy Committee is to ensure the alignment of the IT strategy with the overall strategy of the central management (and its declination in the RPOs). As long as the role of the steering committee is to implement the IT strategy. This committee is the guarantor of the timely completion of the project while respecting the allocated budget.

4.3.2. Process :

P1 : The central IT department is in charge of the realization of the IS strategic plan of all the organizations whatever their levels (central or regional). It is also responsible for achieving its declination at the level of RPOs by developing a master plan for the regional IS.

P2 : To date of this study, the RPO does not use any dashboard on the IT issue to track and monitor IT activities at the regional level. However, this process has been implemented at the central level. It also provides information on the quality and volume of services provided by RPO entities.

P3 : Central top management made the irreversible decision to operate in "project mode" for all IT activities: acquisition, implementation, monitoring, and evolution. This allows for a clear definition of objectives, means, responsibilities and monitoring protocols.

P4 : In the RPO, the SLA is adopted on several levels: on the one hand, to organize the relations between the RPO and the CIO of the central management for the exploitation of the IT resources put at its disposal. And on the other hand, an SLA agreement can emerge when the RPO commits to outsource one of its IT activities without added value.

« ... we are serious about outsourcing one of our IT activities. This strategy will be very useful especially when we realize the scarcity of experienced IT profiles ... »

P5 : The development of IT governance guidelines was inspired by IT governance and security best practices (COBIT, ITIL, ISO 27001 ..). Central top management has taken a long time to develop an appropriate governance framework that meets the requirements of regionalization.

P6 : The alignment of information systems with the overall strategy of the central management is the cornerstone and the first objective of the IT governance guidelines. It is therefore essential that it establishes methods to measure the maturity of its processes.

4.3.3. Relational mechanisms:

De Haes and Grembergen (2004) emphasized the implementation of a set of relational mechanisms given their impact on the effectiveness of IT governance. In this section we will study the mechanisms implemented by the RPO.

RM1 and RM2 : According to the statements of the Regional Director of IS, he revealed the importance of stakeholder involvement in the success of IT projects. Indeed, when it is necessary to realize an IT solution to satisfy a need of the RPO (Non-standardized solution). It is necessary, even imperative, to consult with all stakeholders and especially the CIO of the central management (guarantor of overall homogeneity, standardization and IS security). In the event that this solution envisaged does not have a national scope, it must certainly be useful to several RPOs (as much as possible).

RM4 : *« ... all services have become co-located at the RPO level ... »*

The RPO operates in a "social" field where the intention of the government (State) is to provide a fast and quality service. Collocation is now a practice that goes hand in hand with regionalization objectives. Indeed, with the new division, all central entities were created at the regional level.

RM5, RM6 and RM7 : the business units are considered as partners essential to the success of the RPO's mission. In this sense, the success of the implementation of IT solutions depends on a shared understanding of business and IT objectives.

In addition, the service (business) concerned by an IT solution is called to participate throughout the various phases of design, implementation, and implementation of the project. In addition, the regional IT department ensures the resolution of potential conflicts, through the introduction of better communication management, training and change management.

RM8 : *« ... planning business/IT job rotation days is a constructive practice, certainly, but not feasible in terms of security ... »*

The manager did not exclude the possibility of implementing this mechanism. But, it anticipated an implementation after the operationalization of the IS security charter. In other words, after detailing the types of access and affordable information for consultation.

5. CONCLUSION :

The adoption of an IT governance framework seems to be an essential solution to preserve the achievements of IT investment organizations, whether in the public or private sector.

However, public organizations must embody the practices of new public management to overcome flaws and problems related to political influences and government reshuffles.

These parameters can lead to changes in the highest level of decision-making. And consequently, the change in programme priorities. This will cause unavoidable long-term planning and governance problems (Sethibe and al., 2007).

In this article, we have assessed the intentional implementation of an IT governance framework in a public organization in an advanced regionalization context.

The development of governance guidelines was an essential step and an intelligent practice on the part of central management, to avoid any slippage and misunderstanding. The results of this study show that the OPR should make a great effort to "decentralize" processes at the regional level to better support IT projects with regional specificities, and to improve its structures (missing positions).

