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## Article

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## **STATE OF IMPLEMENTATION OF SUPPLY CHAIN MANAGEMENT IN COMPANIES IN ROMANIA**

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### **Abstract**

The aim of this study was to assess the degree of supply chain management's development in Romanian companies. For this, a selective, explorative survey, on a sample of 225 Romanian companies was used. The objectives of the research focused on highlighting the importance of logistics in the companies' management and on identifying specific issues related to supply chain management - role, objectives, predisposing factors, applications.

From the research, it was found that supply chain management is at an early stage of development, specifically for the 80s and 90s. In addition, there is insufficient awareness that SCM is a tool for increasing business performance and competitiveness in the global market. The value of the study is given also by the fact that it is a pioneering work in Romania, where there were little such researches, especially in PhD thesis.

**Keywords:** Supply chain management (SCM), logistics, performances of companies, logistic cooperation, integration of firm's activities, global market, competitiveness.

**JEL Classification:** F 14, M 19, N 7

### **Introduction**

A great part of the literature attempts to identify the components of supply chain, the factors that favour the success of its implementation and to provide examples of good practice that can be models for other companies. Also, these factors try the foundation of some theories regarding the supply chain management, which could then become real guides for the implementation, expansion and development of supply chain within companies (Teller et al., 2011, Marra, Ho, Edwards, 2012, Kotzab, Teller, Grant, Sparks, 2011). These have led to a variety of definitions, meanings and functions, leading to increased heterogeneity of literature. Furthermore, the heterogeneity is also found among international institutions concerned with Supply Chain Management (SCM), including The Supply Chain Council, Council of Logistics Management, and Institute for Supply Management, etc.

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We consider the functional design of systems theory to be much more useful for highlighting the features of supply chain. In this way, the focus is on the flows occurring in the system and on the functions of the supply chain, i.e. its role in companies' activity (Senge, 1994). Therefore, the supply chain must be seen in a holistic and not analytic way. A definition in this respect is the one given by The Supply Chain Council in 2002: "a supply chain includes every effort involved in the production and delivery of a final product from the provider's provider to the customer's client" (The Supply Chain Council in Chen and Paulraj, 2004, p 122).

The results sought by creating a supply chain that can turn into sources of competitive advantage refer to the cost, quality, speed and flexibility, while the sources of differentiation are based on agility, adaptability and alignment (Ketchen and Hult Jr., 2007). The common elements that support the creation of a supply chain and represent determinant factors of its management are human resources, information technology, integration and communication (Al-Mudimigh et al., 2004). Our article aims to highlight the progress made with the introduction of supply chain management concepts in companies in Romania and directions of development achieved so far. In doing so we assume that the practical importance of SCM is known in the Romanian business environment.

### **1. The Evolution of Supply Chain Management**

The literature shows that SCM contributes to companies' performance and represents a major factor of competitiveness. The global economic crisis, overlapped on the situation of over-supply of most goods and services markets has led to changing the way in which the competition operates. Companies no longer compete as simple autonomous, individual entities, but participate in the creation of associations with business partners. In this way, inter-network competition becomes one of the main features of the global business environment (Lambert and Cooper, 2000). Logistics chains represent such business networks and become an effective way in which companies compete on the market, changing rivalry from companies to logistics chains.

The conceptualization of logistic chain is placed in time in the 80's. The concept, although evolving, is closely linked to business performances. The evolution of economic conditions in which performance can be achieved has determined new extensions of the concept of supply chain. If initially the performance of the logistic chain depends on the actions of suppliers (upstream) and distributors (downstream), currently the supply chain is no longer limited to the simple movement of goods. An efficient management of a supply chain takes into consideration any activity affecting the availability of a product that meets customers' needs (Anderson and Delattre, 2002). This involves various areas such as quality management, product design, operational management, supply, marketing, logistics etc. (Ellinger, Ellinger and Keller, 2002).

A major concern was to identify the factors leading to the development of SCM. Although there are different opinions in this regard, we consider the approach of Chen and Paulraj (2004) a comprehensive one. Thus, among the factors contributing to the expansion of SCM, they include the uncertainty of the environment, focusing on customer, support of top management, supply strategy, information technology, supply chain structure, the buyer-supplier relationship management, logistic integration, and supply chain performance

measurement. In this sense, the issue of ensuring the supply chain and identifying the focal (central) company around which the chain is organized is raised. Focal firms are those that usually fulfil several functions simultaneously, leading the supply chain, providing direct contact to consumer and projecting the offered product on the market (Handfield, 1999, Schary and Skjott, 2001). Of course, logistics development has led to 3PL and 4PL provider type, which in some cases provides leadership of the logistics chains without being focal companies.

