









Development of a document management system in accordance with ISO 9001:2015 for the coordination of comprehensive transportation in Irapuato

Desarrollo de un sistema de gestión documental conforme la ISO 9001:2015 para la coordinación del transporte integral en Irapuato

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Abstract

This project proposes the design of a Document Management System [DMS] in accordance with the ISO 9001:2015 Standard, applied to the Coordination of the Integral Transport System of Irapuato [SITIPago]. It arises as a response to deficiencies in the issuance, documentary control of prepaid cards, which mainly affect students. From a documentary and technical diagnosis, the absence of standardized procedures and traceability was evidenced. A hierarchical model of documents was developed, with conservation policies, control formats, instructions, and continuous improvement tools. In addition, flowcharts and standard operating procedures were designed to facilitate capacity and standardization. The result is the development of an SGD Manual, aimed at future implementation. In which it is demonstrated that by applying international standards, public management and quality of service in Irapuato are improved in the issue of the coordination of the integral transport system.

Design of a Document Management System (DMS) for the Coordination of the Irapuato Integral Transport System of the General Directorate of Mobility and Transport in accordance with the ISO 9001:2015 standard.




Objectives	Methodology	Contribution
<p>Design a Document Management System (DMS) in accordance with ISO 9001:2015, for the Coordination Department of the Integrated Transportation System of Irapuato (SITIPago).</p> 	<ul style="list-style-type: none"> Documentary and technical diagnosis Process analysis Development of a hierarchical model Creation of flowcharts and standardized procedures Standard applied: ISO 9001:2015 	<ul style="list-style-type: none"> DMS Manual. Standardization of processes. Improvement of traceability. Optimization of public management and transportation service 

Document management, Standardization, Public management

Resumen

Este proyecto propone el diseño de un Sistema de Gestión Documental [SGD] conforme a la Norma ISO 9001:2015, aplicado a la Coordinación de Sistema Integral de Transporte de Irapuato [SITIPago]. Surge como respuesta a deficiencias en la emisión, control documental de las tarjetas de prepago, que afectan principalmente a estudiantes. A partir de un diagnóstico documental y técnico, se evidenció la ausencia de procedimientos estandarizados y trazabilidad. Se desarrolló un modelo jerárquico de documentos, con políticas de conservación formatos de control, instructivos, y herramientas de mejora continua. Además, se diseñaron diagramas de flujo y procedimientos normalizados para facilitar la capacidad y estandarización. El resultado es la elaboración de un Manual del SGD, orientado a una futura implementación. En el que se demuestra que al aplicar normas internacionales se mejora la gestión pública y calidad del servicio en Irapuato en el tema de la coordinación del sistema integral de transporte.

Diseño de un Sistema de Gestión Documental (SGD) para la Coordinación de Sistema Integral de Transporte de Irapuato de la Dirección General de Movilidad y Transporte conforme a la norma ISO 9001:2015

Objetivos	Metodología	Contribución
<p>Diseñar un Sistema de Gestión Documental (SGD) conforme a la Norma ISO 9001:2015 para la Coordinación de Sistema Integral de Transporte de Irapuato (SITIPago).</p> 	<ul style="list-style-type: none"> Diagnóstico documental y técnico. Análisis de procesos. Desarrollo de modelo jerárquico. Elaboración de diagramas de flujo y procedimientos normalizados. Normativa: ISO 9001:2015 	<ul style="list-style-type: none"> Manual del SGD. Estandarización de procesos. Mejora de la trazabilidad. Optimización en la gestión pública y del servicio de transporte. 

Gestión documental, Estandarización, Gestión pública

Area: Advocacy and attention to national problems

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Peer review under the responsibility of the Scientific Committee MARVID[®] in the contribution to the scientific, technological and innovation Peer Review Process through the training of Human Resources for the continuity in the Critical Analysis of International Research.



Introduction

In the last few years, prepaid systems for public transportation have become popular in different cities in Mexico as part of efforts to modernize urban mobility. In Irapuato, Guanajuato, the Irapuato Integrated Transportation System has implemented the Prepaid and Credentialing System [SITIPago], managed by the Irapuato Integrated Transportation System Coordination Office in the General Directorate of Mobility and Transportation in collaboration with concessionaires and the company NRTec, which is responsible for manufacturing the cards issued by the coordination office, installing recharge points, and monitoring cash flows.

This system represents a significant step toward more efficient transportation; however, it faces operational and documentary challenges that affect its performance, especially for the student community, one of the largest and most frequent users of the service, representing a significant portion of the population of 145,308 students according to INEGI, 2020.

The importance of optimizing SITIPago lies in its direct impact on users' quality of life, by facilitating access to public transport and ensuring a reliable and equitable service. The added value of this research lies in the proposal of a Document Management System [DMS] based on Microsoft SharePoint and aligned with the ISO 9001:2015 standard, as opposed to manual systems or non-standardized platforms that predominate in similar contexts. As observed in the current system, it lacks traceability and control, which is why the proposed DMS aims to achieve:

1. A hierarchical structure that organizes documents logically.
2. Standardized workflows that streamline key processes such as card issuance and complaint management.
3. Control formats that ensure consistency and traceability.
4. Regulatory compliance with international and local standards.
5. An SGD Manual that serves as a practical guide for implementation.

