

Supply Chain Design of a Radio Station: Case Study in Bulgaria

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The paper provides a framework of characteristics of the supply chain design for the Radio Varna radio station, based on the concept for the service industry. The comparison between the radio design and logistics design reveals new features for evaluation. The principal components are J1T news information delivery, listener satisfaction and the planning of financial and journalistic control. Some priority indicators of the logistics design like costs or specification of the radio location do not have any additional influence. The basis for the supply chain system for Radio Varna indicates some points for re-designing.

Key words: radio design, logistics design, logistics service

Introduction

The number of radio services has grown significantly during the last decades in Bulgaria. This sector is dynamic and expands continuously, new operators keep emerging and new users are added. The indicated growth is expected to continue in the future because of the Internet radio stations. Such a radio station can be accessed from any computer with the Internet access (Struzak 2001, 339–340). For this reason the listener is now a part of a huge and still growing network of radio stations (Agrell et al. 2004, 1–2). Due to competitiveness in the sector it is expected that in the future transmission costs will decrease and logistic competency and consequently quality will boost the radio market and its revenue gains shall increase (Krishnan and Chang 2000, 609–610).

In recent years, the supply chain knowledge has become important in many industries, including the service industry. The main reasons for that are faster on-line connections and inter-organizational relationships which limit the risks (Ballou 2007, 332–335). Radio services are no exception since they have started to adopt the supply chain knowledge for implementing productivity improvement in the radio systems (Extreme Networks 2007, 2–4). The link between radio and logistics designs has becoming a topical issue. In the recent years there have been several empirical studies carried out that

showed the importance of radio communications output for controlling and monitoring radio design and signal processing (Liljenstam et al. 2001, 308–309). As a result the application of these components to the supply chain design provides tangible benefits for logistics service industry (Tajima 2007, 261–264). Furthermore, a quick literature review shows that radio industry is, as a part of logistics service industry, influenced by both logistics management and radio management.

This paper puts emphasis on the importance of recognizing practical links between supply chain design and radio design for obtaining a more competitive performance in a radio station. We analyze a supply chain design model in the radio format on the example of Radio Varna, which is a local branch of the Bulgarian National Radio. In addition we also provide guidelines for a possible supply chain re-design.

The body of the paper is divided into 7 sections. Section 2 describes features of a radio design and introduces specific performance of a logistics design in a radio station. Section 3 explains the methodology for studying logistics design in the target radio station, Radio Varna. Section 4 presents a case study of the logistics design of Radio Varna and analyzes its most important features. Section 5 is based on the radio's propositions to benefit from supply chain re-design. Finally, some conclusions are given in Section 6 followed by some promising areas for future research noted in Section 7.

Literature Review for Radio Design and Logistics Design in the Context of Service Industry

In our paper we discuss radio design as a design within the organization of a radio station, which means 'specific cooperation between customers and designers' (Kensing et al. 1998, 243; Chin et al. 2006, 103). In this case, customers are the users; whereas the term designers includes technical, administrative staff, journalists, and outsourcing providers. The last category of designers (outsourcing providers) manages financial reports and accounts, and is responsible for artistic control of the media. However, some features of the logistics design are inadequate to meet the radio design needs. That is mostly because radio systems have more limited resources in comparison with traditional logistics systems. However, it is obvious that one of the principal resources of this system is high-speed communication and its efficient radio management. This kind of management is in the literature known as 'radio resource management' and as such provides high quality services, specific air interface de-

sign and network planning (Hwang 2002, 283–284). The challenge of the supply chain of a radio system is to maximize radio performance throughout available technological resources in order to obtain listener satisfaction and at the same time match the limited financial budget of a radio station. The effectiveness of the supply chain of a radio system is also influenced by the following concepts (Wan et al. 2003, 1931–1933):

1. 'Optimum connectivity' (minimizing radio operator resources);
2. Location management (measuring the signals received by the listeners);
3. Control policy for the information flows of the radio station.

