

**SYSTEM OF THE WATER DISTRIBUTION IN THE CONCRETE REGION****Silvia Leczova**

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**Keywords:** logistics, distribution, system, manufacturing, efficiency, competitiveness**Abstract:** This article aims to review the current representation of distribution systems and distribution strategies, describe possible ways of product flows from the producer to the final customer and to describe individual distribution strategies used in today's systems. The main aim is to analyse, give advice and streamline the activity of a distribution system of a specified company, which distributes mineral water. After performing the above-mentioned activities, there will be proposed a way to streamline the system of logistic distribution. After analysing the customer's portfolio and segmentation of the customers, it is possible to point out one of the main problems of the company and according to the analysis of the current state, it is possible to point out the bottle-neck. The proposed changes can be evaluated from the savings point of view and also from the raise of the additional value.**1 Introduction**

The product only gains its value when it is on the place, where it can fulfil the desire of the customer. Up to this moment, the product is only a commodity, which ties up the funds, deprives the owner of the interest and uses other tools for its maintenance and storage. Those costs cannot be refund by raising the price, because of the competition on the market. It is therefore obvious, that they consume a large part of the profit. One of the possibilities of minimizing these costs is the streamlining of the distribution system's structure. The structure of the distribution system is the result of strategic decisions. Therefore the costs are the result of different decisions at different levels of the distribution systems, considering uncertain information about the future economical state of the market. This is the reason why the distribution strategy of a company has to have a model, which allows it to use existing tools to improve the decisions.

Distribution consists of all the activities, which allow the movement of product's physical and disposal law from one subject to another. Distribution system has to bring the products from the producers to the users and then to the final customers. Distribution also includes several distribution subjects, that are a strict part of it and that cannot be omitted from the realisation of the distribution functions [1].

Currently, the pressure of streamlining of activities among distribution grows continually. The main problem among the distribution is the correct distribution of the storage units, semistorages and distribution and operating centres. The search for the optimal topology of the distribution network on a known operational place and optimizing of the transport represent a very important task. [1].

In order to be able to realise the distribution, the existence of the distribution subjects is necessary. The basic subjects of the distribution are producer and consumer. We can call them obligatory subjects [2].

Except for them, there occur also the facultative objects; distribution mediator and distribution assistant. We can ask why the producer moves a certain part of his seller's tasks to the distribution mediator. It obviously represents a loss of control over the product selling. On the other hand, this also raises some advantages. By using of the mediators, the producer obtains bigger efficiency – the product will be available on the target markets. The mediators team with contacts, experience and range of the activity, providing the producer with much more than he could do by himself.

The distribution mediators are individual companies, whose activities consist of transfer of economical competence over the products and they do it for a financial compensation [2].

**2 Design of distribution channel and its strategy**

Distribution channel is organized collection of institutions with the main purpose of securing the availability of the products and services to the users, doing it under appropriate economic and ecologic requirements. The distribution channel connects time, spatial and possessive differences that separate the products and services from the users. Individual distribution subject each take over the functions, which they are able to perform for their own purpose in the best way, but also to reach the effect of the whole channel [3].

The creation of the distribution channel consists of two main parts; segmentation and configuration. The design of the distribution channel deals with the organising of the distribution channels in order to obtain effectiveness and no problems. Segmentation means dividing the market into groups of final customers. Configuration is made according to the segmentation

By defining the segment, the company decides about the segments that should be considered and omits those that can be ignored. In this case there can occur some blank

## SYSTEM OF THE WATER DISTRIBUTION IN THE CONCRETE REGION

Silvia Leczova

spaces, for example among households, where the company could also profit.

### 3 How to start the distribution?

At the first sight, the business with selling of mineral water seems simple. The producer rents the source of the mineral water (source of some mineral stream) from the country, builds the filling machine and counts the money. This business is, however, not so simple. From all the mineral water sources, only 20 are actively used for filling the bottles. The reason is that to acknowledge the source one has to invest a lot of time and money. The source has to be examined for several years, in order to prove the constancy of its composition. Then one can ask for the acknowledgement and the approval for the intended use. After these procedures, the prospect can prepare for the investments to the filling machine, establishing the brand and getting the support on the market. [4].