These features enable more efficient, transparent, and scalable document management, overcoming the limitations of the current system to be migrated.

The main problem addressed by this research is the lack of standardization and traceability in the document management of the Irapuato Integrated Transport System Coordination managed by SITIPago, which generates inefficiencies in processes such as card issuance and reactivation, as well as in the reception and resolution of complaints.

These deficiencies mainly affect students, who depend on preferential fares, but they also impact other sectors such as the elderly, people with disabilities, and in general the 71,000 users who use public transportation in the municipality of Irapuato [Garduño, F., 2024].

The research question asks whether the design of an SGD aligned with ISO 9001:2015, supported by industrial engineering tools, will optimize internal coordination processes, improve the user experience, and ensure regulatory compliance, fostering an organizational culture of continuous improvement.

Methodology

For the development of the research project, an analysis was carried out on the regulations applicable to document management and information control, without neglecting the perception of the end customer, in this case, public transport users in Irapuato. According to the International Organization for Standardization [2015], “documented information must be controlled to ensure that it is available and suitable for use when and where it is needed.” That is why we propose the development of a document management system for the Coordination of the Integrated Transport System in Irapuato, Guanajuato, based on the ISO 9001:2015 standard and supported by industrial engineering methodologies. To develop this project, different tools and methodologies are incorporated that allow for the schematization, examination, and optimization of document management processes in coordination. Among the most notable tools are the following:

Flowcharts and UML

A flowchart is a graphical representation that illustrates the flow of an algorithm or a sequence of routine actions using specific symbols connected by arrows, which indicate the order of operations.

Espinosa-Sánchez, Adriana, Vargas-Rodríguez, Bertha Laura and Cabello-Jaime, Emilio. [2025]. Development of a document management system in accordance with ISO 9001:2015 for the coordination of comprehensive transportation in Irapuato. *Journal Applied Computing*. 9[23]1-11: e4923111. <https://doi.org/10.35429/JAC.2025.9.23.4.1.11>

In the field of administration and organizational management, both in the public and private sectors, it is used to show the stages or steps of a process, the logical sequence in which they are carried out, and the interactions between those responsible for executing them. [Ministry of National Planning and Economic Policy, 2009].

Flowcharts and UML [Unified Modeling Language] activity diagrams were used to describe processes as workflows through sequential, concurrent, and branched actions to support the credentialing and complaint management processes in the SITI payment system.

These tools allow the flow of decisions, tasks, and roles to be visualized, facilitating the detection of critical points and inefficiencies in the system.

Process map

A process map is a graphical representation that illustrates the interactions and flows within an organization's processes in a structured way.

According to [Plazas, 2017], its purpose is to observe the sequence and integration of all processes, emphasizing that they should not focus solely on a specific area, but rather on how the company's functions interrelate to meet strategic objectives and satisfy the customer. This type of tool allows organizations to clearly visualize how activities are connected, from management processes to operational and support processes, facilitating the identification of areas for improvement.

Process maps contribute to document management planning. These types of maps represent a group of tasks that allow for the proper control and organization of documentation, from its receipt to its final disposal. To create the DMS manual, strategic processes were broken down and the general planning of the document system was established. At this point, the policies and guidelines that encompass the DMS are broken down. It also includes the audit program and continuous improvement. Operational processes cover the main actions of the document lifecycle, whether physical or digital. These documents are classified to retain important information and eliminate obsolete information.

Once stored, they are made available for access and consultation, allowing SGD users to obtain information quickly and securely. Throughout their useful life, documents are subject to preservation, but when they are no longer needed, they can be disposed of in a controlled manner or transferred to historical archives. Support processes involve training staff so that those involved in the SGD are familiar with the regulations and the use of tools to ensure proper implementation. Technical support for the system is also considered, which includes updating the SGD and protecting sensitive information by restricting access to unauthorized personnel.

By mapping these processes, optimized, secure document management is guaranteed, aligned with the objectives of the organizations, so that all processes are recorded, transparent, and preserve institutional information appropriately.

SIPOC diagram

The SIPOC diagram is a graphical representation of a management process that includes Suppliers, Inputs, Process, Outputs, and Customers, and is particularly useful for mapping processes at different levels of detail [Parkash and Kaushick, 2011] and [González and Escobar, 2021]. Indeed, this tool is particularly useful in public institutional environments, where document traceability and proper information management are key elements for efficient administration.

