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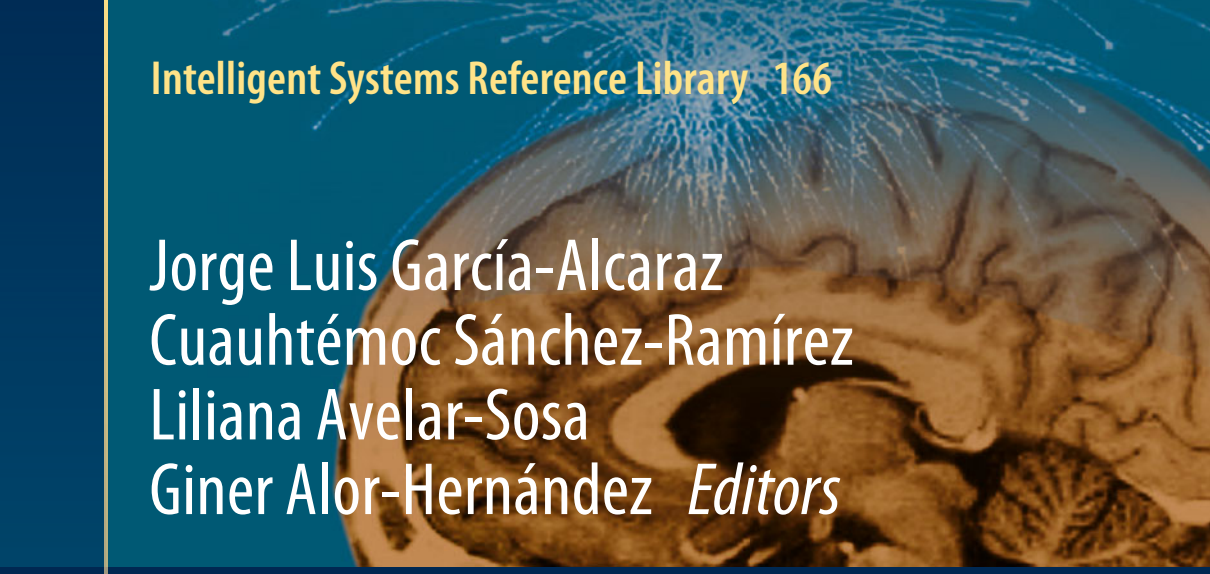

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# Techniques, Tools and Methodologies Applied to Global Supply Chain Ecosystems

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# Chapter 6
# Knowledge and Skills of a Logistics Manager Required by the Manufacturing Industry of Ciudad Juárez


**Roberto Romero López, Marie Karen Issamar Favela Herrera, Erwin Adán Martínez Gómez and Patricia Cristina Parroquín Amaya**

**Abstract** This chapter presents a model that integrates six main skills and/or knowledge that a logistics professional should have. This model is validated through the confirmatory factorial analysis technique. The research work was carried out specifically in the Export Manufacturing Industry of Ciudad Juárez, Chihuahua, applying a questionnaire of 33 items to the personnel of the medium and high levels responsible for the logistics area. The results indicate that the factors with the greatest explanatory power are: Information technology, Supply chain management and Quantitative methods.

**Keywords** Logistics skills · Factorial analysis · Supply chain

## 6.1 Introduction

The globalization of the markets has been generated due to the evolution of the industrial and commercial environment. It has driven companies to implement improvements in their processes in order to make them more efficient and thus, to offer their customers a reasonable combination of quality, quantity, opportunity and low cost of the goods and services that it produces, which allows to obtain competitive advantages respect to the competition [43]. To achieve this, it is necessary to have in mind a change in the patterns of work and education for the correct application of the logistics processes within the Supply Chain, consolidating a set of skills and competencies of human talent [56], in which is considered increasingly disruptive changes [4, 12].

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For this reason, in recent years there has been a growing awareness of the fundamental role played by people, knowledge and talent in the context of logistics and the success of the supply chain [31, 52].

