

Towards the Best Value Tender: the SMART Assessment Tool

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SMART formulation is an essential aspect of the Best Value philosophy to demonstrate performance, evaluate proposals and is required for the continuous improvements within organizations. Based on an evaluation of projects that have been tendered with the BVP award mechanism, it was concluded that both for the tender documents, as the interviews in the procurement process, SMART formulation allows for significant improvement. This study proposes the SMART assessment tool, which is a straightforward and effective method to assess tender documents on their degree of SMART formulation and is illustrated by application on the studied tenders.

Keywords: Best Value Procurement, BVP, private party's perspective, SMART assessment tool, the Netherlands.

Introduction

This study is based on the master thesis "*Towards the Best Value vendor – a study to BVP tenders from a private party's perspective*" (Booij, 2013) and contains an abridged version of the research to and the development of the SMART assessment tool. The graduation research is part of the final graduation at the Delft University of Technology and has been carried out with the support of engineering firm Royal HaskoningDHV.

In 2009 Rijkswaterstaat, the executive body of the Dutch ministry of Infrastructure and Environment, first introduced Best Value Procurement (BVP) (Kashiwagi, 2004) in the Dutch construction industry. Rijkswaterstaat applied the BVP award mechanism for the accelerated realization of the so-called emergency approach of thirty road expansion projects in the Netherlands. The main objective of the emergency approach was to start all road projects before May 2011 and to complete at least ten out of thirty road projects before May 2011.

In a letter to the chairman of the Dutch parliament, the Dutch minister of Infrastructure and Environment, Melanie Schultz van Haegen, presented the final outcomes of the emergency approach: 28 out of 30 projects have started and 16 projects have been completed already. Although the objective has not been attained entirely, the project nevertheless can be called a success. (Dutch ministry of Infrastructure and Environment, 2011)

These satisfying results have stimulated Rijkswaterstaat to put more projects on the market in the future and also within private organizations in the Dutch construction industry the BVP award

mechanism has been received positively. Subsequently, also Royal HaskoningDHV realizes that the BVP mind-set must be implemented within their organization and further research is needed to investigate opportunities to improve their performances.

In the search for these opportunities, three projects have been investigated for this study in which both Rijkswaterstaat and Royal HaskoningDHV participated, resp. as the client and the (potential) vendor. The projects in the case study are all concerned with the plan study phase (i.e. not the realization phase) of hydraulic projects, i.e. (1) *additional drainage capacity Afsluitdijk* (2010), (2) *third lock Beatrix lock system* (2012) and (3) *exploration reinforcement Houtribdijk* (2012).

As part of the case study interviews have been conducted with team members that have been involved in these projects from both a client and vendor's perspective (i.e. Rijkswaterstaat and Royal HaskoningDHV). In addition also the tender assessment of Rijkswaterstaat, including the assessment of the RAVA-plan (i.e. risk assessment – client, risk assessment – vendor and the value added) and the interviews, has been evaluated. In these documents Rijkswaterstaat elaborates more extensively on the grades that have been awarded to the tender documents and the interviews with the key figures of each vendor (here: Royal HaskoningDHV).

Resulting from a thorough analysis on the tender assessments of Rijkswaterstaat and the interviews, it turned out both client and vendor acknowledge SMART formulation as the point of attention with the most potential for improvement. Out of thirteen points of attention SMART formulation is indicated most frequently as a pitfall for the composition of the tender documents and the interviews. Subsequently, it is concluded that an assessment of SMART formulations should be investigated more extensively to improve the tender documents and the interviews as part of the Best Value Procurement award mechanism.

SMART Formulation

The term SMART is often applied in several industries for many purposes. Subsequently, there are found various abbreviations for the SMART acronym. For example, in an article on software engineering the following variations of the abbreviation are found, i.e. Significant, Motivational, Achievable, Reasonable and Traceable (Mannion & Keepence, 1995). In the latest edition of the book "*Prestatieinkoop - met Best Value naar succesvolle projecten*" (Rijt & Santema, 2013), which is the Dutch equivalent of Best Value Procurement (Kashiwagi, 2004), the following abbreviation is found: Specific, Measurable, Ambitious, Realistic and Time-bound. Although different abbreviations are found and used, the essence of the SMART conditions is to provide clear answers, actions and prevent the use of ambivalent statements that lead to misunderstanding in the project execution and ineffective use of project resources.