Microsoft SharePoint

Microsoft SharePoint is a web platform that can be used as a secure place to store, organize, and share information from any device, as well as access it. All you need is a web browser, such as Microsoft Edge, Chrome, or Firefox, which works in conjunction with tools such as Word, Excel, Teams, and Copilot, according to Microsoft.com, 2025. Therefore, SharePoint facilitates content management, intranet portal creation, and internal communication, optimizing workflows and increasing productivity. According to Microsoft, it is a platform that offers granular permission settings, meaning it has the ability to define specific access permissions for users or groups that make up the system, allowing administrators to control access at the site, list, and item level.

Google Drive

Google Drive is a cloud storage service developed by Google that allows users to securely store files and documents such as text files, spreadsheets, presentations, images, and videos on remote servers, according to Pienzasolution.com, 2025.

Results

A diagnosis was carried out, which made it possible to identify the problems causing dissatisfaction among SITIPago users in terms of coordination, mainly related to a non-existent document management system, as well as other problems that need a short-term solution. We identified these using a cause-and-effect diagram or Ishikawa diagram, which in this work sets out the causes and sub-causes of the problem.

Box 1

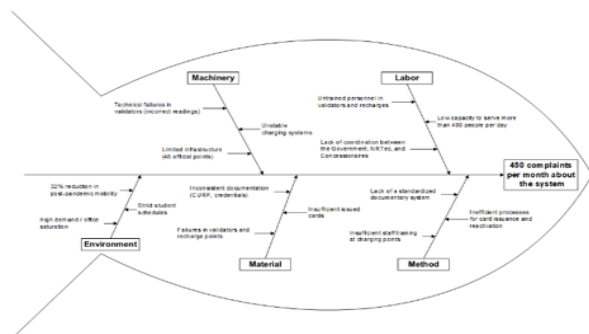


Figure 1

Cause and Effect Diagram: Inefficiency in the Document and Operational Management of the SITIPago System

The main causes of this problem: Non-existent document management system. Although there is document management in place at the Irapuato Transport System Coordination Office, there is no system for controlling and reviewing the documents generated during its daily operations, which complicates and hinders administrative and operational processes. Considering that the Prepayment and Credentialing System is relatively new in its operation [in the last four years] since the coordination focused on the mass issuance of the prepayment card. [Government of Irapuato, 2023].

- Limited technological infrastructure. The lack of adequate technological tools and systems hinders the efficient management of documents and operational processes, affecting the speed and accuracy of daily operations.

- Lack of training. Staff do not have sufficient training to effectively manage the system's processes and tools, which contributes to errors and delays in management.
- Inefficient operational design. Current operational processes are neither optimized nor standardized, creating bottlenecks, service saturation [such as long lines at offices], and a high number of complaints, with 450 complaints reported monthly. [Venegas, N., 2024]

According to field research, it was observed that this generates dissatisfaction among students, as there are numerous complaints about the lack of access to the benefits of the preferential card due to documentary and operational inefficiencies. Figure 2 shows the number of students enrolled at ITESI's Irapuato campus as an example of this situation.

Box 2

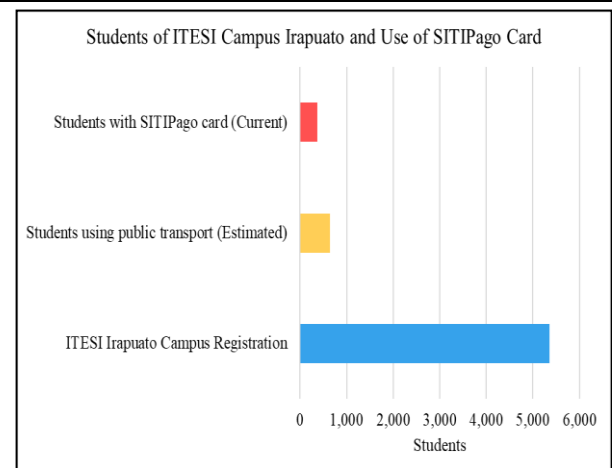


Figure 2

ITESI Campus Irapuato Registration and Use of SITIPago Card

Following this analysis and using the methodology selected for the design of the document management system, the following phases were developed:

Phase 1: Document management system for the Coordination of the Irapuato Integrated Transport System

During this phase, the current situation and document requirements are assessed by carrying out the following activities:

1.1 Compilation of existing information [Review of regulations and regulatory framework]:

It consisted first of reviewing local and institutional regulations such as the federal archives law, the federal law on the protection of information held by private individuals, the general law on transparency and access to information, and the regulations of the Irapuato, Guanajuato, mobility and transportation department to identify the documentary scope of the Irapuato comprehensive transportation system coordination and the minimum obligations that must be met in terms of documentary control and monitoring.

Highlighting Article 6 of the mobility and transportation regulations, which establishes the existence of a database as a tool for storing, controlling, and monitoring all information related to transportation [Mobility and Transportation Regulations of the Municipality of Irapuato, Guanajuato, 2021].

1.2 Survey the population and analyze the results:

A survey was conducted among 387 users of the SITIPago system to ascertain their actual perceptions of the problems they encounter with the processing, recharging, and use of cards. The results revealed numerical data and various opinions of dissatisfaction with the system's operational failures due to the lack of defined procedures.

