An IT Service Management Methodology for an Electoral Public Institution

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***Abstract*—The document presents an adaptation of the Information Technology Infrastructure Library (ITIL) standards and best practices provided from its service life cycle in the IT department (ITD) of a Local Electoral Public Institution (LEPI) in Mexico. These type of autonomous and public organizations are in charge of organizing elections in each state. The ITD is in charge of IT problem solving and improvement projects related to elections and other needs of the organization. Most of the work is generated from user needs as they arise, but there's a lack of Standard Operating Procedures (SOPs) which prevents continuous monitoring, improvement and follow through. The main challenge to providing quality IT services in Electoral Institutions of this nature, is their adaptability to unexpected changes that occur in regulations. Service requests are caused by untimely changes arising from agreements and resolutions of Institutes and Court; this creates a work environment in which sudden decision-making is encouraged in terms of IT solutions management, which is why having an IT strategy that aligns with the strategic objectives of LEPI is crucial to guarantee a continuous improvement in the local democratic functioning. There is limited research on the application of standards and best practices in IT services for the public sector in Mexico, this methodology can be implemented in each of the 32 IT departments within the country.**

Keywords-ITIL; IT service management; best practices

I. INTRODUCTION

Organizations seek to understand and control the state of their technological tools and the level of administration they have on them, especially if they are dedicated to providing IT solutions. Not having a precise vision that fits the strategic objectives and enables adaptation through change management, prevents providing quality services. The widespread use of information technologies to service developing has made the process of business information management and performance measurement critical and fundamental [1]. The information system of any company must guarantee an adequate flow of information, be capable of supporting activities related to management and control, as well as corporate governance processes. In this context, it is necessary to think about the application of management and logic methods to IT.

IT governance defines that part of corporate governance that deals with the management of a company's IT systems, it has been identified as an organizational ability of great importance for IT strategic alignment and the delivery of business though information technologies [2].

IT administration and government have been present and in constant analysis since the creation of information technologies themselves. Due to IT sophistication increase and response time to incidents decrease, best practices tend to be formalized in globally recognized compendiums that are applicable to different contexts [3]. In the IT field, there are successful experiences of implementation in public management that must be taken into account, so learning from outside initiatives and taking advantage of the knowledge accumulated around best practices is relevant to move towards a wider IT management [4]. Global best practices focused on IT, tend to be a guide for the acquisition and development of IT services that make interoperability possible through exchange and access to information [5].

IT service management is a strategy that focuses on defining, managing and providing IT services and addresses the need for information technologies to focus more users by offering systems with high performance [6]. The efficient delivery of high quality IT services, in a constantly changing business environment, poses a great challenge. If the management is effective, the changes are proactively adapted to the strategy of the organization [7].

We live in a global world where technology, especially information and communication technology, is changing the manner in which businesses create and capture value, how and where we work, and how we interact and communicate [8]. People are considered as a crucial element to provide world class service experiences to users. Processes need to be standardized to guarantee their repeatability and their performance measurement. Finally, information technology consists of the IT infrastructure. One of the main objectives of the management of IT services is to maintain a stable infrastructure and reduce the amount of downtime [9].

II. LOCAL ELECTORAL PUBLIC INTITUTIONS IN MEXICO

Local Electoral Public Institutions (LEPI) are autonomous institutions in charge of the election processes in

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the country. The entire preparation, organization and development on which the corresponding elections depend is called Electoral Process and begins ten months before the next election. The legislation dictates that 24 hours a day and 7 days a week are business, that is why its characterized by long working shifts that exceed 15 hours a day. The IT department form the LEPI is in charge of IT problem solving and improvement projects related to elections and other needs of the institution such as decision making on critical projects, planning, developing, training, implementing and monitoring information systems developed by them. Although the Electoral Process begins only 10 months before the elections, when it comes to its end, the ITD continues with its daily operation providing IT services.

A. Sonora's Local Electoral Public Institution

Services provided from Sonora's IT department are considered functional, since they comply with the requirements that users present at the moment, but there is a lack of standardized procedures, what makes impossible to guarantee a continuous monitoring and improvement of them. The main cause is due to service requests are propitiated by untimely changes in the different regulations, derived from agreements and resolutions from other Institutions and Courts. The problems presented in the IT department each election period are similar. There are crucial activities that are developed without carrying out documentation, which prevents taking advantage of the resources available in a more efficient way. The work environment encourages sudden decision making regarding the management of IT services. In addition, there is a lack of procedures to document experiences related to changes that arise in the service providing that allow to guarantee, monitor and continuously improve the technical IT services offered. This has caused wasted resources, rework and wasted time.