There are other issues that will need to be studied in future research. Such as the issue of inter-organizational IT governance and its impact on IS performance and organizations.

REFERENCES :

- Aagesen, G., van Veenstra, A. F., Janssen, M., & Krogstie, J. : « The entanglement of enterprise architecture and IT-governance: the cases of Norway and the Netherlands », In System Sciences (HICSS), 44th Hawaii International Conference, 2011, pp. 1-10.
- Al Qassimi, N., & Rusu, L. : « IT governance in a public organization in a developing country: a case study of a governmental organization », *Procedia Computer Science*, 2015, 64, 450-456.
- Baharein, K. : « Case Study: A Strategic Research Methodology », *American Journal of Applied Sciences*, (5)11, 2008, pp. 1602-1604.
- Bhattacharjya, J., & Chang, V. : « Adoption and Implementation of IT Governance : Cases from Australian Higher Education », *Australasian (ACIS)*, 2006.
- Bianchi, I. S., and Sousa, R. D. : « IT Governance Mechanisms in Higher Education », *Procedia Computer Science* (100), 2016, pp. 941-946.
- Bianchi, I. S., Sousa, R. D., Pereira, R., & Luciano, E. : « IT Governance Structures in Brazilian, Dutch and Portuguese Universities », *Procedia computer science*, 121, 2017, pp.927-933.
- Bianchi, I., Sousa, R., Pereira, R., & Hillegersberg, J. : « Baseline mechanisms for IT governance at universities », In Proceedings of the 25th European Conference on Information Systems, 2017 , pp. 1551-1567.
- Currie, W. L., & Guah, M. W. : « Conflicting institutional logics: a national programme for IT in the organisational field of healthcare », *Journal of Information Technology*, 22(3), 2007, pp.235-247.
- Dahlberg, T., & Helin, A. : « Why and how do municipal areas govern interorganizational ICT cooperation: Indeed, "The emperor has no clothes" », In Proceedings of the 25th European Conference on Information Systems (ECIS), Guimarães, Portugal, June 5-10, 2017, pp. 1536-1550.

- Dawes, S, Pardo, TA, Simon, S, Cresswell, AM, LaVigne, MF, Andersen, DF & Bloniarz, PA, : « *Making smart IT choices: Understanding value and risk in government IT investments* », 2nd edn, Centre for Technology in Government, University of Albany, New York, 2004.
- De Haes, S., Van Grembergen, W. : «IT governance and its mechanisms», Information systems control journal, Volume 1, 2004.
- De Haes, S., Van Grembergen, W. :«IT governance structures, processes and relational mechanisms, achieving IT/business alignment in a major belgian financial group», Proceedings of the 38th Hawaii International Conference on System Sciences, 2005, Pp.1-10.
- Erlangga, E., Sucahyo, Y. G., & Hammi, M. K. : « The evaluation of information technology governance and the prioritization of process improvement using control objectives for information and related technology version 5: Case study on the ministry of foreign affairs », In Advanced Computer Science and Information Systems (ICACISIS), International Conference, 2016, pp. 189-194.
- Fabac, R., Kirinić, V., & Zebić, V. « IT Governance in Croatian Public Administration-The Human Resources Issues », In *Central European Conference on Information and Intelligent Systems*, 2015, p. 19.
- Georgel, F. : « *IT gouvernance, maitrise d'un système d'information*», Paris: édition Dunod, 2005, 212 P.
- Hicks, M. W., Pervan, G., & Perrin, B. : « A study of the review and improvement of IT governance in Australian universities », In CONF-IRM, 2012, p. 22.
- Ismail, N. : « Information technology governance, funding and structure: A case analysis of a public university in Malaysia », *Campus-Wide Information Systems*, 25(3), 2008, 145-160.
- IT Governance Institute : « Board Briefing on IT Governance »,2001, Available on: www.itgi.org
- Jaafar, N. I., & Jordan, E. : «Information Technology Governance (ITG) Practices and Accountability of Information Technology (IT) Projects-A Case Study in a Malaysian Government-Linked Company (GLC) », PACIS Proceedings, 2009, pp. 31.
- Jonathan, G. M., & Rusu, L. : « IT Governance in Public Organizations: A Systematic Literature Review », *International Journal of IT/Business Alignment and Governance (IJITBAG)*, 9(2), 2018, pp. 30-52.
- Kaur, J., & Bahri, A. H. S. : « Implementation of Information Technology Governance in the Malaysian Public Sector Practice », In PACIS, 2014, p. 119.
- Liu, Q & Ridley, G, : « IT control in the Australian public sector: An international comparison » , *Proceedings of the 13th European Conference on Information Systems*, Germany, 2005, 12 p.
- Martin, N., & Gregor, S. : « Ict governance: frameworks for managing australian egovernment », *Journal of e-government*, 2(3), 2006, pp. 19-49.
- Nfuka, E. N., & Rusu, L. : « The effect of critical success factors on IT governance performance », *Industrial Management & Data Systems*, 111(9), 2011, pp.1418-1448.
- Ngoma, M., & Erasmus, W. : « Maturity of IT governance in the South African public sector », In Proceedings of the International Association for the Management of Information Technology, 2017, p. 214.
- Nicho, M. and Khan, S. : « IT governance measurement tools and its application in IT-business alignment », *Journal of international technology and information management* [online], 26(1), 2017.
- Rusu, L., Viscusi, G. : « Information Technology Governance in Public Organizations », Integrated Series in Information Systems, vol 38. Springer, Cham, 2017.