Figure 3 below shows the percentage of users who would recommend the use of the SITIPago card. It shows that only 55% of users are satisfied with the card, as approximately 45% of users are unlikely to recommend it, suggesting that a significant proportion of users are not fully satisfied.

Box 3

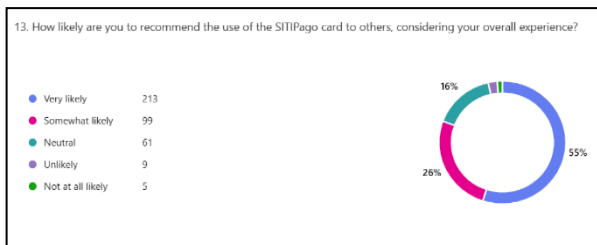


Figure 3
Percentage of users who would recommend using the SITIPago card

1.3 Development of a checklist based on ISO9001:2015:

To evaluate the status of the document management system for the coordination of the comprehensive transportation system in Irapuato, a checklist was developed based on section 7.5 of ISO 9001:2015, which helped identify whether the basic elements of a document management system were present.

1.4 Analysis of current document processes:

In turn, tools such as flowcharts and SIPOC diagrams were used to identify inputs, outputs, key processes, and actors related to information management in order to better understand the processes, using the mobility and transportation regulations of the municipality of Irapuato, Guanajuato, as a reference.

The construction of the SIPOC diagram and the flowchart of the database are shown below.

Box 4

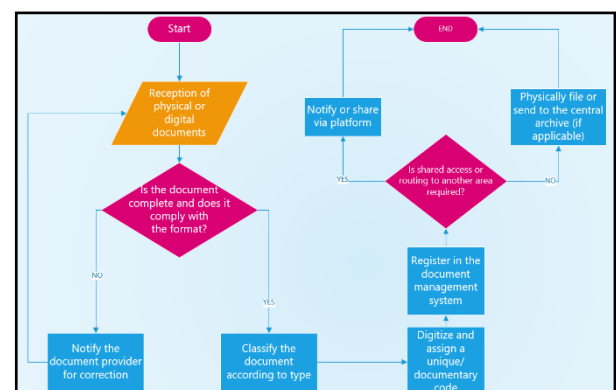


Figure 4
Database flowchart

Box 5

Process: Database of the General Directorate of Mobility and Transport				Date: 07/05/2025
Prepared for: Emilio Cabello Jaime				
DIAGRAM SIPOC				
S (Supplier)	I (Inputs)	P (Process)	O (Outputs)	C (Customers)
Inspectors	Reports	Document Reception	Organized documents	Dirección general
Dealers	Proceedings	Document review	Digital database	Inspectors
Traffic police	Trades	Classification and validation	Electronic backup	Administrative units
Private companies (NRTec)	Files	Registration and digitization	Accessible history	Citizenship (when applicable)
Ciudadanía	SITIPago card issuance/replacement requests	Indexing		
	Physical formats	Safeguarding and control		
	Digital formats			

Figure 5
Diagram SIPOC

1.5 Theoretical identification of gaps with the Data Bank:

Thanks to the information gathered in Activity 1 and with the help of the checklist, significant gaps were identified between the provisions of the mobility and transport regulations of the municipality of Irapuato, Guanajuato, and international requirements applicable to each department of the Secretariat of Mobility and Transport, including the coordination of the Irapuato integrated transport system. such as the lack of policies for archiving or identifying documents, the absence of an established format, and the lack of measures to protect information from loss, damage, or misuse

Box 6

GENERAL DIRECTORATE OF MOBILITY AND TRANSPORT		Code	DMGT-CSITI-FR-01
DOCUMENT COMPLIANCE CHECKLIST FORMAT BASED ON ISO 9001:2015 IN THE INTEGRATED TRANSPORT SYSTEM COORDINATION OF IRAPUATO		Version	1.0
		Date	05-30-2025
		Page	1 de 1
PERSON IN CHARGE OF COMPLETING AND VERIFYING THE LIST			
Name	Cabello Jaime Emilio, Campos Guevara Maria Daniela, Crisanto Lopez Mariana Guadalupe, Linares Ramirez Karla Angelica		
Position	External		
DESCRIPTION OF THE CRITERION	YES	NO	OBSERVATIONS
The information is available and is suitable for use when needed		x	Partially Inferred Gap: It is understood that management is responsible, but the availability or relevance of the information when required is not guaranteed.
The information is protected against loss of confidentiality, misuse, or loss of integrity.		x	There is no mention of security mechanisms, backups, or access controls. Gap: It is not mentioned how information is protected against damage, loss, or misuse.
Every document is identified with title, date, author, etc.		x	The regulations mention the Database as a general instrument, but do not indicate how its internal elements are identified. Gap: Absence of formal criteria for document identification.
The appropriate format and access methods have been determined.		x	The regulations do not specify whether the database is physical, digital, or hybrid. Gap: Lack of definition of the document format and storage medium.
The documents are reviewed and approved by the competent authority.		x	Document validation or authorization by competent personnel is not mentioned. Gap: A formal workflow for document review and approval is not guaranteed.
Distribution, access, retrieval, use, storage, preservation, change control, and final disposal are controlled.		x	The regulations do not include version control mechanisms or a change history. Gap: There is no traceability of modifications or version control.
External access is controlled (if applicable), ensuring confidentiality.		x	It is inferred that access is managed by the General Directorate, but the process and authorization levels are not detailed, and retention periods, document disposal, and citizen or institutional access are not addressed. Gap: There are no policies on document preservation, archiving, or identification.
Prepared by:	Reviewed by:	Approved by:	
(Name)	(Name)	(Name)	
Position:	Position:	Position:	
Date:	Date:	Date:	
DATE:		VERSION	REQUEST

