1. Introduction

Logistics (i.e., product storage and distribution) is today an extremely relevant activity in the product-to-market process. Modern logistics are part of the various operations involved in transforming consumables into products and ensuring they reach their end user. A poor management could lead not only to dissatisfied customers and consumers, but also to significant losses due to the need for additional or urgent transport, perishable products, the loss of market opportunities, as well as a negative impact on the organization’s reputation, among others.

Based on the definition of Logistics as a relevant and independent process, and not as a secondary activity or conclusion of other activities deemed more relevant, methods have been developed to efficiently manage delivery.

After the implementation of the European Recovery Program (also known as Marshall Plan) following WWII, a suite of resources called «Quality Tools» (where «Quality» is the set of activities aimed at ensuring processes result as expected, including detection and improvement procedures) have emerged. Some of these tools are mainly intuitive, such as Pareto Charts, Ishikawa Diagrams, Brainstorming, while others are more complex (Statistical Process Controls, Experimental Design, and more) [1, 2]. Additionally, several methodologies or models were developed to promote the implementation of these tools within other processes (including strategy management, risk assessment, people management, among others). Some examples of these are the ISO 9000 Standards and the National Quality Awards models. This paper will assess the impact of the Argentine National Quality Award Model, as well as their counterparts in other countries of the region, in Logistics companies [3, 4].

Although no scientific articles directly related to the topic of this research have been found, it is worth mentioning publications such as [5–10].

Thus, this paper’s goal is to measure awareness and use of the Excellence in Quality models by organizations specialized in Logistics at a local and regional level, with a focus on the strongest markets in this area (Argentina, Chile, and Brazil). Also, as a supplement, this paper aims at assessing

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the proper use of Quality Management Models and other
related standards (ISO 9001 Quality Management Systems,
ISO 14001 Environmental Management Systems, ISO 39001
Road Traffic Safety Management Systems, and ISO 45001
Occupational Safety and Health Management Systems).
The assessment’s conclusions may serve as the foundation
of comprehensive policy that will ensure, through the use
of Standards, a global improvement in Logistics processes.

2. Materials and Methods

2.1. Determine Target Population. Since the scope of
the project in its first stage is to assess the local market,
and with the understanding that Logistics involves a series
of complex scenarios (for instance, some large companies
have their own Logistics resources, while others resort
to third-parties for this process), the target population at
a local level was comprised of the most relevant local Lo-
gistics Operators, members of CEDOL (Cámara Empresaria
de Operadores Logísticos, the local Chamber of Logistics
Operators). The Chamber member companies are those
considered in a better position to more easily implement
the Standards (either because they have available resources,
contact with other chambers and relevant stakeholders, etc.).
The Chamber has 41 active members and 9 acceding members.
Our reference will be active members, since they are the

To determine the target population for the second
stage of the project (an assessment at a regional level),
various regional associations and chambers (ABOL, the
Brazilian Association of Logistics Operators; ALOG, the
Chilean Association of Logistics Operators; APPRO-
LOG, the Peruvian Association of Logistics Professionals;
and duly certified some ISO Management System or any
other model, whether own or provided by Chambers, Re-
gional Agencies, etc.) [4, 18–21].

2.2. Information Acquisition Methodology. The original
plan was to acquire information through a survey on
4 clearly defined content areas:

a) Area 1: Company Characteristics:
This content area is aimed at gathering basic and general
information about the organization, for context purposes.

- Context: This has to do with the general charac-
teristics of the company, including staffing, Middle
Management development programs, among others.
- Origin: It is important to know how the company
was established in order to understand its history (i. e.
whether it is a family business, an affiliate of an in-
ternational corporation, if its growth can be traced
back to one particular customer, among others).
- Activities: This question requests specific information
about the company’s activities. The aim is to establish
whether they render only distribution services or if, for
instance, they provide storage services to their customers.
- Markets served: Since some markets (e. g., food, medi-
cines cosmetic) require certain certifications or have
special Compliance rules, this is necessary information.

b) Area 2: Awareness of the methodologies related to
Quality and Excellence:
This topic area delves deeper on the staff awareness
at an organizational level on topics related to Quality
and Excellence. The questions asked are directly related
to the following models:
- National Quality Award [16, 17].
- ISO 39001 Road Safety Management Systems.
- ISO 45001 Occupational Safety and Health Man-
gement Systems.
- Additional models (the operators’ own models, those
developed by Chambers, Associations, etc.) [4, 18–21].

c) Area 3: Implementation of methodologies related to
Quality and Excellence.
This is to determine whether there are models
in force, as described in Area 2. The questionnaires ask
what models have been applied and their scope (whether
they apply to every organizational process or only to some
processes, etc.).

d) Area 4: Results, obtained or expected, of the imple-
mentation of Quality and Excellence Management methodolo-
gies as determined in Area 3. This means the questions in
this item only apply to those organizations with enforced
good practices and that have reached conclusions, results
and expectations.