## 6.2 Logistics: Definition

According to Castellanos [7], trying to define logistics, perhaps involves entering a debate, due to the current literature records more than thirty definitions of this term; some very simple and others much more complex. Within the different definitions of logistics, the following can be cited, in order to illustrate the great variety of the term:

- "The part of Supply Chain Management (SCM) that plans, implements and controls the efficient and effective flow of materials and the storage of products, as well as the associated information from the origin point to the point of consumption, in order to satisfy the customers' needs" [28].
- "It is the movement of the right goods, in the right amount, to the right place at the right time" [2, 16].
- "The process of effectively and efficiently planning, implementing and controlling the flow and storage of goods, services and related information, from the point of origin to the point of consumption, in order to fulfil the client's requirements" Council of Logistics Professionals (CLMP), cited by Castellanos [7].

In accordance, logistics services offer companies a competitive advantage [50]; also, the total satisfaction of the client [27] and the quality of the service [44] is added as differentiating elements, becoming in turn, a key element for achieving the objectives of the organizations.

In addition, the concept of integrated logistics management of the eighties, added to logistics, physical distribution in response to the deregulation of transport and the growing globalization [11]. The influence of the value chain model of Porter [42], extended the logistic management to foresee the efficiency and effectiveness of the total system of interrelated companies, from the original sellers to the final consumers, concept that was known in the 90s as management of the supply chain [48].

## 6.3 Importance of Logistics

At present, the issue of logistics is assumed with such importance that in organizations it is stipulated a specific area for its treatment [51]; its evolution through time has been constant, until today, where it becomes one of the main tools for an organization to be considered as a first world company [25].

On the other hand, the improvement of the efficiency in logistic processes, focusing the efforts on the real need of the clients, eliminates the costs of services that do not add any value, improving in this way the productivity [10, 43].

According to the report of the Ministry of Economy (2008), quoted by Botello [3], the total cost of logistics of companies is in the order of 5% on the value of sales of consumer products. In the case of Mexico, these costs represent an average of 12.6%, of which 40% corresponds to the cost of transportation and 60% to inventories, order processing, storage and planning of transport operations [8].

Decreasing these logistics costs is translated into lower costs of the produced goods, which in turn, generates a significant number of benefits. Some benefits are: increased demand, production and employment; of the exchange flows, of the profitability of the company, increase of the value of the product given by the client and an increase in the shares of the investors of the company [22].

Another report by the Ministry of Economy (2011), cited by Olivos and Orue [39], shows that logistics allows companies to project their activities in an external scenario, visualize the activities and necessary links to market the products and raise their competitiveness at the national or international levels [45].

Authors such as Mendoza [33], affirm that logistics activities are the engine for new investments in infrastructure, helping to link supply and demand; therefore, it is important to know the performance of these activities and thus be able to know if the established objectives are achieved.

At a global level, there is a benchmark index that measures the efficiency of the supply chain, this is known as the logistic performance index, which measures aspects such as cargo transport, storage, customs clearance and payment system. The data comes from surveys and evaluations conducted by the World Bank every two years, in partnership with academic and international institutions, private companies and individuals involved in international logistics.

In the report Connecting to Compete: Trade Logistics in the Global Economy 2016, it is indicated that Mexico is located in the 54th place with an overall performance of 3.11, which it lost four positions among 160 economies with respect to its last evaluation, in 2014.

This performance measurement consists of a scale from 1 to 5, where 1 is the least efficient level and 5 is the most efficient level. The logistic performance of Mexico in the six factors measured by the World Bank was: Efficiency of the customs clearance process 2.88, infrastructure 2.89, international shipments 3.00, quality of logistics services 3.14, tracking and tracking of shipments 3.40, punctuality 3.38. These measurements and positions of Mexico in the world ranking reveal that there are opportunities for improvement in the different areas of logistics, which if they are corrected, it will raise the competitiveness of the country to some extent [1].

## 6.4 Skills of the Logistics Professional

It is considered that Logistics personnel is an essential component in the analysis of supply chains, since they are responsible for making it work in an integrated and effective way [33]. The supply chain is an upper echelon of development and is responsible for managing flows from the main suppliers to the final customer [64].

In order to achieve customer satisfaction, it is essential to work in a systemic way; therefore, it is vital to identify and evaluate the labor competencies of the personnel that works in the logistic integrated system of the organizations [7].

That is why there is a growing demand for gifted professionals with skills to manage networks, who understand and manage internal and external operations, thinking in terms of processes, with sufficient skills to reduce costs [45], minimize risks of supply and improve service levels to customers [47, 52].

