

USE OF INFORMATION GENERATED IN THE SUBPROCESSES OF THE QUALITY MANAGEMENT SYSTEM AS A DATABASE

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Flores Carpintero María de Jesús¹ , Ortega Millán Jeanett del Carmen^{2*}.

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¹ National Technological Institute of Mexico/Zacatepec Technological Institute, maria.fc@zacatepec.tecnm.mx ,
<https://orcid.org/0009-0006-8238-3309>

² National Technological Institute of Mexico/Zacatepec Technological Institute, jeanett.om@zacatepec.tecnm.mx ,
<https://orcid.org/0009-0000-8270-1668>

Summary -- The Academic-Administrative Guidelines Manual of the National Technological Institute of Mexico [1] defines the Academy as: a collegiate body comprising the Head of the Academic Department, professors, and professor-researchers who serve the different educational levels and carry out teaching, research, outreach, and academic management activities. According to the same document, there are fifteen such activities.

The people who make up this body generate multiple documents on an ad hoc basis, using data that is recorded in isolation and only for the purpose of the document in question. As a result, the academies do not have a historical record of all the information produced, and no data analysis is carried out to optimize their processes.

This paper proposes the hypothesis that the information handled in academies can be categorized into variables that allow databases to be generated, using existing guidelines and procedures, to generate new knowledge about the processes that concern it.

The subject of study was the Academy of Engineering in Administration, part of the same educational program, belonging to the Department of Economic and Administrative Sciences of the National Technological Institute of Mexico-Zacatepec.

This is a qualitative-documentary study, which used the Professional Residency Report as a base document to extract information, categorize it into variables, process the data using a spreadsheet, and use the results in the design of specialties to test the proposed hypothesis, in accordance with the sub-processes and activities established by the Quality Management System of the National Technological Institute of Mexico-Zacatepec [2].

The results indicate that the information generated in the sub-processes of the Academies' activities can be used in others, concluding that it is possible to define and categorize each piece of data recorded in each of the deliverables, allowing for its analysis.

Keywords: Academy, Database, Management Engineering, Quality Management System.

Abstract. The Manual of Academic-Administrative Guidelines of the National Technological Institute of Mexico [1] defines the Academy as: a collegiate body that integrates the Head of the Academic Department, professors, and professor-researchers who attend the different educational levels and who carry out teaching, research, linkage, and academic management activities. According to the same document, there are fifteen such activities.

The people who make up this instance generate multiple documents in a timely manner, using data that are recorded in isolation and only for the purpose of the document in turn, being that the academies do not have a historical record of all the information produced, additionally a data analysis is not carried out that allows the optimization of their processes.

This paper hypothesizes that the information managed in the Academies can be categorized into variables that allow the generation of databases, using existing guidelines and procedures, to generate new knowledge about the processes that concern them.

The subject of the study was the Academy of Administration Engineering, part of the same educational program, belonging to the Department of Economic and Administrative Sciences of the National Institute of Technology of Mexico-Zacatepec.

This is a qualitative-documentary study, which used as a base document the Opinion of professional residencies, to extract the information, categorize it into variables, treat the data by means of a spreadsheet and using the results in the design of specialties to verify the hypothesis raised, according to the sub-processes and activities marked by the Quality Management System of the National Technological Institute of Mexico-Zacatepec [2].

The results indicate that the information generated in the subprocesses of the Academies' activities can be used in others, concluding that it is possible to define and categorize each piece of data recorded in each of the deliverables, allowing for its analysis.

Key words – Academy, Database, Processes, Management Engineering, Quality Management System.

INTRODUCTION

Within the Academic-Administrative Guidelines Manual of the National Technological Institute of Mexico [1], chapter 18, entitled "Guidelines for the integration and operation of academies," lists fifteen substantive activities that these bodies must carry out as part of their work:

1. Bank of Project for professional residencies
2. Project bank for the comprehensive qualification process
3. Comprehensive dual education projects
4. Specializations
5. Specializations in dual education
6. Needs of training and professional development
7. Strategies and programs for human capital training
8. Training courses offered
9. Consulting
10. Consulting
11. Community development projects
12. Technical assistance
13. Technological development
14. Business incubation
15. Technological innovation projects.

