

ProM@in



Task M2:

European RAMS Database -

First steps in Harmonising Data Categories

European RAMS Database - First step: Nordic demonstrator

Problem description

Utilisation of reliability data is an important factor in RAMS (Reliability, Availability, Maintainability and Safety) analysis and RAMS management. There are several dimensions to discuss wrt collection of RAMS related data. First we should ensure that we have appropriate data types to support the various types of RAMS analyses, e.g. quantitative risk assessment, human error analysis, approval of safety critical systems etc. Another important dimension is to ensure that data can support the life cycle perspective of a system.

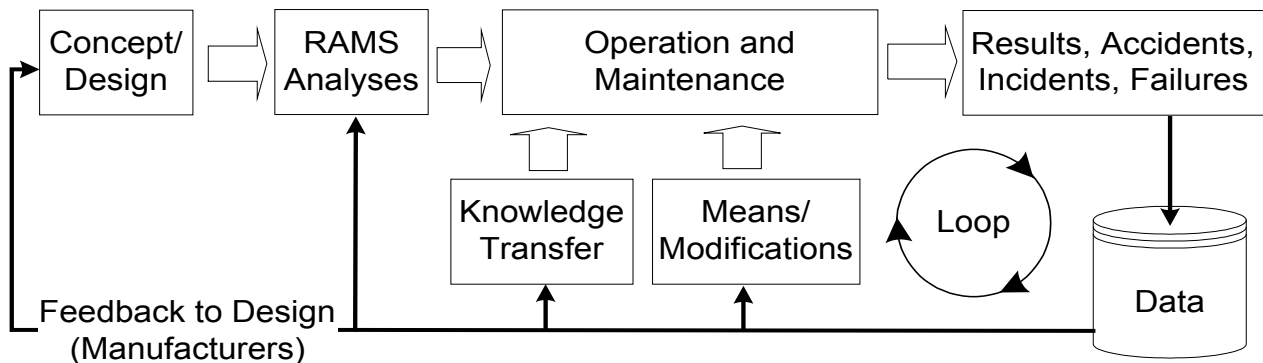


Figure 1: Use of experience (heuristic) data

Figure 1 illustrates the role of data in the life cycle perspective of a system. Most industries suffer from good data collection concepts that support and promote the various feedback loops in Figure 1. An objective of ProMain is to set a new standard at this area. For the railway industry it is also important to demonstrate that they have incident and accident reporting systems that comply with the requirements of the safety authorities. A very important question here is how data should be collected and analysed in order to verify fulfilment of the single fault principle and safety critical functions.

Goals and benefits

The goal is to establish a European database for RAMS analyses, which serves the needs of railway infrastructure owners and manufactures of railway equipment. The benefit of multinational collaboration on data collection has been demonstrated in e.g. the oil and gas industries. Case studies have been performed that especially demonstrate the benefits of good quality data when important decision about safety are to be made. With support from the data, simple and inexpensive solutions have proved to comply with the safety requirements. It is expected that similar benefits will be achieved also within the railway industry.

Since access to experience data is essential in RAMS analyses and RAMS management, the benefits of good data collection systems are obvious. The question is rather if it is beneficial to work towards a common European system. Some arguments for this are:

- better estimates for the reliability parameters due to more data,
- gives an operator in one country access to reliability figures for equipment that is in use only in other countries,
- feedback to manufactures of equipment may be more efficient, since all countries report in the same format,
- makes benchmarking easier, which helps each infrastructure operator to see his weak points compared to the "average",
- gives a sound basis for new European research and development projects to improve RAMS performance of equipment contributing most to RAMS problems, and
- a common European Accident database will be important for the safety authorities when new systems and solutions should be approved.

Approach offered by ProMain

The work is proposed to be organised in two phases, whereby Phase I could be viewed as a feasibility study financed by internal ProMain resources. If this succeeds, ProMain will work with external resources to continue into Phase II.

ProMain web database demonstrator (Phase I activity)

The ProMain web server using WebGenesis, is the natural environment for a database demonstrator. It should be kept simple, but advanced enough to offer a possibility to explore it and to simulate some tasks in order to test the userfriendliness in an easy way. WebGenesis will also be a platform for defining the requirements of such a database. It is expected that ProMain and a possible project launched by ProMain will be the drivers in the process of European requirements definition. However, it is important that the potential users continuously give input to this process. Important elements to include in the database demonstrator are

- what is in it now? This part of the demonstrator will exploit what really has been implemented in the ProMain prototype database as time goes by,
- what will come,
- task simulator which will allow the users (all railway stakeholders) to test the functionality of the ProMain database on the internet, and
- a site for feedback and suggestions.

The Nordic Pilot project (Phase I activity)

The ProMain objective is to work towards a European database standardisation. The realistic way to start this process is to start with a small number of infrastructure operators and gain some experience (pilot project). Since both Denmark and Norway are now working out more or less similar systems, it is therefore a ProMain recommendation to use the Nordic countries in such a pilot project. Important elements to include are

- survey the status within the different Nordic countries, investigate the possibility for harmonisation on concepts,
- investigate the possibility for sharing data (willingness to share data, pricing policies, etc),
- technical problems with sharing data, and data retrieval, and
- continuous presentation of the result on WebGenesis.

Working towards a common European database (Phase II activity)

If the feasibility study succeeds, the aim is to work towards a European dimension. It is expected that the Nordic Pilot project will have resulted in some fruitful concepts. Furthermore, the ProMain web database will have been in operation for more than one year, and European users will have given their comments, and suggestions. This will be important input to the work, but the detail planning of this activity should be postponed until completion of Phase I.

Deliverables

The Phase I deliverables will be the ProMain web database demonstrator and a report on the Nordic pilot.

Further information about this task

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