Get requests for proposals and successfully implement them

**New opportunities in
Local Rail Transportation (LRT)**

Any operator who wants to get new routes in local rail transportation is confronted with a variety of challenges. A systematic and sustainable approach in a suitable software environment facilitates qualified responses to requests for proposals (RFP) and the successful implementation of large projects to ongoing operation.

Contents

Executive summary

In large-scale requests for proposals transportation authorities get the opportunity to successfully administer railway routes or networks with once defined conditions, vehicles and facilities for many years.

In addition to legal framework, association guidelines and operation regulations, requirements include comprehensive technical specifications for vehicles to be deployed and other technical facilities – all the way to maintenance of the deployed railway vehicles.

With conventional means and methods it is possible to record in detail, update and communicate several hundred of these requirements. However, continuous versioning and change history as well as cross-division collaboration are doomed to failure.

That is why the use of a professional software program is recommended for requirements management that has already proven itself in many other areas of the economy.

Not only does such a program support location independent collaboration in the recording, testing and updating of all requirements in role-specific views, it also ensures the continuous use of all information over the entire lifecycle of a successful RFP project.

Seize opportunities professionally: Around 100 local railway networks are currently being operated in Germany by private transportation companies.

New opportunities:
requests for proposals in LRT

The privatization of public transportation in Germany means numerous opportunities for interested operators throughout Europe. However, first they must face the challenge of responding correctly to a public request for proposals from a technical, commercial and formal standpoint. In particular, in local rail transportation (LRT) requirements are becoming increasingly complex. The expectations of the administrative authorities, shareholders and of the management of rail transportation companies are rising. The specifications set forth in federal and state laws and regulations have become confusing due to their large number and scope of application. The guidelines of the Association of Transport Operators (in Germany VDV) play an important role and must also be taken into account.

Whoever wants to compete successfully as a transport company for a railway route or network must do the following:

- absolutely eliminate any errors in form, so that the proposal is accepted in the RFP process
- make certain that the concepts of the sub-projects actually meet all requirements
- meet the legal regulations and guidelines of an association of transport operators

While in routine business the issue of recording and management of requirements has been solved for years, there is still no proven procedure for the systematic analysis and recording of requirements for LRT requests for proposals.

Requirements
Management

Reuse & Branch
Management

Collaboration
Traceability
Workflow

Change &
Configuration
Management

Audits & Metrics,
Reports

In software-development as well as in the automotive industry, chronologically and spatially structured requirements management is routine for many companies
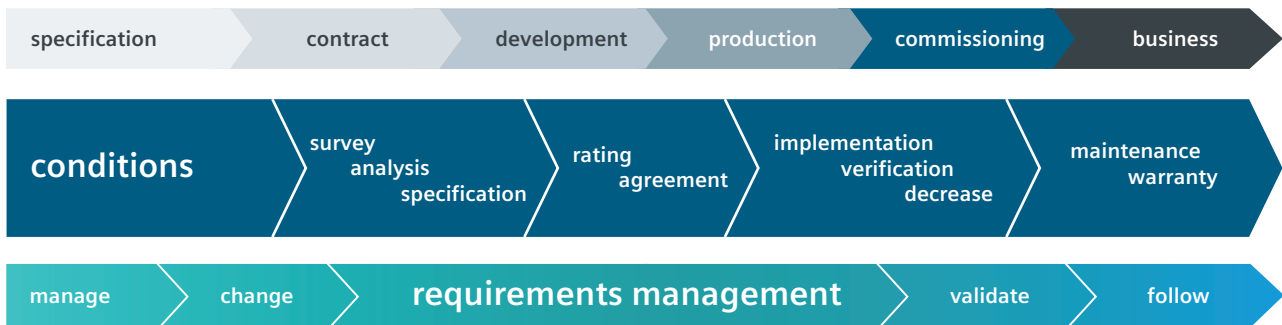
Lacking means and methods

In the case of LRT projects with regularly around 600 to 800 requirements, solutions based on checklists and documents quickly run into their limitations. The requirements are often hidden in word processing documents, encoded and not clearly formulated. Overlapping requirements are not communicated in all the relevant sub-projects. Often there are differing versions of requirements and documents which must be merged and kept valid with considerable expenditure of time and expense. It is difficult for project management and decision makers to get an overview of which requirements are actually being considered in the processing of the proposal. This can result in loss of information and lead to an error sequence that can extend from the purchasing of vehicles all the way to ongoing operation. Checklists, text documents and tables are simply not sufficient for collection and consideration of the variety of basic conditions, requirements and rules of a conventional request for proposal for an LRT project.