The procedures for each activity within TecNM are derived from these guidelines. The management system used is called: SGC (Quality Management System of the National Technological Institute of Mexico), (TecNM-CA-MC-001)) [3], which is based on the ISO 9001: 2015 standard.

This model has four substantive processes:

- Strategic Academic Process
- Strategic Outreach Process
- Strategic Quality Process
- Strategic Resource Management Process

Within TecNM-Zacatepec, the Quality Management System Manual of the Zacatepec Institute of Technology (SGC) [2] is used to implement this system. It sets out three levels:

1. Strategic Level
2. Substantive Level
3. Support Level

For all substantive processes, the sub-processes include three elements:

1. Scope and policies
2. Process map
3. Flowchart

In other words, this system is designed as a set of clearly defined processes and responsibilities that make the Institutes function. Like all systems, it is fed by inputs from the academies themselves, which are generally information. This information

goes through a process and results in a final product, which can take the form of documents, reports, specialties, projects, among others.

These products have a shelf life, although it is generally six months, resulting in a continuous and repetitive process: the same data is used, the information is emptied, and documentary products are delivered.

The experience and observations of the authors of this paper have shown that valuable information is lost in these activities that could be used in other activities, provided that it is treated appropriately, verifying the relationship between them.

In other words, this paper raises the possibility of creating a database containing all the information relating to the educational process from the academic sphere, which would enable this collegiate body to carry out its work more efficiently.

A database is a tool for collecting and organizing information. Databases can store information about people, products, orders, or anything else. [4]

This project developed its own methodology, in a qualitative study using documentary techniques, analyzing the information to verify whether this link existed, and finally presenting the results.

Current status of the issue

To complete this section, it was necessary to review the existing documentation, which is regulatory in nature.

We began by analyzing the SGC (Quality Management System of the National Technological Institute of Mexico), (TecNM-CA-MC-001) [3], at each of its substantive levels. At the substantive level:

Comprehensive Student Training - Outreach - Professional Residency - Professional residency operation file, 2009-2010 study plans, from the

aforementioned Quality Management System Manual of the Zacatepec Institute of Technology [2] has a sub-process called: Operation and accreditation of professional residencies for the 2009-2010 competency-based study plans. In the process map for this sub-process, which consists of twenty-eight activities, number fifteen indicates: "Send preliminary report on professional residency project," referring to the Academic Department Academic Department, but whose author is the

Academy of the respective Department; as input, it appears: projects generated with companies and/or institutions and whose applicable record indicates: Database of professional residency reports. The term database appears twice in this substantive process, but it does not indicate what it should contain or how it should be done.

In relation to the substantive level: **Comprehensive student training – Academic – Specializations – Specialization operation sheet**. The process map for this sub-process has seven activities, number two of which states: (Perform) "Analysis of professional residency projects completed/surveys to graduates and

employers/analysis of trends in areas of knowledge," again referring to the Academic Department/Department Academy as the author and having as input: Generic curriculum and Official grid, given that these documents do not contain any information that allows for the design of specialties in practice.

In other words, in the authors' opinion, there are two gaps: one procedural in generating a document and another in input because it is not the correct document. These errors can be corrected with the same information generated by the Academy, using it in other processes.

The processes within a system are interrelated; all organizations work as systems. [5] In this case, we will analyze the relationship between two substantive activities of the academy, number one and number four, at two different substantive levels: Linkage and Academic, in order to determine, as a first hypothesis, whether the variables that intervene between them can be operationalized to treat them as a database.

Understanding operationalization as: a logical process of breaking down the most abstract elements—theoretical concepts—to reach the most concrete level, the facts produced in reality that represent indications of the concept, but which we can observe, collect, and evaluate, that is, its indicators. [6] Currently, each of these activities is carried out in isolation, generating reports and projects that fulfill their purpose only for the assigned number, but for no activity is the information recorded as a database, resulting in the loss of valuable data, semester after semester, generation after generation, causing reprocessing and duplication of work.