That said, job skills are part of the set of knowledge, skills, attitudes, skills, values that an individual must develop for successful performance in their job [57]. According to the growth trends of the supply chain, one of them is leadership: the ability to plan and execute strategies with a different focus to the tactical knowledge of processes. It is also a strategic vision based on an understanding of the business environment, including markets, industry trends and awareness of local conditions and the ability to demonstrate the value of supply chain management through financial results [29].

In addition, there are several skills and competencies in the area of logistics that have been highlighted by a series of previous studies that are summarized below.

First, there are Murphy and Poist [35] who classify the necessary skills of logistics managers such as business skills, logistics skills and management skills. Within the business skills, transport and logistics stand out, as well as general business administration and business ethics as the most important areas. In terms of logistics skills, there is traffic and transport management, customer service and storage, while in terms of management skills, there is personal integrity, the ability to motivate and the ability to plan.

In another study, Murphy and Poist [36] demonstrate an aggregation to these three skill areas. They incorporated human resources management or strategic management into business skills. Also in management skills, they included soft skills, such as communication and leadership. Almost ten years later, they review this study to reveal emerging trends in SCM [37] and conclude that skills related to supply chain management have become the highest within the category of entrepreneurial skills.

Mangan and Christopher [31] identified three key areas of skills and competencies required by logistics and supply chain (SCM) specialists: General (finance, technology and innovation, management/strategy), Logistics/SCM-specific (operations/SCM, processes/flows, legislation, security and international trade, multimodal logistics, logistics in emerging markets) and Competencies/skills (analytical, interpersonal, leadership, change management, project management).

In your research of human capital in the supply chain; Myers et al. [38] indicated that, despite the great improvement of information and communication technologies

(ICT), a considerable number of mid and intermediate level employees are still needed to maintain efficient operations of the supply chain. These tacit skills include social skills, decision-making, problem solving and time management.

Similarly, Gammelgaard and Larson [18], consider 45 skills relevant to the supply chain and group these as interpersonal skills/management, quantitative/technological skills and basic supply chain skills. In addition, they affirm that the ability to communicate with others is critical for professionals, a statement supported by Myers et al. [38].

For his part, Ballou [2] attributes to SCM the same importance as marketing or finances in an organization and considers purchasing (acquisition), production and logistics as functions of the supply chain. Similarly Sodhi et al. [53] classified the supply chain issues such as: supply chain design and location, transport and logistics, inventory and forecasting, marketing and restructuring of channels, supply and management of suppliers, information and electronically mediated environments, product design, introduction of new products, inverse logistics and green issues, outsourcing and organizational alliances, metrics and performance and global issues.

Gravier and Farris [19] consider skills and competencies within the broad area of the supply chain with an emphasis on innovation/technology and soft skills. Likewise, Ozment and Keller [40] highlight management, marketing and finance, as well as the central area of SCM. Just as Vokurka [60] emphasizes management, quantitative methods, technology, innovation, and finance and points to the problem as the lack of defined competencies required by supply chain professionals.

In addition, an important area within the companies is the Corporate Social Responsibility (CSR) where Harrison and van Hoek [24] define it in a supply chain as the effort to face the social and environmental consequences of the operations of the chain of supply. Companies are beginning to deal with CSR and global logistics through what is now known as the green supply chain [54].

Another logistical skill to take into account is to use metaheuristic techniques to examine risk and supply chain interruptions, intermodal operations, customer service compensations, backhaul strategies and simultaneous location of facilities and problems of vehicle routes [21].

Finally, a logistics professional must be able to integrate, communicate and analyze from an international perspective, perform financial analysis, maintain a good relationship with industry and customers, exhibit good interpersonal skills and understand the laws and regulations [61].

## 6.5 Skills and Knowledge in Logistics Required by Companies

With business environments subject to rapid and continuous changes, it is essential that logistics professionals are well trained and equipped with the most relevant and important skills and knowledge [17]. A qualified workforce contributes greatly to the

success of any business sector, with logistics and supply chain management being an area that directly supports the achievement of that success [55].

In relation to above, Closs [9] suggested that one of the biggest challenges for management in the next decade is the shortage of trained supply chain managers, and that a substantial change in logistics and the supply chain was necessary to face these challenges. This perception has been reinforced by Cacciolatti et al. [5], who argued that supply management organizations will assume a higher value role in the next decade, so success will depend on whether they can attract personnel with adequate skills and capabilities to excel in the future.

