

**Dragana Rejman  
Petrovic<sup>1)</sup>  
Zora Arsovski<sup>1)</sup>  
Vladimir Rankovic<sup>1)</sup>  
Zoran Kalinic<sup>1)</sup>  
Igor Milanovic<sup>1)</sup>**

1) Faculty of Economics,  
University of Kragujevac,  
Serbia  
{rejman, zora, vladar,  
zkalinic, djdji}@kg.ac.rs

## **BUSINESS PROCESSES MAPPING IN E-SUPPLY CHAIN**

**Abstract:** *Business processes mapping leads to improvement of strategic planning in the supply chain, ease monitoring supply chain strategy, creating a common point of view, the easier key information exchange, facilitate the redesign or modification of the supply chain. In addition, improve communication, better insight into supply chain dynamics, provides a basis for analyzing and improvement of supply chain. Quick identification of critical suppliers which do not belong to tier 1 level, driven future research and monitoring critical point or area in the supply chain. Overlapping and duplicate activities become visible and their elimination leads to the business processes optimization.*

**Keywords:** *Business processes, mapping, supply chain*

### **1. INTRODUCTION**

To cope with the challenges they face, organizations need to adopt the principles-based management process, particularly those who want to successfully manage their supply chains. Process paradigm implies a new way of looking at the organization's operations, and that the process of performing, not on the basis of functional units or departments. Process organization is an organizational form for a world in constant change [1].

Orientation on business processes can be interpreted as an organizational effort required to create a business process platform for organizational planning and strategic planning [2-3]. Process-oriented organizations are also often referred to as "horizontal organization" [4], the "process-centered organization" [5], "process oriented organization" [6] or simply "process organization" Several authors argue that the orientation of the business processes are favorable. Hammer states that in almost every industry, in

organizations of various sizes major improvements in cost, quality, speed, profitability, and other key areas have been reached, focusing on measuring and redesigning their relationships between customers and internal processes [7].

Although factors such as strategy, technology, employees, etc., affect organizational performance, the ability to manage and improve the business processes of the organization is also an important determinant of the performance [8]. Many organizations have realized the benefits bring due to application process orientation [9]. Several authors and empirical studies point out the positive impact of process-oriented organizational design performance organization [10]. However, the existing literature on process-oriented organization aims to educate managers on how to apply process management, but research or empirical focus miss [11,12].

Ko, Lee and Lee define a business process as a way to provide "... support business processes using methods,

techniques and software for the design, implementation, control, and analyze operational processes including employees, organizations, applications, documents, and other sources of information" [13].

## 2. BUSINESS PROCESSES IN E-SCM

Global Supply Chain Forum (GSCF) defines the SCM as the integration of key business processes from end user to the suppliers providing products, services and information that add value for customers and other stakeholders. GSCF framework

includes eight processes: Customer Relationship Management; Customer Service Management; Demand Management; Order Fulfillment; Manufacturing Flow Management; Supplier Relationship Management; Product Development and Commercialization; Returns Management (Figure 1) [14].

Each of the eight key processes has sub-processes at the strategic and operational levels, which are inherent to the process, as well as the interfaces between key processes. Analysis of these interfaces can lead to an assessment of the level and strength of the relation between the key processes.

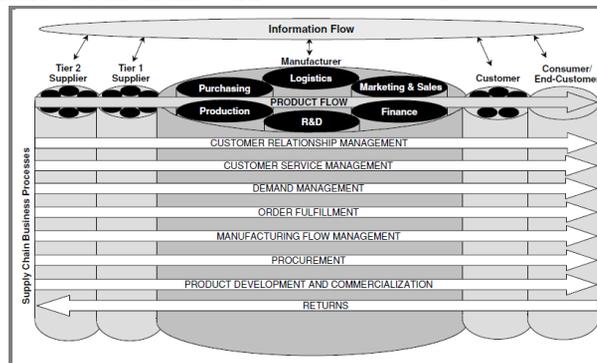


Figure 1. Integrating and managing business processes across the supply chain [14]

The strategic level is primarily focused on establishing, managing and providing guidelines for implementation, as opposed to the operational level, which is the actualization of the process after it has been established [15]. The process of customer relationship management and process management relationships with suppliers form a critical link in the supply chain. Each of the eight processes is cross-functional and inter-organizational.