This research aims to determine whether the processing of information through computer tools, using existing guidelines and procedures, allows academies to take advantage of these and use them to generate new knowledge about the processes that concern them, particularly the design of specialties.

Databases are currently of great importance, as they are a valuable tool for storing and processing information in TecNM's educational programs.

Additionally, the accrediting agencies generally request information by generational cohorts, which requires the academies to generate statistics and reports that could be easily obtained if this information were treated as a database.

General research objective

To determine whether the information generated in the sub-processes of the Academies' activities can be useful in activities other than those for which it was originally intended.

Specific

- Verify that it is possible to define and categorize this information into variables in order to process the data appropriately (operationalization).
- Analyze the information obtained to determine its usefulness in decision-making.
- Verify that this is a model that can be scaled to all academies and substantive processes, in order to generate a database that integrates knowledge and information immediately.

Justification

There are systems and procedures within the National Technological Institute of Mexico - Zacatepec for the analysis and recording of information; however, these systems are not integrated into a "common" database, or records are made on a temporary basis simply to comply with delivery requirements, thus losing valuable information both for the development of future internal actions, such as the Academy's own activities, and for external presentation, as in the case of accreditation agencies or business organizations.

It is important that data processing be carried out in a consistent, orderly, and periodic manner, treating data as variables, understood as "an observed characteristic, quality, or property that can take on different values and can be quantified or measured in a study." [7], in this case within a database that allows analysis and establishes the relationship between them. The aim of this project is to verify that this activity is possible, using existing instruments and regulations, allowing the Academies to obtain valuable information that enables them to streamline their work.

DEVELOPMENT

Methodology

This research was carried out at the National Technological Institute of Mexico – Zacatepec. It is qualitative and documentary in nature, with qualitative research understood as research that produces descriptive data: people's own words, spoken or written, and observable behavior. [8]

It is documentary because the authors "attempt to read and make sense of documents that were written with a different intention than the one with which they are now being interpreted. We seek to systematize and disseminate knowledge produced prior to what we are now attempting to construct." [9]

The object of study was the six-semester professional residencies of the Engineering in Administration educational program, belonging to the Academy of the same name in the Department of Economic and Administrative Sciences at the National Technological Institute of Mexico-Zacatepec.

The instrument from which the information was extracted to create the database is the Preliminary Draft Report on Professional Residencies, [2] whose subprocess is professional residency. This document is as follows:

Figure 1. Preliminary Report on Professional Residencies.

Source: TecNM-Zacatepec, 2017. ²

It includes the following sections:

1. Name of the corresponding department, in this case Economic and Administrative Sciences.
2. Year in the corresponding semester.
3. Consecutive number of the evaluated preliminary draft.
4. Control number of the student candidate for residency.
5. Full name of the student: paternal surname, maternal surname, and first name(s).
6. Gender of the student: M Male or F Female.
7. Full name of the preliminary project.
8. Full name of the company.
9. Start date of professional residency.
10. Date of completion of professional residency.
11. Name of Internal Advisor and External Advisor.
12. Preliminary draft assessment.
13. Date on which the preliminary draft was assessed.
14. Name and signature of the President of the corresponding Academy.
15. Name and signature of the Head of the corresponding Academic Department.
16. Name and signature of the Academic Deputy Director.

Method

The methodology is typical of an exploratory study and consists of six steps:

1 The data, two hundred and four in total, were recorded and tabulated in an eight-column matrix with the following headings:

- a) Number consecutive of Preliminary draft evaluated.
- b) Number of control of Student candidate for residency.
- c) Full name of the student: paternal surname, maternal surname, and first name(s).
- d) Full name of the preliminary project
- e) Name of the company
- f) Type of company
- g) Sector to which it belongs

This data corresponds to the semesters detailed below:

Table 1. Resident students enrolled in the semesters under study.