The identification of factors that lead to best practices in SCM is also enjoying a special attention. Among these factors, we can include: strategic partnership with suppliers, automating of tasks, customer relationship management, design of products and processes, performance management, information sharing, etc. (Li, Rao, Ragu-Nathan, Ragu-Nathan, 2005, Brigas, 2005). They lead to the redesigning of activities and have as starting point the chain competitiveness. It strengthens relationships with the suppliers of materials and services and with customers. Specialized computer programs are widely used, leading to the integration of information flows with the material ones, and are adapting to various organizational levels - strategic, tactical, and operational. Widespread recourse is made to outsourcing, subcontracting, standardization, and modularization. In conclusion, the best practice is not limited to a single dimension (integration of suppliers and / or customers, automation, redesigning activities etc.), but is based on strong complementarities between them.

## **2. Brief overview of the logistic sector in Romania**

In making this point, we started from the fact that the implementation, expansion and development of SCM within the Romanian companies have as a starting point the logistics development.

Despite Romania's favourable geographical position, we can argue that the logistics sector is not yet properly developed, although it has made some progress. This is due to poor transport infrastructure, public policies, and the economic crisis (Moanță, 2008).

The Romanian logistics market is attractive, which is justified by the presence of large international groups. This has seen an upward evolution until 2008, followed by a strong decrease during the economic crisis. Currently, there are slight tendencies of recovery.

The logistics sector development is unbalanced, but consistent with the evolution of the Romanian economic environment, characterized by concentration in few centers: Bucharest, Arad, Cluj Napoca, Constanta, and Ploiești. The infrastructures logistics closely watch the areas where investments in economy, especially foreign, were made. However, modern and well-equipped logistics platforms appeared, on the same level as those of companies from developed countries in Europe and the U.S.A. In addition, the fleet has been renewed and diversified (Felea, 2008).

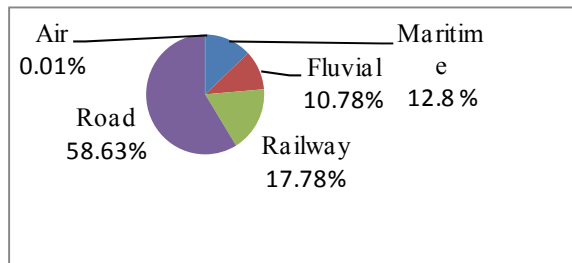
Transport of goods is characterized by the strong dominance of roadway (around 59% of total goods transport) as can be seen in table no. 2.1 and figure no. 2.1. Rail represents less than 18% of goods transport, although it benefits of an extensive but outdated infrastructure. The main port is Constanta, where international flows begin to grow. River transport is still under-exploited, although Romania has the largest share of the Danube on its territory, with around 11% of goods transported in 2010.

**Table no. 2.1: Transport of goods in Romania in 2010**

- Thousands tones

Means of transportation	Maritime	Fluvial	Railway	Road	Air	Total
Quantity	38118	32088	52932	174551	25,5	297714,5

Source: adaptation from the Ministry of Transport and Infrastructure, 2010

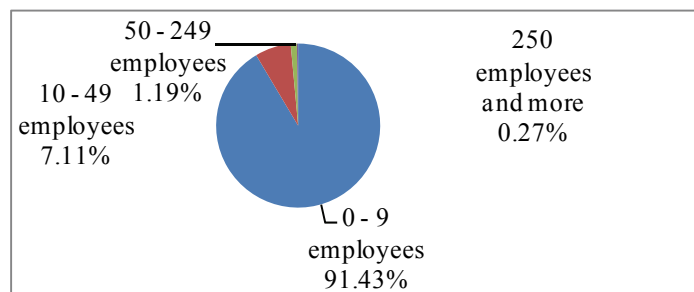
**Figure no. 2.1: Goods transported in 2010 in thousands tones**

International operators coexist within the logistics sector in Romania, offering complete logistics, 3PL type (about 3% of the companies transport and storage) with very diverse national operators. There are several large Romanian companies, which tend to be 3PL type and many small companies, focusing particularly on transport operations. (table 2.2. and figure 2.2).

**Table no. 2.2: Number of active companies in the transportation and storage area in 2009**

Company type	0 -9 employees	10 - 49 employees	50 -249 employees	250 employees and more	Total	Foreign Capital	SMEs
Number	32059	2494	416	95	35064	1053	34696

Source: adaptation from the National Institute of Statistics, 2009

**Figure no. 2.2: Number of transport and storage companies, in 2009, on class and size**

Sector heterogeneity has led to several associations of transport: Railway Transporters Association of Romania (AFTER), Confederation of Licensed Operators and Transporters of Romania (COTAR), Romanian Federation of Transport Operators (FORT), National

Union of Road Transporters from Romania (UNTRR) etc. and only a single association of logistics - Romanian Logistics Association (ARILOG).

