

## THE CONCEPT OF STREAMLINING THE LOGISTICS PROCESS AT THE COMPANY

Radosław Drozd\* and Marcin Kisielewski\*\*

\* Faculty of Management and Economics, Gdańsk University of Technology, Gdańsk,  
Poland, Email: rdrozdz@zie.pg.gda.pl

\*\* Faculty of Finance and Management, WSB University in Gdańsk, Gdańsk, Poland,  
Email: m.kisielewski@wsb.gda.pl

---

**Abstract:** The aim of the article is to present a concept related to the improvement of the logistics process at the company, by the modernisation of the main railway siding of the terminal. The paper presents the reasons for the decision that was once made in order to obtain the expected advantages after the modernisation. The comparison of the incurred expenses and the profits that might be gained in the future allows us to state that the decision about the modernisation was the right one. The decision about the modernisation also referred to a trend towards an increase in cargo handling operations, which could be observed at the company at that time. The decision about modernisation was made when the terminal operated using its full capacities of the railway siding. Therefore, the modernisation was necessary in order to meet expectations expressed by the current and potential customers who might appear in the future.

**Paper type:** Case Study

**Published online:** 10 July 2017

Vol. 7, No. 3, pp. 211–220

DOI: 10.21008/j.2083-4950.2017.7.3.3

ISSN 2083-4942 (Print)

ISSN 2083-4950 (Online)

© 2017 Poznan University of Technology. All rights reserved.

**Keywords:** *streamlining the logistics process*

---

## 1. INTRODUCTION

Over the years transport has been of significant importance in the development of interpersonal relations and trade exchange (Michałowska, 2010, pp. 22–23). It has always affected social and economic life of countries. In the 21st century, it is difficult to imagine our everyday life without properly functioning transport, in its broad scope. The lack of transport would come as a massive impediment for civilizational advancement; furthermore, it would negatively affect the direct development of the society (Neider, 2008, pp.7–8).

Undoubtedly, transport of products comes as one of the inseparable elements of business and our everyday life. Various products are continually moved with the use of the transportation means from one place to another (Neider, 2008, pp. 67–68).

In the 21st century transport of products has massively contributed to the development of the intermodal transport network (Coyle & Bardi, 2002, pp. 27–29). In Poland, intermodal transport, also referred to as multimodal transport (Neider, Marciniak-Neider, 1997, pp. 16–17), is defined as transportation of goods with the use of at least two various transport modes, based on a contract of multimodal carriage, from a location in one country where the goods are passed to a multimodal transport operator, to a specified destination located in another country (Jaworski & Mytlewski, 2009, pp. 34–35).

The development of the container market is significant to the development of intermodal transport as it facilitates integration of rail, road and sea transport modes (Janiak, 2006, pp. 11–12). Intermodal transport may contribute to the lowering of the costs related to the whole transportation process and to the quality improvement of transport services (Rydzkowski, Wojewódzka-Król, 2002, pp. 47–48).

Analysed in the article, the company runs its business operations mainly on the basis of intermodal transport.

The aim of the article is to present a concept related to the streamlining of the logistic processes which take place at the company, and which are related to the modernisation of a railway siding of the terminal

## 2. IDENTIFICATION OF THE COMPANY

The company is a modern Polish container terminal which is capable of handling the largest container vessels in the world. It is possible mainly because of the suitable water depth at the quays and proper infrastructure and facilities.

The main tasks implemented by the company involve handling containers from various means of transport, including (Bloch, 2013, pp. 71–81):

- handling sea and land transportation means, that is: loading and unloading land and sea transportation means, performed with the use of the quay gan-

try cranes, yard rubber tyred gantry cranes and self-propelled lift trucks and tractors with semi-trailers.

- mooring and unmooring vessels, with availability of berthing places at the quay.

### **3. THE ANALYSIS OF THE PROJECT OF THE RAILWAY SIDING MODERNISATION**

A decision about the modernisation of the main railway siding at the company resulted from a considerable increase in the number of operations involving loading and unloading of containers and in the number of cargo handling operations at the main railway siding.

Before the discussed modernisation, the company had only one operational railway track from which containers were unloaded by a crane.

The first stage of the modernisation involved a reconstruction of the railway track and the adjustment of its train handling capacities; it was intended to provide one more operational track. During the first stage, it was also assumed that a yard gantry crane should be used for handling trains. Thus, one of the gantry cranes which had been so far used for cargo handling in the storage yards, was dedicated to handle the railway siding. In that way, it was possible to handle two trains simultaneously. Operations on the new track would have been impossible without the gantry crane specifically dedicated to handle the railway siding, and the modernisation of the whole facility would have been pointless.