Period of residence	Gender		Total
	M	M	
August-December 2020	7	17	24
January-June 2021	16	31	47
August-December 2021	12	20	32
January-June 2022	14	17	31
August-December 2022	16	20	36
January-June 2023	13	21	34
TOTAL	78	126	204

Source: TecNM-Zacatepec. DCEA, 2025. ¹²

2. The record was made using a Microsoft Excel spreadsheet.

Figure 2. Sample of the database

AGOSTO-DICIEMBRE 2020				
1	2	3	4	5
No. del Draft Preliminar				
1	1	ALBAICEN	UN PLAN DE NEGOCIO PARA EL PERSONAL DE NUEVO INGRESO, EN LA EMPRESA CRESTA MORELOS S.A. DE C.V.	CRESTA MORELOS S.A. DE C.V.
2	2	ALBAICEN	UN PLAN DE NEGOCIO PARA EL PERSONAL DE NUEVO INGRESO, EN LA EMPRESA CRESTA MORELOS S.A. DE C.V.	CRESTA MORELOS S.A. DE C.V.
3	3	ALBAICEN	UN PLAN DE NEGOCIO PARA EL PERSONAL DE NUEVO INGRESO, EN LA EMPRESA CRESTA MORELOS S.A. DE C.V.	CRESTA MORELOS S.A. DE C.V.
4	4	ALBAICEN	UN PLAN DE NEGOCIO PARA EL PERSONAL DE NUEVO INGRESO, EN LA EMPRESA CRESTA MORELOS S.A. DE C.V.	CRESTA MORELOS S.A. DE C.V.
5	5	ALBAICEN	UN PLAN DE NEGOCIO PARA EL PERSONAL DE NUEVO INGRESO, EN LA EMPRESA CRESTA MORELOS S.A. DE C.V.	CRESTA MORELOS S.A. DE C.V.
6	6	ALBAICEN	UN PLAN DE NEGOCIO PARA EL PERSONAL DE NUEVO INGRESO, EN LA EMPRESA CRESTA MORELOS S.A. DE C.V.	CRESTA MORELOS S.A. DE C.V.
7	7	ALBAICEN	UN PLAN DE NEGOCIO PARA EL PERSONAL DE NUEVO INGRESO, EN LA EMPRESA CRESTA MORELOS S.A. DE C.V.	CRESTA MORELOS S.A. DE C.V.
8	8	ALBAICEN	UN PLAN DE NEGOCIO PARA EL PERSONAL DE NUEVO INGRESO, EN LA EMPRESA CRESTA MORELOS S.A. DE C.V.	CRESTA MORELOS S.A. DE C.V.
9	9	ALBAICEN	UN PLAN DE NEGOCIO PARA EL PERSONAL DE NUEVO INGRESO, EN LA EMPRESA CRESTA MORELOS S.A. DE C.V.	CRESTA MORELOS S.A. DE C.V.
10	10	ALBAICEN	UN PLAN DE NEGOCIO PARA EL PERSONAL DE NUEVO INGRESO, EN LA EMPRESA CRESTA MORELOS S.A. DE C.V.	CRESTA MORELOS S.A. DE C.V.

Source: TecNM-Zacatepec. DCEA, 2025. ¹²

3. For each record in column six, the companies were researched using the Google internet search engine to verify the information provided.

Figure 3. Column six of the database (Company)

5	6
Empresa	
DISEÑO DE UN CURSO DE INDUCCIÓN PARA EL PERSONAL DE NUEVO INGRESO, EN LA EMPRESA CRESTA MORELOS S.A. DE C.V.	CRESTA MORELOS S.A. DE C.V.
DISEÑO DE UN PLAN DE NEGOCIO DE UNA MICROEMPRESA DE MAQUILADORA DE ROPA PARA DAMA	CHIE DEL ITZ
REDUCCIÓN DE COSTOS PARA LA CONTRATACIÓN DE PERSONAL SINDICALIZADO EN INDUSTRIAS TECNO S.A. DE C.V.	INDUSTRIAS TECNO S.A. DE C.V.
MANUAL DE PROCESOS DE SIERRA H.M. DEL DEPARTAMENTO DE PRODUCCIÓN DE AFILADOS DE MÉXICO S.A. DE C.V.	AFILADOS DE MÉXICO S.A. DE C.V.
ELABORACIÓN DEL MANUAL DE PROCEDIMIENTOS PARA LA INTEGRACIÓN DEL PERSONAL DEL H. AYUNTAMIENTO DE TEMICCO, MORELOS	H. AYUNTAMIENTO DE TEMICCO
PROPUESTA DE UN PLAN ESTRATÉGICO PARA EL ÁREA DE VENTAS MAYORISTAS ON LINE DE LA EMPRESA TIAN TECHNOLOGY S.A.S. DE C.V.	TIAN TECHNOLOGY S.A.S. DE C.V.