'Design' focuses on the needs analysis as well as form and functionality features. Radio station design is normally evaluated on the basis of written documents. It helps in program planning and broadcasting and it therefore needs coordination mechanisms by the editorial board. The design may include various different aspects, as well as the organization of logistics design. Logistics design requires a structured system and network in order to solve several problems such as, to determine the minimum number of locations, ensure optimal delivery route and decide upon the service level for the customers (Dröge and Germain 1998, 27–29). Dröge and Germain explain that logistics organizational design is a mix of four components: decentralization, specialization, formalization, and integration and control. Due to organization size, technology and environmental influence the components receive different degree of attention in the logistic management literature (Pirttilä and Huiskonen 1996, 135–136).

The target of logistics design is to optimize the performance of logistics systems in service industry and to provide a potentially efficient and useful model for solving design problems. One of the benefits from an applicable logistics design is also the optimal structure of an organization. Cost efficiency, on the other hand, is one of the problems of applicable logistics design. Radio management has as a part of the service industry the main task to conduct an effective cost-service analysis in order to minimize the total logistics costs. The components of the analysis are (Korpela et al. 1998, 304–306):

- Service level offered by the competitors;
- Satisfaction of the customer's /user's requirements;
- Character of the radio's own logistics system.

User satisfaction is of course the ultimate measure for service performance and as such creates a value for the supply chain. The ob-

jective behind the user satisfaction is to design logistics systems and procedures for supply control as efficiently as possible. In radio service industry the principal service elements are time, quality, planning, urgent deliveries, information system links, experience and personal contact (Bottani and Rizzi 2006, 593). The functions of the logistics service help to drive the knowledge for logistics design. The main factors for the success of logistics service are regularity, reliability, completeness, flexibility, correctness, harmlessness. In the case of radio logistics service these indicators evaluate the productivity and just-in-time (JIT) transmission of a radio station (Denton 2006, 556–557).

Research Methodology

The focus of our study is a radio station design with its corresponding supply chains features. In order to examine the logistics design of Radio Varna we have collected information from administrative, operative and financial documents of Radio Varna between 2004 and 2007. The research process for the study will continue also in the future. The process will include a number of interviews with target respondents/practitioners of the radio station.

The aim of the current research is to analyse how the supply chain design creates sustainable advantages for Radio Varna and if its re-design could indeed contribute to operational savings and better visibility in the radio management. The re-design is discussed as a tool that has the ability to create logistics monitoring, accuracy of expenditure's planning and suitable standards in customer satisfaction (Angelis 2005, 51–53).

Case Study and Discussion

66 journalists, administrative staff and directors are involved in the production, broadcasting and administration of 24 hours of radio programming each day all year round. The profile of Radio Varna, which broadcasts regionally and internationally all across the Black Sea coast is a mix of news and music for adult audience. The radio produces 8,760 hours of program per year and 86 hours of advertisements. Each radio program has its own concept for political, economic and cultural issues as well as for musical or sport events. The structure of the radio is described in figure 1.

Radio Varna was established in 1934 and two years later it became a branch of the national radio station in Bulgaria – the Bulgarian National Radio. The structure of the radio design is specific because of public ownership and centralized governance. Information