Figure 6
Document compliance checklist and existing gaps in the database

1.6 Preparation of the diagnostic report:

A diagnostic report was developed that compiles and summarizes the findings obtained in the previous activities. The main findings are as follows:

- Disorganization and lack of document standardization
- Absence of formal control over versions, access, and responsible parties
- Lack of clarity regarding document preservation and final disposal
- Negative user perception of the SITIPago system.

1.7 Review and adjustment of the diagnosis

After preparing the initial diagnostic report, I proceed to review and adjust it to ensure that the information is consistent, accurate, and useful for the next phase of the project.

Phase 2: Structuring the document management system based on ISO 9001:2015

Continuing with the development of the next phase, the following activities were carried out:

2.1. Definition of the SGD structure:

The activity consisted of designing a hierarchical and structured system to classify the documents in the document management system for the Irapuato integrated transport system coordination area in accordance with Article 7.5 of the ISO9001:2015 standard.

In order to define the various types of existing documents, understand their grouping, and identify those responsible for their preparation, review, and control, thus ensuring that documentation is orderly, accessible, traceable, and managed in an appropriate manner, the structure is as follows:

Box 7

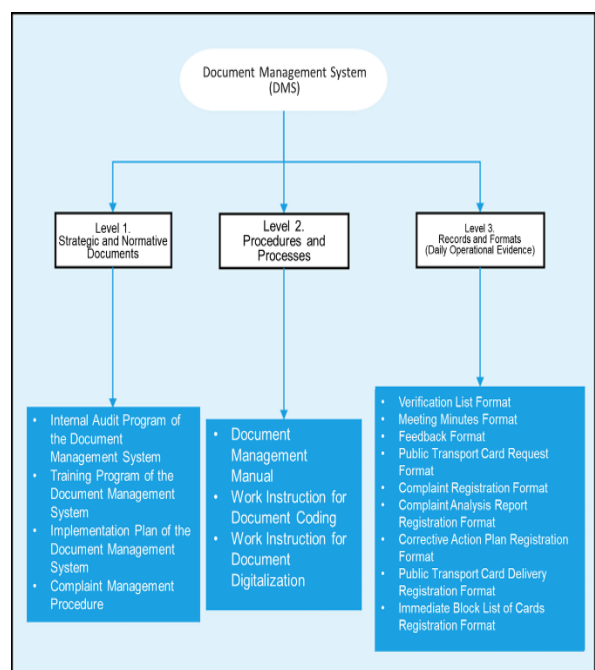


Figure 7
Hierarchical diagram of the proposed document structure

2.2. Selection of digital tools for data storage:

Microsoft SharePoint is chosen as a viable option for digital storage due to the aforementioned features.

Below is the workspace of the Microsoft SharePoint digital tool.

Box 8



Figure 8

Microsoft SharePoint Workspace

Source: Own elaboration, obtained from:
<https://mspoweruser.com/wp-content/uploads/2016/05/SharePoint-home-page.png>

2.3. Development of a document control matrix:

This tool ensured the systematic organization and tracking of all documents generated in the area for the coordination of the comprehensive transportation system in Irapuato, linking each document with its code, date of issue, responsible party, hierarchical level, and review status.

2.4. Definition of access, update, and version control policies:

Access, updating, and version control policies were designed to ensure that each document is available to those who need it, protected against unauthorized modifications, and updated based on operational or regulatory changes. The proposed policies based on ISO 9001:2015 are presented below.

Document policies

- **Controlled access:** Access to documents will be restricted according to the user's role. Only authorized personnel may modify or delete documents.
- **Scheduled updates:** Documents must be reviewed and, if applicable, updated at least once a year or when the process is modified.

- **Version control:** All updates must generate a new version documented with its respective change history, including version, date, and person responsible.
- **Use of standard formats:** All documentation must comply with the institutional format [logo, code, version, date, responsible party].
- **Deactivation of obsolete versions:** Once a new version is issued, the previous version will be archived as “obsolete” and withdrawn from operational use.
- **Means of publication:** Current documents will be available in authorized digital media [institutional Drive], with restricted access by area.