On the other hand, Green [20] indicated that companies in recent years have recognized the vital role that people play in driving innovation in their supply chains and therefore the need to improve their results, instead of investing only in technology and processes.

Similarly Eskandari et al. [14], found that companies want professionals in the area of logistics have the following strengths, "ability to analyze, creativity to synthesize, understanding the system, focusing on the client, with knowledge of the context social and the impact of being a citizen of the world".

Radovilsky, Hegde and Kandasamy try to connect the competences identified to carry out the logistics work with the offer of study programs in 2007 (according to Radovilsky and Hegde [46]). Yew et al. [62] analyzed work announcements in the UK labor market and suggested that all supply chain management jobs could be divided into two groups, "managers" and "employees [6]. They also indicated what competencies employers prefer and made recommendations for educational institutions [15].

Finally, Villanueva [59], states that companies require employees with continuous learning skills, flexible attitude and open mind, adaptation to the permanent change of the environment. Also they require participation in quality processes and incessant improvement, leadership of work teams, communication with peers and with the hierarchical line, capacity for interpretation of technical documentation and management, capacity to give reflexive responses to unforeseen situations [30], as well as participation in the management and control of the task itself.

Obviously, an analysis of the new trends planned for the next few years is essential when trying to diagnose the new specific skills for those who intend to survive within the sector [13]. In this sense, it seems that the key to the global logistics industry lies in a set of skills and competences not only correct, but functional and effective.

## 6.6 Theoretical Model

The development of a literature review is fundamental, since it supports the generation of a theoretical model; it is from this framework that the construction of the same is justified [49, 63].

Based on the review of the literature consulted, the authors consider as skills and competencies the following 6 dimensions: supply chain management [37], informa-

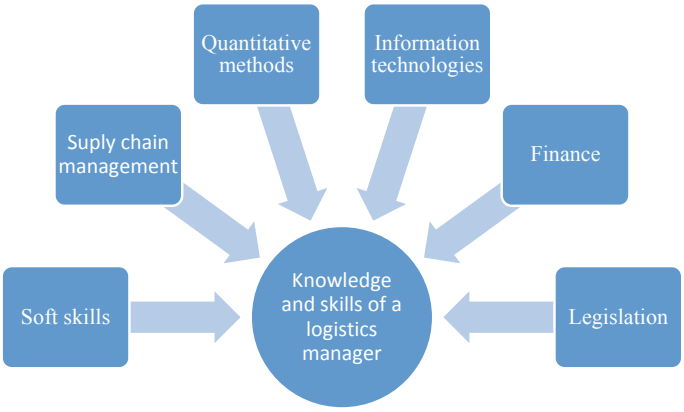


**Fig. 6.1** Theoretical model of skills and capabilities of a logistics manager

tion technologies [31], quantitative methods [19], Finance [60], Legislation [53] and Soft Skills [61]. In the following paragraphs, they are described, and, in Fig. 6.1, the theoretical model is shown.

### *6.6.1 Supply Chain Management*

It consists of the monitoring of materials, information and finances during the process that goes from the supplier to the manufacturer, to the wholesaler, to the retailer, and to the consumer. The management of the supply chain involves the coordination and integration of these flows, both within the same company and between different companies.

### *6.6.2 Quantitative Methods*

They are those that rely on numbers to investigate, analyze and verify information and data. In the logistics they allow the professional to optimize own processes of the supply chain, in addition to developing the ability to interpret and implement solutions with practical criteria of the results obtained to the problems raised.

### 6.6.3 Information Technologies

They are a fundamental part of the new business administration due to they allow manipulation, organization, communication and the integration of the company's data and processes, as well as helping to maintain close relationships with the customer.

### 6.6.4 Finance

Logistics finance becomes a strategic tool in the supply chain, allowing an opportunity to the emerging markets for the optimization of inventories (strategic location of the distribution network), speed of delivery and rotation of inventories. It also allows reducing investment risks, ensuring budgeted profit margins and locating cost reduction opportunities.

### 6.6.5 Legislation

Set of rules, or rules to follow. They have legal power that is conferred by the government authority in charge. In the area of logistics, it is important to know about international regulations that affect goods, customs regulations and export and import regulations.

### 6.6.6 Soft Skills

These are related to the coefficient of emotional intelligence, personality traits, social skills, communication, language, personal habits and optimism that characterizes relationships with other people. It includes common sense and a positive flexible attitude and among them are the skills communicative and relational, creativity, the ability to work as a team, responsibility, honesty, commitment and proactive attitudes when solving problems and generate innovative ideas that help boost the growth of the organization.