This study concerns assessing the BV tender documents of engineering firms for public planning phase tenders by the SMART conditions. Although for consistency and unambiguity, it would be practical to use the same abbreviation as suggested in BV related literature (i.e. *Prestatieinkoop*, presented above), an alternative interpretation is applied. This interpretation is selected to prevent confusion on how the individual terms within SMART should be used which would have made testing and evaluating the tender documents impossible.

Hence, here the following interpretation of the acronym is applied:

1. Specific.
2. Measurable.
3. Attainable.
4. Relevant.
5. Time-bound.

Interpretation of the SMART Conditions

Both client and vendor address the SMART formulation of the tender documents as an important aspect with potential for improvement. Although frequently mentioned in both tender evaluations and interviews, both client and vendor use multiple interpretations of the SMART acronym. Especially for the client, the challenge and ambiguity to formulate SMART risks and mitigations in tender documents and interviews is one of the reasons why this term is often mentioned in tender evaluations as one of the main potential improvements. In order to create common understanding of the conditions of the SMART acronym in the assessment of the tender documents, these conditions are put under the microscope separately in the following paragraphs.

Condition 1: Specific

The term specific answers the *what*-question for the client; what is described for the client to assess. It is often thought that specific is about describing the mitigation or exploitation at a low abstract level or about informing the client in (technical) details. For Best Value tenders this is not where specific is about. Too detailed information is irrelevant for the client in the assessment of the tender documents. (Kashiwagi, 2004) The client is not interested in *how* the vendor aims to achieve his proposal, the client is interested in *what* to expect from the vendor. Specific is about the *what*-question in order to make clear what measures are undertaken in order to mitigate the risk or to exploit the opportunity.

Aspects that contribute to focus the ‘what’ of the mitigations and exploitations are clear formulation of measures to prevent ambiguity and multiple interpretations and consistency. It is of importance to be consistent in the use of terminology throughout the tender documents. A simple example: do not use the terms ‘vendor’ and ‘contractor’ interchangeably, but use one of them consistently instead. (Mannion & Keepence, 1995)

Condition 2: Measurable

The term measurable provides the means to test the statement for both the client and the vendor, this is essential to assess the proposals and required for the metrics needed for Best Value projects. In the assessment of the mitigations and exploitations two aspects are taken into account regarding the measurability. First, the measures need to be accompanied with metrics, i.e. the correct quantity and its associated unit. Adding figures and units to each measure makes it possible to verify whether or not each of the measures has been accomplished and to obtain a picture of the vendor’s experience.

Second, the measurability of each measure should be demonstrated. The demonstration and underpinning of mitigations or exploitations is conducted with measurable performance information, which indicates the vendor's experience with the particular measure in previous projects. Here, at times indistinctness arises over the nature of the experience, i.e. (1) the experience of the involved key figures or (2) the experience of the entire company. Both types of measurable performance information are relevant for the client and thus vendors are allowed to apply both types of underpinning to make mitigations and exploitations measurable.

Condition 3: Attainable

The third condition may be interpreted in two ways. Attainability is often understood as the practicality of the measures, i.e. is the vendor able to execute the proposed action? This question is considered to be irrelevant, since the vendor is not likely to offer a measure that cannot be lived up to. In this study the interpretation of the attainability of a measure is defined in line with the feasibility of the measure, e.g. is the mitigation sufficient to prevent the risk from happening? Or is this opportunity ensured with this exploitation? The latter interpretation of the condition *attainable* is related to effectiveness of the measure. In the SMART assessment the attainability is applied in the sense of the effectiveness of the measure. (Mannion & Keepence, 1995)

Condition 4: Relevant

The condition relevant answers the *why*-question for the client and links the measures with the project objectives described by the client in the tender documents. The mitigation of a risk or the exploitation of an opportunity, defined by the vendor, has to be coupled to at least one of the project objectives, because a risk that does not affect one of the client's objectives, it simply is not a risk for the project. Similarly, an opportunity that does not contribute to one of the client's objectives is no opportunity for the project.

In addition, the priority of the objectives and the risks or opportunities should also be taken into account. When a risk concerned with the main project objective of the client, is indicated as the least important risk by the vendor, the interpretation of the vendor and the client do not correspond. Whenever this might occur, this could lead to a less favorable evaluation for the vendor's proposal.