99.7% of the total transportation and storage companies in 2009 were small and medium enterprises. It has to be emphasized that official statistics do not indicate distinctly the logistics services. In addition, logistics activities in Romania are carried out both in specialized companies and in companies with different profiles. However, logistic activities tend to be increasingly outsourced to specialist providers (Dinu, 2008).

Regarding the Romanian specialized literature, we can say that it is still in its early days, with a tendency of expansion and inclusion in education programs. However, there is a tendency to clarify some consecrated logistics terms, derived from English, instead of insisting on their role and their application in economic practice. An example of this is the SCM itself, which we encounter in various forms - as such, expressed in English, supply chain management, supply- delivery chain management, distribution chain management, etc. (Mărunțelu (Albăstroiu), 2008). We have chosen the supply chain management, considering that there are many chains run by 3PL and 4PL companies, which leads to a broader sense of the term.

In research, there are a small number of studies in the fields of logistics in general and SCM in particular. Most of them are under the initiative of companies who want to start or diversify their activities in Romania. Others have as initiative higher education institutions and ARILOG.

We conclude that, in Romania, while theory tries to give the best sense to the concept of SCM, companies are interested to adopt it in order to improve their performance and increase the competitiveness.

### 3. Research methodology

In order to highlight the degree of development of the supply chain management in Romanian companies we have chosen to make an exploratory research, following the methodology of a selective survey (Balaure et al, 2000).

*The purpose of the research* is to identify the state in which the implementation of the Supply Chain Management companies in Romania is.

*The objectives* pursued in this research are:

- Highlighting the importance of the logistic function in the management of companies from Romania;
- Knowing respondents' opinions on the role of SCM in companies' activity;
- Identifying the factors that favor the construction of logistic chains in companies with activity on the Romanian market;
- The determination of software programs used in the management of logistic chains and their applications.

*The hypotheses* of the research are:

- The logistic function has an increasing importance in the management of companies in Romania.
- SCM is considered a contributing factor to the improvement of firm performance.
- The factors favoring the construction of logistics chains are trust, interdependence of partners, communication and integration of activities.
- Romanian companies use most commonly the computer programs Enterprise Resource Planning (ERP) and Customer Relationship Management (CRM).

The researched *community* is made up of active companies in the Romanian economy. In order to gather information the method used was a selective survey, explorer type, using the *questionnaire*. Respondents use self-recording of answers after they were invited to participate in the research. It was conducted online after the questionnaire was posted on the website [www.kwiksurveys.com](http://www.kwiksurveys.com), from February, 1<sup>st</sup> to June, 15<sup>th</sup> 2012. The content of the questionnaire consists of questions of content and identification. Regarding the content questions, 5 of them had unique answer and 10 multiple choice answers, preferring closed questions. Also, there are 4 questions of identification, in order to shape the profile of the firms that participated in the research.

*The sample* is not representative of the Romanian economy. The invited companies were chosen based on the personal relationships of the authors in business and recommendations of our acquaintances for other enterprises. In total, 350 invitations were sent to participate in the research, out of which we received 225 questionnaires completed, fully usable, which means a response rate of about 64%. During the research we gave to the participating companies our personal e-mails for possible ambiguities in the questionnaire content. The main difficulty we faced was a hacker attack on the site, and its activity was blocked for about two weeks in late June.

#### 4. Research results

After processing the collected answers, we can draw a picture on the degree of development of supply chain management in companies from Romania based on respondents' opinions.

Thus, 55% of companies participating in the research have logistics department in their organization and 50% of them (table no. 4.1 and figure no. 4.1) use to strategic planning in this area, as you can see in table no. 4.2 and figure no. 4.2.

**Table no. 4.1: Presence of the logistic department**

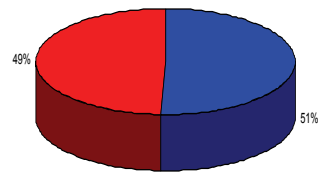
Logistic Departament	No. companies	Percent %
Yes	102	55
No	123	45
<b>Total</b>	<b>225</b>	<b>100</b>



**Figure no. 4.1: Structure of the companies**

**Table no. 4.2: Strategic Planification of logistics**

Logistic Planification	No. companies	Percent %
Yes	114	51
No	111	49
<b>Total</b>	<b>225</b>	<b>100</b>



**Figure no. 4.2: Structure of the companies according to the strategic planification**

Regarding the way in which supply chain management is done in the studied firms, most responses indicated partnership with suppliers/transporters (37.86%) and partnership with customers (26.49%). However, respondents felt that improving SCM can be made, especially through the use of just-in-time supply (21.7%), partnership with customers (20%), partnership with suppliers/transporters (18.87%) and outsourcing (approximately 18%).