The capacity of the railway siding at the company was estimated as 55 000 TEU annually (the data for 2011). After the modernisation, it has been defined at the level of 110 000 TEU which means that the company has doubled its capacity. That aspect of the modernisation process came as a significant issue, largely related to the intermodal strategy of the company which assumed the adjustment of the railway siding to the level achieved by European and other terminals in the world (Bloch, 2013, pp. 71–81).

### **4. THE PROJECT PLAN**

The project was aimed at the streamlining of the logistic processes at the company, which were based on the modernisation of the railway siding of the terminal.

An important aspect of the project involved the limitation of the problems which were related with the access tracks to the terminal of the company. The nearest railway station was the Z Port, from where only one railway track led to the terminal of the company. After the handling of a train had been finished, with only

one operational railway track, it was necessary to move the train back to the Z Port station, and then another train could enter the terminal – an engine could roll one train in and roll another one, waiting at the terminal, off. The suggested solution was designed to streamline the operation of the terminal and to shorten cargo handling time.

The modernisation process was commenced in May 2013 and ended in October 2013. The reconstruction work took place from Monday to Friday, starting at 8.00am and ending at 6.00 pm, with a half-an-hour break. The work was not performed at the construction site during all the weekends and holidays of that period. Such conditions resulted from the working hours of the Project Department which was directly responsible for the implementation of the modernisation project.

The project of the modernisation of the railway siding was divided into the specific stages and tasks, which made the whole undertaking clear and understandable. The particular stages included specific tasks whose implementation time defined the implementation of the whole stage.

Before the construction work, some preliminary preparations were necessary to develop technical documentation and a construction tender. The preparation stage for the reconstruction of the railway siding started on 2nd January 2012, and it lasted until the beginning of May that year. The preparation stage was ended with the closing of the tender and the commencement of the construction work.

The development of the required technical documentation for the project came as one of the longest and the most important stages in the whole undertaking. The proper preparation of that stage came as a crucial element of the construction work. The development of the specifications for the construction design and the scope of work for the contractor, took over a month.

After the first verification of the documents, the second month was dedicated to the correction of the project. The key element of the project was a construction permit which was required to start the construction work. During that stage some further corrections of the documents were also necessary along with the provision of new elements which were indicated by the officials after the preliminary verification. A close cooperation with the City Hall allowed the company to shorten that time maximally.

Another important stage was a call for tenders and the selection of a contractor of the modernisation work. The documentation required for the bid was largely based on the previously developed documents submitted during the process of obtaining the construction permit. Hence, the time needed to develop the required documentation was not that long. The call for tenders was issued on 3rd April and closed on 17th April. The entities interested in winning the bid had two weeks to prepare their competitive offers. After the analysis of all the submitted tenders, the Tender Committee announced the ultimate winner of the bid on the company website on 30th April.

The construction work was started at the beginning of May 2012, and it was divided into five construction stages. Each stage was ended with a report on the per-

formed work and the quality control of the completed tasks. After a positive verification, the company transferred the funds to the bank account specified by the contractor. The payment tranches were also divided into the particular stages and amounts corresponding to the completed work.

The most important stages of the project were: the preparation stage, the stage involving indispensable tests and analyses, the process of public procurement, the construction, the monitoring of the progress and quality control of completed work, the final acceptance of the completed facility and the final closure of the construction site.

The budget allocated to the first stage of the modernisation of the railway siding was €1 221 000, 30% of which financed with the acquired EU funds.

One of the most important assumptions and priorities was the maximal limitation of the impact exerted by the construction work on the business operation of the railway siding. The company could not afford closing the siding for a time period longer than 24 hours during the whole project. The requirement was met, and during the several months of the modernisation work – despite some inconveniences – the railway siding was not closed for longer than 24 hours, and trains were handled on regular basis.

## 5. CRITICAL POINT OF THE PROJECT

Each project plan includes some critical points which must be completed properly before the next stage of the project implementation is started. Such points are referred to as the milestones which come as a summary of some completed tasks or project stages. The discussed project included 10 following milestones:

1. The development of the budget for the requirements of the project – deadline 31st Jan. 2012.
2. The development of the required technical specifications and modernisation plans – deadline 31st March 2012.
3. The selection of the contractor for the construction work (public procurement procedures) – deadline 31st April 2012.
4. Acceptance of the I stage of the construction – deadline 31st May 2012.
5. Acceptance of the II stage of the construction – deadline 30th June 2012.
6. Acceptance of the III stage of the construction – deadline 31st July 2012.
7. Acceptance of the IV stage of the construction – deadline 27th Aug. 2012.
8. Acceptance of the V stage of the construction – deadline 30th Sept. 2012.
9. Testing of machinery and railway infrastructure – deadline 10th Oct. 2012.
10. The final completion, acceptance and commissioning of the railway siding – deadline 12th Oct. 2012.