Besides the link with the projects objectives, the condition relevant is also concerned with the abstraction level at which the mitigation or exploitation is defined. As already mentioned under 'specific' the client in a Best Value tender is not interested in too detailed (technical) information. The client expects the vendor to be an expert and thus know best how to accomplish these measures. Concerning the relevance, the client is interested in the *why*-question instead, i.e. why is a particular measure adequate to mitigate a risk or to exploit an opportunity?

Condition 5: Time-bound

The condition time-bound answers the *when*-question of the measure and is concerned with time. If a measure is related to a risk or opportunity that affects the schedule of the project, then the

delay or acceleration has to be mentioned explicitly. Besides that, it is possible a measure does not affect the premise time, but the measure does contain a phase of the project or the duration of an action that has to be executed. In that case, the associated period of time also has to be added to the measure to make sure the time-bound condition is met. This could be subsumed under as the *when*-question.

It is conceivable that a particular measure is does not affect a time-bound objective of the client, nor contains any other time-bound aspects. Subsequently, the time-bound condition is simply not applicable for the measure at stake. In that case, the measure is awarded with a score one to prevent the average score of the concerned measure declines without a valid reason.

The SMART Assessment Tool

Distance is measured in miles or kilometers and temperature in degrees Celsius or Fahrenheit. But how to measure SMART conditions in the mitigations and exploitations of the RAVA-plan or in the answers of the key figures during the interviews? For the quantification of the SMART conditions an empirical system has to be mapped onto a mathematical system. With the introduction of a scale it is possible to make the SMART conditions measurable. A scale consists of a minimum and a maximum value and makes it possible to apply mathematical operations on the obtained numbers. (Gunsteren & Binnekamp, 2011) Likewise, these metrics can also be used to underpin mitigations and exploitations with measurable performance information for the composition of future tenders.

Quantification of the SMART Conditions

The descriptions of the five conditions serve as the starting point for quantification of the SMART criteria. Every SMART condition is mapped separately onto a mathematical system with a scale from null to two. Here, a null score corresponds with a *bad* and a two score with an *excellent* appreciation. A score one resembles a *neutral* appreciation or is *not applicable* (N.A.) for the particular measure. The above is shown in table 1 for the condition *specific*. Successively, there is created a scale that maps the empirical system on a mathematical system and thus it is allowed to perform calculations with the obtained scores, e.g. adding up the separate scores on every condition to determine the total SMART score on each measure.

Table 1

Mapping an empirical system onto a mathematical system

Example condition ‘specific’	Appreciation	Score
Specific	Excellent	2
Rather specific	Neutral / N.A.	1
Not specific	Bad	0

The scores on the condition *specific* are visualized as slices of a pie chart (Figure 1). When mitigations are rated as *not specific*, it receives a score null and the entire slice of the condition specific is left uncolored. Mitigations that are rated *neutral* (or are considered not applicable) are rewarded with a score one and half the slice is colored (here: light blue). Finally, when

mitigations are rated as *specific* the full score of two points are awarded and the entire slice is colored (here: bright blue). Note that besides coloring the slices, also the darkness of the slices increases with the scores.

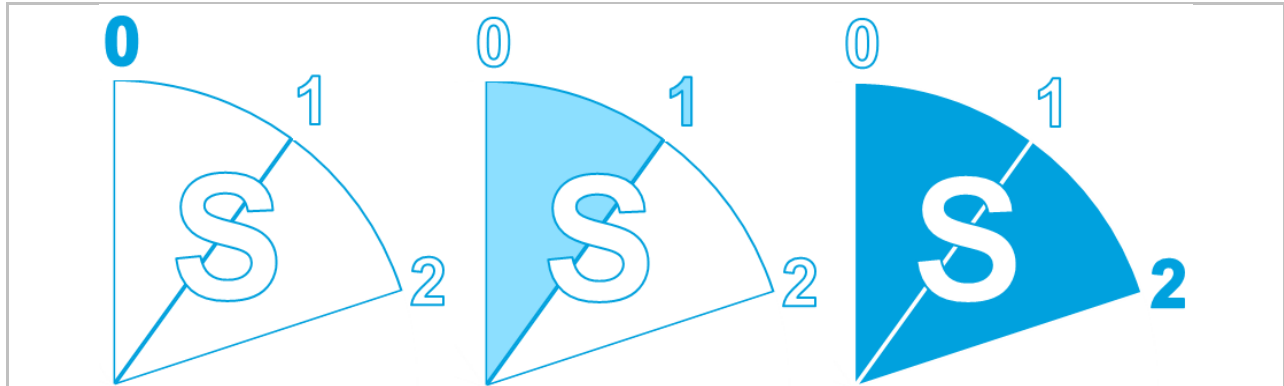


Figure 1: visualization of the mathematical system for the condition *specific*.