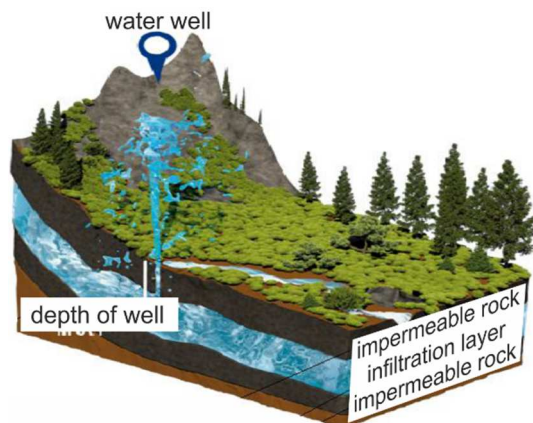


Figure 1 Position of the mineral water

The mineral water is microbiologically clean water with the origin under the ground with the original composition. It comes out of the ground through one or several natural holes. The source has to be acknowledged according to a special regulation. The mineral water in its original state is approved to be used by children and adults. It is not chemically treated and its quality is examined the most from all types of beverages for human use. That is why it is the best beverage for the correct drinking regime. [4].

The whole mineralisation is 1000mg/l of solid or gas substances, the concentration of sulphates is 1mg/l and the temperature at the source is minimally 20°C. According to the high number of minerals, its consumption should be watched [4].

The water supply water underground or ground water used for collective supplying of water to the population. The water supply has to be chemically treated. The quality of drinking water is different in every part of SR, depending on the source and the quality of water pipes. The quality of drinking water is not examined as strictly as the mineral water [4].

### 4 System of the distribution of the mineral water

The whole process of ensuring the mineral water on the market starts in the filling machine. The process of filling of the mineral water into 18.9 l polycarbonate bottles takes place automatically in the filling line. The mineral water is brought here directly from the source without any other treatment [5]. The filling process is divided into following activities:

- input of the empty bottles into the system, washing of the bottles with detergent and hot water from the inside and outside at the same time, sanitation of the bottles by water containing ozone,
- filling of the bottles with the mineral water, closing of the bottles and moving of the bottles to the rolling conveyors,
- labelling the expiration date and code of the production line on the bottles during their conveyor transport,
- storing of the bottles in the transport system by the pneumatic manipulator, which makes them ready for the expedition.



Figure 2 Process of the filling, cleaning, labelling and preparation of the water for the distribution

#### 4.1 Reversed logistics – polycarbonate bottles

Polycarbonate (PC) is a material, which has a high impact resistance, is firm and flexible. It can absorb the impact energy. It is resistant to wind abrasion and tolerates movement without its damaging. Its low weight and unbreakability allow simple and safe manipulation during transport and storing. Properties: good light transparency (depending on the width - up to 82% of light spectrum), heat isolation (saving compared to glass: 50%), UV filter, Thermal stability (-40°C – +120°C), impact resistance (practically unbreakable).



Figure 3 Polycarbonate bottles of the company



**SYSTEM OF THE WATER DISTRIBUTION IN THE CONCRETE REGION**

Silvia Leczova

The main purpose of the reversed logistics is the supporting of the alternative usage of products that have already been used before. Generally, it is possible to define the reversed logistics as a process of re-gaining of the recycled and reused materials, waste and re-produced items from a certain point of production. These items can be used for maintenance, re-producing or elimination or storing. Reversed logistics consists of activities that support material recycling and that aim to minimize the production waste. From another point of view, it has the closest connection to the waste management of the company and it fulfils the legislative demands of the country through the ecological aims.

The company also aims to preserve the environment and therefore this chapter mainly deals with the reversed logistics of the company. From the above-mentioned it follows, that although the polycarbonate is impact resistant, it can be damaged. The main damage is caused during the manipulation of returned bottles.

**4.2 Logistics and distribution of the mineral water**

The distribution system of the company AQUA PRO evolved thanks to many years of experiences. The company was founded in 1998 and developed continually in the current state. Now it owns a filling machine, three distribution centres and a car park.

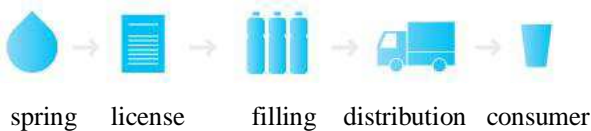


Figure 4 Elements of the company's distribution system

Every day, fresh mineral water is shipped to individual regional logistic-distribution centres of the company. From there, it is distributed directly to the customer. This short logistic cycle ensures that the water is not stored and will be fresh once it arrives to the customer. The aim is that the water should not be stored for more than two days.

