



Integration of security methods based of ISO/IEC 27002 standard for record management in the process of sending and receiving official documents for e-government

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Abstract

This research is about of information security on record management in the process of sending and receiving of official documents for electronic government (e-government). Through of this report, explains how business strategies are linked with IT strategies, and how them have having importance in the public administration. Next, it takes a case study a government dependency where did the research and the IT strategy results a prototype, and the same time the need to assurance the government's information. Additionally, implements the steps of methodologic model used, contributing to finish them. It concludes with security methods based of ISO/IEC 27002 that increase and guarantee a high parameter of information security in the process of sending and receiving official documents in the e-government.

Keywords: Record Management, ISO/IEC 27002, Information Security.

Introduction

In accordance with Koontz et al (2012) "the strategic is defined as the way in the long term basic objectives of a company are determinate, the implementation of the courses of action and the allocation to achieve the objectives". For this reason, that companies and organizations use strategic actions for to get them.

Jimenez (2011) "the business strategy is a for managerial analysis tool used to plan the future route of the organization, it is responsible for considering both the internal



and external environment, the competence, the vision and the allocation of the resources of the company". Likewise, it defines that Information Technologies (IT) strategies are a business strategic tool, used for structure the route and manage IT resources, as well as the internal and external IT interrelations with the business, the flow and storage of the organization's data.

Thus, it assumes that the correct implementation of managerial strategies as well as IT strategies brings to get objectives of the organizations and private companies. This begins the Alignment Model between IT and business strategy, in accordance with Henderson & Venkatraman (1993), the model defines four alignment perspectives classified in two types, they show in the table num. 1:

Table 1. Alignment model between IT and business strategy

Internal	External
<ul style="list-style-type: none">• Business strategy• IT strategy	<ul style="list-style-type: none">• Infrastructure and business processes• Infrastructure and IT processes

Source: Henderson & Venkatraman, 2013.

This framework pretends make easier comparison activities, through analysis of goals, IT objectives in front of the organization, in other words, it identifies and adapts what IT strategy matches with the needs of the organization. So, this model serves as support to achieve alignment of the business strategies and IT. It has been found that using IT have been the bases for the success of entities, furthermore they lead to formation of digital strategies.

In several countries, they have adopted the concept e-government, in agreement with United Nations Educational, Scientific and Cultural Organization (UNESCO) which produced a document entitled "Electronic Government: Country profiles", where it mentions the advances that certain countries have about e-government topics, for example, Canada has the Canadian Health Network that contains the financial resources of more than 460 organizations, in addition, the National Job Bank, its objective is collect job offers in kiosks throughout the country and through Internet (UNESCO, 2002). It can be noted that Canada has implemented IT strategic solutions.

Republic of Korea according to UNESCO (2002), it is pioneer using IT strategies for Federal Public Administration (FPA) processes. The Koreans have carried out record digitalization projects and operations related to public functions, like payments and pensions, for optimize managerial processes on line.



The objective of digital government strategy around the world is achieving the using IT benefits in dependencies and entities of FPA for accelerate citizen electronic procedures, improve to be transparent the public function and increase the quality of government services (OEA, 2017). Electronic strategies purpose is to optimize administrative processes, in the reduction of the number of documents per file to be processed, plus cost of paper and other elements are related with the sending process, such as transportation costs of official documents to addressee.

Mexico, in accordance with the program met like e-government, it promotes the use of Internet and government Intranet. At July 2006, the citizen had access to 1,879 on-line government electronic procedures and services, they were provided by dependencies and entities of FDA through web platform, call centers, kiosks and single windows for the citizens (OEA, 2017).

The decree 267 of Official Journal of Tabasco, in article 56, section IX says: “Establish programs to promote savings for electricity power, fuels, telephones, drinking water, printing and photocopying materials, and inventories. Likewise, other items current expenditure, which must be submitted for the consideration of the holders and governing bodies respectively” (Periódico oficial, 2015). This way the purpose of decree 267 lead to the reduction of paper articles and improve the processes through electronic choices.