This visualization is also applied for the other four conditions, of course indicated with different colors. Together these slices form the SMART assessment tool (see figure 2). A maximum of two points can be earned for each SMART condition, i.e. specific, measurable, attainable, relevant and time-bound. When the separate SMART scores are added up the overall SMART score is obtained. A measure that has been awarded with a 100% score on every SMART condition achieves the maximum overall SMART score of ten points. Similarly, one point earned for the condition *specific* corresponds to a 10% overall SMART score.

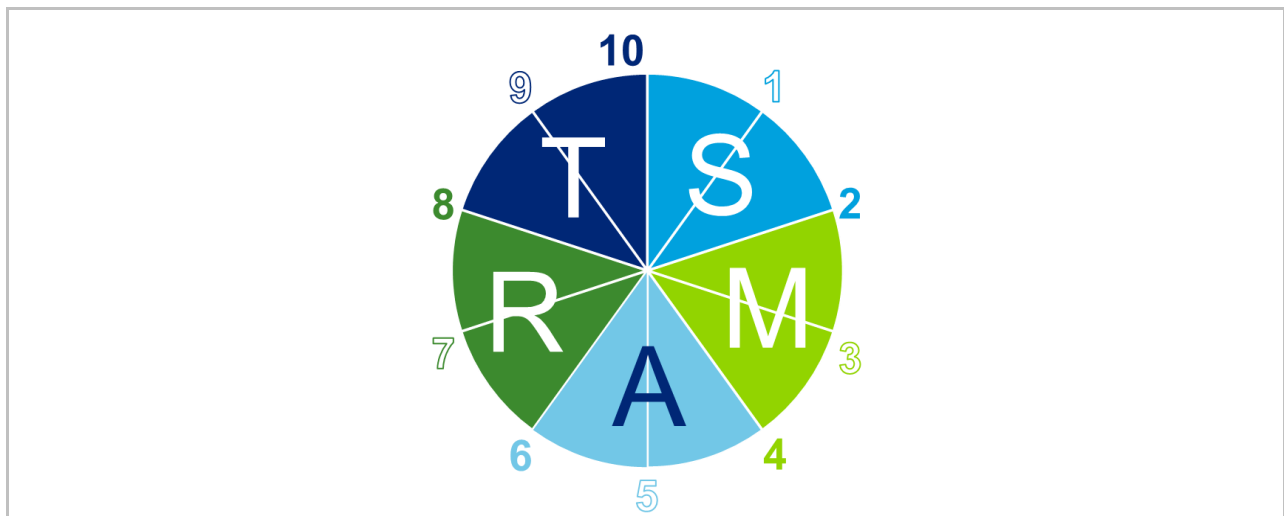


Figure 2: the SMART assessment tool.

Put the SMART Assessment Tool to the Test

It is often heard that measurement of quality criteria, like SMART conditions, are all that subjective. Indeed, that remark is entirely true, since measuring preferences is by definition

subjective, because the underlying system of the measurement is dependent on the person. However, a possible solution for subjectivity can be found in objectivity by multi-subjectivity (Verheul, Rydell & Santema, 2013). The more individual peer reviews are taken into account, the less subjective (or the more objective) a qualitative measurement will be. This also applies to the SMART assessment tool.

To illustrate the potential of the SMART assessment tool, a SMART assessment has been carried out for one of the tenders in the case study under the guidance of qualified supervisors. Because the assessment is executed only once the scores are not objective. The assessment is intended to illustrate the applicability of the SMART assessment tool for a vendor's tender team and offers a more detailed insight in the formulation of the mitigations and exploitations of the RAVA-plan. For confidentiality, the original RAVA-plan (or tender documents) that have been assessed is excluded from this paper.

During the SMART assessment the original mitigations and exploitations of the RAVA-plan are scored for each of the five conditions and an explanation is given to substantiate these scores. After the SMART assessment of the original RAVA-plan, these tender documents are need to be reformulated and the measures improved. The SMART assessment tool provides concrete actions and even text suggestions for this matter. Suggestions are formulated to illustrate how the assessed mitigations and exploitations can be formulated in a more SMART way. Subsequently, also the suggested formulation of the RAVA-plan is put to the test with the SMART assessment tool. Hence, both the original and suggested formulations are awarded with a SMART score and the differences and similarities become apparent.