The involvement of key suppliers / transporters in decisions of firms participating in the research is rather low, having an average score of 2.49 (according to table no. 4.3 from above). Above average were the supply and distribution areas, while lower values were obtained by production, research - development, and design of software for the supply chain.

**Table no. 4.3: The involvement of suppliers/transporters in decisions**

Involvement degree Areas	No involvement 1	Low involveme nt 2	Medium involveme nt 3	Strong involveme nt 4	Collective decisions 5	Avera ge
Research & development	69	150	129	96	45	2.17
Supplying	27	60	261	288	45	3.03
Stock Management	72	78	189	144	75	2.48
Production	90	120	126	120	15	2.09
Distribution	33	84	144	336	54	2.89
Design of software for the supply chain.	87	78	171	120	60	2.29
<b>Average score</b>	<b>2,49</b>					

The involvement of key customers can be appreciated as even lower than suppliers' (average score 2.36) (according to table no. 4.4). The areas with greater involvement are distribution, research, and development, while the lowest value is registered by the design of software for supply chains.



Table no. 4.4: Involvement of customers in decision making

Involvement degree Areas	No involvement 1	Low involvement 2	Medium involvement 3	Strong involvement 4	Collective decisions 5	Average
Research & development	39	114	198	240	15	2.69
Supplying	69	126	189	120	5	2.26
Stock Management	84	120	135	120	30	2.17
Production	78	153	198	96	30	2.47
Distribution	42	180	252	144	15	2.81
Design of software for the supply chain.	117	108	54	72	45	1.76
Average score	2.36					

The respondents consider that in the organization of their firms, SCM contributes mainly to supply activities (25%), transportation, inventory management, and warehousing (all with values of about 21%).

In the relationship with suppliers, the supply chain management aims to reduce the costs (35.19%) and quality services (31.5%), while in the one with customers the aim is to reduce costs and simplify the process of launching calls for proposals (both by 27%).

The main objectives in the development of cooperation by building a supply chain refer to: improve customer services (17.82%), cost reduction within the organization (17.82%), increased profitability (16.31%), ensuring an improved quality (14.8%) and providing benefits for customers (13.9%).

The main factors favoring the construction of supply chain, according to the respondents are: trust in partners (15.55%), integrated information systems (13.41%), the existence of mutual interests (12.8%), security of supply (11.28%), joint business planning (10.67%) and free flow of information (10%). In contrast, in the category of factors that prevent the construction of supply chains, the most often mentioned are: poor understanding of the concept (25.75%), followed equally by the lack of commitment of top management and the lack of an appropriate information technology, each with 21.56%.

The most used software to support the SCM in the surveyed companies are Customer Relationship Management (23.49%) and Enterprise Resource Planning (18%). It has to be noted that 24 of the companies participating in the survey (10.6% of total) do not use any computer system for SCM.

Regarding the areas where computer system are applied, the respondents indicate the duration of order fulfillment (22.45%), the rate of returns (20%) and returns processing costs (18%). What surprises is the low levels of order fulfillment rate (3.27%) and total logistics costs (5.71%).

The questionnaire mentions a series of measures designed to support the effort of companies in the management of supply chains that respondents consider as relatively important (average score 3.46) as it can be seen in table no. 4.5. Higher scores indicating a greater importance obtained the measures of creating better infrastructure and more support in obtaining funding sources, while closer cooperation between companies and government and better circulation of information are considered of a relatively lower importance.

**Table no. 4.5: Measures to support companies in the supply chain management**

Importance degree Measures	Unimportant 1	Low importance 2	Medium importance 3	Impor- tant 4	Very important 5	Average
Strong cooperation between companies and government	30	162	234	96	60	2.59
More education of the labor force	6	48	234	360	135	3.48
Easier acces to training in the field	3	54	279	288	150	3.44
More support in obtaining financing sources	6	54	171	360	255	3.76
Better infrastructure	3	6	90	336	525	4.27
Better circulation of information	6	84	225	408	5	3.24
Medium average	3.46					

According to the sector in which firms operate, the sample structure is as follows: services enterprises 68%, enterprises in the processing industry 20%, and trading enterprises 12%.

