

## Go from Winning the Game, to Winning the Season

### *Increasing project performance and business value through adding Value Control in projects*

**Koen Schmitz MSc PVM TVM**

**Timme Hendriksen MSc CVS PVM TVM**

**Pieter Smit MSc**

Koen Schmitz has a Master's degree in Civil Engineering & Management (University of Twente, 2001) and is a Professional in Value Management (PVM) and Trainer (TVM). He is active as a Value Engineer for ProRail since 2005 and has led more than 20 Value Studies. Besides Value Engineer, he also works as a Senior Systems Engineer for ProRail. He is chairman of the National Certification Council Value Management and the Dutch representative in the European Governing Board (EGB) for Value Management.



Timme Hendriksen has a Master's degree in Industrial Engineering & Management (University of Twente, 2002) and is a certified Value Specialist (CVS), Value Manager (PVM) and Trainer (TVM). During the past fifteen years, he has introduced, built and still leads the ProRail Value Management programme with an active pool of 31 Value Engineers. Within DACE, he is a former member of the Board and past Chairman of the Value Management Society (SIG VM). He has led over 100 Value Engineering studies.

Pieter Smit has a Master's degree in Construction Management & Engineering (University of Twente, 2013). His graduation specialisation was Value Management and Systems Engineering methodologies. Since 2014, he is a certified Value Engineer and has led two Value Engineering studies and various workshops making use of Value Engineering tools. He currently works as Systems Engineer and Value Engineer at ProRail.



## Abstract

Are Value studies enough to ensure that *the organisation* receives maximum value for money? The answer is no. Research on the effectiveness of the ProRail Value Management programme shows all conditions for successful Value Studies are met, resulting in a lot of Value adding proposals. Unfortunately the full Value potential is not realised. To reach this potential, three aspects need to be addressed: 1) timing of the Value-interventions, 2) implementation of results and 3) a continuous focus on Value throughout the project-lifecycle, looking at a project from a business goal perspective. The management of Value needs to be an integral part of the project. Therefore we introduce Value Control as an addition to the Value Management Framework. In this paper we will first explain the ProRail context, then describe the research-results and finally introduce our proposal for Value Control.

## ProRail's Value Management history

ProRail is the manager of the Dutch railway network, one of the most heavily used railway networks of Europe. ProRail has over 4000 employees and spends around €2 billion/year to maintain and expand its network. ProRail receives a large share of its financing from governments and railway undertakings and is charged with using these resources responsibly.

Value Engineering (VE) was first applied in ProRail in 1999. This first Value study was so successful that Value Engineering was placed on a list of measures aimed at realising a 10% reduction in capital expenditures. The growth process that followed was hindered by the limited availability of VE expertise in the Netherlands. Indeed, the development of this expertise in the Netherlands went hand-in-hand with the growth process of VE at ProRail. ProRail has, for example, made a significant contribution towards setting up courses and certification, as well as the further strengthening of the Value Society in the Netherlands (DACE Special Interest Group Value Management). See Figure 1 for an overview of the development steps taken by ProRail in the field of Value Engineering.



Figure 1: ProRail's Value Management history

The application of VE at ProRail has over the years evolved from trouble shooting to a more proactive and programmed approach, and is currently moving towards a value-driven organisation.

The use of VE has yielded ProRail, and thus taxpayers, €500 million in potential savings with a Return on investment of 127:1. But the most important effect is the fact that VE contributes to shorter and integral project development, satisfied stakeholders and risk mitigation.

## Current Value Management programme

The Value Management programme at ProRail is managed by two Value Management coordinators, whose main task is to safeguard and expand the VM policy. In 2009 Value Engineering was made compulsory by the board of Directors for all projects above 15 million euro. Additionally, in 2010 it was included in ProRail's project management process at the moments shown below (Figure 2). Project managers are required to include Value Engineering in their project plan. Checks are done at stage gate moments to determine whether Value studies have been carried out.

