

Quick Response Quality Control as an innovative approach in the conditions of rail transport

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Abstract. Customer satisfaction with the provided transport services is closely related to the ability of management to respond flexibly to process changes and maintain the required quality. QRQC is also considered as a method for troubleshooting and it can be applicable in many different areas along rail transport. The innovative qualitative approach QRQC highlights the principle of thorough analysis of the causes of problems. After a problem situation occurs in a traffic operation, it is necessary to proceed according to the specified sequence in order to reduce the undesirable influence in the shortest possible time. The article deals with the possibility of applying this method to rail transport processes.

1 Introduction

The achievement of true success lies in the ability to predict future trends and embrace them successfully rather than letting them adversely affect business. This fact is completely correct also in the case of rail transport undertakings. Adapting to change is particularly difficult for transport undertaking providing services with its long historic basics, assets which last for decades, the dominance of other means of transport which tend to react slowly and consequently lose good position in the transport market. A railway undertaking is affected by risks of internal environment, external, similarly interactive [1].

Development in the transport market includes the rapid growth of technology and globalisation, necessity to eliminate CO₂ emissions, pollution, and energy consumption, and the growing gap between various means of transport. There is also a whole range of social and economic issues. Rail transport has to face lots of issues, congestion is a problem in all countries, but there is a lack of infrastructure in developing countries while in developed countries it is very old.

Sustainable innovation connected with new quality management approaches can help to improve the quality of rail freight services. According to Mr Masaki Ogata, a president of the UITP: "we need to know the genuine needs of our customers, which will create the seeds for innovation." The knowledge economy describes a new stage in the development of society, the essence of which is sustainable economic growth based on information, knowledge and innovation [2].

Adapting to change is not an option but a requirement if rail wants to survive and prosper. Worldwide, there are several famous quality management approaches and according to the transport market's requirements it is highly important to apply them on new approaches. Market influences emerged to challenge the status quo, including various approaches by Juran, Deming or other famous members of total quality control. It is necessary to interconnect the cost of quality monitoring with orientation on customer, with the process orientation in the area of quality [3].

There are typical visible characteristics for rail market development in connection with quality management such as liberalisation of transport market and specific conditions in product providing connecting customer needs. The specific purpose of transportation is therefore to fulfill a demand for mobility both in passenger and freight transport [4].

2 Needful innovative quality management approach in rail freight transport

Rail freight transport carriers endeavour to create such conditions for its customers as to maintain the existing transports and to gain new transport orders. For example, the state rail cargo carrier in Slovakia transport volumes have been largely dependent on the situation and development of metallurgical industry in Slovakia and the surrounding countries. The transport volume shares attributable to metallurgy accounts for as much as 66% of the total volume of transported goods. There are also great changes in the business relations of the steel plants or their production when the flows of transport of goods are redicted or the transported commodity is changed, which is consequently associated with varying requirements for the use of locomotives or wagon types for transshipment [5].

Rail freight transport creates difficult system where lots of impacts exist, but new challenge for it is characterised by seeking a progressive route for trespassing inferior services. Quality of services in rail freight transport is possible to follow within the frame of whole transportation chain or in division on its single stages. A current issue is to identify the quality not only prior or during actual transport but also after the transportation. At that time the customer often requires additional services, eventually, if the customer is not content with the transportation, he raises claim. Rail freight undertakings have to find relevant response to the problems and protect their customers [6].

3 Application of Quick Response Quality Control in rail freight transport

This philosophy emphasizes the team approach and consists of a quick response to accrued problem and the need to protect the customer and processes before staying in the undesirable situation. This method is universal and each railway undertaking can slightly modify it for particular transport processes. Simultaneously, it is necessary to constantly monitor the processes and solve particular tasks based on current trends and thus to operationally manage the internal processes in railway transport. The QRQC is based on activities such as the initial detection of the problem, the communication and the problem allocation at all levels within the rail transport processes from first contact employees until to high-level managers. After analysing and determining the solution to the problem, comes the verification itself, which determines whether the chosen solution was correct and the desired result was achieved.