2.3. Tools for the Analysis. Due to some limitations
in the acquisition of first-hand information, it was not
possible to establish relations with significant statistical
value. However, some descriptive statistic tools were used
for the analysis.

3. Results and Discussion

3.1. Results. As a consequence of the aforementioned,
total cases for the analysis were 109, as per Table 1.

<table>
<thead>
<tr>
<th>Country</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>41</td>
</tr>
<tr>
<td>Brazil</td>
<td>30</td>
</tr>
<tr>
<td>Chile</td>
<td>16</td>
</tr>
<tr>
<td>Colombia</td>
<td>14</td>
</tr>
<tr>
<td>Peru</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>109</td>
</tr>
</tbody>
</table>

Once processed, the information from the different areas
was combined and the results are as follows. In keeping
up with the logic throughout that compares Argentina
to the Region, we are including a general analysis fol-
lowed by a comparison between Argentina and the rest
of the Region.

3.1.1. Excellence practice. In terms of implementation
of some sort of Excellence practice (i. e. having implemented
and duly certified some ISO Management System or any
other model, whether own or provided by Chambers, Re-
gional Agencies, etc.), Table 2 and Fig. 1.

Comparing Argentina with the region, results are as shown
in Table 3, Fig. 2, and Fig. 3.
Table 2

<table>
<thead>
<tr>
<th>Practices In Force</th>
<th>Number of Companies</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>25</td>
<td>22.9</td>
</tr>
<tr>
<td>One</td>
<td>31</td>
<td>28.4</td>
</tr>
<tr>
<td>Two</td>
<td>24</td>
<td>22.0</td>
</tr>
<tr>
<td>Three</td>
<td>18</td>
<td>16.5</td>
</tr>
<tr>
<td>Four</td>
<td>9</td>
<td>8.3</td>
</tr>
<tr>
<td>Five</td>
<td>2</td>
<td>1.8</td>
</tr>
<tr>
<td>Total</td>
<td>109</td>
<td>100</td>
</tr>
</tbody>
</table>

Fig. 1. Case Distribution by Number of Practices in Force

Table 3

<table>
<thead>
<tr>
<th>Practices in Force</th>
<th>Argentina</th>
<th>Rest of the Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>26.8 %</td>
<td>20.6 %</td>
</tr>
<tr>
<td>One</td>
<td>36.6 %</td>
<td>23.5 %</td>
</tr>
<tr>
<td>Two</td>
<td>19.5 %</td>
<td>23.5 %</td>
</tr>
<tr>
<td>Three</td>
<td>7.3 %</td>
<td>22.1 %</td>
</tr>
<tr>
<td>Four</td>
<td>9.8 %</td>
<td>7.4 %</td>
</tr>
<tr>
<td>Five</td>
<td>0 %</td>
<td>2.9 %</td>
</tr>
<tr>
<td>Total</td>
<td>100 %</td>
<td>100 %</td>
</tr>
</tbody>
</table>

Fig. 2. Case Distribution by Number of Practices in Force, Argentina vs. Rest of the Region

Fig. 3. Difference in Cases by Number of Practices in Force, Argentina vs. Rest of the Region
3.1.2. Types of Practices in Force. As with the previous item, practices and models in force both in Argentina and the rest of the region are analyzed in the cumulative totals (Table 4).

Distribution by Type of Practice – Argentina and Rest of the Region shown in Fig. 4.

<table>
<thead>
<tr>
<th>Practice</th>
<th>Argentina</th>
<th>Rest of the Region</th>
<th>Region Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number*</td>
<td>%**</td>
<td>Number*</td>
</tr>
<tr>
<td>ISO 9001 Quality MS</td>
<td>28</td>
<td>68.29</td>
<td>46</td>
</tr>
<tr>
<td>ISO 14001 Environmental MS</td>
<td>10</td>
<td>24.39</td>
<td>23</td>
</tr>
<tr>
<td>ISO 45001 OSH MS</td>
<td>4</td>
<td>9.76</td>
<td>13</td>
</tr>
<tr>
<td>ISO 39001 Road Safety MS</td>
<td>1</td>
<td>2.44</td>
<td>9</td>
</tr>
<tr>
<td>National Quality Awards</td>
<td>2</td>
<td>4.88</td>
<td>0</td>
</tr>
<tr>
<td>Other Models</td>
<td>10</td>
<td>24.39</td>
<td>32</td>
</tr>
</tbody>
</table>

Notes: * – Refers to the number of companies that states having implemented the mentioned practices. Many of these organizations have more than one practice in force; ** – Refers to the percentage as relates to the universe of companies analyzed (41 in Argentina, 68 in the Rest of the Region, for a total of 109).