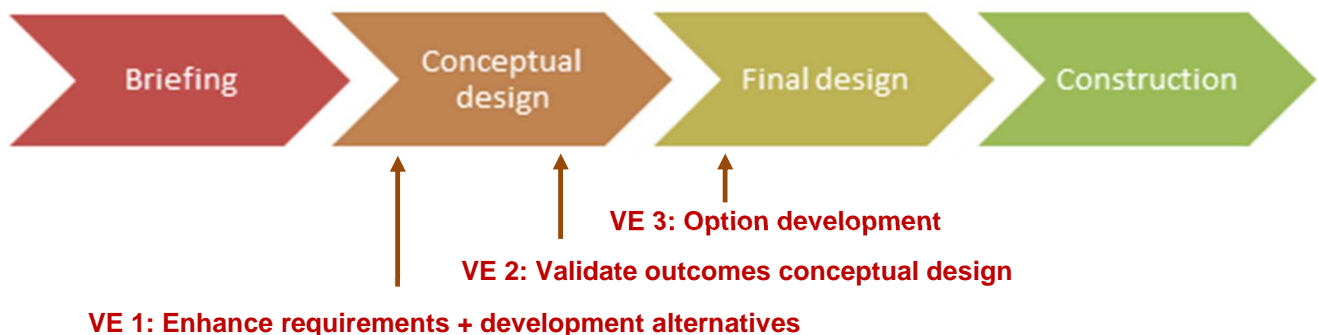


Figure 2: VE in ProRail's project management process

A significant part of policy implementation comprises the coordination of Value studies. This consists of the intake, capacity allocation, progress monitoring and quality assurance, but also the continuous improvement of the application. With respect to the improvement aspect, the VM coordinators make sure that each Value study is evaluated with the VE team, the client and the Value Engineers in order to improve the VE application and the skills of the Value Engineers. All insights are entered into a lessons learned database.

ProRail has an in-house pool of around 30 Value Engineers and performs 20 to 30 Value studies per year. Unlike the VM coordinators, Value Engineers only commit part of their time (10-20% of their working hours) to Value studies. They do this in pairs, usually in the form of master-apprentice. Annually about four new Value Engineers are trained.

## **Research on the effectiveness of the Value Management Programme**

Value Engineering has in the past 15 years become a fixed element of ProRail's project development process. Although the Value studies are practically always successful, it is also often concluded that they would have been more effective if they had been carried out earlier in the project development process. Moreover, it is often unclear what exactly is done with the outcome of the Value study. This makes it difficult to actually quantify the contribution of VE to ProRail's value creation process. Therefore it was decided to do research on the effectiveness of the Value Management programme and formulate proposals aimed at further improvement.

### ***Room for improvement: Value focus in projects***

The study started with desk research into what is understood under value management and which factors play a role in this. The following Key-factors for successfully managing Value were identified:

1. **Continuous focus on value:** A continuous focus during the generic project development process on the degree to which (maximum) value will be created for the client, the business owner or the organisation as a whole.
2. **Timely interventions:** The timely use of interventions by means of Value studies. The timeliness has a large impact on the ultimate value potential of a project. For instance, later initiation of a Value study leads to higher cost of implementing changes.
3. **Compliance with intervention conditions:** Compliance with the conditions for a Value study. The effectiveness of a Value study is to a large degree underpinned by conditions regarding the preparation, team composition and the execution of the study.
4. **Implementation of intervention results:** The deliberate implementation of the results of Value studies within the generic project development process. Deliberate implementation is required to prevent (part of) the effect of a Value study being lost.
5. **Supporting infrastructure:** The organising and coordinating of a Value Culture, training and continuous improvement within the organisation.