The transport of the bottles into the distribution centres and to the customer is performed by the company itself. The car park of the company has a daily capacity of 430 tons. This avoids the need of external distributors

Truck transport with the capacity of 1040 bottles continuously refills the supplies of the mineral water in areas of Košice, Žilina and Bratislava.

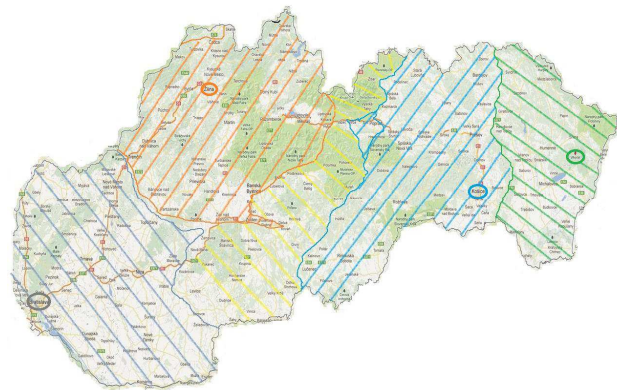


Figure 5 Distribution scheme according to the individual depots

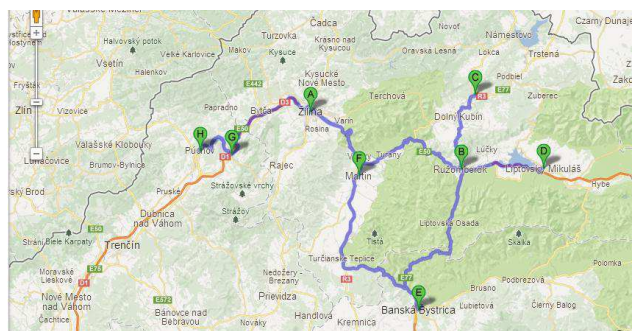


Figure 6 Routes of the mineral water distribution I.

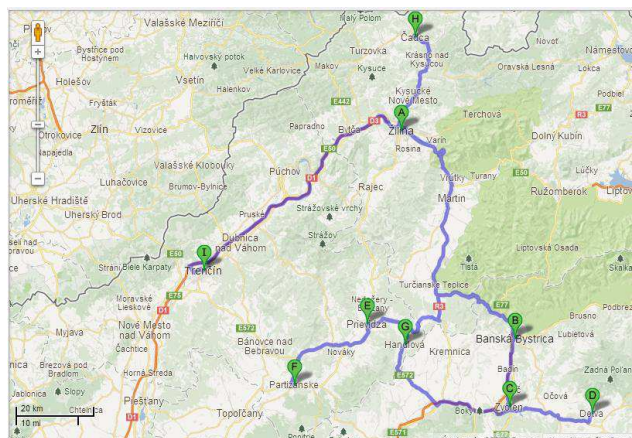


Figure 7 Routes of the mineral water distribution II.

Positive discoveries according to the analysis:

- Long-time influence on the market,
- Own production and storage area,
- Own transport/car park,
- Flexibility and speed of delivery,
- Flexibility of the production process,
- Flexibility of the distribution plan,
- Modern information system,
- Free-of-charge hotline,
- Qualified and trained staff,
- Complex care of the hygiene of the fillers,
- Recycling of the plastic packing.

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**SYSTEM OF THE WATER DISTRIBUTION IN THE CONCRETE REGION**Silvia Leczova

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Negative discoveries according to the analysis:

- Rising of the distribution prices because of higher inputs,
- Uncovered areas of SR without distribution,
- Continuous fight with the competing companies,
- Improper location of the filling machine according to the location of west and east depot,
- Small number of domestic customers,  
High transport costs.

## 5 Conclusions

The system approach was used within the solving of the current task. After the solving, the company gained significant savings related to truck delivery costs. The main reasons behind that are changes and suggestions of new distribution routes, aiming not only to lower the fuel costs, but also to lower the weight of the distributing vehicle, which can now be used for other distribution activities. The above-mentioned also predetermines the company to extend its influence on the market, to ensure the drinking regime for new domestic customers and partially to extend the production abroad. Overall, it is possible to say that the solution requires the finding of the new source of mineral water and to build a new filling machine located in the middle Slovakia.

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## Review process

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