From Request for Proposals (RFP) to operation
This reduces opportunities, not only in the RFP process itself. In particular, after getting a network of routes, systematic requirements management can pay huge dividends for the transportation company. In the phase from commissioning to contractual provision of services the requirements must be observed if the contract shall be optimally managed. With a current and comprehensive basis for information, all corporate activities can be directed as conceptualized and calculated in the request for proposal.

However, in reality it turns out that when there is a change of responsible parties and employees the knowledge about the original concept and its requirements is lost. Along with commercial and technical difficulties with day to day operation, quite often the result is high contractual penalties, which place additional financial difficulties on operators.

specification	contract	development	production	commissioning	business

conditions	survey analysis specification	rating agreement	implementation verification decrease	maintenance warranty

manage	change	requirements management	validate	follow

Every project phase has different requirements, partly in constraints.
An end-to-end requirements management provides an overview.

Methodical minimum conditions

In light of these consequences the question arises as to which methodical minimum conditions should be applicable for requirements management. According to which criteria must requirements be analyzed and documented so that they can become a secure foundation for the following activities?

Beginning with contracts, to functional descriptions, the production of vehicles and their documentation, to ongoing operation, over and over again there are specific requirements that are dependent upon one another. However, over the entire term of the contract it must be ensured that all information about the respective status remains available. Who can reconstruct why specific regulations were made 15 years ago, when, for example the relevant employees left the company?

For this reason, it is also important to identify, formulate and keep available over the long-term all relevant requirements. To this end, the following items constitute a "best practice" from a variety of approaches found in the literature:

- each requirement gets a unique identity number as a reference
- arrangement into independent requirements that can be formulated in one sentence if possible
- active formulation according to the scheme:
  Who must do what under which condition?
- dependencies to other requirements, references, laws and sources are described
- the binding nature of a requirement must be defined:
  Must, should, can, must not ...

These methodical minimum conditions already improve the quality of the requirement documents. As a formal rule, merging text documents to a more transparent table structure has also proven effective.

„In everyday life, the knowledge about an original proposal´s concept and it´s requirements get lost with management changes or retirements."

Dipl.-Ing. Dirk Hellebrand, Certified Professional for Requirements Engineering (IREB)

Dirk Hellebrand used Polarion to administer requirements at TÜV Rheinland Intertraffic GmbH

Collaboration and traceability

This would seem to have exhausted the possibilities of requirements management with conventional means.

However, two important prerequisites have not been met:

- collaboration of a large number of internal and external employees on RFP projects must be made possible

- versioning of requirements must allow the traceability of the respective valid rules over years

That's why we recommend the methodical analysis and structuring of requirements in a software program for requirements management (RM), such as Polarion from Siemens PLM Software. Here users are automatically furnished with means and methods for seamless requirements management. Any data required by product or process can be added and administered. Data remain reliably preserved there in order to also support future processes.

As a web-based tool, Polarion RM supports fully integrated team collaboration. Without local installation, the software can be used by any registered project collaborator via a web browser. As is customary today, a large number of employees collaborate on one project from various locations. In so doing, they no longer have to wait for sequentially preceding steps to be taken. The software automatically keeps the data valid.

A history is automatically generated for each requirement and change, making all processing steps transparent and traceable at all times.

Effective requirements management over the entire lifecycle of the project

- As an exclusive innovation, Polarion **LiveDocs** makes it possible for you to have **simultaneous**, **secure** collaboration on specification documents, whereby every single segment remains identifiable and traceable.

- All specification documents are immediately made accessible to all other collaborators for testing, release or development.