Therefore, the Government of State Tabasco follows the Digital Agenda 2013-2018 called Tabscoob 2.0, that aims to digitize manual processes and optimize electronic processes, through of single windows and electronic kiosks for to reduce costs and improvement of processes, to comply with aforementioned decree 267.

The Coordination of Administrative Modernization and Government Innovation (CAMGI) belongs to Secretary of Administration and Government Innovation (SAGI) assigned to Government of Tabasco, Mexico, the process of record management is used for daily operations, this way the government uses paper for many administrative purposes, for example procedures, requests, memos, information documents through semiautomatic processes. CMGI is considered a Spending Responsible Unit (SRI) for the organic structure of SAGI, next, it mentions processes that the Coordination operates day by day (Gobierno del Estado de Tabasco, 2017):

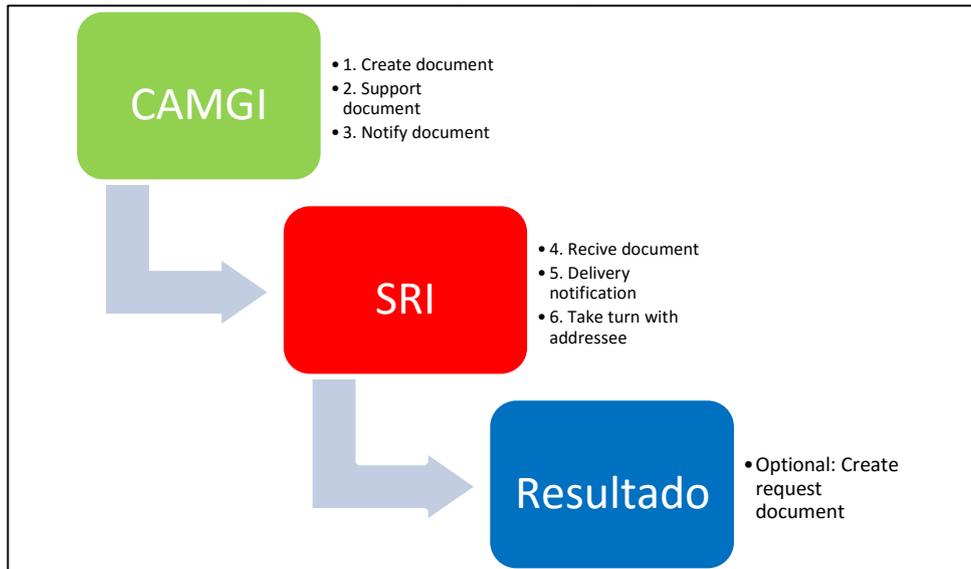
- Software development
- IT
- Procedures for to removal motor and movable property.
- Technical approvals



- Preparation and elaboration of organization manuals

Based on the analysis of the CAMGI procedures, it found that there are generic processes in the sending and receiving of official documents, but they do not have standards that support the current process. The figure num. 1 can observe the process before mentioned.

Figure 1. Generic process of CMGI's activities



Source: Frank, F. et al (2018).

The current delivery process of the documents is like this, the CAMGI creates documents, it attachments support documents (if apply), next, it creates notify document for sending to addressee. The responsible person of correspondence office moves it to building addressee. Then, the documentation is delivered to reception office, person in charge of correspondence seals the delivery acknowledgment and turns the areas or final person. In case of contestation, the process is repeated reciprocally. In the other words, since output of the documentation until input documentation generates time that can be minutes up to five days.

The implemented process shows many deficiencies, e.g. excessive paper use, this origins forest deforestation for the manufacturing of it. In the same way it mentions precise problematics about linked to sending and receiving process:

- With information obtained by the researcher through personal interviews with the staff, CAMGI spends 120 packs of paper per month, this represents approximately \$10,100.00 MXN monthly.