Source: TecNM-Zacatepec. DCEA, 2025. ¹²

4. It was necessary to add two columns, one for the type of industry and another for the type of sector to which it belonged, as the ruling on residences does not cover this.

Figure 4. *Sample of the database with added columns.*

[illegible]

Source: *TecNM-Zacatepec. DCEA, 2025.* ¹²

5. The data was processed, obtaining, among others, these results:

Figure 5. *Residencies completed by industry sector in each semester*



Source. Graphical representation prepared by the authors

Regarding the type of residency by sector: 72% correspond to the service sector, 27% to the industrial sector, and only 1% to the raw materials extraction sector.

Figure 6. *Residencies by type of industry in each semester*



Source: Graphical representation prepared by the authors

By type of industry, professional residencies are most common in the private sector, accounting for 66%.

6. Each of the Academy's activities was analyzed to determine where this information could be useful

information, identifying the Design of specialties. [1]

This includes an assessment of the region and a study of the Institute's capabilities; [1] based on this, the Department of Economic and Administrative Sciences, in coordination with the Academy, must carry out a study in relation to the degree program, which, among other things, includes the following sections in which the information serves this purpose:

- b. Predominant and emerging professional fields
- e. Relevant content in the techno-scientific field
- h. Needs of the social and productive sector

This information is intended to respond to these three points, which are supported below.

DISCUSSION AND ANALYSIS OF RESULTS

Various studies have shown that systematizing the information generated in the subprocesses of the Quality Management System (QMS) allows for the creation of a strategic institutional database that is useful for the continuous improvement and optimization of subprocesses such as Professional Residencies and Specialty Design, which are the focus of our study.

Studies such as that by Donís Sánchez et al. (2022) highlight that subprocesses such as internal audits, teacher evaluation, control of non-compliant outputs, and management review generate records that, when properly organized, allow for the identification of performance patterns, user feedback, and the fulfillment of institutional objectives. [10]

The TecNM QMS Manual establishes that these records must be traceable, accessible, and useful for decision-making, which supports their integration into an institutional database. [11]

Having historical information on related productive sectors, teaching performance, and results from previous projects allows for the optimization of advisor assignments and project selection, which improves the efficiency of the educational process. This statement is supported by the study conducted by Balandra Aguilar et al., who developed a web application to manage corrective actions, project monitoring, and advisor evaluation, demonstrating that the strategic use of institutional data strengthens decision-making within TecNM [12].

Reinforcing this last point, procedure TecNM-AC-PO-007 establishes that the design of specialties must be based on relevance studies and regional diagnoses.

The TecNM Institutional Repository (RI-TecNM) houses multiple theses and articles that address process improvement through the use of databases derived from the SGC [13]. These studies agree that the information generated should be used not only to comply with the ISO 9001:2015 standard, but also to drive innovation and strategic decision-making.

The above research reinforces the results of this study: the information generated in the QMS allows

the results obtained in other sub-processes of the same system to be used, i.e., the system remains open, allowing for feedback, resulting in a phase for strategic management, as long as the data is processed methodically and consistently, resulting in an institutional database.

For our object of study: TecNM-Zacatepec, and to confirm our hypothesis, we used information from the professional residency subprocess for another subprocess: the design of specialties, which made it necessary to clarify these two sections conceptually. In the first: "**Professional and emerging fields**," we understand professional field to mean the space of interaction between the professional, the universe of care, and the institution, where projects that address social and economic problems are produced. It is also understood as the labor market, given that professional activity deserves financial compensation for its specialized knowledge.