- Simply import existing elements with the rules-based Import Wizard. It detects artifacts like requirements, test cases etc. contained in Microsoft® **Word** or **Excel**® and imports them to our modern, browser-based platform.

- Document **Round-trip** seamlessly imports changes made offline back.

- The built-in **ReqIF** allows a loss-free exchange of requirements and test case specifications with clients and suppliers.

- Invite collaborators to digitally sign specification documents before releasing them for production.

- **The uniform solution** for requirements and tests enables you to create test cases parallel to the requirements.

Practical experiences

A leading provider of consulting services for railway techno-logy uses Polarion in RFP projects. This starts with the analy-sis and review of clients' requirements specifications. These are imported from tables and text documents into the program. The requirements are identified, isolated and categorized. Comments or questions can be added using a commentary function. The possibility of having these comments processed by clients directly in the software saves time and avoids additional document processing. Answers are post-processed directly in the document. Analysis of requirements later provides the foundation for comprehensive lists and documents to requests for proposals and the bidding process.

The first gains in efficiency are already evident in the first days of application. Co-workers who used to require days or even weeks to merge requirements from various client documents now store the data in the software and generate lists as needed, simply by clicking a button! The time gained can be invested in other activities.

A large regional transportation authority in Germany implemented Polarion to invite proposals for new subways and streetcars. Some thousands of requirements were collected over several years and merged into individual documents. Many licenses of Polarion were used to meet the great need for coordination between Requirements Management, Technology, Purchasing and the Legal department. Here it was necessary, for example, to adapt requirements that presumably none of the vehicle manufacturers could meet. The change history was logged and the changes were made known at each level of collaboration.

„Co-workers, who needed days or even weeks to merge requirements from various client documents, now store the data in the software and generate lists as needed, simply by clicking a button!"

Dipl.-Ing. Dirk Hellebrand, Certified Professional for Requirements Engineering (IREB)

Conclusions

Theoretical considerations as well as results from practical experience show that transportation companies can create integrated requirements management through a methodical approach combined with a professional software program. Polarion not only helps you succeed in the request for proposal phase, but also enables you to successfully implement those proposals.

Increased efficiency, a goal often pursued in theory, becomes reality here. Employing this methodology and software in the phases of production and commissioning is the logical next step, since requests for proposals are only the beginning of a long lifecycle of the relevant vehicles and transportation contract.

If the administrative authorities stored their requirements in the appropriate software and made them available to transportation companies, they would gain a great deal of time to work up ideal concepts for the administrative authorities.

To sum up, integrated requirements management enables you to achieve significant results:

- substantial increase in documentation quality

- cost savings

- risk minimization

- high transparency for all collaborators

- unlimited traceability

- much easier collaboration

„Using Polarion for requirements management of a transport company has proven exceptionally fruitful during the entire preparation of the invitation for proposal documents – it was also used during the implementation"

Dipl.-Ing. Dirk Hellebrand, Certified Professional for Requirements Engineering (IREB)

Siemens PLM Software

Headquarters
Granite Park One
5800 Granite Parkway
Suite 600
Plano, TX 75024
USA
+1 972 987 3000

Americas
Granite Park One
5800 Granite Parkway
Suite 600
Plano, TX 75024
USA
+1 314 264 8499

Europe
Stephenson House
Sir William Siemens Square
Frimley, Camberley
Surrey, GU16 8QD
+44 (0) 1276 413200

Asia-Pacific
Suites 4301-4302, 43/F
AIA Kowloon Tower,
Landmark East
100 How Ming Street
Kwun Tong, Kowloon
Hong Kong
+852 2230 3308

About Siemens PLM Software
Siemens PLM Software, a business unit of the Siemens Digital Factory Division, is a leading global provider of software solutions to drive the digital transformation of industry, creating new opportunities for manufacturers to realize innovation. With headquarters in Plano, Texas, and over 140,000 customers worldwide, Siemens PLM Software works with companies of all sizes to transform the way ideas come to life, the way products are realized, and the way products and assets in operation are used and understood. For more information on Siemens PLM Software products and services, visit www.siemens.com/plm.

www.siemens.com/plm