Reflection on the Results of the SMART Assessment

In the previous sections it is explained how the SMART assessment tool has been applied for the assessment of the original tender documents of Royal HaskoningDHV and also for the suggested tender documents for the improvement of the SMART formulation. Now, it is time to compare these two with one other in order to illustrate the effects of the SMART assessment tool. Besides that, it also indicates the strengths and weaknesses of this particular RAVA-plan and offers insight in the potential improvements for each of the SMART conditions.

The scale to measure the SMART-ness of the measures, allows to perform calculations with the obtained numbers. First, the results of the SMART assessment of the original tender documents are evaluated and secondly this is done for the results of the suggested tender documents.

Original formulation

Table 2 shows the average scores on every single SMART condition for each mitigation (or exploitation) in the three tender documents of the RAVA-plan. The SMART conditions are listed horizontally and the tender documents are listed vertically. The columns below each condition are subdivided into two separate columns, in which the left column lists the average score of the tender document on every single SMART condition (indicated as the average score X out of the maximum score of two). In the right column the average scores are expressed as percentage of the maximum score. In the most left column the overall SMART score is calculated for every

tender document and in the bottom row the weighted average per for each condition is determined.

Table 2

Average SMART scores of the original formulation of the tender documents

Document	SMART condition									
	Specific		Measurable		Attainable		Relevant		Time-bound	
	X / 2	[%]	X / 2	[%]	X / 2	[%]	X / 2	[%]	X / 2	[%]
1. RA client	1,33	66,5	0,22	11,1	1,22	61,1	1,67	83,3	1,0	50,0
2. RA vendor	1,28	64,0	0,71	35,7	1,14	57,1	1,57	78,6	0,57	28,6
3. VA	0,33	16,7	0,33	16,7	0,00	0,0	0,33	16,7	1,0	50,0
Weighted average	1,15	57,7	0,42	20,9	1,00	50,0	1,42	71,1	0,84	42,1

What do the scores in table 2 actually tell? Again, the condition *specific* is taken as an example. It is seen that the two risk assessments (client and vendor) score approximately the same, but that the value added document is rewarded with a much lower grade. This is the document to blame for the lower score on the weighted average. It has to be noted that the weighted average is calculated by adding up the separate condition scores for each measure, divided by the total number of measures.

For each tender document the performance on the SMART conditions are indicated and the weighted average represents the scores of the entire proposal. In table 3 the lowest and highest scoring conditions are derived from table 2 and the overall SMART scores are expressed in the most right column. Apparently, the measurability is the biggest pitfall in the SMART formulation of the measures in this particular RAVA-plan. The least difficulties are experienced with the relevancy, since this is the highest scoring condition in the assessment. With an overall SMART score of 48,4% the documents of the RAVA-plan has earned approximately half the points that could have been acquired in the SMART assessment.

Table 3

Results of the SMART assessment of the original formulation

Document	Lowest scoring condition	Highest scoring condition	Overall SMART score	
			X/10	[%]
1. RA client	Measurable	Relevant	5,44	54,4
2. RA vendor	Time-bound	Relevant	5,29	52,9
3. VA	Attainability	Time-bound	2,00	20,0
Weighted average	Measurable	Relevant	4,84	48,4

Suggested Formulation

In table 4 the average SMART scores of the suggested formulation of tender documents are shown. The table must be interpreted in the same manner as table 2.

Remarkably, not all the scores of the suggested measures are awarded with the maximum number of points that can be acquired. Why are the suggested improvements not formulated in such a way that these are one hundred per cent SMART? First of all, simply not every SMART condition is applicable for each mitigation or exploitation. Secondly, this is also a result of the subjective nature of the SMART assessment. In another peer review someone could have examined the measures in a different way and would have suggested other improvements.

Table 4

Average SMART scores of the suggested formulation of the tender documents

Document	SMART condition									
	Specific		Measurable		Attainable		Relevant		Time-bound	
	X / 2	[%]	X / 2	[%]	X / 2	[%]	X / 2	[%]	X / 2	[%]
1. RA client	1,78	88,9	2,00	100	1,67	83,3	1,89	94,4	1,44	72,2
2. RA vendor	2,00	100	2,00	100	1,71	85,7	2,00	100	2,00	100
3. VA	2,00	100	2,00	100	1,67	83,3	1,33	66,7	1,67	83,3
Weighted average	1,90	94,8	2,00	100	1,68	84,1	1,84	92,1	1,68	84,1

In table 5 the best and worst performing conditions are shown for the suggested formulation of the tender documents. The lowest score in the original RAVA-plan is a zero score on the condition *attainable* (see Value Added, table 2). Here, the lowest scoring condition in the suggested formulation is the *relevance* with a score of 1,33 (see Value Added, table 5). Furthermore, table 5 shows that the lowest scoring condition in the original formulation has become the highest scoring condition in the suggested formulation, i.e. measurability.