- Sambamurthy, V & Zmud, RW, :« Arrangements for information technology governance: A theory of multiple contingencies », *MIS Quarterly*, vol. 23, no. 2, 1999, pp. 261-290.
- Sethibe, T., Campbell, J., and McDonald, C. : « IT Governance in Public and Private Sector organisations: Examining the Differences and Defining Future Research Directions », In *Proceedings of Australasian Conferences on Information Systems*, 2007.
- Van Grembergen, W. : «Introduction to the Minitrack IT Governance and Its Mechanisms», *Proceedings of the 35th Hawaii International Conference on System Sciences (HICSS)*, 2002.
- Vejseli, S., Rossmann, A., & Connolly, T. : «IT governance and its agile dimensions: exploratory research in the banking sector », *Proceedings of the 52nd Hawaii International Conference on System Sciences*, 2019, page :6209-6218
- Weill, P., Ross, J. W. : « *IT Governance – How Top Performers Manage IT Decision Rights For Superior Results* » Boston. Massachusetts: Harvard Business School Press, 2004, pp. 5-272.
- Wilkin, C. L., & Riddett, J. : « IT governance challenges in a large not-for-profit healthcare organization: The role of intranets », *Electronic Commerce Research*, 9(4), 2009, 351-374.
- Wilkin, C., & Campbell, J. : « Corporate Governance of IT: A Case Study in An Australian Government Department », In *PACIS*, 2010, p. 75.
- Winkler, T. J. : « IT governance mechanisms and administration/IT alignment in the public sector: A conceptual model and case validation », In *Wirtschaftsinformatik*, 2013, p. 53.
- Winkler, T. J., Lvova, N., & Günther, O. : « Towards transformational IT governance-the case of mobile government adoption », In *ECIS*, 2011, p. 83.
- Wu, S. P.-J., Straub, D. W., and Liang, T.-P. : « How Information Technology Governance Mechanisms and Strategic Alignment Influence Organisational Performance: Insights from a Matched Survey of Business and It Managers », *MIS Quarterly* (39:2), 2015, pp. 497-518.
- Yin, R. K. : « Case Study Research Design and Methods », (5th ed.) . Thousand Oaks, CA: Sage, 2014, 282 pages
- Zahi, J., Belhaj, A. : « La gouvernance des Technologies de l'Information : un dispositif de contrôle du système d'information éducatif », *Revue "Repères et Perspectives Economiques"* [En ligne], 03 / 1er semestre 2018, mis en ligne le 28 juin 2018.