

OUTSOURCING EXAMINATION FOR FINISHED GOODS STORAGE ACTIVITY WITH ELECTRONIC MARKETPLACE

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Abstract: In this paper is introduced a virtual logistics enterprise's conception which support the examination of outsourcing in the case of finished goods warehouse. The paper is defined the outsourcing's alternatives of the possibility examinations regarding the finished goods storage. There is reviewed the VLE's fundamentals (performers, databases, programs) and the connection between these so.

Keywords: outsourcing, warehousing, electronic marketplace

1. Introduction

In this paper is reviewed a conception of the electronic marketplace which assign the finished goods storage tasks with the suitable logistics providers. We can examine the possible outsourcing decision alternatives and the outsourced warehousing tasks' translocation with this electronic marketplace. There is an important competition factor the choosing of the products or group of product's amounts and warehousing places since the can progress the service level end can decrease the warehousing cost too. The determining performers are manufacturer companies in the EM model (electronic marketplace), who want to be theirs warehousing activities more economic and more efficient. The other main performers are the logistics providers, who want to reach more order and incoming. The warehousing tasks are assigned with the warehouses by the help of Electronic Marketplace Centre (EMC). The conformation and working of Electronic Marketplace Centre are introduced by figure 1. In behalf of long-term operability we defined the interests regarding the external performers.

The manufacturer- and service companies can be connected to the virtual logistics center by numerous advantageous.

Regarding the manufacturer company we can determine the follows:

- Advantages:
 - The logistics services providers (these company's main activities is the warehousing) can be chosen from a numerous set thus we can execute more complex tasks.
 - The logistics services providers give the required data in a uniform structure (for example: warehousing capacities and alternatives, etc.) thus the data will be compared.

- The experts can extend the electronic marketplace with new performers. In this case the experts can use finder methods (centre finder methods).
- The experts of EMC introduce the possibility examination alternatives and the operational principle of EMC for the manufacturer company. The company can choose the best alternative for the examination.
- The lead time and cost of examination decrease significantly so the companies will be more competitive.
- The examination's cost has to pay only in the case of successful assignment. The determination of cost can based on activities or revealed cost.
- Disadvantageous:
 - It has to pay after the successful assignment (manufacturer company's product - logistics provider company's warehouse) for the EM.
 - Giving the data to the other performers is a important risk because of the competitor. Thus have to been a privacy contracts as base condition.

We can determine in the case of logistics services provider the follows:

- Advantageous:
 - The logistics provider can gain new orders thus can increase it's incoming.
 - The payment is happened after a successful assignment (manufacturer company's product - logistics provider company's warehouse).
 - The logistics provider can get advices in the interest of increasing the competitive (for example: moderner warehousing system, softver development, etc.) from the EM's experts.
- Disadvantageous:
 - The logistics provider has to pay after the successful assignment (manufacturer company's product - logistics provider company's warehouse) for the EM.
 - Giving the data to the other performers is a important risk because of the competitor. Thus have to been a privacy contracts as base condition.

2. Introduction of the electronic marketplace's components

The EM's performers, necessary databases, information relation between the performers can be observed on figure 1. These are shown in details in this chapter.

The electronic marketplace's performers:

- **Manufacturer companies:** These performers are connected because of outsourcing the warehousing activities. The manufacturer companies can reach lower warehousing cost and higher service level with EM. Theirs tasks that modify the saved data if want to execute a new examination.
- **Logistics provider:** These companies are connected to the EM because of more order and revenues. Theirs tasks that modify the dynamically variable data (for example: free load capacity in the warehouse, etc.) via the front-end processor.
- **Researcher and developer group:** These groups execute research and development for the EM.
- **Enterprise management:** These performers bring strategy and tactical decision for the VLE with researcher and developer group. Theirs tasks that assign and create a connection contracts with the new logistics providers and manufacturer companies. The new performers (logistics providers, manufacturer companies) is assigned by the help of EM's experts.

- **Experts:** Their tasks are follows in connection with the logistics provider and manufacturer companies:
 - o evaluation of warehousing systems objectively,
 - o sending the data to EM's database via front-end processor (user interface),
 - o searching the new manufacturer companies and logistics providers for the EM by different finder programs.
- **Bank:** This performer assure the money moving from the logistics providers and manufacturer companies for the EM's working.

Connection programs of virtual logistics enterprise:

- **M connection program:** This program is assured the bidirectional connection between the manufacturer companies and theirs database respectively the necessary queries. In addition the manufacturer company sends the dynamically variable data via this program to the database so.
- **LP connection program:** This program is assured the bidirectional connection between the logistics provider and theirs database respectively the necessary queries (the logistics provider can query only own data). In addition the logistics provider sends the dynamically variable data via this program to the database so (for example: free warehousing capacity, cost function, etc.).
- **E connection program:** This program is assured the bidirectional connection between the experts and the VLE's databases respectively the necessary queries (the experts can query whatever data). In addition the experts send the manufacturer companies's and logistics providers's static data via this program to the database so.