Table 5

Results of the SMART assessment of the suggested formulation

Document	Lowest scoring condition	Highest scoring condition	Overall SMART score	
			X/10	[%]
1. RA client	Time-bound	Measurable	8,78	87,8
2. RA vendor	Attainable	Specific, Measurable, Relevant, Time-bound	9,71	97,1
3. VA	Relevance	Specific, Measurable	8,67	86,7
Weighted average	Attainable, Time-bound	Measurable	9,11	91,1

Conclusion

In the final step of the SMART assessment the percentage scores of the SMART conditions are compared with one other in table 6. Potentially, the overall SMART score of the RAVA-plan at hand can be improved from an insufficient to neutral score (48,4%, see table 3) to a good to excellent score (91,1%, see table 5). This comes down to a potential improvement of the overall SMART score of 42,7 percent point. The table below shows a breakdown of the overall SMART scores of the original and suggested formulations for the separate SMART condition.

Table 6

Comparing the original and the suggested SMART scores

Weighted average	SMART condition				
	Specific	Measurable	Attainable	Relevant	Time-bound
Original	57,7%	20,9%	50,0%	71,1%	42,1%
Suggested	94,8%	100%	84,1%	92,1%	84,1%
Difference	+37,1 p.p	+79,1 p.p	+34,1 p.p	+21,0 p.p	+42,0 p.p

Note. The difference between the original and suggested scores is expressed in percentage points (p.p.)

Table 6 clearly shows the SMART condition with the most potential for improvement is the condition measurable (+79,1 p.p.). Largely, this is due to the fact that the measures are insufficiently underpinned with measurable performance information from comparable projects in the past. According to this SMART assessment, the condition that should be least worried about is the relevance of the measures. Apparently, the mitigations and the exploitations of the risks and opportunities are well connected to the project objectives. Most important aspect here is to keep in mind to mention explicitly to what objectives the defined measures are coupled.

Furthermore, the conditions *specific*, *attainable* and *time-bound* have approximately the same order of magnitude regarding the potential for improvement. Although the differences are somewhat alike, it has to be noted that the *specific* score of the suggested formulation is over 10% higher than the *attainable* and *time-bound* scores on the suggested formulation. The first can be attributed to the fact that the attainability is related to the content of the measures and therefore cannot be improved by a non-expert that easily. The second can be attributed to the fact not every measure can be directly coupled to a particular moment in time and therefore is indicated as *not applicable* and is rewarded with a neutral score.

Although the SMART assessment tool has only been applied on the tender documents for one of the projects in the case study, it can also be applied for assessment of the interviews. This way, key figures have the opportunity to improve the SMART formulation of their answers, e.g. during rehearsal interviews.

References

Booij, A. (2013). *Towards the Best Value vendor: a study to BVP tenders from a private party's perspective*. Delft University of Technology, the Netherlands.

Gunsteren, van, L. & Binnekamp, R. (2011). *Stakeholder-Oriented Project Management*. Delft: IOS Press.

Kashiwagi, D.T. (2004). *Best Value Procurement: how to use information systems to minimize risk, increase performance, and increase efficiency*. Tempe: Performance Based Studies Research Group.

Mannion, M., & Keepence, B. (1995). SMART requirements. *ACM SIGSOFT Software Engineering Notes*, 20 (2), 42-47.

Dutch ministry of Infrastructure and Environment. (2011, May 16). *Kamerbrief evaluatie spoedaanpak wegen*. [WWW document]. URL <http://www.rijksoverheid.nl/documenten-en-publicaties/kamerstukken/2011/05/16/kamerbrief-evaluatie-spoedaanpak-wegen.html>.

Rijt, van de, J., & Santema, S.C. (2013). *Prestatieinkoop: met Best Value naar succesvolle projecten*. Driebergen: Graphicom International.

Verheul, D., Rydell, M., & Santema, S.C. (2013). *Prestatieverkoop: klanten winnen met Best Value*. Driebergen: Graphicom International.