In the case of emerging professional fields, this is understood as the prospective capacity to respond over time to theoretical, conceptual, or paradigmatic changes that have manifested themselves or are about to occur,[15] which account for factual or theoretical developments that have been scarcely addressed and whose further development will lead to a new definition of the field of study.

In this case, in the economic and administrative sciences, and particularly for the educational program in Management Engineering, the results were as follows in ascending order:

- 1 Human Resources
- 2 Strategic Management
- 3 Accounting and Finance
- 4 Marketing
- 5 Quality Systems
- 6 Information Technologies
- 7 Production

The following image (Figure 7) shows the percentages obtained:

Figure 7. Professional fields of development for professional residencies in the Engineering in Administration PE.



Source: Graphical representation prepared by the authors.

To determine the **emerging fields**, it was necessary to review the database again to identify the following areas of knowledge [16]:

- 1 Incorporation of sustainable processes
- 2 Strategic planning
- 3 Stress management and occupational health.
- 4 Use of administrative software tools, such as Aspel NOI and Aspel SAE.

Regarding item **e)**, **Relevant content in the techno-scientific field**, the results indicate that our students, when applying for professional residency, must have in-depth knowledge of the following topics and processes:

- 1 Organization and procedure manuals
- 2 Recruitment and selection
- 3 Performance evaluation
- 4 Training
- 5 Quality systems
- 6 Work environment
- 7 Safety and hygiene
- 8 Induction processes
- 9 Organizational Development

As shown in the following figure:

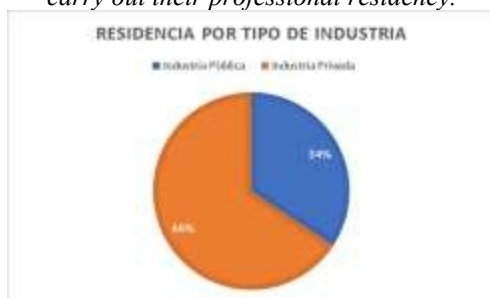
Figure 8. Necessary content in the techno-scientific field for residents of the Engineering in Management Educational Program.



Source: Graphic representation prepared by the authors

Finally, in section **h) Needs of the social and productive sector**, the residents of this Academy carry out their projects in the following types and sectors of industry (Figures 9 and 10)

Figure 9. Type of industry in which students in the Engineering in Administration Educational Program carry out their professional residency.



Source: Graphical representation prepared by the authors.

And in the following sectors of the economy:

Figure 10. Type of industry sector in which students in the Engineering in Management Education Program carry out their professional residency.



Source: Graphic representation prepared by the authors.

In other words, it is necessary to carry out residency projects that primarily serve the private industry in the service sector.

The result is positive; the information generated in the SGC allows the results obtained in other subprocesses to be used.

CONCLUSIONS

The Quality Management System (QMS), aligned with the ISO 9001:2015 standard, has evolved within the National Technological Institute of Mexico (TecNM) as a cross-cutting tool that not only guarantees institutional quality but also directly affects the operation of multiple academic and administrative processes.

Several studies have addressed the application of the Quality Management System (QMS) in TecNM's internal processes. For example, the Pinotepa Nacional Institute of Technology documents how the records generated by the QMS—such as registration forms, teacher evaluations, and professional residency monitoring—are directly integrated into academic subprocesses

, allowing for operational traceability between areas such as teacher training and course management. [17] On the other hand, the Instituto Tecnológico Superior de Progreso presents an administrative approach, where QMS data is reused in processes such as maintenance, purchasing, and recruitment, highlighting supplier evaluation as a key input for strategic decision-making. This research shows that the SGC not only complies with regulatory standards, but also becomes a functional tool for continuous improvement and institutional efficiency. [18]

And not only in practice, from a theoretical perspective, Reyes Chacón et al. highlight that the QMS promotes adaptive, creative organizational environments that are prone to continuous improvement, proposing its potential as a basis for structural innovation in educational contexts [19].