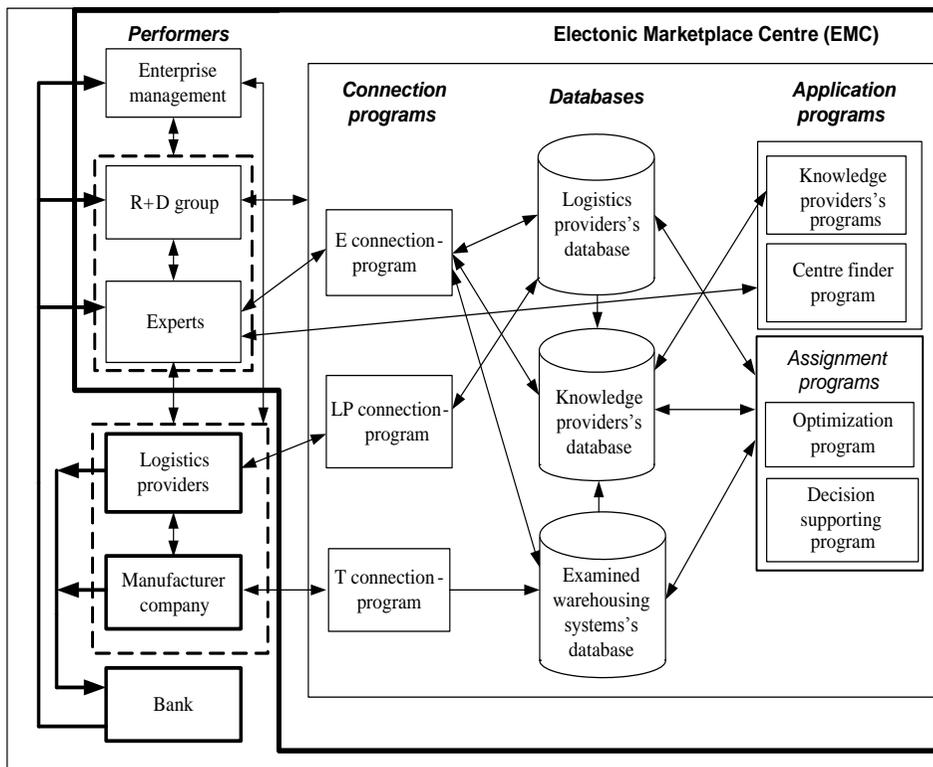


Figure 1. EM conception for the warehousing activities assignment to logistics providers

Databases of electronic marketplace:

- ***Database of Logistics provider:***
 - Warehousing specific cost.
 - Free warehousing capacities.
 - Warehousing properties (used storage modes and -principles (FIFO or FPFO), etc.).
 - Logistics indicators for qualification of warehousing activities.
 - GPS position of warehouses.
- ***Database of knowledge providers:***
 - Distances between the more important materials moving objects (manufacturer companies, warehouses, customers). These data is appeared in matrix
- ***Databases of examined warehousing systems:***
 - Warehousing- and transportation specific cost functions.
 - Minimum and maximum number of unit loads which it have to storages.
 - Minimum and maximum number of unit loads which it have to moves regarding the warehousing.
 - Parameters of unit loads which it have to storage (weights, sizes, etc.).
 - Logistics indicators for qualification of warehousing activities (XX).
 - Parameters of the warehousing systems (applied warehousing modes and warehousing principles (FIFO/FPFO), etc.).
 - Storage requirements of products (for example: maximal distance from the customer, minimal stock level, can use storage mode, FIFO/FPFO storage principles, etc.).
 - Amount of unit loads which it have to deliveries to the customers.
 - GPS position of manufacturer companies, customers, warehouses.

Electronic marketplace's application programs:

- ***Web knowledge providers's program:*** This program determine the distances between the materials moving objects on the base of GPS position. The materials moving objects are logistics provider's and manufacturer companies's warehouses and the manufacturer companies's customers.
- ***Centre finder program:*** The experts search the new performers for the EM by the help of this program. This program determines materials moving centre of some allocated logistics objects.
- ***Optimization program:*** This program determines the optimal assignments on the base of on the EM's databases. The optimalization opportunities are shown on figure 2 (where the examination method is optimization method).
- ***Decision supporting program:*** This program determine the optimal decision on the base of on the EM's databases. The decision opportunities are shown on figure 2 (where the examination method is decision method).