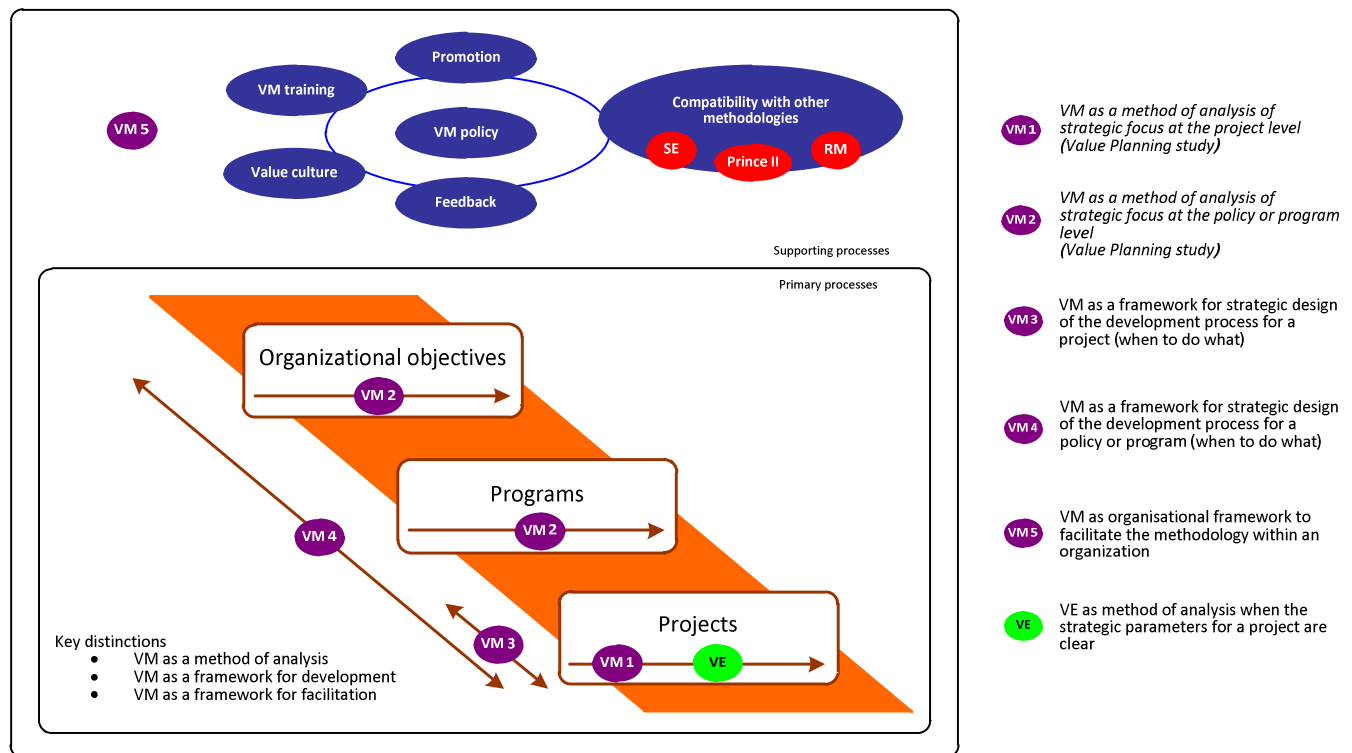
These factors formed the basis of a field study in which 22 interviews were taken at 6 different projects aimed at identifying the current constraints to Value Management. The field study identified the following constraints:

- Insufficient coordination within ProRail between the generic project development process and the Value study interventions. Restricting factors are the suboptimal timeliness (cost of change is too high) of the application and the implementation of Value study results.
- ProRail lacks an explicit value-driven approach within the generic Systems Engineering process. Systems Engineering is used at ProRail for the (technical) subject matter side of the project development process, whereby the approach is standardised in a guideline that applies to the entire Dutch civil engineering sector (ProRail 2009). Restricting factors are the too early and detailed setting of requirements, the lack of flexibility in expressing the required functionality and the absence of an explicit connection between business and project goals.

The problems identified by the field study concern the lack of *steering possibilities* in terms of value during the generic project development process of ProRail and the value creation process itself. For this reason, it has been decided to develop a structure for the timely use of interventions to improve steering towards value (creation) within Systems Engineering.

## A new Value Management Framework

Based on the above findings from the field study, a new structure was created for the management of value (creation). Value Management can be applied at various organisational levels: an organisation such as ProRail has organisational objectives, which are translated into programmes, which subsequently take the form of projects (see Figure 3).



**Figure 3: 5 types of Value Management**

The forms of application in figure 3 can be bundled into three clusters of Value Management:

1. **VM as an intervention:** this cluster consists of VM 1, VM 2 and VE. These all involve interventions in the form of Value studies, although the studies are different in type and take place at different organisational levels. The generic (VM) job plan is the same in all cases.
2. **VM as part of the generic project development process:** this cluster consists of VM 3 and VM 4 and concerns the organisation of the generic project development process with a continuous focus on value.
3. **VM as supporting the value creation process:** this cluster consists of only VM 5, in order to embed and support the primary value creation processes of VM 1 to VM 4 within the organisation.

In order to create a complete framework for value management at ProRail, these 3 clusters of Value Management were integrated into a single framework: (1) maintaining focus on value during a generic project development process (**Value Control**), (2) the effective use of interventions (**Value Studies**) and (3) an organised support infrastructure to embed value creation processes within the organisation (**Value Embedment**) (See Figure 4). This framework is based on the European standard EN12973: Value Management.