Supply Chain Design of a Radio Station

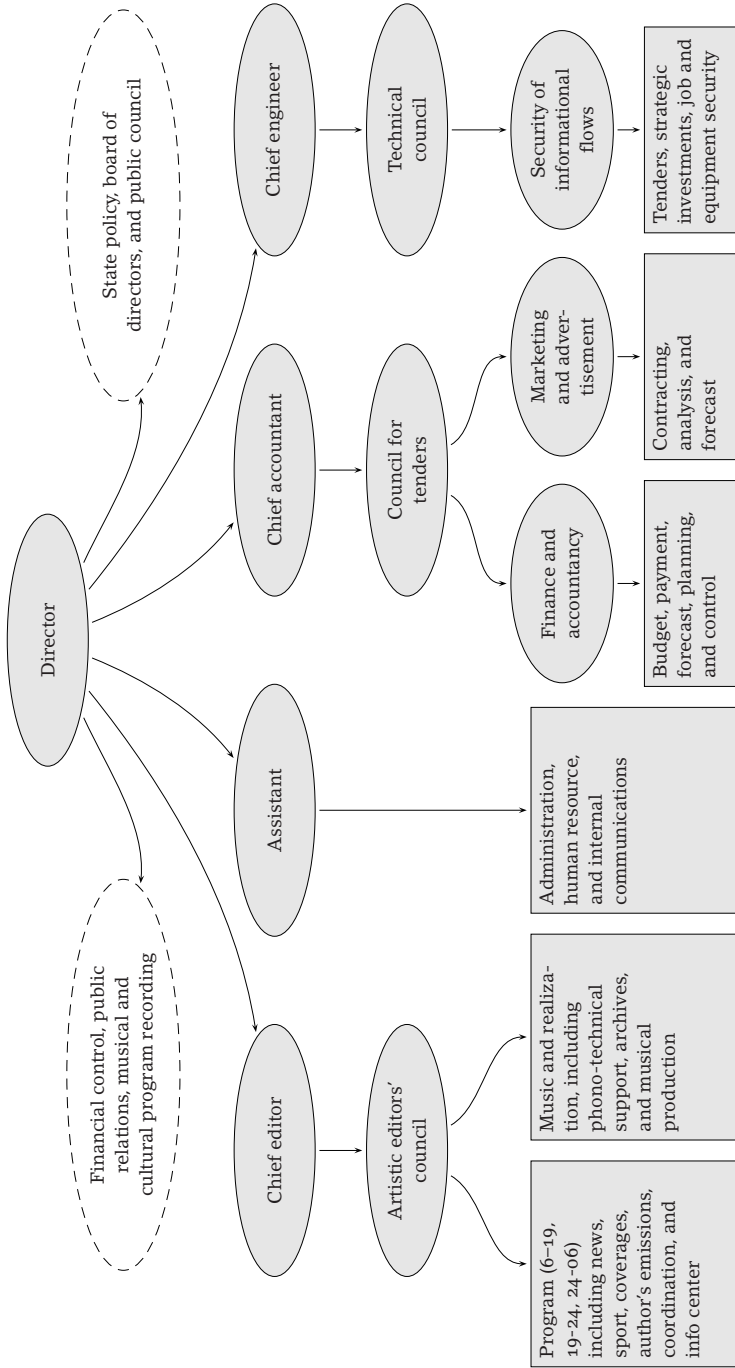


FIGURE 1 Organizational structure of Radio Varna (adapted from Radio Varna 2007)

provider Bulgarian Telegraph Agency and another 3 or 4 domestic private and international information agencies can be considered as the outsourcing providers.

Radio station control is divided into two parts: internal control and external control. The internal control is carried out on a daily basis by the director of Radio Varna, who also indicates the strategic management issues of the radio format. In addition, the internal control is done once a month through an administrative check from the Bulgarian National Radio. The external control is done every three years by the Ministry of Treasury and by the National Audit Office of the Republic of Bulgaria.

Such practices at the same time influence the logistics design of Radio Varna. However, at the station high centralization is not associated with less integration, since creative jobs at Radio Varna are independent and well arranged from technological point of view. The radio has DALET digital system for speaker coordination and a multifunctional studio of 1,600 m² for PR, musical or cultural events. This is an important advantage of Radio Varna in comparison to private radio stations in the region as well as with other Bulgarian National Radio branch offices in Shumen, Stara Zagora, Plovdiv, Blagoevgrad and Sofia. Furthermore, the structure of the radio design is based on the-so-called 'list of ideas' which includes general ideas as well as ideas for special occasions. The work of our journalists is spurred by the ideas of the 'working team'. For example, activities of musical journalists include additional assignments such as the radio theatre and recording folk or other artistic groups. In this way the radio keeps in touch with the audience. Recorded audio tracks are later evaluated and offered for sale.

The implementation of the logistics design within the radio design is presented in figure 2.