## 3. SUPPLY CHAIN MAP

Visualization, monitoring and management of supply chains have become more complex as organizations

increasingly used outsourcing strategies and supply and delivery systems become increasingly global. As the supply chain involves the integration of multiple functions or processes in multiple organizations in order to achieve added value for stakeholders, it is important for organizations to know who is or should be a part of its supply chain, or whose supply chain is a part of, how many tiers organization managed by suppliers and / or customers should be involved in the supply chain, when it is desirable to redesign their supply chain, and so on.

Well-designed map of supply chain leads to improvement of strategic planning in the supply chain, the easier exchange of key information, facilitate the redesign or

modification of the supply chain, better insight into the dynamics of the supply chain, creating a common point of view, to improve communication, ease monitoring supply chain strategy and provides a basis for analyzing supply chain. One of the reasons for making maps is a way to link corporate strategy to the strategy of the supply chain. Map of the supply chain with the right information, easy to view and understand, improve testing process of strategic planning. The key to making good maps for strategic purposes is the full synchronization of mapping process and strategic planning.

For mapping is necessary storage and distribution of key information for the survival of the organization in a dynamic environment. The map can warn planners to the possible limitations of the system. Quickly identify critical suppliers, with more than one level- tier between, trigger further research and monitoring bottlenecks in the supply chain. Supply chain map provides a basis for modifying or redesigning the supply chain. The map shows "what" or "what can be." Helps visualize the supply chain and identify areas for further analysis or indicate inefficiency not so obvious when examining only a small segment of the supply chain. Through the visualization overlapping and duplication of activities are more visible and rationalization of the supply chain becomes easier.

The supply chain map shows the current dynamics of the supply chain. Issues such as relative size, power, competitive positioning, etc., can be analyzed and incorporated into the map. For example, it is possible to assess the relative importance of supply chain members what can be shown by symbols of different sizes. Well-documented approach supply chain mapping leads to improved supply chain management process. In any continuous improvement, the need for consistent and documented processes is the basis for incremental

improvement. Mapping makes it easier to manage large changes in the supply chain.

Supply chain map can be directly linked to corporate strategy, and thus be an integral part of the strategic planning process, or a mean to implement a supply chain strategy. Key attributes of folders supply chain can be divided into three categories: geometry, perspective and implementation issues [16].

The geometry includes the number of tiers, the degree of aggregation and the inclusion of explicit spatial relations. The number of tiers is analyzed by direction and length. Direction can be observed upstream (oriented to the supplier, and to the final consumer), downstream (customer-oriented), or in both directions. Tier length is the distance in both directions of the observed organizations, not including the organization observed. Geometrical width of supply chain map is a measure of aggregation within tier. Spatial maps include an explicit geographical distribution and spatial relations.

Observation point and observed area is another attribute of supply chain map. There are two views as follows: a view from the observed organization and look at the observed industry. The area to be considered include the width of the product range, the width of the observation of the supply chain, showing smaller or larger number of processes and the width of the displayed flows (tracking raw materials to the final consumer or to monitor delivery along with the procedures for the return, recycling and product recall).

The third attribute of the map shows how the supply chain map provides information and how they will be distributed. The density of information is the amount of information that is integrated into a visual display. Select of information to display for each link and each node is what will distinguish the supply chain map from the map of the

supply chain for strategic planning.

The map connected to the database can then be easily drawn, as conditions change, or show in different appearance, depending on the user needs. The map may have a direct relationship with one or more databases that are available within the supply chain in order to obtain high density of information. Associated databases allow individual users to access a single map in accordance with their needs. The supply chain map generated from the data in the database, allows customization for different users.

Figure 2 provides a number of conventions that are derived from the model of lean production [16].

Figure 3 shows the supply chains from analyzed organization T 3.7, which distributes its products manufacturers OEM X and OEM Y [17].

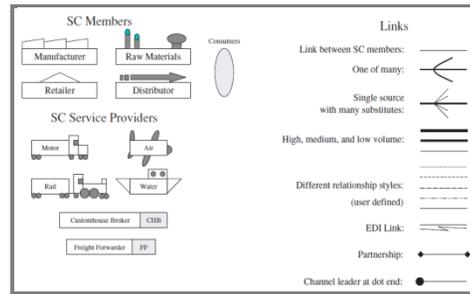


Figure 2. Sample supply chain mapping conventions [16]

It is shown in which Tier-supply chain is which supplier. The times given in hours, days or weeks are the lead-time, needed that previous participant in the supply chain produce and deliver materials to the next participant in the chain from the moment of order received from its customer (Figure 3).