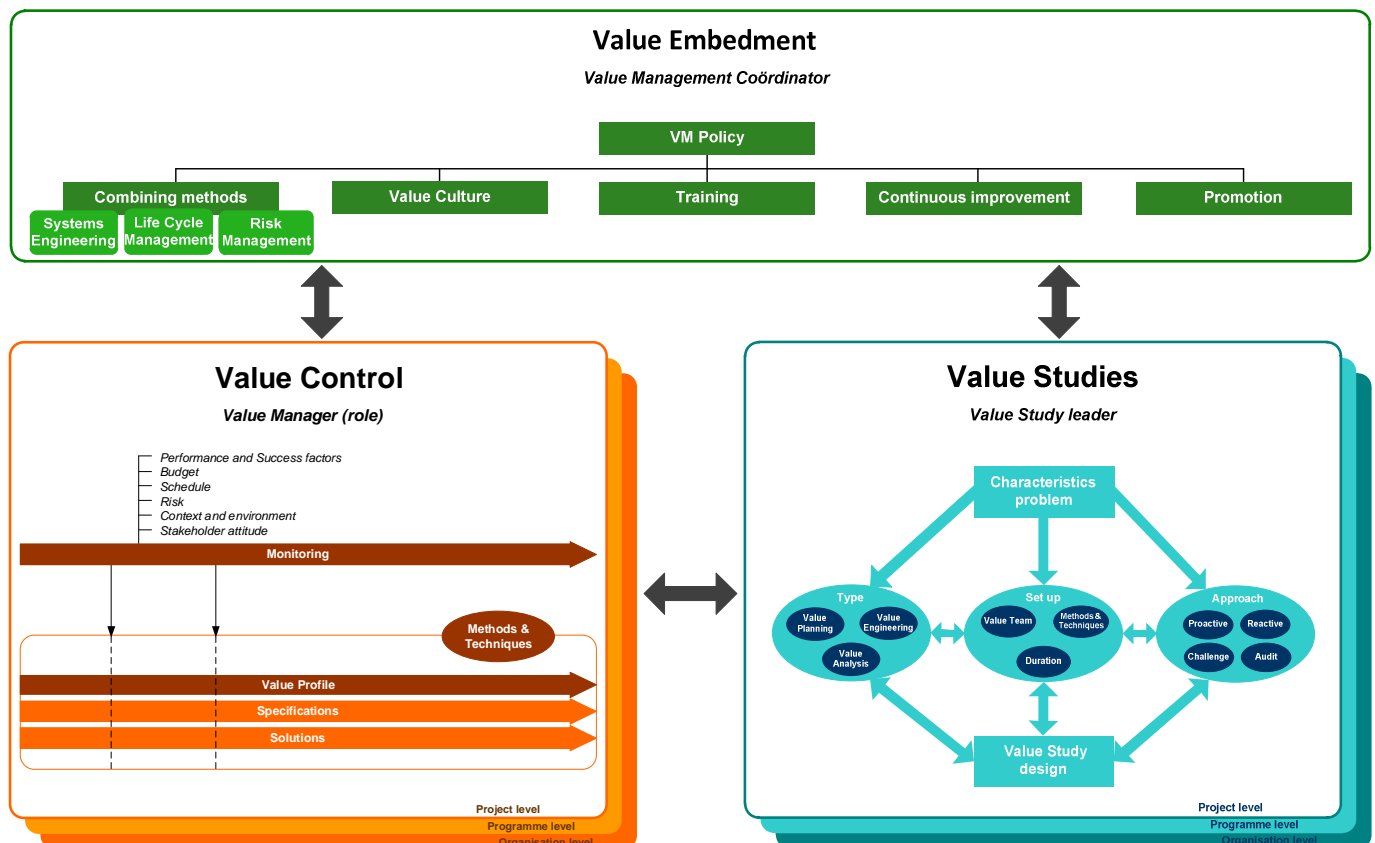


Figure 4: ProRail's Value Management framework

The clusters Value Embedment and Value Studies are already present within ProRail. In the next paragraph we will elaborate on Value Control.

### Value Control: Continuous focus on value

Value Control is the recording and monitoring of the value of a project, during the duration of a project, with the addition of the following elements to a project:

- **Value Manager:** A role in a project (or programme) that (also) organises and coordinates the value creation processes.
- **Value Profile:** The description of what a project or system should essentially do, how well it should do it and within which bandwidths.
- **Value Monitoring:** Monitoring whether the project requirements and solutions (in the form of designs) comply with the Value Profile.