- Using CAMGI official vehicles is one way for sending documents, however, when the documents are urgent it uses personal vehicles of workers and administrative personal. Approximately there are until five output at day to different destinations. This contributes to generate CO₂. The vehicles consume fossil fuels, they spend \$9,500.00 MXN per month, in addition to reducing the useful life of them.
- The budget of expenditures approved of Government of State Tabasco for “*Clasificador por Objeto del Gasto (COG), Materiales de administración, emisión de documentos y artículos oficiales*” was \$70,862,581.00 MXN. For the SAGI was approved \$46,149,300.00 MXN (Periódico oficial, 2015). The CMGI’s budget, section “*Materiales y suministros*” was \$590,600.00 MXN at tax year 2016 (Periódico oficial, 2015, p.208). The budget section “*Materiales y suministros*” includes paper and toner. It estimates that average monthly spending is \$49,216.66 MXN.
- The CAMGI has exclusive personal for the output of correspondence, who drives official government vehicles for deliver them to different people in the dependencies.

This way it requires an analysis of the strategies for record management in the federal government for to optimize the processes of sending and receiving official documents and including the quality assurance of the information.

Therefore, questions arising that enrich the research, for example, What IT strategies are suitable for the record management? What do regulations or standards implement for support the security in the sending and receiving official documents? What security methods are appropriate for the needs of e-government? What new IT tools would support information security?

IT have helped to accomplish the FPA objectives, the research focuses on the analysis of current process of CAMGI activities, in sending and receiving official documents, then the definition of the integration of security methods based on international standards for the certification, guarantee and assurance of information.

Methods

For the purposes of this research, it implemented the qualitative inquiry, because the characteristics of this are based in descriptive, interpretative and intuitive methods, with the purpose to exploring, understanding, interpreting and describing the behavior of study reality (Muñoz, 2011). Also it adopted this kind of research for the way of



descriptive study, it helps to know who, where, when, how and why the study object (Nagui, 2005).

The validity and reliability of the research, three qualitative inquiry were chosen, organizational ethnography, system theory and organizational hermeneutic (Patton, 2002); three data sources, those information obtained from observation, object groups, and organizations' documents, finally data obtained by researcher, stakeholders, collaborators, staff members, including written policies of the organization.

Secondary data sources are met materials already, with specific results to apply record analysis techniques on primary data sources. It decided uses secondary data sources because the studying of organizational documents, process and procedure analysis, in addition standards, laws, decrees that CAMGI uses to know the Coordination's environment.

The methods of data collections chosen were filed research, observation and focus group, they provide real time information and they do not distortion by third persons, and in the case of focus group for obtains important information about the feeling of group of stakeholders relating to situation of CAMGI (Guizar, 2013).

Development model used was a methodology fusion result, in the other words, it implemented procedures of research methodology with SCRUM, it opted because is an agile development method to get goals and comfort time costs (Laines, F, 2015). In table num. 2 can be appreciate the activities in the methodology fusion.

**Table 2. Methodology fusion**

Phase	Processes
Phase 1: Initiate	<ol style="list-style-type: none">1. Create Project Vision2. Apply ISO 154893. Set data collection methods.4. Preview analysis to define Coordination processes sampling5. Align business strategies with IT strategies.6. Identify Scrum Master and Stakeholders.7. Form Scrum Team8. Model standards for the process of sending and receiving official documents.9. Develop Epics10. Create Prioritized Product Backlog11. Create software architecture12. Conduct release planning.
Phase 2: Plan and estimate	<ol style="list-style-type: none">13. Create user stories.14. Approve, estimate, and commit user stories.15. Create and estimate tasks.16. Create sprint backlog.
Phase 3: Implement	<ol style="list-style-type: none">17. Create deliverables.18. Conduct daily standup.19. Groom prioritized product backlog.
Phase 4: Review and retrospect	<ol style="list-style-type: none">20. Convene Scrum of Scrums.21. Demonstrate and validate Sprint.22. Retrospect Sprint.
Phase 5: Release	<ol style="list-style-type: none">23. QA Test by software requirements.24. Apply ISO/IEC 27002.25. Capacitation.26. Help Desk27. Shio Deliverables and retrospect Project.28. Results and improvements.