3.1.3. Interactions Between the Various Excellence Models in Force. This section assesses whether organizations have implemented one or several practices or models. For the purposes of this study, the comparison between Argentina and the rest of the Region is not relevant (Table 5, Fig. 5).

Table 5

<table>
<thead>
<tr>
<th>Practices In Force</th>
<th>Number</th>
<th>%</th>
<th>Cumulative (in %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only ISO 9001</td>
<td>23</td>
<td>43</td>
<td>43</td>
</tr>
<tr>
<td>ISO 9001 + Other Models</td>
<td>12</td>
<td>27</td>
<td>70</td>
</tr>
<tr>
<td>Other Combinations</td>
<td>41</td>
<td>23</td>
<td>93</td>
</tr>
<tr>
<td>Only Other Models</td>
<td>8</td>
<td>7</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>84</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>
3.1.4. Results of the Implementation of Practices. It should be noted that some practices (mainly National Quality Award and Road Safety Management System) were implemented by very few organizations.

As mentioned before, the degree of response to the surveys was low, so conclusions and results below have a significant limitation in terms of casuistry.

Regarding the primary goal (measuring use of the Excellence Model National Quality Award), it appears it has been implemented only in Argentina, where an organization refers not only to having enforced it, but also having been the recipient of the award in one of its editions. The organizations refer that having implemented this practice contributed to an improvement in terms of process organization and consolidated a vertical and horizontal approach towards its management, highlighting the information flow used for the improvement process applies all senses, thus creating feedback for the management system in force [11].

On the other hand, as it will become apparent from the Discussion and Conclusions sections, models created by chambers (ABIQUIM, CEDOL) are characterized by a direct relation with the organization’s management process and, when integrating this to the ISO 9001 system, it renders, in many aspects, a model comparable to that of the National Quality Awards [2, 16, 17].

3.2. Discussion. This research aimed to analyze the use of excellence models (National Quality Awards) in the surveyed organizations (Table 1), both at the local level (Argentina) and at the regional level (South America). It is interesting to note the number of models implemented per organization, as shown in Table 2 and Fig. 1.

Per this assessment, according to what is observed in Table 4 and Fig. 4, ISO 9001 is highly considered in Argentina (and the trend replicates at a regional level). However, except for the National Quality Awards, all other types or practices are well below the regional average, as can be seen in Table 3, Fig. 2 and Fig. 3.

As can be observed in Table 5 and Fig. 5, it is worth noting that, except for the case of «Only Other Models», the other practices not detailed (ISO 14001, ISO 39001, ISO 45001, and National Quality Awards) were mostly accompanied at least by the implementation of an ISO 9001 Quality Management System; only two cases informed the implementation of the ISO 39001 Road Safety System.

This is expected, since implementing the ISO suite of Management Systems (mainly ISO 9001 – Quality Management System) enables entry to certain markets that expressly require their providers to follow this Standard. They also enable a certain degree of trust from their customers and other stakeholders, since external audits by an impartial agency ensures there are no interested parties involved in the reviews.

At the internal level, implementing Management Systems aids with task organization and standardization, which in turn improves processes. It also promotes a better understanding of the behaviors and requirements of consumers and regulatory bodies by the staff, since language and concepts are uniform at the local and international levels [22].

Also, in several cases, the ISO 14001 – Environmental Management System is a required standard by parent companies and even certain specific customers. In the cases where ISO 45001 and ISO 39001 are in force, it is usually linked to an organizational interest, a trend that is slowly but steadily growing. Organizations in Peru are a clear case of this trend.

3.3. Limitations during research. The main limitation was that the surveyed casuistry (positive responses) regarding Area 4 (importance, advantages, benefits, and other conclusions) was too low to consider it statistically relevant, so the analysis of this area was qualitative.

3.4. Prospects for further research. Both ISO Management System models and models of excellence or quality awards have as their primary objective the continuous improvement of operations and support processes.

In this globalized and competitive world, where standards are consistently being surpassed, it is essential to establish minimum acceptance requirements for each of the processes.

This paper can serve as a starting point for analyzing the scenario in other regions where different issues may arise (e. g., Ukraine, the Middle East, etc.), but within a framework of similar geographical characteristics.