### Value Manager

Assigning a Value Manager to a project forms the first addition to the current VM process at ProRail. This role does not exist at present. The current ProRail Value Engineers partly fulfil these roles in their projects on which they work, when they are not conducting Value Studies.

The Value Manager can then assume responsibility for the following matters:

- Drawing up a Value Profile for the project
- Periodically validating the Value Profile with the Business Goals
- Strategically designing of the deployment of Value (Engineering) Techniques and Studies within the project
- Validating the design in case of important decisions based on the Value Profile
- Monitoring the implementation of Value Study results
- Reporting his or her insights to a higher organisational level such as the Business Owner

There can be a conflict of interest between the role of a Value Manager and the other members of the project team. The project team is assigned to delivering a defined scope within set constraints of time and money. A Value Manager might find it necessary to explore options which might fit the organisations (changing) business goals better, but which introduce new uncertainties for the project schedule and budget. Therefore a Value Manager is preferably well connected to the project team, but not an integral part of it.

### Value Profile

When recording the scope of a project in (system) requirements, a Value Profile is leading. The Value Profile describes what a project or system should essentially do, how well it should do it and within which bandwidths. See Figure 5 for an example.

	Criterion	Unit of measurement	Bandwidth	Target level
	Which criteria define project success?	In which way can this be measured and in which units?	Min & max levels	Target level
Goals	Sufficient deployment capacity	# Number of railcars that can be set up in a 24 hour period taking into account efficiency losses	170 - 200	175
	Sufficient servicing capacity	# Number of railcars that can be serviced in a 24 hour period taking into account efficiency losses	170 - 200	175
	Available on time	Realization date (year)	2018 - 2022	2018
	Improve efficiency processes NedTrain	The means Nedtrain has to give up (budget/personel) to service a railcar (€/railcars ( 1= current situation; 3 = very efficient [expert judgment])	1 - 3	2
	Minimize management costs	The average means that need to be given up annually (budget) to maintain performance at a certain level (€mln/year)	0 - 1	0.5
	Ability to deploy railcars during realization	Minimum railcar deployment capacity during realization per 24 hours	140 - 170	140
	Ability to service railcars during realization	Minimum railcar servicing capacity during realization per 24 hours	140 - 170	140
Limitations	Positive cost/benefit balance	# Mln € for total project (to achieve the required capacity)	12-16	14
	Meet environmental needs	# dB sound emission with direct deployment.	50-55	50
	Availability of train services	Degree to which train services are being obstructed by in/out flux of deployment & servicing area for railcars. 1= current situation, 3 = no obstructions) [expert judgment]	1-3	2