Thus, the information generated in the sub-processes of activities that are not exclusive to the Academies can be used in others, as demonstrated in this study.

It is possible to define and categorize each piece of data (operationalize the variables) recorded in each of the deliverables, allowing for their analysis and processing, i.e., performing Data Analytics (DA), a science that allows data to be analyzed and converted into knowledge in order to improve the environment where that data is produced [20].

Data analytics for these sub-processes can be descriptive, diagnostic, and predictive. With the necessary study, it could even be prescriptive.

If generated and fed correctly, it can become a valuable tool that allows the Academies of all the country's Technological departments, given that we are a system, to carry out their activities more efficiently, making decisions based on data. The term for this is Business Intelligence.

The Institute's SGC has both procedural and input errors, which must be corrected immediately in order to carry out each activity in a way that is useful and consistent with the development of the process.

In this particular case, and in order to provide useful information to this Academy, the design of specialties in the future must focus on Human Capital issues, on products such as procedure manuals and all the processes of this department, designing plans with a strong influence of sustainable processes and work stress management, mainly serving the tertiary sector, in private industry, which coincides with official data indicating that the tertiary sector is the largest, representing 65.2% of GDP [22], which means an absolute opportunity for our graduates.

This data was used by the respective Academy, resulting in the Specialization called: **Management and Innovation in Organizations. (IADE-GIO-2024-01)**, [23] whose objective is: To train

professionals capable of managing and innovating in organizations, with the aim of optimizing their resources to achieve maximum productivity and competitiveness.

The graduate profile has the following elements:

- 1 Strategically implements effective communication systems in personal and professional settings.
- 2 Develops organizational systems to optimize the resources involved in the company with a focus on quality.
- 3 Recognizes trends in administrative management in order to analyze and determine those tools and/or techniques that can be applied in organizations to achieve maximum productivity and competitiveness.
- 4 Uses Aspel and Excel technology tools, collaborative platforms, and artificial intelligence to digitize processes and evaluate business management performance within organizations.
- 5 Apply management skills in your professional performance to achieve objectives in different contexts.
- 6 Make decisions that contribute to the optimization of company resources to achieve greater productivity and competitiveness at the local, regional, national, and international levels.
- 7 Exercise effective leadership focused on developing work teams to achieve organizational objectives.
- 8 Develops systems considering the principles of professional ethics.

And the subjects for this specialization were given the following names:

- 1 Management Skills Development
- 2 Management Communication Skills
- 3 Technological Tools
- 4 Organizational Systems Workshop I
- 5 Organizational Systems Workshop II
- 6 Business Management Topics.

This demonstrates that the information generated is used efficiently in another sub-process of the Quality Management System, thus enabling the continuous flow of information for data-based decision-making. This makes its design feasible and useful for all the institutes that make up the National Technological Institute of Mexico.

Furthermore, we believe that it is urgent to use digital tools and massive databases to:

- Evaluate teacher and student performance using historical indicators
- Optimize processes such as professional residency, outreach, and mentoring
- Manage corrective actions and internal audits with web platforms

- Visualize trends in related productive sectors to select more relevant projects

The information is available; it needs to be processed institutionally, linking these metrics from the Quality Management System (QMS) to strengthen academic decision-making.

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Table of Contribution Roles

Role	Author(s)
Conceptualization	Ortega Millán Jeanett del Carmen
Data cleansing	Flores Carpintero María de Jesús
Methodology	Ortega Millán Jeanett del Carmen
Administration of the project	Ortega Millán Jeanett del Carmen
Resources	Flores Carpintero María de Jesús
Software	Flores Carpintero María de Jesús
Supervision	Ortega Millán Jeanett del Carmen
Validation	Ortega Millán Jeanett del Carmen
Visualization	Flores Carpintero María de Jesús
Writing (original draft)	Ortega Millán Jeanett del Carmen
Editor (revision and editing)	Ortega Millán Jeanett del Carmen



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