The companies included in the survey belong mostly to the service sector, according to the main activity: transport, storage, advertising, market research, real estate, banking, construction etc. Of these, 21 companies (9%) of the total sample are logistics companies. The rest of the companies are from various fields: large distribution, agro-alimentary, electronics, electrical, electro technical.

According to the number of employees, most firms in the sample are large (over 250 employees, about 34%), followed by small enterprises (under 50 employees, representing 32% of the total).

Regarding the distribution of firms from the sample by turnover, most of them recorded in 2011 an income of less than 1 million euros (28%). There are four relatively equal groups of companies and the smallest group is that of firms with turnover in the range 51-100 million euros (5% of the total).

Considering the above-mentioned aspects, we believe that all four research hypotheses are confirmed and can therefore be accepted as valid.

## 5. Discussions

Although logistics activity begins to have an increasing recognition in larger firms in Romania, by creating specific departments and placing it at a strategic level, SCM still remains at a low developed level.

It appears that supply chain management is achieved mostly through partnerships with suppliers / transporters and, respectively, with customers, i.e. through the expansion of upstream and downstream firms' activity. This feature was specific to SCM in its initial development stage (years 80 and 90), which illustrates a lagging behind compared to the global trends. Integrating the activity of other interveners in logistics chains is very low.

Strategic decisions of companies are done, especially within the firm, with modest involvement of providers/transporters and customers. This leads us to the idea that Romanian companies have not yet realized the importance of SCM as a factor to increase competitiveness in the global market. The lack of cooperation between companies and upstream and downstream partners in the design of software for the supply chain shows that there are no extensive bonds, information does not freely circulate, no information sharing, which leads to the conclusion of a limited communication. Economic effects of such a situation are reflected in the possibility of over-demand with orders for some upstream firms and a lack of request for other firms, extend delivery times, customer dissatisfaction about the delay of products on the market etc.

Although the development of SCM is still low, the respondents show that they understand the importance of the concept and its role in firms' activity. This is proved by the fact that it shows the same contributions of SCM in the internal organization of firms, and the same objectives in the cooperation to build supply chains, as in the specialized literature (Ketchen Jr., Hult, 2007, Mudimigh et al, 2004). The same conclusion is drawn from the indicating of favoring factors and the ones that prevent the construction of logistics chains.

The role of IT in the construction of supply chains is known. However, the computer programs used are mainly CRM and ERP, which are not specialized for SCM. In addition, their applications are limited, being used mainly for corrective actions and not to plan activities better – the duration of order fulfillment, returns rate and operating returns cost. This indicates a weak collaboration between customers and suppliers, based rather on the delivery safety and not on qualitative aspects such as accuracy and consistency of delivery with the order, deadlines compliance, quality of products delivered etc. Also the integration of activities is weak, which indicates that logistics chains are communicative type, based on a weak dependence of members and on the cooperation in market pricing. This is specific to periods of beginning in their evolution, considering that the global competition is between logistics chains characterized by strong interdependence between partners and common sharing of goals, interests and tasks (Lejeune, Yakov, 2005).

Regarding the necessary measures to support the effort of companies in SCM a series of contradictory aspects appear. Although respondents consider important the measures to create a better infrastructure and more support in obtaining funding sources, closer cooperation between business and government is not regarded as very important. It is specifically through public policies adopted by the government that the listed measures can be accomplished. For these policies to be effective, it is necessary a consultation of the political decision makers with the business environment.

### **Conclusions**

We can appreciate that the issue of SCM is of interest to companies in Romania. The stage of development is low, predominant being only the expansion and integration of companies with suppliers and distributors. The role of outsourcing, use of 3PL type providers, and integration of all activities is still undervalued.

The companies are predominantly oriented inwards when designing strategies, working with partners remaining limited. There is reluctance to expand cooperation in carrying out activities, in the establishment of common databases, in achieving free flow of information between supply chain members. All these lead to competitive disadvantages of Romanian

companies on the global market, as competition takes place between groups of enterprises and not between independent firms. Orientation to market is low.

The limits of the research are related to its type - exploratory - , but also to the sampling mode and the gathering of answers (self-registration). These factors have led to a structure of the sample different from the structure of the firms by sector, respectively in 2009 active enterprises operated in the fields of manufacturing, 10.55%, trade 38.13% and services 51.32% (National Institute of Statistics, 2010).

However, we believe that we obtained a picture of the current state in which is the development of the SCM in companies in Romania. In the future, we plan to resume the research and to apply it on a representative sample. In addition, we consider that such a study can be repetitive, using a panel of firms.

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