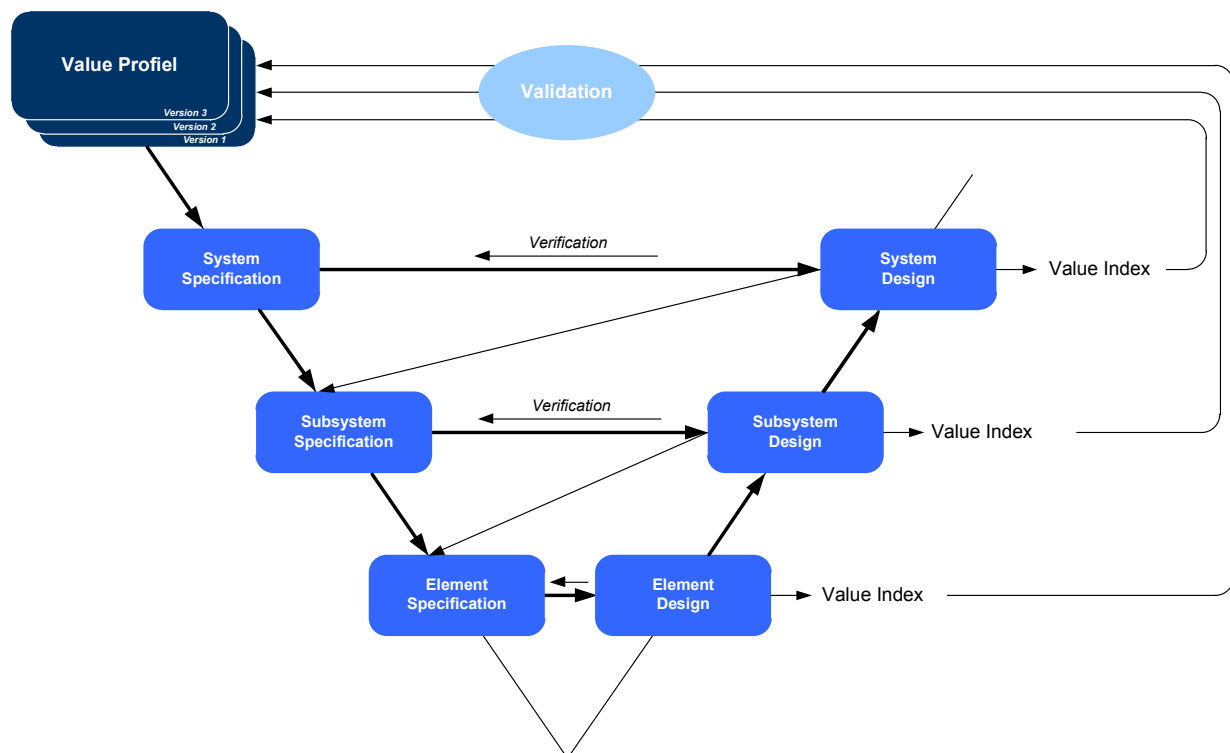
Figure 5: Value profile example

After each design phase or -change, the design is validated against the Value Profile to determine whether the project produces the desired Value (Value Index). Based on this assessment, the project scope can be adjusted. Due to progressive insight, a Value Profile can be adjusted (several times) within a project development process. The Value Profile can be adjusted if it appears, for example, that a significant amount of resources is required to maintain a specific function. The Value Profile must be included in the description of the project requirements (What are we designing?) and in the Business Case (Why do we invest?). Using a Value Profile yields a continuous focus on value as well as provides a link between the Business Case and project requirements.

An important precondition for producing a substantiated and realistic Value Profile involves the performance of a synthesis prior to determining the Value Profile. A synthesis (sketches, designs) not only expresses the desirability of a requirement, it also gives insight into the feasibility and value ratio of that requirement. For that reason, a project should undergo a Value Study before the Value Profile is drawn up/validated. Ideally the creation of a Value Profile should be a result of the Value Study.

### Value Monitoring

Value Monitoring is the third addition to the current VM process of ProRail. Designs generated during the project development process are compared with the Value Profile (see Figure 6). The degree to which a design performs on the Value Profile is defined in a Value Index. If the Value Index of a design deviates from the bandwidth of the Value Profile, a Value Gap (APMG, 2010) arises. As part of the project development process, various reflections are carried out to determine whether further refinement of the Value Profile is required.



**Figure 6: Incorporating Value Monitoring in Systems Engineering**

The Value index indicates how well the project currently performs on the Value Profile and moreover gives insight into the factors that influence the success factors, such as money, time and risks, as well as the external context and stakeholder relationships. The most important function of a Value Index is

to give insight into the status of the project and alert when certain interventions are required. Moreover, the dashboard can identify opportunities that lie outside the project framework and present these to the decision-makers. For example, A client decided to accept a lower speed on part of the tracks to create space for a the train station with a better connection to the nearby city center.

Value Monitoring can also be used by a higher authority than project management, such as the business owner, to give an instruction for a Value Study. This creates the possibility at both organisation and programme level to reallocate resources over projects, or indeed to cease projects altogether.

## **Winning the season**

We are now winning games. Value studies do deliver impressive results for the ProRail organisation. But we are far from winning the season. Therefor we need to make sure that projects have a continuous focus on the Value in order to increase the value creation of the organisation as a whole. A significant adjustment of the ProRail organisation is required, whereby it will take a number of years before the process is satisfactorily completed. For further decision-making on the basis of value and in order to integrate Value Control within the project development process it will be necessary to not only acquire support within management and the Systems Engineering department, but also to develop the associated working practices and expertise.

ProRail is, however, already running several pilots at project level on working according to the new VM framework. The success stories and examples from these pilots are necessary to boost further implementation in the organisation. The first experiences are highly promising in the sense that VM greatly accelerates project development processes and delivers better coordination between stakeholders. We also observe that the results of the Value Studies are being taken into consideration at an even higher level of decision-making in order to achieve an optimal balance between objectives and resources.

Based on this experience we definitely recommend you to explore the added Value which Value Control can have for your organisation.

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