III. METHODOLOGY

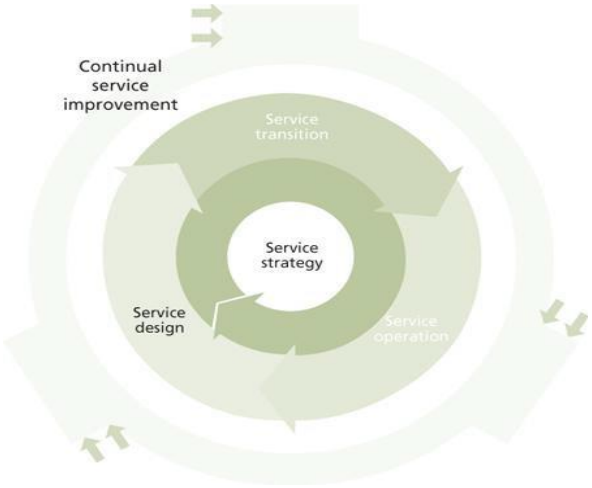

Figure 1. ITIL service life cycle phases and processes [14].

Based on Hernando-Ibáñez [10], Blumberg et al. [11], Gomez et al.[12], Almeida et al. [13], Verlaine et al. [14], Mahy et al. [15], El et al. [16], Iden [17] , Sukmana et al. [18], Berrahal et al. [19], Limanto et al. [20], Ng [21] and Dayal et al. [22] whose works have similarities among each other in the problematic they present and due to all of them use ITIL as a solution methodology, it was decided to implement the IT Infrastructure Library processes and best practices to address the problem exposed in this paper due to its similarity with those mentioned above. ITIL offers a total of 26 processes that compose the service life cycle shown in Fig. 1.

The proposed methodology arises from the analysis of the work carried out by Pasos-Zayas [23], Hernando-Ibáñez [10] and Blumberg et al. [11]. It is presented in Fig. 2 and shows the stages, phases, processes and activities with which the management of information technology services offered by the LEPI was carried out.

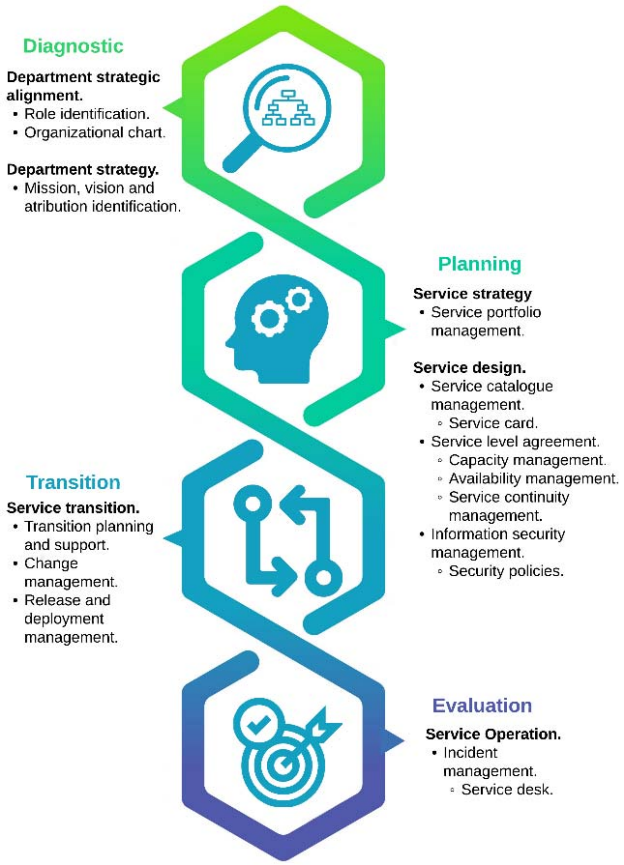

Figure 2. Implemented methodology in the IT department.