On the basis of these attributes Radio Varna aims to achieve appropriate and optimized logistics design. The design involves a series of logistics activities and tasks aimed at observing user/customer characteristics, measuring the availability of information, evaluating the journalists, Internet infrastructure and frequencies or radio performance database. The current challenge for Radio Varna is to use the existing organizational structures and available resources in order to obtain better return-on-investment in a limited time period. However, this must be done without disturbing the routine operations of the branch. Due to public organizational structure of the radio station the logistics task comes with a high-class responsibility. At the same time, the realization of the task requires integrated

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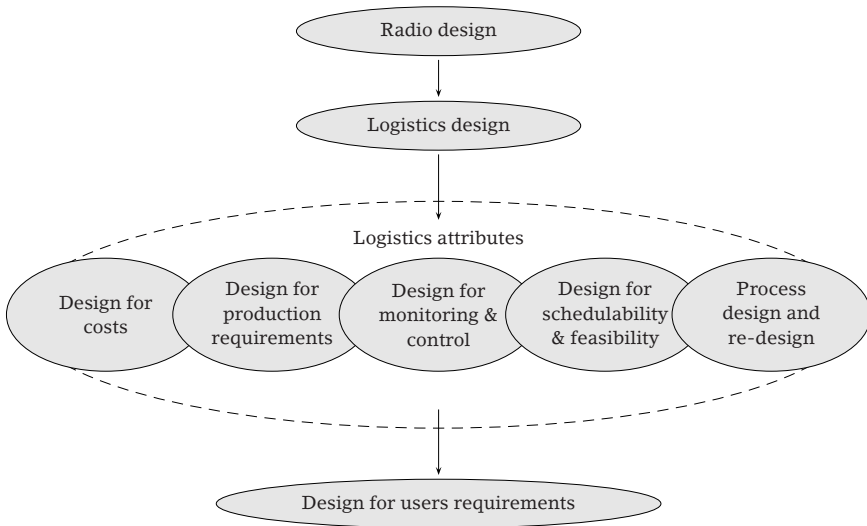


FIGURE 2 Principal Attributes of the Radio Logistics Design
(adapted from Dowlatsiati 1999, 62–65)

radio logistics service, strategic flexibility and cost minimization approach. The awareness of these logistics components speeds up the re-definition of radio logistics design.

The Benefits of Supply Chain Re-Design

Due to specific structure of the supply chain network, the re-design in the public radio station increases its market strength. The re-design also directly guarantees competitive transmission of logistics knowledge by reorganization of the radio players. The ideas for re-design are used to update and improve radio services and add innovative supply chain solutions. The re-design can be taken as business process re-engineering (BPR) which creates a sustainable advantage based on information technology and at the same time represents the basis for achieving supply chain integration (Polenakovik et al. 2001, 220–222).

Radio Varna intends to benefit from radio re-design in two main steps:

1. The implementation of synchronised European Broadcast Standard until 2015. This project worth approximately 100m Euros will be funded by the Bulgarian National Radio. The target is to build the station's own effective telecommunication and physical supply chain infrastructure, including its own radio transmitting

set. The future project is supported by the Bulgarian government, which is the issuer of the license.

2. Converting the radio's summer-time program entitled 'Holiday' into an all year program. By 2011 this program has to be present at all important events and cover in different foreign languages – English, French, German, Spanish, Italian and Russian. Such a program is attractive and suitable for a tourist region like Varna. The idea will be based on the experience of the National Radio of Turku, Finland (one of 37 EU partners of Radio Varna). The logistical challenge represented by the idea is to use the same radio staff working at the same location in order to develop an additional program. The aim is to make the radio activity as diverse as possible without any additional logistics costs. The success of the new program scheme will be financed by the revenues from radio advertisements. In order put the plan of re-design into practice, two other sub-areas need to be considered: the costs of logistics and the maximization of the radio performance.