## 6.7 Methodology

The methodology used is based on factor analysis, which is a technique especially suitable for analyzing the patterns of complex and multidimensional relationships found by researchers [34, 58]. Its main purpose is to define the underlying structure

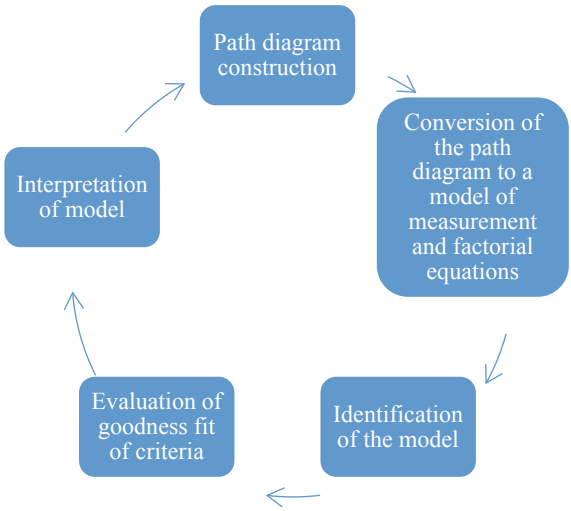


**Fig. 6.2** Used Methodology in the research

in a data matrix, analyzing the structure of the interrelations (correlations) between a large number of variables with the definition of a series of common underlying dimensions, known as factors.

With this analysis, the researcher can first identify the separate dimensions of the structure and then, to determine the degree to which each variable is justified for each dimension. Once this is done, the two main objectives for the factor analysis can be achieved: the summary and the reduction of data [23, 41].

The confirmatory factor analysis (CFA), tries to determine if the number of factors obtained and their loads correspond to those that would be expected in light of a previous theory about the data [26].

The methodology consists of five stages: Construction of the path diagram from the theoretical model, conversion of the path diagram to a model of measurement and factorial equations, identification of the model, evaluation of goodness-of-fit criteria and, finally, interpretation of the model. In Fig. 6.2, the used methodology is presented.

The following sections explain in detail the results obtained in each of the phases of this methodology carried out for the approach and validation of the model, referring to the skills that a professional in logistics should possess.

## 6.8 Results

The results obtained in the confirmatory factor analysis are presented below. In order to obtain data, a survey composed of 33 items was applied to logistics personnel who have positions in middle and upper management of the export maquiladora industry located in Ciudad Juárez, Chihuahua.

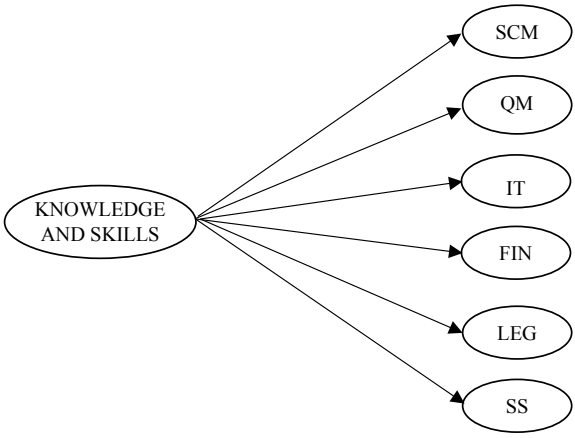


**Fig. 6.3** Path diagram of the theoretical model of logistics knowledge and skills

For the process of administering the survey, a list of export manufacturing industries provided by the IMIP (Municipal Institute for Research and Planning) was consulted and applied to 44 people in charge of the logistics areas.

### *6.8.1 Construction of the Path Diagram*

The path diagram is a visual representation not only of the predictive relationships between constructs (dependent-independent), but also of associative relations (correlations) between constructs [32], see Fig. 6.3.

### *6.8.2 Conversion of the Path Diagram in a Model of Measurement and Factorial Equations*

The measurement model is the set of connections between the observed and unobserved variables; it can be represented in a diagram or in equations. To develop the measurement model, the researcher specifies which variables define each construct [32]. Tables 6.1 and 6.2 shows the unobserved and observe variables respectively.