The LEPI IT department works under an internal operational regulation, since the department depends on others, for example, in the case of financial management depends on the administrative department, it was impossible to apply all the processes described by the ITIL compendium. From the 26 applicable processes, 11 were chosen based on the applicability they had in the ITD and their needs. The stages, phases, processes and activities shown in Fig 2. are described below.

A. Stage I: Diagnostic

The first stage of the methodology is formulated with the department strategic alignment phase, where a job description from the ITD was made; and the department strategy phase where relevant information was identified to understand under what principles the services are provided and the objective of the department.

1) Department strategic alignment phase

To gather the information and know the objectives of the staff, the technique used was the observation and review of the limited documentation that the ITD had, such as organization manuals whose last update was made in 2015.

2) Department strategy phase

Due the ITD belongs to a LEPI, it was important to first know the mission, vision and general attributions of the institution since they are the supporting aspects of the strategic framework. Knowing the strategic information of the institution, the same analysis was made to the ITD which enabled the identification of objectives, the guiding principles and the functions that the department has as an IT service provider.

B. Stage II: Planning

In order to implement the methodology, it was first necessary to identify the services that the ITD offers to the LEPI. Based on the information gathered from the strategic and regulatory data (mission, vision and attributions) of both, the existence of five general services which detach different products was identified. The services identified are the following: Systems Development, Information Request Attention, Technical Support Request Attention, User Account Management and Data Center Administration. The planning stage is composed by two phases: Service Strategy and Service Design.

1) Service strategy

In this phase, a strategic orientation of the identified IT services was carried out, in order to capture which ones will be offered to the users. The focus was to enable service management as a strategic asset and always focus on the Institution objectives. The ITD did not managed a service portfolio, so one was created composed by the sections presented on Table I.

TABLE I. SERVICE PORTFOLIO ELEMENTS

Section	***Description***
Id	Official service identifier.
Service	Name assigned to the offered assistance.
Objective	Describes the purpose of the service.
Version	Indicates the number of adaptations or changes that the service has suffered.
Modification date	Indicates when the modification was carried out.
Description	Provides an explanation of the modification if it exists.
Portfolio category	This section is divided into three categories. 1. *Service creation*: all those that are in the creation process by the provider and that are not available to users yet. 2. *Service catalog*: this includes the services that are currently operating or those that are about to be released. 3. *Service retired*: services that for any reason the ITD stopped providing are identified with this category.
Frequency	Indicates how much the service is used.
Status	Indicates the status in which the service is currently. 1. Requirements. 2. Defined 3. Analyzed. 4. Approved. 5. Rented. 6. Designed. 7. Developed. 8. Built. 9. Tested. 10. Released. 11. Operational. 12. Retired.

To clearly define each service, a procedures manual was elaborated which contained information such as purpose of the service, operating policies, description of procedures, responsible roles, applicable regulations and procedure diagram.

2) Service design

In the second phase of this stage, a service catalog was established, helping the identification of new services that should be included or based on those with an available status, could be the indicated if similar functions were required. To strengthen the service catalog, a service card was developed, which details what can be expected when acquiring any service, what is the importance of the service and provides certainty of the responsible roles under the perspective of a user. Then it was needed to establish a Service Level Agreement (SLA) for each service, this document included aspects from other ITIL processes such as capacity management (performance, IT and human resources needed), availability management (service schedule, support schedule, incident frequency, response time) and service continuity management (monitoring, contingency plan). Contingency plans were prepared to guarantee each service continuity, this provided ITD staff with procedural safety at the time of attending an incident report by giving them a document with guidelines to follow (possible incidents, actions to carry out and responsible roles). The last process from this phase was the information security management, where a document that establish integrity and availability policies for IT infrastructure and IT services was created. The purpose of this document is to set guidelines in the IT service providing, this document includes crucial points such as general provisions (software and hardware), computer equipment uses, web browsing, internet usability policies, intranet access, information security and users information. Security policies ensure that the information is maintained with the same accuracy and precision with which it was created without going through unauthorized modification processes

and enables its availability to authorized staff, who need to make inquiries avoiding interruptions.

C. Stage III: Transition

It was found that when making a service transition to the user, the ITD had no documentation that regulates, supports or justifies the attention to any request which cause that important points between service design and service operation are omitted.