## 6. THE PROJECT TEAM

Similarly to any other projects of that type, during the modernisation of the railway siding the indispensable resources had to be defined first. On the part of the company, it was a project team consisted of people with extensive knowledge which they could mutually complement. The terminal was not a direct contractor of the construction project – it acted as an investor and a supervisor of the performed work. Hence, its main resources involved human and financial resources.

During the project, the Project Department came as a separate functional unit which reported directly to the Managing Director. Additionally, there were representatives of the Financial, Operational, IT and Technical Departments who also participated in the project.

The Financial Department was mainly responsible for the budget and legal issues. Considering legal issues, it was necessary to develop an adequate agreement with the contractor, which could protect the interest of the terminal. From the point of view of the X company, two questions were equally significant: the quality of the performed work and the duration time of the modernisation process. The development of an agreement which could satisfy all the involved parties proved to be a hard challenge. Moreover, one of the most important tasks faced by the Financial Department was to complete the proper documentation required for the acquisition of the EU funds. The EU funds were supposed to cover 30% of the project financing, therefore any failure in their acquisition could have ended in the failure of the whole project. The development of a sound application supported with the required arguments took several months and involved a lot of efforts. Moreover, each time, after granting any subsidies, the European Union makes some specified requirements which must be met, otherwise the involved entity might be punished or even required to return the granted funds. Therefore, the Financial Department formed a purchase unit whose task was to provide the company with all the necessary resources at the right time. Considering a large number of tasks, the people employed in the Financial Department came as one of the largest representations among all the employees involved into the project work.

The representatives of the Operational Department provided knowledge related to the particular operational processes. It was crucial during the modernisation work, as they helped in the minimisation of the negative impact exerted on the productiveness of the particular operational processes. Additionally, their task was also to duly inform other workers of the department about the work advancement and about any possible inconveniences in their everyday work.

The people employed in the IT and Technical Department were responsible for the consulting and providing technical expertise related to their activities. In the project team they acted as consultants and experts in the fields related with technical equipment and its implementation. Additionally, a representative of the IT Department was responsible for the updating of the information on the project status.

The Project Manager was responsible for all the work performed during the project: not only for the proper implementation of the construction work but also for the efficient communication inside the project team of the company. The Project Manager was also obliged to report on the work advancement to all the directors of the company and to its Supervisory Board. His tasks involved delegating particular assignments to employees; he could also increase the number of people in the project team, if necessary.

## **7. LIMITATIONS OF THE PROJECT**

Each project has its assumptions and limitations which come as target achievement indicators. One of the basic limitations is the implementation time of modernisation work, that is, briefly speaking, a time limitation. In the discussed project, the deadline was defined for 12th October 2012. Two railway tracks were expected to be ready and accepted for use up to then.

Another considerable limitation was the budget allocated for the implementation of the project. The financial limit was EUR 1 221 000, including 30% of the funds obtained from the European Union. The financial means for the implementation of various projects run by the company are granted by the shareholders. Each modernisation project and improvements need the approval of the shareholders, and therefore a sound justification for such investments is essential. It is important to define the required expenses at the beginning of the project as in most cases, it is impossible to increase the once allocated budget.

## **8. THE EXPECTED ADVANTAGES**

The company saw the project of the railway siding modernisation as one of the stages in the improvement of its processes which could positively affect customers' satisfaction. The main advantage resulting from the first stage of the railway siding modernisation was an increase in the railway capacity. The initial assumptions referred to an increase in railway operations by approximately 40%. Comparing the results of 2011, it can be stated that an average growth was assumed up to 10 000 containers handled at the railway siding per month approximately.

Another important aspect was the minimisation of the problems related to the fact that there had been only one railway track from the A railway station to the terminal of the company. Therefore, the company decided to modernise its own railway siding which would make it possible to handle two trains simultaneously, and 4 trains in the nearest future (the third quarter of 2013). In that way, the impact

of the delays resulting from the fact that there had been only one operational railway track to the terminal, could be minimised.