2.5. Proposed guidelines for document preservation and final disposal:

In turn, a proposal was designed to establish critical conservation objectives and final disposal of documents, such as secure storage, responsible disposal, and compliance with information retention periods.

Phase 3: Develop standardized procedures and workflow:

Likewise, the following activities were carried out during the final phase:

3.1. Development of operating procedures:

This activity consolidates a functional operational framework for the SGD, facilitating internal communication, timely access to information, and compliance with quality standards for document management in SITI coordination.

Box 9

Table 1

Description of the SITI complaint management procedure

STEP	ACTIVITY	RESPONSIBLE	DOCUMENT / ENTRY RECORD	DOCUMENT / CHECK-OUT
1	Verbal or written receipt of the complaint.	Recipient of complaint.	Verbal or written complaint.	Complaint registration form.
2	Data registration and sending to the corresponding area.	Recipient of complaint.	Complaint registration form.	Registration sent to the corresponding area.
3	Analysis of the complaint and validation of root cause.	Quality coordinator.	Record of complaints.	Complaint analysis report.
4	Proposal of solution and corrective action if applicable.	Quality coordinator.	Analysis report.	Corrective action plan.
5	Response communication to the user.	Recipient / Quality Coordinator.	Corrective action plan.	Closure communication to the user.
6	Closure of the case and archiving of the file.	Document Control Coordinator.	Closing communication.	Complete complaint file filed.

Box 10

Table 2

Description of the SITI card management procedure

STEP	ACTIVITY	RESPONSIBLE	DOCUMENT/CHECK-IN	DOCUMENT/CHECK-OUT
1	Receipt of card application.	Applicant/SITI Coordination	-	Application record in database.
2	Delivery and validation of data and requirements of the applicant.	NR Tec	Applicant's documents.	List of requirements with validated documents.
3	Approval by the Finance area.	NR Tec	List of validated documents.	List of documents signed by the finance department.
4	Application and activation of the card with the SITIPago system provider.	NR Tec	List of documents approved.	Confirmation email and photo taking.
5	Physical delivery to the user of the contract.	NR Tec / Applicant	Card printing and activation.	SITIPago card delivery record in a database.
6	Digital or physical receipt of the procedure file.	Document control (Government/ Applicant/ NR Tec)	Scanned user file to upload to the database.	Delivery of contract to the user.

3.2. Workflow diagram design:

It guarantees uniform and controlled management of document processes, reinforcing the traceability of information and promoting compliance with the guidelines established in the SDG structure and in the ISO 9001:2015 standard.