Mathematically, the relationship between observable variables and factors can be expressed:

$$X = \Delta\xi + \delta \tag{6.1}$$

where

X will be a vector (q × 1) of observable variables.
ξ will be a vector (s × 1) of common factors.

**Table 6.1** Unobserved variables

| Construct | Label | Variable | Type |
|---|---|---|---|
| Logistics skills and abilities | Knowledge and skills | $X_0$ | Exogenous |
| Supply chain management | SCM | $Y_1$ | Endogenous |
| Quantitative methods | QM | $Y_2$ | Endogenous |
| Information technologies | IT | $Y_3$ | Endogenous |
| Finance | FIN | $Y_4$ | Endogenous |
| Legislation | LEG | $Y_5$ | Endogenous |
| Soft skills | SS | $Y_6$ | Endogenous |

**Table 6.2** Observed variables

| Construct | Observed variable | Label | Construct | Observed variable | Label |
|---|---|---|---|---|---|
| SCM | Process mapping | I1 | IT | Business resource planning | I18 |
| | Optimal assignment of supply sources | I2 | | Electronic business | I19 |
| | Efficient use of transportation resources | I3 | | Mobile communications type GPS | I20 |
| | Distribution | I4 | | Bar codes, RFID, voice picking | I21 |
| | Storage | I5 | | Key performance indicators | I22 |
| | Customer service | I6 | FIN | Financial indicators | I23 |
| | Relationship with suppliers | I7 | | Logistics expenses | I24 |
| | Risk | I8 | | Logistic utility | I25 |
| | Multimodal logistic | I9 | LEG | International regulations | I26 |
| | Logistics in emerging markets | I10 | | Customs regulations | I27 |
| | Inventory and forecast | I11 | | Export and import regulations | I28 |
| | Reverse logistics | I12 | SS | Communication | I29 |
| QM | Simulation | I13 | | Leadership | I30 |
| | Analytical methods | I14 | | Personal development | I31 |
| | Metaheuristics methods | I15 | | Foreign languages | I32 |
| | Lean tools | I16 | | Ethic | I33 |
| | Six Sigma | I17 | | | |

**Table 6.3** Calculation of the number of degrees of freedom

| | |
|---|---|
| Number of distinct sample moments | 561 |
| Number of distinct parameters to be estimated | 71 |
| Degrees of freedom (561 − 71) | 490 |

$\Delta$ will be a matrix (q × s) of factorial weights that relate the observable variables (X) with the latent ($\xi$) and

$\delta$ will be a vector (q × 1) of residuals or error terms.

Next, an extract of the equations is presented, showing the variables that intervene in the equations of the measurement model where the estimation is considered for the constructs with first order factors.

$$I1 = Y1 * \lambda_1 + \delta_1$$
$$\ldots$$
$$Y1 = X0 * \lambda_{34} + \delta_1$$

In this research we used the method of unweighted least squares (USL, for its acronym in English), since this procedure analyzes the model without restricting the size of the sample, as well as making some kind of assumption about the form of the distribution of the initial values, therefore, estimates the own adjustment solutions and their parameters.

### *6.8.3 Identification of the Model*

For the identification of the model, it is necessary to know the degrees of freedom of this, which is calculated by subtracting the number of different moments and the number of different parameters to estimate. The results obtained from the analysis are shown in Table 6.3.

The value of the degrees of freedom was 490 and because of it is bigger than zero, it is said that the model is over identified.

### *6.8.4 Evaluation of the Criteria of the Goodness of Adjustment*

It is observed that the result of the CMIN (minimum value of the discrepancy) has reached the minimum in Table 6.4. This value indicates that the reproduced covariance matrix and the observed covariance matrix (initials) are close and therefore the minimum has been reached, therefore, the function converges towards a solution.

With respect to the evaluation of the adjustment quality criteria, there are several measures that when used in combination evaluate the results from three perspectives:

**Table 6.4** Calculation of the CMIN

| Model | NPAR | CMIN |
|---|---|---|
| Default model | 71 | 311.479 |
| Saturated model | 561 | 0.000 |
| Independence model | 33 | 1935.138 |

**Table 6.5** Calculation of the global adjustment goodness

| Model | GFI | RMR |
|---|---|---|
| Default model | 0.875 | 0.105 |
| Saturated model | 1.000 | 0.000 |
| Independence model | 0.221 | 0.263 |

Global adjustment, incremental adjustment and parsimony adjustment. The results obtained are shown.