After the modernisation, it was also possible to minimise the impact of the delays caused by the railway operators responsible for the process of rolling trains in and out of the railway siding. Before the modernisation, if any of the operators had been late, the company workers would have had to wait for an engine to come and to roll a train off the siding and then to roll another train in for handling operations. At present, an engine can roll in a train which is waiting to enter the Northern Port station, and then it can roll out another train which is waiting for a railway operator who is late. Hence, the company workers can start their handling operations immediately after the train has been rolled in, and the engine can roll out the railway carriages which have been already handled. Before the modernisation, a train had to wait for cargo handling until the previous one was rolled out; in that way the time of the handling operations has been shortened by the time needed for train rolling in/out.

The modernisation of the railway siding has brought some advantages for the external entities, including the carriers. Now they are given more possibilities in terms of the time available to book handling service. In this way, railway operators may increase the number of connections directed to the company and, consequently, increase their turnover and income resulting from cargo handling. Before the modernisation, the railway siding and the time available for cargo handling operations were practically used up in the maximal way. The company could expect that the construction of an additional railway track should increase cargo handling possibilities for railway operators as well.

Furthermore, the modernisation of the railway siding comes as an indirect advantage for the Sea Port Authorities in terms of higher taxes. The development of the infrastructure and the growth of the assets in the company mean that there shall be more income for the state budget. An additional indirect advantage is also a possibility of providing new job vacancies, not only at the company, but also among the railway operators and forwarding agents. An increase in the cargo handling railway operations at the company means that there shall be more tasks to perform and the demand for employees shall grow too.

## 10. CONCLUSION

The article presents the analysis of the project of the railway siding modernisation, involving the construction of an additional railway track which contributes to the improvement of service quality. The paper presents the reasons for the decision that was once made in order to obtain the expected advantages after the modernisation. The comparison of the incurred expenses and the profits that might be gained in the future allows us to state that the decision about the modernisation was the



right one. The decision about the modernisation also referred to a trend towards an increase in cargo handling operations, which could be observed at the company at that time. The decision about modernisation was made when the terminal operated using its full capacities of the railway siding. Therefore, the modernisation was necessary in order to meet expectations expressed by the current and potential customers who might appear in the future.

The risk which appears during the implementation of each investment should be always minimised to the largest possible extent. All the actions which can prevent any particular risks or limit their results when they have occurred, should be taken. The critical points, such as disturbances in the simultaneous course of the ongoing modernisation tasks and business operations and any delays caused by the contractor should be secured first, mainly because there is high likelihood of their occurrence and because they exert strong impact.

The modernisation of the railway siding assumes a number of advantages not only for the terminal itself, but also for numerous related entities. The analysis of the whole process allows us to conclude that in the nearest future the discussed modernisation shall contribute to even greater success in the operation of the company.

## REFERENCES

- Bloch P. (2013), *Improving logistics processes in a company*, PG, Gdańsk.
- Coyle J. & Bardi E. (2002), *Zarządzanie logistyczne*, Polskie Wydawnictwo Ekonomiczne, Warszawa.
- Janiak T. (2006), *Słownik Terminologii Logistycznej*, Biblioteka Logistyka.
- Jaworski J. & Mytlewski A. (2009), *Funkcjonowanie Systemów Logistycznych*, CEDEWU.
- Michałowska M. (2010), *Efektywność transportu w teorii i praktyce*, Uniwersytet Ekonomiczny w Katowicach.
- Neider J., (1997), *Marciniak-Neider D., Transport intermodalny*, Polskie Wydawnictwo Ekonomiczne, Warszawa.
- Neider J. (2008), *Transport Międzynarodowy*, Polskie Wydawnictwo Ekonomiczne, Warszawa.
- Rydzkowski W. & Wojewódzka-Król K. (2002), *Transport*, Wydawnictwo Naukowe PWN, Warszawa.

## BIOGRAPHICAL NOTES

**Radosław Drozd** is a lecturer at Gdańsk University of Technology, a practitioner with many years of experience in construction, electric power and paint industry; an author of publications on contemporary supply logistics, production, distribution, waste management and occupational health and safety in production enterprises.

**Marcin Kisielewski** is a lecturer and manager of the major study courses in Logistics at the WSB University in Gdańsk. A graduate from the doctoral courses at the Faculty of Management, the University of Gdańsk. His main field of interest and scientific research is the improvement in efficiency of management in the transport, forwarding and logistics sector. He is a specialist in the field of efficient management in transport, forwarding and logistic project management; an auditor of internal processes of production.