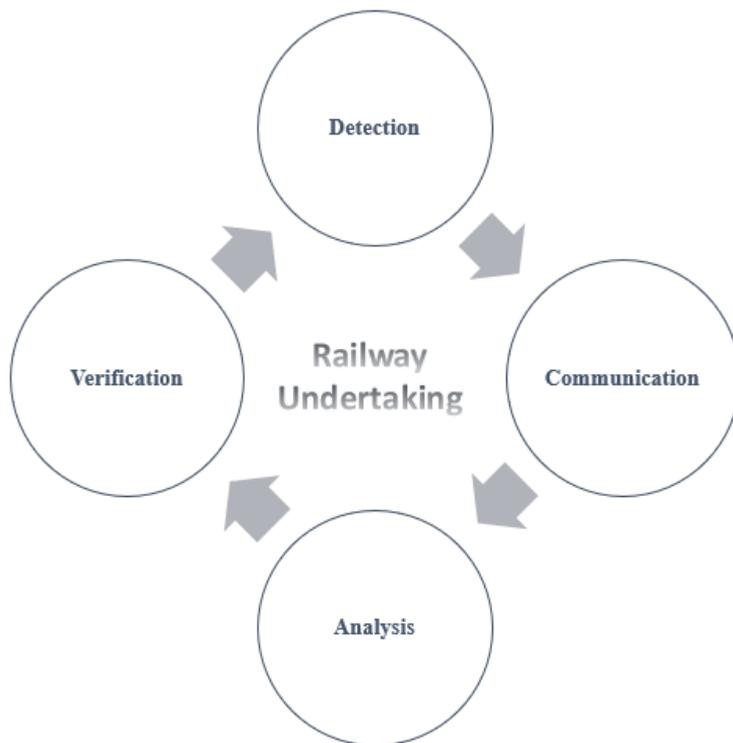


Fig. 1. QRQC in the conditions of a railway undertaking.

It allows clearly to capture the significant factors that cause problems in different areas such as logistics, transport operation and transport services with related quality. In terms of rail transport, this mentioned quality approach has been applied by University of Žilina in cooperation with the state railway company Cargo Slovakia, a.s. (ZSSK CARGO). This research was carried out in regards to application of this method in the case of a certified "logistic trains" product. This type of product is suitable for customers who utilize the significant logistics method just in time, these trains are given a better attention and in addition are considered to be priority trains. Rail company ZSSK CARGO has implemented the quality management system for these trains and also holds ISO 9001:2009 quality certificate. Research has shown the following advantages:

- an analysis that has to be carried out in the event of a problem situation in the process,
- a pre-arranged and functioning team meeting regularly on this product,
- capturing the problem in the process at the right time and immediately reporting the issue, then creating the subsequent documentation,
- introducing a permanent approach to solving the problem through a hardworking team,
- the ability to prevent problems by focusing on internal processes.

Head of department in rail company has to understand the principles of QRQC in order to be able to eliminate the growing problem and understand the main difficulties within transport processes [7]. The sequence of steps is illustrated by the following figure.