The logistics costs of Radio Varna could be divided into two categories: the first is represented by the percentage of the national budget for national radio stations, whereas the second one is the radio's own plan for additional costs/benefits. In the national radio station in Bulgaria expenditures represent a quota from the national budget where a balance is needed between the costs made and the benefits received during the accounting year. Radio Varna has the autonomy to gather its share of benefits either by advertisements or by organizing/recording various public and social events. In 2006 Radio Varna gathered for 10.3 percent more of its own benefits. Total expenditures of the radio are sub-divided in the following categories: 58.66 percent for salary and administration, 35.79 percent for equipment and 5.55 percent for strategic assets. The rate of intangible assets increased for 62.68 percent in 2006. Obviously the annual growth of radio benefits is a factor promoting better financial performance in the future. This indicator contributes to dynamic BPR and improved control of the operational processes (Slats et al. 1995, 12).

The key factor in determining the performance is full digitalisation. The radio is the first to adopt to new digital technology among the local competitors. For this reason, the independent digital system of Radio Varna is considered as the most important indicator for further re-design. Fundamental frequencies of Radio Varna cover regions of the Black Sea coast. Because of the radio's internal environ-

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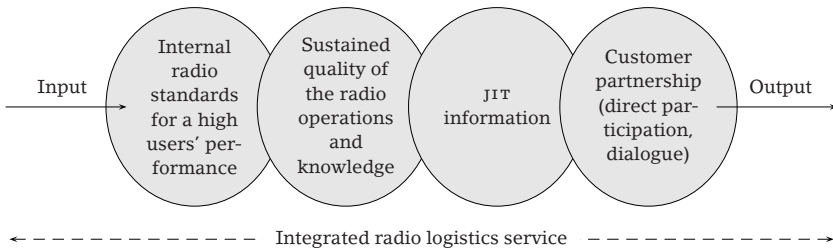


FIGURE 3 Components of the integrated radio logistics service

ment (strategic tourist location of the town of Varna in South Eastern Europe) and also because of its external environment (institutional links with the Bulgarian National Radio and European Broadcast Union), Radio Varna promotes an extended supply chain performance. Thus, a successful supply chain re-design of Radio Varna should provide a greater number of frequencies and more territorial coverage using digital technology, and greater presence of the media at different locations in the Black Sea Coast region. Efficient digital performance of the radio will result in the increase in audience. On the basis of marketing research from 2006, the number of potential users of Radio Varna should triple by 2009. The target potential audience should grow up to 2.5m listeners. Until 2006 the regular audience of Radio Varna was between 750,000 and 850,000 people (only the region of Varna accounts for a population of about 450,000 people).

The indicated supply chain re-design of Radio Varna has a great potential to increase its radio management dynamic. This dynamic environment is linked to complexity, supply availability, equipment monitoring and innovation potential of journalistic tasks or 'task force'. In this way new knowledge about the integration of the supply chain in the radio station is obtained, which is also shown in figure 3.

The integration mentioned includes a number of logistics components of the radio supply chain design and has enormous influence on customer satisfaction, news delivery and reduction of the customer's costs.

Conclusion

The paper provides a framework on sustainable advantages of the supply chain design in a radio station. In the case of Radio Varna we present all traditional components of the logistics design, such as decentralization, specialization, formalization, integration and control.

Radio Varna has the necessary technical knowledge to implement sustainable logistics design and also to re-design the supply chain process. Learning about new practices contributes to some sustainable advantages such as the improvement of radio system's productivity, journalistic specialization and better informational and cultural coordination. Furthermore, the effects of organizational supply chain re-design are linked to the integration of radio logistics services and visibility of radio operations. Hence Radio Varna will remain highly operative and competitive, mainly because of its two principal advantages which are continuous updating of information flows and new original ideas implemented in the radio program which contribute to user satisfaction.

Recommendations

We could summarise that the logistics concept is valid to knowledge about the service capacity of the radio industry. Logistics design of every radio station needs to be an integral part of the whole radio structure design. In the case of Radio Varna, the Bulgarian National Radio as a parent organizational structure needs be prepared to plan its logistics design and ensure a logistic design team within its radio management.

Radio Varna demonstrates a high impact of supply chain design. In order to be included in the strategic administrative planning of the organization, the radio station needs a defined written logistics mission. A detailed logistics radio design and its initial implementation will increase the visibility and control of the supply chain system.

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