Source: Frank, F. et al (2018).



Results

In accordance with the activities conducted of methodology fusion, for to answer to research questions, it proceeds to mention the obtained results. Firstly, on the phase 1, it created the project vision, in addition it applied procedures of ISO 15489 for record management in the process of sending and receiving official documents. Next, it established data collection methods, for example interviews, field research, also, it aligned a business strategic with IT strategies.

Between the research and the alignment IT throw that opted by an analysis and design of a record management prototype for to support the process of sending and receiving official documents. Having the control areas of international standard ISO/IEC 27002 Information Security Management Systems, it designed the security methods for to implements in the prototype (ISO/IEC 27002, 2013). See table num. 3:



Table 3. Security methods designed in base ISO/IEC 27002

Control area	Security method	Description
Organization of information security	N/A	Established communication for incidents reports between final user and first level of helpdesk.
Operations security	Advanced electronic signature.	In accordance with <i>“La ley de la firma electrónica avanzada”</i> published by Official Journal of Mexico on January 11, 2012, it acquired the using of this technology for the needs of the government, then, it will apply in the prototype for real time validation with <i>“Servicio de Administración Tributaria”</i> (SAT).
	Original string	Automatic syntaxes generated in the sending of the document in the prototype, composed by: “Number of the document” “Full Name” “Number of certificate” “Subject” “Location, date, hour of broadcast”. E.g: SAGI/CMGI/DGTIC/001 Fabián Frank Hernández 2700010000121 Nombramiento de personal Villahermosa, Tabasco, México, 01-06-2018, 17:00:20.
Access control	Access controls	Implementation of control Access to prototype through username and password.
	Centralized database	Centralized database on PostgreSQL, hosted in a dedicated Linux Server for the information security.
Cryptography	Data encryption	Sensible items like passwords, e-signature, encrypted by SHA 256 bits.
		Access by public and private key to production servers.
Physical and environmental security	SITE	The virtualized server is mounted a special site with restricted access, UPS, and controls for to prevent fire and cutting electricity.



Communications security	Communication channel protection	Implementation of Secure Socket Layer (SSL) like control of channel protection.
APIS security	Using Secure Shell (SSH) for secure communication between the system administrator and production server. The tool recommended is MobaXterm because is free and adaptable for public and private key, in addition has a friendly user interface.	
Accestoken	Credential for the authorization of operational transactions between the prototype and the database, support by Rest Framework and OAuth framework.	

Source: Frank, F. et al, 2018

The ISO/IEC 27002 implemented, it scoped control areas that guarantee a high security parameter in the record management prototype. The Advanced Electronic Signature provides pluses and advantages in the security methods, because for anyone has the Advanced Electronic Signature, first, he should take a biometric testing procedures made by the “*Servicio de Administración Tributaria*” (SAT) of the Mexican Government. For this reason, the technology applied assurances integrity, no rejection, authenticity and confidentiality in the process (Berumen, 2015). It approaches this IT strategy based on the collaboration agreement of federal government through SAT for the electronic signature implementation in dependencies and entities of federal public administration, where Tabasco is involved in the agreement (IFT, 2016).

Thus, the research conclusion is, the information security is important in government process, the IT strategies used like software development, virtual server and cloud computing, currently these technologies are several requested in Federal Public Administration. The standard ISO/IEC 27002 leads and routes the topics of information security, and based of it, contributes to maxim the security in record management in the process of sending and receiving official documents. To finish, the researchers’ expertise, they precise what security methods are the recommended to satisfy and accomplish the security requirements in the process before mentioned for enriches the electronic process in an electronic government.



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