Understanding the commonalities and differences in the implementation of these models in different regions can be of great interest, as it can help establish a set of minimum agreements for quality development in logistics operators.

4. Conclusions

1. Conclusions at the local level (Argentina):
- There are few Logistics Operators who are aware of or have implemented the Excellence model known as National Quality Award: one has openly and publicly implemented it (and won the Award in 2017), while two other companies have partially implemented the practice.
- The most widely used Quality Management System is ISO 9001, with similar rates across the region. However, the rest of the standards are less enforced.
- 10 of these organizations are certified by CEDOL, CEDOL developed a guide of Good Management Practices that includes some aspects of Quality Management and others related to corporate Excellence and Social Responsibility.
The main benefits of applying quality models are an improvement in customer satisfaction, in the company's reputation and in internal processes.

An ISO 9001 Quality Management System Certification enables operators to render services to customers that specifically require this. Customers have begun to require Road Safety Management System (ISO 39001) certifications. No cases have been observed of mandatory requirement of the National Quality Award.

Although there are virtually no companies with the ISO 39001 Standard (Road Safety) certification, there is a trend towards its implementation, since this System was specifically designed for organizations as those objects of this study.

2. Conclusions at the regional level:
- The National Quality Award model (which has specific rules in each country) is less widely used among Logistics Operators: Based on all interviews conducted and Online research, the most important takeaway is that even those countries with the highest number of Logistics Operators (Chile and Brazil) have not openly implemented the model. It’s worth noting that the National Quality Awards are specific to each country, but do have many things in common (this includes the Argentinean model).
- Regionally, the ISO 9001 Quality Management System remains the most widely used, and it has been successfully implemented (i.e. certified) by 68 % of the surveyed organizations. All other models remain far from this scope, and only other management models appear to have been implemented.
- In Brazil, Quality Management Systems and other models are much more prevalent than in Argentina: 80 % of the surveyed operators have implemented and obtained ISO 9001 Quality Management System certifications, while 33 % have obtained ISO 14001 Environmental Management System certification. Also, there is an interesting level of introduction of other models, like the ISO 45001 Occupational Safety and Health Management System and the ISO 39001 Road Safety Management System. Also, as part of a corporate mandate, companies operating in the chemical industry are usually certified through a specific model known as Comprehensive Management System (SASSMAQ) that based on our survey, is the road to certification with the other aforementioned Management Systems.
- In the case of Chile, the other country with comparable development among Logistics Operators, 50 % are ISO 9001-certified. In some very specific cases, some international corporations have completed Environmental Management System (ISO 14001) and Occupational Safety and Health System (ISO 45001) certifications.
- Regarding the rest of the region, although fewer operators were surveyed, the trend is similar to the Argentinean case. They work with local standards and are very slowly moving towards the implementation of different types of Management Systems. As is the usual case, they expect to first implement ISO 9001 Quality Management System and move on to the rest after that. In the case of Peru, the trend also points to the Road Safety Management System (ISO 39001) at a higher rate than the rest of the region. When asked about this trend, the Logistic Operators’ representatives agree that sooner, rather than later, this will become a mandatory requirement both nationally and internationally.

As mentioned in previous passages, it can be concluded that Excellence models (National Quality Awards) are not a goal among companies of the sector. In the case of Argentina, the model is more widely recognized in the industry, but at a regional level there were no relevant references to it.

Evidence shows these organizations find standard models (ISO Management Systems) more attractive, since they have global recognition and are usually required by their parent companies. It is worth mentioning that in those cases where the National Quality Award System was implemented in Argentina, they were national companies.

Also, all the surveyed countries have their own specific standards, either defined by their chambers (for instance, CEDOL in Argentina) or by operators associations (like the SASSMAQ model designed by the Brazilian Association of Chemical Industries). Both models were mentioned and are not binding or mandatory, but are widely implemented, and show high growth rates.

There is an opportunity of development, probably at a small scale, of a model that includes the requirements of the National Quality Awards, with a focus on the industry’s particular characteristics and difficulties. To ensure its implementation, this model should incorporate some concepts of the National Quality Awards to the models developed by the chambers. Also, there is an additional opportunity in engaging support and collaboration from local authorities across the region to establish some common requirements that will enable a standardized regional model, more generic in nature, and that considers each country’s distinctive features (cultural, legal, market development and other aspects).

Conflict of interest
The authors declare that they have no conflict of interest in relation to this study, including financial, personal, authorship, or any other, that could affect the study and its results presented in this article.

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Data availability
The manuscript has no associated data.

Use of artificial intelligence
The authors confirm that they did not use artificial intelligence technologies when creating the current work.

References