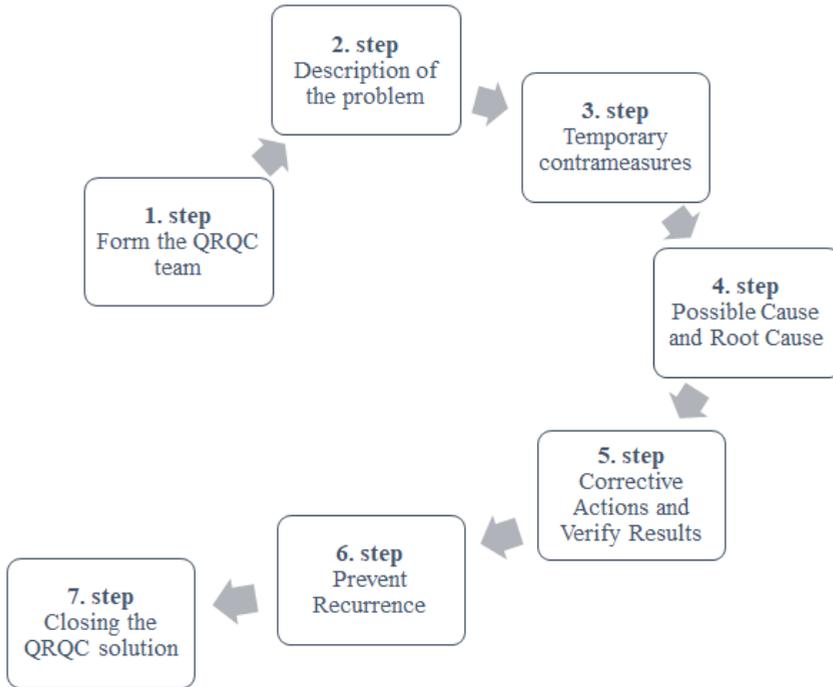


Fig. 2. QRQC in the conditions of a railway undertaking.

The accurate creation of the team is the basis for the successful functioning of the processes whereby individual team members should have the necessary knowledge of the issue [8]. The department manager or coordinator of transport process is considered to be the owner of the process where the problem has occurred. In solving the problem in rail transport according to QRQC, the team of experts in that field is first formed, then corrective measures are proposed which prevent recurrence. In order to eliminate the deficiencies in the process, the efforts are stressed on defining the origin that firstly caused them. The 5W1H method can be used precisely to identify the problem encountered in logistics trains operation. This is also related to determining and asking for specific questions when a problem arises.

- What is a logistical train problem?
- Which employee or customer has found this issue?
- When was the problem with logistics trains detected?
- Where was the problem identified?
- How was the problem recorded (form, complaint)?
- How many logistics trains have this problem?

The next step represents collecting as much information as possible as described in the idea "Well-described problem is a problem that is already solved halfway". The definition and implementation of corrective actions takes place within 24 hours on the basis of a quick and simple analysis to stop the spread of the problem into other areas. Subsequently, it is necessary to analyse and look for the factors and causes of the problem and to find out why the problem has not been detected in time. The controller in area of quality management should be involved to define quality objectives in cooperation with quality managers, so that goals can be quantified and tools developed to measure the quality [9]. A control point is determined for each factor, and so it is possible to compare the current state to its standard with the prescribed value. Within the railway undertaking interface, this is

a percentage assessment using the change index over the previous period [10]. Finally, it is important to remove the root cause of the resource in order to resolve the problem and prevent its recurrence in the future. The railway undertaking must choose the right position to solve the problems [11]. If the problem is viewed as a possibility of growth, rail company will solve the problems more easily and at the same time it will move forward and will become more competitive on the rail market. After identifying and describing the problem, the railway undertaking has to take immediate corrective action. Preparation activities should contain also monitoring schemes of critical situation thus eliminating the flaws of particular processes [12]. These are recorded in the QRQC form for each problem whereby the responsible team and the finished date have to be assigned to particular problem situation.



Fig. 3. 5W1H (Description of the problem)

A lot of tools are used for a thorough analysis, one of the most used being 5W1H, which allows the problem to be broken down and determine a root cause. [13] Based on careful analysis, it is necessary to take corrective action to avoid recurrence of the problem and customers are satisfied with the logistic train product. In support of intermodal transport, logistics trains are an important element and therefore it is essential to meet customer expectations. Therefore, it is essential that speed and guaranteed quality are respected.

4 Conclusion

Through this method, various transport problems within rail operation can be clearly solved already in a relatively short time. Long-term arrangements will ensure that the root eliminated, thus ensuring that the problem is not repeated for the future. QRQC enables for certified products in rail transport to guarantee not only quality but also delivery times. It is also related to choosing the right wagon for transport, meeting the expected transport speed, and even ensuring train movement tracking. Once a long-term solution has been implemented, validation will be carried out on the basis of measurable results of the process and its improvement will be assessed.

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