### *6.8.5 Measures of Goodness of Global Adjustment*

With these indices, the degree to which the proposed model predicts the observed correlation or covariance matrix was determined. The results are shown in Table 6.5.

The results indicate that the Goodnees-of-Fit Index (GFI) with a value of 0.875 (close to 1) is a good general degree of model fit. With respect to the Root Mean Square Residual (RMR), its value was 0.105 (close to 0), therefore the errors between the observed matrix and the reproduced matrix would be very low, which means that the adjustment is very good. In general, with the values obtained with these two indices, it can be indicated that the model has a good fit.

### *6.8.6 Measures of Goodness of Incremental Adjustment*

These indices compare the analyzed model with a base model that is commonly qualified as a null model. What is sought is to determine if the model, in addition to having a good fit, is adequate. Table 6.6 shows the results of these indices.

These results indicate that with an incremental Adjusted Goodness-of-Fit Index (AGFI) of 0.856 the data fit well with the proposed model, likewise the Normed Fit

**Table 6.6** Calculation of incremental goodness of fit

| Model | AGFI | NFI |
|---|---|---|
| Default model | 0.856 | 0.839 |
| Independence model | 0.172 | 0.000 |

**Table 6.7** Calculation of parsimony fit goodness

| Model | PGFI | PNFI |
|---|---|---|
| Default model | 0.764 | 0.779 |
| Independence model | 0.208 | 0.000 |

Index (NFI) with a value of 0.839 is better adjusted if we compare it with the null model (0.000), the closer you are to the 1, the model is better adjusted.

### *6.8.7 Measures of Adjustment of Parsimony*

These indexes diagnose if there is over identification of the data and if there are too many parameters present. Table 6.7 shows the results of these indices.

The results indicate that a value of 0.764 in the Parsimony Goodness-of-Fit Index (PGFI) and 0.779 in the standardized Parsimony Normed Fit Index (PNFI) that there is an equilibrium in the proposed model and the number of estimated parameters, so that the conditional evidence of the parsimony of the model is allowed.

Overall, it can be summarized that the different global measures of quality of adjustment provide sufficient evidence to consider the results as an acceptable representation of the supposed constructs.

### *6.8.8 Interpretation of the Model*

Once it is verified that the values obtained are coherent and the goodness of fit indexes show that the model has a good fit, the obtained results are presented in terms of the factorial loads and their repercussion in the latent variables presented in the model (see Fig. 6.4).

The interpretation of the model is based on the values of the factorial loads (standardized values), therefore, these serve the researcher to know as soon as an observable variable (indicator) contributes with the latent variable (factor). It is important to note that, according to Hair et al. [23], the values of the factorial loads greater than 0.30 can be considered as elements that contribute significantly to the latent variables.

Within the model, it is observed that the indicator Logistics on emerging markets (I10) is the one that contributes the most (0.83) with the latent variable Management of the supply chain and the one that contributes the least (0.30) is Customer Service (I6). Regarding the quantitative methods factor, we have the ones that contribute the most is Simulation (I13) and metaheuristic models (I15) with factor loads of 0.796 and 0745 respectively, for this factor all indicators contribute significantly.

In relation to the Information Technologies factor, the indicator that contributes most is the Enterprise Resource Planning (I18) with a load of 0.642 and the one that