Box 11

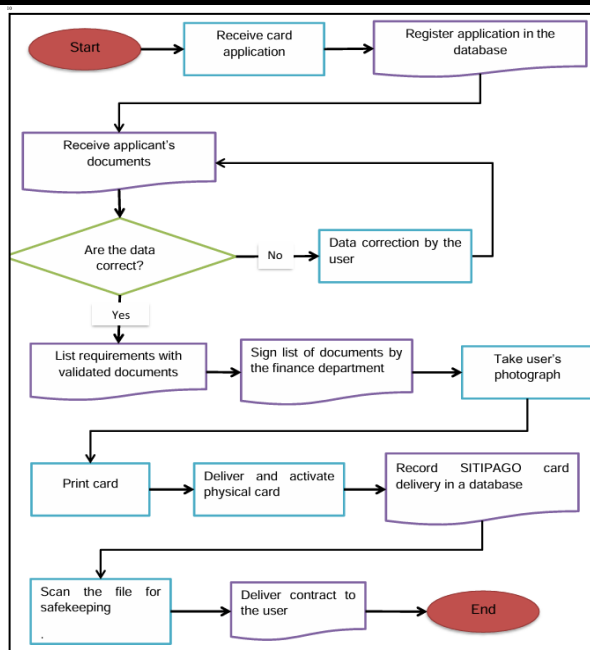


Figure 9
SITI Complaint Management Workflow Diagram

Box 12

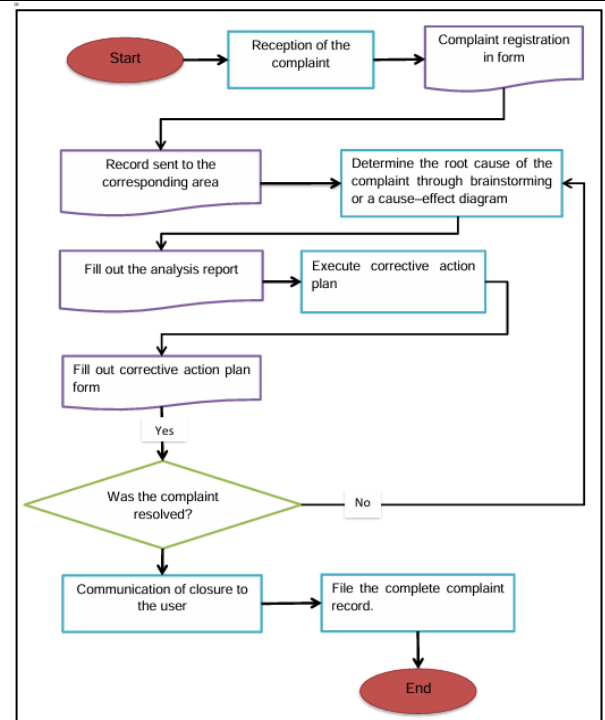


Figure 10
SITI card application management workflow diagram

3.3. Format for informational meetings:

The purpose of this activity is to provide clear, standardized templates for meeting notices, meeting minutes, and follow-up on agreements, ensuring the traceability of decisions made and promoting the participation of the operational team in the SGD.

3.4. Proposals for a gradual implementation plan:

Developing a gradual implementation plan ensures that the system implementation is feasible, understandable, and adaptable to current human and technological resources, while allowing adjustments to be made at each stage based on the results observed and the needs identified.

3.5. Proposal for a training program:

The incorporation of a training program is a key element in ensuring the correct implementation and sustainability of the Document Management System [DMS] in the System Coordination. Staff training ensures that each member understands their documentary responsibilities, the proper use of formats, the traceability of information, and compliance with established guidelines.

3.6. Proposed internal audit program:

The purpose of this audit is to verify that the elements of the system, as well as its document structure, version control, nomenclature, preservation, and access, are aligned with the criteria defined in the document management manual and with the requirements established in Article 7.5 of ISO 9001:2015.

3.7. SGD Manual:

As a result of the work carried out in the previous objectives, we present the Document Management System [DMS] Manual designed for the Coordination of the Irapuato Integrated Transport System of the General Directorate of Mobility and Transport. This document integrates in a structured manner all the theoretical elements proposed during the project: from the document structure, operating procedures, and technical guidelines to the policies for access, conservation, and control of documents.

The purpose of the manual is to serve as an institutional guide for organizing, controlling, and improving the management of documented information, ensuring its traceability, accessibility, and regulatory compliance based on Article 7.5 of ISO 9001:2015.

The contents of the Manual are shown below, see figures 13, 14, and 15:

Box 13



Figure 11
SGD Manual Cover

Box 14

DOCUMENT MANAGEMENT MANUAL ISO 9001:2015 version		Code: DGMT-MGD-01
GENERAL DIRECTORATE OF MOBILITY AND TRANSPORT OF IRAPUATO		Date: June 2025
DOCUMENT MANAGEMENT MANUAL		Version: 1.0
		Sheet: 2 of 60
CONTENT		
1. OBJECTIVE	4	
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3. REGULATORY BASIS	4	
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6. DOCUMENTARY POLICIES	5	
7. DOCUMENT STRUCTURE OF THE SGD	6	
8. EVALUATION AND CONTINUOUS IMPROVEMENT	6	
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b. Document Structure	7	
c. Storage and Access	7	
d. Protection and Backup	7	
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Figure 12
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Box 15

DOCUMENT MANAGEMENT MANUAL ISO 9001:2015 version		Code: DGMT-MGD-01
GENERAL DIRECTORATE OF MOBILITY AND TRANSPORT OF IRAPUATO		Date: June 2025
DOCUMENT MANAGEMENT MANUAL		Version: 1.0
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Figure 13
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3.8. Proposals for digital tools for data storage: For document collection, data storage, and collaborative access, two digital tools are proposed, which are defined above:

Figure 16 shows Microsoft SharePoint with custom permissions and document flow automation, ideal for institutions that require traceability.

Box 16



Figure 14

Microsoft SharePoint, página para coordinación de SITI

Figure 17 shows Google Drive with cloud storage, which allowed us to securely store, organize, and share files, with agile information management.

Box 17

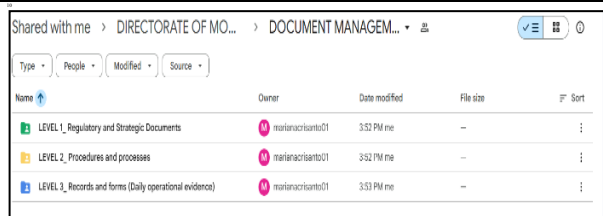


Figure 15

Google Drive, page for the Directorate of Mobility and Transportation of Irapuato

Source: own elaboration

Both tools are accessible, scalable, and secure, making them viable options for improving document efficiency and collaborative work.

Recommendations

It is recommended to start implementing the system gradually, beginning with the validation and adaptation of the document structure, giving priority to areas such as card issuance and complaint management. It is also advisable to use the manual as a basis for future actions, allowing for adaptations without losing alignment with ISO 9001:2015.

In addition, train the staff responsible for document management and the SITIPago system to improve communication with users and conduct regular internal audits to ensure compliance with the proposed system in order to identify areas for improvement and adopt digital tools that facilitate document management.