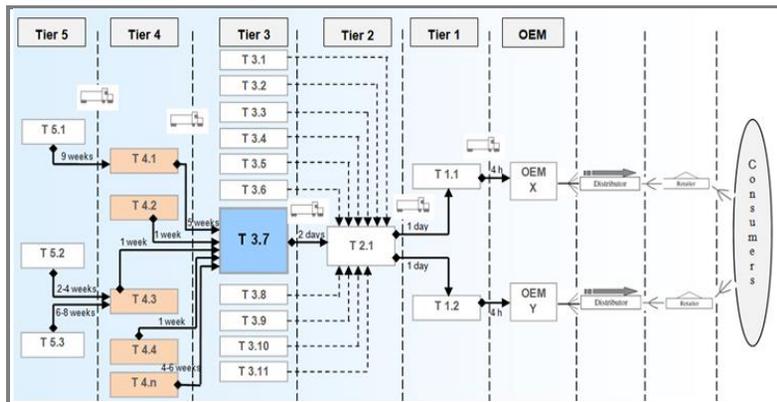


Figure 3. Supply chains from analyzed organization

The map shows the supply chain 1) in both directions, with three levels downstream and two upstream level, 2) a high level of aggregation, 3) without displaying spatial relations, 4) from the perspective of a manufacturing organization, the third link in the supply chain of automotive industry, 5) without visually precise definition of product range wide, 6) does not include a breakdown of the key processes, 7) does not show the flows return, recall and recycling, 8)

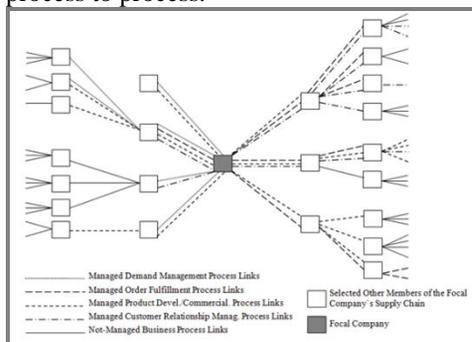
without too many details and 9) with or without connectivity to the database.

#### 4. BUSINESS PROCESSES MAPPING IN E-SUPPLY CHAIN

In organizations that have been analyzed, Douglas M. Lambert and Martha C. Cooper noted that business processes were linked by the same organization. In other words, different business processes

had different views on the network structure of the supply chain. An example organization includes a vendor A, but not a vendor B, while the product development process and the process of demand managing associate with both suppliers [18]. Therefore, organizations integrate and manage a variety of relationships in the supply chain for various business processes.

Integration and management of business processes links, of one organization in observation may vary from process to process.



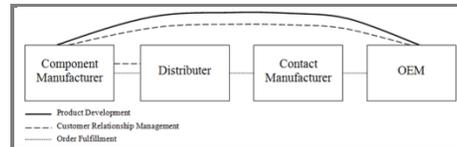
**Figure 4. Supply chain combining the integrated and managed business process links [18]**

For simplicity, in figure 4 are represented only links between business processes to be managed and relationships between business processes that without need to be managed, while links between business processes that need to be monitored and relationships between business processes non-members of the observed supply chain are omitted. Also, the picture shows a very small number of members of the supply chain.

Therefore, it is necessary first to map the individual business processes, and then present them in a map of the supply chain. This could be one of the approaches that managers can use when mapping their supply chains.

Figure 5 shows an example of how the supply chain links different from the processes. So there are not always a direct

links between all members of the supply chain upstream or downstream in the chain. The figure shows that only the process of fulfilling orders exist directly between each component in the supply chain.



**Figure 5. Network structure linkages for four tiers of a supply chain [18]**

The literature involved in this analyze suggests that some or all business processes are linked through the supply chain, from the source of supply to the consumer. Douglas M. Lambert and Martha C. Cooper in their study did not find such examples, nor similar cases described in the literature. Organizations that they studied had only integrated links between the selected key processes, while other connections were only monitored.

## 5. CONCLUSION

Mapping the e-supply chain in the strategic purposes is focused on the flow of goods / products / services, information and money in both directions, upstream and downstream, and within the organization. In maps design it is possible to include all processes. Business can be viewed as a set of interrelated processes. Mapping the e-supply chain in the strategic purposes emphasizes measures such as volume, cost, and lead-time. Supply Chain Management looks at the overall perspective that is how processes work together between organizations. Also, the mapping of supply chains can exclude non-critical entities in order to simplify the map. Mapping the supply chain aims to help create a supply chain that will better fit the strategy, or to check whether the current supply chain mach to the strategy.

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