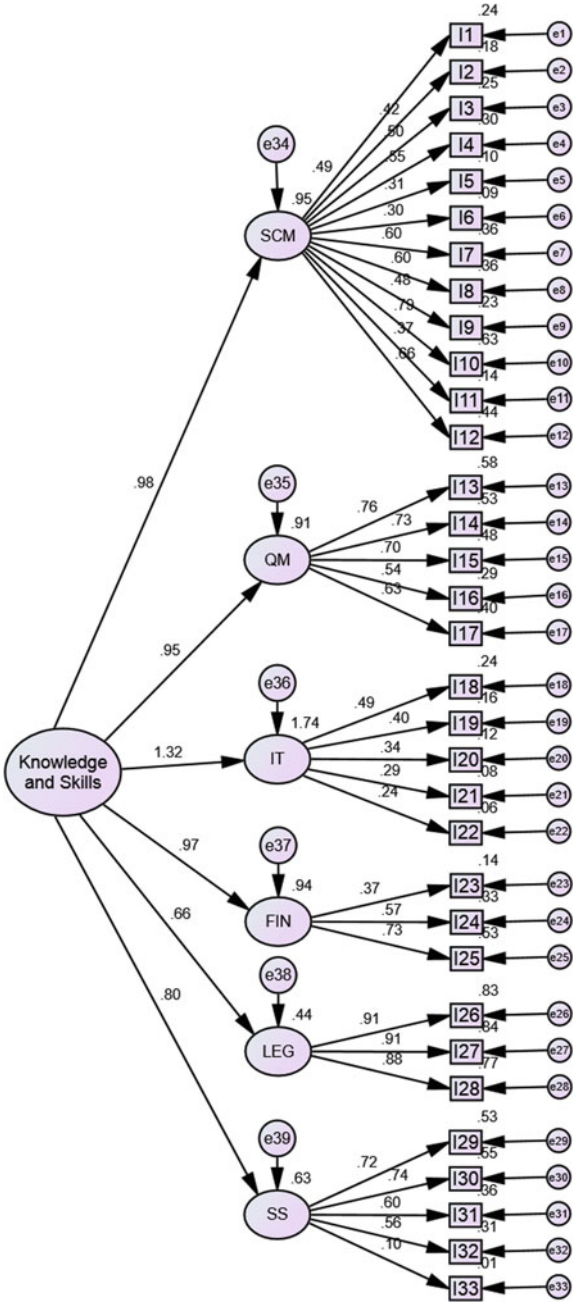


**Fig. 6.4** Factorial loads of the logistics skills and capacities model

contributes least is Key Performance Indicators (I22) with 0.372 factor load. For the Finance factor, the indicator with the highest contribution is Logistic Utility (I25) with a load of 0.748 and the one that contributes least is Financial Indicators (I23) with 0.308 factor load.

Regarding the Legislation factor, all indicators: International regulations (I26), Customs regulations (I27) and Export and import regulations (I28) contribute significantly with values of 0.877, 0.936 and 0.896, respectively. The last factor of the first order is soft Skills, where the indicator Communication (I29) contributes significantly with a load of 0.707 and, on the contrary, the indicator with very low significant contribution is Ethics (I33) with a factorial load of 0.201, a value that is well below that established in the theory [23]. It would be interesting to carry out an analysis of why the personnel of the logistics area of Ciudad Juarez does not consider it as part of the soft skills that a logistics professional must possess.

Finally, it is necessary to perform the interpretation of the second order factor Logistics Skills, where it is observed that all first order factors contribute significantly. The factor that contributes the most is Information Technology with a factorial load of 0.991, followed by the supply chain Management factor with 0.972, then the factor Quantitative methods with 0.958, Finance with 0.923, Soft skills with 0.811 and finally, the factor Legislation with 0.668 factor load.

## 6.9 Conclusions

Within this research, a second-order confirmatory factor analysis model is proposed, in order to examine the theories that reflect the development of the skills and abilities that a logistics professional should possess. The review was based on different articles related to the skills and logistical capacities necessary for the effective management of the supply chain, as well as the requirements that companies demand from a logistics professional.

The skills and capacities that were identified are 6: management in the supply chain, application of quantitative methods, management of information technologies, knowledge in finance, laws and, finally, the development of soft skills.

The confirmatory factor analysis offers adequate support to the proposed model based on the factorial analyzes, and the results obtained show that the model is properly identified, since the value of the degrees of freedom was equal to 490.

All the parameters have been estimated properly, given that the discrepancy function (CMIN) obtained a minimum, whose value was 311.479, and finally the goodness indices: GFI = 0.875, RMR = 0.105, AGFI = 0.856, NFI = 0.839, PGFI = 0.764 and PNFI = 0.779, state that the model has a good fit. Therefore, it is considered a recommendable instrument for a first step in the identification of skills and abilities in a professional specialized in logistics.

Finally, with respect to the factor that has the greatest explanatory power on Skills and capabilities in the area of logistics, it has to be that of Information Technologies

with a factorial load of 0.991, followed by the Supply Chain Management factor with 0.972 and, thirdly, that of Quantitative methods with a factorial load of 0.958.

Apparently, these tendencies are those that will present implications for any professional in the supply chain of the future and, like any sudden change, they will first of all require an adaptation capacity, depending on the speed with which it occurs. So that said skills will be required to survive in the sector to face these changes.

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