Conclusions

The project arose in response to the documentation problems faced by the public transport prepaid card system, which hinders efficient and equitable access to the service. In light of this situation, a structured proposal for a Document Management System was designed, based on the principles of ISO 9001:2015.

This standard establishes clear guidelines to ensure that all documented information is accessible, reliable, and well organized. Through an initial diagnosis, several problems were identified, such as the lack of clear procedures, errors in record management, and the absence of a defined document structure. Based on this analysis, a technical manual was created containing the complete proposal for the document system, designed especially for the comprehensive transportation system coordination department.

This manual includes key elements such as document hierarchy, access policies, version control, and standardized procedures.

Annexes

Box 18

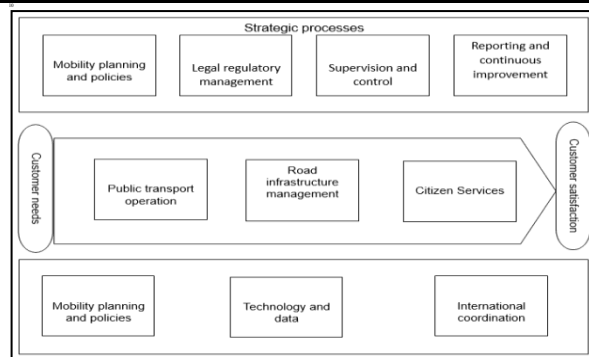


Figure 16

Process map of the General Directorate of Mobility and Transportation of Irapuato

Source: own elaboration

Box 19

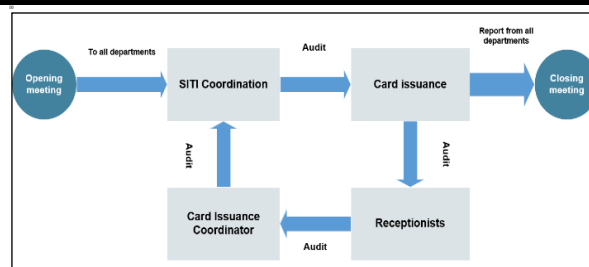


Figure 17

Block diagram, audit flow

Source: own elaboration

Declarations

Conflict of interest

The authors declare that they have no conflicts of interest. They have no competing financial interests or known personal relationships that could have influenced the article presented in this paper.

Author contribution

Espinosa-Sánchez-Adriana: Contributed to the project idea, method, and research technique.

Vargas-Rodríguez-Bertha-Laura: Contributed to reviewing the research structure and developing the methodology used.

Jaime-Cabello-Emilio: Contributed to field research, conducting surveys and interviews with transportation system personnel in Irapuato.

Availability of data and materials

The data obtained in the course of this research, related to document management in accordance with ISO 9001:2015 for the Coordination of Integrated Transport in Irapuato, is available for consultation upon request.

This information includes interviews, process analyses, internal documentation, and records generated during the diagnosis and proposal of the document management system.

Due to the institutional and confidential nature of some of the data, its availability is subject to approval by the Comprehensive Transportation Coordination and compliance with the guidelines established by that entity.

Those interested in accessing this information should contact the project manager or the institution.

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Abbreviations

NRTec	Desarrollos tecnológicos
SIPOC	Suppliers, Inputs, Process, Outputs, Customers
SITIpago	Sistema de tarjeta prepagada
SGD	Sistema de Gestión Documental

References

Basic

Dirección de Planeación y Evaluación. [2025]. Matriculación del ITESI. *Instituto Tecnológico Superior Campus Irapuato*.

Garduño, F. [18 de agosto de 2024]. [Aún faltan poco menos de 30 mil usuarios de transporte público por tramitar SITIPago](#). *El Sol de Irapuato*.

Gobierno de Irapuato. [23 de mayo de 2023]. [ARRANCA SITI PAGO](#). *Boletines*.

González, H., & Escobar Prado, C. A. [2021]. [Aplicación de la herramienta SIPOC a la cadena de suministro interna de una empresa distribuidora de medicamentos](#). *Revista Ingenierías Universidad de Medellín*, [20]38, 119–134.

Instituto Nacional de Estadística y Geografía. [2020]. *Censo de Población y Vivienda 2020*. INEGI.

Microsoft. [2025]. [Página web de Microsoft](#).

Ministerio de Planificación Nacional y Política Económica. [2009]. [Guía para la Elaboración de Diagramas de Flujo](#).

Piensa Solution. [2025]. [Página web de Piensa Solution](#).

Plazas, H. [2017]. [Diseño de Procesos. Obtenido de Fundación Universitaria del Área Andina](#):

Venegas, N. [23 de septiembre de 2023]. [¿Aumentará el pasaje del transporte público de Irapuato? Autoridades lo aclaran](#). *Periódico Correo*.

International Organization for Standardization. [2015]. *ISO 9001:2015 – Quality management*