3. Working introduction in the case of electronic marketplace

This chapter is introduced the outsourcing mechanism for finished goods warehousing by electronic marketplace. Firstly the manufacturer company is chosen the examination alternative on the base of figure 2. In this choosing help the VLE's experts. The experts examine the warehouse system after the choosing of the alternative and send the determinated data via E connection program to the warehousing system's database. The manufacturer company can look theirs data via M connection program. The experts can search new logistics provider(s) for the better decision or optimization by centre finder

program. If they found a suitable logistics provider and the management agree with its connection then can create the connection contract. The materials moving object's distance is determined in matrix by web knowledge program. The warehousing tasks will be associated with the logistics providers's warehouses on the base of choosing alternatives's decision- or optimization method. The results of the examination can be looked via the M connection program. The manufacturer company can execute a new examination if it modifies the examination's parameters. If the result of the examination is adequate for the manufacturer company then it can create the collaboration contract with the logistics providers by the help of EM's experts and management.

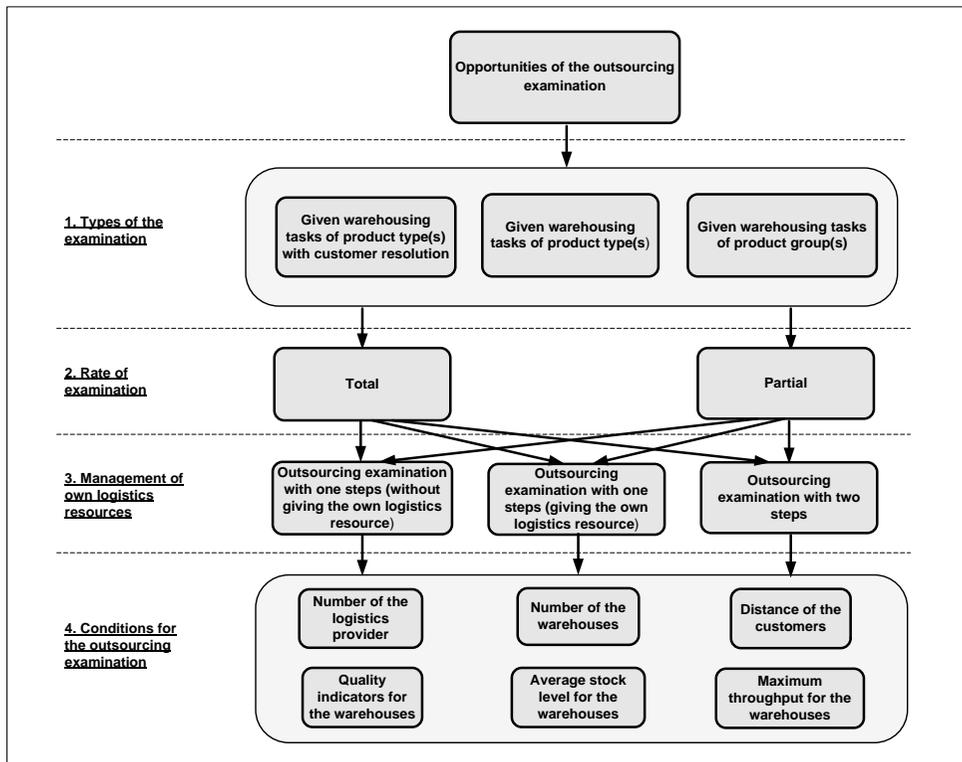


Figure 2. Outsourcing alternatives for examination of finished goods storage's activities

Remark: The figure 2. shows the possible alternatives of outsourcing examination. The alternatives are indicated by different lines.

4. Summary

In this paper is introduced a virtual logistics enterprise's conception which support the examination of outsourcing in the case of finished goods warehouse. The paper is defined the outsourcing's alternatives of the possibility examinations regarding the finished goods storage. There is reviewed the EM's fundamentals (performers, databases, programs) and the connection between these. There is revealed the EM performers's advantageous and disadvantageous because of the connection to the VLE so. In our opinion the determined EM conception is operability in long term because of EM's advantageous (for example:

because of the shorter lead time of examination or better utilization of the human and/or machine resources for the logistics provider and so on).

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References

- [1.] TAMÁS P., ILLÉS B.: **Termelő vállalat alapanyag raktározási SAP moduljának kiegészítése az FPFO elv érvényesítése mellett**, Doktoranduszok Fóruma 2009., Miskolci Egyetem
- [2.] DR. CSELÉNYI J., DR. ILLÉS B.: **Logisztikai rendszerek I.** Tankönyv, Miskolci Egyetemi Kiadó, 2004.
- [3.] BRUCKNER L., CSELÉNYI J.: **Modellek és megoldási algoritmusok logisztikával integrált elektronikus piacokhoz**, Ph.D. disszertáció, Miskolci Egyetem, Hatvany József Informatikai Tudományok Doktori Iskola, 2005.