1) Service transition

In this phase, the transition planning and support, change management and release and deployment management processes were chosen since it was identified that they were those whose characteristics did not exist in the ITD procedures. A general transition strategy for each service was created, which helped to establish and visualize in a simpler way how the interaction between the user and the ITD will be, some points established in the transition strategy are applicable regulations, service type of users, usage policies, roles and responsibilities, deliverable and type of delivery (major, minor or emergency). Also, it was found that the ITD does not perform any type of change management in its services, it only receives requests where the modification or update of a service is specified and in certain cases, when the request is cataloged as complex, a meeting is scheduled with the user, however, at the time of the event, no documentation is generated to support the request, which results in incidents due to lack of understanding by some of the parties. A change request format was created in which a risk analysis is carried out to identify possible incidents that could delay the prompt response to the request or that represent a vulnerability in any part of the attention process, afterwards, a change execution plan is established, which specifies the activities that will serve as input, process and output when attending the request, this section also defines required resources, responsible (which can be staff from the ITD or the user area) and scheduled delivery dates along with the dates of compliance. To complement this process and in order to have internal control and traceability, a change control sheet was implemented. In addition, it was identified that the ITD do not manage any kind of delivery, in order to control their service deliveries, a delivery card format was implemented where both parties ensure that the service meets all the requirements necessary to be considered functional and high quality.

D. Stage IV: Evaluation

It was identified that the ITD did not handle any record or reports that helps them monitor the performance of their services and did not have any kind of platform that allowed them to receive, categorize, prioritize and close incidents, due to this, stage IV concentrated on incident management.

1) Service operation

Currently, a Service Desk System (SDS) is being developed using PHP for the coding, the SDS will be enabled on the institution's intranet providing access to each department of the LEPI, maintaining a single point of contact between the users and the ITD when they need help. The objectives of the SDS are logging incidents and service requests and allocate categories and priorities, solve incidents and service requests, escalate incidents and service requests to the responsible role within agreed timescales and service level, keep users informed of progress, close all solved incidents and service requests, conduct satisfaction surveys and form a knowledge cluster that allows ITD staff to monitor, analyze statistics and predict possible future incidents. Incident information is being managed through a Google Forms document which has 208 records at the moment. When the ITD receives a request, some crucial elements that needs to be captured are: reception date, reception time, who registers, requesting department, type of request, request reception (e-mail, phone, oral, intranet chat, other), request description and attention deadline. When the request is closed, the relevant information is: attention date, attention hour, who attended and attention description. When carrying out this type of procedures, a knowledge silo is generated that will help not only ITD staff but also that users so they can return to their activities in a faster and more efficient way.

IV. Results

This section shows preliminary results on the methodology implemented so far. It was identified that the ITD did not use any framework or some type of documentation to enable traceability of its services. Table II shows a list of the documentation created and its relation to ITIL phases and processes.

TABLE II. Gnerated Documentation and ITIL Conexion

Document	***ITIL phases and processes***
Service portfolio and procedures manual	Service strategy (service portfolio management)
Service catalog and service card	Service design (service catalog management)
Service level agreement	Service design (service level management, capacity management, availability management and service continuity management)
Contingeny plan	Service design (service continuity management)
Information security policies	Service design (information security management)
Transition strategy	Service transition (transition planning and support)
Change request and change control sheet	Service transition (change management)
Delivery card	Service transition (release and deployment management)
Incident management document	Service operation (incident management)

By analyzing the incident management document, it was possible to make an estimate of the average time it took to attend any type of incident before using the implemented documentation. When introducing the Service Desk System in combination of the documentation that is currently part of the daily operation of the ITD, the average time of incident attention will be analyzed and is expected to decrease.

V. CONCLUSIONS

The implementation of a methodology based on best practices, enables an IT department to start managing their IT service providing, it adds value to their procedures by identifying key activities and providing a general vision aligned to their strategic goals. By using ITIL processes it was possible to identify the main functions, define new services, continuously modify and improve existing ones or retire those that are considered obsolete. The use of a strategic methodology approach that allows an effective administration of resources and information, will define crucial elements for the success and survival of any institution, specially electoral ones where processes must be completely clear and transparent. Effectively managing information is a key element in any organization, since it enables the process operation and performance. By adapting this kind of methodology, a complete service administration was achieved, consolidating the ITD as an internal high quality information technology services provider.

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